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Modeling the Effects of Ice Accretion on the Low-Pressure Compressor and the Overall Turbofan Engine System Performance

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Abstract

During the past two decades the occurrence of ice accretion within commercial high bypass aircraft turbine engines under certain operating conditions has been reported. Numerous engine anomalies have taken place at high altitudes that were attributed to ice crystal ingestion such as degraded engine performance, engine roll back, compressor surge and stall, and even flameout of the combustor. As ice crystals are ingested into the engine and low-pressure compression system, the air temperature increases and a portion of the ice melts allowing the ice-water mixture to stick to the metal surfaces of the engine core. The focus of this paper is on estimating the effects of ice accretion on the low-pressure compressor (LPC), and quantifying its effects on the engine system throughout a notional flight trajectory. In this paper it was necessary to initially assume a temperature range in which engine icing would occur. This provided a mechanism to locate potential component icing sites and allow the computational tools to add blockages due to ice accretion in a parametric fashion. Ultimately the location and level of blockage due to icing would be provided by an ice accretion code. To proceed, an engine system modeling code and a mean line compressor flow analysis code were utilized to calculate the flow conditions in the fan-core and low-pressure compressor and to identify potential locations within the compressor where ice may accrete. Note that there is a baseline value of aerodynamic blockage due to low velocity air near the compressor inner and outer walls and blade surfaces (boundary layer blockage). There is also a blockage due to the blade metal thickness. In this study, the "additional blockage" refers to blockage due to the accretion of ice on the metal surfaces. Once the potential locations of ice accretion are identified, the levels of additional blockage due to accretion were parametrically varied to estimate the effects on the low-pressure compressor blade row performance operating within the engine system environment. This study includes detailed analysis of compressor and engine performance during cruise and descent operating conditions at several altitudes within the notional flight trajectory. The purpose of this effort is to develop the codes to provide a predictive capability to forecast the onset of engine icing events, such that they could help in the avoidance of these events.

It has been reported that ice crystal accretion in gas turbine engines is dependent on the amount of mixed phase conditions (liquid and solid) that exist. In addition, the problem of ice accretion is highly multi-disciplinary, since it involves heat transfer from the air to the compressor metal surfaces. The first phase of this study focuses on addressing the thermodynamic cycle through the engine system code and the mean line flow analysis through the compressor through a flight trajectory. The second phase of this study focuses on the ice particle physics in the flow field that was computed in the first phase.

Nomenclature

Variable Description of COMDES Compressor Code Output

Area1	Rotor leading edge annular area, $in.^2$
A1/A*	Ratio of annular area at the rotor leading edge to the choke area
A*	Choke area of rotor, $in.^2$
AeroBl	Aerodynamic blockage (e.g., 0.98 = 2% blockage)
AthrRotor	Throat area of rotor, $in.^2$
Alfa	Absolute flow angle at stator exit, degrees
Abs MACH	Absolute Mach number
Beta BLADE	Blade angle, degrees
B2 axial	Rotor exit height in axial direction, in.
BetaFlo	Relative flow angle, degrees
BetaBlade	Rotor blade angle, degrees
Beta FLO	Relative flow angle, degrees
C	Absolute velocity, ft/s
ChokeMargin	Choke margin of rotor
Cu	Tangential component of absolute velocity at rotor leading edge, ft/s
Cm	Meridional component of velocity at rotor leading edge, ft/s
Cp	Specific heat at constant pressure
CFM	Volumetric flow rate, ft^3/min
DelRCu	Angular momentum change through blade
Del Enthalpy	Enthalpy rise
Del_H/U^2	Head coefficient (Enthalpy rise/tip speed squared)
Del T	Total temperature rise, R
Deviat	Flow deviation angle from blade trailing edge, degrees
Diff Fct	Diffusion factor
DIFF LOSS	Diffuser, or stator loss coefficient
Efficiency	Efficiency, adiabatic
EffAVG	Rotor average efficiency, adiabatic
GAMMA	Ratio of specific heats (Cp/Cv).
GHP	Horsepower
Incid	Rotor leading edge incidence angle, degrees
NBLAD	Number of rotor blades
Ns	Specific speed
Ns nondim	Specific speed, non-dimensional
OPR	Overall Pressure ratio, total-to-total
PR	Stage pressure ratio, total-to-total
Pdisch	Discharge pressure, psia
Pt	Inlet total pressure, psia
Ps	Static pressure, lbf/ft^2
POTH	Potential ratio hub, absolute axial velocity at hub/axial velocity at mean radius radius (typical value can be 0.9, or 10% lower velocity at hub)
POTS	Potential ratio shroud, absolute axial velocity at tip/axial velocity at mean radius (typical value can be 1.1, or 10% higher velocity at tip)
RPM cor	Shaft rotational speed, corrected to standard temperature conditions of 518.7 R
Rel Mach	Relative Mach number

THK	Rotor blade thickness, in.
R	Radius from centerline at rotor leading edge, in.
Rg	Gas constant, Universal gas constant/mole weight, for air Rg = 53.35 ft-lbf/R
RPM act	Shaft rotational speed, rotations per minute
Reynolds#	Reynolds number
Slip F	Slip factor
Solidity	Solidity
SCFM	Volumetric flow rate, standard cubic feet per minute (14.7 psia, 518.7 R)
Stator	Setting angle at stator, or inlet guide vane exit, degrees
THK	Blade normal thickness, in
Tt	Inlet total temperature, degrees, R
Ts	Static temperature, R
TR	Temperature ratio, total-to-total
Texit	Total temperature at last stage exit, R
U	Blade peripheral velocity at rotor leading edge, ft/sec
U1 corrected	Rotor peripheral tip speed corrected to standard inlet temperature
W act	Mass flow rate, lbm/s
W cor	Mass flow rate corrected to standard pressure and temperature conditions (14.7 psia, 518.7 R)
Ws1/W2	Inlet tip relative velocity/exit relative velocity
W	Relative velocity, ft/s

Subscripts

1	Rotor inlet (leading edge)
2	Rotor exit (trailing edge)
3	Radial diffuser vane inlet
4	Radial diffuser exit

Introduction

In this paper, several computational tools are used to estimate the effects that ice accretion in the low-pressure compression system has on the engine performance. Here we utilize a representative engine in the 40,000 lbf thrust class and a notional flight trajectory that is appropriate for a commercial aircraft equipped with this engine.

Many of the reported engine icing events (Refs. 1 and 2) occurred at altitude ambient temperatures exceeding the International Standard Atmosphere (ISA) by an additional 18 to 36 Rankin (Fig. 1). In this paper the Numerical Propulsion System Simulation (Ref. 3) (NPSS) code is used. NPSS is an advanced thermodynamic cycle code written in an object-oriented language for system modeling of gas turbine engines. The code provides the overall component-level performance and flow conditions of pressures and temperatures. However, the details within the stages and blade rows are not provided at this level of fidelity. Therefore, COMDES (Ref. 4), a mean line compressor flow code was utilized to provide the flow conditions within each blade row of the multi-stage low-pressure compressor. The COMDES and the NPSS codes were coupled such that they exchange boundary conditions iteratively at each operating point through the flight trajectory. With this combined engine-compressor performance estimation tool, the notional engine is “flown” over the flight trajectory to determine the flow conditions, including the pressure and temperature between each rotor and stator blade row of the low-pressure compressor. Based on preliminary experimental results of ice accretion on a stator vane (Ref. 5), a narrow range of static air temperature from 509 to 515 Rankin was tentatively utilized to identify the stator vane that may be

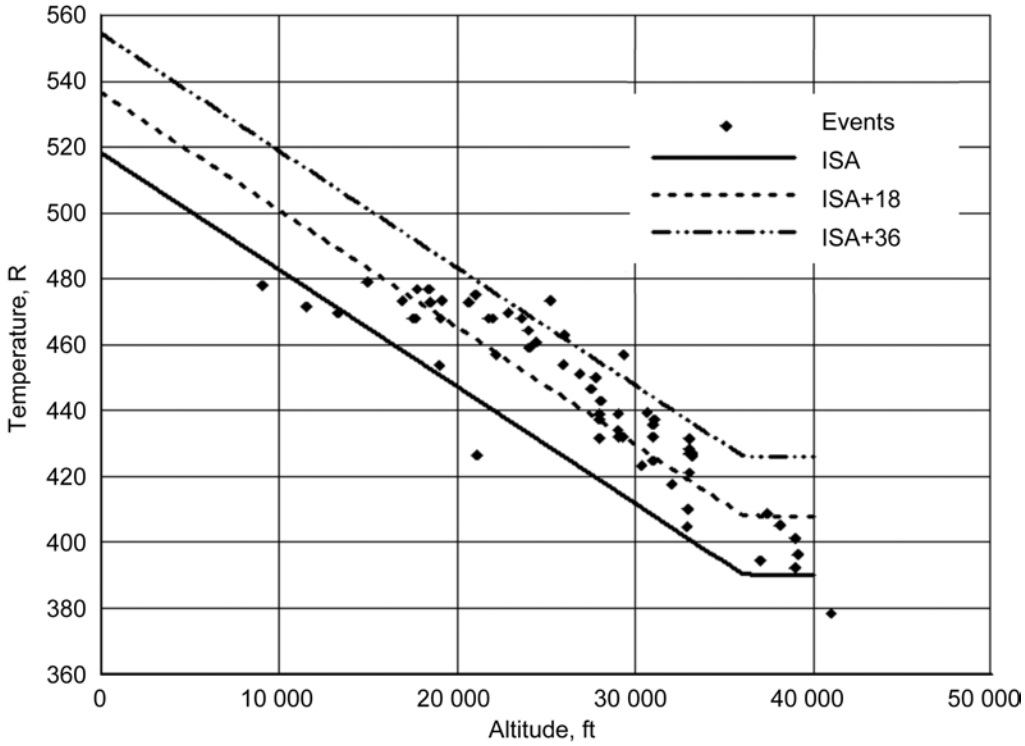


Figure 1.—Engine icing events with International Standard Atmosphere (ISA) and elevated (+18, +36) temperatures plotted (Refs. 1 and 2).

susceptible to ice accretion. However, it is recognized that other parameters such as relative humidity, ice and water content in the fluid and heat transfer coefficient are key parameters that must be considered, but which are not currently included in the NPSS-COMDES code analyses. Therefore, for an initial study on the effects of ice accretion on engine performance, the blockages within the identified compressor stator vane were parametrically varied to estimate the effects on the performance of the low-pressure compressor blade row. This was done throughout the flight trajectory. The NPSS-COMDES computations were run at constant engine thrust at a given altitude.

The flight trajectory includes two cruise altitudes and one descent profile. The first cruise altitude is at 35,000 ft, where the engine thrust is reduced from 100 percent down to 69 percent of maximum thrust at the end of the cruise. The aircraft then proceeds to 39,000 ft where again the thrust reduces from 100 percent down to 79 percent maximum thrust at that altitude. The engine is then spooled back to 10 percent maximum thrust at 39,000 ft as it prepares to descend in altitude. The engine is maintained at 10 percent maximum thrust as it descends to 10,000 ft. This study has determined that there are several potential locations in the flight path where, based on the selected temperature range, icing may occur in the low-pressure compression system.

In order to perform the study, it was necessary to have the details of the LPC geometry to estimate the flow conditions between each blade row with the mean line compressor flow analysis code. To that end, a conceptual design was completed to determine key dimensions within the LPC. Details of the LPC design are provided in the next section in this paper. The baseline engine performance was computed with the NPSS-COMDES code, across the complete flight trajectory. The locations within the LPC where ice accretion could be initiated were determined. At those operating points and locations within the LPC, additional blockage was applied and the NPSS-COMDES code was used to estimate the effects on the LPC and the overall engine performance.

Analysis of the simulation results indicate that as the amount of blockage is increased, the LPC pressure ratio, choke margin, efficiency, and stall margin are reduced. All of these have a net detrimental

effect on engine performance causing an increase in turbine inlet temperature and an increase in the specific fuel consumption.

Once the flow field results from the NPSS code have been completed, they are provided to GlennICE as boundary conditions. GlennICE is a two-dimensional ice accretion code with a model for multiphase ice accretion. Recently (Ref. 6) several changes were made to GlennICE in order to model the ice crystal behavior. Four modifications have been made to GlennICE for handling ice particle impacts. First, there were changes made to the grid inputs to handle internal flows and more complex grid topologies. Second, there are the modifications to the particle trajectory routine that track the energy transfer to and from an ice particle. Third, there is a model for mass loss due to erosion and bouncing in a mixed phase environment. Finally, there are changes to the mass and energy balance whereby the incoming ice particles can add to the ice mass at the surface. In addition to these modifications, an analysis was performed to assess if coupling between the air and ice phases is necessary.

This technical memorandum is a more detailed version of the study that was reported in (Ref. 7), as this report contains the full computational result output listings from the engine system thermodynamic cycle and the compressor flow analysis codes.

Methodology

Design of Fan-Core and Low-Pressure Compressor

Due to the lack of publicly available, non-proprietary engine geometry and performance data, a notional engine was assumed for this study, and a conceptual design of its fan and low-pressure compressor (LPC) was performed. The conceptual design of the fan and LPC was completed by treating the fan as two separate components. This method facilitated the modeling of these regions with the NPSS engine system code, which treats the fan-tip and the fan-core together with the LPC as two separate compressors. Thus, the conceptual design and analysis of the fan-core and the LPC was executed with the mean line flow code as one 5 stage compressor. The 39.25-in.-tip radius fan was sized to accommodate the 1122 lbm/sec flow rate through the bypass duct at the design point. The focus of this effort, however, was on the fan-core and the LPC, since that is the region where icing has been observed to occur in several turbine engines under certain operating conditions. The overall design point objectives for the fan-tip and the fan-core with LPC are described in Table 1. The conceptual sizing study of the fan and LPC flow path was completed with the COMDES mean line compressor flow analysis code. The resulting flow path showing the rotor blade and stator vane leading and trailing edges is illustrated in Figure 2. The key geometric and design point aerodynamic details of the fan-core and LPC resulting from the mean line conceptual design are listed in Appendix A, and the mid-span values of key parameters are summarized in Table 2.

TABLE 1.—THE FAN AND LOW-PRESSURE COMPRESSOR (LPC) DESIGN POINT OBJECTIVES

Fan-tip	
Flow, corrected, lbm/sec	1122
Pressure ratio	1.701
Efficiency	91.1
Shaft speed, corrected, rpm	3761.1
Fan-core and LPC	
Flow, corrected, lbm/sec	172
Pressure ratio	2.23
Efficiency	87.0

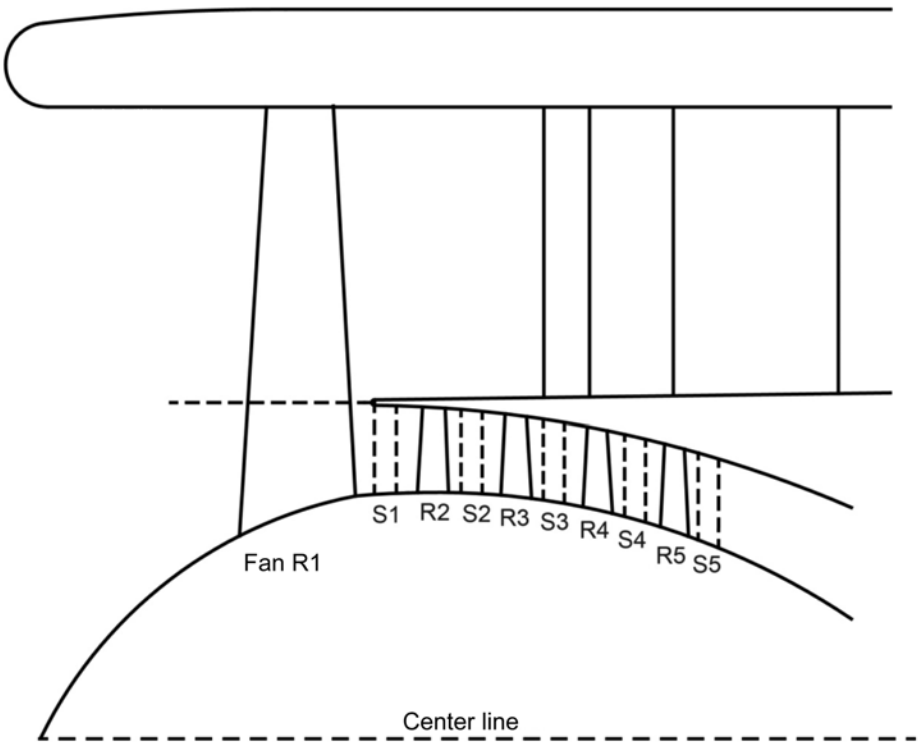


Figure 2.—The cross section of the low-pressure compression system of a representative modern turbofan aircraft engine in the 40,000 thrust class.

TABLE 2.—THE FAN-CORE AND LPC DESIGN POINT GEOMETRIC AND AERODYNAMIC PARAMETERS

	Fan-hub Rotor 1	Fan-hub Stator 1	LPC Rotor 2	LPC Stator 2	LPC Rotor 3	LPC Stator 3	LPC Rotor 4	LPC Stator 4	LPC Rotor 5	LPC Stator 5
Leading edge										
Pressure static, psia	13.67	14.67	16.61	18.785	20.12	22.45	23.91	26.41	27.88	30.04
Temperature static, R	508.0	522.1	542.22	564.55	576.56	597.76	609.40	629.48	640.0	656.21
Mach no., abs.	0.38	0.638	0.46	0.534	0.42	0.499	0.39	0.449	0.34	0.417
Blade angle	47.20	35.4	42.3	30.6	23.5	31.5	43.80	32.4	44.80	33.0
Abs flow angle	0	36.15	0	31.22	0	32.18	0	33.00	0	0
Tip radius, in.	20.63	20.6171	20.5304	20.3433	20.0960	19.6905	19.3131	18.8420	18.2524	17.6890
Hub radius, in.	12.51	15.1021	15.2113	15.2026	15.0546	14.8484	14.3197	13.7204	13.0749	12.2606
Trailing edge										
Pressure static, psia	14.69	16.35	18.76	19.79	22.40	23.56	26.19	27.53	30.06	31.22
Temperature static, R	521.86	539.72	563.96	573.81	597.00	606.82	627.60	637.69	655.84	663.90
Mach no, abs.	0.63	0.481	0.53	0.448	0.49	0.413	0.46	0.368	0.41	0.338
Blade angle	12.7	0	23.5	0	23.5	0	23.5	0	23.5	0
Abs flow angle	36.93	0	31.59	0	32.30	0	32.27	0	33.24	0
Tip radius, in.	20.63	20.5733	20.4459	20.1704	19.9256	19.4117	19.0737	18.4850	17.9280	17.2148
Hub radius, in.	15.0	15.1901	15.2230	15.2026	14.8484	14.4742	13.9111	13.2848	12.4811	11.6228

Approach

The approach which was deemed best suited for the analysis of the engine was the use of three specialized computer codes. The framework for the engine system analysis was the NPSS code, which provided the thermodynamic cycle analysis of the complete engine system. However, the NPSS analysis by itself would not have provided the fluid condition at each blade row within the multistage compression system, as it typically lumps the entire component into one characteristic performance map. The traditional approach therefore was considered inadequate for the current icing study, since it is critical to model the conditions between each of the blade rows in the LPC. It was decided to utilize the COMDES mean line compressor flow analysis code to determine the performance of each blade row within the fan-core and multistage LPC. This was accomplished by tightly coupling the NPSS code to the COMDES code such that the NPSS code provided the required inlet boundary conditions and shaft speed to the COMDES code. In this new procedure, as the NPSS code is executed at each operating point on the flight trajectory, the COMDES code is executed simultaneously to iteratively determine the overall pressure ratio, temperature ratio, and efficiency of the fan-core and LPC, which are then provided to the NPSS code. As a result of this iterative process, the details of the flow conditions between each rotor and stator of the LPC are also determined.

After the complete flight trajectory has been computed with the combined NPSS-COMDES codes, the conditions of pressures, temperatures, velocities, Mach number, and flow rates at each blade and stator row were provided to the GlennICE ice accretion code for further analysis. The GlennICE code then estimates whether ice accretion can occur at any of the stator vanes of the LPC, at any of the operating points in the flight trajectory.

Flight Trajectory

A typical flight trajectory was generated using the Flight Optimization System (FLOPS) code (Ref. 8) for a commercial aircraft. The flight trajectory illustrated in Figure 3 includes a climb, two cruise

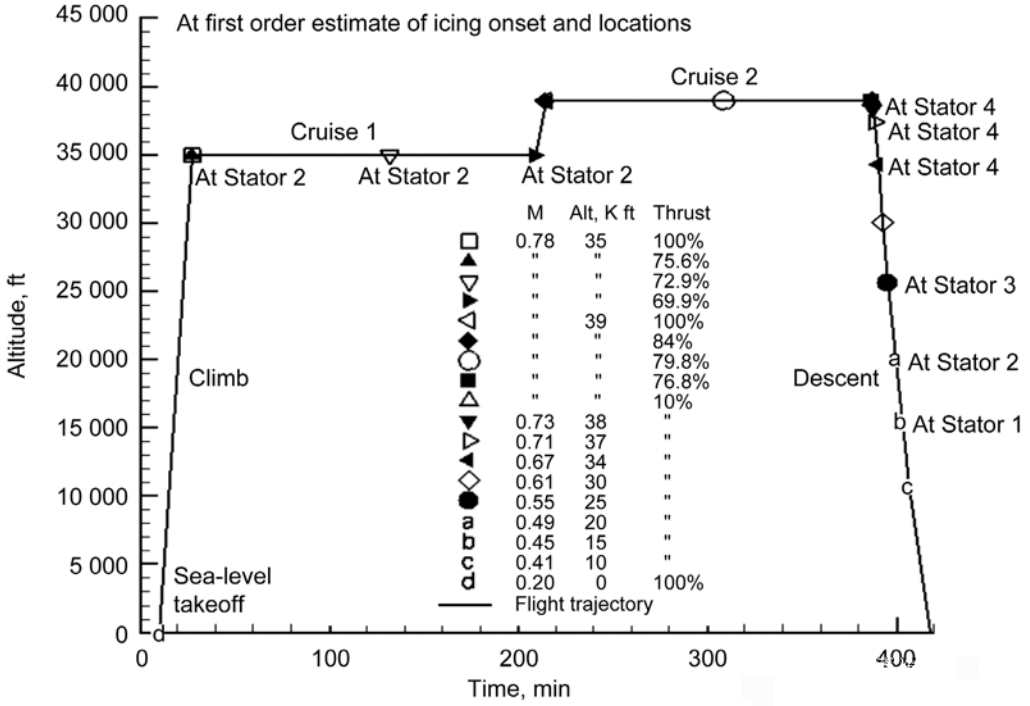


Figure 3.—A flight trajectory consisting of two cruise altitudes and a descent profile. Locations in the flight trajectory are indicated where engine icing may occur at altitude and percent-maximum thrust. Estimated stage stator locations of ice accretion are shown at assumed temperature range.

altitudes, and one descent profile. The detailed output listing of the flight trajectory is included in Appendix B. The first cruise altitude is at 35,000 ft, where the engine thrust is reduced from 100 percent down to 69 percent of maximum thrust at the end of this cruise segment. The aircraft then proceeds to another cruise condition at 39,000 ft where again the thrust is reduced from 100 percent down to 79 percent maximum thrust at that altitude. As the aircraft prepares to go into the descent mode, the engine is then spooled back to 10 percent of maximum thrust at 39,000 ft. Through the remainder of the descent conditions studied, the engine is maintained at 10 percent of maximum thrust down to 10,000 ft. Since most of the suspected engine icing events, due to ice crystal ingestion, have historically occurred during the cruise and descent segments at temperature well above ISA, we focused our analyses on these segments of the flight trajectory. Reducing the thrust during descent to a value lower than 10 percent of maximum thrust put several of the stages in the LPC excessively close to their surge limit. For the analyses that follow the engine was flown initially at an altitude of 35,000 ft at cruise and 100 percent maximum thrust. The ambient temperature at all altitudes was specified as being elevated by 22 Rankin above the ISA (see Fig. 1).

Fan-Core and LPC Baseline Performance Characteristic Maps

Following the conceptual design of the fan-core and low-pressure compressor, the off-design characteristic performance maps were generated with the mean line compressor flow analysis code. Note that this was done separately with the COMDES code in the stand-alone mode, and not with the coupled NPSS-COMDES trajectory analysis code. The compressor performance map was generated in order to illustrate the location of the engine operating points along the vehicle flight trajectory. The fan-core and LPC pressure ratio and efficiency maps generated for the baseline case, without ice accretion. Speed lines from 110 to 40 percent were generated from choke to surge by varying the flow rate. Choke was defined as a point on the speed line where the stage efficiency becomes significantly low to a point where the engine would not be normally operated. Surge was defined as the point where the relative velocity ratio through the rotor reached a peak value near 1.9. The resulting baseline map of pressure ratio versus corrected rotational speed (referenced to a standard inlet temperature of 518.7 Rankin) and corrected flow (referenced to a standard inlet temperature of 518.7 Rankin and pressure of 14.7 psia) is shown in Figure 4. The baseline overall compressor map of efficiency versus corrected speed and flow are illustrated in Figure 5. The plot file of the overall compressor maps shown in Figures 4 and 5 are listed in Appendix C and the complete output listing of the mean line compressor flow analysis code, along the entire baseline performance map is listed in Appendix D.

The compressor operating points with baseline levels of blockage, that is, no additional blockage due to simulated ice accretion, along the engine operating line are superimposed onto the performance maps in Figures 4 and 5, and the corresponding compressor code detailed analysis results are listed in Appendix E. The plot file for the air flow rate, versus overall pressure ratio and overall efficiency of the fan-core and LPC, along the engine operating line, is listed in Appendix F.

Aero-Thermodynamic Engine and LPC Analysis

In this study the computational tools shown in Figure 6 are used to estimate the effects that ice accretion has on the performance of the low-pressure compression system and on the engine. The NPSS code is used for the thermodynamic cycle analysis throughout the flight trajectory. As mentioned earlier, the COMDES mean line compressor flow analysis code is coupled and runs concurrently with the NPSS code. The two codes exchange boundary conditions at every operating point throughout the flight trajectory. The use of the COMDES code eliminates the need for component performance maps that NPSS has traditionally used in order to achieve thermodynamic equilibrium of the engine components at a given operating point. In the mean line compressor code additional blockages can be added to any blade row in the compression system, and their effects on engine performance are calculated and communicated to the NPSS system code.

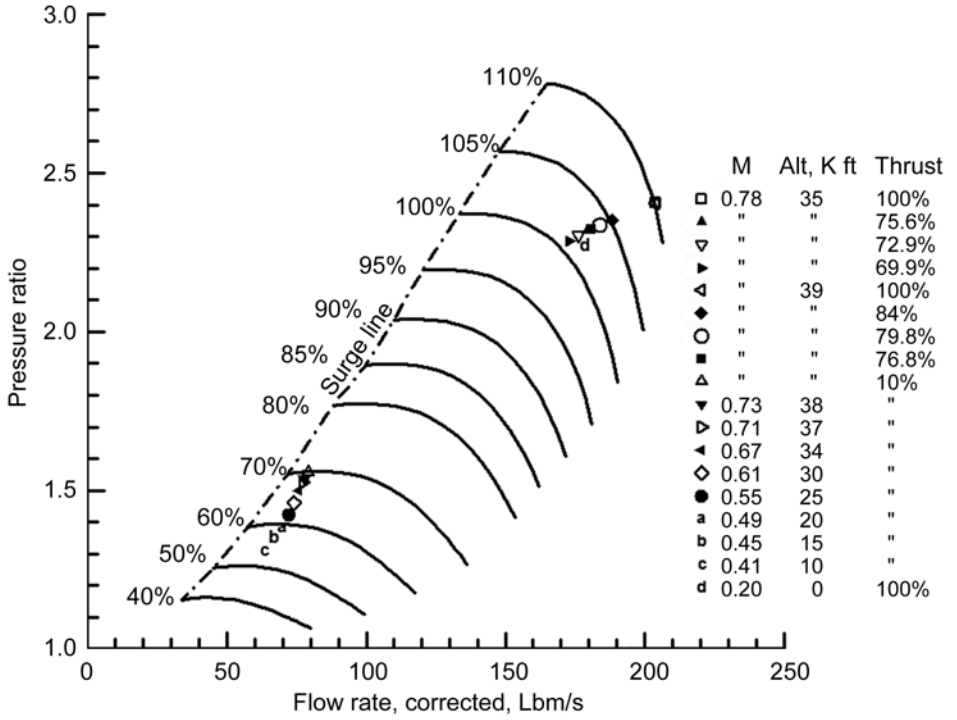


Figure 4.—Fan-core and low-pressure compressor (LPC) stage total pressure ratio versus corrected flow rate for a range of corrected speed lines. Operating points at key locations in the flight trajectory are also indicated on the baseline map.

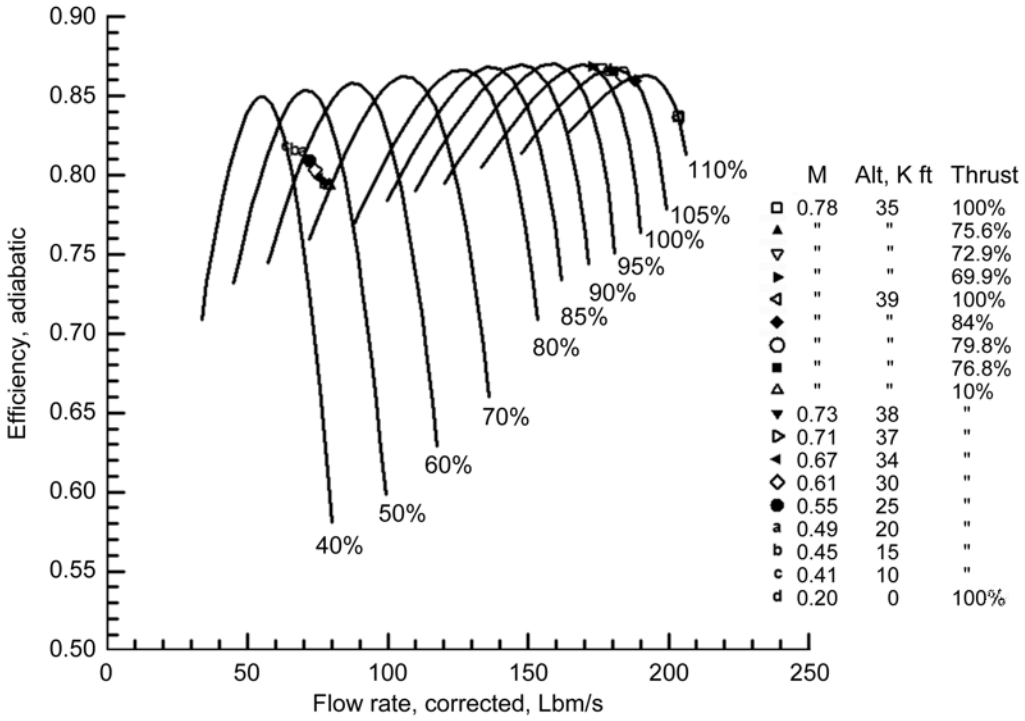


Figure 5.—Fan-core and low-pressure compressor (LPC) stage efficiency versus corrected flow rate for a range of corrected speed lines. Operating points at key locations in the flight trajectory are also indicted on the baseline map.

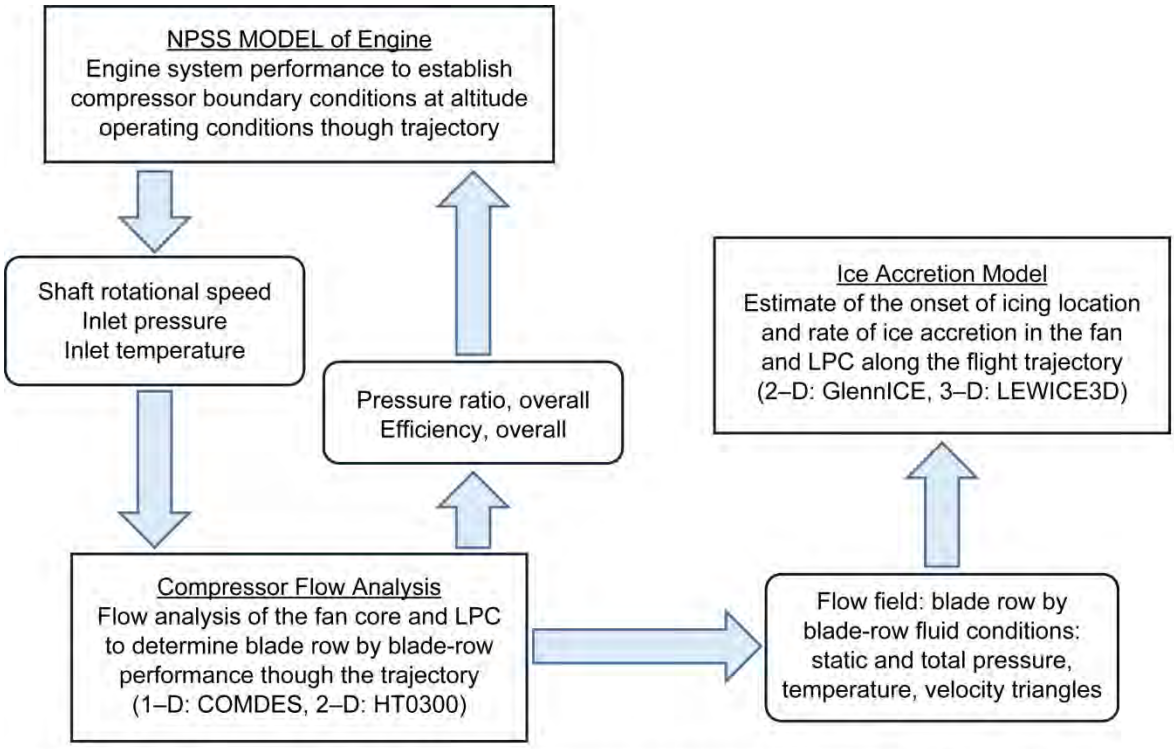


Figure 6.—The approach for the engine icing performance estimation consists of three distinct functions. The codes exchange boundary conditions of key flow conditions such as pressure, temperature, and flow.

An engine system thermodynamic cycle analysis through the vehicle trajectory was computed with the NPSS-COMDES code in order to generate a set of operating points for the baseline case, that is, without any additional blockages due to ice accretion. These results were plotted onto the baseline LPC performance maps in Figures 4 and 5, and also provided as detailed boundary conditions to subsequent analysis with the GlennICE ice accretion code. Appendix G is a listing of the NPSS cycle analysis through the flight trajectory, with baseline blockages.

The next phase of this study involved simulating the effects of ice accretion with the addition of blockage at specific blade rows. Certain assumptions have been made in this analysis. The compression system icing occurs in the fixed components such as the stators, that is, there is no ice accretion on the rotors. However, the wake of the additional ice blockage in a stator is assumed to propagate to the inlet of the downstream rotor, causing an increased level of aerodynamic blockage. Since no limits were placed on the engine analysis through a control module, the engine is operating in a constant thrust mode while blockage is added incrementally at a specific stator, in order to simulate the effects of ice accretion. A static temperature range is assumed where ice accretion may occur. This range, based on preliminary results from laboratory tests (Ref. 5), is between 509 and 515 Rankin. Note that the location and fluid conditions where ice accretion initiates will be further verified by means of the GlennICE analysis, which takes into consideration other effects such as the pressure, relative humidity, and ice-water content of the air throughout the compression system. Other limitations in the application of the NPSS-COMDES analysis codes are also realized. Humidity is not currently taken into account, nor is the multi-phase flow of ice crystals and water droplets considered. These will need to be included in future analyses, in order to improve the codes' performance predictive accuracy in a high ice-water content environment. Currently the unsteadiness effects due to rotor-stator interactions are not considered in either the compressor flow analyses, or the ice accretion model. Therefore, any ice accretion shapes obtained as a result of this study would need further validation.

It has been confirmed in Reference 5 that ice accretes on the vane over time. However, the current study is not considering time directly, that is, it is being performed as a quasi-steady state analysis. The flight trajectory in Figure 3 indicates the stator row which has been identified to have static temperatures within the range assumed to support ice accretion. At that particular stator the aerodynamic blockage is increased from the baseline values parametrically from 10 to 40 percent to simulate the effect that increasing levels of ice accretion can have on the LPC and the overall engine performance.

The engine system analysis of the NPSS cycle code, with parametrically added blockages at select stator vanes, is listed in Appendix H, while the corresponding flow analysis of the fan-core and LPC with the COMDES code is listed in Appendix I.

To gain understanding of how the fan-core and LPC perform within the engine system through the flight trajectory, the overall pressure ratio and efficiency are illustrated in Figures 7 and 8 as a function of additional blockage. It was observed that during the cruise condition at 35,000 ft the compressor efficiency declined sharply as the additional blockage is increased to 27 percent, where it appeared to choke. This resulted in the engine system model unable to run beyond that point. At 27 percent additional blockage, there is a 6 percent reduction in overall fan-core and LPC component efficiency (Fig. 8), resulting in deteriorated engine performance. To maintain constant thrust level of the baseline engine, the engine with simulated ice blockage of 27 percent resulted in a 59 Rankin rise in turbine inlet temperature as shown in Figure 9.

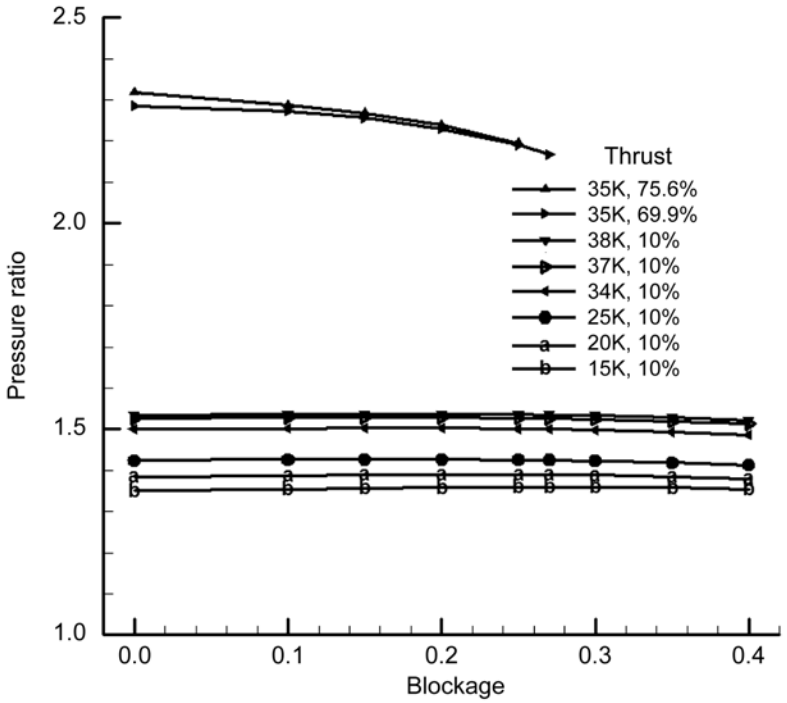


Figure 7.—The effects of additional blockage due to ice accretion on the overall fan-core and LPC pressure ratio along the flight trajectory.

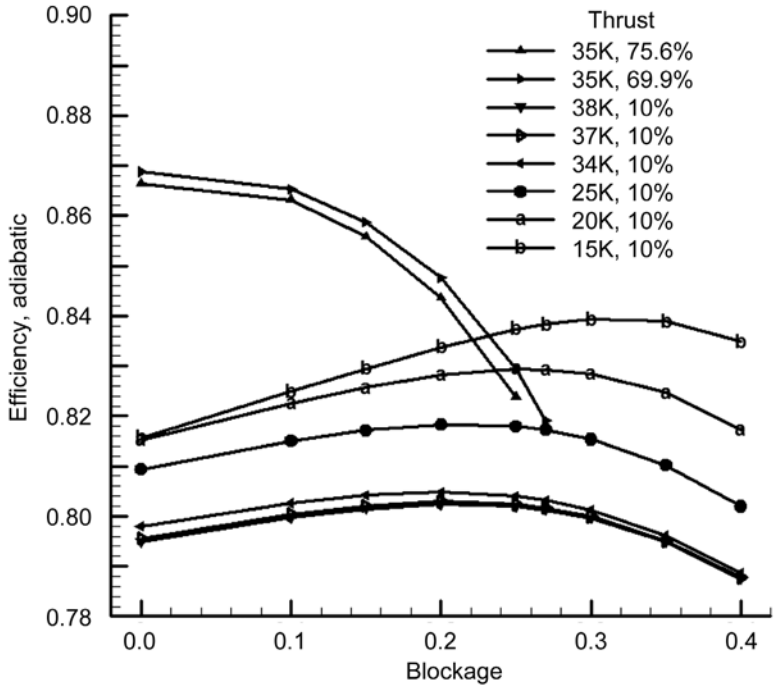


Figure 8.—The effects of additional blockage due to ice accretion on the overall fan-core and LPC efficiency along the flight trajectory.

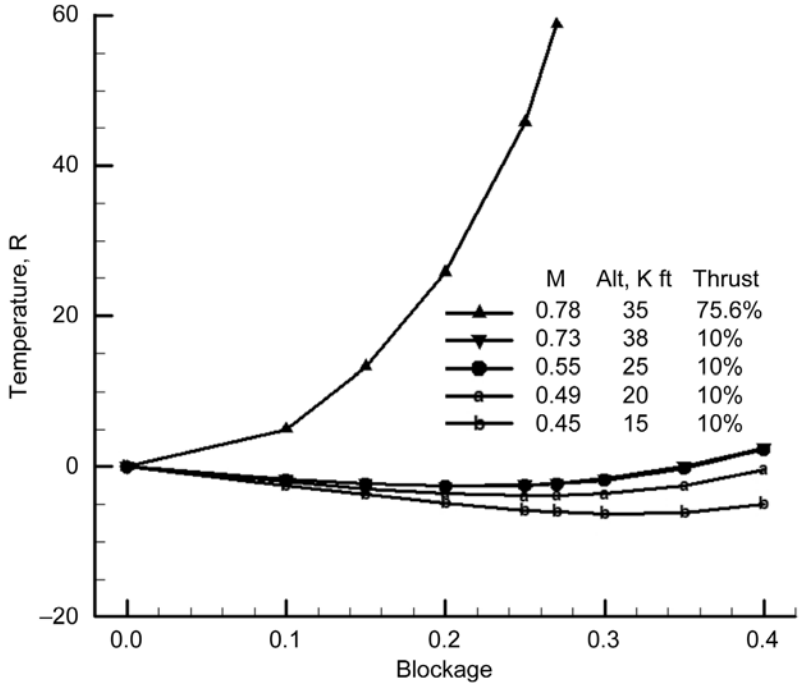


Figure 9.—Effect of additional blockage in the LPC on turbine inlet temperature.

To further understand the effects of blockage on stage efficiency and operability, the individual stage efficiency and relative velocity ratio were plotted with respect to blockage at several key operating points in the flight trajectory, and are illustrated in Figures 10 to 19. During the cruise at 35,000 ft at an engine operating point where the thrust is reduced to 75.6 percent of the maximum, as blockage is increased in the stator of stage 2, the efficiency falls off rapidly in both stages 2 and 3 of the LPC (Fig. 10). Eventually at blockages higher than 27 percent in the stators, the efficiency of stages 2 and 3 fall off rapidly, indicating that they are near choke. Likewise, the rotor relative velocity ratio of stage 3 begins to approach, but does not exceed the surge limit (Fig. 11), since at this operating point, stages 2 and 3 appear to choke before the surge limit is reached in stage 3.

During descent, where the thrust is set to 10 percent of the maximum, the effect of the additional blockage on the fan-core and LPC did not have a significant effect on the overall pressure ratio and its overall efficiency, as illustrated in Figures 12 to 19. In general as the additional blockage increases to 40 percent in the stage that includes the affected stator blade row, the stage efficiency rises then falls. The same effect but to a much greater degree is seen in the adjacent stage downstream. This can be attributed to a temporary improvement in the aerodynamic matching of the stages due to improved incidence angles during all phases of the descent mode, which are at off-design operating conditions. However, as the blockage further increases towards 40 percent, the efficiency begins to decrease. In every instance during the descent segment of the trajectory, the additional blockage causes the stage surge margin limit to be reached or exceeded, effectively causing the engine to experience surge that occurs earlier than in the baseline case without blockage. While additional blockage produces a dramatic increase in the turbine inlet temperature during operation at cruise, during descent, there is minimal effect as was illustrated in Figure 9.

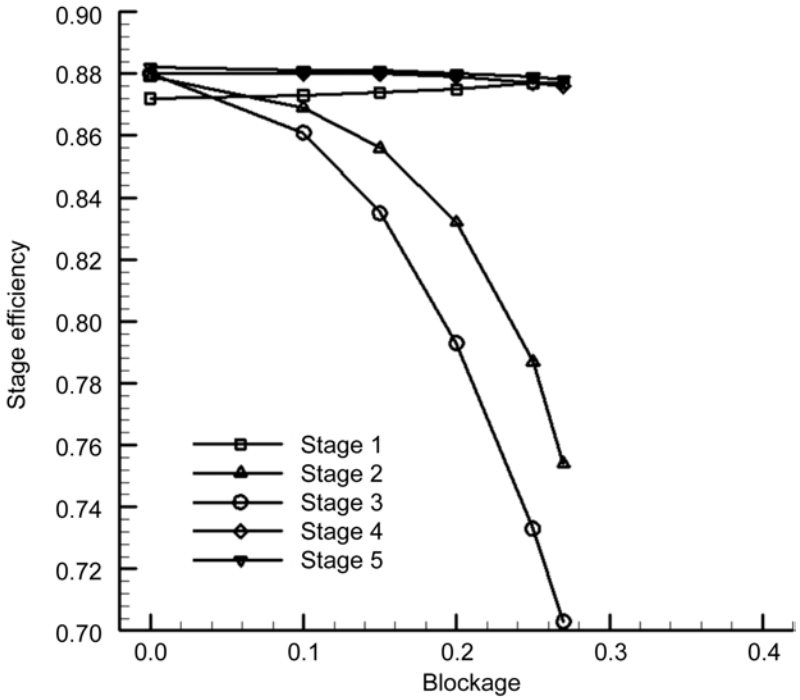


Figure 10.—The effects of additional blockage due to simulated ice accretion applied to the stage 2 stator on the LPC stage efficiencies at a cruise altitude of 35,000 ft with an inlet Mach number of 0.78 and 75.6 percent of maximum thrust.

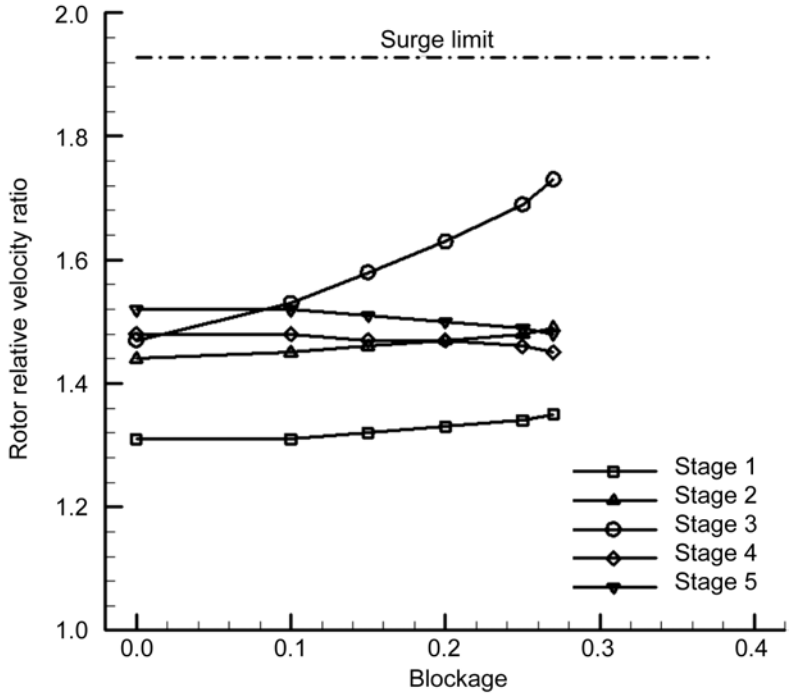


Figure 11.—The effects of additional blockage due to simulated ice accretion applied to the stage 2 stator on the LPC rotor relative velocity ratio at a cruise altitude of 35,000 ft with an inlet Mach number of 0.78 and 75.6 percent of maximum thrust.

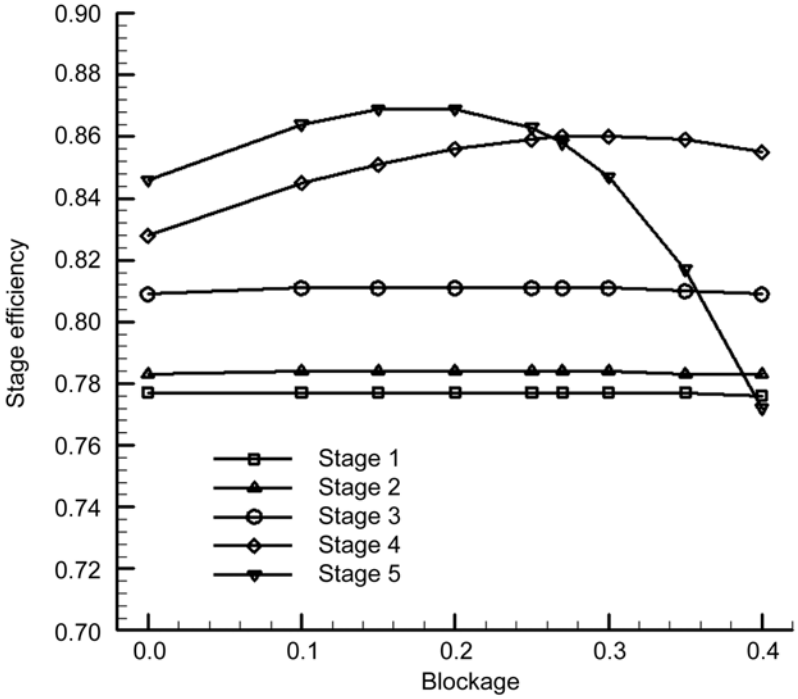


Figure 12.—The effects of additional blockage due to simulated ice accretion applied to the stage 4 stator on the LPC stage efficiencies during descent at an altitude of 38,000 ft with an inlet Mach number of 0.73 and 10 percent of maximum thrust.

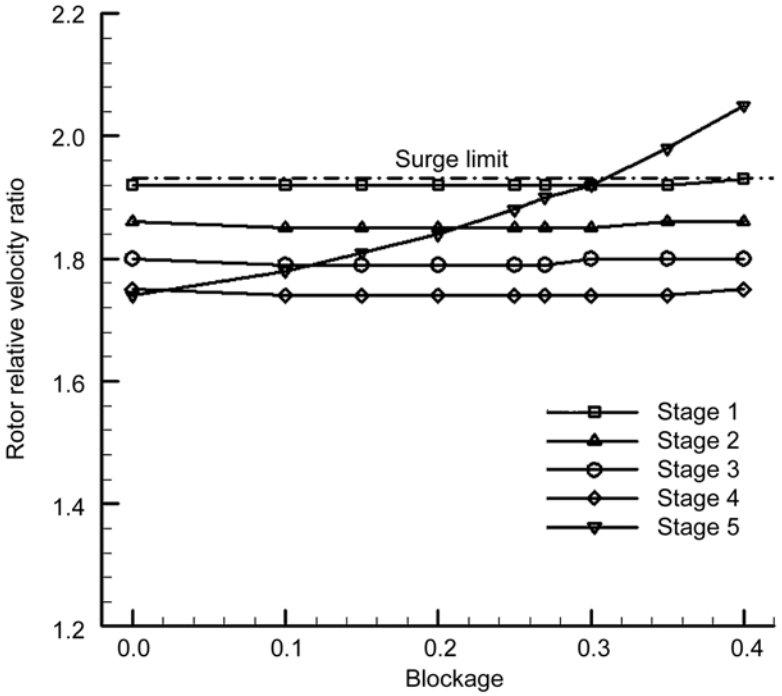


Figure 13.—The effects of additional blockage due to simulated ice accretion applied to the stage 4 stator on the LPC stage relative velocity ratio during descent at an altitude of 38,000 ft with an inlet Mach number of 0.73 and 10 percent of maximum thrust.

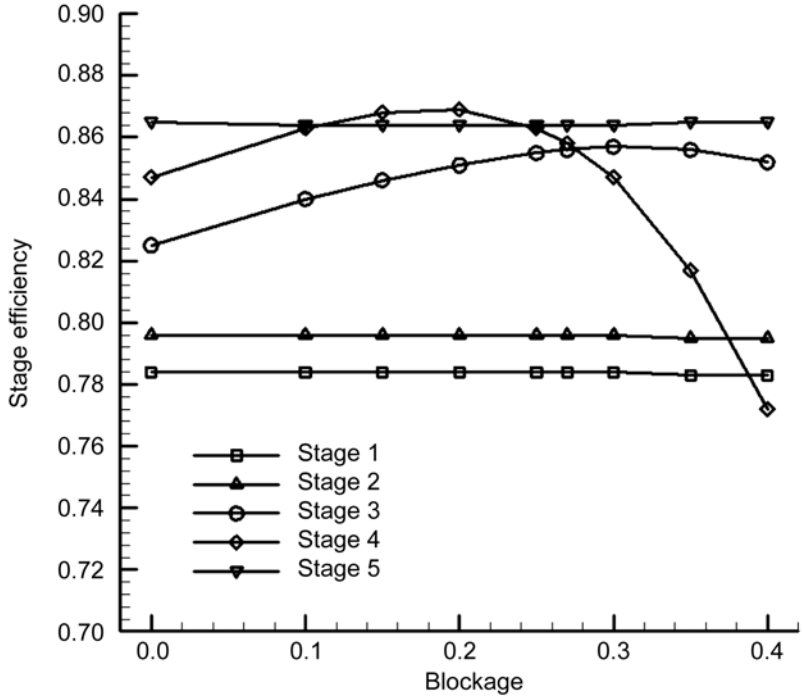


Figure 14.—The effects of additional blockage due to simulated ice accretion applied to the stage 3 stator on the LPC stage efficiencies during descent at an altitude of 25,000 ft with an inlet Mach number of 0.55 and 10 percent of maximum thrust.

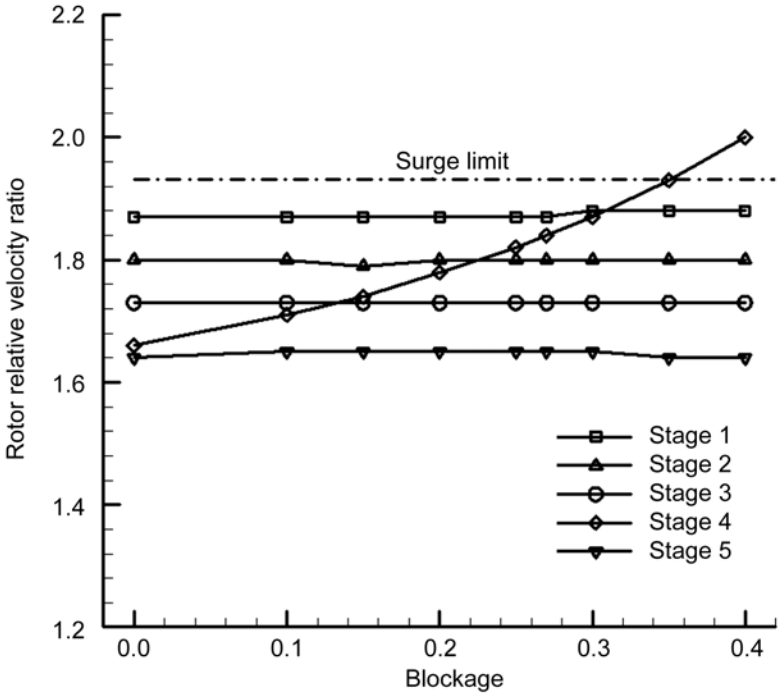


Figure 15.—The effects of additional blockage due to simulated ice accretion applied to the stage 3 stator on the LPC stage relative velocity ratio during descent at an altitude of 25,000 ft with an inlet Mach number of 0.55 and 10 percent of maximum thrust.

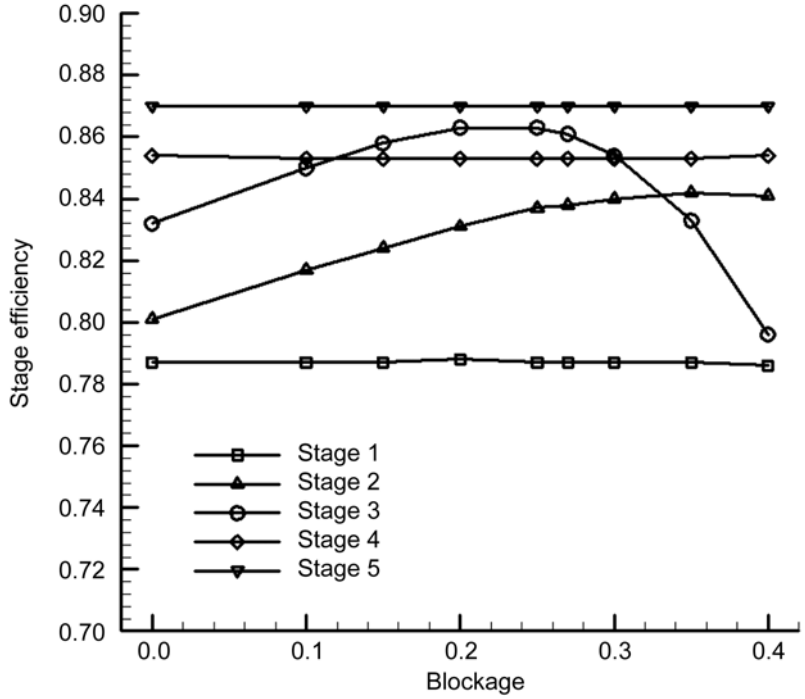


Figure 16.—The effects of additional blockage due to simulated ice accretion applied to the stage 2 stator on LPC stage efficiencies during descent at an altitude of 20,000 ft with an inlet Mach number of 0.49 and 10 percent of maximum thrust.

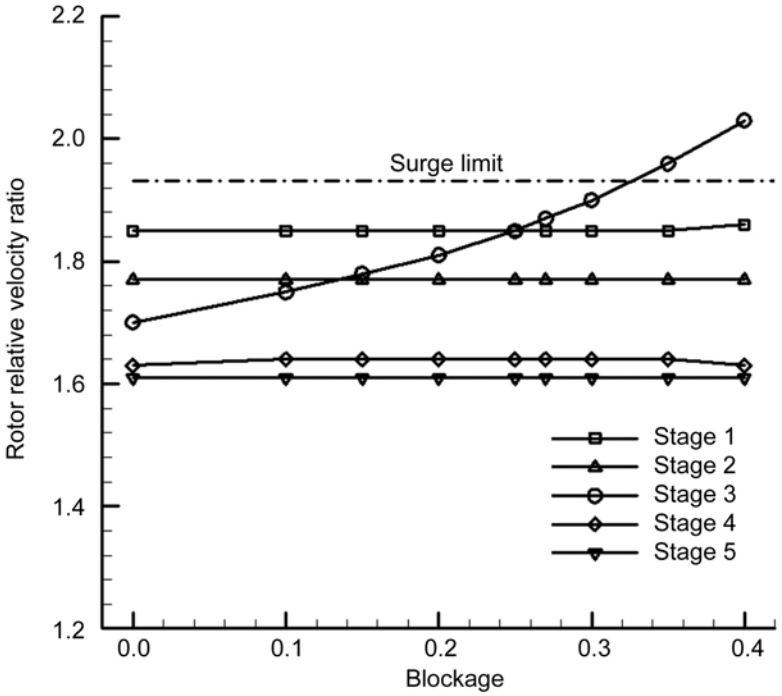


Figure 17.—The effects of additional blockage due to simulated ice accretion applied to the stage 2 stator on the LPC stage rotor relative velocity ratio during descent at an altitude of 20,000 ft with an inlet Mach number of 0.49 and 10 percent of maximum thrust.

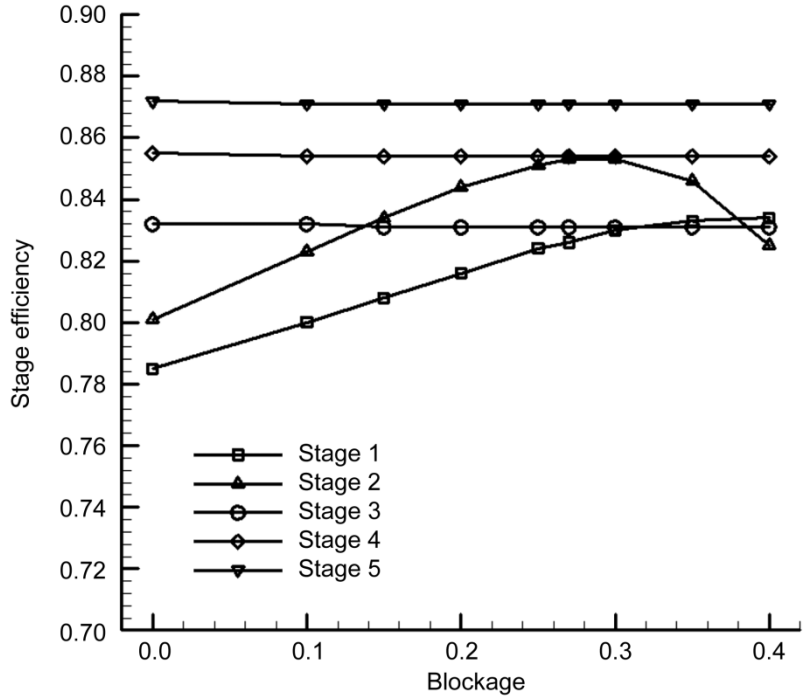


Figure 18.—The effects of additional blockage due to simulated ice accretion applied to the stage 1 stator on the LPC stage efficiencies during descent at an altitude of 15,000 ft with an inlet Mach number of 0.45 and 10 percent of maximum thrust.

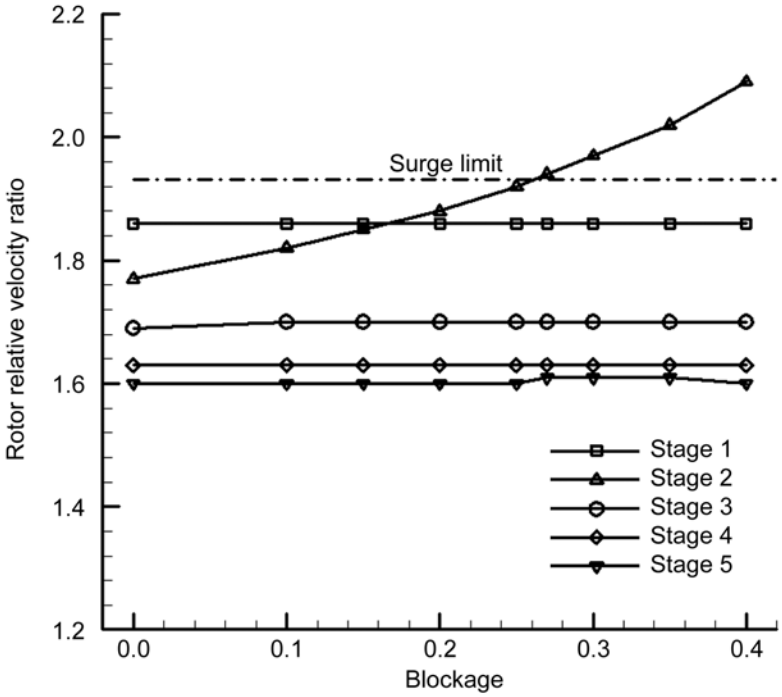


Figure 19.—The effects of additional blockage due to simulated ice accretion applied to the stage 1 stator on the LPC stage rotor relative velocity ratio during descent at an altitude of 15,000 ft with an inlet Mach number of 0.45 and 10 percent of maximum thrust.

As the altitude decreases during descent the potential for ice accretion moves to the upstream stages. As the altitude decreases, the inlet temperature increases, causing the assumed temperature where icing can accrete, to be reached in earlier compressor stages. In order to maintain equivalent thrust levels as that of the baseline engine, the engine system study has shown that during descent mode additional blockage has only a minimal effect on fan-core and LPC pressure ratio (Fig. 7), efficiency (Fig. 8), and likewise on the turbine inlet temperature (Fig. 9) at 25,000, 20,000, and 15,000 ft. Appendix J lists the plot file for Figures 7 and 8 for the overall pressure ratio and efficiency versus parametrically varying blockages along the engine operating line.

Appendix K lists the plot data for the rotor relative velocity ratio and efficiency of each stage with parametrically varying blockages along the engine operating line, as illustrated in Figures 10 to 19.

Parametric Blockage Effect on Fan-Core and LPC Performance Characteristic Maps

To illustrate the sensitivity of the fan-core and LPC performance characteristic to additional blockage in one of the compressor stages, a study was done independent of the engine system. The aerodynamic blockage in one of the stages was varied parametrically from the baseline value, and a complete characteristic map was created using the COMDES compressor flow analysis code. For that study, the stage 2 stator was selected arbitrarily as the location where the blockage was applied, and varied between 10 percent and 40 percent blockage, in 5 percent increments. The resulting overall pressure ratio and efficiency for the fan-core and LPC are illustrated in Figures 20 and 21, and the plot files for the figures are listed in Appendix L. The data for that plot file was obtained from the detailed compressor flow analysis results with the COMDES code through the entire map with parametrically varied blockages in the stator of stage 2, listed in Appendix M. The “blocked” compressor maps in Figures 20 and 21 were created to support a separate activity focused on simulating engine rollback due to ice buildup (Ref. 9). These maps were provided to the researchers who utilized the C-MAPSS40K engine controls modeling code to simulate the engine rollback due to the loss of pressure produced by the fan-core and LPC.

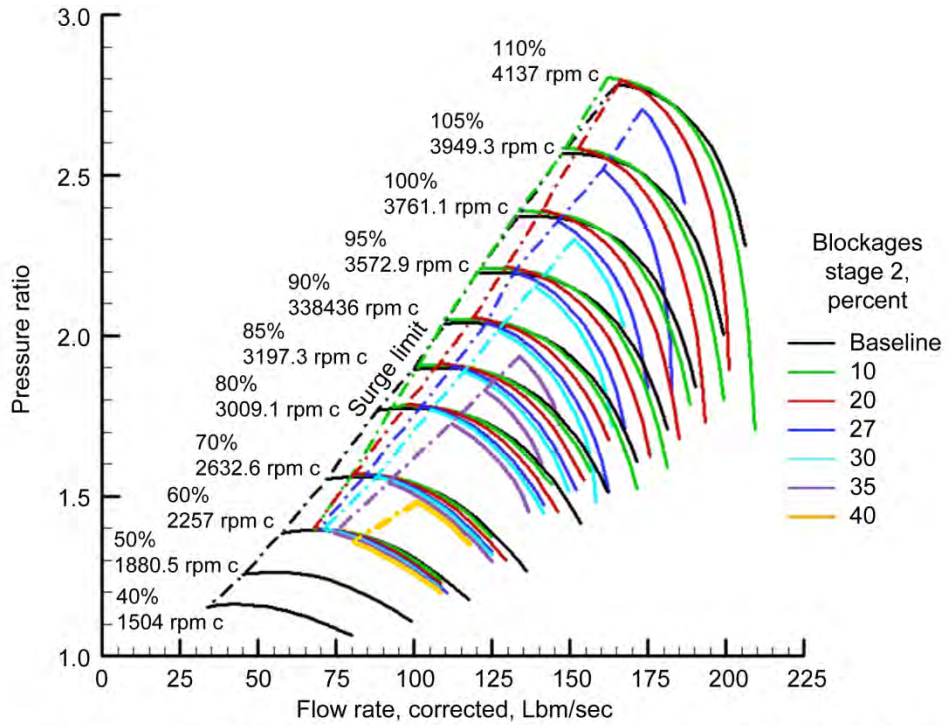


Figure 20.—Overall pressure ratio of the fan-core and low-pressure compressor, as a function of additional blockages applied to the LPC stage 2 stator. Note the reduction in pressure and surge margin, with increasing level of blockage applied to stator 2. (The compressor flow analysis listing is in Appendix L and the plot file is in Appendix M.)

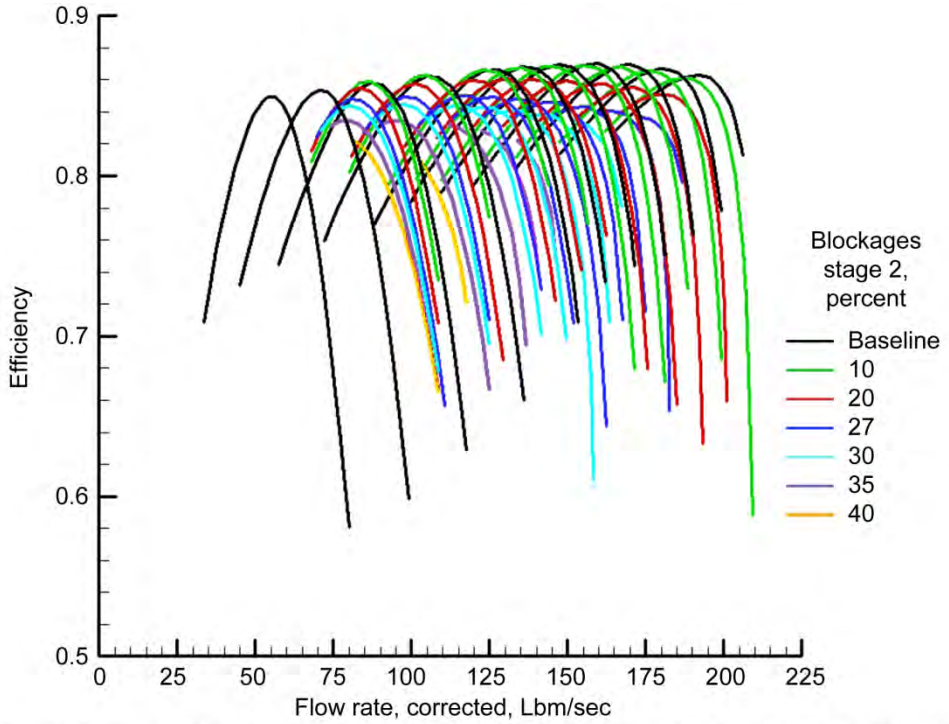


Figure 21.—Overall efficiency of the fan-core and low-pressure compressor, as a function of additional blockages applied to the LPC stage 2 stator. Note the decrease in peak efficiency at all speed lines, with increasing level of blockage applied to stator 2. (The compressor flow analysis listing is in Appendix L and the plot file is in appendix M.)

To better show the effects of additional blockage in the stator of stage 2 on the overall surge and choke margins, the blocked performance of the 100 percent and the 60 percent speed lines are illustrated separately in Figures 22 to 25. Figure 22 illustrates the effect of additional blockage on the overall pressure ratio of the fan-core and LPC characteristic performance at 100 percent corrected speed, while Figure 23 illustrates its effect on overall efficiency along the same speed line. The net effect indicates that as blockage is increased from the baseline value, the choke and surge margins are reduced as well as a reduction in overall efficiency. Figure 24 illustrates the effect of additional blockage on the overall pressure ratio of the fan-core and LPC characteristic performance at 60 percent corrected speed, while Figure 25 illustrates its effect on overall efficiency along the same speed line. At this speed, the net effect indicates that as blockage is increased from the baseline, the surge margin is reduced, but there is less of an effect on the choke margin. However, the effect on overall efficiency along this speed line is most significant with 40 percent additional blockage.

GlennICE

The current accretion analysis is the second phase of this study. The temperature, pressure, and flow rates through the fan and LPC blade rows were provided from the results of the first phase. The purpose of this phase is to analyze the complete flight trajectory with GlennICE to determine whether ice accretion may occur at any of the operating points along the flight trajectory within the fan or LPC.

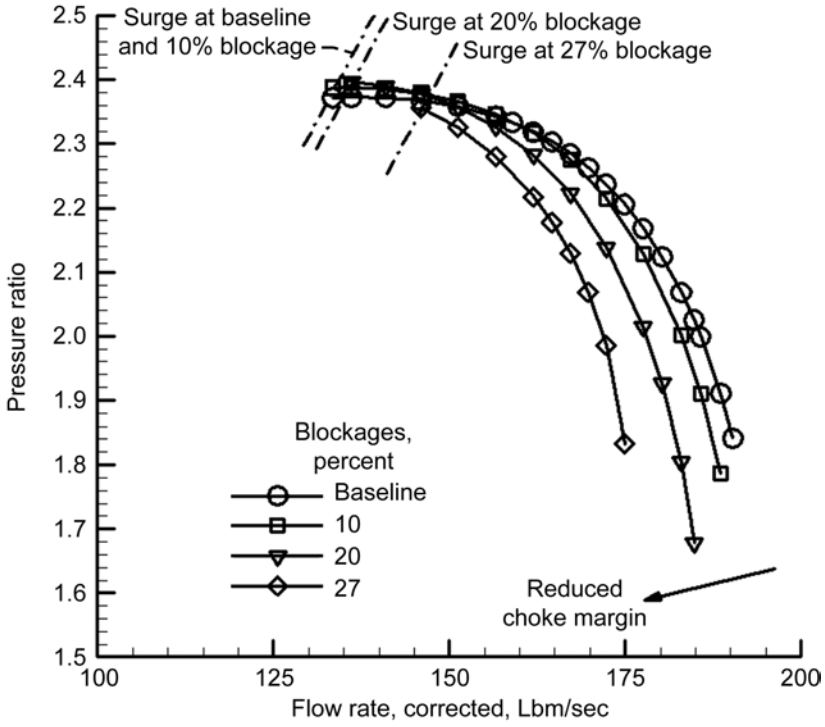


Figure 22.—Overall pressure ratio at 100 percent corrected speed as a function of additional blockages applied to the stage 2 stator in the low-pressure compressor.

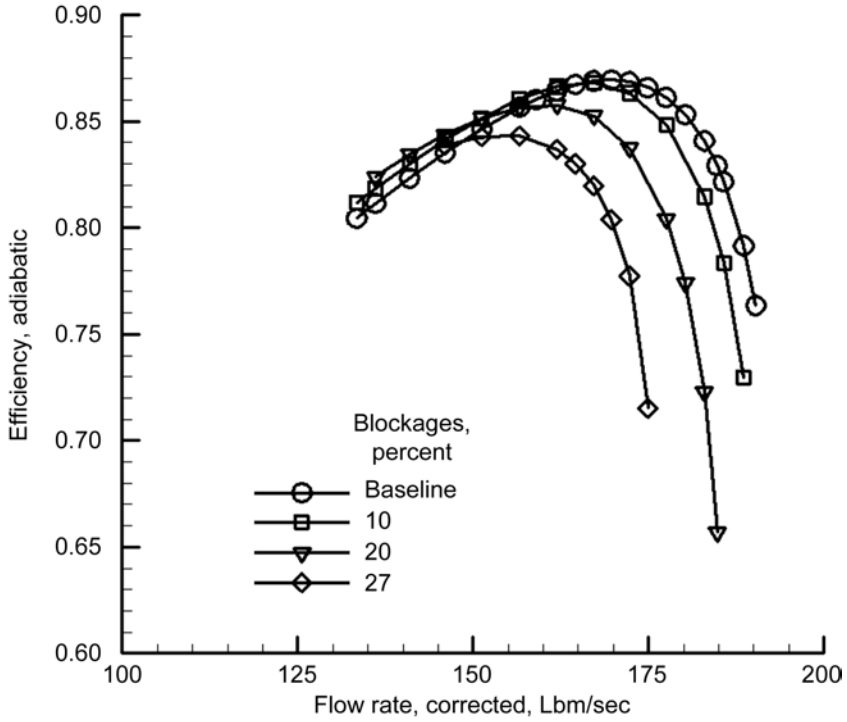


Figure 23.—Overall efficiency at 100 percent corrected speed as a function of additional blockages applied to the LPC stage 2 stator.

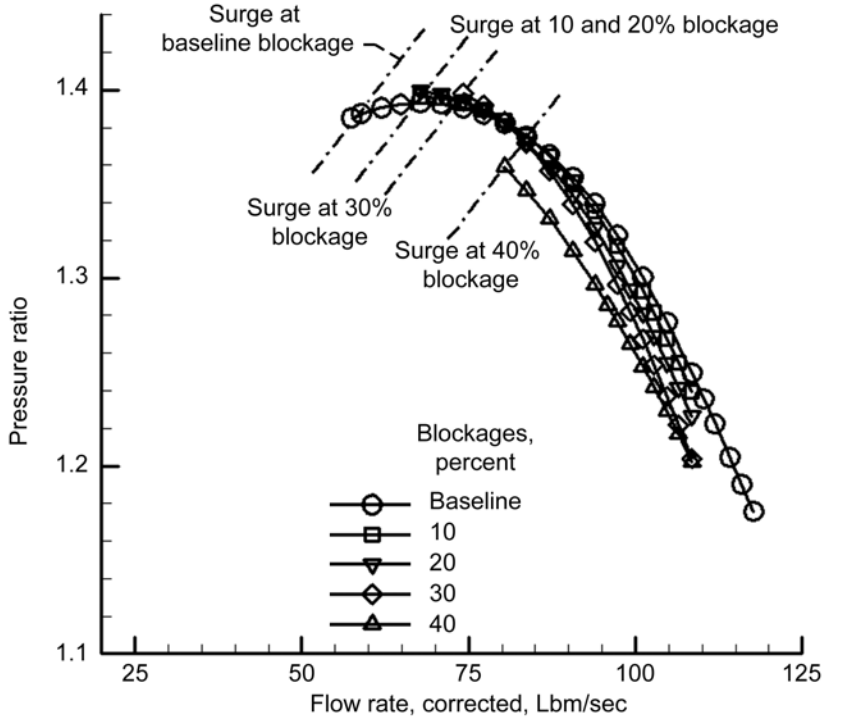


Figure 24.—Overall pressure ratio at 60 percent corrected speed as a function of additional blockages applied to the LPC stage 2 stator.

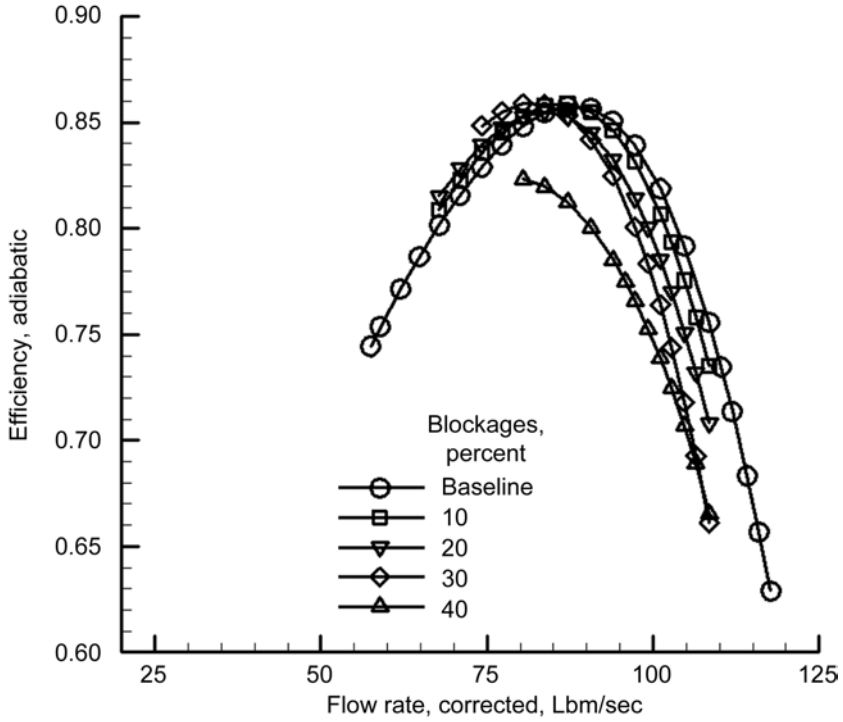


Figure 25.—Overall efficiency at 60 percent corrected speed as a function of additional blockages applied to the LPC stage 2 stator.

The first change to the existing methodology (Ref. 10) was a change in the grid inputs in order to handle more complex grid topologies. In LEWICE 3.2.2, a single block "C-grid" was typically used for most airfoil calculations. Even for multi-element airfoils, the number of grid blocks was held to a minimum. Due to the more complex topography of the internal flow passages typically seen in turbomachinery, additional grid blocks were needed to describe the regions of interest adequately. In addition, LEWICE did not include impacts on grid boundaries. In internal flow, the overall grid boundaries at the top and bottom are walls of the flow path. GlennICE was modified to handle impacts on the internal walls. In addition, GlennICE allows input of single block or multi-block unstructured grids, although this capability is not demonstrated in the current report. As GlennICE was written in FORTRAN90, this allows for dynamically-allocated array sizes. This allows for as many grid blocks and size of grid as are necessary for a given problem.

The second change to the existing methodology was to the equations for particle trajectories. There are two separate modifications to the particle trajectory equations in order to handle ice crystals. First, a separate drag equation is needed. The drag equation for liquid droplets includes an increase in drag due to particle deformation whereas it is assumed that ice crystals do not deform prior to impact. It is also assumed that ice crystals do not breakup due to shear. In addition, drag correlations were added for ice particles that are cylindrical as well as disk-shaped. The second modification was to track the change in particle temperature (and phase change if necessary) through the air stream. Previously, GlennICE did not track droplet temperature as they were assumed to be in equilibrium with the air. However, the mixed phase capabilities have been added to analyze engine ice events. In this scenario, the air, water drops and ice crystals will increase in temperature when they enter the engine. Since the air will respond more rapidly to this increase, there is a driving force for energy transfer between the particles and the surrounding air stream. Additionally, in previous icing analyses, the airflow and particle dynamics were calculated separately, which implies that coupling of the equations were unnecessary. In this regime, it should be clarified whether or not coupling is needed. Crowe (Ref. 11) provided several dimensionless

parameters that could be calculated to determine the necessity of coupling the air and water transport. Mass coupling, momentum coupling and energy coupling (including phase change) were evaluated in a previous report by Wright (Refs. 6 and 10). That report determined that it was not necessary to couple the equations. This allowed for the traditional methodologies to be used whereby the particle trajectories are calculated from the airflow.

The third change to the existing methodology was to the impact of ice crystals with the geometry in question. In LEWICE, particles either adhered to the surface or were splashed according to the supercooled large droplets (SLD) correlations developed previously (Ref. 10). GlennICE included the effects of solid particle bouncing and erosion. For bouncing, when a solid particle hits a surface, the resulting collision is considered elastic or inelastic. If the collision is elastic, none of the incoming energy is absorbed by the surface. For inelastic collisions, some of the energy is absorbed by the surface and some is used to determine the velocity of the particle after the collision. This energy ratio is called the coefficient of restitution. If this coefficient is equal to one, the collision is considered elastic. If this coefficient is equal to zero, all of the energy is absorbed by the surface. In this case, all of the mass must remain on the surface as well. Therefore, in the ice crystal environment being modeled, the coefficient of restitution can be used to determine the fraction of impinging ice crystals that remain on the surface, similar to the splashing model used for SLD.

Higa (Ref. 12) measured the coefficient of restitution for an ice sphere with a 3 cm diameter at velocities up to 0.7 m/s and a wide range of temperatures. Based on his analysis, most ice particle collisions at the surface will have essentially a zero restitution coefficient, meaning that almost all of the energy of the collision is transferred to the surface and the ice crystals are expected to fragment. Initial build up of an ice layer is then caused in part by the kinetic energy of the collision being used to melt the surface ice fragments. GlennICE assumes that the fraction of ice crystals present on the surface will be the fraction of energy transferred to the surface during the collision with the surface. However, this does not necessarily mean that the ice crystals will accumulate. In order for accretion to occur, a liquid water film thickness must be present. Otherwise, the ice fragments would be swept away by the flow field. In the current model, the energy and mass balances are calculated assuming the ice crystals remain on the surface. For control volumes that do not have a liquid film, the ice crystal mass is removed prior to the geometry modification routines. Recent tests (Ref. 6) have provided some initial data on which to base such a model. However, the data from this test is still being analyzed, so a model based on film thickness has not been included in this current analysis.

Erosion effects, however, are accounted for in all regimes. Ice erosion occurs when ice particles hit an ice shape that has already accreted. The force of impact can dislodge portions of the ice shape, especially individual ice feathers. Al-Khalil (Ref. 13) performed tests in the Cox icing tunnel in order to document the mixed phase capabilities of that facility. The model was a 36 in. chord NACA0012 airfoil. All cases were run for 10 min. at 100 knots, angle of attack (α) = 0° and a water median volume diameter (MVD) = 20 μm. Results from that report show that ice impacts can cause erosion of an ice shape in a mixed phase test.

Finally, additional changes included in GlennICE are modifications to the mass and energy balance due to the inclusion of ice crystals. Due to the inclusion of the mass of the impinging ice crystals, the mass balance changes. The energy equation adds the energy from the impacting ice crystals as well as their change of phase. The temperature of water droplets and ice crystals is also transferred from the result of the particle energy balance described earlier. In the solution procedure, the terms other than melting and freezing are summed. Based on the sign of that term, the remaining energy is used to either freeze additional surface water or to melt incoming ice. In a situation where more energy is carried away allowing additional freezing, the freezing fraction of the incoming ice crystals is equal to one and the additional freezing fraction of the incoming water is calculated from the energy balance. In a situation where more energy is available to melt the incoming ice, the freezing fraction of the incoming water is zero and the fraction of incoming ice that is melted is again calculated from the energy equation. In any situation where the sum of the other terms is exactly zero, the freezing fraction of the incoming water is

zero and the freezing fraction of the incoming ice is equal to one. The solution procedure determines the mass of ice or water directly and does not rely on calculating a freezing fraction.

A grid was generated (Fig. 26) and the results from NPSS-COMDES were interpolated at the grid points. Given that GlennICE does not perform a flow analysis, the grid can be somewhat coarser than that used for typical Navier-Stokes analysis, since its only purpose is for tracking particle trajectories. There were 6 grid blocks used with a total of 25,000 grid points in order to interpolate the NPSS-COMDES results to a grid that GlennICE could use. The stators were included in this model as individual airfoils in the flow; since GlennICE solves on a two-dimensional meridional plane, the stators were rotated 90° such that ice could collect near the leading edge if conditions are appropriate. The grid was refined near each stator in order to represent the curvature of the surface more accurately for ice accretion, however, the leading edge is not resolved. Spherical ice crystals of 115 μm MVD were then tracked through this artificial flow field to find collection efficiencies for the geometries where ice crystals impacted. The ice water content was set at 5 g/m^3 and the liquid water content was set at 2 g/m^3 with a 40 μm drop size. The conditions were taken from Case 149 of the NRC test (Ref. 6). The icing time was 30 sec. The conditions shown in Figure 3 result in 17 separate scenarios for ice accretion to occur, which correspond to the engine/compressor operating conditions along the flight trajectory. Table 3 shows the maximum icing rate for these conditions in inches per minute. It should be noted that effects of ice crystal bouncing, erosion, and ice shedding are not included in this analysis which accounts for the large ice accretion on the splitter. The ice shapes on the splitter and stator 5 are shown in Figures 27 and 28, respectively. For this case, the inlet Mach number was 0.78 at 35,000 ft and 75.6 percent of maximum thrust; the static temperature was 416 R and the static pressure was 3.47 psia. Relative humidity was set at 50 percent for all cases. Even with the additional grid refinement, the contours of the stator were not preserved, leading to a square leading edge. Note that this may have increased the collection efficiency.

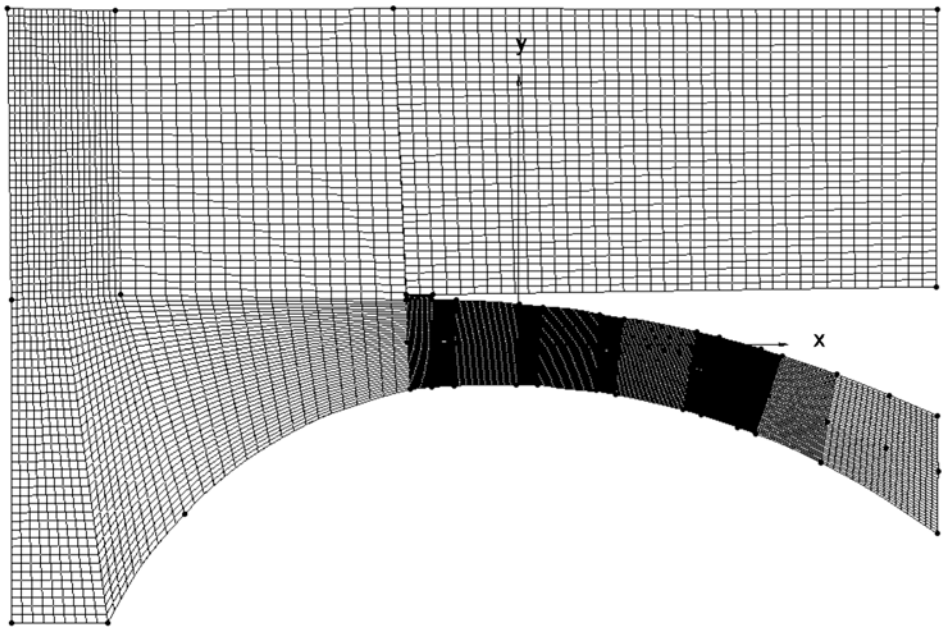


Figure 26.—The computational grid for GlennICE simulation of ice accretion.

TABLE 3.—ESTIMATED ICING COLLECTION RATE USING GLENNICE FOR SELECTED OPERATION POINTS IN THE FLIGHT TRAJECTORY

Altitude (ft)	Mach number	Maximum thrust, percent	Splitter (in./min.)	Stator 1 (in./min.)	Stator 2 (in./min.)	Stator 3 (in./min.)	Stator 4 (in./min.)	Stator 5 (in./min.)
35,000	0.78	100	3.46	0	0	0	0	0
35,000	0.78	75.6	3.81	0	0	0	0	0.09
35,000	0.78	72.9	3.81	0	0	0	0	0
35,000	0.78	69.9	3.81	0	0	0	0	0.09
39,000	0.78	100	3.38	0	0	0.017	0	0
39,000	0.78	84	3.38	0	0	0.017	0	0
39,000	0.78	79.8	3.38	0	0	0.017	0	0
39,000	0.78	76.8	3.38	0	0	0.017	0	0
39,000	0.78	10	1.87	0	0	0.068	0	0
38,000	0.73	10	1.05	0	0	0	0.00018	0
37,000	0.71	10	0.974	0	0	0.00027	0	0
34,000	0.67	10	3.1	0	0	0.085	0	0.042
30,000	0.61	10	2.32	0	0	0	0	0
25,000	0.55	10	2.53	0	0	0	0	0
20,000	0.49	10	1.87	0	0	0.068	0	0
15,000	0.45	10	1.74	0	0	0.00012	0.00093	0
10,000	0.41	10	1.36	0	0	0	0	0

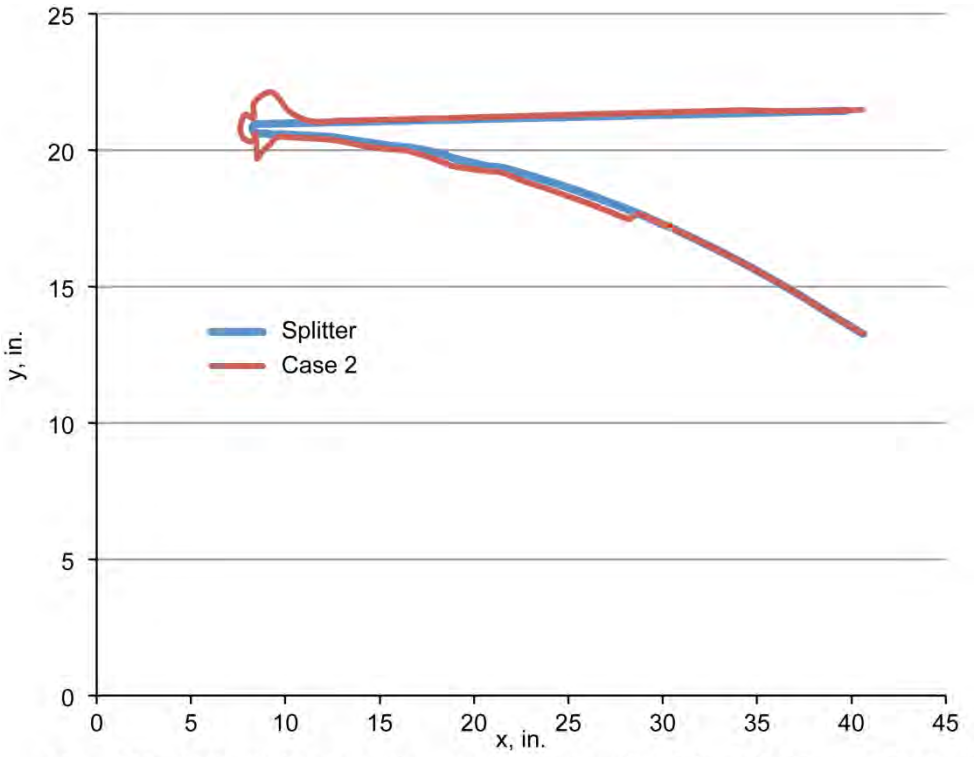


Figure 27.—Estimated ice accretion on splitter using GlennICE at 35,000 ft., 0.78 Mach number, 75.6 percent maximum thrust (Case 2).

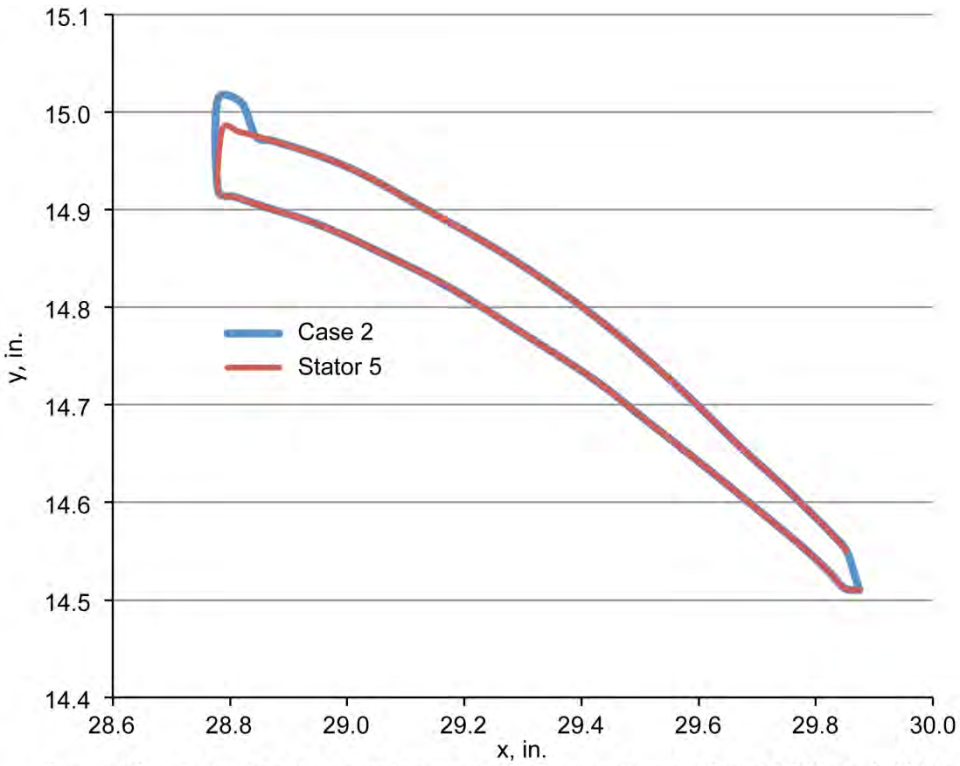


Figure 28.—Estimated ice accretion on stator 5 using GlennICE at 35,000 ft., 0.78 Mach number, 75.6 percent maximum thrust (Case 2).

Future Research

Future research will include using GlennICE to identify ice accretion locations, and iterating with the NPSS-COMDES analyses results obtained in the first phase of this study to parametrically vary the blockage at the identified locations within the LPC. This will estimate the effects on the performance of the LPC and the engine system. Further development of the ice accretion model may include investigating the capability of a higher dimensional analysis, including time dependence due to unsteady rotor-stator interactions and its effect on ice accretion. In addition, a compressor analysis code with higher fidelity capability will be investigated for coupling to the NPSS engine system code. This will provide the ability to specify additional blockages due to ice accretion allowing it to be varied in the span-wise direction. Additional future research will focus on prescribing key engine parameter limits while allowing the thrust to vary. Further improvements are needed in the GlennICE model to better account for bouncing of ice crystals and erosion effects. It will be necessary to refine the grid to determine whether or not the blunt leading edge and loss of stator curvature on the stator geometry due to the sub-optimal grid resolution affects ice accretion.

Summary/Conclusions

A computational tool is being developed for modeling the effects of ice accretion on the performance of the low-pressure compressor, operating in a gas turbine engine system environment. The purpose of this effort is to develop the codes to provide a predictive capability to forecast the onset of engine icing events, such that they could be better anticipated and mitigated. The tool consists of an engine thermodynamic cycle model, a compressor mean line flow analysis model, and an ice accretion model. The tool has been applied to a notional turbine engine to assess the effects of blockage due to ice

accretion through a flight trajectory of a typical commercial aircraft. However, the problem of ice accretion is highly multi-disciplinary since it involves heat transfer from the air to the compressor metal surfaces as well as multi-phase flow, since the air contains ice-water mixtures, which are not directly addressed in the engine system and compressor models. In the first phase, an engine system modeling code and a mean line compressor flow analysis code were utilized to calculate the flow conditions in the fan-core and low-pressure compressor and to identify potential locations within the compressor where ice may accrete. For the blockage study, a narrow temperature range in which engine icing would occur was assumed. This allowed the computational tools to parametrically add blockages to illustrate the effects of ice accretion on the low-pressure compressor blade row performance operating within the engine system environment. This study includes a mean line flow field analyses of the low-pressure compressor and the engine performance during cruise and descent operating conditions at several altitudes within the notional flight trajectory. Ultimately an improved estimation of the location and level of blockage due to icing would be provided by the ice accretion code.

The second phase of this study focused on the ice particle physics in the low-pressure compressor flow field that was computed in the first phase. The results demonstrate that if erosion and ice bouncing effects are neglected, ice accretion mainly occurs on the leading edge of the splitter, which is consistent with results from supercooled large droplet studies. Small amounts of ice accrete on the stators of the LPC. The stage number in which ice accretes on the stator depends on the engine operating condition in flight trajectory. Note that the leading edge and some of the stator curvature is lost due to the coarseness of the grid.

Appendixes

The following appendixes can be accessed from the hyperlinks below or from the bookmarks panel located on the left-hand side of this document.

A.—Design point performance compressor code (COMDES output listing)

B.—Vehicle flight trajectory (FLOPS output listing)

C.—Overall performance characteristic map; plot file data; baseline blockages

D.—Compressor analysis code (COMDES output listing) along map; baseline blockages

E.—Compressor analysis code (COMDES output listing) along engine operating line through flight trajectory

F.—Overall pressure ratio and efficiency; plot file; along engine operating line

G.—Engine analysis (NPSS output listing) through flight trajectory with baseline blockages

H.—Compressor analysis code (COMDES output listing) along flight trajectory; parametric blockages

I.—Engine analysis (NPSS output listing) along flight trajectory with parametrically varying blockages

J.—Rotor Relative Velocity Ratio and Efficiency along flight trajectory versus parametrically varying blockage; plot file data

K.—Stage Pressure Ratio and Efficiency; parametrically varied blockage; plot file; on engine operating line

L.—Compressor flow analysis 110 to 60 percent rpm; COMDES output listing along complete map; with Stator 2 blockages varied parametrically from 10 to 40 percent

M.—Overall performance characteristic map; plot file data; Stator 2 blockages parametrically varied from 0 percent (baseline) up to 40 percent

Appendix A.—Design Point Performance; Compressor Code Output Listing of the Fan-Core and LPC

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**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000 BLEED =  0.000   DPInc = 6.012   EfDer =  0.999   RH =    0.00

    W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     176.353    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   80.16045

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     172.279    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM        SCFM           A1/A*      Area1        A*         AthrRotor  ChokeMargin
  135665.266  138378.281       1.657     831.557     501.715     619.754       1.235

      ROTOR LEADING EDGE CONDITIONS, STAGE            1
         R1       Stator    Alfa     C1      CU1      Cm1        M abs  U1 corrected
  TIP     20.63     0.00    -0.02   420.48    -0.14   420.48     0.38   677.10
  MEAN    17.06     0.00    -0.02   420.48    -0.14   420.48     0.38
  HUB     12.51     0.00    -0.02   420.48    -0.14   420.48     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     TwetBulb1   M rel
  TIP     58.27    50.47     7.80   679.80   799.45    13.67   508.04   489.09     0.72
  MEAN    53.21    47.20     6.01   562.16   702.13    13.67   508.04   489.09     0.64
  HUB     44.44    38.62     5.82   412.23   588.94    13.67   508.04   489.09     0.53

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   668.44   381.63   548.79  1126.50     0.59
  MEAN    18.04   703.47   422.65   562.34  1120.84     0.63
  HUB     15.00   808.49   553.16   589.63  1110.61     0.73

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   624.55   298.16     0.55  7876.04
  MEAN   594.32   587.96   171.67     0.52  7625.47     1.33
  HUB    494.28   592.57    58.88     0.53  8299.19

         Pt2       PR      Ps2     Tt2       TR      Ts2     TwetBulb2  Eff2uC  Eff2incC
  TIP     19.31     1.28    15.21   564.50     1.08   527.19   500.44     0.92     0.91
  MEAN    19.16     1.27    14.69   563.17     1.08   521.86   497.33     0.92     0.91
  HUB     19.56     1.29    13.74   566.74     1.08   512.19   491.44     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     34.82    28.52    24.20     4.32     0.93     0.30     2.90
  MEAN    36.93    16.98    12.70     4.28     0.93     0.25     3.51     0.91
  HUB     43.17    -5.70    -9.30     3.60     0.93     0.10     4.78

      blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m       C3        Cu3       Cm3       Ao3          Mach3      cp 2-3
   18.0711   715.0781   421.8333   577.4023  1120.8982     0.6380    -0.0051

    Pt3        Ps3       Ts3       TwetBulb3   Vane#      FloAlpha3  VaneAlpha3  Incid3
   19.2960    14.6681   522.0970   497.4292    24.0000    36.1508    35.4000    -0.7508

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
   RCG       Cth        Cuth       Cmth      Aoth         Machth     cp 2-Th
   18.0711   598.5550   421.8333   732.2645  1134.5392     0.5276     0.2817

   BlockageTh  PtTh      PsTh      TsTh       TwetBulbTh  AreaTh     w2-Th     DiffFact4
    0.9500    19.2234    15.8993   534.8818   504.7196   528.7961     0.0251     0.4304

    VANED DIFFUSER EXIT:
   R4        C4          Cu4       Cm4       Ao4          Mach4      cp 3-4
   18.0829   548.0781     0.0000   548.0781  1139.6547     0.4809     0.3498

   Blockage4   Ps4      Ts4       TwetBulb4    VaneAlpha4  Vane Thk4  w2-4OD     cp 2-4
    0.9500    16.3457   539.7160   507.3303     0.0000     0.0600     0.0399     0.3748

    STAGE EXIT CONDITIONS, STAGE             1
    Eff4      Pt4         PR4      Texit       Del T     Ns        Ns nondim
    0.8765    19.1525     1.2678   564.8056    41.9956   217.3922     1.6852

   Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  261458.922       0.566    2605.665    1768070.250
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000 BLEED =  0.000   DPInc = 6.012   EfDer =  1.000   RH =  100.00

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    176.353    3776.000      19.153     564.806      1.000       1.000       0.980
W Kg/sec =   80.16045

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    141.243    3618.600       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*        AthrRotor  ChokeMargin
 135665.266  138378.281       1.436     590.487     411.342     474.134       1.153

    ROTOR LEADING EDGE CONDITIONS, STAGE             2

       R1      Stator    Alfa     C1      CU1      Cm1         M abs  U1 corrected
TIP     20.55     0.00    -0.02   520.10    -0.18   520.10     0.46   648.91
MEAN    18.08     0.00    -0.02   520.10    -0.18   520.10     0.46
HUB     15.21     0.00    -0.02   520.10    -0.18   520.10     0.46

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     TwetBulb1   M rel
TIP     52.48    46.36     6.12   677.16   853.98    16.61   542.22   542.22     0.75
MEAN    48.89    42.30     6.59   595.71   790.94    16.61   542.22   542.22     0.69
HUB     43.95    37.84     6.11   501.20   722.41    16.61   542.22   542.22     0.63

     ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   599.80   307.48   514.99  1169.13     0.51
MEAN    18.01   614.66   321.99   523.58  1164.97     0.53
HUB     15.22   668.79   403.63   533.26  1160.89     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    672.88   631.45   365.40     0.54  6282.35
MEAN   593.46   589.77   271.47     0.51  5802.28     1.45
HUB    501.63   542.19    97.99     0.47  6147.23

        Pt2       PR      Ps2     Tt2       TR      Ts2     TwetBulb2  Eff2uC  Eff2incC
TIP     23.00     1.20    19.21   598.04     1.06   568.00   568.00     0.92     0.91
MEAN    22.69     1.18    18.76   595.50     1.05   563.96   563.96     0.92     0.91
HUB     22.91     1.20    18.29   597.33     1.06   559.99   559.99     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.84    35.36    31.50     3.86     0.93     0.32     2.90
MEAN    31.59    27.41    23.50     3.91     0.93     0.32     3.30     0.91
HUB     37.12    10.41     6.50     3.91     0.93     0.32     3.92

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m       C3        Cu3       Cm3       Ao3          Mach3      cp 2-3
  17.9595   622.9638   322.8948   532.7503  1165.5101     0.5345     0.0054

   Pt3        Ps3       Ts3       TwetBulb3   Vane#      FloAlpha3  VaneAlpha3  Incid3
  22.8224    18.7846   564.5516   564.5516    46.0000    31.2196    30.6000    -0.6196

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
  RCG       Cth        Cuth       Cmth      Aoth         Machth     cp 2-Th
  17.9595   533.7812   322.8948   623.8456  1174.3680     0.4545     0.2457

  BlockageTh  PtTh      PsTh      TsTh       TwetBulbTh  AreaTh     w2-Th     DiffFact4
   0.9500    22.7771    19.7642   573.1653   573.1653   511.1510     0.0210     0.3283

   VANED DIFFUSER EXIT:
  R4        C4          Cu4       Cm4       Ao4          Mach4      cp 3-4
  17.8235   526.5400     0.0000   526.5400  1175.0248     0.4481     0.2436

  Blockage4   Ps4      Ts4       TwetBulb4    VaneAlpha4  Vane Thk4  w2-4OD     cp 2-4
   0.9500    19.7853   573.8065   573.8065     0.0000     0.0600     0.0367     0.2508

   STAGE EXIT CONDITIONS, STAGE             2
   Eff4      Pt4         PR4      Texit       Del T     Ns        Ns nondim
   0.8798    22.7126     1.1859   596.9559    32.1503   248.8247     1.9289

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 200283.328       0.442    1995.997 1593531.250
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000 BLEED =  0.000   DPInc = 6.012   EfDer =  1.000   RH =  100.00

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    176.353    3776.000      22.713     596.956       1.000       1.000       0.980
W Kg/sec =   80.16045

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    122.447    3519.808       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*        AthrRotor  ChokeMargin
 135665.266  138378.281       1.530     545.479     356.621     429.765       1.205

    ROTOR LEADING EDGE CONDITIONS, STAGE             3

       R1      Stator    Alfa     C1      CU1      Cm1         M abs  U1 corrected
TIP     20.07     0.00    -0.02   494.31    -0.17   494.31     0.42   616.45
MEAN    17.74     0.00    -0.02   494.31    -0.17   494.31     0.42
HUB     15.05     0.00    -0.02   494.31    -0.17   494.31     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     TwetBulb1   M rel
TIP     53.23    46.36     6.87   661.34   825.80    20.12   576.56   576.56     0.70
MEAN    49.79    43.40     6.39   584.52   765.64    20.12   576.56   576.56     0.65
HUB     45.10    38.84     6.26   495.92   700.32    20.12   576.56   576.56     0.59

     ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   578.30   301.72   493.36  1202.15     0.48
MEAN    17.51   592.00   316.36   500.38  1198.49     0.49
HUB     14.85   643.66   394.80   508.36  1194.87     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    652.78   605.51   351.06     0.50  5980.44
MEAN   576.87   564.13   260.52     0.47  5541.31     1.47
HUB    489.33   517.07    94.53     0.43  5865.40

        Pt2       PR      Ps2     Tt2       TR      Ts2     TwetBulb2  Eff2uC  Eff2incC
TIP     26.79     1.18    22.86   628.57     1.05   600.66   600.66     0.92     0.91
MEAN    26.47     1.17    22.40   626.25     1.05   597.00   597.00     0.92     0.91
HUB     26.71     1.18    21.92   627.97     1.05   593.39   593.39     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.45    35.43    31.50     3.93     0.93     0.33     2.90
MEAN    32.30    27.50    23.50     4.00     0.93     0.33     3.28     0.91
HUB     37.83    10.53     6.50     4.03     0.93     0.33     3.87

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m       C3        Cu3       Cm3       Ao3          Mach3      cp 2-3
  17.3924   597.9450   318.4314   506.1024  1199.2048     0.4986     0.0115

   Pt3        Ps3       Ts3       TwetBulb3   Vane#      FloAlpha3  VaneAlpha3  Incid3
  26.6147    22.4534   597.7551   597.7551    46.0000    32.1774    31.5000    -0.6774

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
  RCG       Cth        Cuth       Cmth      Aoth         Machth     cp 2-Th
  17.3924   514.7593   318.4314   605.2898  1206.9297     0.4265     0.2467

  BlockageTh  PtTh      PsTh      TsTh       TwetBulbTh  AreaTh     w2-Th     DiffFact4
   0.9500    26.5737    23.4463   605.4810   605.4810   471.9919     0.0196     0.3444

   VANED DIFFUSER EXIT:
  R4        C4          Cu4       Cm4       Ao4          Mach4      cp 3-4
  17.1214   498.8988     0.0000   498.8988  1208.2664     0.4129     0.2604

  Blockage4   Ps4      Ts4       TwetBulb4    VaneAlpha4  Vane Thk4  w2-4OD     cp 2-4
   0.9500    23.5633   606.8229   606.8229     0.0000     0.0600     0.0368     0.2741

   STAGE EXIT CONDITIONS, STAGE             3
   Eff4      Pt4         PR4      Texit       Del T     Ns        Ns nondim
   0.8804    26.5007     1.1668   627.5978    30.6420   241.5946     1.8728

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 191004.031       0.448    1903.521 1533169.125
```

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000 BLEED = 0.000 DPInc = 6.012 EfDer = 1.000 RH = 100.00

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
176.353	3776.000	26.501	627.598	1.000	1.000	0.980

W Kg/sec = 80.16045

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
107.603	3432.807	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
135665.266	138378.281	1.638	513.330	313.412	401.059	1.280

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	M abs	U1 corrected
TIP	19.26	0.00	-0.02	467.07	-0.16	467.07	0.39	576.95
MEAN	16.97	0.00	-0.02	467.07	-0.16	467.07	0.39	
HUB	14.32	0.00	-0.02	467.07	-0.16	467.07	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	TwetBulb1	M rel
TIP	53.66	46.36	7.30	634.65	788.13	23.91	609.40	609.40	0.65
MEAN	50.14	43.80	6.34	559.22	728.74	23.91	609.40	609.40	0.60
HUB	45.30	37.84	7.46	471.87	664.06	23.91	609.40	609.40	0.55

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	549.86	288.91	467.84	1232.20	0.45
MEAN	16.57	560.60	299.29	474.02	1228.68	0.46
HUB	13.89	605.97	368.58	480.98	1225.18	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	622.13	574.38	333.22	0.47	5457.75	
MEAN	546.14	534.45	246.85	0.43	4963.05	1.48
HUB	457.70	489.16	89.12	0.40	5121.93	

	Pt2	PR	Ps2	Tt2	TR	Ts2	TwetBulb2	Eff2uC	Eff2incC
TIP	30.60	1.15	26.68	656.43	1.05	631.21	631.21	0.92	0.91
MEAN	30.21	1.14	26.19	653.82	1.04	627.60	627.60	0.92	0.91
HUB	30.33	1.14	25.66	654.66	1.04	624.03	624.03	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.70	35.46	31.50	3.96	0.93	0.33	2.90	
MEAN	32.27	27.51	23.50	4.01	0.93	0.33	3.29	0.91
HUB	37.46	10.50	6.50	4.00	0.93	0.33	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.4812	552.7786	300.9688	463.6615	1230.4952	0.4492	0.0535

Pt3	Ps3	Ts3	TwetBulb3	Vane#	FloAlpha3	VaneAlpha3	Incid3
30.3375	26.4107	629.4775	629.4775	46.0000	32.9881	32.4000	-0.5881

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.4812	479.6051	300.9688	566.2184	1236.6398	0.3878	0.2712

BlockageTh	PtTh	PsTh	TsTh	TwetBulbTh	AreaTh	w2-Th	DiffFact4
0.9500	30.3053	27.3165	635.7798	635.7798	456.5731	0.0177	0.3598

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.0960	455.1656	0.0000	455.1656	1238.4919	0.3675	0.2665

Blockage4	Ps4	Ts4	TwetBulb4	VaneAlpha4	Vane Thk4	w2-4OD	cp 2-4
0.9500	27.5306	637.6857	637.6857	0.0000	0.0600	0.0367	0.3221

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.8800	30.2252	1.1405	654.9698	27.3719	247.8075	1.9210

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
170742.469	0.441	1701.597	1524277.375

```
    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000 BLEED =  0.000   DPInc = 6.012   EfDer =  1.000   RH =  100.00

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    176.353    3776.000      30.225     654.970       1.000       1.000       0.980
W Kg/sec =   80.16045

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    96.379    3360.311       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*        AthrRotor  ChokeMargin
 135665.266  138378.281       1.815     509.668     280.740     390.276       1.390

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1         M abs  U1 corrected
TIP     18.32     0.00    -0.02   423.76    -0.15   423.76     0.34   537.20
MEAN    15.91     0.00    -0.02   423.76    -0.15   423.76     0.34
HUB     13.07     0.00    -0.02   423.76    -0.15   423.76     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     TwetBulb1   M rel
TIP     54.94    47.36     7.58   603.68   737.68    27.88   640.00   640.00     0.59
MEAN    51.06    44.80     6.26   524.36   674.30    27.88   640.00   640.00     0.54
HUB     45.47    38.84     6.63   430.68   604.31    27.88   640.00   640.00     0.49

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   513.60   284.99   427.28  1259.83     0.41
MEAN    15.50   518.15   284.04   433.36  1255.87     0.41
HUB     12.59   552.12   333.53   439.99  1251.93     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    591.16   525.65   306.17     0.42  5115.32
MEAN   510.67   489.04   226.63     0.39  4404.31     1.51
HUB    414.86   447.44    81.33     0.36  4201.11

        Pt2       PR      Ps2     Tt2       TR      Ts2     TwetBulb2  Eff2uC  Eff2incC
TIP     34.40     1.14    30.68   681.97     1.04   659.98   659.98     0.92     0.91
MEAN    33.79     1.12    30.06   678.22     1.04   655.84   655.84     0.92     0.91
HUB     33.62     1.11    29.42   677.15     1.03   651.73   651.73     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.70    35.62    31.50     4.12     0.93     0.35     2.90
MEAN    33.24    27.61    23.50     4.11     0.93     0.34     3.34     0.91
HUB     37.16    10.47     6.50     3.97     0.93     0.33     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m       C3        Cu3       Cm3       Ao3          Mach3      cp 2-3
  15.2185   524.1179   289.2517   437.0733  1256.2159     0.4172    -0.0050

   Pt3        Ps3       Ts3       TwetBulb3   Vane#      FloAlpha3  VaneAlpha3  Incid3
  33.8612    30.0364   656.2099   656.2098    46.0000    33.4963    33.0000    -0.4963

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
  RCG       Cth        Cuth       Cmth      Aoth         Machth     cp 2-Th
  15.2185   457.4107   289.2517   541.1941  1261.4308     0.3626     0.2117

  BlockageTh  PtTh      PsTh      TsTh       TwetBulbTh  AreaTh     w2-Th     DiffFact4
   0.9500    33.8114    30.8730   661.6694   661.6694   440.8271     0.0328     0.3714

   VANED DIFFUSER EXIT:
  R4        C4          Cu4       Cm4       Ao4          Mach4      cp 3-4
  14.7013   427.1457     0.0000   427.1457  1263.5568     0.3381     0.3055

  Blockage4   Ps4      Ts4       TwetBulb4    VaneAlpha4  Vane Thk4  w2-4OD     cp 2-4
   0.9500    31.2244   663.9016   663.9015     0.0000     0.0600     0.0367     0.3021

   STAGE EXIT CONDITIONS, STAGE            5
   Eff4      Pt4         PR4      Texit       Del T     Ns        Ns nondim
   0.8811    33.7963     1.1181   679.1149    24.1451   258.2498     2.0019

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 150727.172       0.431    1502.127 1555663.750

  OVERALL EXIT CONDITIONS; ALL           5   STAGES

 Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   974215.94   9708.9072    172.2792      2.2371      0.8686      6.0120      1.2990
```

Appendix B.—Vehicle Flight Trajectory Summary (Output of FLOPS Trajectory Code)

SEGMENT 1 CLIMB

WEIGHT	ALTITUDE ENERGY	MACH NO. VELOCITY	DELTA T TIME	DELTA D DIST	DELTA F FUEL	THRUST T/TMAX	FUEL FLOW SFC	EX POW DH/DT*	CLIFT CDRAG	LIFT DRAG	L/D SP RANGE	Q NOX	PCODE ENG PAR
172183.	0.	0.3000	0.00	0.0	0.	38219.	19137.	3205.2	0.93275	172183.	16.006	133.3	1
	1743.	198.44	9.64	0.0	526.	1.00000	0.50072	2047.8	0.05828	10757.	0.01037	0.0	28.231
172053.	839.	0.3467	0.41	1.5	130.	36279.	18935.	3685.2	0.71920	172053.	19.327	172.8	1
	3154.	228.70	10.05	1.5	655.	1.00000	0.52194	2047.8	0.03721	8902.	0.01208	3.3	28.385
171961.	1500.	0.3799	0.29	1.2	92.	35174.	18824.	3935.6	0.61342	171961.	20.370	202.5	1
	4267.	250.00	10.34	2.6	747.	1.00000	0.53517	2264.9	0.03011	8442.	0.01328	5.7	28.570
171847.	2922.	0.3818	0.37	1.5	114.	34151.	18246.	3772.3	0.63946	171847.	20.110	194.1	1
	5688.	250.00	10.71	4.1	861.	1.00000	0.53427	3853.9	0.03180	8545.	0.01370	8.6	28.025
171732.	4343.	0.3837	0.39	1.6	115.	33128.	17666.	3605.3	0.66687	171732.	19.803	186.0	1
	7110.	250.00	11.10	5.7	977.	1.00000	0.53328	3688.8	0.03367	8672.	0.01415	11.5	27.465
171615.	5765.	0.3857	0.40	1.7	117.	32118.	17122.	3441.6	0.69575	171615.	19.525	178.1	1
	8531.	250.00	11.50	7.4	1094.	1.00000	0.53308	3523.5	0.03563	8790.	0.01460	14.4	26.962
171496.	7186.	0.3876	0.42	1.7	119.	31120.	16606.	3274.5	0.72618	171496.	19.185	170.6	1
	9953.	250.00	11.92	9.1	1213.	1.00000	0.53361	3358.0	0.03785	8939.	0.01505	17.3	26.506
171374.	8608.	0.3896	0.45	1.8	121.	30123.	16089.	3102.4	0.75827	171374.	18.787	163.2	1
	11374.	250.00	12.37	11.0	1334.	1.00000	0.53411	3188.5	0.04036	9122.	0.01554	20.2	26.047
171252.	10000.	0.3916	0.46	1.9	122.	29145.	15580.	2929.3	0.79141	171252.	18.354	156.3	1
	12767.	250.00	12.83	12.9	1456.	1.00000	0.53457	3015.8	0.04312	9331.	0.01605	23.1	25.593
171103.	10000.	0.5060	0.57	2.7	149.	27729.	16107.	3624.8	0.47370	171103.	19.516	260.9	1
	14619.	323.00	13.40	15.6	1605.	1.00000	0.58087	0.0	0.02427	8767.	0.02005	26.6	26.792
170999.	11212.	0.5187	0.39	2.1	104.	26853.	15718.	3527.8	0.47234	170999.	19.477	261.5	1
	16021.	329.60	13.79	17.7	1709.	1.00000	0.58533	3090.0	0.02425	8779.	0.02097	29.1	26.429
170895.	12423.	0.5312	0.40	2.2	104.	25987.	15322.	3425.2	0.47190	170895.	19.446	261.6	1
	17423.	336.07	14.19	19.9	1813.	1.00000	0.58961	3003.8	0.02427	8788.	0.02193	31.6	26.046
170790.	13635.	0.5438	0.42	2.3	105.	25132.	14920.	3317.1	0.47230	170790.	19.421	261.2	1
	18826.	342.42	14.61	22.3	1918.	1.00000	0.59368	2912.8	0.02432	8794.	0.02295	34.1	25.644
170685.	14847.	0.5562	0.43	2.5	105.	24278.	14504.	3202.4	0.47351	170685.	19.402	260.3	1
	20228.	348.65	15.04	24.7	2024.	1.00000	0.59739	2816.5	0.02441	8797.	0.02404	36.5	25.207
170578.	16059.	0.5686	0.44	2.6	106.	23705.	14330.	3139.6	0.47549	170578.	19.388	259.1	1
	21631.	354.78	15.48	27.3	2130.	1.00000	0.60454	2739.8	0.02452	8798.	0.02476	38.9	25.445
170471.	17270.	0.5810	0.45	2.7	107.	23224.	14223.	3092.2	0.47820	170471.	19.378	257.5	1
	23033.	360.79	15.93	30.0	2237.	1.00000	0.61243	2692.3	0.02468	8797.	0.02537	41.3	25.877
170363.	18482.	0.5933	0.46	2.8	108.	22809.	14156.	3055.0	0.48164	170363.	19.373	255.5	1
	24435.	366.72	16.39	32.8	2345.	1.00000	0.62063	2655.7	0.02486	8794.	0.02591	43.8	26.432
170227.	20000.	0.6088	0.58	3.6	136.	22385.	14134.	3024.4	0.48694	170227.	19.362	252.5	1
	26192.	374.00	16.96	36.3	2481.	1.00000	0.63141	2626.4	0.02515	8792.	0.02646	47.0	27.339
170119.	21112.	0.6243	0.47	2.9	108.	21476.	13663.	2875.4	0.48475	170119.	19.272	253.5	1
	27567.	381.88	17.43	39.3	2589.	1.00000	0.63618	2384.6	0.02515	8827.	0.02795	49.4	26.515
170009.	22223.	0.6398	0.49	3.2	110.	20569.	13176.	2716.6	0.48353	170009.	19.182	253.9	1
	28943.	389.59	17.92	42.4	2699.	1.00000	0.64059	2260.2	0.02521	8863.	0.02957	51.9	25.609
169897.	23335.	0.6552	0.52	3.4	113.	19674.	12684.	2551.0	0.48322	169897.	19.093	253.9	1
	30318.	397.16	18.44	45.8	2812.	1.00000	0.64468	2129.1	0.02531	8898.	0.03131	54.3	24.656
169781.	24446.	0.6705	0.56	3.7	116.	18801.	12192.	2381.3	0.48375	169781.	19.006	253.5	1
	31693.	404.58	19.00	49.6	2927.	1.00000	0.64847	1993.6	0.02545	8933.	0.03318	56.8	23.680
169662.	25558.	0.6857	0.60	4.1	119.	17993.	11740.	2219.0	0.48508	169662.	18.920	252.6	1
	33068.	411.87	19.60	53.6	3047.	1.00000	0.65245	1859.3	0.02564	8967.	0.03508	59.2	22.833
169538.	26670.	0.7009	0.64	4.4	123.	17249.	11328.	2064.7	0.48718	169538.	18.837	251.3	1
	34443.	419.04	20.24	58.1	3170.	1.00000	0.65674	1731.4	0.02586	9000.	0.03699	61.6	22.136
169410.	27781.	0.7160	0.69	4.9	128.	16516.	10917.	1906.8	0.49002	169410.	18.762	249.7	1
	35818.	426.08	20.93	62.9	3298.	1.00000	0.66098	1605.2	0.02612	9029.	0.03903	64.1	21.433
169275.	28893.	0.7311	0.75	5.4	134.	15778.	10488.	1741.0	0.49357	169275.	18.691	247.7	1
	37193.	433.01	21.69	68.3	3433.	1.00000	0.66475	1474.4	0.02641	9057.	0.04129	66.6	20.642
169133.	30004.	0.7462	0.83	6.0	142.	15035.	10043.	1567.8	0.49781	169133.	18.623	245.4	1
	38568.	439.83	22.52	74.4	3575.	1.00000	0.66800	1337.4	0.02673	9082.	0.04379	69.1	19.767
168981.	31116.	0.7613	0.92	6.8	152.	14382.	9689.	1406.8	0.50273	168981.	18.519	242.8	1
	39944.	446.55	23.44	81.2	3727.	1.00000	0.67368	1202.3	0.02715	9125.	0.04609	71.7	19.255
168773.	32702.	0.7720	1.33	10.0	208.	13378.	9056.	1160.4	0.52525	168773.	18.592	232.1	1
	41656.	449.73	24.78	91.2	3935.	1.00000	0.67691	1189.0	0.02825	9078.	0.04966	75.2	18.196

168607.	33909.	0.7762	1.13	8.5	166.	12586.	8526.	966.3	0.54923	168607.	18.717	221.7	1
	42862.	449.73	25.91	99.7	4102.	1.00000	0.67741	1063.3	0.02934	9008.	0.05275	77.9	17.264
168434.	35000.	0.7800	1.25	9.4	172.	11868.	8043.	781.7	0.57203	168434.	18.764	212.7	1
	43954.	449.73	27.16	109.0	4274.	1.00000	0.67770	874.0	0.03049	8977.	0.05592	80.5	16.404

SEGMENT 2 CRUISE

WEIGHT	ALTITUDE ENERGY	MACH NO. VELOCITY	DELTA T TIME	DELTA D DIST	DELTA F FUEL	THRUST T/TMAX	FUEL FLOW SFC	EX POW DH/DT*	CLIFT CDRAG	LIFT DRAG	L/D SP RANGE	Q NOX	PCODE ENG PAR
168434.	35000.	0.7800	0.00	0.0	0.	8977.	5889.	781.7	0.57203	168434.	18.764	212.7	1
	43954.	449.73	27.16	109.0	4274.	0.75639	0.65601	0.0	0.03049	8977.	0.07637	80.5	12.730
168000.	35000.	0.7800	4.42	33.2	434.	8958.	5876.	788.8	0.57055	168000.	18.755	212.7	1
	43954.	449.73	31.59	142.2	4708.	0.75480	0.65598	0.0	0.03042	8958.	0.07654	86.1	12.713
166400.	35000.	0.7800	16.40	122.9	1600.	8889.	5830.	815.2	0.56512	166400.	18.720	212.7	1
	43954.	449.73	47.99	265.1	6308.	0.74901	0.65587	0.0	0.03019	8889.	0.07714	106.4	12.650
164800.	35000.	0.7800	16.53	123.9	1600.	8821.	5785.	841.8	0.55968	164800.	18.682	212.7	1
	43954.	449.73	64.52	389.0	7908.	0.74332	0.65576	0.0	0.02996	8821.	0.07774	126.5	12.588
163200.	35000.	0.7800	16.66	124.9	1600.	8755.	5740.	868.6	0.55425	163200.	18.641	212.7	1
	43954.	449.73	81.18	513.9	9508.	0.73773	0.65565	0.0	0.02973	8755.	0.07835	146.6	12.528
161600.	35000.	0.7800	16.78	125.8	1600.	8690.	5699.	895.4	0.54882	161600.	18.595	212.7	1
	43954.	449.73	97.96	639.7	11108.	0.73227	0.65575	0.0	0.02951	8690.	0.07892	166.6	12.472
160000.	35000.	0.7800	16.90	126.7	1600.	8628.	5661.	922.1	0.54338	160000.	18.544	212.7	1
	43954.	449.73	114.86	766.4	12708.	0.72704	0.65609	0.0	0.02930	8628.	0.07944	186.6	12.424
158400.	35000.	0.7800	17.01	127.5	1600.	8567.	5624.	949.0	0.53795	158400.	18.490	212.7	1
	43954.	449.73	131.88	893.9	14308.	0.72187	0.65643	0.0	0.02909	8567.	0.07997	206.4	12.376
156800.	35000.	0.7800	17.13	128.4	1600.	8506.	5587.	976.4	0.53252	156800.	18.434	212.7	1
	43954.	449.73	149.01	1022.3	15908.	0.71675	0.65677	0.0	0.02889	8506.	0.08050	226.2	12.329
155200.	35000.	0.7800	17.24	129.2	1600.	8446.	5550.	1004.1	0.52708	155200.	18.376	212.7	1
	43954.	449.73	166.25	1151.5	17508.	0.71168	0.65712	0.0	0.02868	8446.	0.08103	245.8	12.283
153600.	35000.	0.7800	17.35	130.1	1600.	8386.	5514.	1032.2	0.52165	153600.	18.315	212.7	1
	43954.	449.73	183.60	1281.6	19108.	0.70667	0.65746	0.0	0.02848	8386.	0.08156	265.5	12.236
152000.	35000.	0.7800	17.47	130.9	1600.	8328.	5478.	1060.7	0.51621	152000.	18.252	212.7	1
	43954.	449.73	201.07	1412.5	20708.	0.70171	0.65781	0.0	0.02828	8328.	0.08210	285.0	12.191
151276.	35000.	0.7800	7.94	59.6	724.	8301.	5462.	1073.7	0.51375	151276.	18.223	212.7	1
	43954.	449.73	209.01	1472.1	21432.	0.69949	0.65796	0.0	0.02819	8301.	0.08234	293.8	12.170

SEGMENT 3 CLIMB

WEIGHT	ALTITUDE ENERGY	MACH NO. VELOCITY	DELTA T TIME	DELTA D DIST	DELTA F FUEL	THRUST T/TMAX	FUEL FLOW SFC	EX POW DH/DT*	CLIFT CDRAG	LIFT DRAG	L/D SP RANGE	Q NOX	PCODE ENG PAR
151276.	35000.	0.7800	0.00	0.0	0.	11868.	8043.	1073.7	0.51375	151276.	18.223	212.7	1
	43954.	449.73	209.01	1472.1	21432.	1.00000	0.67770	1114.3	0.02819	8301.	0.05592	293.8	16.404
151163.	35954.	0.7793	0.86	6.4	112.	11328.	7696.	937.6	0.53820	151163.	18.436	202.9	1
	44815.	447.38	209.87	1478.5	21545.	1.00000	0.67941	1114.3	0.02919	8199.	0.05813	295.5	16.003
150925.	37534.	0.7800	1.93	14.4	238.	10444.	7138.	702.6	0.57855	150925.	18.624	188.4	1
	46395.	447.38	211.80	1492.8	21783.	1.00000	0.68345	820.1	0.03106	8104.	0.06267	298.9	15.369
150637.	39000.	0.7800	2.52	18.8	288.	9621.	6615.	462.2	0.61943	150637.	18.633	175.6	1
	47861.	447.38	214.31	1511.6	22071.	1.00000	0.68755	582.4	0.03324	8084.	0.06763	302.9	14.771

SEGMENT 4 CRUISE

WEIGHT	ALTITUDE ENERGY	MACH NO. VELOCITY	DELTA T TIME	DELTA D DIST	DELTA F FUEL	THRUST T/TMAX	FUEL FLOW SFC	EX POW DH/DT*	CLIFT CDRAG	LIFT DRAG	L/D SP RANGE	Q NOX	PCODE ENG PAR
150637.	39000.	0.7800	0.00	0.0	0.	8084.	5410.	462.2	0.61943	150637.	18.633	175.6	1
	47861.	447.38	214.31	1511.6	22071.	0.84026	0.66921	0.0	0.03324	8084.	0.08270	302.9	12.406
150400.	39000.	0.7800	2.62	19.6	237.	8071.	5401.	466.8	0.61846	150400.	18.634	175.6	1
	47861.	447.38	216.94	1531.2	22308.	0.83893	0.66920	0.0	0.03319	8071.	0.08283	305.8	12.394
148800.	39000.	0.7800	17.87	133.2	1600.	7986.	5344.	497.7	0.61188	148800.	18.631	175.6	1
	47861.	447.38	234.81	1664.4	23908.	0.83010	0.66915	0.0	0.03284	7986.	0.08371	325.6	12.309
147200.	39000.	0.7800	18.06	134.6	1600.	7904.	5289.	528.5	0.60530	147200.	18.624	175.6	1
	47861.	447.38	252.86	1799.1	25508.	0.82152	0.66911	0.0	0.03250	7904.	0.08459	345.2	12.228
145600.	39000.	0.7800	18.24	136.0	1600.	7825.	5235.	559.0	0.59872	145600.	18.608	175.6	1
	47861.	447.38	271.11	1935.1	27108.	0.81327	0.66906	0.0	0.03218	7825.	0.08546	364.7	12.149
144000.	39000.	0.7800	18.43	137.4	1600.	7750.	5185.	588.7	0.59214	144000.	18.581	175.6	1
	47861.	447.38	289.53	2072.5	28708.	0.80551	0.66902	0.0	0.03187	7750.	0.08629	384.1	12.075
142400.	39000.	0.7800	18.60	138.7	1600.	7677.	5136.	618.6	0.58556	142400.	18.550	175.6	1
	47861.	447.38	308.14	2211.2	30308.	0.79790	0.66897	0.0	0.03157	7677.	0.08712	403.4	12.002
140800.	39000.	0.7800	18.78	140.0	1600.	7605.	5087.	648.8	0.57898	140800.	18.514	175.6	1
	47861.	447.38	326.92	2351.3	31908.	0.79044	0.66893	0.0	0.03127	7605.	0.08794	422.5	11.931
139200.	39000.	0.7800	18.96	141.4	1600.	7535.	5040.	679.1	0.57240	139200.	18.475	175.6	1
	47861.	447.38	345.88	2492.6	33508.	0.78312	0.66888	0.0	0.03098	7535.	0.08877	441.5	11.861

137600.	39000.	0.7800	19.14	142.7	1600.	7466.	4993.	709.7	0.56582	137600.	18.431	175.6	1
	47861.	447.38	365.02	2635.3	35108.	0.77595	0.66884	0.0	0.03070	7466.	0.08960	460.5	11.793
136000.	39000.	0.7800	19.31	144.0	1600.	7398.	4948.	740.6	0.55924	136000.	18.383	175.6	1
	47861.	447.38	384.33	2779.3	36708.	0.76893	0.66880	0.0	0.03042	7398.	0.09042	479.3	11.726
135762.	39000.	0.7800	2.89	21.6	238.	7388.	4941.	745.2	0.55826	135762.	18.376	175.6	1
	47861.	447.38	387.22	2800.9	36946.	0.76790	0.66879	0.0	0.03038	7388.	0.09054	482.1	11.716

SEGMENT 5 DESCENT

WEIGHT	ALTITUDE ENERGY	MACH NO. VELOCITY	DELTA T TIME	DELTA D DIST	DELTA F FUEL	THRUST T/TMAX	FUEL FLOW SFC	EX POW DH/DT*	CLIFT CDRAG	LIFT DRAG	L/D SP RANGE	Q NOX	PCODE ENG PAR
135762.	39000.	0.7800	0.00	0.0	0.	-427.	619.	-2608.1	0.55826	135762.	18.376	175.6	0
	47861.	447.38	387.22	2800.9	36946.	-0.04441	0.00000	0.0	0.03038	7388.	0.72280	482.1	2.182
135760.	39000.	0.7587	0.19	1.4	2.	-398.	613.	-2476.9	0.59008	135760.	18.770	166.2	0
	47383.	435.15	387.41	2802.3	36948.	-0.04176	0.00000	0.0	0.03144	7233.	0.71018	482.1	1.969
135755.	38334.	0.7296	0.54	3.8	6.	-374.	618.	-2348.1	0.61801	135755.	18.991	158.6	0
	46087.	418.48	387.95	2806.1	36954.	-0.03825	0.00000	-1239.1	0.03254	7148.	0.67666	482.1	1.740
135749.	37357.	0.7144	0.56	3.9	6.	-377.	629.	-2287.6	0.61504	135749.	19.103	159.4	0
	44791.	409.78	388.51	2810.0	36960.	-0.03682	0.00000	-1747.3	0.03220	7106.	0.65175	482.1	1.670
135743.	36365.	0.6997	0.57	3.9	6.	-379.	638.	-2229.2	0.61145	135743.	19.209	160.3	0
	43495.	401.32	389.08	2813.8	36966.	-0.03538	0.00000	-1729.2	0.03183	7066.	0.62901	482.1	1.600
135736.	35310.	0.6852	0.59	3.9	6.	-387.	652.	-2182.0	0.60629	135736.	19.317	161.7	0
	42199.	394.49	389.67	2817.7	36972.	-0.03444	0.00000	-1796.1	0.03139	7027.	0.60544	482.1	1.546
135730.	34281.	0.6687	0.60	3.9	7.	-380.	672.	-2127.7	0.60627	135730.	19.409	161.7	0
	40903.	386.78	390.27	2821.6	36979.	-0.03217	0.00000	-1711.6	0.03124	6993.	0.57600	482.1	1.575
135723.	33222.	0.6535	0.62	3.9	7.	-373.	694.	-2078.8	0.60405	135723.	19.491	162.3	0
	39608.	379.78	390.89	2825.6	36986.	-0.02993	0.00000	-1717.4	0.03099	6963.	0.54718	482.1	1.665
135715.	32176.	0.6376	0.63	4.0	7.	-352.	715.	-2024.8	0.60430	135715.	19.564	162.2	0
	38312.	372.29	391.52	2829.5	36993.	-0.02689	0.00000	-1657.0	0.03089	6937.	0.52080	482.1	1.746
135707.	31106.	0.6228	0.65	4.0	8.	-333.	735.	-1975.5	0.60286	135707.	19.631	162.6	0
	37016.	365.37	392.17	2833.5	37001.	-0.02420	0.00000	-1651.2	0.03071	6913.	0.49741	482.2	1.839
135699.	30029.	0.6084	0.66	4.0	8.	-316.	753.	-1928.6	0.60159	135699.	19.691	162.9	0
	35720.	358.54	392.83	2837.5	37009.	-0.02194	0.00000	-1622.4	0.03055	6891.	0.47586	482.2	1.932
135691.	28950.	0.5939	0.68	4.0	9.	-301.	776.	-1883.2	0.60114	135691.	19.739	163.0	0
	34424.	351.65	393.51	2841.5	37018.	-0.01988	0.00000	-1587.3	0.03045	6874.	0.45324	482.2	2.064
135681.	27859.	0.5800	0.70	4.0	9.	-277.	799.	-1837.7	0.60029	135681.	19.779	163.2	0
	33128.	345.00	394.21	2845.6	37027.	-0.01740	0.00000	-1566.0	0.03035	6860.	0.43168	482.2	2.204
135672.	26764.	0.5662	0.71	4.1	10.	-249.	824.	-1792.0	0.60001	135672.	19.815	163.3	0
	31832.	338.35	394.92	2849.6	37037.	-0.01489	0.00000	-1533.1	0.03028	6847.	0.41052	482.2	2.343
135662.	25666.	0.5524	0.73	4.1	10.	-216.	851.	-1745.9	0.60045	135662.	19.846	163.2	0
	30536.	331.67	395.65	2853.7	37047.	-0.01236	0.00000	-1498.5	0.03026	6836.	0.38982	482.3	2.480
135651.	24561.	0.5390	0.75	4.1	11.	-203.	874.	-1705.9	0.60099	135651.	19.874	163.0	0
	29240.	325.11	396.40	2857.8	37058.	-0.01110	0.00000	-1471.8	0.03024	6825.	0.37209	482.3	2.630
135639.	23440.	0.5265	0.77	4.1	11.	-200.	897.	-1670.8	0.60020	135639.	19.902	163.2	0
	27944.	318.99	397.17	2861.9	37069.	-0.01038	0.00000	-1461.2	0.03016	6815.	0.35566	482.3	2.796
135628.	22315.	0.5140	0.78	4.1	12.	-191.	921.	-1634.7	0.60001	135628.	19.926	163.3	0
	26649.	312.87	397.96	2866.1	37081.	-0.00942	0.00000	-1434.5	0.03011	6807.	0.33969	482.3	2.963
135615.	21184.	0.5018	0.80	4.1	12.	-176.	946.	-1598.0	0.60000	135615.	19.948	163.2	0
	25353.	306.85	398.76	2870.2	37093.	-0.00828	0.00000	-1410.1	0.03008	6799.	0.32426	482.4	3.132
135602.	20047.	0.4900	0.82	4.2	13.	-157.	976.	-1561.8	0.60000	135602.	19.963	163.2	0
	24057.	300.95	399.58	2874.3	37106.	-0.00705	0.00000	-1386.6	0.03006	6793.	0.30836	482.4	3.307
135588.	18903.	0.4784	0.84	4.2	14.	-130.	1011.	-1525.1	0.60000	135588.	19.978	163.2	0
	22761.	295.19	400.42	2878.5	37120.	-0.00570	0.00000	-1362.3	0.03003	6787.	0.29191	482.5	3.435
135573.	17753.	0.4672	0.86	4.2	15.	-103.	1047.	-1489.1	0.60000	135573.	19.991	163.2	0
	21465.	289.56	401.28	2882.7	37135.	-0.00439	0.00000	-1337.5	0.03001	6782.	0.27649	482.5	3.568
135558.	16597.	0.4562	0.88	4.2	16.	-76.	1084.	-1454.1	0.60000	135558.	20.005	163.2	0
	20169.	284.05	402.16	2886.9	37151.	-0.00314	0.00000	-1312.8	0.02999	6776.	0.26208	482.6	3.706
135541.	15435.	0.4456	0.90	4.2	17.	-47.	1122.	-1419.5	0.60000	135541.	20.018	163.2	0
	18873.	278.67	403.06	2891.1	37167.	-0.00187	0.00000	-1288.1	0.02997	6771.	0.24826	482.6	3.852
135523.	14268.	0.4352	0.92	4.2	18.	-14.	1171.	-1385.1	0.60000	135523.	20.031	163.1	0
	17577.	273.41	403.98	2895.4	37185.	-0.00055	0.00000	-1263.2	0.02995	6766.	0.23354	482.7	4.009
135504.	13095.	0.4251	0.95	4.3	19.	26.	1223.	-1350.1	0.60000	135504.	20.044	163.1	0
	16281.	268.27	404.93	2899.7	37204.	0.00099	0.00000	-1237.5	0.02993	6760.	0.21930	482.8	4.167
135484.	11918.	0.4153	0.97	4.3	20.	75.	1276.	-1314.3	0.60000	135484.	20.057	163.1	0
	14985.	263.24	405.90	2904.0	37224.	0.00274	16.91116	-1210.7	0.02992	6755.	0.20627	482.9	4.326

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135463.   10735.   0.4058     1.00      4.3      22.     133.    1329.  -1277.9  0.60000  135463.   20.070    163.1      0
          13690.   258.33   406.90   2908.3   37246.  0.00466 10.02060  -1182.7  0.02990    6750.  0.19432    483.0     4.484

135392.    7357.   0.3801     2.99      12.5      70.     276.    1499.  -1182.9  0.60000  135392.   20.118    163.0      0
          10015.   245.02   409.89   2920.8   37316.  0.00885  5.43932  -1131.0  0.02982    6730.  0.16346    483.3     4.893

135307.    3978.   0.3566     3.20      12.7      85.     440.    1689.  -1092.1  0.60000  135307.   20.162    162.9      0
           6375.   232.67   413.09   2933.5   37401.  0.01298  3.84134  -1055.8  0.02976    6711.  0.13776    483.7     5.297

135167.       0.   0.3000     4.59      16.5     140.     874.    1980.   -927.9  0.73223  135167.   18.998    133.3      0
           1743.   198.44   417.68   2950.0   37541.  0.02286  2.26642   -867.5  0.03854    7115.  0.10020    484.5     5.551
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Appendix C.—Overall Performance Map Characteristics; Pressure Ratio, Efficiency Versus Flow and RPM (With Baseline Aerodynamic Blockages)

Flow Rate, Corr., lbm/sec, Pressure Ratio, Efficiency, Rotor 1 Incidence, Temp. Ratio
ZONE T=" 110% of Design Corrected Speed = 4137 RPM", I = 17.0

206.3230	2.2794	0.8126	2.5142	1.3279
203.8517	2.3806	0.8341	2.9529	1.3385
202.2476	2.4331	0.8434	3.2376	1.3443
201.0352	2.4669	0.8485	3.4529	1.3483
198.2180	2.5330	0.8567	3.9532	1.3564
195.2791	2.5876	0.8613	4.4756	1.3638
192.3645	2.6299	0.8629	4.9942	1.3703
189.4935	2.6638	0.8626	5.5058	1.3760
186.6652	2.6912	0.8611	6.0106	1.3812
183.8792	2.7134	0.8586	6.5087	1.3860
181.1348	2.7315	0.8554	7.0004	1.3904
178.4314	2.7462	0.8518	7.4857	1.3944
175.7682	2.7581	0.8477	7.9649	1.3983
173.0626	2.7674	0.8431	8.4529	1.4020
170.2964	2.7741	0.8380	8.9531	1.4056
167.1750	2.7796	0.8319	9.5192	1.4095
164.6798	2.7825	0.8268	9.9730	1.4125

ZONE T=" 105% of Design Corrected Speed = 3949.3 RPM", I = 14.0

199.2340	2.0035	0.7782	2.4621	1.2833
196.2604	2.1310	0.8172	2.9953	1.2964
193.3312	2.2235	0.8397	3.5215	1.3066
190.4457	2.2930	0.8528	4.0409	1.3150
188.1599	2.3383	0.8596	4.4532	1.3208
185.3932	2.3829	0.8642	4.9534	1.3271
182.6354	2.4198	0.8665	5.4534	1.3328
179.8873	2.4504	0.8669	5.9529	1.3380
174.0149	2.4999	0.8635	7.0256	1.3479
168.8593	2.5293	0.8572	7.9735	1.3556
163.5658	2.5485	0.8481	8.9533	1.3628
158.2028	2.5605	0.8375	9.9531	1.3694
152.7519	2.5667	0.8258	10.9770	1.3758
147.4851	2.5682	0.8138	11.9740	1.3816

ZONE T=" 100% of Design Corrected Speed = 3761.1 RPM", I = 20.0

190.2553	1.8420	0.7636	2.7031	1.2507
188.5460	1.9109	0.7916	3.0144	1.2577
185.7319	1.9995	0.8216	3.5283	1.2675
184.7755	2.0253	0.8293	3.7034	1.2704
182.9599	2.0686	0.8408	4.0364	1.2756
180.2291	2.1238	0.8533	4.5386	1.2825
177.5392	2.1686	0.8612	5.0352	1.2886
174.8894	2.2059	0.8660	5.5263	1.2940
172.2791	2.2371	0.8686	6.0120	1.2990
169.7079	2.2633	0.8695	6.4923	1.3035
167.1750	2.2853	0.8691	6.9673	1.3077
164.5934	2.3037	0.8673	7.4534	1.3117
161.9505	2.3192	0.8645	7.9532	1.3156
159.0018	2.3336	0.8604	8.5135	1.3196
156.6287	2.3430	0.8566	8.9664	1.3228
151.2282	2.3589	0.8465	10.0040	1.3296

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146.0140      2.3680      0.8352     11.0152      1.3357
140.9795      2.3722      0.8234     12.0004      1.3413
136.1186      2.3728      0.8114     12.9602      1.3465
133.4166      2.3719      0.8046     13.4974      1.3492
ZONE T=" 95% of Design Corrected Speed = 3572.9 RPM", I = 17.0
181.0216      1.7094      0.7505      2.9530      1.2214
179.3280      1.7675      0.7798      3.2685      1.2275
178.3378      1.7961      0.7924      3.4534      1.2307
175.6672      1.8635      0.8190      3.9536      1.2386
173.0107      1.9184      0.8372      4.4535      1.2453
170.3689      1.9648      0.8501      4.9531      1.2514
167.7381      2.0045      0.8591      5.4531      1.2568
164.6798      2.0437      0.8660      6.0376      1.2626
159.8008      2.0923      0.8702      6.9773      1.2709
154.7835      2.1290      0.8688      7.9532      1.2785
149.6973      2.1560      0.8632      8.9529      1.2855
144.5575      2.1749      0.8547      9.9739      1.2920
139.5732      2.1869      0.8445     10.9747      1.2978
134.7507      2.1938      0.8333     11.9530      1.3032
129.4638      2.1971      0.8199     13.0371      1.3088
125.0000      2.1971      0.8079     13.9618      1.3134
120.0866      2.1944      0.7943     14.9898      1.3182
ZONE T=" 90% of Design Corrected Speed = 3384.6 RPM", I = 16.0
171.4177      1.6064      0.7440      3.2406      1.1957
170.3092      1.6381      0.7634      3.4530      1.1991
167.7087      1.6988      0.7951      3.9535      1.2064
164.6798      1.7572      0.8209      4.5402      1.2137
162.2220      1.7986      0.8367      5.0193      1.2191
157.4157      1.8653      0.8569      5.9641      1.2284
151.9881      1.9221      0.8676      7.0442      1.2375
147.4741      1.9579      0.8697      7.9534      1.2443
142.3999      1.9881      0.8670      8.9875      1.2512
137.4901      2.0092      0.8606     10.0004      1.2574
132.7495      2.0234      0.8517     10.9901      1.2629
128.1724      2.0324      0.8414     11.9567      1.2680
123.1343      2.0380      0.8286     13.0332      1.2733
118.8768      2.0399      0.8169     13.9533      1.2776
114.2156      2.0394      0.8034     14.9715      1.2822
109.7261      2.0366      0.7899     15.9629      1.2864
ZONE T=" 85% of Design Corrected Speed = 3197.3 RPM", I = 17.0
162.1044      1.5115      0.7336      3.4535      1.1714
159.5892      1.5634      0.7688      3.9533      1.1778
156.6287      1.6157      0.7990      4.5460      1.1846
154.2909      1.6521      0.8174      5.0175      1.1894
151.9881      1.6845      0.8320      5.4850      1.1938
149.6973      1.7136      0.8436      5.9530      1.1980
144.5575      1.7687      0.8605      7.0142      1.2064
140.0713      1.8063      0.8673      7.9532      1.2130
135.3568      1.8370      0.8683      8.9530      1.2194
130.7028      1.8597      0.8646      9.9532      1.2252
126.1111      1.8761      0.8577     10.9531      1.2305
121.2965      1.8880      0.8476     12.0155      1.2358
117.0996      1.8946      0.8372     12.9533      1.2402
112.5109      1.8986      0.8244     13.9913      1.2448
108.0884      1.8997      0.8111     15.0041      1.2491
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103.8398      1.8987      0.7977     15.9884      1.2530
99.7208      1.8958      0.7841     16.9533      1.2567
ZONE T=" 80% of Design Corrected Speed = 3009.1 RPM", I = 19.0
153.5195      1.4133      0.7086      3.4810      1.1472
151.2282      1.4527      0.7418      3.9538      1.1524
148.8259      1.4898      0.7693      4.4533      1.1574
146.0140      1.5299      0.7961      5.0429      1.1629
143.8347      1.5585      0.8132      5.5035      1.1668
141.6879      1.5845      0.8273      5.9606      1.1705
136.8026      1.6357      0.8501      7.0126      1.1783
132.0858      1.6754      0.8622      8.0445      1.1850
127.9930      1.7029      0.8665      8.9529      1.1903
123.1343      1.7283      0.8656     10.0471      1.1962
118.8887      1.7448      0.8608     11.0174      1.2010
114.7895      1.7566      0.8534     11.9669      1.2054
110.2775      1.7656      0.8428     13.0264      1.2101
106.3821      1.7704      0.8320     13.9532      1.2139
102.2312      1.7731      0.8194     14.9531      1.2178
97.7779       1.7735      0.8047     16.0399      1.2219
93.9346       1.7721      0.7913     16.9895      1.2253
89.7911       1.7686      0.7762     18.0251      1.2288
88.0087       1.7665      0.7695     18.4744      1.2303
ZONE T=" 70% of Design Corrected Speed = 2632.6 RPM", I = 20.0
136.1186      1.2669      0.6602      3.4667      1.1063
133.9698      1.2921      0.6919      3.9529      1.1102
131.4253      1.3211      0.7258      4.5345      1.1145
129.4638      1.3427      0.7491      4.9872      1.1177
127.4614      1.3639      0.7704      5.4532      1.1208
125.0000      1.3885      0.7930      6.0315      1.1244
121.1299      1.4237      0.8213      6.9532      1.1298
117.0002      1.4564      0.8425      7.9535      1.1351
112.9435      1.4834      0.8554      8.9532      1.1400
108.6316      1.5069      0.8618     10.0345      1.1448
104.8861      1.5232      0.8623     10.9895      1.1487
101.1634      1.5360      0.8589     11.9532      1.1525
97.2890       1.5460      0.8520     12.9716      1.1562
93.4649       1.5531      0.8425     13.9922      1.1597
89.7911       1.5576      0.8314     14.9870      1.1630
86.2617       1.5601      0.8192     15.9559      1.1660
82.4566       1.5608      0.8048     17.0148      1.1692
78.8194       1.5599      0.7899     18.0407      1.1721
75.3427       1.5575      0.7747     19.0337      1.1749
72.0193       1.5536      0.7591     19.9940      1.1774
ZONE T=" 60% of Design Corrected Speed = 2257. RPM", I = 22.0
117.7028      1.1757      0.6291      3.5438      1.0755
115.9461      1.1902      0.6569      3.9922      1.0779
114.1585      1.2048      0.6834      4.4529      1.0803
111.9483      1.2226      0.7137      5.0288      1.0831
110.2775      1.2358      0.7347      5.4688      1.0852
108.4552      1.2497      0.7556      5.9532      1.0874
104.7498      1.2766      0.7917      6.9532      1.0916
101.1179      1.3006      0.8189      7.9529      1.0956
97.2890       1.3228      0.8393      9.0280      1.0995
93.9346       1.3396      0.8507      9.9879      1.1028
90.6187       1.3536      0.8567     10.9534      1.1059
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87.1308       1.3658      0.8579     11.9868      1.1090
83.7060       1.3754      0.8548     13.0194      1.1120
80.4157       1.3824      0.8483     14.0280      1.1147
77.2548       1.3873      0.8395     15.0123      1.1172
74.2182       1.3906      0.8290     15.9719      1.1196
70.9444       1.3926      0.8157     17.0217      1.1221
67.8150       1.3931      0.8016     18.0398      1.1244
64.8237       1.3924      0.7867     19.0262      1.1266
61.9643       1.3906      0.7714     19.9809      1.1286
58.9348       1.3874      0.7536     21.0048      1.1306
57.4761       1.3852      0.7444     21.5023      1.1316
ZONE T=" 50% of Design Corrected Speed = 1880.5 RPM", I = 24.0
99.2594       1.1100      0.5986      3.4637      1.0508
97.6119       1.1195      0.6276      3.9534      1.0524
95.8370       1.1298      0.6572      4.4873      1.0542
94.3052       1.1386      0.6813      4.9535      1.0557
92.5326       1.1488      0.7073      5.4992      1.0574
91.0741       1.1570      0.7272      5.9534      1.0587
89.3421       1.1666      0.7490      6.4986      1.0603
87.9141       1.1743      0.7654      6.9531      1.0616
84.5493       1.1914      0.7983      8.0419      1.0645
81.6341       1.2051      0.8204      9.0055      1.0670
78.8194       1.2169      0.8362      9.9539      1.0692
75.7213       1.2284      0.8475     11.0185      1.0717
73.0520       1.2368      0.8525     11.9530      1.0737
70.2367       1.2443      0.8535     12.9562      1.0758
67.4759       1.2503      0.8506     13.9573      1.0778
64.7751       1.2549      0.8444     14.9533      1.0797
61.9643       1.2584      0.8351     16.0072      1.0816
59.4811       1.2605      0.8246     16.9529      1.0832
56.8929       1.2617      0.8119     17.9529      1.0849
54.1208       1.2620      0.7962     19.0400      1.0867
51.7336       1.2614      0.7813     19.9894      1.0881
49.2043       1.2598      0.7637     21.0082      1.0896
46.7987       1.2572      0.7451     21.9893      1.0910
45.1851       1.2548      0.7314     22.6539      1.0920
ZONE T=" 40% of Design Corrected Speed = 1504. RPM", I = 25.0
80.0137       1.0661      0.5805      3.4576      1.0319
78.4253       1.0725      0.6130      4.0348      1.0331
77.2548       1.0772      0.6359      4.4657      1.0339
75.7213       1.0835      0.6644      5.0372      1.0350
74.5911       1.0880      0.6842      5.4636      1.0358
73.1105       1.0940      0.7088      6.0289      1.0368
72.0121       1.0984      0.7258      6.4532      1.0376
70.5897       1.1040      0.7463      7.0089      1.0385
68.1558       1.1132      0.7772      7.9764      1.0402
65.7516       1.1218      0.8024      8.9529      1.0417
63.2192       1.1301      0.8230     10.0038      1.0434
60.9785       1.1367      0.8362     10.9531      1.0447
58.6402       1.1428      0.8452     11.9632      1.0462
56.3352       1.1481      0.8493     12.9783      1.0476
54.1208       1.1523      0.8493     13.9717      1.0488
51.9714       1.1556      0.8457     14.9530      1.0501
49.7001       1.1584      0.8386     16.0081      1.0513
47.5078       1.1603      0.8288     17.0439      1.0526
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45.6130	1.1614	0.8183	17.9529	1.0536
43.4090	1.1620	0.8038	19.0260	1.0547
41.4943	1.1620	0.7894	19.9719	1.0557
39.4656	1.1614	0.7723	20.9874	1.0567
37.5361	1.1601	0.7540	21.9660	1.0577
35.5225	1.1580	0.7323	23.0000	1.0587
33.6169	1.1550	0.7085	23.9903	1.0595

Appendix D.—Compressor Flow Analysis of Fan-Core and LPC Along Map; Baseline Blockages

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 110% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 2.514   EfDer =  0.981

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     211.202    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   96.00080

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     206.323    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM        SCFM           A1/A*      Area1        A*      AthrRotor  ChokeMargin
  162473.812  165722.922       1.384     831.557     600.857     619.754       1.031

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   524.36    -0.18   524.36     0.48   744.88
  MEAN    17.06     0.00    -0.02   524.36    -0.18   524.36     0.48
  HUB     12.51     0.00    -0.02   524.36    -0.18   524.36     0.48

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     54.97    50.47     4.50   747.85   913.51    12.92   499.84     0.83
  MEAN    49.71    47.20     2.51   618.44   810.95    12.92   499.84     0.74
  HUB     40.87    38.62     2.25   453.49   693.38    12.92   499.84     0.63

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   789.09   367.88   698.09  1114.22     0.71
  MEAN    18.04   836.74   434.97   714.80  1109.13     0.75
  HUB     15.00   985.01   620.57   764.94  1095.19     0.90

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   794.80   379.97     0.71  7593.10
  MEAN   653.81   747.55   218.85     0.67  7848.16     1.19
  HUB    543.76   768.78    76.82     0.70  9310.85

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.50     1.29    13.95   567.03     1.08   515.10     0.92     0.90
  MEAN    19.66     1.30    13.48   568.51     1.09   510.15     0.92     0.90
  HUB     20.61     1.36    12.19   577.03     1.10   496.33     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     27.79    28.56    24.20     4.36     0.93     0.20     2.90
  MEAN    31.32    17.02    12.70     4.32     0.91     0.16     3.51     0.90
  HUB     39.05    -5.73    -9.30     3.57     0.91    -0.01     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.981

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     860.388     434.122     742.835    1106.781       0.777      -0.024

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     19.856      13.313     509.027      24.000      30.303      35.400       5.097

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     779.652     434.122     892.367    1118.740       0.697       0.150

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.669      14.214     520.086     528.796       0.038       0.348

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     706.248       0.000     706.248    1128.505       0.626       0.235

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      14.895     529.197       0.000       0.060       0.078       0.252

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.809      19.400       1.284     570.856      48.046     241.424       1.872

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 299130.250       0.535    3570.180 2204906.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 2.514   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    211.202    4154.000      19.400     570.856       1.000       1.000       0.980
W Kg/sec =   96.00080

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    167.885    3959.690       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 162473.812  165722.922       1.208     590.487     488.942     474.134       0.970

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   662.19    -0.23   662.19     0.58   710.08
 MEAN    18.08     0.00    -0.02   662.19    -0.23   662.19     0.58
 HUB     15.21     0.00    -0.02   662.19    -0.23   662.19     0.58

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.37    46.36     2.01   744.95   996.89    15.39   534.25     0.88
 MEAN    44.71    42.30     2.41   655.35   931.81    15.39   534.25     0.82
 HUB     39.79    37.84     1.95   551.37   861.83    15.39   534.25     0.76

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   706.00   276.16   649.74  1163.30     0.61
 MEAN    18.01   726.80   308.80   657.94  1160.32     0.63
 HUB     15.22   792.70   426.45   668.22  1157.42     0.68

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   798.45   464.07     0.69  5643.98
 MEAN   652.87   742.48   344.07     0.64  5565.53     1.35
 HUB    551.84   679.88   125.39     0.59  6495.33

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.12     1.19    18.03   603.70     1.06   562.11     0.92     0.90
 MEAN    23.07     1.19    17.70   603.24     1.06   559.17     0.92     0.90
 HUB     23.73     1.22    17.33   608.66     1.07   556.24     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.03    35.54    31.50     4.04     0.93     0.25     2.90
 MEAN    25.14    27.61    23.50     4.11     0.91     0.25     3.30     0.90
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 HUB     32.55    10.63     6.50     4.13     0.91     0.27     3.92


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     739.760     309.663     671.828    1160.266       0.638       -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.250      17.680     559.513      46.000      24.746      30.600       5.854

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     679.762     309.663     746.972    1167.615       0.582       0.122

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.122      18.375     566.623     511.151       0.033       0.231

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.823     672.775       0.000     672.775    1168.431       0.576       0.117

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      18.338     567.412       0.000       0.060       0.061       0.116

    STAGE EXIT CONDITIONS, STAGE            2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.823      22.964       1.184     605.200      34.344     293.938       2.279

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 213964.016       0.390    2553.704 2017359.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 2.514   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    211.202    4154.000      22.964     605.200       1.000       1.000       0.980
W Kg/sec =   96.00080

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    146.037    3845.697       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 162473.812  165722.922       1.282     545.479     425.340     429.765       1.010

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   624.83    -0.22   624.83     0.53   673.53
 MEAN    17.74     0.00    -0.02   624.83    -0.22   624.83     0.53
 HUB     15.05     0.00    -0.02   624.83    -0.22   624.83     0.53

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.35    46.36     2.99   727.55   959.19    18.93   572.62     0.82
 MEAN    45.83    43.40     2.43   643.03   896.76    18.93   572.62     0.76
 HUB     41.14    38.84     2.30   545.57   829.64    18.93   572.62     0.71

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   677.95   274.33   619.97  1200.08     0.56
 MEAN    17.51   697.37   305.80   626.75  1197.40     0.58
 HUB     14.85   760.52   417.93   635.39  1194.75     0.64

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   762.44   443.79     0.64  5438.80
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 MEAN   634.62   707.77   328.82     0.59  5357.40     1.36
 HUB    538.32   646.69   120.39     0.54  6209.54

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.95     1.17    21.70   636.83     1.05   598.49     0.92     0.90
 MEAN    26.88     1.17    21.36   636.36     1.05   595.79     0.92     0.90
 HUB     27.55     1.20    20.97   641.31     1.06   593.07     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.87    35.60    31.50     4.10     0.93     0.25     2.90
 MEAN    26.01    27.68    23.50     4.18     0.91     0.26     3.28     0.90
 HUB     33.34    10.73     6.50     4.23     0.91     0.29     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     705.372     307.811     634.667    1198.036       0.589       0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.069      21.403     596.647      46.000      25.873      31.500       5.627

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     651.614     307.811     720.658    1204.132       0.541       0.128

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.954      22.082     602.734     471.992       0.030       0.252

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     630.628       0.000     630.628    1206.373       0.523       0.148

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.257     604.980       0.000       0.060       0.053       0.158

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.834      26.818       1.168     638.166      32.966     282.847       2.193

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 205515.141       0.399    2452.865 1913170.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 2.514   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    211.202    4154.000      26.818     638.166       1.000       1.000       0.980
W Kg/sec =   96.00080

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    128.409    3745.051       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 162473.812  165722.922       1.372     513.330     374.029     401.059       1.072

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   585.55    -0.20   585.55     0.48   629.43
 MEAN    16.97     0.00    -0.02   585.55    -0.20   585.55     0.48
 HUB     14.32     0.00    -0.02   585.55    -0.20   585.55     0.48

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.02    46.36     3.66   698.18   911.38    22.85   609.57     0.75
 MEAN    46.42    43.80     2.62   615.20   849.46    22.85   609.57     0.70
 HUB     41.57    37.84     3.73   519.11   782.66    22.85   609.57     0.65

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   641.70   266.28   583.84  1234.01     0.52
MEAN    16.57   658.27   291.29   590.31  1231.14     0.53
HUB     13.89   714.59   390.86   598.22  1228.29     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    684.41   718.12   418.13     0.58  5031.24
MEAN   600.81   666.53   309.52     0.54  4831.29     1.37
HUB    503.52   608.74   112.66     0.50  5431.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     30.88     1.15    25.68   667.40     1.05   633.07     0.92     0.90
MEAN    30.71     1.15    25.27   666.24     1.04   630.11     0.92     0.90
HUB     31.22     1.16    24.82   669.73     1.05   627.16     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     24.52    35.61    31.50     4.11     0.93     0.26     2.90
MEAN    26.26    27.67    23.50     4.17     0.91     0.27     3.29     0.90
HUB     33.16    10.67     6.50     4.17     0.91     0.29     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.982

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     646.017     292.932     575.785    1233.832       0.524       0.060

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    30.878      25.612     632.987      46.000      26.965      32.400       5.435

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     600.456     292.932     668.099    1238.440       0.485       0.168

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      30.786      26.210     637.723     456.573       0.026       0.274

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     567.659       0.000     567.659    1241.538       0.457       0.169

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      26.571     640.918       0.000       0.060       0.047       0.232

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.844      30.670       1.144     667.791      29.625     287.613       2.230

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 184834.641       0.395    2206.039 1878276.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 2.514   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    211.202    4154.000      30.670     667.791       1.000       1.000       0.980
W Kg/sec =   96.00080

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    114.858    3661.037       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 162473.812  165722.922       1.523     509.668     334.589     390.276       1.166
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    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   525.35    -0.18   525.35     0.42   585.28
MEAN    15.91     0.00    -0.02   525.35    -0.18   525.35     0.42
HUB     13.07     0.00    -0.02   525.35    -0.18   525.35     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.66    47.36     4.30   664.11   846.92    27.13   644.79     0.68
MEAN    47.68    44.80     2.88   576.85   780.36    27.13   644.79     0.63
HUB     42.06    38.84     3.22   473.79   707.56    27.13   644.79     0.57

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   592.62   270.60   527.24  1266.16     0.47
MEAN    15.50   603.68   280.54   534.54  1262.31     0.48
HUB     12.59   648.40   354.68   542.79  1258.53     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    650.33   649.75   379.74     0.51  4857.82
MEAN   561.80   604.02   281.26     0.48  4350.57     1.41
HUB    456.39   552.23   101.71     0.44  4467.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     34.95     1.14    30.07   696.00     1.04   666.73     0.92     0.90
MEAN    34.48     1.12    29.48   693.05     1.04   662.68     0.92     0.90
HUB     34.59     1.13    28.86   693.73     1.04   658.70     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     27.17    35.76    31.50     4.26     0.93     0.29     2.90
MEAN    27.69    27.75    23.50     4.25     0.91     0.28     3.34     0.90
HUB     33.16    10.61     6.50     4.11     0.91     0.28     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.985

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     610.378     285.683     539.394    1262.777       0.483      -0.004

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    34.568      29.459     663.209      46.000      27.907      33.000       5.093

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     569.037     285.683     636.724    1266.640       0.449       0.096

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      34.427      29.972     667.273     440.827       0.047       0.293

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    14.701     528.068       0.000     528.068    1270.190       0.416       0.214

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      30.572     671.019       0.000       0.060       0.045       0.212

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.850      34.436       1.123     694.260      26.468     295.203       2.288

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 165277.922       0.391    1972.625 1891672.625

   OVERALL EXIT CONDITIONS; ALL          5   STAGES
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   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1068721.88  12755.4141    206.3230      2.2794      0.8126      2.5142      1.3279
*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

    P&W Fan Hub + 4 Stage LPC 110% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 2.953   EfDer =  0.985

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     208.672    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   94.85092

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     203.852    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  160527.719  163737.922       1.401     831.557     593.660     619.754       1.044

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   516.27    -0.18   516.27     0.47   744.88
  MEAN    17.06     0.00    -0.02   516.27    -0.18   516.27     0.47
  HUB     12.51     0.00    -0.02   516.27    -0.18   516.27     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.39    50.47     4.92   747.85   908.89    12.98   500.55     0.83
  MEAN    50.15    47.20     2.95   618.44   805.75    12.98   500.55     0.73
  HUB     41.31    38.62     2.69   453.49   687.28    12.98   500.55     0.63

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   779.13   376.30   682.24  1116.58     0.70
  MEAN    18.04   826.24   439.51   699.64  1111.06     0.74
  HUB     15.00   970.58   618.71   747.80  1097.25     0.88

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   776.85   371.55     0.70  7766.73
  MEAN   653.81   731.73   214.30     0.66  7930.12     1.21
  HUB    543.76   751.55    74.96     0.68  9282.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.63     1.30    14.17   568.04     1.09   517.40     0.92     0.90
  MEAN    19.73     1.31    13.66   568.99     1.09   512.07     0.92     0.90
  HUB     20.61     1.36    12.39   576.87     1.10   498.47     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     28.88    28.57    24.20     4.37     0.93     0.22     2.90
  MEAN    32.14    17.03    12.70     4.33     0.91     0.17     3.51     0.90
  HUB     39.60    -5.72    -9.30     3.58     0.91     0.01     4.78

    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.985

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     847.611     438.660     725.273    1109.239       0.764      -0.020

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      19.926      13.532     511.292      24.000      31.166      35.400       4.234

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     756.255     438.660     874.268    1122.436       0.674       0.177

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.762      14.574     523.530     528.796       0.035       0.364

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     685.564       0.000     685.564    1131.531       0.606       0.260

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.242     532.043       0.000       0.060       0.069       0.279

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.825      19.538       1.293     571.298      48.488     237.915       1.844

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 301882.188       0.540    3559.869 2170892.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 2.953   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    208.672    4154.000      19.538     571.298       1.000       1.000       0.980
W Kg/sec =   94.85092

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    164.772    3958.158       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 160527.719  163737.922       1.230     590.487     479.876     474.134       0.988

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   644.17    -0.22   644.17     0.57   709.81
 MEAN    18.08     0.00    -0.02   644.17    -0.22   644.17     0.57
 HUB     15.21     0.00    -0.02   644.17    -0.22   644.17     0.57

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.16    46.36     2.80   744.95   985.00    15.71   536.65     0.87
 MEAN    45.50    42.30     3.20   655.35   919.09    15.71   536.65     0.81
 HUB     40.57    37.84     2.73   551.37   848.06    15.71   536.65     0.75

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   692.92   291.37   628.69  1167.12     0.59
 MEAN    18.01   713.63   319.43   638.15  1163.48     0.61
 HUB     15.22   779.00   430.32   649.36  1159.99     0.67

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   772.48   448.87     0.66  5954.29
 MEAN   652.87   720.01   333.44     0.62  5756.92     1.37
 HUB    551.84   660.63   121.53     0.57  6554.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.53     1.20    18.54   605.95     1.06   565.88     0.92     0.90
 MEAN    23.39     1.20    18.14   604.80     1.06   562.30     0.92     0.90
 HUB     23.97     1.23    17.71   609.44     1.07   558.81     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.87    35.53    31.50     4.03     0.93     0.27     2.90
 MEAN    26.59    27.59    23.50     4.09     0.92     0.27     3.30     0.90
 HUB     33.53    10.60     6.50     4.10     0.92     0.29     3.92

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     725.419     320.326     650.864    1163.667       0.623      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.576      18.137     562.795      46.000      26.204      30.600       4.396

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     655.060     320.326     729.186    1172.020       0.559       0.155

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.472      18.981     570.904     511.151       0.029       0.256

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     647.108       0.000     647.108    1172.909       0.552       0.154

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.982     571.768       0.000       0.060       0.051       0.155

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.845      23.349       1.195     606.729      35.431     283.213       2.195

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 220736.828       0.403    2602.983 1973673.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 2.953   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    208.672    4154.000      23.349     606.729       1.000       1.000       0.980
W Kg/sec =   94.85092

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    142.089    3840.849       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 160527.719  163737.922       1.318     545.479     413.842     429.765       1.038

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   602.49    -0.21   602.49     0.51   672.68
 MEAN    17.74     0.00    -0.02   602.49    -0.21   602.49     0.51
 HUB     15.05     0.00    -0.02   602.49    -0.21   602.49     0.51

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.38    46.36     4.02   727.55   944.79    19.53   576.44     0.80
 MEAN    46.87    43.40     3.47   643.03   881.33    19.53   576.44     0.75
 HUB     42.17    38.84     3.33   545.57   812.94    19.53   576.44     0.69

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   662.59   292.99   594.28  1205.42     0.55
 MEAN    17.51   681.53   319.01   602.26  1202.04     0.57
 HUB     14.85   743.64   422.81   611.75  1198.75     0.62

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   730.69   425.13     0.61  5808.38
 MEAN   634.62   679.95   315.61     0.57  5588.45     1.39
 HUB    538.32   622.56   115.51     0.52  6281.84

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.72     1.19    22.57   640.51     1.06   603.88     0.92     0.91
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 MEAN    27.54     1.18    22.14   639.23     1.05   600.48     0.92     0.91
 HUB     28.10     1.20    21.67   643.26     1.06   597.13     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.24    35.58    31.50     4.08     0.93     0.28     2.90
 MEAN    27.91    27.66    23.50     4.16     0.92     0.28     3.28     0.91
 HUB     34.65    10.69     6.50     4.19     0.92     0.30     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     688.886     321.103     609.472    1202.797       0.573       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.731      22.196     601.396      46.000      27.783      31.500       3.717

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     622.055     321.103     700.042    1210.086       0.514       0.168

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.644      23.080     608.707     471.992       0.025       0.283

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     601.604       0.000     601.604    1212.160       0.496       0.190

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.273     610.795       0.000       0.060       0.043       0.202

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      27.544       1.180     640.998      34.269     269.777       2.091

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 213647.781       0.414    2519.387 1867436.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 2.953   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    208.672    4154.000      27.544     640.998       1.000       1.000       0.980
W Kg/sec =   94.85092

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    123.803    3736.770       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 160527.719  163737.922       1.423     513.330     360.614     401.059       1.112

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   559.91    -0.19   559.91     0.46   628.04
 MEAN    16.97     0.00    -0.02   559.91    -0.19   559.91     0.46
 HUB     14.32     0.00    -0.02   559.91    -0.19   559.91     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.28    46.36     4.92   698.18   895.11    23.81   614.85     0.74
 MEAN    47.70    43.80     3.90   615.20   831.99    23.81   614.85     0.68
 HUB     42.85    37.84     5.01   519.11   763.66    23.81   614.85     0.63

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   625.03   287.26   555.11  1240.67     0.50
 MEAN    16.57   640.52   306.31   562.53  1237.14     0.52
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 HUB     13.89   695.22   396.41   571.12  1233.66     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   682.55   397.15     0.55  5427.12
 MEAN   600.81   634.96   294.50     0.51  5079.96     1.41
 HUB    503.52   581.08   107.11     0.47  5508.92

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.08     1.16    26.97   672.53     1.05   639.95     0.92     0.91
 MEAN    31.78     1.15    26.47   670.51     1.05   636.30     0.92     0.91
 HUB     32.16     1.17    25.92   673.01     1.05   632.71     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.36    35.58    31.50     4.08     0.93     0.29     2.90
 MEAN    28.57    27.63    23.50     4.13     0.92     0.29     3.29     0.91
 HUB     34.76    10.62     6.50     4.12     0.92     0.30     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     629.533     308.029     549.026    1239.646       0.508       0.058

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.950      26.790     638.966      46.000      29.294      32.400       3.106

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     569.271     308.029     647.264    1245.476       0.457       0.211

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.885      27.626     644.991     456.573       0.022       0.309

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     538.692       0.000     538.692    1248.201       0.432       0.211

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.962     647.816       0.000       0.060       0.040       0.272

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      31.784       1.154     672.017      31.020     271.688       2.106

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 193554.156       0.413    2282.438 1830355.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 2.953   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    208.672    4154.000      31.784     672.017       1.000       1.000       0.980
W Kg/sec =   94.85092

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    109.852    3649.509       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 160527.719  163737.922       1.593     509.668     320.006     390.276       1.220

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   499.51    -0.17   499.51     0.40   583.44
 MEAN    15.91     0.00    -0.02   499.51    -0.17   499.51     0.40
 HUB     13.07     0.00    -0.02   499.51    -0.17   499.51     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.06    47.36     5.70   664.11   831.13    28.48   651.22     0.66
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 MEAN    49.12    44.80     4.32   576.85   763.19    28.48   651.22     0.61
 HUB     43.50    38.84     4.66   473.79   688.59    28.48   651.22     0.55
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   577.83   291.45   498.95  1273.55     0.45
 MEAN    15.50   586.68   295.66   506.73  1269.19     0.46
 HUB     12.59   628.76   360.27   515.30  1264.90     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   614.61   358.89     0.48  5231.74
 MEAN   561.80   572.36   266.13     0.45  4584.83     1.46
 HUB    456.39   524.19    96.12     0.41  4538.08

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     36.59     1.15    31.77   702.39     1.05   674.56     0.92     0.91
 MEAN    35.97     1.13    31.07   698.63     1.04   669.95     0.92     0.91
 HUB     35.92     1.13    30.34   698.36     1.04   665.42     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.29    35.73    31.50     4.23     0.93     0.32     2.90
 MEAN    30.26    27.71    23.50     4.21     0.92     0.31     3.34     0.91
 HUB     34.96    10.57     6.50     4.07     0.92     0.30     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     593.287     301.086     511.211    1269.651       0.467      -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.059      31.046     670.459      46.000      30.497      33.000       2.503

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     535.998     301.086     614.773    1274.746       0.420       0.154

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      35.963      31.843     675.851     440.827       0.039       0.331

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     498.562       0.000     498.562    1277.787       0.390       0.261

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.378     679.079       0.000       0.060       0.039       0.258

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      35.964       1.132     699.794      27.776     277.586       2.152

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  173476.797       0.410    2045.681 1843367.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR
Efficiency      Rotor1Inc   TR
    1103297.62  13010.3574    203.8517      2.3806      0.8341      2.9529      1.3385
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 110% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.238   EfDer =  0.987

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     207.030    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   94.10455

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     202.248    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  159264.547  162449.484       1.412     831.557     588.989     619.754       1.052

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   511.08    -0.18   511.08     0.47   744.88
  MEAN    17.06     0.00    -0.02   511.08    -0.18   511.08     0.47
  HUB     12.51     0.00    -0.02   511.08    -0.18   511.08     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.66    50.47     5.19   747.85   905.95    13.02   500.99     0.83
  MEAN    50.44    47.20     3.24   618.44   802.42    13.02   500.99     0.73
  HUB     41.59    38.62     2.97   453.49   683.39    13.02   500.99     0.62

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   773.09   381.56   672.36  1118.03     0.69
  MEAN    18.04   819.75   442.37   690.14  1112.26     0.74
  HUB     15.00   961.62   617.57   737.11  1098.53     0.88

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   765.66   366.28     0.68  7875.29
  MEAN   653.81   721.81   211.44     0.65  7981.60     1.22
  HUB    543.76   740.79    73.81     0.67  9265.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.71     1.30    14.31   568.67     1.09   518.81     0.92     0.90
  MEAN    19.78     1.31    13.78   569.29     1.09   513.25     0.92     0.90
  HUB     20.62     1.36    12.51   576.77     1.10   499.79     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     29.57    28.58    24.20     4.38     0.93     0.23     2.90
  MEAN    32.66    17.03    12.70     4.33     0.92     0.18     3.51     0.90
  HUB     39.96    -5.72    -9.30     3.58     0.92     0.02     4.78

    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.987

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     839.859     441.511     714.445    1110.724       0.756      -0.018

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      19.970      13.665     512.661      24.000      31.715      35.400       3.685

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     742.310     441.511     863.688    1124.602       0.660       0.193

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.818      14.788     525.552     528.796       0.033       0.374

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     673.335       0.000     673.335    1133.298       0.594       0.274

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.445     533.708       0.000       0.060       0.064       0.294

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.834      19.616       1.299     571.576      48.766     235.705       1.827

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 303608.125       0.543    3552.049 2149045.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.238   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    207.030    4154.000      19.616     571.576       1.000       1.000       0.980
W Kg/sec =   94.10455

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    162.858    3957.198       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 159264.547  162449.484       1.245     590.487     474.302     474.134       1.000

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   633.42    -0.22   633.42     0.56   709.63
 MEAN    18.08     0.00    -0.02   633.42    -0.22   633.42     0.56
 HUB     15.21     0.00    -0.02   633.42    -0.22   633.42     0.56

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.63    46.36     3.27   744.95   978.00    15.89   538.08     0.86
 MEAN    45.98    42.30     3.68   655.35   911.58    15.89   538.08     0.80
 HUB     41.05    37.84     3.21   551.37   839.92    15.89   538.08     0.74

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   685.67   300.22   616.45  1169.31     0.59
 MEAN    18.01   706.13   325.67   626.54  1165.32     0.61
 HUB     15.22   771.01   432.59   638.22  1161.50     0.66

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   757.38   440.01     0.65  6135.03
 MEAN   652.87   706.83   327.20     0.61  5869.30     1.39
 HUB    551.84   649.27   119.25     0.56  6588.67

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.77     1.21    18.83   607.28     1.06   568.04     0.92     0.91
 MEAN    23.58     1.20    18.40   605.73     1.06   564.12     0.92     0.91
 HUB     24.10     1.23    17.93   609.92     1.07   560.32     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.97    35.52    31.50     4.02     0.93     0.28     2.90
 MEAN    27.47    27.57    23.50     4.07     0.92     0.28     3.30     0.91
 HUB     34.13    10.58     6.50     4.08     0.92     0.29     3.92

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     717.319     326.587     638.660    1165.619       0.615       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.763      18.400     564.683      46.000      27.084      30.600       3.516

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     640.990     326.587     719.393    1174.519       0.546       0.174

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.671      19.327     573.339     511.151       0.027       0.270

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     632.723       0.000     632.723    1175.420       0.538       0.174

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.343     574.218       0.000       0.060       0.047       0.176

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.855      23.564       1.201     607.642      36.066     277.119       2.148

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 224697.453       0.410    2628.837 1946917.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.238   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    207.030    4154.000      23.564     607.642       1.000       1.000       0.980
W Kg/sec =   94.10455

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    139.787    3837.964       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 159264.547  162449.484       1.340     545.479     407.137     429.765       1.056

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   589.86    -0.20   589.86     0.50   672.18
 MEAN    17.74     0.00    -0.02   589.86    -0.20   589.86     0.50
 HUB     15.05     0.00    -0.02   589.86    -0.20   589.86     0.50

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.97    46.36     4.61   727.55   936.78    19.86   578.61     0.79
 MEAN    47.48    43.40     4.08   643.03   872.74    19.86   578.61     0.74
 HUB     42.78    38.84     3.94   545.57   803.62    19.86   578.61     0.68

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   654.64   303.26   580.17  1208.35     0.54
 MEAN    17.51   673.08   326.35   588.67  1204.63     0.56
 HUB     14.85   734.40   425.53   598.55  1201.01     0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   713.24   414.86     0.59  6011.64
 MEAN   634.62   664.50   308.27     0.55  5716.90     1.41
 HUB    538.32   609.09   112.79     0.51  6322.18

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.15     1.19    23.05   642.60     1.06   606.84     0.92     0.91
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 MEAN    27.91     1.18    22.58   640.89     1.05   603.09     0.92     0.91
 HUB     28.40     1.21    22.06   644.41     1.06   599.41     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.60    35.57    31.50     4.07     0.93     0.29     2.90
 MEAN    29.00    27.64    23.50     4.14     0.92     0.30     3.28     0.91
 HUB     35.41    10.67     6.50     4.17     0.92     0.31     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     680.150     328.493     595.563    1205.426       0.564       0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.099      22.635     604.027      46.000      28.880      31.500       2.620

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     606.096     328.493     689.391    1213.331       0.500       0.190

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.023      23.628     611.975     471.992       0.024       0.300

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     586.107       0.000     586.107    1215.301       0.482       0.213

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.823     613.964       0.000       0.060       0.039       0.225

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.868      27.937       1.186     642.630      34.989     262.796       2.037

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 218143.922       0.423    2552.165 1840303.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.238   EfDer =  0.995

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    207.030    4154.000      27.937     642.630       1.000       1.000       0.980
W Kg/sec =   94.10455

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    121.252    3732.021       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 159264.547  162449.484       1.453     513.330     353.184     401.059       1.136

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   546.11    -0.19   546.11     0.45   627.24
 MEAN    16.97     0.00    -0.02   546.11    -0.19   546.11     0.45
 HUB     14.32     0.00    -0.02   546.11    -0.19   546.11     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.98    46.36     5.62   698.18   886.54    24.34   617.76     0.73
 MEAN    48.41    43.80     4.61   615.20   822.76    24.34   617.76     0.68
 HUB     43.56    37.84     5.72   519.11   753.59    24.34   617.76     0.62

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   616.95   298.25   540.07  1244.21     0.50
 MEAN    16.57   631.60   314.25   547.87  1240.36     0.51
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 HUB     13.89   685.17   399.36   556.75  1236.59     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   663.92   386.16     0.53  5634.50
 MEAN   600.81   618.29   286.56     0.50  5211.48     1.44
 HUB    503.52   566.41   104.16     0.46  5549.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.73     1.17    27.67   675.37     1.05   643.63     0.92     0.91
 MEAN    32.35     1.16    27.10   672.91     1.05   639.64     0.92     0.91
 HUB     32.66     1.17    26.51   674.88     1.05   635.73     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.91    35.57    31.50     4.07     0.93     0.31     2.90
 MEAN    29.84    27.61    23.50     4.11     0.92     0.31     3.29     0.91
 HUB     35.65    10.60     6.50     4.10     0.92     0.32     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     621.276     316.014     534.901    1242.771       0.500       0.057

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.526      27.419     642.194      46.000      30.574      32.400       1.826

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     553.135     316.014     637.042    1249.212       0.443       0.234

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      32.470      28.378     648.868     456.573       0.020       0.328

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     523.717       0.000     523.717    1251.753       0.418       0.233

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.698     651.510       0.000       0.060       0.038       0.293

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      32.374       1.159     674.384      31.753     263.643       2.044

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 198144.312       0.423    2318.180 1802702.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.238   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    207.030    4154.000      32.374     674.384       1.000       1.000       0.980
W Kg/sec =   94.10455

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    107.188    3643.100       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 159264.547  162449.484       1.632     509.668     312.249     390.276       1.250

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   486.07    -0.17   486.07     0.39   582.41
 MEAN    15.91     0.00    -0.02   486.07    -0.17   486.07     0.39
 HUB     13.07     0.00    -0.02   486.07    -0.17   486.07     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.81    47.36     6.45   664.11   823.12    29.19   654.69     0.66
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MEAN    49.89    44.80     5.09   576.85   754.46    29.19   654.69     0.60
HUB     44.28    38.84     5.44   473.79   678.90    29.19   654.69     0.54
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   571.00   302.04   484.58  1277.43     0.45
MEAN    15.50   578.46   303.39   492.52  1272.83     0.45
HUB     12.59   618.92   363.13   501.19  1268.30     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    650.33   596.77   348.30     0.47  5421.60
MEAN   561.80   556.19   258.41     0.44  4704.47     1.49
HUB    456.39   509.80    93.26     0.40  4574.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     37.45     1.16    32.65   705.85     1.05   678.68     0.92     0.91
MEAN    36.75     1.14    31.89   701.69     1.04   673.81     0.92     0.91
HUB     36.62     1.13    31.12   700.93     1.04   669.01     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.94    35.71    31.50     4.21     0.93     0.34     2.90
MEAN    31.63    27.68    23.50     4.18     0.92     0.32     3.34     0.91
HUB     35.92    10.54     6.50     4.04     0.92     0.31     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219      585.061     308.952     496.835    1273.276       0.459      -0.004

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    36.842      31.875      674.300      46.000      31.875      33.000       1.125

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219      519.555     308.952     604.474    1278.957       0.406       0.182

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      36.759      32.808     680.330     440.827       0.036       0.351

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     483.761       0.000     483.761    1281.767       0.377       0.284

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      33.313     683.323       0.000       0.060       0.037       0.282

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.877      36.756       1.135     702.826      28.442     268.986       2.085

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 177651.734       0.420    2078.428 1815815.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1122245.50  13129.6582    202.2476      2.4331      0.8434      3.2376      1.3443
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 110% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.989

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     205.789    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   93.54043

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     201.035    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  158309.812  161475.672       1.420     831.557     585.458     619.754       1.059

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   507.18    -0.17   507.18     0.46   744.88
  MEAN    17.06     0.00    -0.02   507.18    -0.17   507.18     0.46
  HUB     12.51     0.00    -0.02   507.18    -0.17   507.18     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.86    50.47     5.39   747.85   903.75    13.05   501.33     0.82
  MEAN    50.65    47.20     3.45   618.44   799.95    13.05   501.33     0.73
  HUB     41.81    38.62     3.19   453.49   680.47    13.05   501.33     0.62

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   768.72   385.45   665.11  1119.08     0.69
  MEAN    18.04   815.01   444.50   683.13  1113.13     0.73
  HUB     15.00   955.06   616.73   729.23  1099.46     0.87

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   757.43   362.40     0.68  7955.34
  MEAN   653.81   714.47   209.32     0.64  8019.94     1.23
  HUB    543.76   732.87    72.97     0.67  9253.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.77     1.31    14.41   569.14     1.09   519.83     0.92     0.90
  MEAN    19.81     1.31    13.86   569.51     1.09   514.12     0.92     0.90
  HUB     20.62     1.36    12.60   576.69     1.10   500.75     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     30.09    28.59    24.20     4.39     0.93     0.24     2.90
  MEAN    33.05    17.04    12.70     4.34     0.92     0.19     3.51     0.90
  HUB     40.22    -5.71    -9.30     3.59     0.92     0.03     4.78

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     834.264     443.634     706.531    1111.793       0.750      -0.016

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.002      13.762     513.649      24.000      32.125      35.400       3.275

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     732.311     443.634     856.207    1126.138       0.650       0.204

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.858      14.941     526.989     528.796       0.032       0.381

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     664.602       0.000     664.602    1134.551       0.586       0.284

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.589     534.889       0.000       0.060       0.061       0.305

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.840      19.671       1.302     571.781      48.971     234.066       1.814

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 304886.438       0.545    3545.622 2132648.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    205.789    4154.000      19.671     571.781       1.000       1.000       0.980
W Kg/sec =   93.54043

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    161.458    3956.488       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 158309.812  161475.672       1.256     590.487     470.224     474.134       1.008

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   625.70    -0.22   625.70     0.55   709.51
 MEAN    18.08     0.00    -0.02   625.70    -0.22   625.70     0.55
 HUB     15.21     0.00    -0.02   625.70    -0.22   625.70     0.55

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.98    46.36     3.62   744.95   973.02    16.02   539.09     0.85
 MEAN    46.34    42.30     4.04   655.35   906.24    16.02   539.09     0.80
 HUB     41.40    37.84     3.56   551.37   834.12    16.02   539.09     0.73

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   680.71   306.47   607.81  1170.84     0.58
 MEAN    18.01   700.90   330.10   618.30  1166.62     0.60
 HUB     15.22   765.38   434.23   630.28  1162.57     0.66

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   746.72   433.76     0.64  6262.61
 MEAN   652.87   697.47   322.77     0.60  5949.00     1.40
 HUB    551.84   641.16   117.62     0.55  6613.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.94     1.22    19.04   608.22     1.06   569.55     0.92     0.91
 MEAN    23.71     1.21    18.57   606.40     1.06   565.40     0.92     0.91
 HUB     24.20     1.23    18.08   610.27     1.07   561.39     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.76    35.51    31.50     4.01     0.93     0.29     2.90
 MEAN    28.10    27.57    23.50     4.07     0.92     0.29     3.30     0.91
 HUB     34.56    10.57     6.50     4.07     0.92     0.30     3.92

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     711.697     331.027     630.027    1166.987       0.610       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.895      18.583     566.009      46.000      27.718      30.600       2.882

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     631.161     331.027     712.701    1176.259       0.537       0.187

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.810      19.569     575.038     511.151       0.026       0.281

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     622.757       0.000     622.757    1177.159       0.529       0.187

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.592     575.918       0.000       0.060       0.044       0.191

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.861      23.712       1.205     608.297      36.516     272.875       2.115

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 227502.594       0.415    2645.700 1927383.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    205.789    4154.000      23.712     608.297       1.000       1.000       0.980
W Kg/sec =   93.54043

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    138.155    3835.896       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 158309.812  161475.672       1.356     545.479     402.385     429.765       1.068

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   581.06    -0.20   581.06     0.49   671.81
 MEAN    17.74     0.00    -0.02   581.06    -0.20   581.06     0.49
 HUB     15.05     0.00    -0.02   581.06    -0.20   581.06     0.49

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.40    46.36     5.04   727.55   931.26    20.09   580.12     0.79
 MEAN    47.91    43.40     4.51   643.03   866.82    20.09   580.12     0.73
 HUB     43.21    38.84     4.37   545.57   797.18    20.09   580.12     0.67

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   649.43   310.31   570.50  1210.36     0.54
 MEAN    17.51   667.41   331.41   579.32  1206.41     0.55
 HUB     14.85   728.10   427.41   589.44  1202.57     0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   701.27   407.81     0.58  6151.34
 MEAN   634.62   653.87   303.21     0.54  5805.39     1.43
 HUB    538.32   599.79   110.91     0.50  6350.09

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.45     1.20    23.38   644.07     1.06   608.88     0.92     0.91
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 MEAN    28.16     1.19    22.87   642.06     1.06   604.89     0.92     0.91
 HUB     28.61     1.21    22.33   645.22     1.06   601.00     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.54    35.56    31.50     4.06     0.93     0.30     2.90
 MEAN    29.77    27.63    23.50     4.13     0.92     0.30     3.28     0.91
 HUB     35.95    10.66     6.50     4.16     0.92     0.32     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     674.304     333.584     586.010    1207.232       0.559       0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.352      22.934     605.839      46.000      29.651      31.500       1.849

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     595.265     333.584     682.363    1215.547       0.490       0.206

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.282      24.001     614.212     471.992       0.023       0.312

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     575.793       0.000     575.793    1217.428       0.473       0.226

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.189     616.115       0.000       0.060       0.038       0.240

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      28.198       1.189     643.781      35.485     258.087       2.001

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 221238.734       0.429    2572.856 1820816.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    205.789    4154.000      28.198     643.781       1.000       1.000       0.980
W Kg/sec =   93.54043

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    119.519    3728.682       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 158309.812  161475.672       1.475     513.330     348.137     401.059       1.152

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   536.89    -0.18   536.89     0.44   626.68
 MEAN    16.97     0.00    -0.02   536.89    -0.18   536.89     0.44
 HUB     14.32     0.00    -0.02   536.89    -0.18   536.89     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.45    46.36     6.09   698.18   880.89    24.69   619.74     0.72
 MEAN    48.90    43.80     5.10   615.20   816.66    24.69   619.74     0.67
 HUB     44.05    37.84     6.21   519.11   746.93    24.69   619.74     0.61

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   611.88   305.47   530.17  1246.58     0.49
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 MEAN    16.57   625.86   319.47   538.18  1242.54     0.50
 HUB     13.89   678.59   401.30   547.21  1238.57     0.55

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   651.67   378.94     0.52  5770.81
 MEAN   600.81   607.29   281.34     0.49  5297.94     1.46
 HUB    503.52   556.68   102.22     0.45  5576.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     33.16     1.18    28.12   677.31     1.05   646.09     0.92     0.91
 MEAN    32.73     1.16    27.52   674.56     1.05   641.90     0.92     0.91
 HUB     32.99     1.17    26.89   676.18     1.05   637.78     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.95    35.56    31.50     4.06     0.93     0.32     2.90
 MEAN    30.69    27.60    23.50     4.10     0.92     0.32     3.29     0.91
 HUB     36.25    10.58     6.50     4.08     0.92     0.32     3.90

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     615.976     321.263     525.563    1244.877       0.495       0.057

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    32.906      27.833     644.374      46.000      31.436      32.400       0.964

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     542.582     321.263     630.559    1251.708       0.433       0.249

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      32.854      28.871     651.466     456.573       0.020       0.341

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     513.931       0.000     513.931    1254.131       0.410       0.247

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.180     653.990       0.000       0.060       0.037       0.306

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      32.759       1.162     676.017      32.235     258.462       2.004

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 201160.312       0.429    2339.358 1783178.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    205.789    4154.000      32.759     676.017       1.000       1.000       0.980
W Kg/sec =   93.54043

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    105.421    3638.697       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 158309.812  161475.672       1.660     509.668     307.100     390.276       1.271

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   477.26    -0.16   477.26     0.38   581.71
 MEAN    15.91     0.00    -0.02   477.26    -0.16   477.26     0.38
 HUB     13.07     0.00    -0.02   477.26    -0.16   477.26     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.30    47.36     6.94   664.11   817.95    29.66   657.04     0.65
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 MEAN    50.41    44.80     5.61   576.85   748.82    29.66   657.04     0.60
 HUB     44.80    38.84     5.96   473.79   672.62    29.66   657.04     0.54
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   566.84   308.89   475.29  1279.99     0.44
 MEAN    15.50   573.30   308.39   483.29  1275.25     0.45
 HUB     12.59   612.61   364.99   492.01  1270.58     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   585.22   341.45     0.46  5544.43
 MEAN   561.80   545.70   253.41     0.43  4781.85     1.50
 HUB    456.39   500.43    91.41     0.39  4597.34

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     38.02     1.16    33.22   708.20     1.05   681.42     0.92     0.91
 MEAN    37.26     1.14    32.43   703.77     1.04   676.38     0.92     0.91
 HUB     37.08     1.13    31.62   702.70     1.04   671.43     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.02    35.69    31.50     4.19     0.93     0.35     2.90
 MEAN    32.54    27.67    23.50     4.17     0.92     0.33     3.34     0.91
 HUB     36.57    10.52     6.50     4.02     0.92     0.32     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      579.901     314.040      487.508    1275.691       0.455       -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     37.351      32.413      676.865       46.000      32.789      33.000       0.211

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      509.017     314.040     598.097    1281.738       0.397        0.200

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       37.273       33.432     683.298     440.827       0.036       0.365

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701      474.242       0.000     474.242    1284.408       0.369       0.299

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       33.917      686.147       0.000       0.060       0.037       0.297

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.880       37.268        1.138      704.890       28.873     263.538        2.043

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 180352.781       0.426    2097.380 1796457.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1135140.88  13200.9150     201.0352      2.4669      0.8485      3.4529      1.3483
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 110% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     202.905    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   92.22959

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     198.218    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  156091.328  159212.812       1.441     831.557     577.254     619.754       1.074

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   498.21    -0.17   498.21     0.45   744.88
  MEAN    17.06     0.00    -0.02   498.21    -0.17   498.21     0.45
  HUB     12.51     0.00    -0.02   498.21    -0.17   498.21     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.33    50.47     5.86   747.85   898.75    13.12   502.08     0.82
  MEAN    51.15    47.20     3.95   618.44   794.29    13.12   502.08     0.72
  HUB     42.32    38.62     3.70   453.49   673.81    13.12   502.08     0.61

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   759.20   394.15   648.86  1121.41     0.68
  MEAN    18.04   804.48   449.27   667.34  1115.08     0.72
  HUB     15.00   940.42   614.87   711.56  1101.53     0.85

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   739.00   353.69     0.66  8134.91
  MEAN   653.81   697.98   204.54     0.63  8105.99     1.25
  HUB    543.76   715.10    71.12     0.65  9225.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.90     1.32    14.64   570.18     1.09   522.09     0.92     0.91
  MEAN    19.88     1.32    14.05   570.01     1.09   516.03     0.92     0.91
  HUB     20.62     1.36    12.80   576.53     1.10   502.86     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     31.28    28.59    24.20     4.39     0.93     0.25     2.90
  MEAN    33.95    17.04    12.70     4.34     0.92     0.20     3.51     0.91
  HUB     40.83    -5.71    -9.30     3.59     0.92     0.04     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     821.996     448.398     688.924    1114.127       0.738      -0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.072      13.974     515.808      24.000      33.059      35.400       2.341

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     710.612     448.398     840.256    1129.420       0.629       0.228

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.943      15.270     530.066     528.796       0.030       0.396

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     645.728       0.000     645.728    1137.226       0.568       0.305

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.895     537.416       0.000       0.060       0.055       0.327

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.851      19.786       1.310     572.242      49.432     230.360       1.786

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 307759.969       0.550    3528.884 2094922.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    202.905    4154.000      19.786     572.242       1.000       1.000       0.980
W Kg/sec =   92.22959

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    158.340    3954.891       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 156091.328  159212.812       1.280     590.487     461.142     474.134       1.028

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   608.92    -0.21   608.92     0.53   709.22
 MEAN    18.08     0.00    -0.02   608.92    -0.21   608.92     0.53
 HUB     15.21     0.00    -0.02   608.92    -0.21   608.92     0.53

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.75    46.36     4.39   744.95   962.31    16.30   541.29     0.84
 MEAN    47.11    42.30     4.81   655.35   894.73    16.30   541.29     0.78
 HUB     42.17    37.84     4.33   551.37   821.60    16.30   541.29     0.72

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   670.60   319.85   589.40  1174.07     0.57
 MEAN    18.01   689.97   339.63   600.60  1169.37     0.59
 HUB     15.22   753.37   437.72   613.16  1164.88     0.65

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   723.97   420.39     0.62  6535.55
 MEAN   652.87   677.37   313.24     0.58  6120.49     1.43
 HUB    551.84   623.69   114.12     0.54  6666.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.29      1.23    19.47   610.27     1.07   572.74     0.92     0.91
 MEAN    23.99      1.21    18.95   607.86     1.06   568.13     0.92     0.91
 HUB     24.39      1.23    18.41   611.04     1.07   563.67     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.49    35.50    31.50     4.00     0.93     0.30     2.90
 MEAN    29.49    27.54    23.50     4.04     0.92     0.30     3.30     0.91
 HUB     35.52    10.54     6.50     4.04     0.92     0.31     3.92
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996
    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     700.027     340.582     611.589    1169.873       0.598       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.171      18.969     568.810      46.000      29.113      30.600       1.487

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     610.473     340.582     699.051    1179.906       0.517       0.214

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.097      20.072     578.608     511.151       0.024       0.303

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     601.965       0.000     601.965    1180.785       0.510       0.216

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.108     579.470       0.000       0.060       0.039       0.221

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      24.016       1.214     609.723      37.481     263.974       2.046

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 233515.641       0.426    2677.573 1883930.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.998

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    202.905    4154.000      24.016     609.723       1.000       1.000       0.980
W Kg/sec =   92.22959

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    134.656    3831.407       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 156091.328  159212.812       1.391     545.479     392.193     429.765       1.096

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   562.58    -0.19   562.58     0.47   671.03
 MEAN    17.74      0.00    -0.02   562.58    -0.19   562.58     0.47
 HUB     15.05      0.00    -0.02   562.58    -0.19   562.58     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.29     46.36     5.93   727.55   919.84    20.58   583.31     0.78
 MEAN    48.83     43.40     5.43   643.03   854.54    20.58   583.31     0.72
 HUB     44.13     38.84     5.29   545.57   783.81    20.58   583.31     0.66

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   639.28    324.82    550.61  1214.49      0.53
 MEAN    17.51   656.07    341.88    559.96  1210.11      0.54
 HUB     14.85   715.20    431.32    570.50  1205.84      0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   676.65   393.31     0.56  6438.50
 MEAN   634.62   631.86   292.74     0.52  5988.54      1.46
 HUB    538.32   580.45   107.00     0.48  6408.01

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     29.05     1.21    24.05   647.16     1.06   613.06     0.92     0.91
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 MEAN    28.68     1.19    23.48   644.54     1.06   608.63     0.92     0.91
 HUB     29.03     1.21    22.88   646.98     1.06   604.31     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.54    35.54    31.50     4.04     0.93     0.32     2.90
 MEAN    31.41    27.60    23.50     4.10     0.92     0.32     3.28     0.91
 HUB     37.09    10.62     6.50     4.12     0.92     0.33     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     662.647     344.121     566.288    1210.962       0.547       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.867      23.545     609.588      46.000      31.286      31.500       0.214

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     573.214     344.121     668.576    1220.089       0.470       0.237

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.804      24.759     618.811     471.992       0.021       0.337

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     554.815       0.000     554.815    1221.795       0.454       0.254

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.930     620.543       0.000       0.060       0.037       0.268

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      28.722       1.196     646.230      36.507     248.591       1.927

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 227622.547       0.441    2610.000 1778205.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    202.905    4154.000      28.722     646.230       1.000       1.000       0.980
W Kg/sec =   92.22959

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    115.914    3721.612       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 156091.328  159212.812       1.520     513.330     337.636     401.059       1.188

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   518.04    -0.18   518.04     0.42   625.49
 MEAN    16.97     0.00    -0.02   518.04    -0.18   518.04     0.42
 HUB     14.32     0.00    -0.02   518.04    -0.18   518.04     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.43    46.36     7.07   698.18   869.53    25.39   623.85     0.71
 MEAN    49.91    43.80     6.11   615.20   804.40    25.39   623.85     0.66
 HUB     45.07    37.84     7.23   519.11   733.50    25.39   623.85     0.60

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   602.34   320.00   510.31  1251.38     0.48
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 MEAN    16.57   614.74   330.04   518.63  1246.97     0.49
 HUB     13.89   665.50   405.23   527.91  1242.65     0.54
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   627.06   364.41     0.50  6045.03
 MEAN   600.81   585.06   270.78     0.47  5472.99     1.49
 HUB    503.52   536.98    98.29     0.43  5631.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.02     1.18    29.03   681.35     1.05   651.09     0.92     0.91
 MEAN    33.49     1.17    28.36   678.02     1.05   646.51     0.92     0.91
 HUB     33.64     1.17    27.67   678.94     1.05   642.01     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.09    35.53    31.50     4.03     0.93     0.34     2.90
 MEAN    32.47    27.57    23.50     4.07     0.93     0.33     3.29     0.91
 HUB     37.51    10.55     6.50     4.05     0.93     0.34     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     605.728     331.891     506.710    1249.178       0.485       0.055

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.666      28.661     648.840      46.000      33.225      32.400      -0.825

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     521.510     331.891     618.162    1256.776       0.415       0.280

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.617      29.858     656.757     456.573       0.019       0.368

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     494.411       0.000     494.411    1258.971       0.393       0.275

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.138     659.053       0.000       0.060       0.037       0.332

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      33.522       1.167     679.438      33.208     248.271       1.925

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 207248.781       0.442    2376.387 1740952.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    202.905    4154.000      33.522     679.438       1.000       1.000       0.980
W Kg/sec =   92.22959

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.835    3629.523       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 156091.328  159212.812       1.718     509.668     296.656     390.276       1.316

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   459.63    -0.16   459.63     0.36   580.24
 MEAN    15.91     0.00    -0.02   459.63    -0.16   459.63     0.36
 HUB     13.07     0.00    -0.02   459.63    -0.16   459.63     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.32    47.36     7.96   664.11   807.78    30.58   661.83     0.64
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MEAN    51.46    44.80     6.66   576.85   737.70    30.58   661.83     0.58
HUB     45.88    38.84     7.04   473.79   660.22    30.58   661.83     0.52

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   559.23   322.39   456.95  1285.17     0.44
MEAN    15.50   563.51   318.28   465.01  1280.16     0.44
HUB     12.59   600.29   368.66   473.75  1275.22     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    650.33   562.45   327.95     0.44  5786.55
MEAN   561.80   524.91   243.51     0.41  4935.13     1.54
HUB    456.39   481.81    87.74     0.38  4643.47

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     39.13     1.17    34.35   713.02     1.05   686.96     0.92     0.91
MEAN    38.26     1.14    33.49   708.08     1.04   681.62     0.92     0.91
HUB     37.97     1.13    32.62   706.39     1.04   676.36     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.20    35.67    31.50     4.17     0.93     0.37     2.90
MEAN    34.39    27.64    23.50     4.14     0.93     0.35     3.34     0.91
HUB     37.89    10.49     6.50     3.99     0.93     0.34     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     570.139     324.118     469.048    1280.576       0.445      -0.004

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    38.354      33.472     682.074      46.000      34.645      33.000      -1.645

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     488.426     324.118     586.185    1287.325       0.379       0.235

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      38.275      34.654     689.282     440.827       0.036       0.393

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    14.701     455.578       0.000     455.578    1289.736       0.353       0.328

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      35.102     691.866       0.000       0.060       0.038       0.325

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4         PR4       Texit        Del T       Ns        Ns nondim
     0.882      38.267       1.142     709.162      29.724     253.030       1.961

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 185688.766       0.439    2129.173 1754719.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1161835.75  13322.0166    198.2180      2.5330      0.8567      3.9532      1.3564
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 110% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.476   EfDer =  0.995

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     199.897    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   90.86214

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     195.279    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  153777.031  156852.234       1.462     831.557     568.695     619.754       1.090

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   488.97    -0.17   488.97     0.44   744.88
  MEAN    17.06     0.00    -0.02   488.97    -0.17   488.97     0.44
  HUB     12.51     0.00    -0.02   488.97    -0.17   488.97     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.83    50.47     6.36   747.85   893.66    13.19   502.84     0.81
  MEAN    51.68    47.20     4.48   618.44   788.52    13.19   502.84     0.72
  HUB     42.85    38.62     4.23   453.49   667.01    13.19   502.84     0.61

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   750.10   402.82   632.76  1123.66     0.67
  MEAN    18.04   794.18   454.08   651.57  1116.99     0.71
  HUB     15.00   925.98   613.05   693.99  1103.56     0.84

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   720.71   345.03     0.64  8313.69
  MEAN   653.81   681.49   199.74     0.61  8192.65     1.28
  HUB    543.76   697.44    69.29     0.63  9197.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.03     1.33    14.85   571.22     1.09   524.27     0.92     0.91
  MEAN    19.95     1.32    14.24   570.52     1.09   517.90     0.92     0.91
  HUB     20.62     1.36    12.99   576.37     1.10   504.92     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     32.48    28.60    24.20     4.40     0.93     0.27     2.90
  MEAN    34.87    17.04    12.70     4.34     0.92     0.22     3.51     0.91
  HUB     41.46    -5.70    -9.30     3.60     0.92     0.06     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     810.206     453.197     671.600    1116.359       0.726      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.140      14.179     517.877      24.000      34.012      35.400       1.388

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	689.863	453.197	825.408	1132.494	0.609	0.251

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.023	15.580	532.955	528.796	0.029	0.412

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	627.747	0.000	627.747	1139.735	0.551	0.324

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.179	539.791	0.000	0.060	0.051	0.348

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.860	19.888	1.316	572.704	49.894	226.629	1.757

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
310635.781	0.555	3509.049	2056097.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 4.476 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
199.897	4154.000	19.888	572.704	1.000	1.000	0.980

W Kg/sec = 90.86214

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
155.253	3953.296	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
153777.031	156852.234	1.306	590.487	452.151	474.134	1.049

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	592.81	-0.20	592.81	0.52	708.93
MEAN	18.08	0.00	-0.02	592.81	-0.20	592.81	0.52	
HUB	15.21	0.00	-0.02	592.81	-0.20	592.81	0.52	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.50	46.36	5.14	744.95	952.19	16.55	543.36	0.83
MEAN	47.88	42.30	5.58	655.35	883.84	16.55	543.36	0.77
HUB	42.94	37.84	5.10	551.37	809.72	16.55	543.36	0.71

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	661.71	332.35	572.19	1177.04	0.56
MEAN	18.01	680.06	348.63	583.89	1171.94	0.58
HUB	15.22	742.17	441.05	596.90	1167.04	0.64

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	740.23	702.69	407.89	0.60	6790.78	
MEAN	652.87	658.40	304.24	0.56	6282.47	1.45
HUB	551.84	607.10	110.79	0.52	6717.18	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.62	1.24	19.86	612.22	1.07	575.67	0.92	0.91
MEAN	24.24	1.22	19.29	609.26	1.06	570.66	0.92	0.91
HUB	24.56	1.23	18.70	611.79	1.07	565.82	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.15	35.48	31.50	3.98	0.93	0.32	2.90	
MEAN	30.84	27.52	23.50	4.02	0.92	0.31	3.30	0.91
HUB	36.46	10.52	6.50	4.02	0.92	0.32	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999
    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     689.498     349.607     594.291    1172.535       0.588       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.420      19.319     571.400      46.000      30.467      30.600       0.133

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     591.401     349.607     687.008    1183.250       0.500       0.240

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.352      20.528     581.891     511.151       0.023       0.324

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     582.972       0.000     582.972    1184.090       0.492       0.241

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.570     582.717       0.000       0.060       0.037       0.248

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      24.282       1.221     611.092      38.387     255.828       1.983

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 239168.406       0.436    2701.729 1840968.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.476   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    199.897    4154.000      24.282     611.092       1.000       1.000       0.980
W Kg/sec =   90.86214

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    131.351    3827.114       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 153777.031  156852.234       1.426     545.479     382.567     429.765       1.123

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   545.59    -0.19   545.59     0.46   670.28
 MEAN    17.74     0.00    -0.02   545.59    -0.19   545.59     0.46
 HUB     15.05     0.00    -0.02   545.59    -0.19   545.59     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.14    46.36     6.78   727.55   909.54    21.01   586.25     0.77
 MEAN    49.69    43.40     6.29   643.03   843.45    21.01   586.25     0.71
 HUB     45.01    38.84     6.17   545.57   771.70    21.01   586.25     0.65

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   630.85   337.84   532.76  1218.18     0.52
 MEAN    17.51   646.28   351.32   542.45  1213.45     0.53
 HUB     14.85   703.71   434.84   553.28  1208.83     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   654.56   380.29     0.54  6696.30
 MEAN   634.62   611.98   283.30     0.50  6153.74     1.49
 HUB    538.32   562.88   103.48     0.47  6460.13

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.59     1.22    24.64   650.03     1.06   616.82     0.92     0.91
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 MEAN    29.13     1.20    24.01   646.87     1.06   612.02     0.92     0.91
 HUB     29.39     1.21    23.36   648.65     1.06   607.34     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.38    35.52    31.50     4.02     0.93     0.34     2.90
 MEAN    32.93    27.58    23.50     4.08     0.93     0.34     3.28     0.91
 HUB     38.16    10.59     6.50     4.09     0.93     0.34     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     652.616     353.625     548.505    1214.322       0.537       0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.318      24.081     612.977      46.000      32.810      31.500      -1.310

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     553.645     353.625     656.943    1224.151       0.452       0.264

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.256      25.422     622.939     471.992       0.021       0.360

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     536.230       0.000     536.230    1225.706       0.437       0.278

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.574     624.523       0.000       0.060       0.037       0.293

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      29.172       1.201     648.518      37.426     240.277       1.863

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 233364.453       0.453    2636.166 1736824.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 4.476   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    199.897    4154.000      29.172     648.518       1.000       1.000       0.980
W Kg/sec =   90.86214

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.633    3715.041       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 153777.031  156852.234       1.565     513.330     328.079     401.059       1.222

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   501.25    -0.17   501.25     0.41   624.39
 MEAN    16.97     0.00    -0.02   501.25    -0.17   501.25     0.41
 HUB     14.32     0.00    -0.02   501.25    -0.17   501.25     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.33    46.36     7.97   698.18   859.63    26.01   627.57     0.70
 MEAN    50.84    43.80     7.04   615.20   793.68    26.01   627.57     0.65
 HUB     46.01    37.84     8.17   519.11   721.74    26.01   627.57     0.59

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   594.71   332.64   492.98  1255.62     0.47
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 MEAN    16.57   605.46   339.27   501.47  1250.92     0.48
 HUB     13.89   654.23   408.68   510.88  1246.30     0.52
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   605.61   351.76     0.48  6283.65
 MEAN   600.81   565.58   261.54     0.45  5625.93     1.53
 HUB    503.52   519.61    94.84     0.42  5679.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.76     1.19    29.81   685.02     1.06   655.53     0.92     0.91
 MEAN    34.15     1.17    29.09   681.20     1.05   650.63     0.92     0.91
 HUB     34.19     1.17    28.34   681.51     1.05   645.82     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.01    35.51    31.50     4.01     0.93     0.36     2.90
 MEAN    34.08    27.54    23.50     4.04     0.93     0.35     3.29     0.91
 HUB     38.66    10.52     6.50     4.02     0.93     0.35     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     597.201     341.177     490.151    1253.009       0.477       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.315      29.370     652.833      46.000      34.840      32.400      -2.440

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     503.241     341.177     607.991    1261.257       0.399       0.307

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      34.263      30.701     661.456     456.573       0.020       0.393

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     477.510       0.000     477.510    1263.261       0.378       0.299

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.953     663.560       0.000       0.060       0.039       0.354

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      34.163       1.171     682.575      34.057     239.624       1.858

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 212559.906       0.454    2401.150 1700374.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 4.476   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    199.897    4154.000      34.163     682.575       1.000       1.000       0.980
W Kg/sec =   90.86214

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     98.669    3621.174       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 153777.031  156852.234       1.773     509.668     287.437     390.276       1.358

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   444.30    -0.15   444.30     0.35   578.91
 MEAN    15.91     0.00    -0.02   444.30    -0.15   444.30     0.35
 HUB     13.07     0.00    -0.02   444.30    -0.15   444.30     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.22    47.36     8.86   664.11   799.16    31.37   666.13     0.63
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MEAN    52.40    44.80     7.60   576.85   728.25    31.37   666.13     0.58
HUB     46.85    38.84     8.01   473.79   649.64    31.37   666.13     0.51

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   553.35   333.88   441.28  1289.70     0.43
MEAN    15.50   555.57   326.76   449.31  1284.49     0.43
HUB     12.59   589.92   371.79   458.01  1279.33     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    650.33   543.02   316.46     0.42  5992.58
MEAN   561.80   507.07   235.03     0.39  5066.47     1.58
HUB    456.39   465.76    84.60     0.36  4682.87

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     40.06     1.17    35.29   717.35     1.05   691.83     0.92     0.91
MEAN    39.10     1.14    34.38   711.97     1.04   686.26     0.92     0.91
HUB     38.71     1.13    33.46   709.75     1.04   680.75     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.11    35.65    31.50     4.15     0.93     0.39     2.90
MEAN    36.03    27.61    23.50     4.11     0.93     0.37     3.34     0.91
HUB     39.07    10.47     6.50     3.97     0.93     0.35     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     562.248     332.754     453.208    1284.880       0.438      -0.005

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    39.191      34.359     686.683      46.000      36.287      33.000      -3.287

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     471.001     332.754     576.687    1292.209       0.364       0.264

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      39.104      35.673     694.539     440.827       0.038       0.418

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     439.728       0.000     439.728    1294.414       0.340       0.352

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      36.090     696.912       0.000       0.060       0.040       0.349

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.881      39.092       1.144     713.024      30.449     244.297       1.894

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 190242.188       0.450    2149.042 1714696.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1185970.75  13397.1348    195.2791      2.5876      0.8613      4.4756      1.3638
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 110% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.994   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     196.913    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   89.50601

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     192.365    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  151481.891  154511.203       1.484     831.557     560.207     619.754       1.106

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   479.94    -0.17   479.94     0.44   744.88
  MEAN    17.06     0.00    -0.02   479.94    -0.17   479.94     0.44
  HUB     12.51     0.00    -0.02   479.94    -0.17   479.94     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.32    50.47     6.85   747.85   888.74    13.26   503.57     0.81
  MEAN    52.19    47.20     4.99   618.44   782.95    13.26   503.57     0.71
  HUB     43.39    38.62     4.77   453.49   660.41    13.26   503.57     0.60

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   741.83   411.04   617.54  1125.75     0.66
  MEAN    18.04   784.60   458.66   636.57  1118.77     0.70
  HUB     15.00   912.42   611.33   677.34  1105.46     0.83

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   703.42   336.81     0.62  8483.07
  MEAN   653.81   665.81   195.15     0.60  8275.29     1.30
  HUB    543.76   680.70    67.57     0.62  9172.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.16     1.33    15.05   572.21     1.09   526.28     0.92     0.91
  MEAN    20.02     1.33    14.41   571.00     1.09   519.63     0.92     0.91
  HUB     20.61     1.36    13.18   576.22     1.10   506.82     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     33.65    28.61    24.20     4.41     0.93     0.29     2.90
  MEAN    35.77    17.04    12.70     4.34     0.92     0.24     3.51     0.91
  HUB     42.07    -5.70    -9.30     3.60     0.92     0.07     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     799.372     457.773     655.317    1118.400       0.715      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.202      14.367     519.772      24.000      34.936      35.400       0.464

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     670.832     457.773     812.140    1135.255       0.591       0.272

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.093      15.860     535.557     528.796       0.028       0.426

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     611.280       0.000     611.280    1141.995       0.535       0.341

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.431     541.934       0.000       0.060       0.048       0.367

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      19.975       1.322     573.144      50.334     223.054       1.729

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 313369.875       0.560    3487.100 2018101.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.994   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    196.913    4154.000      19.975     573.144       1.000       1.000       0.980
W Kg/sec =   89.50601

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    152.328    3951.781       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 151481.891  154511.203       1.331     590.487     443.634     474.134       1.069

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   577.95    -0.20   577.95     0.50   708.66
 MEAN    18.08     0.00    -0.02   577.95    -0.20   577.95     0.50
 HUB     15.21     0.00    -0.02   577.95    -0.20   577.95     0.50

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.20    46.36     5.84   744.95   943.01    16.78   545.26     0.82
 MEAN    48.60    42.30     6.30   655.35   873.94    16.78   545.26     0.76
 HUB     43.66    37.84     5.82   551.37   798.91    16.78   545.26     0.70

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   654.21   343.63   556.69  1179.68     0.55
 MEAN    18.01   671.38   356.78   568.74  1174.24     0.57
 HUB     15.22   732.11   444.07   582.06  1169.00     0.63

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   683.52   396.60     0.58  7021.06
 MEAN   652.87   641.20   296.09     0.55  6429.14     1.48
 HUB    551.84   591.95   107.77     0.51  6763.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.90      1.25    20.20   614.00     1.07   578.27     0.92     0.91
 MEAN    24.45      1.22    19.59   610.55     1.07   572.93     0.92     0.91
 HUB     24.70      1.24    18.96   612.50     1.07   567.76     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.69    35.47    31.50     3.97     0.93     0.34     2.90
 MEAN    32.10    27.50    23.50     4.00     0.93     0.33     3.30     0.91
 HUB     37.34    10.49     6.50     3.99     0.93     0.33     3.92
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000
    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     680.327     357.779     578.653    1174.901       0.579       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.635      19.624     573.708      46.000      31.728      30.600      -1.128

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     574.412     357.779     676.724    1186.208       0.484       0.263

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.569      20.924     584.803     511.151       0.023       0.343

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     566.410       0.000     566.410    1186.981       0.477       0.261

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.958     585.565       0.000       0.060       0.037       0.269

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      24.497       1.226     612.351      39.207     248.629       1.927

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 244279.094       0.446    2718.276 1800285.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.994   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    196.913    4154.000      24.497     612.351       1.000       1.000       0.980
W Kg/sec =   89.50601

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    128.385    3823.178       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 151481.891  154511.203       1.459     545.479     373.930     429.765       1.149

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   530.69    -0.18   530.69     0.45   669.59
 MEAN    17.74     0.00    -0.02   530.69    -0.18   530.69     0.45
 HUB     15.05     0.00    -0.02   530.69    -0.18   530.69     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.90    46.36     7.54   727.55   900.68    21.37   588.85     0.76
 MEAN    50.48    43.40     7.08   643.03   833.88    21.37   588.85     0.70
 HUB     45.80    38.84     6.96   545.57   761.24    21.37   588.85     0.64

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   624.14   349.02   517.43  1221.37     0.51
 MEAN    17.51   638.19   359.47   527.32  1216.36     0.52
 HUB     14.85   693.93   437.88   538.32  1211.45     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   635.59   369.10     0.52  6917.77
 MEAN   634.62   594.79   275.15     0.49  6296.35     1.52
 HUB    538.32   547.61   100.44     0.45  6505.33

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.03     1.23    25.13   652.57     1.07   620.07     0.92     0.91
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 MEAN    29.50     1.20    24.45   648.96     1.06   614.98     0.92     0.91
 HUB     29.68     1.21    23.75   650.17     1.06   610.00     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.00    35.50    31.50     4.00     0.93     0.36     2.90
 MEAN    34.28    27.56    23.50     4.06     0.93     0.35     3.28     0.91
 HUB     39.13    10.57     6.50     4.07     0.93     0.35     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     644.344     361.830     533.159    1217.235       0.529       0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.684      24.522     615.923      46.000      34.163      31.500      -2.663

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     536.967     361.830     647.499    1227.650       0.437       0.288

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.620      25.969     626.508     471.992       0.022       0.381

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     520.415       0.000     520.415    1229.080       0.423       0.298

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.102     627.969       0.000       0.060       0.039       0.313

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      29.530       1.205     650.569      38.218     233.274       1.808

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 238310.812       0.462    2651.862 1698258.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 4.994   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    196.913    4154.000      29.530     650.569       1.000       1.000       0.980
W Kg/sec =   89.50601

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    109.777    3709.180       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 151481.891  154511.203       1.605     513.330     319.764     401.059       1.254

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   486.91    -0.17   486.91     0.40   623.40
 MEAN    16.97     0.00    -0.02   486.91    -0.17   486.91     0.40
 HUB     14.32     0.00    -0.02   486.91    -0.17   486.91     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.11    46.36     8.75   698.18   851.34    26.51   630.80     0.69
 MEAN    51.65    43.80     7.85   615.20   784.70    26.51   630.80     0.64
 HUB     46.84    37.84     9.00   519.11   711.85    26.51   630.80     0.58

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   588.82   343.27   478.42  1259.23     0.47
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 MEAN    16.57   598.00   347.06   486.98  1254.32     0.48
 HUB     13.89   644.85   411.56   496.44  1249.46     0.52
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   587.59   341.14     0.47  6484.08
 MEAN   600.81   549.12   253.75     0.44  5755.04     1.56
 HUB    503.52   504.88    91.96     0.40  5718.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     35.36     1.20    30.43   688.23     1.06   659.32     0.92     0.91
 MEAN    34.66     1.17    29.67   684.00     1.05   654.18     0.92     0.91
 HUB     34.63     1.17    28.87   683.79     1.05   649.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.66    35.49    31.50     3.99     0.93     0.38     2.90
 MEAN    35.48    27.52    23.50     4.02     0.93     0.37     3.29     0.91
 HUB     39.66    10.49     6.50     3.99     0.93     0.36     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     590.369     349.016     476.155    1256.299       0.470       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.831      29.939     656.275      46.000      36.241      32.400      -3.841

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     487.950     349.016     599.922    1265.083       0.386       0.330

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      34.774      31.380     665.485     456.573       0.021       0.414

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     463.378       0.000     463.378    1266.935       0.366       0.319

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      31.604     667.434       0.000       0.060       0.042       0.372

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      34.666       1.174     685.339      34.770     232.517       1.802

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 217024.625       0.463    2414.995 1662794.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 4.994   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    196.913    4154.000      34.666     685.339       1.000       1.000       0.980
W Kg/sec =   89.50601

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.980    3613.865       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 151481.891  154511.203       1.823     509.668     279.606     390.276       1.396

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   431.45    -0.15   431.45     0.34   577.74
 MEAN    15.91     0.00    -0.02   431.45    -0.15   431.45     0.34
 HUB     13.07     0.00    -0.02   431.45    -0.15   431.45     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.00    47.36     9.64   664.11   792.08    32.00   669.83     0.62
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MEAN    53.21    44.80     8.41   576.85   720.47    32.00   669.83     0.57
HUB     47.69    38.84     8.85   473.79   640.92    32.00   669.83     0.51

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   548.96   343.38   428.30  1293.55     0.42
MEAN    15.50   549.29   333.75   436.26  1288.18     0.43
HUB     12.59   581.44   374.37   444.88  1282.86     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    650.33   526.94   306.95     0.41  6163.00
MEAN   561.80   492.27   228.04     0.38  5174.72     1.61
HUB    456.39   452.38    82.02     0.35  4715.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     40.79     1.18    36.04   721.10     1.05   695.99     0.92     0.91
MEAN    39.76     1.15    35.08   715.36     1.04   690.22     0.92     0.91
HUB     39.29     1.13    34.12   712.70     1.04   684.53     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.72    35.63    31.50     4.13     0.93     0.41     2.90
MEAN    37.42    27.60    23.50     4.10     0.93     0.39     3.34     0.91
HUB     40.08    10.45     6.50     3.95     0.93     0.36     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     556.017     339.872     440.048    1288.549       0.432      -0.005

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    39.847      35.059     690.627      46.000      37.681      33.000      -4.681

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     456.676     339.872     569.268    1296.345       0.352       0.287

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      39.746      36.476     699.010     440.827       0.041       0.439

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     426.665       0.000     426.665    1298.392       0.329       0.372

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      36.866     701.219       0.000       0.060       0.044       0.367

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.878      39.730       1.146     716.387      31.047     237.231       1.839

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 194000.953       0.459    2158.793 1677625.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1206985.38  13431.0254    192.3645      2.6299      0.8629      4.9942      1.3703
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 110% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.506   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     193.974    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   88.17013

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     189.493    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  149221.016  152205.109       1.507     831.557     551.846     619.754       1.123

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   471.15    -0.16   471.15     0.43   744.88
  MEAN    17.06     0.00    -0.02   471.15    -0.16   471.15     0.43
  HUB     12.51     0.00    -0.02   471.15    -0.16   471.15     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.79    50.47     7.32   747.85   884.02    13.32   504.27     0.80
  MEAN    52.71    47.20     5.51   618.44   777.59    13.32   504.27     0.71
  HUB     43.92    38.62     5.30   453.49   654.05    13.32   504.27     0.59

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   734.34   418.81   603.21  1127.67     0.65
  MEAN    18.04   775.71   463.02   622.36  1120.42     0.69
  HUB     15.00   899.72   609.72   661.62  1107.23     0.81

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   687.11   329.04     0.61  8643.35
  MEAN   653.81   650.95   190.79     0.58  8353.89     1.32
  HUB    543.76   664.90    65.96     0.60  9147.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.27     1.34    15.24   573.14     1.10   528.13     0.92     0.91
  MEAN    20.08     1.33    14.57   571.46     1.09   521.24     0.92     0.91
  HUB     20.61     1.36    13.34   576.08     1.10   508.58     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     34.77    28.61    24.20     4.41     0.93     0.30     2.90
  MEAN    36.65    17.04    12.70     4.34     0.92     0.25     3.51     0.91
  HUB     42.66    -5.69    -9.30     3.61     0.92     0.09     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     789.432     462.125     640.034    1120.266       0.705      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.259      14.539     521.508      24.000      35.830      35.400      -0.430

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     653.324     462.125     800.244    1137.746       0.574       0.291

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.154      16.113     537.910     528.796       0.028       0.440

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     596.127       0.000     596.127    1144.042       0.521       0.357

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.657     543.879       0.000       0.060       0.045       0.383

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      20.049       1.327     573.560      50.750     219.640       1.703

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 315964.094       0.565    3463.492 1981140.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.506   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    193.974    4154.000      20.049     573.560       1.000       1.000       0.980
W Kg/sec =   88.17013

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    149.557    3950.345       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149221.016  152205.109       1.356     590.487     435.561     474.134       1.089

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   564.21    -0.19   564.21     0.49   708.40
 MEAN    18.08     0.00    -0.02   564.21    -0.19   564.21     0.49
 HUB     15.21     0.00    -0.02   564.21    -0.19   564.21     0.49

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.87    46.36     6.51   744.95   934.65    16.99   546.98     0.81
 MEAN    49.28    42.30     6.98   655.35   864.91    16.99   546.98     0.75
 HUB     44.35    37.84     6.51   551.37   789.03    16.99   546.98     0.69

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   647.82   353.87   542.63  1182.03     0.55
 MEAN    18.01   663.75   364.21   554.90  1176.31     0.56
 HUB     15.22   723.03   446.82   568.44  1170.78     0.62

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   666.13   386.37     0.56  7229.98
 MEAN   652.87   625.49   288.66     0.53  6562.96     1.50
 HUB    551.84   578.06   105.02     0.49  6804.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.15      1.25    20.50   615.63     1.07   580.60     0.92     0.91
 MEAN    24.64      1.23    19.85   611.75     1.07   574.97     0.92     0.91
 HUB     24.82      1.24    19.19   613.16     1.07   569.52     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.11    35.45    31.50     3.95     0.93     0.35     2.90
 MEAN    33.28    27.48    23.50     3.98     0.93     0.34     3.30     0.91
 HUB     38.17    10.47     6.50     3.97     0.93     0.34     3.92
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000
    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     672.287     365.235     564.424    1177.019       0.571       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.821      19.890     575.778      46.000      32.907      30.600      -2.307

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     559.132     365.235     667.851    1188.850       0.470       0.283

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.753      21.269     587.411     511.151       0.024       0.361

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     551.548       0.000     551.548    1189.562       0.464       0.279

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.294     588.115       0.000       0.060       0.038       0.288

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.881      24.678       1.231     613.513      39.953     242.207       1.878

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 248926.688       0.454    2728.650 1761746.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.506   EfDer =  0.999

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    193.974    4154.000      24.678     613.513       1.000       1.000       0.980
W Kg/sec =   88.17013

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    125.662    3819.555       1.401       0.249      53.349      56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 149221.016  152205.109       1.490     545.479     365.997     429.765       1.174

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   517.26    -0.18   517.26     0.43   668.95
 MEAN    17.74      0.00    -0.02   517.26    -0.18   517.26     0.43
 HUB     15.05      0.00    -0.02   517.26    -0.18   517.26     0.43

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     54.60     46.36      8.24   727.55   892.83     21.68   591.19      0.75
 MEAN    51.19     43.40      7.79   643.03   825.39     21.68   591.19      0.69
 HUB     46.54     38.84      7.70   545.57   751.93     21.68   591.19      0.63

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   618.61    358.93    503.84   1224.19      0.51
 MEAN    17.51   631.28    366.73    513.83   1218.94      0.52
 HUB     14.85   685.34    440.60    524.93   1213.80      0.56

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12    618.77    359.20     0.51   7113.92
 MEAN   634.62    579.47    267.89     0.48   6423.31     1.55
 HUB    538.32    533.95     97.72     0.44   6545.58

         Pt2       PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     30.41     1.23     25.54    654.87     1.07    622.94      0.92      0.91
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 MEAN    29.81     1.21    24.82   650.86     1.06   617.61     0.92     0.91
 HUB     29.92     1.21    24.09   651.57     1.06   612.38     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.47    35.49    31.50     3.99     0.93     0.38     2.90
 MEAN    35.52    27.54    23.50     4.04     0.93     0.37     3.28     0.91
 HUB     40.01    10.55     6.50     4.05     0.93     0.37     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     637.294     369.135     519.502    1219.818       0.522       0.014

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.992      24.897     618.543      46.000      35.396      31.500      -3.896

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     522.266     369.135     639.548    1230.744       0.424       0.309

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.922      26.434     629.673     471.992       0.023       0.400

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     506.493       0.000     506.493    1232.066       0.411       0.316

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.547     631.027       0.000       0.060       0.042       0.331

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      29.826       1.209     652.434      38.921     227.171       1.761

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 242701.734       0.471    2660.415 1661981.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.506   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    193.974    4154.000      29.826     652.434       1.000       1.000       0.980
W Kg/sec =   88.17013

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    107.219    3703.874       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149221.016  152205.109       1.644     513.330     312.314     401.059       1.284

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   474.24    -0.16   474.24     0.38   622.51
 MEAN    16.97     0.00    -0.02   474.24    -0.16   474.24     0.38
 HUB     14.32     0.00    -0.02   474.24    -0.16   474.24     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.82    46.36     9.46   698.18   844.15    26.94   633.68     0.68
 MEAN    52.38    43.80     8.58   615.20   776.90    26.94   633.68     0.63
 HUB     47.60    37.84     9.76   519.11   703.24    26.94   633.68     0.57

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   584.08   352.50   465.72  1262.40     0.46
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 MEAN    16.57   591.75   353.86   474.29  1257.31     0.47
 HUB     13.89   636.77   414.09   483.75  1252.26     0.51
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   571.89   331.91     0.45  6658.31
 MEAN   600.81   534.73   246.95     0.43  5867.58     1.58
 HUB    503.52   491.95    89.43     0.39  5753.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     35.85     1.20    30.95   691.11     1.06   662.66     0.92     0.91
 MEAN    35.09     1.18    30.15   686.51     1.05   657.32     0.92     0.91
 HUB     34.99     1.17    29.32   685.85     1.05   652.04     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.12    35.48    31.50     3.98     0.93     0.39     2.90
 MEAN    36.73    27.51    23.50     4.01     0.93     0.38     3.29     0.91
 HUB     40.56    10.47     6.50     3.97     0.93     0.37     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     584.658     355.849     463.893    1259.203       0.464       0.051

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     35.258      30.412     659.322      46.000      37.492      32.400      -5.092

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     474.655     355.849     593.233    1268.448       0.374       0.349

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      35.193      31.948     669.039     456.573       0.023       0.433

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     451.098       0.000     451.098    1270.171       0.355       0.335

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.144     670.857       0.000       0.060       0.045       0.387

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      35.075       1.176     687.825      35.391     226.435       1.755

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 220913.719       0.472    2421.582 1627571.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.506   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    193.974    4154.000      35.075     687.825       1.000       1.000       0.980
W Kg/sec =   88.17013

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.615    3607.327       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149221.016  152205.109       1.869     509.668     272.720     390.276       1.431

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   420.26    -0.14   420.26     0.33   576.69
 MEAN    15.91     0.00    -0.02   420.26    -0.14   420.26     0.33
 HUB     13.07     0.00    -0.02   420.26    -0.14   420.26     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.68    47.36    10.32   664.11   786.03    32.52   673.11     0.62
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MEAN    53.93    44.80     9.13   576.85   713.82    32.52   673.11     0.56
HUB     48.44    38.84     9.60   473.79   633.43    32.52   673.11     0.50

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   545.49   351.54   417.11  1296.92     0.42
MEAN    15.50   544.11   339.79   424.97  1291.42     0.42
HUB     12.59   574.23   376.59   433.50  1285.97     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    650.33   513.08   298.79     0.40  6309.34
MEAN   561.80   479.47   222.01     0.37  5268.19     1.65
HUB    456.39   440.78    79.81     0.34  4743.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     41.38     1.18    36.64   724.43     1.05   699.64     0.92     0.91
MEAN    40.29     1.15    35.66   718.39     1.04   693.72     0.92     0.91
HUB     39.75     1.13    34.66   715.34     1.04   687.87     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.12    35.62    31.50     4.12     0.93     0.42     2.90
MEAN    38.64    27.58    23.50     4.08     0.93     0.40     3.34     0.91
HUB     40.98    10.43     6.50     3.93     0.93     0.38     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     550.894     346.018     428.668    1291.771       0.426      -0.006

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    40.379      35.631     694.103      46.000      38.910      33.000      -5.910

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     444.379     346.018     563.206    1299.964       0.342       0.307

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      40.262      37.134     702.935     440.827       0.044       0.458

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     415.431       0.000     415.431    1301.880       0.319       0.388

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      37.499     705.009       0.000       0.060       0.048       0.383

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.874      40.242       1.147     719.388      31.562     231.247       1.793

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 197236.031       0.466    2162.035 1642843.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1225742.25  13436.1738    189.4935      2.6638      0.8626      5.5058      1.3760
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 110% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.011   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     191.079    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   86.85419

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     186.665    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  146993.875  149933.438       1.530     831.557     543.610     619.754       1.140

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   462.59    -0.16   462.59     0.42   744.88
  MEAN    17.06     0.00    -0.02   462.59    -0.16   462.59     0.42
  HUB     12.51     0.00    -0.02   462.59    -0.16   462.59     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.27    50.47     7.80   747.85   879.49    13.38   504.94     0.80
  MEAN    53.21    47.20     6.01   618.44   772.43    13.38   504.94     0.70
  HUB     44.44    38.62     5.82   453.49   647.91    13.38   504.94     0.59

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   727.54   426.16   589.66  1129.45     0.64
  MEAN    18.04   767.44   467.17   608.86  1121.97     0.68
  HUB     15.00   887.80   608.21   646.73  1108.87     0.80

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   671.70   321.68     0.59  8795.07
  MEAN   653.81   636.82   186.64     0.57  8428.69     1.35
  HUB    543.76   649.94    64.45     0.59  9125.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.38     1.35    15.41   574.03     1.10   529.84     0.92     0.91
  MEAN    20.13     1.33    14.72   571.89     1.09   522.73     0.92     0.91
  HUB     20.60     1.36    13.50   575.95     1.10   510.21     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     35.86    28.61    24.20     4.41     0.93     0.32     2.90
  MEAN    37.50    17.04    12.70     4.34     0.93     0.26     3.51     0.91
  HUB     43.24    -5.69    -9.30     3.61     0.93     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     780.264     466.267     625.625    1121.981       0.695      -0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.310      14.696     523.106      24.000      36.696      35.400      -1.296

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	637.088	466.267	789.485	1140.013	0.559	0.309

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.207	16.342	540.055	528.796	0.028	0.453

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	582.057	0.000	582.057	1145.912	0.508	0.371

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.860	545.659	0.000	0.060	0.044	0.398

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.874	20.111	1.331	573.956	51.146	216.372	1.677

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
318428.000	0.569	3438.405	1945162.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 6.011 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
191.079	4154.000	20.111	573.956	1.000	1.000	0.980

W Kg/sec = 86.85419

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
146.916	3948.984	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
146993.875	149933.438	1.380	590.487	427.870	474.134	1.108

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	551.40	-0.19	551.40	0.48	708.16
MEAN	18.08	0.00	-0.02	551.40	-0.19	551.40	0.48	
HUB	15.21	0.00	-0.02	551.40	-0.19	551.40	0.48	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.50	46.36	7.14	744.95	926.97	17.18	548.57	0.81
MEAN	49.93	42.30	7.63	655.35	856.60	17.18	548.57	0.75
HUB	45.01	37.84	7.17	551.37	779.91	17.18	548.57	0.68

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	642.32	363.24	529.74	1184.15	0.54
MEAN	18.01	656.96	371.06	542.14	1178.19	0.56
HUB	15.22	714.74	449.36	555.82	1172.41	0.61

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	740.23	650.19	376.99	0.55	7421.33	
MEAN	652.87	611.01	281.81	0.52	6686.23	1.52
HUB	551.84	565.18	102.48	0.48	6843.53	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.36	1.26	20.76	617.14	1.08	582.70	0.92	0.91
MEAN	24.81	1.23	20.08	612.86	1.07	576.83	0.92	0.91
HUB	24.92	1.24	19.39	613.78	1.07	571.14	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.44	35.44	31.50	3.94	0.93	0.37	2.90	
MEAN	34.39	27.47	23.50	3.97	0.93	0.35	3.30	0.91
HUB	38.95	10.45	6.50	3.95	0.93	0.35	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999
    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     665.154     372.103     551.334    1178.936       0.564       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.982      20.124     577.655      46.000      34.016      30.600      -3.416

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     545.212     372.103     660.088    1191.240       0.458       0.302

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.910      21.573     589.775     511.151       0.025       0.378

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     538.035       0.000     538.035    1191.895       0.451       0.295

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.587     590.424       0.000       0.060       0.041       0.305

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.880      24.830       1.235     614.593      40.637     236.407       1.833

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 253194.625       0.462    2734.010 1725039.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.011   EfDer =  0.997

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    191.079    4154.000      24.830     614.593       1.000       1.000       0.980
W Kg/sec =   86.85419

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    123.136    3816.197       1.401       0.249      53.349      56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 146993.875  149933.438       1.521     545.479     358.640     429.765       1.198

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   505.00    -0.17   505.00     0.42   668.36
 MEAN    17.74      0.00    -0.02   505.00    -0.17   505.00     0.42
 HUB     15.05      0.00    -0.02   505.00    -0.17   505.00     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.24     46.36     8.88   727.55   885.78    21.96   593.31     0.74
 MEAN    51.86     43.40     8.46   643.03   817.76    21.96   593.31     0.68
 HUB     47.22     38.84     8.38   545.57   743.55    21.96   593.31     0.62

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   613.97   367.82   491.60  1226.71     0.50
 MEAN    17.51   625.27   373.26   501.64  1221.27     0.51
 HUB     14.85   677.66   443.03   512.78  1215.92     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   603.64   350.30     0.49  7290.00
 MEAN   634.62   565.64   261.36     0.46  6537.56     1.57
 HUB    538.32   521.56    95.29     0.43  6581.60

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.73     1.24    25.89   656.98     1.07   625.52     0.92     0.91
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 MEAN    30.08     1.21    25.15   652.60     1.06   619.98     0.92     0.91
 HUB     30.11     1.21    24.38   652.86     1.06   614.54     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.80    35.47    31.50     3.97     0.93     0.39     2.90
 MEAN    36.65    27.52    23.50     4.02     0.93     0.38     3.28     0.91
 HUB     40.83    10.53     6.50     4.03     0.93     0.38     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     631.169     375.708     507.167    1222.140       0.516       0.014

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.253      25.217     620.904      46.000      36.531      31.500      -5.031

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     509.092     375.708     632.717    1233.518       0.413       0.328

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.176      26.834     632.519     471.992       0.025       0.417

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     494.029       0.000     494.029    1234.747       0.400       0.331

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.928     633.780       0.000       0.060       0.045       0.346

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      30.071       1.211     654.146      39.553     221.765       1.719

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 246645.641       0.478    2663.294 1627594.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.011   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    191.079    4154.000      30.071     654.146       1.000       1.000       0.980
W Kg/sec =   86.85419

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.895    3699.025       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 146993.875  149933.438       1.680     513.330     305.546     401.059       1.313

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   462.86    -0.16   462.86     0.37   621.70
 MEAN    16.97     0.00    -0.02   462.86    -0.16   462.86     0.37
 HUB     14.32     0.00    -0.02   462.86    -0.16   462.86     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.46    46.36    10.10   698.18   837.81    27.30   636.28     0.68
 MEAN    53.05    43.80     9.25   615.20   770.00    27.30   636.28     0.62
 HUB     48.29    37.84    10.45   519.11   695.61    27.30   636.28     0.56

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   580.17   360.68   454.44  1265.23     0.46
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 MEAN    16.57   586.39   359.88   462.97  1259.98     0.47
 HUB     13.89   629.67   416.32   472.41  1254.78     0.50
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   557.96   323.73     0.44  6812.65
 MEAN   600.81   521.91   240.94     0.41  5967.24     1.61
 HUB    503.52   480.39    87.20     0.38  5784.92

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     36.26     1.21    31.39   693.71     1.06   665.65     0.92     0.91
 MEAN    35.45     1.18    30.56   688.80     1.05   660.13     0.92     0.91
 HUB     35.27     1.17    29.70   687.74     1.05   654.69     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.44    35.47    31.50     3.97     0.93     0.41     2.90
 MEAN    37.86    27.49    23.50     3.99     0.93     0.39     3.29     0.91
 HUB     41.39    10.46     6.50     3.96     0.93     0.38     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     579.775     361.900     452.954    1261.805       0.459       0.049

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     35.611      30.809     662.059      46.000      38.624      32.400      -6.224

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     462.868     361.900     587.552    1271.454       0.364       0.367

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      35.537      32.426     672.222     456.573       0.024       0.451

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     440.214       0.000     440.214    1273.066       0.346       0.349

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.596     673.928       0.000       0.060       0.050       0.400

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      35.408       1.177     690.087      35.941     221.123       1.714

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 224356.469       0.479    2422.615 1594250.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.011   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    191.079    4154.000      35.408     690.087       1.000       1.000       0.980
W Kg/sec =   86.85419

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.499    3601.411       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 146993.875  149933.438       1.912     509.668     266.557     390.276       1.464

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   410.31    -0.14   410.31     0.32   575.75
 MEAN    15.91     0.00    -0.02   410.31    -0.14   410.31     0.32
 HUB     13.07     0.00    -0.02   410.31    -0.14   410.31     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.30    47.36    10.94   664.11   780.76    32.96   676.06     0.61
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MEAN    54.58    44.80     9.78   576.85   708.01    32.96   676.06     0.56
HUB     49.12    38.84    10.28   473.79   626.88    32.96   676.06     0.49
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   542.71   358.73   407.24  1299.92     0.42
MEAN    15.50   539.74   345.11   415.00  1294.32     0.42
HUB     12.59   567.95   378.54   423.41  1288.75     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    650.33   500.87   291.60     0.39  6438.25
MEAN   561.80   468.16   216.69     0.36  5350.58     1.67
HUB    456.39   430.51    77.85     0.33  4767.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     41.88     1.18    37.14   727.44     1.05   702.90     0.92     0.91
MEAN    40.73     1.15    36.13   721.13     1.04   696.86     0.92     0.91
HUB     40.12     1.13    35.11   717.75     1.04   690.87     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.38    35.60    31.50     4.10     0.93     0.44     2.90
MEAN    39.75    27.57    23.50     4.07     0.94     0.41     3.34     0.91
HUB     41.80    10.42     6.50     3.92     0.94     0.39     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219      546.575     351.435     418.615    1294.647       0.422       -0.006

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    40.813      36.103      697.214      46.000      40.014      33.000      -7.014

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
    15.219      433.577     351.435     558.118    1303.186       0.333       0.324

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      40.680      37.678     706.442     440.827       0.048       0.475

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     405.549       0.000     405.549    1304.991       0.311       0.401

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      38.022     708.401       0.000       0.060       0.053       0.396

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.869      40.656       1.148     722.103      32.016     226.049       1.752

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 200086.062       0.473    2160.541 1609899.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1242710.75  13418.8643    186.6652      2.6912      0.8611      6.0106      1.3812
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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 110% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.509   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     188.227    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   85.55788

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     183.879    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  144799.969  147695.656       1.553     831.557     535.496     619.754       1.157

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   454.26    -0.16   454.26     0.41   744.88
  MEAN    17.06     0.00    -0.02   454.26    -0.16   454.26     0.41
  HUB     12.51     0.00    -0.02   454.26    -0.16   454.26     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.73    50.47     8.26   747.85   875.13    13.44   505.57     0.79
  MEAN    53.71    47.20     6.51   618.44   767.47    13.44   505.57     0.70
  HUB     44.96    38.62     6.34   453.49   641.99    13.44   505.57     0.58

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   721.34   433.16   576.81  1131.10     0.64
  MEAN    18.04   759.72   471.13   595.99  1123.41     0.68
  HUB     15.00   876.55   606.78   632.58  1110.41     0.79

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   657.07   314.69     0.58  8939.32
  MEAN   653.81   623.37   182.69     0.55  8499.94     1.37
  HUB    543.76   635.72    63.03     0.57  9103.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.47     1.36    15.57   574.87     1.10   531.42     0.92     0.91
  MEAN    20.18     1.34    14.85   572.31     1.09   524.13     0.92     0.91
  HUB     20.58     1.36    13.64   575.82     1.10   511.73     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     36.91    28.62    24.20     4.42     0.93     0.33     2.90
  MEAN    38.33    17.04    12.70     4.34     0.93     0.28     3.51     0.91
  HUB     43.81    -5.69    -9.30     3.61     0.93     0.12     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     771.766     470.213     611.982    1123.565       0.687      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.357      14.841     524.584      24.000      37.537      35.400      -2.137

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     621.933     470.213     779.680    1142.091       0.545       0.325
   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.253      16.550     542.026     528.796       0.028       0.466

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     568.894       0.000     568.894    1147.635       0.496       0.385

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.044     547.301       0.000       0.060       0.044       0.412

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      20.165       1.335     574.333      51.523     213.237       1.653

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 320772.969       0.574    3412.029 1910119.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.509   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    188.227    4154.000      20.165     574.333       1.000       1.000       0.980
W Kg/sec =   85.55788

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    144.387    3947.688       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 144799.969  147695.656       1.404     590.487     420.506     474.134       1.128

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   539.36    -0.19   539.36     0.47   707.93
 MEAN    18.08     0.00    -0.02   539.36    -0.19   539.36     0.47
 HUB     15.21     0.00    -0.02   539.36    -0.19   539.36     0.47

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.10    46.36     7.74   744.95   919.85    17.34   550.04     0.80
 MEAN    50.55    42.30     8.25   655.35   848.90    17.34   550.04     0.74
 HUB     45.64    37.84     7.80   551.37   771.44    17.34   550.04     0.67

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   637.53   371.91   517.81  1186.08     0.54
 MEAN    18.01   650.87   377.42   530.27  1179.92     0.55
 HUB     15.22   707.12   451.72   544.03  1173.92     0.60

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   635.45   368.33     0.54  7598.17
 MEAN   652.87   597.55   275.45     0.51  6800.59     1.54
 HUB    551.84   553.16   100.12     0.47  6879.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.56     1.27    20.99   618.55     1.08   584.61     0.92     0.91
 MEAN    24.95     1.24    20.28   613.90     1.07   578.54     0.92     0.91
 HUB     25.01     1.24    19.56   614.36     1.07   572.62     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.69    35.42    31.50     3.92     0.93     0.38     2.90
 MEAN    35.44    27.45    23.50     3.95     0.93     0.36     3.30     0.91
 HUB     39.70    10.43     6.50     3.93     0.93     0.36     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     658.758     378.475     539.184    1180.687       0.558       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.122      20.330     579.372      46.000      35.067      30.600      -4.467

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     532.394     378.475     653.212    1193.423       0.446       0.320

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.044      21.843     591.939     511.151       0.026       0.394

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     525.615       0.000     525.615    1194.026       0.440       0.310

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.845     592.538       0.000       0.060       0.043       0.320

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      24.959       1.238     615.604      41.271     231.112       1.792

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 257147.453       0.469    2735.251 1689925.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.509   EfDer =  0.995

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    188.227    4154.000      24.959     615.604       1.000       1.000       0.980
W Kg/sec =   85.55788

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    120.773    3813.062       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 144799.969  147695.656       1.551     545.479     351.760     429.765       1.222

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   493.69    -0.17   493.69     0.41   667.81
 MEAN    17.74      0.00    -0.02   493.69    -0.17   493.69     0.41
 HUB     15.05      0.00    -0.02   493.69    -0.17   493.69     0.41

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     55.85     46.36     9.49   727.55   879.38     22.20   595.27      0.73
 MEAN    52.49     43.40     9.09   643.03   810.83     22.20   595.27      0.68
 HUB     47.87     38.84     9.03   545.57   735.91     22.20   595.27      0.61

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   610.03   375.91   480.45  1229.00      0.50
 MEAN    17.51   619.99   379.22   490.48  1223.39      0.51
 HUB     14.85   670.73   445.25   501.63  1217.87      0.55

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   589.86   342.21      0.48  7450.23
 MEAN   634.62   552.99   255.40      0.45  6641.90      1.60
 HUB    538.32   510.19    93.06      0.42  6614.59

         Pt2       PR       Ps2     Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     31.00      1.24    26.19   658.92      1.07   627.87      0.92     0.91
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 MEAN    30.30     1.21    25.42   654.22     1.06   622.15     0.92     0.91
 HUB     30.28     1.21    24.63   654.06     1.06   616.52     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.04    35.46    31.50     3.96     0.93     0.40     2.90
 MEAN    37.71    27.51    23.50     4.01     0.93     0.39     3.28     0.91
 HUB     41.59    10.51     6.50     4.01     0.93     0.38     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     625.786     381.711     495.887    1224.252       0.511       0.014

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.475      25.494     623.055      46.000      37.587      31.500      -6.087

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     497.120     381.711     626.763    1236.039       0.402       0.345

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.389      27.181     635.111     471.992       0.027       0.433

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     482.711       0.000     482.711    1237.185       0.390       0.345

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.255     636.289       0.000       0.060       0.049       0.360

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      30.275       1.213     655.732      40.128     216.901       1.681

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 250241.547       0.485    2661.793 1594802.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.509   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    188.227    4154.000      30.275     655.732       1.000       1.000       0.980
W Kg/sec =   85.55788

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.759    3694.548       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 144799.969  147695.656       1.715     513.330     299.323     401.059       1.340

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   452.51    -0.16   452.51     0.37   620.94
 MEAN    16.97     0.00    -0.02   452.51    -0.16   452.51     0.37
 HUB     14.32     0.00    -0.02   452.51    -0.16   452.51     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.06    46.36    10.70   698.18   832.13    27.61   638.66     0.67
 MEAN    53.67    43.80     9.87   615.20   763.82    27.61   638.66     0.62
 HUB     48.93    37.84    11.09   519.11   688.76    27.61   638.66     0.56

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   576.91   368.05   444.25  1267.79     0.46
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 MEAN    16.57   581.74   365.31   452.73  1262.42     0.46
 HUB     13.89   623.32   418.31   462.11  1257.08     0.50
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   545.39   316.36     0.43  6951.76
 MEAN   600.81   510.32   235.50     0.40  6057.26     1.64
 HUB    503.52   469.90    85.21     0.37  5812.54

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     36.61     1.21    31.76   696.11     1.06   668.36     0.92     0.91
 MEAN    35.75     1.18    30.90   690.91     1.05   662.69     0.92     0.91
 HUB     35.51     1.17    30.02   689.49     1.05   657.10     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.64    35.46    31.50     3.96     0.93     0.42     2.90
 MEAN    38.90    27.48    23.50     3.98     0.94     0.40     3.29     0.91
 HUB     42.15    10.45     6.50     3.95     0.94     0.39     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     575.542     367.365     443.048    1264.167       0.455       0.048

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     35.906      31.144     664.549      46.000      39.665      32.400      -7.265

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     452.244     367.365     582.650    1274.177       0.355       0.383

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      35.823      32.833     675.116     456.573       0.026       0.467

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     430.405       0.000     430.405    1275.693       0.337       0.362

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.977     676.723       0.000       0.060       0.054       0.412

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      35.682       1.179     692.169      36.436     216.395       1.677

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 227459.438       0.486    2419.462 1562502.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.509   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    188.227    4154.000      35.682     692.169       1.000       1.000       0.980
W Kg/sec =   85.55788

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.577    3595.991       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 144799.969  147695.656       1.953     509.668     260.959     390.276       1.496

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   401.34    -0.14   401.34     0.31   574.88
 MEAN    15.91     0.00    -0.02   401.34    -0.14   401.34     0.31
 HUB     13.07     0.00    -0.02   401.34    -0.14   401.34     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.86    47.36    11.50   664.11   776.08    33.32   678.75     0.61
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 MEAN    55.18    44.80    10.38   576.85   702.85    33.32   678.75     0.55
 HUB     49.74    38.84    10.90   473.79   621.03    33.32   678.75     0.49
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   540.40   365.13   398.38  1302.63     0.41
 MEAN    15.50   535.96   349.85   406.03  1296.94     0.41
 HUB     12.59   562.38   380.28   414.32  1291.28     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   489.95   285.20     0.38  6553.04
 MEAN   561.80   458.02   211.95     0.35  5424.03     1.70
 HUB    456.39   421.26    76.12     0.33  4789.48

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     42.28     1.18    37.56   730.18     1.05   705.85     0.92     0.91
 MEAN    41.09     1.15    36.53   723.63     1.05   699.70     0.92     0.91
 HUB     40.43     1.13    35.49   719.95     1.04   693.60     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.51    35.60    31.50     4.10     0.93     0.45     2.90
 MEAN    40.75    27.56    23.50     4.06     0.94     0.42     3.34     0.91
 HUB     42.55    10.41     6.50     3.91     0.94     0.40     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      542.843     356.265     409.577    1297.252       0.418       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     41.171      36.496      700.041      46.000      41.018      33.000      -8.018

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      423.912     356.265     553.738    1306.096       0.325       0.339

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      41.020      38.132     709.619     440.827       0.052       0.491

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     396.697       0.000     396.697    1307.807       0.303       0.413

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      38.457     711.479       0.000       0.060       0.058       0.408

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864      40.992       1.149     724.589      32.420     221.459       1.717

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 202624.875       0.479    2155.300 1584867.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1258246.38  13383.8350    183.8792      2.7134      0.8586      6.5087      1.3860
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 110% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.000   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     185.418    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   84.28091

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     181.135    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  142638.812  145491.297       1.576     831.557     527.504     619.754       1.175

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   446.14    -0.15   446.14     0.40   744.88
  MEAN    17.06     0.00    -0.02   446.14    -0.15   446.14     0.40
  HUB     12.51     0.00    -0.02   446.14    -0.15   446.14     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.19    50.47     8.72   747.85   870.94    13.50   506.19     0.79
  MEAN    54.20    47.20     7.00   618.44   762.69    13.50   506.19     0.69
  HUB     45.48    38.62     6.86   453.49   636.27    13.50   506.19     0.58

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   715.69   439.82   564.59  1132.64     0.63
  MEAN    18.04   752.51   474.92   583.71  1124.76     0.67
  HUB     15.00   865.93   605.44   619.10  1111.85     0.78

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   643.15   308.03     0.57  9076.70
  MEAN   653.81   610.51   178.90     0.54  8568.29     1.39
  HUB    543.76   622.17    61.68     0.56  9083.48

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.57     1.36    15.71   575.67     1.10   532.90     0.92     0.91
  MEAN    20.23     1.34    14.98   572.71     1.10   525.43     0.92     0.91
  HUB     20.57     1.36    13.77   575.71     1.10   513.15     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     37.92    28.62    24.20     4.42     0.93     0.35     2.90
  MEAN    39.13    17.04    12.70     4.34     0.93     0.29     3.51     0.91
  HUB     44.36    -5.69    -9.30     3.61     0.93     0.13     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     763.873     473.997     599.022    1125.034       0.679      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.399      14.975     525.957      24.000      38.354      35.400      -2.954

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	607.702	473.997	770.698	1144.008	0.531	0.341

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.293	16.741	543.847	528.796	0.029	0.479

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	556.502	0.000	556.502	1149.233	0.484	0.397

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.211	548.826	0.000	0.060	0.043	0.424

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	20.210	1.338	574.693	51.883	210.222	1.630

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
323014.562	0.578	3384.592	1875968.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.000 EfDer = 0.996

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
185.418	4154.000	20.210	574.693	1.000	1.000	0.980

W Kg/sec = 84.28091

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
141.957	3946.452	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
142638.812	145491.297	1.428	590.487	413.428	474.134	1.147

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	527.99	-0.18	527.99	0.46	707.71
MEAN	18.08	0.00	-0.02	527.99	-0.18	527.99	0.46	
HUB	15.21	0.00	-0.02	527.99	-0.18	527.99	0.46	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.68	46.36	8.32	744.95	913.23	17.50	551.42	0.79
MEAN	51.15	42.30	8.85	655.35	841.72	17.50	551.42	0.73
HUB	46.25	37.84	8.41	551.37	763.53	17.50	551.42	0.66

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	633.33	379.98	506.68	1187.86	0.53
MEAN	18.01	645.36	383.36	519.15	1181.52	0.55
HUB	15.22	700.05	453.93	532.94	1175.32	0.60

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	740.23	621.70	360.26	0.52	7762.87	
MEAN	652.87	584.94	269.51	0.50	6907.57	1.57
HUB	551.84	541.86	97.91	0.46	6912.90	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.73	1.27	21.20	619.86	1.08	586.38	0.92	0.91
MEAN	25.07	1.24	20.46	614.89	1.07	580.12	0.92	0.91
HUB	25.08	1.24	19.72	614.92	1.07	574.01	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.87	35.41	31.50	3.91	0.93	0.39	2.90	
MEAN	36.44	27.44	23.50	3.94	0.93	0.37	3.30	0.91
HUB	40.42	10.41	6.50	3.91	0.93	0.37	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996
    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     652.981     384.435     527.820    1182.300       0.552       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.244      20.514     580.957      46.000      36.068      30.600      -5.468

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     520.485     384.435     647.066    1195.435       0.435       0.336

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.159      22.083     593.938     511.151       0.028       0.410

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     514.092       0.000     514.092    1195.991       0.430       0.323

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.074     594.490       0.000       0.060       0.047       0.334

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.874      25.067       1.240     616.556      41.863     226.233       1.754

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 260835.438       0.476    2733.070 1656213.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.000   EfDer =  0.993

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    185.418    4154.000      25.067     616.556       1.000       1.000       0.980
W Kg/sec =   84.28091

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
    118.548    3810.118       1.401       0.249      53.349      56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*     AthrRotor  ChokeMargin
 142638.812  145491.297       1.580     545.479     345.280     429.765       1.245

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   483.18    -0.17   483.18     0.40   667.30
 MEAN    17.74      0.00    -0.02   483.18    -0.17   483.18     0.40
 HUB     15.05      0.00    -0.02   483.18    -0.17   483.18     0.40

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     56.42     46.36     10.06   727.55    873.51     22.41   597.08     0.73
 MEAN    53.09     43.40      9.69   643.03    804.46     22.41   597.08     0.67
 HUB     48.48     38.84      9.64   545.57    728.89     22.41   597.08     0.61

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81    606.65    383.35    470.17   1231.09      0.49
 MEAN    17.51    615.28    384.71    480.17   1225.34      0.50
 HUB     14.85    664.40    447.29    491.28   1219.67      0.54

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12    577.17    334.77     0.47   7597.58
 MEAN   634.62    541.31    249.91     0.44   6737.97     1.62
 HUB    538.32    499.65     91.03     0.41   6644.70

         Pt2        PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     31.24      1.25     26.46    660.73      1.07    630.02      0.92      0.91
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 MEAN    30.49     1.22    25.66   655.73     1.06   624.14     0.92     0.91
 HUB     30.41     1.21    24.85   655.19     1.06   618.36     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.19    35.45    31.50     3.95     0.93     0.41     2.90
 MEAN    38.70    27.50    23.50     4.00     0.94     0.40     3.28     0.91
 HUB     42.32    10.50     6.50     4.00     0.94     0.39     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     620.992     387.238     485.466    1226.191       0.506       0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.663      25.734     625.035      46.000      38.578      31.500      -7.078

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     486.119     387.238     621.502    1238.352       0.393       0.361

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.568      27.484     637.495     471.992       0.029       0.449

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     472.314       0.000     472.314    1239.424       0.381       0.357

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.539     638.599       0.000       0.060       0.053       0.372

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.868      30.445       1.215     657.213      40.658     212.476       1.647

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 253547.359       0.492    2656.705 1563382.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.000   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    185.418    4154.000      30.445     657.213       1.000       1.000       0.980
W Kg/sec =   84.28091

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.775    3690.383       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 142638.812  145491.297       1.749     513.330     293.546     401.059       1.366

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   442.98    -0.15   442.98     0.36   620.24
 MEAN    16.97     0.00    -0.02   442.98    -0.15   442.98     0.36
 HUB     14.32     0.00    -0.02   442.98    -0.15   442.98     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.61    46.36    11.25   698.18   826.98    27.88   640.85     0.67
 MEAN    54.25    43.80    10.45   615.20   758.21    27.88   640.85     0.61
 HUB     49.53    37.84    11.69   519.11   682.54    27.88   640.85     0.55

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   574.13   374.76   434.95  1270.13     0.45
 MEAN    16.57   577.64   370.28   443.35  1264.64     0.46
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 HUB     13.89   617.59   420.14   452.65  1259.19     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   533.91   309.65     0.42  7078.43
 MEAN   600.81   499.70   230.53     0.40  6139.63     1.66
 HUB    503.52   460.27    83.38     0.37  5837.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     36.90     1.21    32.07   698.32     1.06   670.84     0.92     0.91
 MEAN    36.00     1.18    31.19   692.87     1.05   665.05     0.92     0.91
 HUB     35.71     1.17    30.29   691.12     1.05   659.32     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.75    35.45    31.50     3.95     0.93     0.43     2.90
 MEAN    39.87    27.47    23.50     3.97     0.94     0.41     3.29     0.91
 HUB     42.87    10.44     6.50     3.94     0.94     0.40     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     571.823     372.366     433.965    1266.333       0.452       0.047

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.152      31.429     666.839      46.000      40.631      32.400      -8.231

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     442.541     372.366     578.359    1276.673       0.347       0.398

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      36.060      33.182     677.773     456.573       0.028       0.482

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     421.445       0.000     421.445    1278.104       0.330       0.373

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      33.302     679.293       0.000       0.060       0.059       0.422

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      35.908       1.179     694.102      36.889     212.125       1.644

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 230293.031       0.492    2413.042 1532092.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.000   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    185.418    4154.000      35.908     694.102       1.000       1.000       0.980
W Kg/sec =   84.28091

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.808    3590.980       1.400       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 142638.812  145491.297       1.992     509.668     255.809     390.276       1.526

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   393.13    -0.14   393.13     0.31   574.08
 MEAN    15.91     0.00    -0.02   393.13    -0.14   393.13     0.31
 HUB     13.07     0.00    -0.02   393.13    -0.14   393.13     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.38    47.36    12.02   664.11   771.86    33.63   681.23     0.60
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 MEAN    55.73    44.80    10.93   576.85   698.19    33.63   681.23     0.55
 HUB     50.32    38.84    11.48   473.79   615.76    33.63   681.23     0.48
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   538.48   370.95   390.32  1305.11     0.41
 MEAN    15.50   532.65   354.17   397.85  1299.35     0.41
 HUB     12.59   557.36   381.84   406.02  1293.60     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   480.01   279.38     0.37  6657.33
 MEAN   561.80   448.77   207.62     0.35  5490.97     1.73
 HUB    456.39   412.81    74.56     0.32  4809.09

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     42.62     1.19    37.91   732.72     1.06   708.56     0.92     0.90
 MEAN    41.38     1.15    36.86   725.95     1.05   702.32     0.92     0.90
 HUB     40.67     1.13    35.80   722.00     1.04   696.12     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.54    35.59    31.50     4.09     0.93     0.46     2.90
 MEAN    41.68    27.56    23.50     4.06     0.94     0.43     3.34     0.90
 HUB     43.24    10.41     6.50     3.91     0.94     0.40     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      539.586     360.667     401.338    1299.638       0.415       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     41.465      36.825      702.636       46.000      41.945      33.000      -8.945

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      415.131     360.667     549.922    1308.760       0.317       0.353

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       41.298       38.515     712.534     440.827       0.056       0.505

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      388.645       0.000     388.645    1310.387       0.297       0.424

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       38.821      714.307       0.000       0.060       0.063       0.418

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.859       41.265        1.149      726.889       32.787     217.330       1.685

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 204930.859       0.485    2147.294 1554822.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
   1272621.25  13334.7041     181.1348      2.7315       0.8554       7.0004       1.3904
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 110% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     182.651    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   83.02301

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     178.431    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  140509.906  143319.797       1.600     831.557     519.631     619.754       1.193

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   438.22    -0.15   438.22     0.40   744.88
  MEAN    17.06     0.00    -0.02   438.22    -0.15   438.22     0.40
  HUB     12.51     0.00    -0.02   438.22    -0.15   438.22     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.64    50.47     9.17   747.85   866.91    13.55   506.77     0.79
  MEAN    54.69    47.20     7.49   618.44   758.08    13.55   506.77     0.69
  HUB     45.99    38.62     7.37   453.49   630.74    13.55   506.77     0.57

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   710.51   446.18   552.94  1134.08     0.63
  MEAN    18.04   745.74   478.54   571.95  1126.04     0.66
  HUB     15.00   855.86   604.14   606.22  1113.21     0.77

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   629.88   301.67     0.56  9207.74
  MEAN   653.81   598.21   175.28     0.53  8633.46     1.42
  HUB    543.76   609.22    60.39     0.55  9064.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.65     1.37    15.85   576.43     1.10   534.28     0.92     0.91
  MEAN    20.27     1.34    15.10   573.09     1.10   526.66     0.92     0.91
  HUB     20.55     1.36    13.90   575.59     1.10   514.47     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     38.90    28.62    24.20     4.42     0.93     0.36     2.90
  MEAN    39.92    17.04    12.70     4.34     0.93     0.30     3.51     0.91
  HUB     44.90    -5.69    -9.30     3.61     0.93     0.14     4.78

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     756.498     477.606     586.670    1126.402       0.672       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.436      15.099     527.236      24.000      39.149      35.400      -3.749

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     594.279     477.606     762.414    1145.785       0.519       0.355

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.326      16.916     545.538     528.796       0.030       0.491

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     544.776       0.000     544.776    1150.720       0.473       0.408

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.364     550.248       0.000       0.060       0.044       0.436

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      20.249       1.340     575.036      52.226     207.320       1.607

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 325151.281       0.581    3356.131 1842667.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    182.651    4154.000      20.249     575.036       1.000       1.000       0.980
W Kg/sec =   83.02301

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    139.614    3945.274       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 140509.906  143319.797       1.452     590.487     406.604     474.134       1.166

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   517.20    -0.18   517.20     0.45   707.50
 MEAN    18.08     0.00    -0.02   517.20    -0.18   517.20     0.45
 HUB     15.21     0.00    -0.02   517.20    -0.18   517.20     0.45

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.24    46.36     8.88   744.95   907.03    17.64   552.70     0.79
 MEAN    51.73    42.30     9.43   655.35   834.99    17.64   552.70     0.72
 HUB     46.84    37.84     9.00   551.37   756.11    17.64   552.70     0.66

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   629.64   387.54   496.24  1189.50     0.53
 MEAN    18.01   640.33   388.94   508.68  1183.00     0.54
 HUB     15.22   693.45   455.98   522.45  1176.62     0.59

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   608.80   352.69     0.51  7917.29
 MEAN   652.87   573.07   263.93     0.48  7007.95     1.59
 HUB    551.84   531.18    95.86     0.45  6944.10

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.88     1.28    21.38   621.10     1.08   588.01     0.92     0.91
 MEAN    25.18     1.24    20.63   615.81     1.07   581.58     0.92     0.91
 HUB     25.13     1.24    19.86   615.44     1.07   575.30     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.99    35.40    31.50     3.90     0.93     0.40     2.90
 MEAN    37.40    27.42    23.50     3.92     0.94     0.38     3.30     0.91
 HUB     41.11    10.40     6.50     3.90     0.94     0.37     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     647.720     390.028     517.125    1183.793       0.547       0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.351      20.678     582.426      46.000      37.024      30.600      -6.424

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     509.343     390.028     641.524    1197.301       0.425       0.351

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.258      22.299     595.794     511.151       0.030       0.425

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     503.325       0.000     503.325    1197.812       0.420       0.335

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.277     596.302       0.000       0.060       0.050       0.346

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      25.158       1.242     617.453      42.418     221.709       1.719

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 264292.094       0.482    2727.958 1623763.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.990

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    182.651    4154.000      25.158     617.453       1.000       1.000       0.980
W Kg/sec =   83.02301

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    116.440    3807.347       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 140509.906  143319.797       1.608     545.479     339.142     429.765       1.267

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   473.32    -0.16   473.32     0.39   666.81
 MEAN    17.74     0.00    -0.02   473.32    -0.16   473.32     0.39
 HUB     15.05     0.00    -0.02   473.32    -0.16   473.32     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.96    46.36    10.60   727.55   868.10    22.60   598.76     0.72
 MEAN    53.65    43.40    10.25   643.03   798.58    22.60   598.76     0.67
 HUB     49.06    38.84    10.22   545.57   722.40    22.60   598.76     0.60

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   603.71   390.25   460.62  1233.03      0.49
 MEAN    17.51   611.05   389.82   470.55  1227.15      0.50
 HUB     14.85   658.56   449.16   481.62  1221.33      0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   565.40   327.88     0.46  7734.04
 MEAN   634.62   530.42   244.81     0.43  6827.22     1.64
 HUB    538.32   489.80    89.16     0.40  6672.50

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.45     1.25    26.69   662.42     1.07   632.01     0.92     0.91
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 MEAN    30.66     1.22    25.87   657.14     1.06   625.99     0.92     0.91
 HUB     30.52     1.21    25.04   656.24     1.06   620.06     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.27    35.44    31.50     3.94     0.93     0.43     2.90
 MEAN    39.64    27.49    23.50     3.99     0.94     0.41     3.28     0.91
 HUB     43.00    10.49     6.50     3.99     0.94     0.40     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     616.688     392.373     475.759    1227.984       0.502       0.014

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.824      25.943     626.869      46.000      39.513      31.500      -8.013

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     475.916     392.373     616.809    1240.490       0.384       0.376

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.719      27.750     639.703     471.992       0.031       0.463

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     462.675       0.000     462.675    1241.495       0.373       0.368

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.786     640.740       0.000       0.060       0.058       0.383

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864      30.586       1.216     658.602      41.148     208.413       1.616

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 256611.188       0.498    2648.677 1533172.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    182.651    4154.000      30.586     658.602       1.000       1.000       0.980
W Kg/sec =   83.02301

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     98.918    3686.491       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 140509.906  143319.797       1.782     513.330     288.139     401.059       1.392

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   434.12    -0.15   434.12     0.35   619.59
 MEAN    16.97     0.00    -0.02   434.12    -0.15   434.12     0.35
 HUB     14.32     0.00    -0.02   434.12    -0.15   434.12     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.13    46.36    11.77   698.18   822.27    28.11   642.89     0.66
 MEAN    54.80    43.80    11.00   615.20   753.07    28.11   642.89     0.61
 HUB     50.10    37.84    12.26   519.11   676.82    28.11   642.89     0.54

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   571.73   380.92   426.35  1272.29     0.45
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 MEAN    16.57   573.98   374.85   434.67  1266.70     0.45
 HUB     13.89   612.33   421.79   443.88  1261.14     0.49
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   523.34   303.49     0.41  7194.68
 MEAN   600.81   489.89   225.96     0.39  6215.21     1.68
 HUB    503.52   451.35    81.73     0.36  5860.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     37.15     1.21    32.34   700.38     1.06   673.13     0.92     0.90
 MEAN    36.20     1.18    31.45   694.69     1.05   667.23     0.92     0.90
 HUB     35.87     1.17    30.52   692.64     1.05   661.38     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.78    35.44    31.50     3.94     0.93     0.44     2.90
 MEAN    40.77    27.47    23.50     3.97     0.94     0.42     3.29     0.90
 HUB     43.54    10.43     6.50     3.93     0.94     0.41     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.986

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     568.500     376.955     425.555    1268.334       0.448       0.046

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    36.358      31.673     668.959      46.000      41.534      32.400      -9.134

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     433.591     376.955     574.540    1278.975       0.339       0.412

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      36.256      33.482     680.230     456.573       0.031       0.496

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     413.176       0.000     413.176    1280.329       0.323       0.383

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      33.578     681.671       0.000       0.060       0.064       0.431

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.857      36.092       1.180     695.904      37.303     208.237       1.614

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 232887.922       0.497    2403.812 1502852.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.984

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   182.651    4154.000      36.092     695.904       1.000       1.000       0.980
W Kg/sec =   83.02301

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    86.167    3586.326       1.400       0.250      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 140509.906  143319.797       2.030     509.668     251.031     390.276       1.555

    ROTOR LEADING EDGE CONDITIONS, STAGE            5
       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   385.54    -0.13   385.54     0.30   573.34
 MEAN    15.91     0.00    -0.02   385.54    -0.13   385.54     0.30
 HUB     13.07     0.00    -0.02   385.54    -0.13   385.54     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.87    47.36    12.51   664.11   768.02    33.90   683.52     0.60
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 MEAN    56.25    44.80    11.45   576.85   693.94    33.90   683.52     0.54
 HUB     50.87    38.84    12.03   473.79   610.94    33.90   683.52     0.48
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   536.84   376.28   382.91  1307.40     0.41
 MEAN    15.50   529.71   358.12   390.31  1301.57     0.41
 HUB     12.59   552.80   383.26   398.36  1295.75     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   470.88   274.06     0.36  6752.81
 MEAN   561.80   440.25   203.67     0.34  5552.17     1.75
 HUB    456.39   405.02    73.13     0.31  4827.04

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     42.90     1.19    38.20   735.07     1.06   711.07     0.92     0.90
 MEAN    41.63     1.15    37.14   728.11     1.05   704.74     0.92     0.90
 HUB     40.87     1.13    36.06   723.90     1.04   698.45     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.50    35.59    31.50     4.09     0.93     0.47     2.90
 MEAN    42.54    27.56    23.50     4.06     0.94     0.44     3.34     0.90
 HUB     43.89    10.40     6.50     3.90     0.94     0.41     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     536.688     364.690     393.744    1301.839       0.412       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     41.708      37.102     705.036      46.000      42.806      33.000      -9.806

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219     407.061     364.690     546.533    1311.213       0.310        0.365

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      41.524      38.839     715.225     440.827       0.059       0.519

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     381.240       0.000     381.240    1312.766       0.290       0.434

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      39.127     716.921       0.000       0.060       0.067       0.427

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.854      41.487       1.149     729.027      33.123     213.575       1.656

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 207041.078       0.490    2137.027 1525879.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1285983.62  13273.6035    178.4314      2.7462      0.8518      7.4857      1.3944
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 110% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.965   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     179.925    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   81.78387

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     175.768    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  138412.766  141180.734       1.625     831.557     511.875     619.754       1.211

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   430.49    -0.15   430.49     0.39   744.88
  MEAN    17.06     0.00    -0.02   430.49    -0.15   430.49     0.39
  HUB     12.51     0.00    -0.02   430.49    -0.15   430.49     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.08    50.47     9.61   747.85   863.03    13.60   507.33     0.78
  MEAN    55.16    47.20     7.96   618.44   753.64    13.60   507.33     0.68
  HUB     46.50    38.62     7.88   453.49   625.39    13.60   507.33     0.57

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   705.75   452.25   541.81  1135.42     0.62
  MEAN    18.04   739.39   482.01   560.68  1127.23     0.66
  HUB     15.00   846.28   602.91   593.88  1114.49     0.76

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   617.20   295.60     0.54  9333.00
  MEAN   653.81   586.41   171.80     0.52  8696.13     1.44
  HUB    543.76   596.82    59.15     0.54  9045.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.73     1.37    15.97   577.16     1.10   535.57     0.92     0.91
  MEAN    20.31     1.34    15.20   573.45     1.10   527.81     0.92     0.91
  HUB     20.54     1.36    14.01   575.48     1.10   515.72     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     39.85    28.62    24.20     4.42     0.93     0.38     2.90
  MEAN    40.69    17.04    12.70     4.34     0.93     0.32     3.51     0.91
  HUB     45.43    -5.69    -9.30     3.61     0.93     0.16     4.78

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     749.604     481.077     574.866    1127.678       0.665       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.470      15.214     528.432      24.000      39.924      35.400      -4.524

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     581.562     481.077     754.751    1147.441       0.507       0.369

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.355      17.077     547.116     528.796       0.031       0.502

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     533.630       0.000     533.630    1152.113       0.463       0.419

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.505     551.580       0.000       0.060       0.044       0.447

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      20.281       1.343     575.365      52.555     204.519       1.585

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 327197.562       0.585    3326.846 1810179.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.965   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.925    4154.000      20.281     575.365       1.000       1.000       0.980
W Kg/sec =   81.78387

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    137.348    3944.147       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 138412.766  141180.734       1.476     590.487     400.006     474.134       1.185

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   506.91    -0.17   506.91     0.44   707.29
 MEAN    18.08     0.00    -0.02   506.91    -0.17   506.91     0.44
 HUB     15.21     0.00    -0.02   506.91    -0.17   506.91     0.44

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.77    46.36     9.41   744.95   901.20    17.76   553.91     0.78
 MEAN    52.29    42.30     9.99   655.35   828.65    17.76   553.91     0.72
 HUB     47.41    37.84     9.57   551.37   749.10    17.76   553.91     0.65

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   626.36   394.66   486.38  1191.03     0.53
 MEAN    18.01   635.73   394.20   498.76  1184.38     0.54
 HUB     15.22   687.27   457.92   512.49  1177.85     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   596.64   345.57     0.50  8062.58
 MEAN   652.87   561.84   258.67     0.47  7102.66     1.61
 HUB    551.84   521.02    93.92     0.44  6973.63

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.02     1.28    21.54   622.28     1.08   589.53     0.92     0.91
 MEAN    25.28     1.25    20.77   616.69     1.07   582.95     0.92     0.91
 HUB     25.18     1.24    19.99   615.94     1.07   576.51     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.06    35.39    31.50     3.89     0.93     0.41     2.90
 MEAN    38.32    27.41    23.50     3.91     0.94     0.39     3.30     0.91
 HUB     41.78    10.38     6.50     3.88     0.94     0.38     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     642.899     395.305     507.004    1185.184       0.542       0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.445      20.825     583.797      46.000      37.943      30.600      -7.343

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     498.851     395.305     636.489    1199.041       0.416       0.365

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.343      22.494     597.528     511.151       0.032       0.439

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     493.194       0.000     493.194    1199.511       0.411       0.346

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.459     597.997       0.000       0.060       0.054       0.358

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      25.235       1.244     618.305      42.940     217.486       1.686

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 267549.281       0.488    2720.360 1592447.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.965   EfDer =  0.987

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    179.925    4154.000      25.235     618.305       1.000       1.000       0.980
W Kg/sec =   81.78387

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    114.433    3804.726       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 138412.766  141180.734       1.637     545.479     333.296     429.765       1.289

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   464.03    -0.16   464.03     0.39   666.35
 MEAN    17.74      0.00    -0.02   464.03    -0.16   464.03     0.39
 HUB     15.05      0.00    -0.02   464.03    -0.16   464.03     0.39

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     57.48     46.36    11.12   727.55   863.07     22.77   600.34      0.72
 MEAN    54.19     43.40    10.79   643.03   793.11     22.77   600.34      0.66
 HUB     49.63     38.84    10.79   545.57   716.34     22.77   600.34      0.60

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   601.14    396.68    451.68   1234.82       0.49
 MEAN    17.51   607.21    394.59    461.53   1228.83       0.49
 HUB     14.85   653.15    450.92    472.52   1222.89       0.53

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12    554.38    321.44     0.45   7861.51
 MEAN   634.62    520.22    240.03     0.42   6910.73      1.66
 HUB    538.32    480.54     87.40     0.39   6698.50

         Pt2       PR       Ps2      Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     31.62      1.25     26.89    664.01      1.07    633.86      0.92      0.90
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 MEAN    30.80     1.22    26.06   658.48     1.06   627.72     0.92     0.90
 HUB     30.61     1.21    25.21   657.25     1.06   621.65     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.29    35.44    31.50     3.94     0.93     0.44     2.90
 MEAN    40.53    27.48    23.50     3.98     0.94     0.42     3.28     0.90
 HUB     43.66    10.48     6.50     3.98     0.94     0.41     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     612.790     397.178     466.649    1229.653       0.498       0.014

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.962      26.126     628.579      46.000      40.402      31.500      -8.902

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     466.376     397.178     612.583    1242.481       0.375       0.390

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.846      27.985     641.763     471.992       0.033       0.477

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     453.662       0.000     453.662    1243.426       0.365       0.378

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.002     642.739       0.000       0.060       0.062       0.393

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      30.702       1.217     659.911      41.607     204.647       1.586

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 259474.828       0.503    2638.262 1504036.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.965   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.925    4154.000      30.702     659.911       1.000       1.000       0.980
W Kg/sec =   81.78387

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.167    3682.832       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 138412.766  141180.734       1.814     513.330     283.041     401.059       1.417

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   425.83    -0.15   425.83     0.34   618.97
 MEAN    16.97     0.00    -0.02   425.83    -0.15   425.83     0.34
 HUB     14.32     0.00    -0.02   425.83    -0.15   425.83     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.63    46.36    12.27   698.18   817.92    28.31   644.79     0.66
 MEAN    55.32    43.80    11.52   615.20   748.32    28.31   644.79     0.60
 HUB     50.65    37.84    12.81   519.11   671.53    28.31   644.79     0.54

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   569.67   386.67   418.34  1274.30     0.45
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 MEAN    16.57   570.68   379.10   426.56  1268.62     0.45
 HUB     13.89   607.49   423.34   435.68  1262.97     0.48
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   513.48   297.74     0.40  7303.08
 MEAN   600.81   480.74   221.71     0.38  6285.71     1.71
 HUB    503.52   443.00    80.17     0.35  5882.36

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     37.37     1.22    32.57   702.32     1.06   675.27     0.92     0.90
 MEAN    36.38     1.18    31.66   696.41     1.06   669.26     0.92     0.90
 HUB     36.00     1.17    30.72   694.07     1.05   663.30     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.75    35.44    31.50     3.94     0.93     0.45     2.90
 MEAN    41.63    27.46    23.50     3.96     0.94     0.43     3.29     0.90
 HUB     44.18    10.43     6.50     3.93     0.94     0.42     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.983

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     565.519     381.236     417.697    1270.199       0.445       0.045

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.531      31.881     670.938      46.000      42.387      32.400      -9.987

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     425.250     381.236     571.120    1281.120       0.332       0.424

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      36.420      33.743     682.524     456.573       0.033       0.510

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     405.466       0.000     405.466    1282.405       0.316       0.393

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      33.816     683.894       0.000       0.060       0.068       0.439

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.852      36.244       1.180     697.601      37.690     204.645       1.586

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 235310.047       0.502    2392.562 1474638.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.965   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.925    4154.000      36.244     697.601       1.000       1.000       0.980
W Kg/sec =   81.78387

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     84.629    3581.964       1.400       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 138412.766  141180.734       2.067     509.668     246.553     390.276       1.583

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   378.46    -0.13   378.46     0.29   572.64
 MEAN    15.91     0.00    -0.02   378.46    -0.13   378.46     0.29
 HUB     13.07     0.00    -0.02   378.46    -0.13   378.46     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.33    47.36    12.97   664.11   764.49    34.12   685.67     0.60
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MEAN    56.74    44.80    11.94   576.85   690.03    34.12   685.67     0.54
HUB     51.39    38.84    12.55   473.79   606.49    34.12   685.67     0.47
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   535.45   381.22   376.00  1309.53     0.41
MEAN    15.50   527.07   361.79   383.29  1303.63     0.40
HUB     12.59   548.58   384.57   391.22  1297.75     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    650.33   462.39   269.12     0.35  6841.44
MEAN   561.80   432.33   200.00     0.33  5608.99     1.77
HUB    456.39   397.76    71.83     0.31  4843.38

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     43.14     1.19    38.44   737.28     1.06   713.40     0.92     0.90
MEAN    41.83     1.15    37.38   730.13     1.05   706.99     0.92     0.90
HUB     41.03     1.13    36.29   725.69     1.04   700.63     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     45.39    35.59    31.50     4.09     0.93     0.48     2.90
MEAN    43.35    27.56    23.50     4.06     0.94     0.45     3.34     0.90
HUB     44.51    10.40     6.50     3.90     0.94     0.42     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.981

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     534.091     368.427     386.672    1303.890       0.410       -0.009

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    41.908      37.335     707.276      46.000      43.616      33.000     -10.616

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     399.563     368.427     543.497    1313.497       0.304       0.377

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      41.708      39.114     717.737     440.827       0.063       0.532

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     374.352       0.000     374.352    1314.983       0.285       0.443

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      39.386     719.362       0.000       0.060       0.072       0.435

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.849      41.667       1.150     731.034      33.434     210.117       1.629

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 208996.547       0.494    2125.014 1497897.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1298528.25  13203.0439    175.7682      2.7581      0.8477      7.9649      1.3983
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 110% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     177.155    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   80.52497

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     173.063    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  136282.172  139007.531       1.650     831.557     503.996     619.754       1.230

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   422.71    -0.15   422.71     0.38   744.88
  MEAN    17.06     0.00    -0.02   422.71    -0.15   422.71     0.38
  HUB     12.51     0.00    -0.02   422.71    -0.15   422.71     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.53    50.47    10.06   747.85   859.17    13.66   507.89     0.78
  MEAN    55.65    47.20     8.45   618.44   749.22    13.66   507.89     0.68
  HUB     47.02    38.62     8.40   453.49   620.06    13.66   507.89     0.56

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   701.25   458.25   530.81  1136.72     0.62
  MEAN    18.04   733.22   485.46   549.50  1128.40     0.65
  HUB     15.00   836.88   601.68   581.68  1115.73     0.75

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   604.67   289.60     0.53  9456.70
  MEAN   653.81   574.71   168.36     0.51  8758.19     1.46
  HUB    543.76   584.55    57.92     0.52  9026.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.81     1.38    16.09   577.88     1.11   536.82     0.92     0.91
  MEAN    20.34     1.35    15.31   573.81     1.10   528.92     0.92     0.91
  HUB     20.52     1.36    14.12   575.38     1.10   516.92     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     40.80    28.62    24.20     4.42     0.93     0.39     2.90
  MEAN    41.46    17.03    12.70     4.33     0.93     0.33     3.51     0.91
  HUB     45.97    -5.69    -9.30     3.61     0.93     0.17     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     742.938     484.513     563.208    1128.911       0.658       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.501      15.323     529.588      24.000      40.705      35.400      -5.305

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     569.097     484.513     747.412    1149.036       0.495       0.382
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.379      17.230     548.638     528.796       0.033       0.514

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     522.778       0.000     522.778    1153.451       0.453       0.429

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.634     552.863       0.000       0.060       0.046       0.457

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.875      20.306       1.344     575.689      52.879     201.730       1.564

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 329219.156       0.589    3295.874 1777481.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.155    4154.000      20.306     575.689       1.000       1.000       0.980
W Kg/sec =   80.52497

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    135.106    3943.034       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 136282.172  139007.531       1.501     590.487     393.478     474.134       1.205

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   496.87    -0.17   496.87     0.43   707.09
 MEAN    18.08     0.00    -0.02   496.87    -0.17   496.87     0.43
 HUB     15.21     0.00    -0.02   496.87    -0.17   496.87     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.30    46.36     9.94   744.95   895.59    17.88   555.08     0.77
 MEAN    52.84    42.30    10.54   655.35   822.55    17.88   555.08     0.71
 HUB     47.99    37.84    10.15   551.37   742.35    17.88   555.08     0.64

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   623.38   401.54   476.83  1192.49     0.52
 MEAN    18.01   631.40   399.29   489.12  1185.71     0.53
 HUB     15.22   681.33   459.80   502.78  1179.03     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   584.88   338.70     0.49  8202.94
 MEAN   652.87   550.95   253.58     0.46  7194.27     1.63
 HUB    551.84   511.14    92.04     0.43  7002.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.14     1.29    21.69   623.42     1.08   590.98     0.92     0.90
 MEAN    25.36     1.25    20.90   617.55     1.07   584.27     0.92     0.90
 HUB     25.22     1.24    20.10   616.43     1.07   577.68     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.10    35.39    31.50     3.89     0.93     0.42     2.90
 MEAN    39.23    27.40    23.50     3.90     0.94     0.40     3.30     0.90
 HUB     42.44    10.37     6.50     3.87     0.94     0.39     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     638.375     400.410     497.186    1186.516       0.538       0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.524      20.956     585.111      46.000      38.846      30.600      -8.246

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     488.717     400.410     631.801    1200.709       0.407       0.379

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.413      22.670     599.193     511.151       0.034       0.453

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     483.416       0.000     483.416    1201.141       0.402       0.357

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.622     599.624       0.000       0.060       0.059       0.369

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.861      25.296       1.246     619.134      43.445     213.441       1.655

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 270696.875       0.494    2709.997 1561289.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.984

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    177.155    4154.000      25.296     619.134       1.000       1.000       0.980
W Kg/sec =   80.52497

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    112.473    3802.176       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 136282.172  139007.531       1.665     545.479     327.590     429.765       1.312

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   455.05    -0.16   455.05     0.38   665.91
 MEAN    17.74     0.00    -0.02   455.05    -0.16   455.05     0.38
 HUB     15.05     0.00    -0.02   455.05    -0.16   455.05     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.98    46.36    11.62   727.55   858.27    22.92   601.86     0.71
 MEAN    54.72    43.40    11.32   643.03   787.88    22.92   601.86     0.65
 HUB     50.18    38.84    11.34   545.57   710.55    22.92   601.86     0.59

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   598.84   402.86   443.07  1236.54      0.48
 MEAN    17.51   603.64   399.16   452.83  1230.44      0.49
 HUB     14.85   647.99   452.59   463.73  1224.39      0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   543.79   315.26     0.44  7983.84
 MEAN   634.62   510.39   235.46     0.41  6990.63     1.69
 HUB    538.32   471.59    85.73     0.39  6723.37

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     31.78     1.26    27.06   665.55     1.07   635.63     0.92     0.90
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 MEAN    30.91     1.22    26.22   659.77     1.07   629.37     0.92     0.90
 HUB     30.68     1.21    25.35   658.22     1.06   623.19     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.28    35.43    31.50     3.93     0.93     0.45     2.90
 MEAN    41.40    27.47    23.50     3.97     0.94     0.43     3.28     0.90
 HUB     44.30    10.47     6.50     3.97     0.94     0.42     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     609.154     401.775     457.871    1231.251       0.495       0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.076      26.285     630.219      46.000      41.267      31.500      -9.767

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     457.216     401.775     608.662    1244.387       0.367       0.403

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.951      28.193     643.738     471.992       0.036       0.491

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     445.005       0.000     445.005    1245.275       0.357       0.388

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.192     644.657       0.000       0.060       0.067       0.403

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854      30.796       1.217     661.180      42.046     201.063       1.559

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 262219.406       0.508    2625.127 1475045.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.155    4154.000      30.796     661.180       1.000       1.000       0.980
W Kg/sec =   80.52497

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.473    3679.296       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 136282.172  139007.531       1.846     513.330     278.107     401.059       1.442

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   417.86    -0.14   417.86     0.34   618.38
 MEAN    16.97     0.00    -0.02   417.86    -0.14   417.86     0.34
 HUB     14.32     0.00    -0.02   417.86    -0.14   417.86     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.11    46.36    12.75   698.18   813.80    28.49   646.62     0.65
 MEAN    55.82    43.80    12.02   615.20   743.81    28.49   646.62     0.60
 HUB     51.18    37.84    13.34   519.11   666.50    28.49   646.62     0.53

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   567.82   392.14   410.66  1276.21     0.44
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 MEAN    16.57   567.61   383.14   418.78  1270.45     0.45
 HUB     13.89   602.89   424.81   427.80  1264.71     0.48
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   504.05   292.27     0.39  7406.43
 MEAN   600.81   471.97   217.67     0.37  6352.61     1.73
 HUB    503.52   434.98    78.71     0.34  5902.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     37.54     1.22    32.77   704.19     1.07   677.31     0.92     0.90
 MEAN    36.52     1.19    31.85   698.07     1.06   671.21     0.92     0.90
 HUB     36.10     1.17    30.89   695.46     1.05   665.15     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.68    35.44    31.50     3.94     0.93     0.46     2.90
 MEAN    42.46    27.46    23.50     3.96     0.94     0.44     3.29     0.90
 HUB     44.80    10.43     6.50     3.93     0.94     0.43     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     562.743     385.298     410.153    1271.985       0.442       0.043

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.672      32.058     672.837      46.000      43.210      32.400     -10.810

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     417.265     385.298     567.948    1283.171       0.325       0.436

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      36.552      33.968     684.722     456.573       0.035       0.523

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     398.080       0.000     398.080    1284.392       0.310       0.401

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      34.019     686.026       0.000       0.060       0.073       0.447

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.846      36.363       1.181     699.237      38.057     201.244       1.560

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 237612.609       0.507    2378.784 1446548.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.978

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.155    4154.000      36.363     699.237       1.000       1.000       0.980
W Kg/sec =   80.52497

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.150    3577.769       1.400       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 136282.172  139007.531       2.104     509.668     242.244     390.276       1.611

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   371.66    -0.13   371.66     0.29   571.97
 MEAN    15.91     0.00    -0.02   371.66    -0.13   371.66     0.29
 HUB     13.07     0.00    -0.02   371.66    -0.13   371.66     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.77    47.36    13.41   664.11   761.15    34.31   687.73     0.59
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MEAN    57.21    44.80    12.41   576.85   686.33    34.31   687.73     0.53
HUB     51.90    38.84    13.06   473.79   602.28    34.31   687.73     0.47
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   534.23   385.93   369.40  1311.56     0.41
MEAN    15.50   524.63   365.28   376.56  1305.61     0.40
HUB     12.59   544.62   385.83   384.37  1299.67     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    650.33   454.28   264.40     0.35  6925.91
MEAN   561.80   424.76   196.51     0.33  5663.05     1.80
HUB    456.39   390.79    70.56     0.30  4859.30

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     43.33     1.19    38.65   739.40     1.06   715.64     0.92     0.89
MEAN    41.99     1.15    37.57   732.08     1.05   709.16     0.92     0.89
HUB     41.16     1.13    36.47   727.42     1.04   702.72     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.25    35.59    31.50     4.09     0.93     0.49     2.90
MEAN    44.13    27.56    23.50     4.06     0.94     0.46     3.34     0.89
HUB     45.11    10.40     6.50     3.90     0.94     0.43     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.978

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      531.689     371.981     379.899    1305.852       0.407      -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     42.069      37.529      709.424      46.000      44.397      33.000     -11.397

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      392.397     371.981     540.690    1315.681       0.298       0.388

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      41.852      39.347     720.144     440.827       0.067       0.545

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     367.764       0.000     367.764    1317.105       0.279       0.451

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      39.603     721.704       0.000       0.060       0.077       0.443

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4        Pt4          PR4        Texit         Del T       Ns        Ns nondim
     0.844       41.807       1.150      732.968      33.731     206.839       1.603

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 210863.031       0.499    2110.989 1469986.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1310611.00  13120.7715    173.0626      2.7674      0.8431      8.4529      1.4020
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 110% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     174.323    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   79.23788

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     170.296    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  134103.875  136785.688       1.677     831.557     495.940     619.754       1.250

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   414.84    -0.14   414.84     0.38   744.88
  MEAN    17.06     0.00    -0.02   414.84    -0.14   414.84     0.38
  HUB     12.51     0.00    -0.02   414.84    -0.14   414.84     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.99    50.47    10.52   747.85   855.32    13.71   508.44     0.77
  MEAN    56.15    47.20     8.95   618.44   744.80    13.71   508.44     0.67
  HUB     47.56    38.62     8.94   453.49   614.72    13.71   508.44     0.56

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   696.96   464.22   519.86  1137.99     0.61
  MEAN    18.04   727.20   488.88   538.35  1129.54     0.64
  HUB     15.00   827.58   600.45   569.51  1116.95     0.74

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   592.20   283.63     0.52  9579.73
  MEAN   653.81   563.04   164.93     0.50  8819.95     1.49
  HUB    543.76   572.33    56.70     0.51  9008.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.88     1.38    16.20   578.60     1.11   538.03     0.92     0.91
  MEAN    20.37     1.35    15.41   574.17     1.10   530.02     0.92     0.91
  HUB     20.50     1.36    14.23   575.27     1.10   518.10     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     41.76    28.62    24.20     4.42     0.93     0.40     2.90
  MEAN    42.24    17.03    12.70     4.33     0.93     0.34     3.51     0.91
  HUB     46.52    -5.69    -9.30     3.61     0.93     0.18     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.996

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     736.438     487.934     551.600    1130.110       0.652       0.003

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      20.529      15.428     530.714      24.000      41.495      35.400      -6.095

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     556.772     487.934     740.320    1150.587       0.484       0.395
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.400      17.377     550.120     528.796       0.034       0.526

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     512.171       0.000     512.171    1154.744       0.444       0.438

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.751     554.102       0.000       0.060       0.049       0.466

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.872      20.322       1.345     576.012      53.202     198.931       1.542

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 331230.094       0.592    3263.004 1744358.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.323    4154.000      20.322     576.012       1.000       1.000       0.980
W Kg/sec =   79.23788

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    132.882    3941.928       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134103.875  136785.688       1.526     590.487     387.000     474.134       1.225

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   487.04    -0.17   487.04     0.42   706.90
 MEAN    18.08     0.00    -0.02   487.04    -0.17   487.04     0.42
 HUB     15.21     0.00    -0.02   487.04    -0.17   487.04     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.83    46.36    10.47   744.95   890.17    17.99   556.21     0.77
 MEAN    53.39    42.30    11.09   655.35   816.64    17.99   556.21     0.71
 HUB     48.55    37.84    10.71   551.37   735.80    17.99   556.21     0.64

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   620.68   408.21   467.55  1193.89     0.52
 MEAN    18.01   627.34   404.24   479.73  1186.99     0.53
 HUB     15.22   675.59   461.61   493.29  1180.17     0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   573.45   332.03     0.48  8339.02
 MEAN   652.87   540.33   248.63     0.46  7283.44     1.65
 HUB    551.84   501.48    90.23     0.42  7029.63

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.24     1.29    21.82   624.53     1.08   592.37     0.92     0.90
 MEAN    25.43     1.25    21.02   618.39     1.07   585.54     0.92     0.90
 HUB     25.24     1.24    20.20   616.92     1.07   578.81     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.12    35.38    31.50     3.88     0.93     0.43     2.90
 MEAN    40.12    27.40    23.50     3.90     0.94     0.41     3.30     0.90
 HUB     43.10    10.37     6.50     3.87     0.94     0.40     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     634.117     405.378     487.620    1187.796       0.534       0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.589      21.071     586.376      46.000      39.738      30.600      -9.138

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     478.877     405.378     627.419    1202.318       0.398       0.392

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.467      22.827     600.802     511.151       0.036       0.467

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     473.926       0.000     473.926    1202.712       0.394       0.367

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.766     601.195       0.000       0.060       0.064       0.379

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.856      25.341       1.247     619.947      43.935     209.548       1.624

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 273751.406       0.500    2696.772 1530070.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.981

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    174.323    4154.000      25.341     619.947       1.000       1.000       0.980
W Kg/sec =   79.23788

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    110.551    3799.682       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 134103.875  136785.688       1.694     545.479     321.993     429.765       1.335

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   446.31    -0.15   446.31     0.37   665.47
 MEAN    17.74     0.00    -0.02   446.31    -0.15   446.31     0.37
 HUB     15.05     0.00    -0.02   446.31    -0.15   446.31     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.48    46.36    12.12   727.55   853.66    23.05   603.33     0.71
 MEAN    55.24    43.40    11.84   643.03   782.86    23.05   603.33     0.65
 HUB     50.72    38.84    11.88   545.57   704.99    23.05   603.33     0.59

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   596.77   408.81   434.76  1238.19     0.48
 MEAN    17.51   600.30   403.56   444.41  1231.99     0.49
 HUB     14.85   643.05   454.21   455.20  1225.84     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   533.56   309.32     0.43  8101.55
 MEAN   634.62   500.88   231.06     0.41  7067.72     1.71
 HUB    538.32   462.91    84.11     0.38  6747.26

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     31.91     1.26    27.21   667.04     1.08   637.33     0.92     0.90
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 MEAN    31.01     1.22    26.36   661.03     1.07   630.97     0.92     0.90
 HUB     30.73     1.21    25.47   659.17     1.06   624.67     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.24    35.43    31.50     3.93     0.93     0.46     2.90
 MEAN    42.24    27.47    23.50     3.97     0.94     0.44     3.28     0.90
 HUB     44.94    10.47     6.50     3.97     0.94     0.43     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     605.752     406.211     449.364    1232.790       0.491       0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.167      26.421     631.801      46.000      42.113      31.500     -10.613

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     448.365     406.211     605.011    1246.221       0.360       0.416

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.031      28.373     645.643     471.992       0.038       0.504

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     436.637       0.000     436.637    1247.057       0.350       0.397

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.354     646.509       0.000       0.060       0.072       0.412

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.848      30.865       1.218     662.416      42.469     197.631       1.532

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 264862.562       0.514    2609.206 1445987.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.977

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.323    4154.000      30.865     662.417       1.000       1.000       0.980
W Kg/sec =   79.23788

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.824    3675.861       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134103.875  136785.688       1.878     513.330     273.305     401.059       1.467

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   410.14    -0.14   410.14     0.33   617.80
 MEAN    16.97     0.00    -0.02   410.14    -0.14   410.14     0.33
 HUB     14.32     0.00    -0.02   410.14    -0.14   410.14     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.57    46.36    13.21   698.18   809.86    28.64   648.39     0.65
 MEAN    56.32    43.80    12.52   615.20   739.50    28.64   648.39     0.59
 HUB     51.70    37.84    13.86   519.11   661.69    28.64   648.39     0.53

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   566.17   397.40   403.26  1278.05     0.44
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 MEAN    16.57   564.76   387.06   411.27  1272.22     0.44
 HUB     13.89   598.50   426.21   420.17  1266.40     0.47
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   494.97   287.01     0.39  7505.65
 MEAN   600.81   463.50   213.75     0.36  6417.51     1.75
 HUB    503.52   427.22    77.31     0.34  5922.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     37.69     1.22    32.93   706.00     1.07   679.28     0.92     0.89
 MEAN    36.64     1.19    32.00   699.68     1.06   673.09     0.92     0.89
 HUB     36.17     1.17    31.03   696.80     1.05   666.94     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.58    35.44    31.50     3.94     0.93     0.47     2.90
 MEAN    43.26    27.46    23.50     3.96     0.94     0.45     3.29     0.89
 HUB     45.41    10.43     6.50     3.93     0.94     0.44     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     560.184     389.238     402.864    1273.704       0.440       0.042

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.782      32.204     674.668      46.000      44.014      32.400     -11.614

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     409.566     389.238     565.022    1285.146       0.319       0.448

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      36.652      34.159     686.844     456.573       0.037       0.536

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     390.952       0.000     390.952    1286.308       0.304       0.410

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      34.188     688.086       0.000       0.060       0.078       0.454

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.841      36.451       1.181     700.828      38.411     197.993       1.535

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 239830.188       0.512    2362.608 1418370.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.975

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.323    4154.000      36.451     700.828       1.000       1.000       0.980
W Kg/sec =   79.23788

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.716    3573.708       1.400       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134103.875  136785.688       2.141     509.668     238.068     390.276       1.639

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   365.10    -0.13   365.10     0.28   571.32
 MEAN    15.91     0.00    -0.02   365.10    -0.13   365.10     0.28
 HUB     13.07     0.00    -0.02   365.10    -0.13   365.10     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.20    47.36    13.84   664.11   757.96    34.47   689.73     0.59
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MEAN    57.68    44.80    12.88   576.85   682.79    34.47   689.73     0.53
HUB     52.39    38.84    13.55   473.79   598.25    34.47   689.73     0.46

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   533.15   390.45   363.04  1313.51     0.41
MEAN    15.50   522.36   368.64   370.08  1307.51     0.40
HUB     12.59   540.82   387.02   377.76  1301.52     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    650.33   446.47   259.88     0.34  7007.00
MEAN   561.80   417.45   193.15     0.32  5715.11     1.82
HUB    456.39   384.07    69.37     0.30  4874.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     43.48     1.19    38.82   741.46     1.06   717.79     0.92     0.89
MEAN    42.12     1.16    37.73   733.97     1.05   711.25     0.92     0.89
HUB     41.25     1.13    36.62   729.09     1.04   704.74     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     47.08    35.60    31.50     4.10     0.93     0.50     2.90
MEAN    44.89    27.56    23.50     4.06     0.94     0.47     3.34     0.89
HUB     45.69    10.41     6.50     3.91     0.94     0.44     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.975

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     529.464     375.404     373.368    1307.741       0.405      -0.010

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    42.190      37.685     711.497      46.000      45.156      33.000     -12.156

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     385.496     375.404     538.085    1317.784       0.293       0.398

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      41.958      39.538     722.467     440.827       0.071       0.557

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     361.416       0.000     361.416    1319.149       0.274       0.459

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      39.779     723.965       0.000       0.060       0.082       0.451

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.838      41.909       1.150     734.843      34.015     203.710       1.579

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 212652.469       0.503    2094.876 1441935.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1322326.75  13026.4658    170.2964      2.7741      0.8380      8.9531      1.4056
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 110% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.519   EfDer =  0.994

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     171.128    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   77.78547

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     167.175    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  131645.797  134278.422       1.708     831.557     486.850     619.754       1.273

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   406.03    -0.14   406.03     0.37   744.88
  MEAN    17.06     0.00    -0.02   406.03    -0.14   406.03     0.37
  HUB     12.51     0.00    -0.02   406.03    -0.14   406.03     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.51    50.47    11.04   747.85   851.09    13.76   509.04     0.77
  MEAN    56.72    47.20     9.52   618.44   739.93    13.76   509.04     0.67
  HUB     48.17    38.62     9.55   453.49   608.81    13.76   509.04     0.55

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   692.48   470.77   507.84  1139.36     0.61
  MEAN    18.04   720.73   492.66   526.06  1130.77     0.64
  HUB     15.00   817.44   599.11   556.12  1118.27     0.73

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   578.51   277.08     0.51  9714.89
  MEAN   653.81   550.19   161.15     0.49  8888.04     1.51
  HUB    543.76   558.87    55.35     0.50  8988.38

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.96     1.39    16.32   579.38     1.11   539.34     0.92     0.91
  MEAN    20.40     1.35    15.52   574.57     1.10   531.19     0.92     0.91
  HUB     20.47     1.36    14.34   575.15     1.10   519.37     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     42.83    28.62    24.20     4.42     0.93     0.42     2.90
  MEAN    43.12    17.03    12.70     4.33     0.94     0.35     3.51     0.91
  HUB     47.13    -5.68    -9.30     3.62     0.94     0.19     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     729.470     491.704     538.844    1131.396       0.645       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.558      15.539     531.923      24.000      42.381      35.400      -6.981

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     543.311     491.704     732.776    1152.251       0.472       0.410
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.420      17.532     551.713     528.796       0.036       0.539

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     500.543       0.000     500.543    1156.138       0.433       0.448

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.874     555.441       0.000       0.060       0.053       0.475

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.868      20.334       1.346     576.368      53.558     195.828       1.518

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 333442.438       0.596    3224.588 1707338.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.519   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    4154.000      20.334     576.368       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    130.407    3940.713       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.555     590.487     379.791     474.134       1.248

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   476.23    -0.16   476.23     0.41   706.68
 MEAN    18.08     0.00    -0.02   476.23    -0.16   476.23     0.41
 HUB     15.21     0.00    -0.02   476.23    -0.16   476.23     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.42    46.36    11.06   744.95   884.30    18.10   557.43     0.76
 MEAN    54.00    42.30    11.70   655.35   810.24    18.10   557.43     0.70
 HUB     49.19    37.84    11.35   551.37   728.69    18.10   557.43     0.63

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   617.94   415.46   457.43  1195.39     0.52
 MEAN    18.01   623.03   409.62   469.45  1188.36     0.52
 HUB     15.22   669.39   463.58   482.88  1181.41     0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   561.00   324.78     0.47  8487.03
 MEAN   652.87   528.73   243.25     0.44  7380.21     1.68
 HUB    551.84   490.88    88.26     0.42  7059.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.34     1.30    21.95   625.75     1.09   593.87     0.92     0.90
 MEAN    25.49     1.25    21.14   619.31     1.07   586.91     0.92     0.90
 HUB     25.25     1.24    20.31   617.44     1.07   580.04     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.25    35.37    31.50     3.87     0.93     0.45     2.90
 MEAN    41.11    27.39    23.50     3.89     0.94     0.42     3.30     0.90
 HUB     43.83    10.36     6.50     3.86     0.94     0.41     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     629.613     410.770     477.158    1189.175       0.529       0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.650      21.188     587.740      46.000      40.724      30.600     -10.124

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     468.156     410.770     622.818    1204.051       0.389       0.407

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.517      22.988     602.537     511.151       0.039       0.482

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     463.587       0.000     463.587    1204.406       0.385       0.378

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.912     602.893       0.000       0.060       0.069       0.390

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.850      25.380       1.248     620.835      44.468     205.345       1.592

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 277071.781       0.506    2679.450 1495439.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 9.519   EfDer =  0.978

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    171.128    4154.000      25.380     620.835       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    108.436    3796.963       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 131645.797  134278.422       1.727     545.479     315.834     429.765       1.361

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   436.77    -0.15   436.77     0.36   664.99
 MEAN    17.74     0.00    -0.02   436.77    -0.15   436.77     0.36
 HUB     15.05     0.00    -0.02   436.77    -0.15   436.77     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.03    46.36    12.67   727.55   848.71    23.18   604.92     0.70
 MEAN    55.82    43.40    12.42   643.03   777.46    23.18   604.92     0.64
 HUB     51.33    38.84    12.49   545.57   698.99    23.18   604.92     0.58

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   594.69   415.23   425.72  1239.96      0.48
 MEAN    17.51   596.81   408.35   435.23  1233.67      0.48
 HUB     14.85   637.73   455.94   445.89  1227.40      0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   522.48   302.89     0.42  8228.68
 MEAN   634.62   490.53   226.27     0.40  7151.51     1.74
 HUB    538.32   453.44    82.38     0.37  6773.01

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     32.03     1.26    27.36   668.67     1.08   639.16     0.92     0.89
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 MEAN    31.10     1.23    26.49   662.41     1.07   632.69     0.92     0.89
 HUB     30.77     1.21    25.60   660.21     1.06   626.28     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.29    35.43    31.50     3.93     0.93     0.47     2.90
 MEAN    43.18    27.47    23.50     3.97     0.94     0.45     3.28     0.89
 HUB     45.64    10.47     6.50     3.97     0.94     0.44     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     602.200     411.032     440.110    1234.445       0.488       0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.251      26.554     633.506      46.000      43.043      31.500     -11.543

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     438.758     411.032     601.212    1248.199       0.352       0.430

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.103      28.554     647.701     471.992       0.041       0.519

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     427.549       0.000     427.549    1248.979       0.342       0.407

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.514     648.511       0.000       0.060       0.078       0.422

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.842      30.924       1.218     663.762      42.927     193.940       1.503

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 267722.562       0.519    2589.038 1413734.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 9.519   EfDer =  0.973

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    4154.000      30.924     663.762       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.020    3672.132       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.915     513.330     268.054     401.059       1.496

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   401.74    -0.14   401.74     0.32   617.18
 MEAN    16.97     0.00    -0.02   401.74    -0.14   401.74     0.32
 HUB     14.32     0.00    -0.02   401.74    -0.14   401.74     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.09    46.36    13.73   698.18   805.64    28.79   650.31     0.64
 MEAN    56.86    43.80    13.06   615.20   734.87    28.79   650.31     0.59
 HUB     52.27    37.84    14.43   519.11   656.52    28.79   650.31     0.53

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   564.51   403.06   395.24  1280.04     0.44
 MEAN    16.57   561.77   391.26   403.11  1274.13     0.44
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 HUB     13.89   593.79   427.72   411.88  1268.22     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   485.15   281.35     0.38  7612.50
 MEAN   600.81   454.32   209.55     0.36  6487.03     1.78
 HUB    503.52   418.80    75.80     0.33  5943.03

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     37.82     1.22    33.09   707.96     1.07   681.40     0.92     0.89
 MEAN    36.74     1.19    32.14   701.43     1.06   675.12     0.92     0.89
 HUB     36.22     1.17    31.17   698.27     1.05   668.88     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.56    35.44    31.50     3.94     0.93     0.48     2.90
 MEAN    44.15    27.47    23.50     3.97     0.94     0.46     3.29     0.89
 HUB     46.08    10.43     6.50     3.93     0.94     0.44     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     557.490     393.460     394.948    1275.558       0.437       0.041

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.879      32.342     676.647      46.000      44.892      32.400     -12.492

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     401.223     393.460     561.952    1287.275       0.312       0.461

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      36.739      34.345     689.135     456.573       0.039       0.550

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     383.220       0.000     383.220    1288.374       0.297       0.419

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      34.349     690.312       0.000       0.060       0.084       0.462

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.835      36.525       1.181     702.554      38.792     194.507       1.508

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 242215.344       0.517    2342.368 1387070.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 9.519   EfDer =  0.971

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    4154.000      36.525     702.554       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.155    3569.314       1.400       0.250      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       2.183     509.668     233.522     390.276       1.671

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   357.98    -0.12   357.98     0.28   570.62
 MEAN    15.91     0.00    -0.02   357.98    -0.12   357.98     0.28
 HUB     13.07     0.00    -0.02   357.98    -0.12   357.98     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.68    47.36    14.32   664.11   754.55    34.62   691.88     0.59
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MEAN    58.18    44.80    13.38   576.85   679.01    34.62   691.88     0.53
HUB     52.93    38.84    14.09   473.79   593.92    34.62   691.88     0.46
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   532.10   395.33   356.15  1315.62     0.40
MEAN    15.50   519.98   372.26   363.05  1309.57     0.40
HUB     12.59   536.75   388.30   370.58  1303.51     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    650.33   438.03   255.00     0.33  7094.52
MEAN   561.80   409.55   189.54     0.31  5771.05     1.85
HUB    456.39   376.78    68.10     0.29  4890.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     43.62     1.19    38.97   743.70     1.06   720.12     0.92     0.89
MEAN    42.22     1.16    37.88   736.02     1.05   713.51     0.92     0.89
HUB     41.32     1.13    36.76   730.91     1.04   706.92     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     47.98    35.60    31.50     4.10     0.93     0.51     2.90
MEAN    45.72    27.57    23.50     4.07     0.94     0.48     3.34     0.89
HUB     46.34    10.41     6.50     3.91     0.94     0.44     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.971

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     527.132     379.083     366.285    1309.779       0.402      -0.011

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    42.295      37.828     713.737      46.000      45.984      33.000     -12.984

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
    15.219     378.024     379.083     535.356    1320.051       0.286       0.409

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      42.046      39.718     724.976     440.827       0.075       0.570

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     354.535       0.000     354.535    1321.355       0.268       0.468

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      39.942     726.409       0.000       0.060       0.087       0.459

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.833      41.992       1.150     736.876      34.322     200.352       1.553

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 214580.609       0.507    2075.124 1410727.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1335032.75  12910.5684    167.1750      2.7796      0.8319      9.5192      1.4095
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 110% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.973   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     168.574    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   76.62451

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     164.680    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  129680.953  132274.297       1.734     831.557     479.584     619.754       1.292

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   399.06    -0.14   399.06     0.36   744.88
  MEAN    17.06     0.00    -0.02   399.06    -0.14   399.06     0.36
  HUB     12.51     0.00    -0.02   399.06    -0.14   399.06     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.92    50.47    11.45   747.85   847.78    13.81   509.51     0.77
  MEAN    57.17    47.20     9.97   618.44   736.13    13.81   509.51     0.66
  HUB     48.66    38.62    10.04   453.49   604.18    13.81   509.51     0.55

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   689.14   475.87   498.46  1140.40     0.60
  MEAN    18.04   715.77   495.60   516.44  1131.71     0.63
  HUB     15.00   809.56   598.04   545.66  1119.28     0.72

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   567.83   271.98     0.50  9819.99
  MEAN   653.81   540.13   158.22     0.48  8940.92     1.54
  HUB    543.76   548.35    54.28     0.49  8972.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     21.01     1.39    16.41   579.99     1.11   540.34     0.92     0.91
  MEAN    20.43     1.35    15.60   574.88     1.10   532.09     0.92     0.91
  HUB     20.45     1.35    14.43   575.06     1.10   520.34     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     43.67    28.62    24.20     4.42     0.93     0.43     2.90
  MEAN    43.82    17.03    12.70     4.33     0.94     0.36     3.51     0.91
  HUB     47.62    -5.68    -9.30     3.62     0.94     0.21     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.992

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     724.141     494.633     528.883    1132.377       0.639       0.005

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      20.578      15.622     532.845      24.000      43.083      35.400      -7.683

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	532.860	494.633	727.050	1153.519	0.462	0.421

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.431	17.648	552.927	528.796	0.038	0.549

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	491.484	0.000	491.484	1157.205	0.425	0.455

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.965	556.467	0.000	0.060	0.056	0.483

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.865	20.340	1.346	576.643	53.833	193.393	1.499

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
335157.344	0.599	3192.798	1678007.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 9.973 EfDer = 0.979

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
168.574	4154.000	20.340	576.643	1.000	1.000	0.980

W Kg/sec = 76.62451

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
128.452	3939.772	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
129680.953	132274.297	1.578	590.487	374.100	474.134	1.267

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	467.80	-0.16	467.80	0.40	706.51
MEAN	18.08	0.00	-0.02	467.80	-0.16	467.80	0.40	
HUB	15.21	0.00	-0.02	467.80	-0.16	467.80	0.40	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.88	46.36	11.52	744.95	879.79	18.18	558.37	0.76
MEAN	54.49	42.30	12.19	655.35	805.31	18.18	558.37	0.69
HUB	49.70	37.84	11.86	551.37	723.20	18.18	558.37	0.62

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	615.96	421.07	449.57	1196.54	0.51
MEAN	18.01	619.81	413.80	461.45	1189.42	0.52
HUB	15.22	664.61	465.09	474.76	1182.36	0.56

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	740.23	551.35	319.17	0.46	8601.48	
MEAN	652.87	519.70	239.07	0.44	7455.42	1.70
HUB	551.84	482.62	86.75	0.41	7082.57	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.41	1.30	22.04	626.69	1.09	595.02	0.92	0.90
MEAN	25.54	1.26	21.22	620.02	1.08	587.95	0.92	0.90
HUB	25.26	1.24	20.38	617.85	1.07	580.98	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.12	35.37	31.50	3.87	0.93	0.46	2.90	
MEAN	41.88	27.39	23.50	3.89	0.94	0.43	3.30	0.90
HUB	44.41	10.35	6.50	3.85	0.94	0.41	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.979
    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     626.240     414.961     469.025    1190.226       0.526       0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.692      21.271     588.782      46.000      41.500      30.600     -10.900

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     459.843     414.961     619.393    1205.380       0.381       0.418

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.549      23.105     603.869     511.151       0.042       0.494

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     455.569       0.000     455.569    1205.706       0.378       0.386

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.017     604.196       0.000       0.060       0.074       0.399

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.845      25.403       1.249     621.523      44.880     202.115       1.567

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 279641.562       0.510    2663.940 1468180.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 9.973   EfDer =  0.975

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    168.574    4154.000      25.403     621.523       1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
    106.781    3794.862       1.401       0.249      53.349      56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       1.754     545.479     311.014     429.765       1.382

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   429.37    -0.15   429.37     0.36   664.63
 MEAN    17.74      0.00    -0.02   429.37    -0.15   429.37     0.36
 HUB     15.05      0.00    -0.02   429.37    -0.15   429.37     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.46     46.36    13.10   727.55   844.92    23.27   606.14     0.70
 MEAN    56.27     43.40    12.87   643.03   773.33    23.27   606.14     0.64
 HUB     51.80     38.84    12.96   545.57   694.38    23.27   606.14     0.58

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   593.21   420.19   418.73  1241.31     0.48
 MEAN    17.51   594.19   412.03   428.12  1234.95     0.48
 HUB     14.85   633.65   457.26   438.67  1228.61     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   513.91   297.93     0.41  8326.90
 MEAN   634.62   482.53   222.59     0.39  7215.88     1.76
 HUB    538.32   446.09    81.06     0.36  6792.56

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     32.11     1.26    27.46   669.93     1.08   640.57     0.92     0.89
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 MEAN    31.15     1.23    26.59   663.47     1.07   634.01     0.92     0.89
 HUB     30.79     1.21    25.68   661.01     1.06   627.51     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.10    35.43    31.50     3.93     0.93     0.48     2.90
 MEAN    43.90    27.47    23.50     3.97     0.94     0.46     3.28     0.89
 HUB     46.19    10.47     6.50     3.97     0.94     0.44     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.975

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     599.534     414.735     432.938    1235.714       0.485       0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.305      26.646     634.814      46.000      43.770      31.500     -12.270

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     431.331     414.735     598.374    1249.715       0.345       0.441

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.148      28.682     649.280     471.992       0.043       0.531

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     420.517       0.000     420.517    1250.454       0.336       0.414

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.626     650.049       0.000       0.060       0.082       0.429

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.837      30.959       1.219     664.803      43.279     191.112       1.481

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 269923.688       0.523    2571.365 1388329.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 9.973   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    4154.000      30.959     664.803       1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     90.617    3669.258       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       1.945     513.330     263.967     401.059       1.519

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   395.24    -0.14   395.24     0.32   616.69
 MEAN    16.97     0.00    -0.02   395.24    -0.14   395.24     0.32
 HUB     14.32     0.00    -0.02   395.24    -0.14   395.24     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.49    46.36    14.13   698.18   802.41    28.89   651.78     0.64
 MEAN    57.29    43.80    13.49   615.20   731.33    28.89   651.78     0.58
 HUB     52.72    37.84    14.88   519.11   652.56    28.89   651.78     0.52

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   563.35   407.44   389.04  1281.55     0.44
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 MEAN    16.57   559.54   394.51   396.80  1275.59     0.44
 HUB     13.89   590.18   428.86   405.46  1269.62     0.46
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   477.56   276.97     0.37  7695.06
 MEAN   600.81   447.23   206.31     0.35  6540.79     1.80
 HUB    503.52   412.27    74.66     0.32  5958.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     37.91     1.22    33.19   709.48     1.07   683.03     0.92     0.89
 MEAN    36.80     1.19    32.24   702.78     1.06   676.68     0.92     0.89
 HUB     36.25     1.17    31.26   699.40     1.05   670.37     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.32    35.45    31.50     3.95     0.93     0.49     2.90
 MEAN    44.83    27.47    23.50     3.97     0.94     0.47     3.29     0.89
 HUB     46.61    10.43     6.50     3.93     0.94     0.45     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     555.494     396.724     388.823    1276.979       0.435       0.040

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.940      32.433     678.166      46.000      45.576      32.400     -13.176

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     394.777     396.724     559.677    1288.909       0.306       0.471

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      36.791      34.472     690.897     456.573       0.041       0.561

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     377.240       0.000     377.240    1289.962       0.292       0.426

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      34.458     692.025       0.000       0.060       0.088       0.468

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.830      36.567       1.181     703.888      39.085     191.836       1.487

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 244052.938       0.521    2324.913 1362396.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 9.973   EfDer =  0.968

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    4154.000      36.567     703.888       1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     78.943    3565.931       1.400       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       2.216     509.668     229.996     390.276       1.697

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   352.46    -0.12   352.46     0.27   570.08
 MEAN    15.91     0.00    -0.02   352.46    -0.12   352.46     0.27
 HUB     13.07     0.00    -0.02   352.46    -0.12   352.46     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.05    47.36    14.69   664.11   751.95    34.72   693.54     0.58
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 MEAN    58.58    44.80    13.78   576.85   676.11    34.72   693.54     0.52
 HUB     53.36    38.84    14.52   473.79   590.62    34.72   693.54     0.46
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   531.36   399.08   350.83  1317.24     0.40
 MEAN    15.50   518.21   375.04   357.61  1311.15     0.40
 HUB     12.59   533.64   389.26   365.02  1305.05     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   431.52   251.25     0.33  7161.75
 MEAN   561.80   403.44   186.75     0.31  5814.19     1.87
 HUB    456.39   371.15    67.13     0.28  4902.40

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     43.70     1.20    39.06   745.42     1.06   721.91     0.92     0.89
 MEAN    42.29     1.16    37.97   737.60     1.05   715.24     0.92     0.89
 HUB     41.35     1.13    36.85   732.32     1.04   708.60     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.68    35.61    31.50     4.11     0.93     0.52     2.90
 MEAN    46.36    27.57    23.50     4.07     0.94     0.49     3.34     0.89
 HUB     46.84    10.42     6.50     3.92     0.94     0.45     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.968

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      525.401     381.919     360.809    1311.343       0.401      -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     42.356      37.920      715.459       46.000      46.628      33.000     -13.628

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      372.252     381.919     533.324    1321.792       0.282       0.418

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       42.094      39.838     726.906     440.827       0.078       0.581

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      349.217       0.000     349.217    1323.049       0.264       0.475

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       40.048     728.290       0.000       0.060       0.091       0.465

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4       Texit         Del T       Ns         Ns nondim
      0.828       42.036        1.150     738.445       34.557     197.780       1.533

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 216060.922       0.511    2058.254 1386088.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
   1344836.38  12811.2686     164.6798      2.7825       0.8268       9.9730       1.4125
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 105% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 2.462   EfDer =  0.981

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     203.945    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   92.70234

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     199.234    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  156891.422  160028.906       1.433     831.557     580.213     619.754       1.068

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   501.43    -0.17   501.43     0.46   710.99
  MEAN    17.06     0.00    -0.02   501.43    -0.17   501.43     0.46
  HUB     12.51     0.00    -0.02   501.43    -0.17   501.43     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     54.92    50.47     4.45   713.82   872.48    13.09   501.81     0.79
  MEAN    49.66    47.20     2.46   590.30   774.65    13.09   501.81     0.70
  HUB     40.81    38.62     2.19   432.86   662.53    13.09   501.81     0.60

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   758.71   347.30   674.56  1113.52     0.68
  MEAN    18.04   802.98   413.71   688.20  1109.27     0.72
  HUB     15.00   940.57   592.33   730.63  1097.02     0.86

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   767.71   366.53     0.69  7168.28
  MEAN   624.07   719.63   210.35     0.65  7464.68     1.18
  HUB    519.02   734.30    73.31     0.67  8887.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.03     1.26    13.94   562.65     1.08   514.63     0.92     0.90
  MEAN    19.20     1.27    13.54   564.30     1.08   510.53     0.92     0.90
  HUB     20.07     1.33    12.41   572.21     1.09   498.55     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     27.24    28.52    24.20     4.32     0.93     0.19     2.90
  MEAN    31.01    17.00    12.70     4.30     0.91     0.15     3.51     0.90
  HUB     39.03    -5.73    -9.30     3.57     0.91    -0.01     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     824.082     412.909     713.174    1107.474       0.744      -0.022

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.371      13.407     509.666      24.000      30.070      35.400       5.330

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     754.792     412.909     860.352    1117.358       0.676       0.138
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.206      14.143     518.804     528.796       0.037       0.336

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     684.940       0.000     684.940    1126.374       0.608       0.223

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      14.775     527.204       0.000       0.060       0.075       0.241

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.810      18.972       1.256     566.388      43.578     242.462       1.880

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 271308.438       0.532    3126.864 2108469.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 2.462   EfDer =  0.975

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    203.945    3965.000      18.972     566.388       1.000       1.000       0.980
W Kg/sec =   92.70234

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    165.127    3794.412       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 156891.422  160028.906       1.228     590.487     480.908     474.134       0.986

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   643.43    -0.22   643.43     0.57   680.44
 MEAN    18.08     0.00    -0.02   643.43    -0.22   643.43     0.57
 HUB     15.21     0.00    -0.02   643.43    -0.22   643.43     0.57

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.87    46.36     1.51   711.05   959.12    15.23   531.82     0.85
 MEAN    44.20    42.30     1.90   625.53   897.53    15.23   531.82     0.79
 HUB     39.29    37.84     1.45   526.28   831.39    15.23   531.82     0.73

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   689.81   247.64   643.82  1155.70     0.60
 MEAN    18.01   708.74   284.23   649.26  1153.80     0.61
 HUB     15.22   771.18   403.77   657.03  1151.84     0.67

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   790.64   458.91     0.68  5061.45
 MEAN   623.16   732.40   338.94     0.63  5122.93     1.31
 HUB    526.73   668.44   122.96     0.58  6149.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.07     1.16    17.34   594.50     1.05   554.80     0.92     0.89
 MEAN    22.11     1.17    17.13   594.85     1.05   552.93     0.92     0.89
 HUB     22.78     1.20    16.86   600.55     1.06   550.94     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.04    35.48    31.50     3.98     0.93     0.22     2.90
 MEAN    23.64    27.57    23.50     4.07     0.91     0.23     3.30     0.89
 HUB     31.57    10.60     6.50     4.10     0.91     0.26     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.975

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     721.852     285.025     663.197    1153.640       0.626      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.267      17.098     553.129      46.000      23.257      30.600       7.343

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     676.781     285.025     734.351    1159.115       0.584       0.087

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.129      17.562     558.392     511.151       0.036       0.203

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     670.707       0.000     670.707    1159.828       0.578       0.078

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.501     559.076       0.000       0.060       0.069       0.075

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.801      21.958       1.157     596.634      30.246     304.231       2.358

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188419.578       0.377    2171.559 1943348.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 2.462   EfDer =  0.967

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    203.945    3965.000      21.958     596.634       1.000       1.000       0.980
W Kg/sec =   92.70234

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    146.432    3696.983       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 156891.422  160028.906       1.279     545.479     426.485     429.765       1.008

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   622.74    -0.21   622.74     0.53   647.48
 MEAN    17.74      0.00    -0.02   622.74    -0.21   622.74     0.53
 HUB     15.05      0.00    -0.02   622.74    -0.21   622.74     0.53

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.12     46.36     1.76   694.45   932.93    18.07   564.27     0.80
 MEAN    44.59     43.40     1.19   613.77   874.52    18.07   564.27     0.75
 HUB     39.91     38.84     1.07   520.75   811.91    18.07   564.27     0.70

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   672.72    234.64    630.48  1186.25       0.57
 MEAN    17.51   690.48    273.20    634.14  1184.98       0.58
 HUB     14.85   750.90    392.47    640.17  1183.57       0.63

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45    775.07    450.81     0.65  4652.49
 MEAN   605.75    716.04    332.55     0.60  4786.57      1.31
 HUB    513.83    651.58    121.36     0.55  5831.40

         Pt2       PR       Ps2      Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     25.04      1.14     20.12   622.46      1.04    584.71      0.92      0.88
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 MEAN    25.13     1.14    19.96   623.21     1.04   583.44     0.92     0.88
 HUB     25.86     1.18    19.72   629.01     1.05   581.98     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.41    35.57    31.50     4.07     0.93     0.21     2.90
 MEAN    23.31    27.67    23.50     4.17     0.91     0.23     3.28     0.88
 HUB     31.51    10.73     6.50     4.23     0.91     0.26     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     699.070     274.991     642.712    1185.409       0.590       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.288      19.980     584.109      46.000      23.164      31.500       8.336

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     667.633     274.991     722.048    1189.042       0.561       0.066

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.140      20.292     587.694     471.992       0.037       0.206

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     647.461       0.000     647.461    1191.281       0.543       0.080

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.412     589.908       0.000       0.060       0.071       0.088

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.789      24.959       1.137     624.894      28.260     302.569       2.345

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 176147.672       0.375    2030.124 1869107.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 2.462   EfDer =  0.959

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    203.945    3965.000      24.959     624.894       1.000       1.000       0.980
W Kg/sec =   92.70234

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    131.842    3612.419       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 156891.422  160028.906       1.337     513.330     384.018     401.059       1.044

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   599.97    -0.21   599.97     0.50   607.14
 MEAN    16.97     0.00    -0.02   599.97    -0.21   599.97     0.50
 HUB     14.32     0.00    -0.02   599.97    -0.21   599.97     0.50

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.01    46.36     1.65   666.42   896.86    21.02   594.87     0.75
 MEAN    44.39    43.80     0.59   587.21   839.65    21.02   594.87     0.70
 HUB     39.56    37.84     1.72   495.49   778.25    21.02   594.87     0.65

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   647.71   215.95   610.65  1213.95     0.53
 MEAN    16.57   663.28   251.30   613.83  1212.76     0.55
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 HUB     13.89   717.97   363.52   619.14  1211.43     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   751.09   437.32     0.62  4081.13
 MEAN   573.48   693.24   322.17     0.57  4168.58     1.30
 HUB    480.61   630.11   117.09     0.52  5052.22

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.84     1.12    22.93   647.54     1.04   612.55     0.92     0.88
 MEAN    27.91     1.12    22.77   648.02     1.04   611.33     0.92     0.88
 HUB     28.56     1.14    22.52   652.93     1.04   609.94     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.48    35.61    31.50     4.11     0.93     0.20     2.90
 MEAN    22.26    27.69    23.50     4.19     0.90     0.22     3.29     0.88
 HUB     30.42    10.71     6.50     4.21     0.90     0.25     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.959

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     649.759     252.717     598.599    1215.517       0.535       0.060

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.048      23.087     614.279      46.000      22.889      32.400       9.511

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     632.753     252.717     681.353    1217.315       0.520       0.087

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.900      23.203     616.098     456.573       0.038       0.210

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     598.618       0.000     598.618    1220.774       0.490       0.081

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.522     619.605       0.000       0.060       0.070       0.146

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.777      27.729       1.111     649.496      24.602     319.520       2.477

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 153440.234       0.360    1768.418 1858070.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 2.462   EfDer =  0.952

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    203.945    3965.000      27.729     649.496       1.000       1.000       0.980
W Kg/sec =   92.70234

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.985    3543.342       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 156891.422  160028.906       1.446     509.668     352.421     390.276       1.107

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   552.45    -0.19   552.45     0.45   566.47
 MEAN    15.91     0.00    -0.02   552.45    -0.19   552.45     0.45
 HUB     13.07     0.00    -0.02   552.45    -0.19   552.45     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.94    47.36     1.58   633.89   840.99    24.11   624.05     0.69
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 MEAN    44.91    44.80     0.11   550.61   780.11    24.11   624.05     0.64
 HUB     39.32    38.84     0.48   452.24   714.06    24.11   624.05     0.58
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   604.20   213.02   565.40  1240.90     0.49
 MEAN    15.50   616.74   235.63   569.95  1238.76     0.50
 HUB     12.59   662.29   326.91   575.98  1236.56     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   697.08   407.73     0.56  3825.05
 MEAN   536.24   644.36   300.60     0.52  3654.78     1.31
 HUB    435.63   586.15   108.72     0.47  4118.32

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.58     1.10    26.00   670.71     1.03   640.27     0.92     0.87
 MEAN    30.45     1.10    25.70   669.76     1.03   638.05     0.92     0.87
 HUB     30.81     1.11    25.34   672.33     1.04   635.77     0.92     0.87

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.64    35.80    31.50     4.30     0.93     0.21     2.90
 MEAN    22.46    27.81    23.50     4.31     0.90     0.22     3.34     0.87
 HUB     29.58    10.69     6.50     4.19     0.90     0.23     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.952

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      623.561     239.954     575.544    1239.133       0.503       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.516      25.667      638.516       46.000      22.632      33.000      10.368

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      618.298     239.954     663.227    1239.661       0.499       -0.035

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       30.239       25.511     639.061     440.827       0.076       0.214

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      570.955       0.000     570.955    1244.206       0.459       0.107

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       26.195      643.755       0.000       0.060       0.071       0.104

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.769       30.267        1.092      670.934       21.437     338.586       2.625

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 133787.109       0.347    1541.913 1888220.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    923103.06  10638.8779     199.2340      2.0035       0.7782       2.4621       1.2833
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 105% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 2.995   EfDer =  0.985

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     200.901    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   91.31874

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     196.260    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  154549.781  157640.453       1.455     831.557     571.553     619.754       1.084

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   492.04    -0.17   492.04     0.45   710.99
  MEAN    17.06     0.00    -0.02   492.04    -0.17   492.04     0.45
  HUB     12.51     0.00    -0.02   492.04    -0.17   492.04     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.43    50.47     4.96   713.82   867.12    13.17   502.59     0.79
  MEAN    50.20    47.20     3.00   590.30   768.61    13.17   502.59     0.70
  HUB     41.35    38.62     2.73   432.86   655.46    13.17   502.59     0.60

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   747.22   356.92   656.46  1116.14     0.67
  MEAN    18.04   790.93   418.93   670.87  1111.42     0.71
  HUB     15.00   924.36   590.26   711.36  1099.29     0.84

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   747.21   356.90     0.67  7366.80
  MEAN   624.07   701.53   205.14     0.63  7558.72     1.20
  HUB    519.02   714.92    71.24     0.65  8856.06

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.17     1.27    14.19   563.76     1.08   517.17     0.92     0.90
  MEAN    19.28     1.28    13.75   564.82     1.08   512.64     0.92     0.90
  HUB     20.07     1.33    12.63   572.04     1.09   500.85     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     28.53    28.53    24.20     4.33     0.93     0.21     2.90
  MEAN    31.98    17.00    12.70     4.30     0.91     0.17     3.51     0.90
  HUB     39.68    -5.72    -9.30     3.58     0.91     0.01     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     809.937     418.116     693.669    1110.095       0.730      -0.018

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.447      13.642     512.081      24.000      31.080      35.400       4.320

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     728.949     418.116     840.350    1121.321       0.650       0.168
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      19.306      14.528     522.491     528.796       0.034       0.355

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     662.050       0.000     662.050    1129.634       0.586       0.251

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      15.145     530.263       0.000       0.060       0.065       0.271

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
    0.828      19.116       1.265     566.872      44.062     238.199       1.847

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 274325.219       0.538    3114.444 2069002.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 2.995   EfDer =  0.984

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   200.901    3965.000      19.116     566.872       1.000       1.000       0.980
W Kg/sec =   91.31874

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
   161.508    3792.790       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 154549.781  157640.453       1.255     590.487     470.365     474.134       1.008

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   623.28    -0.21   623.28     0.55   680.15
 MEAN    18.08     0.00    -0.02   623.28    -0.21   623.28     0.55
 HUB     15.21     0.00    -0.02   623.28    -0.21   623.28     0.55

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.77    46.36     2.41   711.05   945.72    15.56   534.44     0.83
 MEAN    45.11    42.30     2.81   625.53   883.19    15.56   534.44     0.78
 HUB     40.19    37.84     2.35   526.28   815.89    15.56   534.44     0.72

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   673.78   265.19   619.40  1160.08     0.58
 MEAN    18.01   693.02   296.41   626.43  1157.40     0.60
 HUB     15.22   755.13   408.16   635.32  1154.75     0.65

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   760.56   441.36     0.66  5419.63
 MEAN   623.16   706.53   326.75     0.61  5342.25     1.34
 HUB    526.73   646.29   118.58     0.56  6216.64

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.50     1.18    17.90   596.98     1.05   559.09     0.92     0.90
 MEAN    22.45     1.17    17.61   596.55     1.05   556.47     0.92     0.90
 HUB     23.03     1.20    17.28   601.41     1.06   553.83     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.18    35.47    31.50     3.97     0.93     0.24     2.90
 MEAN    25.32    27.55    23.50     4.05     0.91     0.25     3.30     0.90
 HUB     32.72    10.57     6.50     4.07     0.91     0.27     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     704.787     297.244     639.039    1157.504       0.609      -0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.608      17.596     556.838      46.000      24.945      30.600       5.655

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     647.898     297.244     712.830    1164.163       0.557       0.125

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.503      18.229     563.263     511.151       0.031       0.233

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     640.397       0.000     640.397    1164.998       0.550       0.123

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.218     564.070       0.000       0.060       0.056       0.123

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.833      22.376       1.171     598.311      31.438     290.866       2.255

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 195850.609       0.392    2223.514 1893928.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 2.995   EfDer =  0.981

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    200.901    3965.000      22.376     598.311       1.000       1.000       0.980
W Kg/sec =   91.31874

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    141.749    3691.799       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 154549.781  157640.453       1.321     545.479     412.845     429.765       1.041

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   596.36    -0.21   596.36     0.51   646.58
 MEAN    17.74     0.00    -0.02   596.36    -0.21   596.36     0.51
 HUB     15.05     0.00    -0.02   596.36    -0.21   596.36     0.51

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.35    46.36     2.99   694.45   915.52    18.74   568.63     0.78
 MEAN    45.83    43.40     2.43   613.77   855.93    18.74   568.63     0.73
 HUB     41.14    38.84     2.30   520.75   791.86    18.74   568.63     0.68

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   651.69   257.67   598.59  1192.77     0.55
 MEAN    17.51   669.80   289.34   604.08  1190.56     0.56
 HUB     14.85   729.67   398.36   611.33  1188.32     0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   735.73   427.78     0.62  5108.54
 MEAN   605.75   681.93   316.40     0.57  5069.08     1.35
 HUB    513.83   622.14   115.47     0.52  5918.75

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     25.88     1.16    21.12   626.67     1.05   591.24     0.92     0.90
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 MEAN    25.85     1.16    20.85   626.45     1.05   589.02     0.92     0.90
 HUB     26.47     1.18    20.52   631.17     1.05   586.75     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.29    35.55    31.50     4.05     0.93     0.24     2.90
 MEAN    25.59    27.64    23.50     4.14     0.91     0.25     3.28     0.90
 HUB     33.09    10.70     6.50     4.20     0.91     0.28     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     677.453     291.243     611.654    1191.169       0.569       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.012      20.883     589.795      46.000      25.462      31.500       6.038

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     630.049     291.243     694.107    1196.381       0.527       0.118

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.908      21.444     594.968     471.992       0.030       0.244

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     609.844       0.000     609.844    1198.482       0.509       0.138

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      21.606     597.059       0.000       0.060       0.053       0.149

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.833      25.787       1.152     628.098      29.787     284.622       2.206

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 185674.984       0.395    2107.989 1815114.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 2.995   EfDer =  0.978

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    200.901    3965.000       25.787     628.098       1.000        1.000        0.980
W Kg/sec =   91.31874

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    126.023    3603.194        1.401       0.249      53.349       56.000        0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 154549.781  157640.453        1.398     513.330     367.068     401.059       1.093

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   566.97    -0.20   566.97     0.47   605.59
 MEAN    16.97      0.00    -0.02   566.97    -0.20   566.97     0.47
 HUB     14.32      0.00    -0.02   566.97    -0.20   566.97     0.47

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     49.62    46.36     3.26   666.42   875.11     22.14   601.28     0.73
 MEAN    46.01    43.80     2.21   587.21   816.39     22.14   601.28     0.68
 HUB     41.16    37.84     3.32   495.49   753.10     22.14   601.28     0.63

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   621.50   244.43   571.42  1222.73      0.51
 MEAN    16.57   637.18   271.44   576.47  1220.49      0.52
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 HUB     13.89   690.97   370.91   582.98  1218.22     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   702.61   408.84     0.57  4618.62
 MEAN   573.48   650.80   302.04     0.53  4502.11     1.35
 HUB    480.61   593.21   109.70     0.49  5154.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.23     1.13    24.50   653.72     1.04   621.51     0.92     0.90
 MEAN    29.14     1.13    24.19   653.08     1.04   619.21     0.92     0.90
 HUB     29.65     1.15    23.83   656.70     1.05   616.88     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.16    35.58    31.50     4.08     0.93     0.24     2.90
 MEAN    25.21    27.65    23.50     4.15     0.91     0.25     3.29     0.90
 HUB     32.47    10.66     6.50     4.16     0.91     0.27     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     625.280     272.965     562.552    1223.020       0.511       0.059

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.287      24.499     621.884      46.000      25.884      32.400       6.516

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     589.067     272.965     649.238    1226.621       0.480       0.146

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.195      24.929     625.552     456.573       0.028       0.256

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     557.262       0.000     557.262    1229.600       0.453       0.146

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.252     628.594       0.000       0.060       0.051       0.209

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.832      29.076       1.128     654.498      26.400     294.581       2.284

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 164670.984       0.386    1869.528 1798006.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 2.995   EfDer =  0.977

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    200.901    3965.000      29.076     654.498       1.000       1.000       0.980
W Kg/sec =   91.31874

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    114.094    3529.777       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 154549.781  157640.453       1.534     509.668     332.347     390.276       1.174

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   515.89    -0.18   515.89     0.42   564.30
 MEAN    15.91     0.00    -0.02   515.89    -0.18   515.89     0.42
 HUB     13.07     0.00    -0.02   515.89    -0.18   515.89     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.87    47.36     3.51   633.89   817.43    25.78   632.31     0.66
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 MEAN    46.87    44.80     2.07   550.61   754.66    25.78   632.31     0.61
 HUB     41.25    38.84     2.41   452.24   686.16    25.78   632.31     0.56
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   577.13   244.23   522.90  1251.26     0.46
 MEAN    15.50   588.37   257.97   528.80  1248.16     0.47
 HUB     12.59   631.89   335.13   535.70  1245.09     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   644.35   376.51     0.51  4384.81
 MEAN   536.24   597.55   278.27     0.48  4000.73     1.37
 HUB    435.63   545.04   100.50     0.44  4221.62

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.59     1.12    28.17   678.81     1.04   651.04     0.92     0.89
 MEAN    32.27     1.11    27.71   676.68     1.03   647.82     0.92     0.89
 HUB     32.45     1.12    27.22   677.90     1.04   644.62     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.04    35.76    31.50     4.26     0.93     0.26     2.90
 MEAN    26.00    27.75    23.50     4.25     0.91     0.26     3.34     0.89
 HUB     32.03    10.63     6.50     4.13     0.91     0.26     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      594.798     262.699     533.642    1248.587       0.476       -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.344      27.688      648.300      46.000      26.210      33.000       6.790

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      565.968     262.699     623.964    1251.271       0.452       0.057

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      32.188      27.970     651.090     440.827       0.053       0.266

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     525.154       0.000     525.154    1254.833       0.419       0.179

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.536     654.803       0.000       0.060       0.052       0.176

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.831      32.193       1.107     677.796      23.298     307.348       2.383

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 145425.953       0.377    1651.037 1824231.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    965947.75  10966.5117    196.2604      2.1310      0.8172      2.9953      1.2964
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 105% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.521   EfDer =  0.989

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     197.903    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   89.95580

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     193.331    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  152243.109  155287.641       1.477     831.557     563.022     619.754       1.101

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   482.92    -0.17   482.92     0.44   710.99
  MEAN    17.06     0.00    -0.02   482.92    -0.17   482.92     0.44
  HUB     12.51     0.00    -0.02   482.92    -0.17   482.92     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.93    50.47     5.46   713.82   861.97    13.23   503.33     0.78
  MEAN    50.72    47.20     3.52   590.30   762.80    13.23   503.33     0.69
  HUB     41.88    38.62     3.26   432.86   648.63    13.23   503.33     0.59

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   736.87   365.96   639.58  1118.54     0.66
  MEAN    18.04   779.81   423.86   654.57  1113.41     0.70
  HUB     15.00   909.33   588.37   693.33  1101.39     0.83

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   728.06   347.86     0.65  7553.20
  MEAN   624.07   684.50   200.21     0.61  7647.53     1.23
  HUB    519.02   696.79    69.35     0.63  8827.64

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.30     1.28    14.41   564.79     1.08   519.48     0.92     0.91
  MEAN    19.35     1.28    13.94   565.32     1.08   514.58     0.92     0.91
  HUB     20.08     1.33    12.83   571.88     1.09   502.97     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     29.78    28.54    24.20     4.34     0.93     0.23     2.90
  MEAN    32.92    17.01    12.70     4.31     0.92     0.18     3.51     0.91
  HUB     40.32    -5.71    -9.30     3.59     0.92     0.03     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     797.127     423.034     675.614    1112.451       0.717      -0.015

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.517      13.856     514.258      24.000      32.053      35.400       3.347

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     705.981     423.034     823.023    1124.760       0.628       0.195
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.394      14.868     525.701     528.796       0.031       0.372

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     641.887       0.000     641.887    1132.455       0.567       0.275

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.465     532.916       0.000       0.060       0.058       0.297

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.843      19.236       1.273     567.329      44.519     234.161       1.815

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 277171.781       0.544    3099.796 2030649.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.521   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    197.903    3965.000      19.236     567.329       1.000       1.000       0.980
W Kg/sec =   89.95580

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    158.162    3791.261       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 152243.109  155287.641       1.282     590.487     460.622     474.134       1.029

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   605.35    -0.21   605.35     0.53   679.88
 MEAN    18.08     0.00    -0.02   605.35    -0.21   605.35     0.53
 HUB     15.21     0.00    -0.02   605.35    -0.21   605.35     0.53

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.60    46.36     3.24   711.05   933.99    15.85   536.73     0.82
 MEAN    45.95    42.30     3.65   625.53   870.63    15.85   536.73     0.77
 HUB     41.01    37.84     3.17   526.28   802.27    15.85   536.73     0.71

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   660.83   280.31   598.43  1163.77     0.57
 MEAN    18.01   679.86   307.05   606.58  1160.48     0.59
 HUB     15.22   741.34   412.03   616.29  1157.28     0.64

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   734.72   426.25     0.63  5728.21
 MEAN   623.16   684.01   316.12     0.59  5533.64     1.37
 HUB    526.73   626.88   114.70     0.54  6275.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.87     1.19    18.37   599.15     1.06   562.70     0.92     0.91
 MEAN    22.74     1.18    18.02   598.07     1.05   559.49     0.92     0.91
 HUB     23.24     1.21    17.63   602.19     1.06   556.33     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.10    35.46    31.50     3.96     0.93     0.26     2.90
 MEAN    26.85    27.53    23.50     4.03     0.92     0.27     3.30     0.91
 HUB     33.77    10.54     6.50     4.04     0.92     0.28     3.92


  blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     690.663     307.907     618.230    1160.762       0.595       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.899      18.018     559.974      46.000      26.475      30.600       4.125

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     623.747     307.907     695.605    1168.349       0.534       0.158

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.815      18.787     567.318     511.151       0.027       0.258

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     615.635       0.000     615.635    1169.213       0.527       0.159

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.803     568.158       0.000       0.060       0.047       0.161

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.853      22.717       1.181     599.802      32.473     279.773       2.169

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 202296.953       0.405    2262.421 1848451.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.521   EfDer =  0.989

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    197.903    3965.000      22.717     599.802       1.000       1.000       0.980
W Kg/sec =   89.95580

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    137.711    3687.205       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 152243.109  155287.641       1.360     545.479     401.083     429.765       1.072

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   574.54    -0.20   574.54     0.49   645.77
 MEAN    17.74      0.00    -0.02   574.54    -0.20   574.54     0.49
 HUB     15.05      0.00    -0.02   574.54    -0.20   574.54     0.49

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     50.41     46.36     4.05   694.45   901.45     19.28   572.25      0.77
 MEAN    46.90     43.40     3.50   613.77   840.86     19.28   572.25      0.72
 HUB     42.20     38.84     3.36   520.75   775.55     19.28   572.25      0.66

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   636.26    276.04    573.27  1197.93       0.53
 MEAN    17.51   653.99    302.38    579.89  1195.05       0.55
 HUB     14.85   712.89    403.17    587.94  1192.21       0.60

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45    704.45    409.41     0.59  5472.32
 MEAN   605.75    654.45    303.37     0.55  5297.13      1.38
 HUB    513.83    598.26    110.66     0.50  5989.99

         Pt2       PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     26.56      1.17     21.92   630.18      1.05   596.40      0.92      0.91
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 MEAN    26.43     1.16    21.56   629.21     1.05   593.52     0.92     0.91
 HUB     26.95     1.19    21.16   633.06     1.06   590.65     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.71    35.53    31.50     4.03     0.93     0.27     2.90
 MEAN    27.54    27.62    23.50     4.12     0.92     0.28     3.28     0.91
 HUB     34.44    10.66     6.50     4.16     0.92     0.30     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     661.076     304.364     586.842    1195.753       0.553       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.599      21.606     594.342      46.000      27.413      31.500       4.087

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     601.058     304.364     673.727    1202.096       0.500       0.159

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.522      22.354     600.664     471.992       0.025       0.275

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     581.409       0.000     581.409    1204.035       0.483       0.181

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.532     602.603       0.000       0.060       0.042       0.193

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      26.434       1.164     630.815      31.013     271.034       2.101

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 193323.719       0.411    2162.067 1767621.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.521   EfDer =  0.989

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    197.903    3965.000      26.434     630.815       1.000       1.000       0.980
W Kg/sec =   89.95580

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    121.368    3595.425       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 152243.109  155287.641       1.452     513.330     353.508     401.059       1.135

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   541.70    -0.19   541.70     0.45   604.28
 MEAN    16.97     0.00    -0.02   541.70    -0.19   541.70     0.45
 HUB     14.32     0.00    -0.02   541.70    -0.19   541.70     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.90    46.36     4.54   666.42   858.95    23.02   606.34     0.71
 MEAN    47.32    43.80     3.52   587.21   799.04    23.02   606.34     0.66
 HUB     42.46    37.84     4.62   495.49   734.26    23.02   606.34     0.61

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   604.07   265.39   542.65  1229.26     0.49
 MEAN    16.57   618.97   286.43   548.71  1226.35     0.50
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 HUB     13.89   671.39   376.45   555.92  1223.46     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   667.02   387.88     0.54  5014.13
 MEAN   573.48   619.26   287.04     0.50  4750.48     1.39
 HUB    480.61   565.60   104.16     0.46  5231.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.31     1.15    25.69   658.63     1.04   628.20     0.92     0.91
 MEAN    30.09     1.14    25.28   657.17     1.04   625.21     0.92     0.91
 HUB     30.48     1.15    24.84   659.84     1.05   622.24     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.06    35.56    31.50     4.06     0.93     0.28     2.90
 MEAN    27.57    27.61    23.50     4.11     0.92     0.28     3.29     0.91
 HUB     34.10    10.61     6.50     4.11     0.92     0.29     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     608.297     288.044     535.776    1228.704       0.495       0.058

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.243      25.576     627.679      46.000      28.263      32.400       4.137

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     557.755     288.044     627.742    1233.506       0.452       0.191

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.180      26.227     632.595     456.573       0.023       0.291

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     528.041       0.000     528.041    1236.127       0.427       0.190

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.531     635.286       0.000       0.060       0.042       0.251

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      30.080       1.138     658.545      27.730     277.501       2.151

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 172984.406       0.405    1934.600 1747712.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.521   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    197.903    3965.000      30.080     658.545       1.000       1.000       0.980
W Kg/sec =   89.95580

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.974    3518.913       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 152243.109  155287.641       1.606     509.668     317.434     390.276       1.229

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   489.78    -0.17   489.78     0.40   562.56
 MEAN    15.91     0.00    -0.02   489.78    -0.17   489.78     0.40
 HUB     13.07     0.00    -0.02   489.78    -0.17   489.78     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.32    47.36     4.96   633.89   801.20    27.01   638.55     0.65
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 MEAN    48.35    44.80     3.55   550.61   737.05    27.01   638.55     0.59
 HUB     42.73    38.84     3.89   452.24   666.75    27.01   638.55     0.54
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   560.69   265.72   493.73  1258.65     0.45
 MEAN    15.50   570.13   273.50   500.25  1255.00     0.45
 HUB     12.59   611.40   340.86   507.56  1251.39     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   608.12   355.03     0.48  4770.07
 MEAN   536.24   565.05   262.74     0.45  4241.27     1.42
 HUB    435.63   516.33    94.76     0.41  4293.69

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.08     1.13    29.74   684.99     1.04   658.78     0.92     0.91
 MEAN    33.62     1.12    29.18   682.06     1.04   654.96     0.92     0.91
 HUB     33.66     1.12    28.59   682.35     1.04   651.18     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.29    35.72    31.50     4.22     0.93     0.30     2.90
 MEAN    28.67    27.71    23.50     4.21     0.92     0.29     3.34     0.91
 HUB     33.88    10.58     6.50     4.08     0.92     0.29     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     576.437     278.515     504.687    1255.425       0.459       -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.694      29.156     655.428      46.000      28.892      33.000       4.108

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     531.587     278.515     600.129    1259.386       0.422       0.119

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.594      29.717     659.570     440.827       0.042       0.305

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     494.465       0.000     494.465    1262.414       0.392       0.230

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.217     662.746       0.000       0.060       0.042       0.227

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.860      33.590       1.117     683.129      24.584     287.611       2.230

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 153476.047       0.398    1716.425 1772455.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    999252.94  11175.3096    193.3312      2.2235      0.8397      3.5215      1.3066
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 105% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.041   EfDer =  0.993

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     194.949    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   88.61320

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     190.446    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  149970.859  152969.953       1.499     831.557     554.619     619.754       1.117

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   474.05    -0.16   474.05     0.43   710.99
  MEAN    17.06     0.00    -0.02   474.05    -0.16   474.05     0.43
  HUB     12.51     0.00    -0.02   474.05    -0.16   474.05     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.42    50.47     5.95   713.82   857.03    13.30   504.04     0.78
  MEAN    51.24    47.20     4.04   590.30   757.21    13.30   504.04     0.69
  HUB     42.41    38.62     3.79   432.86   642.05    13.30   504.04     0.58

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   727.52   374.46   623.75  1120.74     0.65
  MEAN    18.04   769.54   428.54   639.18  1115.25     0.69
  HUB     15.00   895.31   586.60   676.37  1103.33     0.81

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   710.09   339.36     0.63  7728.42
  MEAN   624.07   668.41   195.53     0.60  7731.90     1.25
  HUB    519.02   679.74    67.59     0.62  8801.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.42     1.29    14.62   565.77     1.08   521.59     0.92     0.91
  MEAN    19.42     1.29    14.12   565.79     1.08   516.37     0.92     0.91
  HUB     20.08     1.33    13.02   571.73     1.09   504.90     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     30.98    28.55    24.20     4.35     0.93     0.25     2.90
  MEAN    33.84    17.01    12.70     4.31     0.92     0.20     3.51     0.91
  HUB     40.93    -5.71    -9.30     3.59     0.92     0.05     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     785.460     427.705     658.799    1114.584       0.705      -0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.581      14.052     516.232      24.000      32.992      35.400       2.408

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     685.258     427.705     807.781    1127.794       0.608       0.219
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.472      15.170     528.540     528.796       0.029       0.388

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     623.790       0.000     623.790    1134.943       0.550       0.296

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.745     535.261       0.000       0.060       0.052       0.319

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.853      19.339       1.280     567.761      44.951     230.326       1.785

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 279860.250       0.549    3083.149 1993349.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.041   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    194.949    3965.000      19.339     567.761       1.000       1.000       0.980
W Kg/sec =   88.61320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    155.038    3789.819       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149970.859  152969.953       1.308     590.487     451.521     474.134       1.050

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   589.12    -0.20   589.12     0.52   679.62
 MEAN    18.08     0.00    -0.02   589.12    -0.20   589.12     0.52
 HUB     15.21     0.00    -0.02   589.12    -0.20   589.12     0.52

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.37    46.36     4.01   711.05   923.55    16.11   538.78     0.81
 MEAN    46.73    42.30     4.43   625.53   859.42    16.11   538.78     0.75
 HUB     41.79    37.84     3.95   526.28   790.10    16.11   538.78     0.69

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   650.11   293.62   580.03  1166.94     0.56
 MEAN    18.01   668.62   316.48   588.97  1163.17     0.57
 HUB     15.22   729.23   415.47   599.30  1159.51     0.63

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   712.01   412.94     0.61  5999.81
 MEAN   623.16   664.03   306.68     0.57  5703.53     1.40
 HUB    526.73   609.55   111.27     0.53  6327.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.19     1.20    18.78   601.09     1.06   565.81     0.92     0.91
 MEAN    22.99     1.19    18.37   599.44     1.06   562.13     0.92     0.91
 HUB     23.41     1.21    17.93   602.91     1.06   558.53     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.85    35.45    31.50     3.95     0.93     0.28     2.90
 MEAN    28.25    27.51    23.50     4.01     0.92     0.28     3.30     0.91
 HUB     34.73    10.52     6.50     4.02     0.92     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     678.681     317.372     599.902    1163.574       0.583       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.148      18.380     562.690      46.000      27.881      30.600       2.719

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     602.949     317.372     681.375    1171.923       0.514       0.187

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.078      19.262     570.794     511.151       0.024       0.280

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     594.630       0.000     594.630    1172.777       0.507       0.189

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.294     571.625       0.000       0.060       0.041       0.193

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      22.999       1.189     601.148      33.386     270.311       2.095

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 207992.125       0.417    2291.396 1806066.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.041   EfDer =  0.995

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    194.949    3965.000      22.999     601.148       1.000       1.000       0.980
W Kg/sec =   88.61320

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    134.141    3683.077       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 149970.859  152969.953       1.396     545.479     390.685     429.765       1.100

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   555.85    -0.19   555.85     0.47   645.05
 MEAN    17.74     0.00    -0.02   555.85    -0.19   555.85     0.47
 HUB     15.05     0.00    -0.02   555.85    -0.19   555.85     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.33    46.36     4.97   694.45   889.66    19.74   575.36     0.76
 MEAN    47.84    43.40     4.44   613.77   828.21    19.74   575.36     0.70
 HUB     43.14    38.84     4.30   520.75   761.81    19.74   575.36     0.65

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   624.39   291.29   552.28  1202.18     0.52
 MEAN    17.51   641.37   313.29   559.64  1198.81     0.54
 HUB     14.85   699.08   407.21   568.24  1195.50     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   678.51   394.16     0.56  5774.32
 MEAN   605.75   631.45   292.45     0.53  5488.06     1.41
 HUB    513.83   578.16   106.62     0.48  6049.92

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.14     1.18    22.57   633.20     1.05   600.67     0.92     0.91
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 MEAN    26.92     1.17    22.15   631.61     1.05   597.29     0.92     0.91
 HUB     27.35     1.19    21.69   634.73     1.06   593.95     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.81    35.52    31.50     4.02     0.93     0.29     2.90
 MEAN    29.24    27.59    23.50     4.09     0.92     0.29     3.28     0.91
 HUB     35.63    10.63     6.50     4.13     0.92     0.31     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     648.067     315.348     566.169    1199.559       0.540       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.084      22.202     598.130      46.000      29.117      31.500       2.383

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     577.484     315.348     657.975    1206.776       0.479       0.192

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.022      23.098     605.350     471.992       0.022       0.301

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     558.859       0.000     558.859    1208.536       0.462       0.213

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.265     607.116       0.000       0.060       0.039       0.226

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      26.941       1.171     633.182      32.035     260.181       2.017

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 199700.984       0.425    2200.055 1724643.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 4.041   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    194.949    3965.000      26.941     633.182       1.000       1.000       0.980
W Kg/sec =   88.61320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    117.525    3588.698       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149970.859  152969.953       1.500     513.330     342.315     401.059       1.172

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   521.50    -0.18   521.50     0.43   603.15
 MEAN    16.97     0.00    -0.02   521.50    -0.18   521.50     0.43
 HUB     14.32     0.00    -0.02   521.50    -0.18   521.50     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.96    46.36     5.60   666.42   846.36    23.72   610.50     0.70
 MEAN    48.40    43.80     4.60   587.21   785.49    23.72   610.50     0.65
 HUB     43.55    37.84     5.71   495.49   719.48    23.72   610.50     0.59

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   591.69   281.66   520.35  1234.42     0.48
 MEAN    16.57   605.50   298.14   527.01  1231.04     0.49
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 HUB     13.89   656.39   380.79   534.65  1227.71     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   639.42   371.61     0.52  5321.24
 MEAN   573.48   594.60   275.33     0.48  4944.40     1.43
 HUB    480.61   543.89    99.82     0.44  5291.75

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.15     1.16    26.62   662.70     1.05   633.50     0.92     0.91
 MEAN    30.84     1.14    26.13   660.61     1.04   630.03     0.92     0.91
 HUB     31.13     1.16    25.62   662.54     1.05   626.60     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.43    35.53    31.50     4.03     0.93     0.30     2.90
 MEAN    29.50    27.58    23.50     4.08     0.92     0.30     3.29     0.91
 HUB     35.46    10.58     6.50     4.08     0.92     0.31     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     595.772     299.818     514.834    1233.254       0.483       0.057

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.990      26.413     632.340      46.000      30.215      32.400       2.185

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     533.824     299.818     612.257    1238.933       0.431       0.226

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.942      27.232     638.177     456.573       0.020       0.320

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     505.739       0.000     505.739    1241.295       0.407       0.224

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.516     640.613       0.000       0.060       0.038       0.283

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      30.851       1.145     661.948      28.766     264.878       2.053

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 179457.781       0.421    1977.041 1703636.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 4.041   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    194.949    3965.000      30.851     661.948       1.000       1.000       0.980
W Kg/sec =   88.61320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.935    3509.857       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149970.859  152969.953       1.667     509.668     305.670     390.276       1.277

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   469.72    -0.16   469.72     0.38   561.11
 MEAN    15.91     0.00    -0.02   469.72    -0.16   469.72     0.38
 HUB     13.07     0.00    -0.02   469.72    -0.16   469.72     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.47    47.36     6.11   633.89   789.09    27.96   643.55     0.63
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MEAN    49.54    44.80     4.74   550.61   723.87    27.96   643.55     0.58
HUB     43.92    38.84     5.08   452.24   652.15    27.96   643.55     0.52

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   549.65   281.76   471.93  1264.37     0.43
MEAN    15.50   557.25   285.16   478.76  1260.35     0.44
HUB     12.59   596.34   345.18   486.28  1256.37     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.74   581.06   338.98     0.46  5057.78
MEAN   536.24   540.60   251.07     0.43  4421.94     1.46
HUB    435.63   494.62    90.45     0.39  4347.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     35.22     1.14    30.93   689.98     1.04   664.80     0.92     0.91
MEAN    34.64     1.12    30.29   686.46     1.04   660.57     0.92     0.91
HUB     34.58     1.12    29.63   686.05     1.04   656.40     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.84    35.69    31.50     4.19     0.93     0.32     2.90
MEAN    30.78    27.67    23.50     4.17     0.92     0.31     3.34     0.91
HUB     35.37    10.54     6.50     4.04     0.92     0.31     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      563.526     290.394      482.942    1260.761       0.447       -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.722      30.270      661.021      46.000      31.019      33.000       1.981

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      506.533     290.394     583.870    1265.600       0.400        0.164

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      34.648      31.025     666.105     440.827       0.036       0.337

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     471.884       0.000     471.884    1268.282       0.372       0.267

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      31.481     668.931       0.000       0.060       0.038       0.265

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      34.641       1.123     687.494      25.546     273.637       2.121

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 159504.359       0.414    1757.219 1727729.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1026515.50  11308.8604    190.4457      2.2930      0.8528      4.0409      1.3150
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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 105% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.453   EfDer =  0.995

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     192.609    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   87.54964

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     188.160    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  148170.891  151133.984       1.518     831.557     547.963     619.754       1.131

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   467.10    -0.16   467.10     0.42   710.99
  MEAN    17.06     0.00    -0.02   467.10    -0.16   467.10     0.42
  HUB     12.51     0.00    -0.02   467.10    -0.16   467.10     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.81    50.47     6.34   713.82   853.20    13.35   504.59     0.77
  MEAN    51.65    47.20     4.45   590.30   752.88    13.35   504.59     0.68
  HUB     42.83    38.62     4.21   432.86   636.94    13.35   504.59     0.58

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   720.64   380.94   611.72  1122.37     0.64
  MEAN    18.04   761.83   432.12   627.41  1116.63     0.68
  HUB     15.00   884.72   585.28   663.46  1104.78     0.80

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   696.43   332.88     0.62  7862.08
  MEAN   624.07   656.12   191.94     0.59  7796.52     1.27
  HUB    519.02   666.76    66.26     0.60  8781.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.51     1.29    14.78   566.51     1.08   523.16     0.92     0.91
  MEAN    19.47     1.29    14.25   566.15     1.08   517.71     0.92     0.91
  HUB     20.08     1.33    13.15   571.62     1.09   506.35     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     31.91    28.55    24.20     4.35     0.93     0.26     2.90
  MEAN    34.56    17.01    12.70     4.31     0.92     0.21     3.51     0.91
  HUB     41.42    -5.70    -9.30     3.60     0.92     0.06     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     776.795     431.283     646.069    1116.161       0.696      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.629      14.197     517.693      24.000      33.725      35.400       1.675

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     669.936     431.283     796.756    1129.995       0.593       0.236
  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      19.528      15.391     530.605     528.796       0.028       0.399

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     610.447       0.000     610.447    1136.749       0.537       0.311

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      15.947     536.967       0.000       0.060       0.049       0.335

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.860      19.410       1.285     568.092      45.282     227.379       1.763

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 281917.562       0.553    3068.538 1964124.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.453   EfDer =  0.997

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   192.609    3965.000      19.410     568.092       1.000       1.000       0.980
W Kg/sec =   87.54964

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
   152.661    3788.716       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 148170.891  151133.984       1.328     590.487     444.600     474.134       1.066

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   577.09    -0.20   577.09     0.51   679.42
 MEAN    18.08     0.00    -0.02   577.09    -0.20   577.09     0.51
 HUB     15.21     0.00    -0.02   577.09    -0.20   577.09     0.51

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.95    46.36     4.59   711.05   915.92    16.29   540.29     0.80
 MEAN    47.32    42.30     5.02   625.53   851.21    16.29   540.29     0.75
 HUB     42.37    37.84     4.53   526.28   781.16    16.29   540.29     0.69

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   642.74   303.27   566.70  1169.20     0.55
 MEAN    18.01   660.67   323.38   576.12  1165.11     0.57
 HUB     15.22   720.49   418.00   586.83  1161.14     0.62

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   695.55   403.28     0.59  6196.88
 MEAN   623.16   649.45   299.79     0.56  5827.61     1.42
 HUB    526.73   596.82   108.73     0.51  6366.28

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.42     1.21    19.06   602.51     1.06   568.03     0.92     0.91
 MEAN    23.16     1.19    18.62   600.46     1.06   564.03     0.92     0.91
 HUB     23.53     1.21    18.15   603.45     1.06   560.13     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.15    35.44    31.50     3.94     0.93     0.30     2.90
 MEAN    29.31    27.49    23.50     3.99     0.92     0.29     3.30     0.91
 HUB     35.46    10.50     6.50     4.00     0.92     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     670.253     324.285     586.581    1165.585       0.575       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.324      18.636     564.635      46.000      28.936      30.600       1.664

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     588.077     324.285     671.562    1174.462       0.501       0.207

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.262      19.597     573.269     511.151       0.023       0.297

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     579.749       0.000     579.749    1175.294       0.493       0.210

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.635     574.081       0.000       0.060       0.038       0.215

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      23.193       1.195     602.144      34.052     263.602       2.043

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 212141.344       0.425    2309.057 1773866.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.453   EfDer =  0.997

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    192.609    3965.000      23.193     602.144       1.000       1.000       0.980
W Kg/sec =   87.54964

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    131.534    3680.029       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 148170.891  151133.984       1.424     545.479     383.091     429.765       1.122

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   542.54    -0.19   542.54     0.46   644.52
 MEAN    17.74     0.00    -0.02   542.54    -0.19   542.54     0.46
 HUB     15.05     0.00    -0.02   542.54    -0.19   542.54     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.01    46.36     5.65   694.45   881.40    20.05   577.58     0.75
 MEAN    48.53    43.40     5.13   613.77   819.32    20.05   577.58     0.70
 HUB     43.84    38.84     5.00   520.75   752.14    20.05   577.58     0.64

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   616.64   301.91   537.67  1205.13     0.51
 MEAN    17.51   632.86   320.94   545.45  1201.44     0.53
 HUB     14.85   689.54   410.04   554.37  1197.82     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   660.45   383.53     0.55  5984.67
 MEAN   605.75   615.33   284.81     0.51  5621.87     1.44
 HUB    513.83   564.00   103.78     0.47  6091.96

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.53     1.19    23.02   635.37     1.06   603.63     0.92     0.91
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 MEAN    27.25     1.18    22.55   633.35     1.05   599.93     0.92     0.91
 HUB     27.61     1.19    22.05   635.96     1.06   596.29     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.32    35.50    31.50     4.00     0.93     0.31     2.90
 MEAN    30.47    27.57    23.50     4.07     0.92     0.31     3.28     0.91
 HUB     36.49    10.60     6.50     4.10     0.92     0.32     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     639.336     323.046     551.717    1202.211       0.532       0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.416      22.609     600.778      46.000      30.350      31.500       1.150

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     561.275     323.046     647.602    1210.012       0.464       0.216

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.361      23.606     608.600     471.992       0.021       0.320

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     543.379       0.000     543.379    1211.651       0.448       0.234

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.762     610.250       0.000       0.060       0.037       0.248

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      27.283       1.176     634.892      32.749     252.826       1.960

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 204155.719       0.435    2222.137 1692586.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 4.453   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    192.609    3965.000      27.283     634.892       1.000       1.000       0.980
W Kg/sec =   87.54964

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    114.814    3583.862       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 148170.891  151133.984       1.535     513.330     334.421     401.059       1.199

     ROTOR LEADING EDGE CONDITIONS, STAGE            4
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   507.56    -0.17   507.56     0.42   602.34
 MEAN    16.97     0.00    -0.02   507.56    -0.17   507.56     0.42
 HUB     14.32     0.00    -0.02   507.56    -0.17   507.56     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.71    46.36     6.35   666.42   837.83    24.19   613.40     0.69
 MEAN    49.17    43.80     5.37   587.21   776.29    24.19   613.40     0.64
 HUB     44.32    37.84     6.48   495.49   709.44    24.19   613.40     0.58

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   583.93   292.65   505.31  1237.93     0.47
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 MEAN    16.57   596.76   306.11   512.26  1234.27     0.48
 HUB     13.89   646.38   383.76   520.14  1230.65     0.53
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   620.79   360.62     0.50  5528.54
 MEAN   573.48   577.84   267.37     0.47  5076.37     1.45
 HUB    480.61   529.08    96.85     0.43  5332.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.72     1.16    27.23   665.56     1.05   637.12     0.92     0.91
 MEAN    31.34     1.15    26.71   663.05     1.04   633.35     0.92     0.91
 HUB     31.56     1.16    26.14   664.47     1.05   629.62     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.08    35.51    31.50     4.01     0.93     0.32     2.90
 MEAN    30.86    27.56    23.50     4.06     0.92     0.31     3.29     0.91
 HUB     36.42    10.55     6.50     4.05     0.92     0.32     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     587.673     307.830     500.600    1236.379       0.475       0.056

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.491      26.975     635.552      46.000      31.588      32.400       0.812

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     517.797     307.830     602.389    1242.630       0.417       0.250

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.449      27.904     641.995     456.573       0.019       0.341

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     490.826       0.000     490.826    1244.824       0.394       0.247

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.171     644.265       0.000       0.060       0.037       0.305

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      31.361       1.149     664.360      29.467     256.621       1.989

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 183845.766       0.431    2001.073 1671220.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 4.453   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    192.609    3965.000      31.361     664.360       1.000       1.000       0.980
W Kg/sec =   87.54964

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.175    3503.480       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 148170.891  151133.984       1.712     509.668     297.633     390.276       1.311

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   456.25    -0.16   456.25     0.37   560.09
 MEAN    15.91     0.00    -0.02   456.25    -0.16   456.25     0.37
 HUB     13.07     0.00    -0.02   456.25    -0.16   456.25     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.26    47.36     6.90   633.89   781.14    28.59   647.01     0.63
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 MEAN    50.36    44.80     5.56   550.61   715.20    28.59   647.01     0.57
 HUB     44.76    38.84     5.92   452.24   642.51    28.59   647.01     0.52
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   542.99   292.35   457.57  1268.22     0.43
 MEAN    15.50   549.15   292.88   464.53  1263.97     0.43
 HUB     12.59   586.56   348.05   472.13  1259.77     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   563.22   328.40     0.44  5247.60
 MEAN   536.24   524.42   243.36     0.41  4541.38     1.49
 HUB    435.63   480.19    87.58     0.38  4384.01

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     35.97     1.15    31.71   693.44     1.04   668.86     0.92     0.91
 MEAN    35.32     1.13    31.02   689.53     1.04   664.39     0.92     0.91
 HUB     35.18     1.12    30.32   688.66     1.04   659.98     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.57    35.67    31.50     4.17     0.93     0.34     2.90
 MEAN    32.23    27.65    23.50     4.15     0.92     0.33     3.34     0.91
 HUB     36.40    10.51     6.50     4.01     0.92     0.32     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      555.424     298.247     468.557    1264.375       0.439       -0.004

     Pt3          Ps3         Ts3          Vane No.     Alpha3     Vane A3      Incid3
     35.399       31.003      664.825       46.000      32.478      33.000       0.522

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth         Cmth          Aoth         Machth       cp 2-Th
     15.219      490.264     298.247     573.856    1269.765       0.386        0.193

   BlockageThr  PtTh         PsTh        TsTh         AreaTh         w 2-Th  DiffFact4
      0.950       35.334       31.879     670.505      440.827       0.035       0.358

    VANED DIFFUSER EXIT:
   R4           C4           Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701      457.145       0.000     457.145    1272.239       0.359       0.292

   Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       32.307      673.121       0.000        0.060       0.037       0.289

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.879       35.325        1.126      690.542       26.182     264.741       2.052

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 163488.266       0.424    1779.492 1695054.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc   TR
   1045548.62  11380.2969     188.1599      2.3383       0.8596       4.4532      1.3208
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 105% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     189.777    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   86.26234

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     185.393    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  145992.219  148911.750       1.540     831.557     539.905     619.754       1.148

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   458.78    -0.16   458.78     0.42   710.99
  MEAN    17.06     0.00    -0.02   458.78    -0.16   458.78     0.42
  HUB     12.51     0.00    -0.02   458.78    -0.16   458.78     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.28    50.47     6.81   713.82   848.67    13.41   505.23     0.77
  MEAN    52.15    47.20     4.95   590.30   747.74    13.41   505.23     0.68
  HUB     43.35    38.62     4.73   432.86   630.86    13.41   505.23     0.57

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   712.89   388.52   597.71  1124.25     0.63
  MEAN    18.04   752.96   436.34   613.64  1118.23     0.67
  HUB     15.00   872.45   583.74   648.39  1106.46     0.79

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   680.50   325.31     0.61  8018.33
  MEAN   624.07   641.72   187.72     0.57  7872.61     1.29
  HUB    519.02   651.62    64.72     0.59  8758.10

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.62     1.30    14.96   567.38     1.09   524.95     0.92     0.91
  MEAN    19.53     1.29    14.40   566.57     1.08   519.25     0.92     0.91
  HUB     20.07     1.33    13.31   571.49     1.09   508.01     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     33.02    28.56    24.20     4.36     0.93     0.28     2.90
  MEAN    35.42    17.01    12.70     4.31     0.92     0.23     3.51     0.91
  HUB     42.00    -5.70    -9.30     3.60     0.92     0.07     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     766.925     435.497     631.282    1117.949       0.686      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.683      14.362     519.353      24.000      34.600      35.400       0.800

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     652.478     435.497     784.465    1132.458       0.576       0.256
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.589      15.638     532.921     528.796       0.027       0.413

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     595.259       0.000     595.259    1138.777       0.523       0.328

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.171     538.884       0.000       0.060       0.046       0.353

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.867      19.485       1.290     568.479      45.669     223.907       1.736

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 284331.688       0.558    3049.309 1929115.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    189.777    3965.000      19.485     568.479       1.000       1.000       0.980
W Kg/sec =   86.26234

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    149.883    3787.424       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 145992.219  148911.750       1.353     590.487     436.508     474.134       1.086

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   563.33    -0.19   563.32     0.49   679.19
 MEAN    18.08     0.00    -0.02   563.33    -0.19   563.32     0.49
 HUB     15.21     0.00    -0.02   563.33    -0.19   563.32     0.49

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.62    46.36     5.26   711.05   907.31    16.50   541.98     0.79
 MEAN    48.00    42.30     5.70   625.53   841.94    16.50   541.98     0.74
 HUB     43.06    37.84     5.22   526.28   771.05    16.50   541.98     0.68

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   634.90   314.10   551.76  1171.70     0.54
 MEAN    18.01   651.98   331.17   561.61  1167.27     0.56
 HUB     15.22   710.71   420.86   572.70  1162.96     0.61

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   677.10   392.46     0.58  6417.82
 MEAN   623.16   632.99   292.00     0.54  5967.79     1.44
 HUB    526.73   582.40   105.87     0.50  6409.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.67     1.21    19.38   604.13     1.06   570.48     0.92     0.91
 MEAN    23.36     1.20    18.89   601.63     1.06   566.14     0.92     0.91
 HUB     23.66     1.21    18.38   604.08     1.06   561.92     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.65    35.42    31.50     3.92     0.93     0.31     2.90
 MEAN    30.53    27.47    23.50     3.97     0.92     0.31     3.30     0.91
 HUB     36.31    10.47     6.50     3.97     0.92     0.31     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     661.078     332.095     571.610    1167.809       0.566       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.515      18.915     566.791      46.000      30.156      30.600       0.444

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     571.577     332.095     661.050    1177.260       0.486       0.230

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.457      19.961     576.003     511.151       0.022       0.316

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     563.570       0.000     563.570    1178.036       0.478       0.231

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.995     576.762       0.000       0.060       0.037       0.237

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      23.390       1.200     603.280      34.801     256.223       1.986

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 216807.922       0.434    2325.152 1736252.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    189.777    3965.000      23.390     603.280       1.000       1.000       0.980
W Kg/sec =   86.26234

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    128.627    3676.561       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 145992.219  148911.750       1.456     545.479     374.627     429.765       1.147

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   527.98    -0.18   527.98     0.45   643.91
 MEAN    17.74      0.00    -0.02   527.98    -0.18   527.98     0.45
 HUB     15.05      0.00    -0.02   527.98    -0.18   527.98     0.45

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     52.76     46.36     6.40   694.45   872.51     20.39   580.01      0.74
 MEAN    49.31     43.40     5.91   613.77   809.76     20.39   580.01      0.69
 HUB     44.61     38.84     5.77   520.75   741.71     20.39   580.01      0.63

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   608.83    313.31    522.03   1208.29      0.50
 MEAN    17.51   624.04    329.18    530.15   1204.28      0.52
 HUB     14.85   679.39    413.12    539.36   1200.35      0.57

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45    641.10    372.14     0.53   6210.26
 MEAN   605.75    597.96    276.56     0.50   5766.08     1.46
 HUB    513.83    548.68    100.71     0.46   6137.51

         Pt2       PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     27.94     1.19     23.49    637.75      1.06    606.82      0.92      0.91
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 MEAN    27.59     1.18    22.97   635.29     1.05   602.79     0.92     0.91
 HUB     27.88     1.19    22.43   637.35     1.06   598.83     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.97    35.48    31.50     3.98     0.93     0.33     2.90
 MEAN    31.84    27.55    23.50     4.05     0.92     0.32     3.28     0.91
 HUB     37.45    10.58     6.50     4.08     0.92     0.33     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     630.297     331.343     536.177    1205.069       0.523       0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.757      23.032     603.640      46.000      31.715      31.500      -0.215

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     544.064     331.343     637.019    1213.476       0.448       0.241

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.707      24.133     612.092     471.992       0.021       0.340

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     526.968       0.000     526.968    1214.990       0.434       0.257

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.275     613.620       0.000       0.060       0.037       0.271

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      27.629       1.181     636.796      33.516     245.111       1.900

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 208946.719       0.445    2240.844 1655750.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    189.777    3965.000      27.629     636.796       1.000       1.000       0.980
W Kg/sec =   86.26234

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    111.878    3578.500       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 145992.219  148911.750       1.575     513.330     325.870     401.059       1.231

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   492.72    -0.17   492.72     0.40   601.44
 MEAN    16.97     0.00    -0.02   492.72    -0.17   492.72     0.40
 HUB     14.32     0.00    -0.02   492.72    -0.17   492.72     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.53    46.36     7.17   666.42   828.92    24.68   616.55     0.68
 MEAN    50.01    43.80     6.21   587.21   766.67    24.68   616.55     0.63
 HUB     45.17    37.84     7.33   495.49   698.89    24.68   616.55     0.57

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   576.34   304.12   489.57  1241.64     0.46
 MEAN    16.57   587.92   314.44   496.77  1237.70     0.48
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 HUB     13.89   636.00   386.85   504.82  1233.81     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   601.32   349.15     0.48  5745.13
 MEAN   573.48   560.24   259.03     0.45  5214.45     1.48
 HUB    480.61   513.45    93.76     0.42  5375.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.30     1.17    27.86   668.66     1.05   640.95     0.92     0.91
 MEAN    31.85     1.15    27.29   665.72     1.05   636.89     0.92     0.91
 HUB     31.99     1.16    26.68   666.61     1.05   632.87     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.85    35.50    31.50     4.00     0.93     0.34     2.90
 MEAN    32.33    27.54    23.50     4.04     0.93     0.33     3.29     0.91
 HUB     37.46    10.52     6.50     4.02     0.93     0.34     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     579.506     316.213     485.630    1239.708       0.467       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.998      27.545     638.985      46.000      33.070      32.400      -0.670

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     501.129     316.213     592.555    1246.542       0.402       0.275

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.958      28.588     646.050     456.573       0.018       0.363

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     475.338       0.000     475.338    1248.567       0.381       0.270

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.835     648.150       0.000       0.060       0.037       0.327

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      31.870       1.154     666.997      30.201     248.211       1.924

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188432.188       0.442    2020.837 1634318.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    189.777    3965.000      31.870     666.997       1.000       1.000       0.980
W Kg/sec =   86.26234

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     99.261    3496.547       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 145992.219  148911.750       1.763     509.668     289.147     390.276       1.350

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   442.21    -0.15   442.21     0.35   558.98
 MEAN    15.91     0.00    -0.02   442.21    -0.15   442.21     0.35
 HUB     13.07     0.00    -0.02   442.21    -0.15   442.21     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.11    47.36     7.75   633.89   773.02    29.23   650.70     0.62
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 MEAN    51.24    44.80     6.44   550.61   706.32    29.23   650.70     0.56
 HUB     45.65    38.84     6.81   452.24   632.62    29.23   650.70     0.51
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   536.68   303.19   442.84  1272.26     0.42
 MEAN    15.50   541.17   300.81   449.86  1267.80     0.43
 HUB     12.59   576.62   350.97   457.50  1263.38     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   544.93   317.56     0.43  5441.96
 MEAN   536.24   507.74   235.43     0.40  4664.25     1.53
 HUB    435.63   465.27    84.66     0.37  4420.71

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     36.72     1.15    32.49   697.15     1.05   673.14     0.92     0.91
 MEAN    36.00     1.13    31.76   692.84     1.04   668.43     0.92     0.91
 HUB     35.77     1.12    31.01   691.49     1.04   663.78     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.40    35.64    31.50     4.14     0.93     0.36     2.90
 MEAN    33.77    27.62    23.50     4.12     0.93     0.34     3.34     0.91
 HUB     37.49    10.48     6.50     3.98     0.93     0.33     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      547.467     306.325     453.745    1268.182       0.432       -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.074      31.735      668.847      46.000      34.023      33.000      -1.023

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      473.732     306.325     564.143    1274.118       0.372       0.222

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      36.011      32.731     675.123     440.827       0.034       0.381

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     442.116       0.000     442.116    1276.394       0.346       0.316

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      33.130     677.537       0.000       0.060       0.037       0.313

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.882      35.999       1.130     693.831      26.834     255.859       1.983

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 167570.922       0.435    1797.111 1657996.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1066089.50  11433.2539    185.3932      2.3829      0.8642      4.9534      1.3271
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 105% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     186.954    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   84.97911

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     182.635    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  143820.469  146696.562       1.563     831.557     531.874     619.754       1.165

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   450.57    -0.16   450.57     0.41   710.99
  MEAN    17.06     0.00    -0.02   450.57    -0.16   450.57     0.41
  HUB     12.51     0.00    -0.02   450.57    -0.16   450.57     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.75    50.47     7.28   713.82   844.26    13.47   505.85     0.77
  MEAN    52.65    47.20     5.45   590.30   742.73    13.47   505.85     0.67
  HUB     43.86    38.62     5.24   432.86   624.91    13.47   505.85     0.57

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   705.72   395.79   584.29  1126.00     0.63
  MEAN    18.04   744.60   440.41   600.38  1119.73     0.66
  HUB     15.00   860.76   582.27   633.93  1108.04     0.78

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   665.24   318.04     0.59  8168.25
  MEAN   624.07   627.85   183.66     0.56  7945.93     1.31
  HUB    519.02   637.07    63.26     0.57  8736.06

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.72     1.31    15.13   568.21     1.09   526.63     0.92     0.91
  MEAN    19.58     1.30    14.55   566.98     1.08   520.70     0.92     0.91
  HUB     20.07     1.33    13.46   571.37     1.09   509.56     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     34.11    28.56    24.20     4.36     0.93     0.29     2.90
  MEAN    36.26    17.01    12.70     4.31     0.92     0.24     3.51     0.91
  HUB     42.57    -5.70    -9.30     3.60     0.92     0.09     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.998

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     757.678     439.556     617.144    1119.616       0.677      -0.006

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      19.733      14.515     520.903      24.000      35.460      35.400      -0.060

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	636.091	439.556	773.189	1134.726	0.561	0.275

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.644	15.866	535.058	528.796	0.027	0.427

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	581.002	0.000	581.002	1140.649	0.509	0.344

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.375	540.658	0.000	0.060	0.044	0.369

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.871	19.551	1.294	568.852	46.042	220.546	1.710

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
286652.688	0.563	3028.469	1894596.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 5.453 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
186.954	3965.000	19.551	568.852	1.000	1.000	0.980

W Kg/sec = 84.97911

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
147.205	3786.183	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
143820.469	146696.562	1.377	590.487	428.709	474.134	1.106

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	550.34	-0.19	550.34	0.48	678.97
MEAN	18.08	0.00	-0.02	550.34	-0.19	550.34	0.48	
HUB	15.21	0.00	-0.02	550.34	-0.19	550.34	0.48	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.27	46.36	5.91	711.05	899.30	16.68	543.56	0.79
MEAN	48.67	42.30	6.37	625.53	833.31	16.68	543.56	0.73
HUB	43.73	37.84	5.89	526.28	761.61	16.68	543.56	0.67

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	628.04	324.10	537.95	1173.97	0.53
MEAN	18.01	644.16	338.39	548.12	1169.24	0.55
HUB	15.22	701.71	423.53	559.49	1164.64	0.60

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	706.56	660.05	382.45	0.56	6622.08	
MEAN	623.16	617.69	284.77	0.53	6097.83	1.46
HUB	526.73	568.93	103.21	0.49	6450.22	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.89	1.22	19.66	605.64	1.06	572.71	0.92	0.91
MEAN	23.52	1.20	19.14	602.72	1.06	568.08	0.92	0.91
HUB	23.77	1.22	18.59	604.68	1.06	563.58	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.07	35.41	31.50	3.91	0.93	0.33	2.90	
MEAN	31.69	27.45	23.50	3.95	0.93	0.32	3.30	0.91
HUB	37.13	10.45	6.50	3.95	0.93	0.32	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000
    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     652.845     339.341     557.722    1169.837       0.558       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.683      19.164     568.761      46.000      31.318      30.600      -0.718

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     556.461     339.341     651.767    1179.802       0.472       0.251

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.628      20.285     578.493     511.151       0.022       0.333

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     548.795       0.000     548.795    1180.524       0.465       0.250

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.313     579.200       0.000       0.060       0.037       0.257

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.880      23.560       1.205     604.347      35.495     249.531       1.934

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 221131.391       0.443    2336.241 1700022.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  1.000

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    186.954    3965.000       23.560     604.347       1.000        1.000        0.980
W Kg/sec =   84.97911

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    125.911    3673.315        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 143820.469  146696.562        1.487     545.479     366.717     429.765       1.172

     ROTOR LEADING EDGE CONDITIONS, STAGE             3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02    514.63    -0.18    514.63     0.43    643.34
 MEAN    17.74      0.00    -0.02    514.63    -0.18    514.63     0.43
 HUB     15.05      0.00    -0.02    514.63    -0.18    514.63     0.43

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     53.47     46.36     7.11   694.45    864.49     20.69    582.24      0.73
 MEAN    50.03     43.40     6.63   613.77    801.11     20.69    582.24      0.68
 HUB     45.35     38.84     6.51   520.75    732.26     20.69    582.24      0.62

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81    602.24    323.56    507.94   1211.12      0.50
 MEAN    17.51    616.35    336.62    516.31   1206.85      0.51
 HUB     14.85    670.32    415.88    525.71   1202.65      0.56

       U2        W2        Wu2      MachRel2  DelRCu     Ws1/W2
 TIP    685.45    623.67    361.89      0.51   6413.34
 MEAN   605.75    582.24    269.12      0.48   5896.27      1.49
 HUB    513.83    534.76     97.95      0.44   6178.50

         Pt2       PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     28.30      1.20     23.89    639.95      1.06    609.68      0.92      0.91
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 MEAN    27.89     1.18    23.34   637.08     1.05   605.37     0.92     0.91
 HUB     28.11     1.19    22.76   638.64     1.06   601.15     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.50    35.47    31.50     3.97     0.93     0.34     2.90
 MEAN    33.10    27.53    23.50     4.03     0.93     0.34     3.28     0.91
 HUB     38.35    10.55     6.50     4.05     0.93     0.34     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     622.435     338.833     522.128    1207.640       0.515       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.052      23.399     606.221      46.000      32.981      31.500      -1.481

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     528.681     338.833     627.943    1216.578       0.435       0.264

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.002      24.591     615.228     471.992       0.021       0.360

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     512.325       0.000     512.325    1217.983       0.421       0.277

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.719     616.649       0.000       0.060       0.037       0.291

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      27.922       1.185     638.555      34.208     238.309       1.847

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 213264.391       0.454    2253.126 1620609.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    186.954    3965.000      27.922     638.554       1.000       1.000       0.980
W Kg/sec =   84.97911

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    109.207    3573.571       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 143820.469  146696.562       1.614     513.330     318.090     401.059       1.261

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   479.42    -0.17   479.42     0.39   600.61
 MEAN    16.97     0.00    -0.02   479.42    -0.17   479.42     0.39
 HUB     14.32     0.00    -0.02   479.42    -0.17   479.42     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.28    46.36     7.92   666.42   821.08    25.10   619.38     0.67
 MEAN    50.78    43.80     6.98   587.21   758.19    25.10   619.38     0.62
 HUB     45.95    37.84     8.11   495.49   689.58    25.10   619.38     0.56

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   570.13   314.24   475.70  1244.93     0.46
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 MEAN    16.57   580.44   321.84   483.04  1240.76     0.47
 HUB     13.89   626.95   389.58   491.21  1236.64     0.51
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   584.15   339.02     0.47  5936.12
 MEAN   573.48   544.66   251.64     0.44  5336.89     1.51
 HUB    480.61   499.58    91.03     0.40  5413.64

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.80     1.17    28.40   671.48     1.05   644.37     0.92     0.91
 MEAN    32.28     1.16    27.78   668.15     1.05   640.05     0.92     0.91
 HUB     32.35     1.16    27.14   668.58     1.05   635.80     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.45    35.48    31.50     3.98     0.93     0.35     2.90
 MEAN    33.67    27.52    23.50     4.02     0.93     0.35     3.29     0.91
 HUB     38.42    10.50     6.50     4.00     0.93     0.35     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     572.607     323.647     472.367    1242.676       0.461       0.053

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.427      28.031     642.055      46.000      34.417      32.400      -2.017

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     486.502     323.647     584.322    1250.015       0.389       0.297

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      32.386      29.171     649.661     456.573       0.019       0.384

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     461.764       0.000     461.764    1251.896       0.369       0.290

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.397     651.618       0.000       0.060       0.038       0.345

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      32.296       1.157     669.403      30.849     240.964       1.868

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 192484.047       0.451    2033.583 1599366.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    186.954    3965.000      32.296     669.403       1.000       1.000       0.980
W Kg/sec =   84.97911

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.670    3490.258       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 143820.469  146696.562       1.810     509.668     281.601     390.276       1.386

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   429.87    -0.15   429.87     0.34   557.98
 MEAN    15.91     0.00    -0.02   429.87    -0.15   429.87     0.34
 HUB     13.07     0.00    -0.02   429.87    -0.15   429.87     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.86    47.36     8.50   633.89   766.03    29.77   654.00     0.61
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 MEAN    52.03    44.80     7.23   550.61   698.66    29.77   654.00     0.56
 HUB     46.46    38.84     7.62   452.24   624.05    29.77   654.00     0.50
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   531.64   312.55   430.05  1275.82     0.42
 MEAN    15.50   534.53   307.69   437.09  1271.19     0.42
 HUB     12.59   568.13   353.53   444.73  1266.59     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   529.08   308.19     0.41  5609.94
 MEAN   536.24   493.24   228.55     0.39  4770.77     1.56
 HUB    435.63   452.24    82.10     0.36  4452.89

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     37.35     1.16    33.14   700.49     1.05   676.93     0.92     0.91
 MEAN    36.56     1.13    32.37   695.84     1.04   672.02     0.92     0.91
 HUB     36.26     1.12    31.58   694.08     1.04   667.17     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.01    35.63    31.50     4.13     0.93     0.38     2.90
 MEAN    35.14    27.60    23.50     4.10     0.93     0.36     3.34     0.91
 HUB     38.48    10.46     6.50     3.96     0.93     0.34     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      540.861     313.329     440.857    1271.551       0.425       -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.636      32.348      672.417       46.000      35.402      33.000      -2.402

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      459.508     313.329     556.168    1277.948       0.360       0.247

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       36.570       33.443     679.201     440.827       0.035       0.402

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      429.152       0.000     429.152    1280.062       0.335       0.337

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       33.817      681.450       0.000       0.060       0.039       0.333

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4        Texit         Del T       Ns         Ns nondim
      0.882       36.555        1.132      696.801       27.398      248.342       1.925

Del Enthalpy   Del_H/U^2    GHP       Reynolds#
 171108.703       0.444    1807.754 1622961.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
   1084641.25  11459.1729     182.6354      2.4198       0.8665       5.4534       1.3328
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    P&W Fan Hub + 4 Stage LPC 105% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     184.141    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   83.70042

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     179.887    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  141656.391  144489.219       1.587     831.557     523.871     619.754       1.183

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   442.47    -0.15   442.47     0.40   710.99
  MEAN    17.06     0.00    -0.02   442.47    -0.15   442.47     0.40
  HUB     12.51     0.00    -0.02   442.47    -0.15   442.47     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.21    50.47     7.74   713.82   839.96    13.52   506.46     0.76
  MEAN    53.15    47.20     5.95   590.30   737.85    13.52   506.46     0.67
  HUB     44.38    38.62     5.76   432.86   619.10    13.52   506.46     0.56

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK         AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   699.10   402.78   571.41  1127.65     0.62
  MEAN    18.04   736.69   444.34   587.60  1121.15     0.66
  HUB     15.00   849.60   580.88   620.01  1109.54     0.77

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   650.58   311.04     0.58  8312.49
  MEAN   624.07   614.47   179.73     0.55  8016.70     1.33
  HUB    519.02   623.08    61.86     0.56  8715.04

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.81     1.31    15.28   569.01     1.09   528.21     0.92     0.91
  MEAN    19.63     1.30    14.68   567.37     1.09   522.06     0.92     0.91
  HUB     20.06     1.33    13.60   571.25     1.09   511.03     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     35.18    28.56    24.20     4.36     0.93     0.31     2.90
  MEAN    37.10    17.01    12.70     4.31     0.92     0.26     3.51     0.91
  HUB     43.13    -5.70    -9.30     3.60     0.92     0.10     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.999

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     748.991     443.475     603.587    1121.176       0.668      -0.004

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      19.779      14.659     522.356      24.000      36.306      35.400      -0.906

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     620.622     443.475     762.786    1136.827       0.546       0.293
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      19.692      16.076     537.041     528.796       0.026       0.440

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     567.531       0.000     567.531    1142.390       0.497       0.358

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      16.562     542.309       0.000       0.060       0.042       0.384

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.875      19.608       1.298     569.212      46.402     217.285       1.684

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 288890.125       0.567    3006.182 1860559.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    184.141    3965.000      19.608     569.212       1.000       1.000       0.980
W Kg/sec =   83.70042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    144.614    3784.988       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141656.391  144489.219       1.402     590.487     421.163     474.134       1.126

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   538.03    -0.19   538.03     0.47   678.75
 MEAN    18.08     0.00    -0.02   538.03    -0.19   538.03     0.47
 HUB     15.21     0.00    -0.02   538.03    -0.19   538.03     0.47

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.89    46.36     6.53   711.05   891.82    16.85   545.04     0.78
 MEAN    49.31    42.30     7.01   625.53   825.22    16.85   545.04     0.72
 HUB     44.38    37.84     6.54   526.28   752.76    16.85   545.04     0.66

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   622.01   333.45   525.08  1176.05     0.53
 MEAN    18.01   637.08   345.17   535.48  1171.07     0.54
 HUB     15.22   693.37   426.03   547.05  1166.21     0.59

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   644.14   373.11     0.55  6812.78
 MEAN   623.16   603.34   278.00     0.52  6219.77     1.48
 HUB    526.73   556.24   100.70     0.48  6488.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.09     1.23    19.91   607.05     1.07   574.75     0.92     0.91
 MEAN    23.68     1.21    19.36   603.76     1.06   569.88     0.92     0.91
 HUB     23.86     1.22    18.78   605.25     1.06   565.12     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.42    35.40    31.50     3.90     0.93     0.34     2.90
 MEAN    32.81    27.44    23.50     3.94     0.93     0.33     3.30     0.91
 HUB     37.91    10.43     6.50     3.93     0.93     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     645.405     346.135     544.737    1171.702       0.551       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.832      19.387     570.576      46.000      32.433      30.600      -1.833

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     542.468     346.135     643.491    1182.138       0.459       0.271

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.777      20.577     580.785     511.151       0.022       0.350

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     535.151       0.000     535.151    1182.808       0.452       0.267

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.597     581.443       0.000       0.060       0.038       0.276

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      23.707       1.209     605.355      36.144     243.392       1.887

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 225176.828       0.451    2343.184 1664995.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    184.141    3965.000      23.707     605.355       1.000       1.000       0.980
W Kg/sec =   83.70042

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    123.351    3670.255       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141656.391  144489.219       1.518     545.479     359.262     429.765       1.196

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   502.26    -0.17   502.26     0.42   642.80
 MEAN    17.74     0.00    -0.02   502.26    -0.17   502.26     0.42
 HUB     15.05     0.00    -0.02   502.26    -0.17   502.26     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.13    46.36     7.77   694.45   857.18    20.95   584.30     0.72
 MEAN    50.71    43.40     7.31   613.77   793.21    20.95   584.30     0.67
 HUB     46.05    38.84     7.21   520.75   723.62    20.95   584.30     0.61

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   596.61   332.91   495.09  1213.69      0.49
 MEAN    17.51   609.57   343.44   503.61  1209.19      0.50
 HUB     14.85   662.12   418.42   513.15  1204.76      0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   607.78   352.54     0.50  6598.50
 MEAN   605.75   567.83   262.30     0.47  6015.60      1.51
 HUB    513.83   521.94    95.40     0.43  6216.18

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.61     1.21    24.25   641.98     1.06   612.28     0.92     0.91
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 MEAN    28.15     1.19    23.66   638.75     1.06   607.74     0.92     0.91
 HUB     28.31     1.19    23.05   639.86     1.06   603.28     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.92    35.45    31.50     3.95     0.93     0.36     2.90
 MEAN    34.29    27.51    23.50     4.01     0.93     0.35     3.28     0.91
 HUB     39.19    10.53     6.50     4.03     0.93     0.35     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     615.514     345.698     509.264    1209.982       0.509       0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.308      23.721     608.577      46.000      34.169      31.500      -2.669

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     514.723     345.698     620.038    1219.397       0.422       0.285

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.255      24.993     618.084     471.992       0.021       0.378

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     499.058       0.000     499.058    1220.703       0.409       0.295

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.106     619.409       0.000       0.060       0.039       0.309

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      28.172       1.188     640.195      34.840     232.210       1.800

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 217211.094       0.462    2260.292 1586868.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    184.141    3965.000      28.172     640.195       1.000       1.000       0.980
W Kg/sec =   83.70042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.746    3568.989       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141656.391  144489.219       1.651     513.330     310.925     401.059       1.290

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   467.34    -0.16   467.34     0.38   599.84
 MEAN    16.97     0.00    -0.02   467.34    -0.16   467.34     0.38
 HUB     14.32     0.00    -0.02   467.34    -0.16   467.34     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.97    46.36     8.61   666.42   814.08    25.47   621.98     0.67
 MEAN    51.49    43.80     7.69   587.21   750.60    25.47   621.98     0.61
 HUB     46.68    37.84     8.84   495.49   681.23    25.47   621.98     0.56

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   564.91   323.28   463.27  1247.89     0.45
 MEAN    16.57   573.96   328.46   470.69  1243.53     0.46
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 HUB     13.89   618.92   392.05   478.92  1239.21     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   568.78   329.99     0.46  6106.63
 MEAN   573.48   530.64   245.02     0.43  5446.52     1.54
 HUB    480.61   487.04    88.56     0.39  5447.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     33.22     1.18    28.86   674.06     1.05   647.44     0.92     0.91
 MEAN    32.65     1.16    28.21   670.40     1.05   642.92     0.92     0.91
 HUB     32.65     1.16    27.53   670.41     1.05   638.46     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.91    35.46    31.50     3.96     0.93     0.37     2.90
 MEAN    34.91    27.50    23.50     4.00     0.93     0.36     3.29     0.91
 HUB     39.30    10.48     6.50     3.98     0.93     0.36     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     566.645     330.303     460.419    1245.363       0.455       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.794      28.449     644.842      46.000      35.655      32.400      -3.255

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     473.430     330.303     577.266    1253.147       0.378       0.318

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      32.749      29.674     652.929     456.573       0.020       0.403

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     449.646       0.000     449.646    1254.903       0.358       0.308

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.878     654.760       0.000       0.060       0.040       0.362

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      32.653       1.159     671.623      31.428     234.601       1.819

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 196109.625       0.460    2040.711 1565961.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    184.141    3965.000      32.653     671.623       1.000       1.000       0.980
W Kg/sec =   83.70042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.329    3484.484       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141656.391  144489.219       1.855     509.668     274.783     390.276       1.420

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   418.83    -0.14   418.83     0.33   557.06
 MEAN    15.91     0.00    -0.02   418.83    -0.14   418.83     0.33
 HUB     13.07     0.00    -0.02   418.83    -0.14   418.83     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.55    47.36     9.19   633.89   759.88    30.24   657.00     0.60
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 MEAN    52.75    44.80     7.95   550.61   691.92    30.24   657.00     0.55
 HUB     47.21    38.84     8.37   452.24   616.50    30.24   657.00     0.49
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   527.53   320.85   418.74  1279.01     0.41
 MEAN    15.50   528.89   313.79   425.75  1274.23     0.42
 HUB     12.59   560.68   355.76   433.35  1269.50     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   515.05   299.90     0.40  5758.63
 MEAN   536.24   480.36   222.45     0.38  4865.23     1.59
 HUB    435.63   440.65    79.86     0.35  4480.95

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     37.88     1.16    33.69   703.53     1.05   680.34     0.92     0.91
 MEAN    37.03     1.13    32.89   698.58     1.04   675.26     0.92     0.91
 HUB     36.67     1.12    32.07   696.45     1.04   670.25     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.46    35.61    31.50     4.11     0.93     0.39     2.90
 MEAN    36.39    27.59    23.50     4.09     0.93     0.37     3.34     0.91
 HUB     39.38    10.44     6.50     3.94     0.93     0.35     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      535.263     319.540      429.419    1274.581       0.420       -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     37.109      32.867      675.640       46.000      36.654      33.000      -3.654

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      446.992     319.540      549.461    1281.380       0.349       0.269

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      37.036       34.045     682.867     440.827       0.037       0.421

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     417.723       0.000     417.723    1283.357       0.325       0.355

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      34.397      684.976       0.000       0.060       0.041       0.351

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      37.018       1.134     699.520      27.897     241.824       1.875

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 174237.062       0.452    1813.106 1589508.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1101624.75  11463.4766    179.8873      2.4504      0.8669      5.9529      1.3380
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 105% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.026   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     178.130    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   80.96808

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     174.015    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  137032.094  139772.453       1.641     831.557     506.769     619.754       1.223

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   425.44    -0.15   425.44     0.38   710.99
  MEAN    17.06     0.00    -0.02   425.44    -0.15   425.44     0.38
  HUB     12.51     0.00    -0.02   425.44    -0.15   425.44     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.21    50.47     8.74   713.82   831.12    13.64   507.69     0.75
  MEAN    54.23    47.20     7.03   590.30   727.76    13.64   507.69     0.66
  HUB     45.50    38.62     6.88   432.86   607.04    13.64   507.69     0.55

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   686.46   416.98   545.31  1130.88     0.61
  MEAN    18.04   721.07   452.38   561.52  1123.97     0.64
  HUB     15.00   827.22   578.06   591.72  1112.50     0.74

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   620.86   296.84     0.55  8605.39
  MEAN   624.07   587.18   171.69     0.52  8161.56     1.38
  HUB    519.02   594.66    59.05     0.53  8672.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.99     1.32    15.58   570.64     1.09   531.29     0.92     0.91
  MEAN    19.72     1.31    14.94   568.17     1.09   524.76     0.92     0.91
  HUB     20.04     1.33    13.87   571.02     1.09   513.91     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     37.40    28.56    24.20     4.36     0.93     0.34     2.90
  MEAN    38.86    17.00    12.70     4.30     0.93     0.28     3.51     0.91
  HUB     44.33    -5.70    -9.30     3.60     0.93     0.13     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     731.981     451.497     576.148    1124.217       0.651      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.865      14.936     525.193      24.000      38.084      35.400      -2.684

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     589.932     451.497     742.879    1140.879       0.517       0.328
  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.777      16.477     540.877     528.796       0.027       0.467

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     540.721       0.000     540.721    1145.770       0.472       0.387

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.915     545.524       0.000       0.060       0.041       0.413

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      19.706       1.304     569.944      47.134     210.574       1.632

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 293452.344       0.576    2953.972 1788956.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.026   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    178.130    3965.000      19.706     569.944       1.000       1.000       0.980
W Kg/sec =   80.96808

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    139.286    3782.554       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 137032.094  139772.453       1.456     590.487     405.648     474.134       1.169

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   513.39    -0.18   513.39     0.45   678.32
 MEAN    18.08     0.00    -0.02   513.39    -0.18   513.39     0.45
 HUB     15.21     0.00    -0.02   513.39    -0.18   513.39     0.45

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.18    46.36     7.82   711.05   877.16    17.18   547.94     0.76
 MEAN    50.63    42.30     8.33   625.53   809.37    17.18   547.94     0.70
 HUB     45.72    37.84     7.88   526.28   735.34    17.18   547.94     0.64

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   611.22   351.66   499.93  1180.02     0.52
 MEAN    18.01   623.84   358.45   510.58  1174.59     0.53
 HUB     15.22   677.20   430.93   522.40  1169.26     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   613.09   354.90     0.52  7184.50
 MEAN   623.16   575.12   264.71     0.49  6458.95     1.53
 HUB    526.73   531.12    95.81     0.45  6562.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.46     1.24    20.37   609.85     1.07   578.66     0.92     0.91
 MEAN    23.95     1.22    19.76   605.82     1.06   573.33     0.92     0.91
 HUB     24.02     1.22    19.13   606.40     1.06   568.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.12    35.37    31.50     3.87     0.93     0.37     2.90
 MEAN    35.07    27.40    23.50     3.90     0.93     0.36     3.30     0.91
 HUB     39.52    10.39     6.50     3.89     0.93     0.35     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     631.525     359.461     519.242    1175.269       0.537       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.099      19.795     574.057      46.000      34.694      30.600      -4.094

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     515.352     359.461     628.331    1186.602       0.434       0.309

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.036      21.111     585.181     511.151       0.024       0.385

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     508.792       0.000     508.792    1187.171       0.429       0.300

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.112     585.742       0.000       0.060       0.042       0.310

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      23.957       1.216     607.356      37.412     231.680       1.796

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 233081.891       0.467    2346.266 1593116.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.026   EfDer =  0.997

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    178.130    3965.000      23.957     607.356       1.000       1.000       0.980
W Kg/sec =   80.96808

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    118.273    3664.203       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 137032.094  139772.453       1.584     545.479     344.472     429.765       1.248

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   478.23    -0.16   478.23     0.40   641.74
 MEAN    17.74      0.00    -0.02   478.23    -0.16   478.23     0.40
 HUB     15.05      0.00    -0.02   478.23    -0.16   478.23     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.45     46.36     9.09   694.45   843.32    21.43   588.27     0.71
 MEAN    52.08     43.40     8.68   613.77   778.22    21.43   588.27     0.65
 HUB     47.45     38.84     8.61   520.75   707.14    21.43   588.27     0.59

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   586.90    350.65    470.63  1218.53      0.48
 MEAN    17.51   597.32    356.45    479.30  1213.63      0.49
 HUB     14.85   646.71    423.25    488.98  1208.80      0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   577.57   334.80     0.47  6949.67
 MEAN   605.75   540.26   249.30     0.45  6243.11      1.57
 HUB    513.83   497.30    90.58     0.41  6287.70

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     29.16      1.22    24.88   645.93     1.06   617.18     0.92     0.91
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 MEAN    28.60     1.19    24.23   642.01     1.06   612.23     0.92     0.91
 HUB     28.63     1.20    23.56   642.26     1.06   607.35     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.69    35.43    31.50     3.93     0.93     0.39     2.90
 MEAN    36.64    27.48    23.50     3.98     0.93     0.38     3.28     0.91
 HUB     40.88    10.49     6.50     3.99     0.93     0.37     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     603.021     358.788     484.670    1214.414       0.497       0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.750      24.288     613.051      46.000      36.512      31.500      -5.012

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     488.342     358.788     605.976    1224.716       0.399       0.325

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.686      25.706     623.495     471.992       0.024       0.414

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     474.028       0.000     474.028    1225.845       0.387       0.327

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.785     624.645       0.000       0.060       0.045       0.342

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      28.590       1.193     643.398      36.041     220.891       1.712

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 224711.250       0.478    2262.005 1518140.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.026   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    178.130    3965.000      28.590     643.398       1.000       1.000       0.980
W Kg/sec =   80.96808

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.006    3560.095       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 137032.094  139772.453       1.728     513.330     297.122     401.059       1.350

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   444.45    -0.15   444.45     0.36   598.35
 MEAN    16.97     0.00    -0.02   444.45    -0.15   444.45     0.36
 HUB     14.32     0.00    -0.02   444.45    -0.15   444.45     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.31    46.36     9.95   666.42   801.16    26.11   626.92     0.65
 MEAN    52.89    43.80     9.09   587.21   736.56    26.11   626.92     0.60
 HUB     48.12    37.84    10.28   495.49   665.73    26.11   626.92     0.54

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   556.20   340.10   440.10  1253.42     0.44
 MEAN    16.57   562.54   340.80   447.55  1248.74     0.45
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HUB     13.89   604.19   396.59   455.80  1244.08     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    653.27   540.15   313.17     0.43  6423.98
MEAN   573.48   504.42   232.67     0.40  5651.01     1.59
HUB    480.61   463.48    84.02     0.37  5510.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     33.95     1.19    29.65   679.02     1.06   653.22     0.92     0.91
MEAN    33.27     1.16    28.94   674.73     1.05   648.34     0.92     0.91
HUB     33.15     1.16    28.20   673.96     1.05   643.51     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.70    35.44    31.50     3.94     0.93     0.40     2.90
MEAN    37.29    27.47    23.50     3.97     0.93     0.38     3.29     0.91
HUB     41.03    10.44     6.50     3.94     0.93     0.38     3.90

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     556.168     342.718     438.027    1250.419       0.445       0.049

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    33.409      29.163     650.106      46.000      38.040      32.400      -5.640

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     449.160     342.718     564.979    1259.018       0.357       0.356

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      33.353      30.542     659.078     456.573       0.023       0.439

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     427.171       0.000     427.171    1260.552       0.339       0.340

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      30.699     660.685       0.000       0.060       0.047       0.391

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.873      33.241       1.163     675.904      32.507     223.054       1.729

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 202856.188       0.475    2042.006 1498226.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.026   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    178.130    3965.000      33.241     675.904       1.000       1.000       0.980
W Kg/sec =   80.96808

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.923    3473.432       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 137032.094  139772.453       1.946     509.668     261.951     390.276       1.490

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   398.29    -0.14   398.29     0.32   555.29
 MEAN    15.91     0.00    -0.02   398.29    -0.14   398.29     0.32
 HUB     13.07     0.00    -0.02   398.29    -0.14   398.29     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.86    47.36    10.50   633.89   748.75    31.02   662.68     0.59
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 MEAN    54.13    44.80     9.33   550.61   679.67    31.02   662.68     0.54
 HUB     48.64    38.84     9.80   452.24   602.73    31.02   662.68     0.48
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   520.82   335.99   397.96  1284.95     0.41
 MEAN    15.50   519.13   324.95   404.84  1279.94     0.41
 HUB     12.59   547.26   359.85   412.31  1274.95     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   489.34   284.76     0.38  6030.09
 MEAN   536.24   456.66   211.28     0.36  5038.19     1.65
 HUB    435.63   419.21    75.77     0.33  4532.37

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     38.76     1.17    34.62   709.31     1.05   686.70     0.92     0.91
 MEAN    37.81     1.14    33.76   703.82     1.04   681.36     0.92     0.91
 HUB     37.34     1.12    32.89   701.01     1.04   676.05     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.17    35.59    31.50     4.09     0.93     0.42     2.90
 MEAN    38.75    27.56    23.50     4.06     0.93     0.40     3.34     0.91
 HUB     41.11    10.41     6.50     3.91     0.93     0.38     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      525.592     330.913     408.342    1280.247       0.411      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     37.887      33.735      681.690      46.000      39.021      33.000      -6.021

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      424.160     330.913     537.973    1287.764       0.329       0.308

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      37.791      35.054     689.719     440.827       0.043       0.458

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     396.828       0.000     396.828    1289.508       0.308       0.387

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      35.364     691.589       0.000       0.060       0.049       0.381

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      37.766       1.136     704.713      28.809     230.176       1.784

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 179956.484       0.467    1811.491 1521665.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1134058.12  11415.7402    174.0149      2.4999      0.8635      7.0256      1.3479
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 105% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.973   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     172.852    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   78.56920

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     168.859    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  132972.188  135631.328       1.691     831.557     491.755     619.754       1.260

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   410.77    -0.14   410.77     0.37   710.99
  MEAN    17.06     0.00    -0.02   410.77    -0.14   410.77     0.37
  HUB     12.51     0.00    -0.02   410.77    -0.14   410.77     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.09    50.47     9.62   713.82   823.70    13.73   508.72     0.74
  MEAN    55.17    47.20     7.97   590.30   719.28    13.73   508.72     0.65
  HUB     46.51    38.62     7.89   432.86   596.85    13.73   508.72     0.54

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   676.85   428.71   523.77  1133.43     0.60
  MEAN    18.04   708.63   459.05   539.84  1126.22     0.63
  HUB     15.00   808.94   575.71   568.28  1114.88     0.73

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   596.34   285.11     0.53  8847.18
  MEAN   624.07   564.50   165.02     0.50  8281.86     1.43
  HUB    519.02   571.10    56.69     0.51  8637.45

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.14     1.33    15.82   571.99     1.09   533.73     0.92     0.91
  MEAN    19.79     1.31    15.15   568.84     1.09   526.91     0.92     0.91
  HUB     20.01     1.32    14.09   570.82     1.09   516.20     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     39.30    28.56    24.20     4.36     0.93     0.37     2.90
  MEAN    40.38    17.00    12.70     4.30     0.93     0.31     3.51     0.91
  HUB     45.37    -5.70    -9.30     3.60     0.93     0.15     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     718.524     458.159     553.504    1126.607       0.638       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.928      15.151     527.429      24.000      39.616      35.400      -4.216

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	565.127	458.159	727.515	1144.037	0.494	0.356

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.833	16.783	543.875	528.796	0.029	0.490

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	519.057	0.000	519.057	1148.417	0.452	0.409

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.178	548.047	0.000	0.060	0.043	0.435

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	19.766	1.308	570.550	47.740	204.941	1.589

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
297221.531	0.583	2903.271	1727269.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.973 EfDer = 0.994

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
172.852	3965.000	19.766	570.550	1.000	1.000	0.980

W Kg/sec = 78.56920

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
134.821	3780.546	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
132972.188	135631.328	1.504	590.487	392.644	474.134	1.208

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	493.37	-0.17	493.37	0.43	677.96
MEAN	18.08	0.00	-0.02	493.37	-0.17	493.37	0.43	
HUB	15.21	0.00	-0.02	493.37	-0.17	493.37	0.43	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.25	46.36	8.89	711.05	865.59	17.42	550.23	0.75
MEAN	51.74	42.30	9.44	625.53	796.81	17.42	550.23	0.69
HUB	46.86	37.84	9.02	526.28	721.50	17.42	550.23	0.63

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	603.64	366.05	479.99	1183.07	0.51
MEAN	18.01	613.96	369.03	490.68	1177.31	0.52
HUB	15.22	664.55	434.81	502.56	1171.65	0.57

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	706.56	588.50	340.50	0.50	7478.29	
MEAN	623.16	552.59	254.14	0.47	6649.25	1.57
HUB	526.73	510.90	91.92	0.44	6621.68	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.72	1.25	20.69	612.09	1.07	581.67	0.92	0.91
MEAN	24.13	1.22	20.04	607.48	1.06	576.01	0.92	0.91
HUB	24.11	1.22	19.38	607.33	1.06	570.46	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.33	35.35	31.50	3.85	0.93	0.39	2.90	
MEAN	36.95	27.38	23.50	3.88	0.94	0.38	3.30	0.91
HUB	40.87	10.37	6.50	3.87	0.94	0.37	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994
    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     621.185     370.064     498.923    1178.020       0.527       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.279      20.085     576.749      46.000      36.565      30.600      -5.965

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     494.023     370.064     617.257    1190.051       0.415       0.340

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.204      21.494     588.589     511.151       0.027       0.414

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     488.124       0.000     488.124    1190.540       0.410       0.325

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.475     589.073       0.000       0.060       0.049       0.335

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      24.114       1.220     608.967      38.417     222.644       1.726

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 239346.094       0.479    2337.941 1532803.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.973   EfDer =  0.992

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    172.852    3965.000      24.114     608.967       1.000       1.000       0.980
W Kg/sec =   78.56920

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    114.174    3659.355       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 132972.188  135631.328       1.640     545.479     332.535     429.765       1.292

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   459.29    -0.16   459.29     0.39   640.89
 MEAN    17.74      0.00    -0.02   459.29    -0.16   459.29     0.39
 HUB     15.05      0.00    -0.02   459.29    -0.16   459.29     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.53     46.36     10.17   694.45   832.72    21.77   591.36     0.70
 MEAN    53.20     43.40      9.80   613.77   766.72    21.77   591.36     0.64
 HUB     48.60     38.84      9.76   520.75   694.47    21.77   591.36     0.58

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   580.33   364.29   451.75  1222.21     0.47
 MEAN    17.51   588.46   366.47   460.42  1217.04     0.48
 HUB     14.85   635.03   426.95   470.08  1211.93     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   554.28   321.16     0.45  7219.73
 MEAN   605.75   518.88   239.27     0.43  6418.51     1.61
 HUB    513.83   478.04    86.88     0.39  6342.59

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     29.53     1.22    25.30   649.04     1.07   620.93     0.92     0.91
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 MEAN    28.89     1.20    24.61   644.59     1.06   615.69     0.92     0.91
 HUB     28.83     1.20    23.90   644.17     1.06   610.52     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.88    35.41    31.50     3.91     0.93     0.41     2.90
 MEAN    38.52    27.46    23.50     3.96     0.94     0.40     3.28     0.91
 HUB     42.25    10.47     6.50     3.97     0.94     0.39     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     594.000     368.879     465.579    1217.807       0.488       0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.037      24.673     616.488      46.000      38.390      31.500      -6.890

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     468.097     368.879     595.975    1228.779       0.381       0.355

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.959      26.197     627.647     471.992       0.027       0.443

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     454.850       0.000     454.850    1229.777       0.370       0.351

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.244     628.667       0.000       0.060       0.052       0.366

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.868      28.847       1.196     645.932      36.966     212.395       1.646

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 230482.656       0.491    2251.363 1460795.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.973   EfDer =  0.991

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    172.852    3965.000       28.847     645.932       1.000       1.000       0.980
W Kg/sec =   78.56920

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     98.294    3553.103        1.401       0.249      53.349      56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 132972.188  135631.328        1.793     513.330     286.310     401.059       1.401

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   426.84    -0.15   426.84      0.35   597.17
 MEAN    16.97      0.00    -0.02   426.84    -0.15   426.84      0.35
 HUB     14.32      0.00    -0.02   426.84    -0.15   426.84      0.35

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     57.37    46.36    11.01   666.42   791.52     26.55    630.74      0.64
 MEAN    53.99    43.80    10.19   587.21   726.07     26.55    630.74      0.59
 HUB     49.27    37.84    11.43   495.49   654.10     26.55    630.74      0.53

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   550.44   352.74   422.57  1257.61      0.44
 MEAN    16.57   554.47   350.12   429.95  1252.70      0.44
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 HUB     13.89   593.26   400.01   438.13  1247.81     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   518.54   300.53     0.41  6662.53
 MEAN   573.48   484.50   223.36     0.39  5805.32     1.64
 HUB    480.61   445.48    80.60     0.36  5558.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.42     1.19    30.17   682.88     1.06   657.61     0.92     0.91
 MEAN    33.66     1.17    29.42   678.12     1.05   652.48     0.92     0.91
 HUB     33.44     1.16    28.65   676.75     1.05   647.40     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.85    35.42    31.50     3.92     0.93     0.42     2.90
 MEAN    39.16    27.45    23.50     3.95     0.94     0.41     3.29     0.91
 HUB     42.40    10.42     6.50     3.92     0.94     0.40     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     548.800     352.088     420.970    1254.270       0.438       0.047

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.796      29.628     654.133      46.000      39.908      32.400      -7.508

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     430.848     352.088     556.413    1263.475       0.341       0.385

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.726      31.116     663.770     456.573       0.026       0.468

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     410.221       0.000     410.221    1264.851       0.324       0.362

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      31.233     665.216       0.000       0.060       0.055       0.411

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      33.596       1.165     679.251      33.318     214.574       1.663

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 207934.250       0.487    2031.109 1441874.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.973   EfDer =  0.990

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    172.852    3965.000      33.596     679.251       1.000       1.000       0.980
W Kg/sec =   78.56920

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.549    3464.865       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132972.188  135631.328       2.021     509.668     252.128     390.276       1.548

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   382.75    -0.13   382.75     0.30   553.92
 MEAN    15.91     0.00    -0.02   382.75    -0.13   382.75     0.30
 HUB     13.07     0.00    -0.02   382.75    -0.13   382.75     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.88    47.36    11.52   633.89   740.60    31.53   667.04     0.58
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MEAN    55.20    44.80    10.40   550.61   670.68    31.53   667.04     0.53
HUB     49.77    38.84    10.93   452.24   592.57    31.53   667.04     0.47
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   516.55   347.22   382.44  1289.43     0.40
MEAN    15.50   512.37   333.28   389.16  1284.26     0.40
HUB     12.59   537.46   362.87   396.46  1279.10     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.74   470.18   273.52     0.36  6231.56
MEAN   536.24   438.91   202.96     0.34  5167.09     1.69
HUB    435.63   403.08    72.76     0.32  4570.28

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     39.32     1.17    35.20   713.77     1.05   691.53     0.92     0.91
MEAN    38.29     1.14    34.31   707.87     1.04   686.00     0.92     0.91
HUB     37.73     1.12    33.41   704.57     1.04   680.50     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.24    35.57    31.50     4.07     0.93     0.45     2.90
MEAN    40.58    27.54    23.50     4.04     0.94     0.42     3.34     0.91
HUB     42.47    10.40     6.50     3.90     0.94     0.39     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.990

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      518.916     339.388     392.543    1284.539       0.404       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     38.364      34.283      686.297       46.000      40.846      33.000      -7.846

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      407.205     339.388     530.094    1292.582       0.315       0.336

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       38.243       35.699     694.919     440.827       0.049       0.486

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      381.277       0.000     381.277    1294.165       0.295       0.409

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       35.976      696.622       0.000       0.060       0.057       0.403

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4       Texit         Del T       Ns         Ns nondim
      0.864       38.211        1.137     708.737       29.486     221.727       1.719

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 184204.703       0.478    1799.318 1465153.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
   1159189.25  11323.0029     168.8593      2.5293       0.8572       7.9735       1.3556
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    P&W Fan Hub + 4 Stage LPC 105% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     167.434    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   76.10618

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     163.566    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  128803.711  131379.516       1.746     831.557     476.339     619.754       1.301

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   395.96    -0.14   395.96     0.36   710.99
  MEAN    17.06     0.00    -0.02   395.96    -0.14   395.96     0.36
  HUB     12.51     0.00    -0.02   395.96    -0.14   395.96     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.99    50.47    10.52   713.82   816.41    13.83   509.71     0.74
  MEAN    56.15    47.20     8.95   590.30   710.92    13.83   509.71     0.64
  HUB     47.56    38.62     8.94   432.86   586.75    13.83   509.71     0.53

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   668.21   440.14   502.77  1135.82     0.59
  MEAN    18.04   696.91   465.57   518.58  1128.34     0.62
  HUB     15.00   791.33   573.41   545.34  1117.12     0.71

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   572.43   273.68     0.50  9083.00
  MEAN   624.07   542.26   158.50     0.48  8399.40     1.47
  HUB    519.02   548.04    54.40     0.49  8602.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.27     1.34    16.03   573.30     1.10   536.01     0.92     0.91
  MEAN    19.84     1.31    15.34   569.50     1.09   528.94     0.92     0.91
  HUB     19.97     1.32    14.28   570.63     1.09   518.35     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     41.20    28.56    24.20     4.36     0.93     0.39     2.90
  MEAN    41.92    16.99    12.70     4.29     0.93     0.33     3.51     0.91
  HUB     46.44    -5.70    -9.30     3.60     0.93     0.18     4.78

    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.996

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     705.905     464.668     531.400    1128.839       0.625       0.002

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      19.981      15.347     529.521      24.000      41.167      35.400      -5.767

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     541.278     464.668     713.371    1146.973       0.472       0.383

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.875      17.060     546.670     528.796       0.032       0.514

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     498.435       0.000     498.435    1150.869       0.433       0.427

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.402     550.390       0.000       0.060       0.048       0.454

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      19.800       1.311     571.141      48.331     199.364       1.545

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 300899.531       0.591    2847.058 1664984.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    167.434    3965.000      19.800     571.141       1.000       1.000       0.980
W Kg/sec =   76.10618

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    130.442    3778.590       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 128803.711  131379.516       1.554     590.487     379.892     474.134       1.248

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   474.22    -0.16   474.22     0.41   677.60
 MEAN    18.08     0.00    -0.02   474.22    -0.16   474.22     0.41
 HUB     15.21     0.00    -0.02   474.22    -0.16   474.22     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.31    46.36     9.95   711.05   854.82    17.62   552.36     0.74
 MEAN    52.84    42.30    10.54   625.53   785.10    17.62   552.36     0.68
 HUB     47.99    37.84    10.15   526.28   708.54    17.62   552.36     0.61

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   597.33   379.50   461.28  1185.85     0.50
 MEAN    18.01   605.20   378.94   471.88  1179.82     0.51
 HUB     15.22   652.85   438.45   483.71  1173.87     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   565.46   327.05     0.48  7752.80
 MEAN   623.16   531.34   244.23     0.45  6827.61     1.61
 HUB    526.73   491.70    88.28     0.42  6677.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.93     1.26    20.96   614.20     1.08   584.41     0.92     0.90
 MEAN    24.27     1.23    20.28   609.06     1.07   578.49     0.92     0.90
 HUB     24.16     1.22    19.58   608.23     1.06   572.65     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.44    35.34    31.50     3.84     0.93     0.41     2.90
 MEAN    38.77    27.36    23.50     3.86     0.94     0.40     3.30     0.90
 HUB     42.19    10.34     6.50     3.84     0.94     0.39     3.92

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     612.023     380.002     479.762    1180.543       0.518       0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.411      20.319     579.224      46.000      38.381      30.600      -7.781

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     474.100     380.002     607.596    1193.221       0.397       0.368

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.321      21.811     591.732     511.151       0.031       0.442

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     468.859       0.000     468.859    1193.637       0.393       0.347

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.770     592.144       0.000       0.060       0.057       0.358

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      24.216       1.223     610.498      39.358     214.356       1.662

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 245208.984       0.491    2320.124 1473157.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    167.434    3965.000      24.216     610.498       1.000       1.000       0.980
W Kg/sec =   76.10618

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    110.265    3654.762       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 128803.711  131379.516       1.699     545.479     321.153     429.765       1.338

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   441.56    -0.15   441.56     0.37   640.09
 MEAN    17.74     0.00    -0.02   441.56    -0.15   441.56     0.37
 HUB     15.05     0.00    -0.02   441.56    -0.15   441.56     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.56    46.36    11.20   694.45   823.07    22.04   594.23     0.69
 MEAN    54.27    43.40    10.87   613.77   756.23    22.04   594.23     0.63
 HUB     49.71    38.84    10.87   520.75   682.87    22.04   594.23     0.57

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   575.01   376.80   434.34  1225.55     0.47
 MEAN    17.51   580.80   375.72   442.91  1220.16     0.48
 HUB     14.85   624.46   430.35   452.49  1214.81     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   532.84   308.65     0.43  7467.52
 MEAN   605.75   499.08   230.03     0.41  6580.25     1.65
 HUB    513.83   460.12    83.48     0.38  6392.96

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.81     1.23    25.63   651.94     1.07   624.35     0.92     0.90
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 MEAN    29.10     1.20    24.91   647.02     1.06   618.87     0.92     0.90
 HUB     28.95     1.20    24.17   645.98     1.06   613.44     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.94    35.40    31.50     3.90     0.93     0.43     2.90
 MEAN    40.31    27.45    23.50     3.95     0.94     0.42     3.28     0.90
 HUB     43.56    10.45     6.50     3.95     0.94     0.41     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     586.204     378.185     447.896    1220.905       0.480       0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.241      24.970     619.638      46.000      40.176      31.500      -8.676

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     449.493     378.185     587.424    1232.490       0.365       0.384

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.148      26.586     631.453     471.992       0.031       0.471

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     437.238       0.000     437.238    1233.375       0.355       0.372

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.601     632.360       0.000       0.060       0.061       0.387

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      29.018       1.198     648.314      37.815     204.732       1.587

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 235787.875       0.502    2230.983 1404228.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    167.434    3965.000      29.018     648.314       1.000       1.000       0.980
W Kg/sec =   76.10618

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.827    3546.571       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 128803.711  131379.516       1.858     513.330     276.214     401.059       1.452

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   410.62    -0.14   410.62     0.33   596.07
 MEAN    16.97     0.00    -0.02   410.62    -0.14   410.62     0.33
 HUB     14.32     0.00    -0.02   410.62    -0.14   410.62     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.37    46.36    12.01   666.42   782.88    26.88   634.25     0.63
 MEAN    55.04    43.80    11.24   587.21   716.65    26.88   634.25     0.58
 HUB     50.36    37.84    12.52   495.49   643.63    26.88   634.25     0.52

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   545.85   364.18   406.60  1261.40     0.43
 MEAN    16.57   547.58   358.57   413.85  1256.31     0.44
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 HUB     13.89   583.51   403.09   421.90  1251.23     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   498.89   289.09     0.40  6878.53
 MEAN   573.48   466.32   214.91     0.37  5945.27     1.68
 HUB    480.61   428.96    77.52     0.34  5600.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.76     1.20    30.56   686.45     1.06   661.61     0.92     0.90
 MEAN    33.93     1.17    29.78   681.28     1.05   656.27     0.92     0.90
 HUB     33.63     1.16    28.97   679.37     1.05   650.98     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.85    35.41    31.50     3.91     0.93     0.44     2.90
 MEAN    40.91    27.44    23.50     3.94     0.94     0.42     3.29     0.90
 HUB     43.69    10.41     6.50     3.91     0.94     0.41     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     542.527     360.585     405.357    1257.784       0.431       0.045

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.065      29.973     657.822      46.000      41.655      32.400      -9.255

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     414.196     360.585     549.163    1267.534       0.327       0.412

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.979      31.555     668.060     456.573       0.030       0.496

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     394.805       0.000     394.805    1268.775       0.311       0.382

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      31.632     669.369       0.000       0.060       0.064       0.429

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.855      33.830       1.166     682.367      34.053     207.032       1.605

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 212532.844       0.498    2010.948 1386332.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.984

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    167.434    3965.000      33.830     682.367       1.000       1.000       0.980
W Kg/sec =   76.10618

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.447    3456.944       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 128803.711  131379.516       2.097     509.668     243.095     390.276       1.605

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   368.59    -0.13   368.59     0.29   552.65
 MEAN    15.91     0.00    -0.02   368.59    -0.13   368.59     0.29
 HUB     13.07     0.00    -0.02   368.59    -0.13   368.59     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.83    47.36    12.47   633.89   733.37    31.91   671.05     0.58
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 MEAN    56.21    44.80    11.41   550.61   662.69    31.91   671.05     0.52
 HUB     50.83    38.84    11.99   452.24   583.51    31.91   671.05     0.46
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   513.22   357.31   368.40  1293.50     0.40
 MEAN    15.50   506.64   340.74   374.94  1288.20     0.39
 HUB     12.59   528.79   365.58   382.06  1282.90     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   452.90   263.44     0.35  6412.42
 MEAN   536.24   422.85   195.50     0.33  5282.63     1.74
 HUB    435.63   388.43    70.05     0.30  4604.32

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     39.70     1.17    35.62   717.88     1.05   695.94     0.92     0.90
 MEAN    38.62     1.14    34.71   711.63     1.04   690.24     0.92     0.90
 HUB     37.98     1.12    33.79   707.87     1.04   684.57     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.12    35.57    31.50     4.07     0.93     0.47     2.90
 MEAN    42.26    27.54    23.50     4.04     0.94     0.44     3.34     0.90
 HUB     43.74    10.39     6.50     3.89     0.94     0.41     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      513.273     346.985     378.220    1288.446       0.398       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     38.686      34.677      690.509       46.000      42.534      33.000      -9.534

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      391.930     346.985     523.458    1296.957       0.302       0.361

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       38.540      36.173     699.661     440.827       0.056       0.513

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      367.244       0.000     367.244    1298.403       0.283       0.429

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       36.419      701.223       0.000       0.060       0.066       0.422

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4       Texit         Del T       Ns         Ns nondim
      0.855       38.501        1.138     712.460       30.093     214.268       1.661

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188016.562       0.488    1778.980 1409360.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
   1182445.75  11188.0938     163.5658      2.5485       0.8481       8.9533       1.3628
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 105% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     161.944    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   73.61079

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     158.203    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  124580.477  127071.820       1.805     831.557     460.721     619.754       1.345

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   381.19    -0.13   381.19     0.34   710.99
  MEAN    17.06     0.00    -0.02   381.19    -0.13   381.19     0.34
  HUB     12.51     0.00    -0.02   381.19    -0.13   381.19     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.90    50.47    11.43   713.82   809.34    13.92   510.67     0.73
  MEAN    57.15    47.20     9.95   590.30   702.79    13.92   510.67     0.63
  HUB     48.64    38.62    10.02   432.86   576.88    13.92   510.67     0.52

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   660.55   451.18   482.46  1138.04     0.58
  MEAN    18.04   686.00   471.90   497.90  1130.33     0.61
  HUB     15.00   774.49   571.17   523.07  1119.22     0.69

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   549.31   262.64     0.48  9310.54
  MEAN   624.07   520.64   152.17     0.46  8513.47     1.52
  HUB    519.02   525.66    52.15     0.47  8569.20

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.39     1.35    16.23   574.56     1.10   538.12     0.92     0.91
  MEAN    19.89     1.32    15.51   570.13     1.09   530.83     0.92     0.91
  HUB     19.93     1.32    14.46   570.44     1.09   520.36     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     43.08    28.56    24.20     4.36     0.93     0.42     2.90
  MEAN    43.46    16.99    12.70     4.29     0.94     0.36     3.51     0.91
  HUB     47.52    -5.69    -9.30     3.61     0.94     0.20     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     694.202     470.985     509.990    1130.904       0.614       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.025      15.524     531.460      24.000      42.723      35.400      -7.323

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     518.453     470.985     700.443    1149.687       0.451       0.409
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      19.905      17.309      549.260     528.796       0.036       0.537

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     478.580       0.000     478.580    1153.157       0.415       0.444

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      17.600      552.581       0.000       0.060       0.054       0.471

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.865      19.818       1.312     571.711      48.901     193.897       1.503

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 304450.594       0.597    2786.207 1602882.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.983

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   161.944    3965.000      19.818     571.711       1.000       1.000       0.980
W Kg/sec =   73.61079

  W cor      RPM cor        GAMMA       Cp          R           Blades       THK
   126.113    3776.705       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 124580.477  127071.820       1.608     590.487     367.284     474.134       1.291

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   455.72    -0.16   455.72     0.39   677.27
 MEAN    18.08     0.00    -0.02   455.72    -0.16   455.72     0.39
 HUB     15.21     0.00    -0.02   455.72    -0.16   455.72     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.35    46.36    10.99   711.05   844.69    17.80   554.37     0.73
 MEAN    53.93    42.30    11.63   625.53   774.06    17.80   554.37     0.67
 HUB     49.12    37.84    11.28   526.28   696.29    17.80   554.37     0.60

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   592.04   392.24   443.46  1188.41     0.50
 MEAN    18.01   597.36   388.37   453.89  1182.15     0.51
 HUB     15.22   641.87   441.87   465.56  1175.95     0.55

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   543.55   314.31     0.46  8012.84
 MEAN   623.16   511.02   234.80     0.43  6997.31     1.66
 HUB    526.73   473.23    84.86     0.40  6728.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.09     1.27    21.18   616.22     1.08   586.95     0.92     0.90
 MEAN    24.38     1.23    20.47   610.58     1.07   580.78     0.92     0.90
 HUB     24.19     1.22    19.75   609.09     1.07   574.69     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.49    35.33    31.50     3.83     0.93     0.44     2.90
 MEAN    40.55    27.35    23.50     3.85     0.94     0.42     3.30     0.90
 HUB     43.50    10.33     6.50     3.83     0.94     0.40     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.983

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     603.824     389.457     461.439    1182.876       0.510       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.511      20.514     581.519      46.000      40.165      30.600      -9.565

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     455.188     389.457     599.061    1196.167       0.381       0.395

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.405      22.081     594.661     511.151       0.036       0.470

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     450.591       0.000     450.591    1196.517       0.377       0.367

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.016     595.009       0.000       0.060       0.066       0.379

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.852      24.283       1.225     611.960      40.249     206.631       1.602

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 250765.062       0.502    2294.899 1414517.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.981

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    161.944    3965.000      24.283     611.960       1.000       1.000       0.980
W Kg/sec =   73.61079

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    106.485    3650.394       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 124580.477  127071.820       1.759     545.479     310.146     429.765       1.386

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   424.70    -0.15   424.70     0.35   639.33
 MEAN    17.74     0.00    -0.02   424.70    -0.15   424.70     0.35
 HUB     15.05     0.00    -0.02   424.70    -0.15   424.70     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.56    46.36    12.20   694.45   814.14    22.26   596.91     0.68
 MEAN    55.33    43.40    11.92   613.77   746.50    22.26   596.91     0.62
 HUB     50.81    38.84    11.97   520.75   672.09    22.26   596.91     0.56

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   570.63   388.49   417.96  1228.64      0.46
 MEAN    17.51   574.05   384.36   426.37  1223.06      0.47
 HUB     14.85   614.67   433.48   435.80  1217.49      0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   512.72   296.96     0.42  7698.87
 MEAN   605.75   480.42   221.38     0.39  6731.50     1.70
 HUB    513.83   443.14    80.35     0.36  6439.37

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     30.02     1.24    25.89   654.69     1.07   627.52     0.92     0.90
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 MEAN    29.25     1.20    25.15   649.32     1.06   621.82     0.92     0.90
 HUB     29.02     1.20    24.38   647.70     1.06   616.17     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.91    35.39    31.50     3.89     0.93     0.45     2.90
 MEAN    42.03    27.44    23.50     3.94     0.94     0.43     3.28     0.90
 HUB     44.85    10.45     6.50     3.95     0.94     0.42     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     579.324     386.887     431.202    1223.773       0.473       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.389      25.205     622.563      46.000      41.899      31.500     -10.399

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     432.039     386.887     579.947    1235.929       0.350       0.411

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.278      26.903     634.993     471.992       0.036       0.498

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     420.711       0.000     420.711    1236.713       0.340       0.392

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.885     635.799       0.000       0.060       0.071       0.406

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.848      29.129       1.200     650.568      38.608     197.681       1.532

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 240736.719       0.512    2203.123 1348671.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.944    3965.000      29.129     650.568       1.000       1.000       0.980
W Kg/sec =   73.61079

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.527    3540.420       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 124580.477  127071.820       1.925     513.330     266.607     401.059       1.504

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   395.35    -0.14   395.35     0.32   595.04
 MEAN    16.97     0.00    -0.02   395.35    -0.14   395.35     0.32
 HUB     14.32     0.00    -0.02   395.35    -0.14   395.35     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.33    46.36    12.97   666.42   774.98    27.14   637.53     0.63
 MEAN    56.05    43.80    12.25   587.21   708.01    27.14   637.53     0.57
 HUB     51.42    37.84    13.58   495.49   633.99    27.14   637.53     0.51

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   542.13   374.80   391.70  1264.91     0.43
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 MEAN    16.57   541.57   366.42   398.78  1259.66     0.43
 HUB     13.89   574.59   405.92   406.67  1254.41     0.46
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   480.60   278.47     0.38  7078.86
 MEAN   573.48   449.33   207.05     0.36  6075.33     1.73
 HUB    480.61   413.47    74.69     0.33  5640.20

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     35.01     1.20    30.85   689.82     1.06   665.31     0.92     0.90
 MEAN    34.13     1.17    30.05   684.25     1.05   659.80     0.92     0.90
 HUB     33.75     1.16    29.22   681.84     1.05   654.31     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.74    35.41    31.50     3.91     0.93     0.46     2.90
 MEAN    42.58    27.44    23.50     3.94     0.94     0.44     3.29     0.90
 HUB     44.95    10.41     6.50     3.91     0.94     0.43     3.90

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.979

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     537.076     368.482     390.733    1261.038       0.426       0.043

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    34.251      30.232     661.250      46.000      43.321      32.400     -10.921

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     398.677     368.482     542.883    1271.293       0.314       0.437

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      34.150      31.898     672.049     456.573       0.034       0.523

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     380.424       0.000     380.424    1272.415       0.299       0.400

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      31.934     673.235       0.000       0.060       0.074       0.445

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.844      33.979       1.167     685.303      34.734     200.144       1.552

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 216796.672       0.508    1984.034 1331784.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.978

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.944    3965.000      33.979     685.303       1.000       1.000       0.980
W Kg/sec =   73.61079

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.529    3449.531       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 124580.477  127071.820       2.173     509.668     234.597     390.276       1.664

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   355.34    -0.12   355.34     0.28   551.47
 MEAN    15.91     0.00    -0.02   355.34    -0.12   355.34     0.28
 HUB     13.07     0.00    -0.02   355.34    -0.12   355.34     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.73    47.36    13.37   633.89   726.80    32.19   674.78     0.57
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 MEAN    57.17    44.80    12.37   550.61   655.42    32.19   674.78     0.51
 HUB     51.85    38.84    13.01   452.24   575.24    32.19   674.78     0.45
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   510.59   366.62   355.37  1297.26     0.39
 MEAN    15.50   501.68   347.63   361.71  1291.84     0.39
 HUB     12.59   520.88   368.02   368.62  1286.42     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   436.89   254.13     0.34  6579.37
 MEAN   536.24   407.93   188.61     0.32  5389.38     1.79
 HUB    435.63   374.77    67.61     0.29  4634.97

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     39.98     1.18    35.93   721.74     1.05   700.02     0.92     0.89
 MEAN    38.84     1.14    35.00   715.15     1.04   694.18     0.92     0.89
 HUB     38.13     1.12    34.06   710.97     1.04   688.37     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.89    35.57    31.50     4.07     0.93     0.48     2.90
 MEAN    43.86    27.54    23.50     4.04     0.94     0.46     3.34     0.89
 HUB     44.95    10.39     6.50     3.89     0.94     0.43     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     508.393     354.004     364.890    1292.062       0.393       -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     38.902      34.962     694.422      46.000      44.132      33.000     -11.132

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     377.775     354.004     517.719    1301.003       0.290       0.384

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      38.729      36.526     704.065     440.827       0.063       0.538

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     354.221       0.000     354.221    1302.329       0.272       0.447

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      36.743     705.502       0.000       0.060       0.075       0.438

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.844      38.682       1.138     715.956      30.653     207.484       1.608

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 191527.453       0.497    1752.781 1354470.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1204276.50  11021.0430    158.2028      2.5605      0.8375      9.9531      1.3694
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 105% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.977   EfDer =  0.986

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     156.364    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   71.07451

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     152.752    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  120288.016  122693.516       1.869     831.557     444.847     619.754       1.393

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   366.41    -0.13   366.41     0.33   710.99
  MEAN    17.06     0.00    -0.02   366.41    -0.13   366.41     0.33
  HUB     12.51     0.00    -0.02   366.41    -0.13   366.41     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.83    50.47    12.36   713.82   802.48    14.01   511.60     0.72
  MEAN    58.18    47.20    10.98   590.30   694.88    14.01   511.60     0.63
  HUB     49.76    38.62    11.14   432.86   567.21    14.01   511.60     0.51

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   653.75   461.88   462.65  1140.11     0.57
  MEAN    18.04   675.77   478.04   477.64  1132.20     0.60
  HUB     15.00   758.26   568.92   501.28  1121.20     0.68

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   526.80   251.94     0.46  9531.28
  MEAN   624.07   499.46   146.02     0.44  8624.14     1.57
  HUB    519.02   503.76    49.91     0.45  8535.43

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.50     1.36    16.40   575.79     1.10   540.09     0.92     0.90
  MEAN    19.93     1.32    15.66   570.75     1.09   532.61     0.92     0.90
  HUB     19.88     1.32    14.63   570.25     1.09   522.24     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     44.95    28.57    24.20     4.37     0.93     0.44     2.90
  MEAN    45.02    17.00    12.70     4.30     0.94     0.38     3.51     0.90
  HUB     48.62    -5.69    -9.30     3.61     0.94     0.23     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     683.249     477.114     489.072    1132.830       0.603       0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.059      15.683     533.271      24.000      44.291      35.400      -8.891

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     496.369     477.114     688.491    1152.221       0.431       0.434

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.922      17.533     551.684     528.796       0.040       0.561

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     459.262       0.000     459.262    1155.310       0.398       0.460

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.774     554.646       0.000       0.060       0.062       0.487

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.856      19.822       1.312     572.262      49.452     188.508       1.461

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 307884.250       0.604    2720.547 1540716.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.977   EfDer =  0.976

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    156.364    3965.000      19.822     572.262       1.000       1.000       0.980
W Kg/sec =   71.07451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    121.799    3774.885       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 120288.016  122693.516       1.665     590.487     354.721     474.134       1.337

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   437.66    -0.15   437.66     0.38   676.94
 MEAN    18.08     0.00    -0.02   437.66    -0.15   437.66     0.38
 HUB     15.21     0.00    -0.02   437.66    -0.15   437.66     0.38

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.39    46.36    12.03   711.05   835.08    17.96   556.27     0.72
 MEAN    55.03    42.30    12.73   625.53   763.56    17.96   556.27     0.66
 HUB     50.26    37.84    12.42   526.28   684.60    17.96   556.27     0.59

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   587.61   404.44   426.27  1190.80     0.49
 MEAN    18.01   590.28   397.42   436.45  1184.34     0.50
 HUB     15.22   631.46   445.13   447.88  1177.91     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   522.48   302.12     0.44  8261.76
 MEAN   623.16   491.37   225.75     0.41  7160.21     1.71
 HUB    526.73   455.25    81.60     0.39  6778.58

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.23      1.27    21.36   618.15     1.08   589.32     0.92     0.89
 MEAN    24.45      1.23    20.63   612.03     1.07   582.94     0.92     0.89
 HUB     24.19      1.22    19.89   609.91     1.07   576.62     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.49    35.33    31.50     3.83     0.93     0.46     2.90
 MEAN    42.32    27.35    23.50     3.85     0.94     0.44     3.30     0.89
 HUB     44.82    10.33     6.50     3.83     0.94     0.42     3.92
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.976
    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     596.403     398.534     443.697    1185.056       0.503       0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.584      20.675     583.669      46.000      41.931      30.600     -11.331

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     436.982     398.534     591.424    1198.938       0.364       0.422

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.459      22.312     597.423     511.151       0.041       0.498

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     433.008       0.000     433.008    1199.228       0.361       0.386

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.221     597.712       0.000       0.060       0.076       0.399

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.840      24.318       1.227     613.366      41.103     199.331       1.545

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 256087.750       0.513    2262.860 1356493.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.977   EfDer =  0.974

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    156.364    3965.000      24.318     613.366       1.000       1.000       0.980
W Kg/sec =   71.07451

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    102.784    3646.209       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 120288.016  122693.516       1.822     545.479     299.366     429.765       1.436

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   408.42    -0.14   408.42     0.34   638.59
 MEAN    17.74     0.00    -0.02   408.42    -0.14   408.42     0.34
 HUB     15.05     0.00    -0.02   408.42    -0.14   408.42     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.54    46.36    13.18   694.45   805.77    22.45   599.45     0.67
 MEAN    56.37    43.40    12.97   613.77   737.36    22.45   599.45     0.61
 HUB     51.90    38.84    13.06   520.75   661.92    22.45   599.45     0.55

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   567.02   399.59   402.30  1231.53     0.46
 MEAN    17.51   568.01   392.59   410.50  1225.77     0.46
 HUB     14.85   605.51   436.44   419.71  1220.03     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   493.52   285.86     0.40  7918.66
 MEAN   605.75   462.54   213.16     0.38  6875.33     1.75
 HUB    513.83   426.79    77.39     0.35  6483.24

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.18     1.24    26.10   657.31     1.07   630.49     0.92     0.89
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 MEAN    29.36     1.21    25.34   651.52     1.06   624.60     0.92     0.89
 HUB     29.05     1.19    24.55   649.35     1.06   618.75     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.81    35.40    31.50     3.90     0.93     0.47     2.90
 MEAN    43.72    27.44    23.50     3.94     0.94     0.45     3.28     0.89
 HUB     46.12    10.45     6.50     3.95     0.94     0.44     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     573.171     395.163     415.176    1226.463       0.467       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.489      25.387     625.314      46.000      43.585      31.500     -12.085

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     415.366     395.163     573.308    1239.163       0.335       0.436

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.360      27.161     638.331     471.992       0.041       0.525

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     404.908       0.000     404.908    1239.857       0.327       0.410

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.109     639.047       0.000       0.060       0.081       0.424

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.837      29.190       1.200     652.727      39.361     191.064       1.481

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 245437.344       0.522    2168.750 1293696.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.977   EfDer =  0.972

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    156.364    3965.000      29.190     652.727       1.000       1.000       0.980
W Kg/sec =   71.07451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.335    3534.561       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 120288.016  122693.516       1.995     513.330     257.310     401.059       1.559

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   380.73    -0.13   380.73     0.31   594.05
 MEAN    16.97     0.00    -0.02   380.73    -0.13   380.73     0.31
 HUB     14.32     0.00    -0.02   380.73    -0.13   380.73     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.27    46.36    13.91   666.42   767.62    27.34   640.64     0.62
 MEAN    57.05    43.80    13.25   587.21   699.94    27.34   640.64     0.56
 HUB     52.47    37.84    14.63   495.49   624.97    27.34   640.64     0.50

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   539.08   384.81   377.52  1268.19     0.43
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 MEAN    16.57   536.20   373.82   384.41  1262.80     0.42
 HUB     13.89   566.26   408.56   392.08  1257.41     0.45
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   463.24   268.45     0.37  7267.83
 MEAN   573.48   433.16   199.65     0.34  6197.89     1.78
 HUB    480.61   398.65    72.05     0.32  5676.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     35.18     1.21    31.07   693.02     1.06   668.79     0.92     0.89
 MEAN    34.25     1.17    30.25   687.09     1.05   663.12     0.92     0.89
 HUB     33.80     1.16    29.41   684.20     1.05   657.46     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.55    35.42    31.50     3.92     0.93     0.48     2.90
 MEAN    44.20    27.45    23.50     3.95     0.94     0.46     3.29     0.89
 HUB     46.18    10.41     6.50     3.91     0.94     0.44     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.972

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     532.229     375.923     376.762    1264.099       0.421       0.040

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.369      30.421     664.485      46.000      44.936      32.400     -12.536

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     383.915     375.923     537.316    1274.829       0.301       0.461

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      34.252      32.162     675.814     456.573       0.038       0.549

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     366.722       0.000     366.722    1275.844       0.287       0.417

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.160     676.890       0.000       0.060       0.084       0.460

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.833      34.060       1.167     688.103      35.376     193.721       1.502

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 220812.703       0.517    1951.160 1277777.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =10.977   EfDer =  0.971

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    156.364    3965.000      34.060     688.103       1.000       1.000       0.980
W Kg/sec =   71.07451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.729    3442.504       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 120288.016  122693.516       2.251     509.668     226.443     390.276       1.724

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   342.70    -0.12   342.70     0.27   550.34
 MEAN    15.91     0.00    -0.02   342.70    -0.12   342.70     0.27
 HUB     13.07     0.00    -0.02   342.70    -0.12   342.70     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.61    47.36    14.25   633.89   720.71    32.40   678.32     0.56
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MEAN    58.11    44.80    13.31   550.61   648.65    32.40   678.32     0.51
HUB     52.85    38.84    14.01   452.24   567.51    32.40   678.32     0.44
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   508.49   375.38   343.00  1300.79     0.39
MEAN    15.50   497.27   354.11   349.12  1295.27     0.38
HUB     12.59   513.56   370.34   355.80  1289.74     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.74   421.72   245.36     0.32  6736.53
MEAN   536.24   393.76   182.12     0.30  5489.79     1.84
HUB    435.63   361.74    65.29     0.28  4664.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     40.15     1.18    36.14   725.41     1.05   703.87     0.92     0.89
MEAN    38.97     1.14    35.20   718.51     1.04   697.91     0.92     0.89
HUB     38.20     1.12    34.25   713.93     1.04   691.96     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     47.58    35.58    31.50     4.08     0.93     0.50     2.90
MEAN    45.41    27.55    23.50     4.05     0.94     0.47     3.34     0.89
HUB     46.15    10.40     6.50     3.90     0.94     0.44     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.971

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      504.069     360.607     352.204    1295.464       0.389       -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     39.031      35.160      698.117      46.000      45.675      33.000     -12.675

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      364.350     360.607     512.628    1304.809       0.279       0.406

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      38.831      36.783     708.224     440.827       0.071       0.563

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     341.850       0.000     341.850    1306.027       0.262       0.463

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      36.971     709.548       0.000       0.060       0.085       0.454

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.834      38.776       1.138     719.283      31.180     201.162       1.559

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 194834.062       0.506    1721.606 1300037.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1225056.12  10824.9229    152.7519      2.5667      0.8258     10.9770      1.3758
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 105% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.974   EfDer =  0.980

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     150.973    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   68.62391

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     147.485    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  116140.570  118463.133       1.936     831.557     429.509     619.754       1.443

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   352.32    -0.12   352.32     0.32   710.99
  MEAN    17.06     0.00    -0.02   352.32    -0.12   352.32     0.32
  HUB     12.51     0.00    -0.02   352.32    -0.12   352.32     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.73    50.47    13.26   713.82   796.15    14.09   512.44     0.72
  MEAN    59.17    47.20    11.97   590.30   687.55    14.09   512.44     0.62
  HUB     50.86    38.62    12.24   432.86   558.22    14.09   512.44     0.50

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   648.00   471.80   444.19  1141.95     0.57
  MEAN    18.04   666.61   483.73   458.68  1133.87     0.59
  HUB     15.00   743.31   566.78   480.90  1122.98     0.66

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   505.84   242.02     0.44  9735.80
  MEAN   624.07   479.67   140.34     0.42  8726.55     1.63
  HUB    519.02   483.27    47.76     0.43  8503.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.59     1.36    16.55   576.93     1.10   541.86     0.92     0.90
  MEAN    19.97     1.32    15.80   571.32     1.09   534.20     0.92     0.90
  HUB     19.83     1.31    14.77   570.07     1.09   523.94     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     46.73    28.58    24.20     4.38     0.93     0.47     2.90
  MEAN    46.52    17.01    12.70     4.31     0.94     0.41     3.51     0.90
  HUB     49.69    -5.67    -9.30     3.63     0.94     0.25     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     673.457     482.786     469.535    1134.548       0.594       0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.084      15.820     534.890      24.000      45.797      35.400     -10.397

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     475.895     482.786     677.907    1154.486       0.412       0.457
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      19.929      17.727     553.855     528.796       0.045       0.584

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     441.260       0.000     441.260    1157.248       0.381       0.475

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      17.921     556.509       0.000       0.060       0.071       0.501

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
    0.847      19.815       1.312     572.771      49.961     183.435       1.422

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 311053.031       0.610    2653.780 1481496.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.974   EfDer =  0.968

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   150.973    3965.000      19.815     572.771       1.000       1.000       0.980
W Kg/sec =   68.62391

  W cor      RPM cor        GAMMA       Cp          R           Blades       THK
   117.692    3773.207       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 116140.570  118463.133       1.723     590.487     342.761     474.134       1.383

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   420.79    -0.14   420.79     0.36   676.64
 MEAN    18.08     0.00    -0.02   420.79    -0.14   420.79     0.36
 HUB     15.21     0.00    -0.02   420.79    -0.14   420.79     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.39    46.36    13.03   711.05   826.36    18.09   557.99     0.71
 MEAN    56.08    42.30    13.78   625.53   754.01    18.09   557.99     0.65
 HUB     51.36    37.84    13.52   526.28   673.94    18.09   557.99     0.58

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   584.08   415.64   410.36  1192.94     0.49
 MEAN    18.01   584.14   405.73   420.24  1186.30     0.49
 HUB     15.22   622.00   448.10   431.39  1179.69     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   503.02   290.92     0.42  8490.25
 MEAN   623.16   473.16   217.43     0.40  7309.80     1.75
 HUB    526.73   438.49    78.64     0.37  6823.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.33     1.28    21.50   619.93     1.08   591.45     0.92     0.89
 MEAN    24.51     1.24    20.76   613.37     1.07   584.89     0.92     0.89
 HUB     24.17     1.22    20.00   610.67     1.07   578.37     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.37    35.33    31.50     3.83     0.93     0.48     2.90
 MEAN    43.99    27.36    23.50     3.86     0.94     0.45     3.30     0.89
 HUB     46.09    10.33     6.50     3.83     0.94     0.43     3.92


  blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.968

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     589.965     406.869     427.219    1187.010       0.497       0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.630      20.801     585.599      46.000      43.602      30.600     -13.002

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     420.147     406.869     584.864    1201.437       0.350       0.446

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.488      22.499     599.920     511.151       0.046       0.524

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     416.736       0.000     416.736    1201.676       0.347       0.404

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.384     600.159       0.000       0.060       0.087       0.417

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.828      24.328       1.228     614.658      41.887     192.702       1.494

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 260968.266       0.523    2226.477 1301728.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.974   EfDer =  0.967

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    150.973    3965.000      24.328     614.658       1.000       1.000       0.980
W Kg/sec =   68.62391

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     99.305    3642.375       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 116140.570  118463.133       1.886     545.479     289.237     429.765       1.486

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   393.32    -0.14   393.32     0.33   637.92
 MEAN    17.74     0.00    -0.02   393.32    -0.14   393.32     0.33
 HUB     15.05     0.00    -0.02   393.32    -0.14   393.32     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.48    46.36    14.12   694.45   798.21    22.59   601.75     0.66
 MEAN    57.35    43.40    13.95   613.77   729.10    22.59   601.75     0.61
 HUB     52.94    38.84    14.10   520.75   652.70    22.59   601.75     0.54

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   564.19    409.72   387.87  1234.13      0.46
 MEAN    17.51   562.82    400.10   395.83  1228.22      0.46
 HUB     14.85   597.24    439.12   404.80  1222.32      0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   475.88   275.72     0.39  8119.36
 MEAN   605.75   446.06   205.64     0.36  7006.82      1.80
 HUB    513.83   411.64    74.71     0.34  6522.94

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     30.29     1.25    26.25   659.72     1.07   633.16     0.92     0.88
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 MEAN    29.42     1.21    25.47   653.54     1.06   627.11     0.92     0.88
 HUB     29.05     1.19    24.67   650.86     1.06   621.10     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.57    35.41    31.50     3.91     0.93     0.49     2.90
 MEAN    45.31    27.45    23.50     3.95     0.95     0.47     3.28     0.88
 HUB     47.33    10.46     6.50     3.96     0.95     0.46     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     567.879     402.728     400.371    1228.886       0.462       0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.546      25.519     627.799      46.000      45.168      31.500     -13.668

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     400.021     402.728     567.633    1242.083       0.322       0.460

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.400      27.360     641.355     471.992       0.045       0.551

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     390.341       0.000     390.341    1242.701       0.314       0.426

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.276     641.993       0.000       0.060       0.092       0.440

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.825      29.209       1.201     654.706      40.048     185.077       1.435

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 249726.703       0.532    2130.568 1241781.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.974   EfDer =  0.965

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    150.973    3965.000       29.209     654.706       1.000       1.000       0.980
W Kg/sec =   68.62391

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     85.361    3529.214        1.401       0.249      53.349      56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 116140.570  118463.133        2.064     513.330     248.652     401.059       1.613

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   367.21    -0.13   367.21     0.30   593.16
 MEAN    16.97      0.00    -0.02   367.21    -0.13   367.21     0.30
 HUB     14.32      0.00    -0.02   367.21    -0.13   367.21     0.30

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     61.15    46.36    14.79   666.42   761.00     27.49    643.46     0.61
 MEAN    57.99    43.80    14.19   587.21   692.68     27.49    643.46     0.56
 HUB     53.46    37.84    15.62   495.49   616.83     27.49    643.46     0.50

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   536.69   393.93   364.49  1271.15      0.42
 MEAN    16.57   531.61   380.59   371.16  1265.64      0.42
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 HUB     13.89   558.77   410.94   378.62  1260.13     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   447.34   259.34     0.35  7439.85
 MEAN   573.48   418.29   192.89     0.33  6309.95     1.83
 HUB    480.61   384.98    69.67     0.31  5709.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     35.29     1.21    31.22   695.95     1.06   671.94     0.92     0.88
 MEAN    34.31     1.17    30.39   689.69     1.05   666.13     0.92     0.88
 HUB     33.80     1.16    29.53   686.36     1.05   660.33     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.22    35.43    31.50     3.93     0.93     0.50     2.90
 MEAN    45.72    27.46    23.50     3.96     0.95     0.48     3.29     0.88
 HUB     47.34    10.43     6.50     3.93     0.95     0.46     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.965

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     528.104     382.727     363.887    1266.863       0.417       0.038

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.428      30.545     667.415      46.000      46.445      32.400     -14.045

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     370.355     382.727     532.581    1278.028       0.290       0.483

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      34.297      32.353     679.232     456.573       0.042       0.573

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     354.110       0.000     354.110    1278.951       0.277       0.433

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.315     680.213       0.000       0.060       0.094       0.473

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.822      34.083       1.167     690.667      35.961     187.923       1.457

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 224470.125       0.526    1915.089 1226738.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =11.974   EfDer =  0.965

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.973    3965.000      34.083     690.667       1.000       1.000       0.980
W Kg/sec =   68.62391

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     75.136    3436.109       1.400       0.250      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 116140.570  118463.133       2.328     509.668     218.893     390.276       1.783

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   331.05    -0.11   331.05     0.26   549.32
 MEAN    15.91     0.00    -0.02   331.05    -0.11   331.05     0.26
 HUB     13.07     0.00    -0.02   331.05    -0.11   331.05     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.43    47.36    15.07   633.89   715.23    32.53   681.54     0.56
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MEAN    58.99    44.80    14.19   550.61   642.56    32.53   681.54     0.50
HUB     53.80    38.84    14.96   452.24   560.55    32.53   681.54     0.44
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   506.90   383.36   331.63  1303.99     0.39
MEAN    15.50   493.50   360.02   337.53  1298.38     0.38
HUB     12.59   506.94   372.37   343.99  1292.76     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.74   407.83   237.38     0.31  6879.65
MEAN   536.24   380.76   176.21     0.29  5581.33     1.88
HUB    435.63   349.76    63.26     0.27  4689.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     40.25     1.18    36.27   728.76     1.06   707.36     0.92     0.88
MEAN    39.03     1.15    35.33   721.57     1.04   701.29     0.92     0.88
HUB     38.21     1.12    34.36   716.64     1.04   695.23     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     49.14    35.59    31.50     4.09     0.93     0.52     2.90
MEAN    46.85    27.57    23.50     4.07     0.95     0.49     3.34     0.88
HUB     47.27    10.42     6.50     3.92     0.95     0.46     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.965

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     500.381     366.626     340.539    1298.542       0.385       -0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     39.085      35.279     701.470      46.000      47.113      33.000     -14.113

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     352.030     366.626     508.271    1308.255       0.269       0.426

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      38.862      36.954     712.003     440.827       0.078       0.587

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     330.481       0.000     330.481    1309.380       0.252       0.478

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      37.116     713.228       0.000       0.060       0.095       0.468

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.823      38.798       1.138     722.325      31.658     195.458       1.515

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 197836.000       0.513    1687.857 1248516.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1244054.12  10613.7705    147.4851      2.5682      0.8138     11.9740      1.3816
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 100% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 2.703   EfDer =  0.983

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     194.754    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   88.52461

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     190.255    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  149820.938  152817.031       1.501     831.557     554.065     619.754       1.119

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   473.47    -0.16   473.47     0.43   677.10
  MEAN    17.06     0.00    -0.02   473.47    -0.16   473.47     0.43
  HUB     12.51     0.00    -0.02   473.47    -0.16   473.47     0.43

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.15    50.47     4.68   679.80   828.56    13.30   504.09     0.75
  MEAN    49.90    47.20     2.70   562.16   735.11    13.30   504.09     0.67
  HUB     41.06    38.62     2.44   412.23   627.89    13.30   504.09     0.57

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   720.93   332.65   639.59  1114.54     0.65
  MEAN    18.04   761.79   395.53   651.06  1110.75     0.69
  HUB     15.00   887.21   562.92   685.76  1100.11     0.81

        U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   727.73   347.14     0.65  6866.01
  MEAN   594.32   680.73   198.79     0.61  7136.62     1.18
  HUB    494.28   689.19    68.65     0.63  8445.89

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.67     1.24    14.08   559.15     1.07   515.78     0.92     0.90
  MEAN    18.82     1.25    13.73   560.59     1.07   512.17     0.92     0.90
  HUB     19.56     1.29    12.74   567.52     1.09   501.90     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     27.48    28.49    24.20     4.29     0.93     0.19     2.90
  MEAN    31.28    16.98    12.70     4.28     0.91     0.15     3.51     0.90
  HUB     39.38    -5.72    -9.30     3.58     0.91     0.00     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.983

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     779.780     394.764     672.472    1109.609       0.703      -0.019

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      18.960      13.630     511.633      24.000      30.414      35.400       4.986

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     713.793     394.764     815.683    1118.499       0.638       0.144
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.829      14.310     519.865     528.796       0.034       0.336

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     649.213       0.000     649.213    1126.383       0.576       0.229

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      14.886     527.217       0.000       0.060       0.066       0.249

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.822      18.650       1.235     562.420      39.610     241.030       1.868

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 246604.859       0.534    2714.067 1990904.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 2.703   EfDer =  0.976

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    194.754    3776.000      18.650     562.420       1.000       1.000       0.980
W Kg/sec =   88.52461

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    159.843    3626.267       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149820.938  152817.031       1.268     590.487     465.515     474.134       1.019

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   611.74    -0.21   611.74     0.54   650.29
 MEAN    18.08     0.00    -0.02   611.74    -0.21   611.74     0.54
 HUB     15.21     0.00    -0.02   611.74    -0.21   611.74     0.54

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.91    46.36     1.55   677.16   912.72    15.28   531.17     0.81
 MEAN    44.25    42.30     1.95   595.71   854.02    15.28   531.17     0.76
 HUB     39.34    37.84     1.50   501.20   790.97    15.28   531.17     0.70

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   662.02   231.66   620.16  1151.56     0.57
 MEAN    18.01   679.47   268.17   624.30  1150.10     0.59
 HUB     15.22   738.37   384.04   630.64  1148.52     0.64

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   761.10   441.22     0.66  4734.75
 MEAN   593.46   703.97   325.29     0.61  4833.61     1.30
 HUB    501.63   641.51   117.59     0.56  5849.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.37     1.15    17.07   587.47     1.04   550.89     0.92     0.89
 MEAN    21.43     1.15    16.92   587.99     1.05   549.46     0.92     0.89
 HUB     22.05     1.18    16.69   593.37     1.06   547.87     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.48    35.43    31.50     3.93     0.93     0.21     2.90
 MEAN    23.25    27.52    23.50     4.02     0.91     0.22     3.30     0.89
 HUB     31.34    10.56     6.50     4.06     0.91     0.25     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.976

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     691.717     268.927     637.300    1150.028       0.601      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.567      16.884     549.659      46.000      22.879      30.600       7.721

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     652.469     268.927     705.718    1154.627       0.565       0.078

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.443      17.261     554.064     511.151       0.036       0.196

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     646.095       0.000     646.095    1155.349       0.559       0.070

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.215     554.755       0.000       0.060       0.068       0.068

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.801      21.293       1.142     589.609      27.190     306.013       2.372

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 169370.016       0.374    1864.041 1838668.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 2.703   EfDer =  0.962

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    194.754    3776.000      21.293     589.609       1.000       1.000       0.980
W Kg/sec =   88.52461

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    143.348    3541.668       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 149820.938  152817.031       1.307     545.479     417.495     429.765       1.029

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   601.09    -0.21   601.09     0.52   620.28
 MEAN    17.74     0.00    -0.02   601.09    -0.21   601.09     0.52
 HUB     15.05     0.00    -0.02   601.09    -0.21   601.09     0.52

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.74    46.36     1.38   661.34   893.85    17.73   559.45     0.77
 MEAN    44.21    43.40     0.81   584.52   838.58    17.73   559.45     0.72
 HUB     39.54    38.84     0.70   495.92   779.40    17.73   559.45     0.67

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   652.07   212.54   616.46  1177.80      0.55
 MEAN    17.51   668.28   252.84   618.60  1177.16      0.57
 HUB     14.85   725.45   371.40   623.17  1176.31      0.62

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   757.51   440.23     0.64  4214.66
 MEAN   576.87   698.33   324.03     0.59  4430.02     1.28
 HUB    489.33   634.23   117.94     0.54  5518.37

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     23.87     1.12    19.38   611.90     1.04   576.42     0.92     0.88
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 MEAN    24.01     1.13    19.29   613.04     1.04   575.77     0.92     0.88
 HUB     24.71     1.16    19.11   618.79     1.05   574.89     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.02    35.53    31.50     4.03     0.93     0.19     2.90
 MEAN    22.23    27.65    23.50     4.15     0.91     0.21     3.28     0.88
 HUB     30.79    10.72     6.50     4.22     0.91     0.25     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.962

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     676.689     254.498     627.008    1177.542       0.575       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.145      19.298     576.354      46.000      22.092      31.500       9.408

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     654.513     254.498     702.251    1180.056       0.555       0.042

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.997      19.467     578.818     471.992       0.040       0.188

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     635.175       0.000     635.175    1182.177       0.537       0.054

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      19.566     580.900       0.000       0.060       0.076       0.062

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.771      23.818       1.119     614.575      24.965     310.714       2.409

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 155586.078       0.365    1712.339 1785992.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 2.703   EfDer =  0.946

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    194.754    3776.000       23.818     614.575       1.000        1.000        0.980
W Kg/sec =   88.52461

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    130.836    3468.988        1.401       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 149820.938  152817.031        1.347     513.330     381.077     401.059       1.052

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   588.95    -0.20   588.95      0.50   583.03
 MEAN    16.97      0.00    -0.02   588.95    -0.20   588.95      0.50
 HUB     14.32      0.00    -0.02   588.95    -0.20   588.95      0.50

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     47.15    46.36     0.79   634.65   865.97     20.13   585.64      0.73
 MEAN    43.53    43.80    -0.27   559.22   812.29     20.13   585.64      0.68
 HUB     38.71    37.84     0.87   471.87   754.79     20.13   585.64      0.64

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   635.68   187.42   607.42  1201.09      0.53
 MEAN    16.57   649.60   226.73   608.75  1200.76      0.54
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 HUB     13.89   701.41   341.85   612.46  1200.20     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   746.95   434.71     0.62  3542.38
 MEAN   546.14   687.46   319.41     0.57  3761.21     1.26
 HUB    457.70   623.32   115.85     0.52  4751.20

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.08     1.10    21.55   633.30     1.03   599.59     0.92     0.87
 MEAN    26.23     1.10    21.49   634.45     1.03   599.26     0.92     0.87
 HUB     26.89     1.13    21.33   639.69     1.04   598.65     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.15    35.59    31.50     4.09     0.93     0.17     2.90
 MEAN    20.43    27.69    23.50     4.19     0.90     0.20     3.29     0.87
 HUB     29.17    10.71     6.50     4.21     0.90     0.23     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.946

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     636.113     228.004     593.847    1203.406       0.529       0.059

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.351      21.780     602.053      46.000      21.004      32.400      11.396

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     631.836     228.004     671.716    1203.858       0.525       0.049

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.185      21.700     602.505     456.573       0.044       0.180

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     598.528       0.000     598.528    1207.269       0.496       0.038

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.969     605.924       0.000       0.060       0.083       0.104

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.733      25.991       1.091     635.812      21.238     336.694       2.610

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 132426.453       0.342    1457.450 1791905.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 2.703   EfDer =  0.928

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    194.754    3776.000      25.991     635.812       1.000       1.000       0.980
W Kg/sec =   88.52461

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    121.951    3410.560       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149820.938  152817.031       1.435     509.668     355.221     390.276       1.099

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   552.09    -0.19   552.09     0.46   545.24
 MEAN    15.91     0.00    -0.02   552.09    -0.19   552.09     0.46
 HUB     13.07     0.00    -0.02   552.09    -0.19   552.09     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.56    47.36     0.20   603.68   818.20    22.54   610.39     0.68
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MEAN    43.54    44.80    -1.26   524.36   761.55    22.54   610.39     0.63
HUB     37.97    38.84    -0.87   430.68   700.32    22.54   610.39     0.58
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   599.75   178.18   572.67  1223.86     0.49
MEAN    15.50   611.37   207.08   575.24  1222.78     0.50
HUB     12.59   655.06   305.16   579.64  1221.55     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    591.16   706.05   412.98     0.58  3199.95
MEAN   510.67   650.44   303.60     0.53  3212.24     1.26
HUB    414.86   589.93   109.71     0.48  3844.41

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     28.10     1.08    23.84   652.72     1.03   622.72     0.92     0.85
MEAN    28.11     1.08    23.69   652.78     1.03   621.61     0.92     0.85
HUB     28.54     1.10    23.46   656.12     1.03   620.34     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     17.28    35.80    31.50     4.30     0.93     0.17     2.90
MEAN    19.80    27.82    23.50     4.32     0.90     0.19     3.34     0.85
HUB     27.76    10.72     6.50     4.22     0.90     0.21     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.928

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     618.193     210.876     581.115    1223.073       0.505      -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.158      23.648     622.003      46.000      19.945      33.000      13.055

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     630.939     210.876     665.246    1221.767       0.516      -0.105

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.814      23.186     620.675     440.827       0.095       0.174

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     581.963       0.000     581.963    1226.633       0.474       0.044

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      23.850     625.629       0.000       0.060       0.092       0.040

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.695      27.828       1.071     653.873      18.061     366.660       2.842

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 112672.531       0.322    1240.044 1835864.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    816659.88   8987.9414    190.2553      1.8420      0.7636      2.7031      1.2507
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 100% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.014   EfDer =  0.986

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     193.004    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   87.72928

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     188.546    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  148474.906  151444.094       1.514     831.557     549.087     619.754       1.129

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   468.27    -0.16   468.27     0.42   677.10
  MEAN    17.06     0.00    -0.02   468.27    -0.16   468.27     0.42
  HUB     12.51     0.00    -0.02   468.27    -0.16   468.27     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.45    50.47     4.98   679.80   825.60    13.34   504.50     0.75
  MEAN    50.21    47.20     3.01   562.16   731.77    13.34   504.50     0.66
  HUB     41.37    38.62     2.75   412.23   623.97    13.34   504.50     0.57

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   714.76   337.85   629.87  1115.90     0.64
  MEAN    18.04   755.31   398.36   641.71  1111.88     0.68
  HUB     15.00   878.65   561.86   675.53  1101.28     0.80

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   716.70   341.94     0.64  6973.21
  MEAN   594.32   670.97   195.96     0.60  7187.65     1.20
  HUB    494.28   678.90    67.58     0.62  8429.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.74     1.24    14.21   559.72     1.07   517.08     0.92     0.90
  MEAN    18.86     1.25    13.84   560.86     1.07   513.25     0.92     0.90
  HUB     19.57     1.30    12.86   567.43     1.09   503.07     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     28.21    28.50    24.20     4.30     0.93     0.20     2.90
  MEAN    31.83    16.98    12.70     4.28     0.91     0.16     3.51     0.90
  HUB     39.75    -5.71    -9.30     3.59     0.91     0.01     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     772.404     397.590     662.216    1110.917       0.695      -0.017

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.999      13.749     512.840      24.000      30.980      35.400       4.420

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	700.498	397.590	805.466	1120.457	0.625	0.160

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.878	14.501	521.686	528.796	0.032	0.346

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	637.444	0.000	637.444	1128.000	0.565	0.244

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.068	528.732	0.000	0.060	0.062	0.264

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.832	18.719	1.239	562.671	39.861	238.570	1.849

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
248166.641	0.537	2706.718	1969041.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 3.014 EfDer = 0.981

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
193.004	3776.000	18.719	562.671	1.000	1.000	0.980

W Kg/sec = 87.72928

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
157.859	3625.459	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
148474.906	151444.094	1.284	590.487	459.736	474.134	1.031

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	601.24	-0.21	601.24	0.53	650.14
MEAN	18.08	0.00	-0.02	601.24	-0.21	601.24	0.53	
HUB	15.21	0.00	-0.02	601.24	-0.21	601.24	0.53	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.41	46.36	2.05	677.16	905.71	15.44	532.49	0.80
MEAN	44.75	42.30	2.45	595.71	846.53	15.44	532.49	0.75
HUB	39.83	37.84	1.99	501.20	782.88	15.44	532.49	0.69

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	653.29	240.92	607.24	1153.83	0.57
MEAN	18.01	670.98	274.62	612.21	1151.96	0.58
HUB	15.22	729.78	386.36	619.12	1150.03	0.63

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	672.88	745.21	431.96	0.65	4923.75	
MEAN	593.46	690.27	318.84	0.60	4949.56	1.32
HUB	501.63	629.76	115.27	0.55	5884.67	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.58	1.15	17.35	588.72	1.05	553.10	0.92	0.90
MEAN	21.59	1.15	17.15	588.86	1.05	551.28	0.92	0.90
HUB	22.17	1.18	16.90	593.80	1.06	549.36	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	21.64	35.43	31.50	3.93	0.93	0.22	2.90	
MEAN	24.16	27.51	23.50	4.01	0.91	0.23	3.30	0.90
HUB	31.97	10.55	6.50	4.05	0.91	0.26	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981
    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     682.590     275.386     624.573    1152.013       0.593      -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.731      17.132     551.556      46.000      23.794      30.600       6.806

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     637.271     275.386     694.227    1157.217       0.551       0.099

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.624      17.593     556.551     511.151       0.033       0.212

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     630.181       0.000     630.181    1157.998       0.544       0.095

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.572     557.301       0.000       0.060       0.060       0.094

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.819      21.497       1.148     590.460      27.789     298.451       2.314

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 173106.938       0.382    1888.052 1812389.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.014   EfDer =  0.970

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    193.004    3776.000      21.497     590.460       1.000       1.000       0.980
W Kg/sec =   87.72928

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    140.811    3539.117       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 148474.906  151444.094       1.330     545.479     410.107     429.765       1.048

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02    587.15    -0.20    587.15     0.51    619.84
 MEAN    17.74      0.00    -0.02    587.15    -0.20    587.15     0.51
 HUB     15.05      0.00    -0.02    587.15    -0.20    587.15     0.51

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     48.41     46.36     2.05   661.34    884.53     18.06    561.68      0.76
 MEAN    44.88     43.40     1.48   584.52    828.64     18.06    561.68      0.71
 HUB     40.20     38.84     1.36   495.92    768.70     18.06    561.68      0.66

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81    640.02    225.00    599.17   1181.28      0.54
 MEAN    17.51    656.69    261.54    602.37   1180.11      0.56
 HUB     14.85    713.78    374.58    607.60   1178.82      0.61

       U2        W2        Wu2      MachRel2  DelRCu     Ws1/W2
 TIP     652.78    736.20    427.78      0.62   4461.25
 MEAN    576.87    679.91    315.33      0.58   4582.22      1.30
 HUB     489.33    618.34    114.75      0.52   5565.56

         Pt2       PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     24.28      1.13     19.88    614.05      1.04    579.87      0.92      0.89
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 MEAN    24.36     1.13    19.73   614.69     1.04   578.71     0.92     0.89
 HUB     25.00     1.16    19.51   619.89     1.05   577.38     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.58    35.53    31.50     4.03     0.93     0.21     2.90
 MEAN    23.47    27.63    23.50     4.13     0.91     0.23     3.28     0.89
 HUB     31.65    10.70     6.50     4.20     0.91     0.26     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     664.584     263.254     610.220    1180.595       0.563       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.498      19.753     579.345      46.000      23.336      31.500       8.164

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     633.958     263.254     686.444    1183.972       0.535       0.071

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.376      20.050     582.665     471.992       0.035       0.208

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     614.403       0.000     614.403    1186.041       0.518       0.088

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.177     584.702       0.000       0.060       0.065       0.097

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.801      24.233       1.127     616.210      25.750     300.032       2.326

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 160485.484       0.377    1750.392 1756893.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.014   EfDer =  0.959

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    193.004    3776.000      24.233     616.210       1.000       1.000       0.980
W Kg/sec =   87.72928

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    127.611    3464.380       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 148474.906  151444.094       1.381     513.330     371.685     401.059       1.079

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   570.73    -0.20   570.73     0.48   582.26
 MEAN    16.97     0.00    -0.02   570.73    -0.20   570.73     0.48
 HUB     14.32     0.00    -0.02   570.73    -0.20   570.73     0.48

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.04    46.36     1.68   634.65   853.68    20.70   589.03     0.72
 MEAN    44.43    43.80     0.63   559.22   799.17    20.70   589.03     0.67
 HUB     39.60    37.84     1.76   471.87   740.66    20.70   589.03     0.62

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   619.44   203.61   585.02  1206.00     0.51
 MEAN    16.57   633.98   238.09   587.58  1205.02     0.53
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 HUB     13.89   685.72   345.99   592.03  1203.91     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   719.30   418.52     0.60  3848.03
 MEAN   546.14   663.43   308.05     0.55  3949.42     1.29
 HUB    457.70   602.48   111.71     0.50  4808.67

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.77     1.10    22.36   636.55     1.03   604.54     0.92     0.88
 MEAN    26.84     1.11    22.23   637.08     1.03   603.56     0.92     0.88
 HUB     27.44     1.13    22.01   641.62     1.04   602.40     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.19    35.58    31.50     4.08     0.93     0.20     2.90
 MEAN    22.06    27.67    23.50     4.17     0.90     0.21     3.29     0.88
 HUB     30.30    10.69     6.50     4.19     0.90     0.25     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.959

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     621.368     239.430     573.387    1207.550       0.515       0.059

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.969      22.509     606.205      46.000      22.664      32.400       9.736

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     606.488     239.430     652.039    1209.068       0.502       0.083

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.839      22.598     607.730     456.573       0.037       0.206

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     573.960       0.000     573.960    1212.250       0.473       0.079

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.892     610.933       0.000       0.060       0.067       0.144

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.779      26.693       1.102     638.418      22.208     320.514       2.485

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 138482.656       0.358    1510.410 1758525.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.014   EfDer =  0.948

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    193.004    3776.000      26.693     638.418       1.000       1.000       0.980
W Kg/sec =   87.72928

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    117.917    3403.591       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 148474.906  151444.094       1.484     509.668     343.471     390.276       1.136

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   530.47    -0.18   530.47     0.44   544.12
 MEAN    15.91     0.00    -0.02   530.47    -0.18   530.47     0.44
 HUB     13.07     0.00    -0.02   530.47    -0.18   530.47     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.70    47.36     1.34   603.68   803.77    23.42   614.95     0.66
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 MEAN    44.68    44.80    -0.12   524.36   746.02    23.42   614.95     0.61
 HUB     39.08    38.84     0.24   430.68   683.41    23.42   614.95     0.56
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   581.10   197.25   546.60  1229.96     0.47
 MEAN    15.50   592.81   220.64   550.22  1228.22     0.48
 HUB     12.59   635.98   310.11   555.25  1226.41     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   673.74   393.90     0.55  3542.05
 MEAN   510.67   621.98   290.04     0.51  3422.24     1.30
 HUB    414.86   565.05   104.75     0.46  3906.71

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.14     1.09    25.01   657.13     1.03   628.97     0.92     0.87
 MEAN    29.05     1.09    24.77   656.50     1.03   627.19     0.92     0.87
 HUB     29.40     1.10    24.47   659.05     1.03   625.33     0.92     0.87

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.84    35.78    31.50     4.28     0.93     0.20     2.90
 MEAN    21.85    27.80    23.50     4.30     0.90     0.21     3.34     0.87
 HUB     29.18    10.68     6.50     4.18     0.90     0.23     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.948

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      599.258     224.682     555.543    1228.576       0.488       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.109      24.735      627.611      46.000      22.020      33.000      10.980

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      597.513     224.682     638.360    1228.746       0.486       -0.047

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.853       24.541     627.785     440.827       0.078       0.204

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     552.648       0.000     552.648    1232.950       0.448       0.092

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      25.147     632.089        0.000       0.060       0.074       0.089

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.756       28.867       1.081      657.559       19.141     344.066       2.667

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 119421.648       0.342    1302.515 1798713.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc   TR
    839663.38   9158.0859     188.5460      1.9109       0.7916       3.0144      1.2577
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 100% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.528   EfDer =  0.989

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     190.124    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   86.41991

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     185.732    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  146258.906  149183.766       1.537     831.557     540.892     619.754       1.146

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   459.79    -0.16   459.79     0.42   677.10
  MEAN    17.06     0.00    -0.02   459.79    -0.16   459.79     0.42
  HUB     12.51     0.00    -0.02   459.79    -0.16   459.79     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.93    50.47     5.46   679.80   820.82    13.40   505.15     0.74
  MEAN    50.73    47.20     3.53   562.16   726.37    13.40   505.15     0.66
  HUB     41.89    38.62     3.27   412.23   617.63    13.40   505.15     0.56

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   705.23   346.12   614.45  1118.02     0.63
  MEAN    18.04   745.12   402.90   626.80  1113.64     0.67
  HUB     15.00   865.12   560.17   659.27  1103.12     0.78

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   699.20   333.67     0.63  7143.79
  MEAN   594.32   655.38   191.42     0.59  7269.34     1.22
  HUB    494.28   662.55    65.89     0.60  8404.52

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.85     1.25    14.41   560.62     1.07   519.11     0.92     0.91
  MEAN    18.92     1.25    14.01   561.29     1.07   514.95     0.92     0.91
  HUB     19.57     1.30    13.03   567.30     1.09   504.88     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     29.39    28.50    24.20     4.30     0.93     0.22     2.90
  MEAN    32.73    16.98    12.70     4.28     0.92     0.18     3.51     0.91
  HUB     40.35    -5.71    -9.30     3.59     0.92     0.03     4.78

    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.989

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     760.931     402.113     646.003    1112.940       0.684      -0.014

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      19.059      13.934     514.710      24.000      31.901      35.400       3.499

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     680.004     402.113     790.000    1123.421       0.605       0.184

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.954      14.793     524.449     528.796       0.030       0.362

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     619.392       0.000     619.392    1130.445       0.548       0.266

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.342     531.028       0.000       0.060       0.055       0.288

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.845      18.820       1.246     563.071      40.261     234.635       1.819

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 250659.797       0.542    2693.106 1933379.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.528   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    190.124    3776.000      18.820     563.071       1.000       1.000       0.980
W Kg/sec =   86.41991

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    154.721    3624.170       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 146258.906  149183.766       1.310     590.487     450.596     474.134       1.052

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   585.05    -0.20   585.05     0.52   649.91
 MEAN    18.08     0.00    -0.02   585.05    -0.20   585.05     0.52
 HUB     15.21     0.00    -0.02   585.05    -0.20   585.05     0.52

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.18    46.36     2.82   677.16   895.04    15.69   534.49     0.79
 MEAN    45.53    42.30     3.23   595.71   835.10    15.69   534.49     0.74
 HUB     40.60    37.84     2.76   501.20   770.51    15.69   534.49     0.68

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   640.69   254.89   587.80  1157.19     0.55
 MEAN    18.01   658.46   284.42   593.86  1154.75     0.57
 HUB     15.22   716.86   389.92   601.54  1152.31     0.62

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   721.26   417.98     0.62  5209.05
 MEAN   593.46   669.46   309.04     0.58  5126.09     1.34
 HUB    501.63   611.82   111.71     0.53  5938.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.89     1.16    17.77   590.63     1.05   556.36     0.92     0.90
 MEAN    21.84     1.16    17.51   590.19     1.05   554.00     0.92     0.90
 HUB     22.34     1.19    17.21   594.49     1.06   551.60     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.44    35.42    31.50     3.92     0.93     0.24     2.90
 MEAN    25.59    27.49    23.50     3.99     0.92     0.25     3.30     0.90
 HUB     32.95    10.52     6.50     4.02     0.92     0.27     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     669.194     285.221     605.367    1154.958       0.579      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.976      17.501     554.378      46.000      25.228      30.600       5.372

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     614.799     285.221     677.738    1161.017       0.530       0.130

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.891      18.082     560.210     511.151       0.029       0.236

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     607.033       0.000     607.033    1161.838       0.522       0.130

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.089     561.002       0.000       0.060       0.051       0.131

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.842      21.793       1.158     591.770      28.699     287.377       2.228

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 178774.188       0.395    1920.762 1770916.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.528   EfDer =  0.981

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    190.124    3776.000      21.793     591.770       1.000       1.000       0.980
W Kg/sec =   86.41991

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    136.981    3535.198       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 146258.906  149183.766       1.367     545.479     398.952     429.765       1.077

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   566.71    -0.20   566.71     0.49   619.15
 MEAN    17.74     0.00    -0.02   566.71    -0.20   566.71     0.49
 HUB     15.05     0.00    -0.02   566.71    -0.20   566.71     0.49

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.41    46.36     3.05   661.34   871.09    18.54   564.96     0.75
 MEAN    45.90    43.40     2.50   584.52   814.27    18.54   564.96     0.70
 HUB     41.20    38.84     2.36   495.92   753.19    18.54   564.96     0.65

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   623.73   242.80   574.53  1186.21      0.53
 MEAN    17.51   640.60   274.07   579.01  1184.35      0.54
 HUB     14.85   697.21   379.16   585.10  1182.45      0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   705.81   409.97     0.60  4813.87
 MEAN   576.87   653.41   302.80     0.55  4801.50     1.34
 HUB    489.33   595.38   110.17     0.50  5633.50

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.87     1.14    20.60   617.22     1.04   584.76     0.92     0.90
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 MEAN    24.87     1.14    20.37   617.16     1.04   582.91     0.92     0.90
 HUB     25.43     1.17    20.09   621.56     1.05   581.00     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.91    35.51    31.50     4.01     0.93     0.24     2.90
 MEAN    25.33    27.61    23.50     4.11     0.91     0.25     3.28     0.90
 HUB     32.94    10.66     6.50     4.16     0.91     0.27     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     647.876     275.870     586.207    1184.936       0.547       0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.008      20.404     583.612      46.000      25.202      31.500       6.298

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     605.326     275.870     665.225    1189.446       0.509       0.111

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.918      20.877     588.063     471.992       0.029       0.239

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     585.961       0.000     585.961    1191.392       0.492       0.133

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.029     589.988       0.000       0.060       0.051       0.143

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.835      24.814       1.139     618.647      26.877     285.436       2.213

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 167514.062       0.393    1799.783 1712378.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 3.528   EfDer =  0.975

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    190.124    3776.000      24.814     618.647       1.000       1.000       0.980
W Kg/sec =   86.41991

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    123.002    3457.551       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 146258.906  149183.766       1.433     513.330     358.259     401.059       1.119

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   545.55    -0.19   545.55     0.46   581.11
 MEAN    16.97     0.00    -0.02   545.55    -0.19   545.55     0.46
 HUB     14.32     0.00    -0.02   545.55    -0.19   545.55     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.33    46.36     2.97   634.65   837.04    21.51   593.82     0.70
 MEAN    45.72    43.80     1.92   559.22   781.38    21.51   593.82     0.65
 HUB     40.87    37.84     3.03   471.87   721.43    21.51   593.82     0.60

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   599.03   225.39   555.01  1212.60     0.49
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 MEAN    16.57   613.74   253.53   558.93  1210.85     0.51
 HUB     13.89   664.87   351.65   564.26  1209.04     0.55
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   682.22   396.74     0.56  4259.06
 MEAN   546.14   630.89   292.61     0.52  4205.19     1.33
 HUB    457.70   574.14   106.05     0.47  4887.10

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.74     1.12    23.48   641.15     1.04   611.22     0.92     0.89
 MEAN    27.70     1.12    23.24   640.87     1.04   609.45     0.92     0.89
 HUB     28.19     1.14    22.95   644.47     1.04   607.60     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.10    35.56    31.50     4.06     0.93     0.23     2.90
 MEAN    24.40    27.63    23.50     4.13     0.91     0.24     3.29     0.89
 HUB     31.93    10.64     6.50     4.14     0.91     0.27     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.975

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     602.340     254.958     545.720    1213.206       0.496       0.058

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.834      23.516     611.895      46.000      25.042      32.400       7.358

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     573.209     254.958     627.353    1216.035       0.471       0.129

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.746      23.826     614.753     456.573       0.029       0.241

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     542.707       0.000     542.707    1218.840       0.445       0.127

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.108     617.592       0.000       0.060       0.055       0.190

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.821      27.627       1.113     642.166      23.519     300.151       2.327

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 146669.266       0.379    1575.825 1709457.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.528   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    190.124    3776.000      27.627     642.166       1.000       1.000       0.980
W Kg/sec =   86.41991

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.561    3393.646       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 146258.906  149183.766       1.554     509.668     327.869     390.276       1.190

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   502.72    -0.17   502.72     0.41   542.53
 MEAN    15.91     0.00    -0.02   502.72    -0.17   502.72     0.41
 HUB     13.07     0.00    -0.02   502.72    -0.17   502.72     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.22    47.36     2.86   603.68   785.72    24.59   621.09     0.64
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 MEAN    46.22    44.80     1.42   524.36   726.54    24.59   621.09     0.59
 HUB     40.60    38.84     1.76   430.68   662.09    24.59   621.09     0.54
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   559.63   221.10   514.10  1237.77     0.45
 MEAN    15.50   570.64   237.70   518.78  1235.31     0.46
 HUB     12.59   612.52   316.40   524.47  1232.84     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   633.44   370.06     0.51  3969.68
 MEAN   510.67   586.21   272.98     0.47  3686.50     1.34
 HUB    414.86   533.63    98.46     0.43  3985.79

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.52     1.10    26.53   663.13     1.03   637.02     0.92     0.89
 MEAN    30.31     1.10    26.18   661.64     1.03   634.48     0.92     0.89
 HUB     30.54     1.11    25.79   663.22     1.03   631.93     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.27    35.75    31.50     4.25     0.93     0.24     2.90
 MEAN    24.62    27.75    23.50     4.25     0.91     0.24     3.34     0.89
 HUB     31.10    10.63     6.50     4.13     0.91     0.25     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      576.785     242.057     523.536    1235.704       0.467       -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.371      26.157      634.918       46.000      24.813      33.000       8.187

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      557.583     242.057     607.857    1237.471       0.451       0.025

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       30.206       26.275     636.734     440.827       0.059       0.244

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      517.540       0.000     517.540    1240.954       0.417       0.149

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       26.796      640.325       0.000       0.060       0.059       0.147

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4       Texit        Del T       Ns         Ns nondim
      0.811       30.206        1.093     662.662      20.496     318.167       2.466

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 127891.328       0.366    1374.073 1746240.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    871508.62   9363.5488     185.7319      1.9995      0.8216      3.5283      1.2675
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 100% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.703   EfDer =  0.991

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     189.145    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   85.97491

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     184.776    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  145505.781  148415.578       1.545     831.557     538.107     619.754       1.152

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   456.93    -0.16   456.93     0.41   677.10
  MEAN    17.06     0.00    -0.02   456.93    -0.16   456.93     0.41
  HUB     12.51     0.00    -0.02   456.93    -0.16   456.93     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.10    50.47     5.63   679.80   819.22    13.42   505.37     0.74
  MEAN    50.90    47.20     3.70   562.16   724.56    13.42   505.37     0.66
  HUB     42.07    38.62     3.45   412.23   615.50    13.42   505.37     0.56

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   702.15   348.85   609.36  1118.71     0.63
  MEAN    18.04   741.79   404.40   621.86  1114.22     0.67
  HUB     15.00   860.67   559.62   653.89  1103.72     0.78

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   693.43   330.94     0.62  7200.05
  MEAN   594.32   650.21   189.92     0.58  7296.54     1.23
  HUB    494.28   657.15    65.34     0.60  8396.26

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.88     1.25    14.48   560.92     1.07   519.77     0.92     0.91
  MEAN    18.94     1.25    14.06   561.43     1.07   515.51     0.92     0.91
  HUB     19.57     1.30    13.09   567.25     1.09   505.48     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     29.79    28.51    24.20     4.31     0.93     0.23     2.90
  MEAN    33.04    16.98    12.70     4.28     0.92     0.18     3.51     0.91
  HUB     40.56    -5.71    -9.30     3.59     0.92     0.04     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     757.209     403.620     640.669    1113.594       0.680      -0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.079      13.994     515.314      24.000      32.211      35.400       3.189

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     673.385     403.620     785.083    1124.364       0.599       0.192
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.978      14.887     525.330     528.796       0.029       0.368

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     613.579       0.000     613.579    1131.223       0.542       0.273

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.429     531.759       0.000       0.060       0.053       0.295

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.848      18.852       1.248     563.204      40.394     233.327       1.809

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 251486.281       0.544    2688.073 1921351.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.703   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    189.145    3776.000      18.852     563.204       1.000       1.000       0.980
W Kg/sec =   85.97491

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    153.686    3623.743       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 145505.781  148415.578       1.319     590.487     447.582     474.134       1.059

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   579.81    -0.20   579.81     0.51   649.84
 MEAN    18.08     0.00    -0.02   579.81    -0.20   579.81     0.51
 HUB     15.21     0.00    -0.02   579.81    -0.20   579.81     0.51

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.44    46.36     3.08   677.16   891.62    15.77   535.13     0.79
 MEAN    45.78    42.30     3.48   595.71   831.44    15.77   535.13     0.73
 HUB     40.85    37.84     3.01   501.20   766.54    15.77   535.13     0.68

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   636.83   259.34   581.63  1158.24     0.55
 MEAN    18.01   654.54   287.55   588.00  1155.63     0.57
 HUB     15.22   712.75   391.04   595.90  1153.04     0.62

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   713.66   413.54     0.62  5299.81
 MEAN   593.46   662.82   305.91     0.57  5182.29     1.35
 HUB    501.63   606.08   110.58     0.53  5955.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.99     1.17    17.90   591.24     1.05   557.39     0.92     0.91
 MEAN    21.91     1.16    17.62   590.62     1.05   554.86     0.92     0.91
 HUB     22.40     1.19    17.30   594.71     1.06   552.31     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.03    35.41    31.50     3.91     0.93     0.25     2.90
 MEAN    26.06    27.49    23.50     3.99     0.92     0.26     3.30     0.91
 HUB     33.27    10.51     6.50     4.01     0.92     0.27     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     665.027     288.353     599.261    1155.881       0.575      -0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.053      17.616     555.264      46.000      25.696      30.600       4.904

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     607.764     288.353     672.699    1162.198       0.523       0.139

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.974      18.234     561.350     511.151       0.028       0.243

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     599.865       0.000     599.865    1163.023       0.516       0.141

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.248     562.146       0.000       0.060       0.048       0.143

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.848      21.883       1.161     592.192      28.988     283.943       2.201

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 180576.703       0.399    1930.138 1757262.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.703   EfDer =  0.984

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    189.145    3776.000      21.883     592.192       1.000       1.000       0.980
W Kg/sec =   85.97491

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    135.762    3533.938       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 145505.781  148415.578       1.380     545.479     395.402     429.765       1.087

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   560.34    -0.19   560.34     0.48   618.93
 MEAN    17.74      0.00    -0.02   560.34    -0.19   560.34     0.48
 HUB     15.05      0.00    -0.02   560.34    -0.19   560.34     0.48

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     49.73     46.36     3.37   661.34   866.95     18.69   565.98      0.74
 MEAN    46.22     43.40     2.82   584.52   809.85     18.69   565.98      0.69
 HUB     41.52     38.84     2.68   495.92   748.41     18.69   565.98      0.64

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   618.98    248.23    567.03   1187.70      0.52
 MEAN    17.51   635.80    277.91    571.85   1185.65      0.54
 HUB     14.85   692.18    380.58    578.17   1183.56      0.58

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78    696.55    404.55     0.59   4921.25
 MEAN   576.87    645.28    298.96     0.54   4868.73     1.35
 HUB    489.33    588.31    108.75     0.50   5654.54

         Pt2       PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     25.06      1.15     20.82   618.21      1.04    586.24      0.92      0.90
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 MEAN    25.02     1.14    20.57   617.94     1.04   584.20     0.92     0.90
 HUB     25.56     1.17    20.27   622.09     1.05   582.11     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.64    35.51    31.50     4.01     0.93     0.25     2.90
 MEAN    25.92    27.60    23.50     4.10     0.91     0.26     3.28     0.90
 HUB     33.36    10.65     6.50     4.15     0.91     0.28     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     642.914     279.737     578.866    1186.257       0.542       0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.164      20.603     584.913      46.000      25.792      31.500       5.708

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     596.735     279.737     659.049    1191.092       0.501       0.124

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.082      21.127     589.691     471.992       0.028       0.248

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     577.516       0.000     577.516    1192.993       0.484       0.146

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.283     591.575       0.000       0.060       0.048       0.157

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.843      24.988       1.142     619.414      27.222     281.127       2.179

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 169663.516       0.398    1813.490 1698029.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 3.703   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    189.145    3776.000      24.988     619.414       1.000       1.000       0.980
W Kg/sec =   85.97491

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    121.592    3455.411       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 145505.781  148415.578       1.449     513.330     354.151     401.059       1.132

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   538.02    -0.19   538.02     0.45   580.75
 MEAN    16.97     0.00    -0.02   538.02    -0.19   538.02     0.45
 HUB     14.32     0.00    -0.02   538.02    -0.19   538.02     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.72    46.36     3.36   634.65   832.16    21.75   595.26     0.70
 MEAN    46.12    43.80     2.32   559.22   776.14    21.75   595.26     0.65
 HUB     41.26    37.84     3.42   471.87   715.75    21.75   595.26     0.60

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   593.38   231.77   546.24  1214.54     0.49
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 MEAN    16.57   607.99   258.06   550.51  1212.58     0.50
 HUB     13.89   658.83   353.33   556.06  1210.58     0.54
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   671.39   390.36     0.55  4379.46
 MEAN   546.14   621.33   288.08     0.51  4280.17     1.34
 HUB    457.70   565.77   104.37     0.47  4910.43

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.03     1.12    23.81   642.56     1.04   613.18     0.92     0.90
 MEAN    27.96     1.12    23.55   642.03     1.04   611.19     0.92     0.90
 HUB     28.42     1.14    23.23   645.36     1.04   609.15     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.99    35.55    31.50     4.05     0.93     0.24     2.90
 MEAN    25.12    27.62    23.50     4.12     0.91     0.25     3.29     0.90
 HUB     32.43    10.63     6.50     4.13     0.91     0.27     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     596.945     259.510     537.585    1214.881       0.491       0.058

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.092      23.815     613.587      46.000      25.768      32.400       6.632

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     563.619     259.510     620.493    1218.071       0.463       0.143

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.014      24.187     616.813     456.573       0.027       0.252

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     533.713       0.000     533.713    1220.772       0.437       0.141

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.466     619.551       0.000       0.060       0.051       0.203

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.832      27.902       1.117     643.317      23.904     294.463       2.283

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 149072.000       0.385    1593.393 1694030.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.703   EfDer =  0.975

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    189.145    3776.000      27.902     643.317       1.000       1.000       0.980
W Kg/sec =   85.97491

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    110.976    3390.607       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 145505.781  148415.578       1.577     509.668     323.253     390.276       1.207

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   494.69    -0.17   494.69     0.40   542.05
 MEAN    15.91     0.00    -0.02   494.69    -0.17   494.69     0.40
 HUB     13.07     0.00    -0.02   494.69    -0.17   494.69     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.67    47.36     3.31   603.68   780.61    24.93   622.91     0.64
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 MEAN    46.68    44.80     1.88   524.36   721.00    24.93   622.91     0.59
 HUB     41.05    38.84     2.21   430.68   656.01    24.93   622.91     0.54
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   553.94   227.87   504.90  1240.02     0.45
 MEAN    15.50   564.58   242.56   509.82  1237.37     0.46
 HUB     12.59   605.93   318.18   515.67  1234.72     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   622.01   363.28     0.50  4091.15
 MEAN   510.67   576.02   268.12     0.47  3761.76     1.36
 HUB    414.86   524.65    96.68     0.42  4008.16

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.93     1.11    26.97   664.92     1.03   639.34     0.92     0.89
 MEAN    30.68     1.10    26.60   663.18     1.03   636.60     0.92     0.89
 HUB     30.87     1.11    26.18   664.49     1.03   633.87     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.29    35.74    31.50     4.24     0.93     0.25     2.90
 MEAN    25.44    27.74    23.50     4.24     0.91     0.25     3.34     0.89
 HUB     31.68    10.62     6.50     4.12     0.91     0.26     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.975

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      570.664     247.004     514.437    1237.766       0.461      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.742      26.571      637.040      46.000      25.648      33.000       7.352

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      546.566     247.004     599.788    1239.945       0.441       0.045

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.599      26.774     639.285     440.827       0.054       0.256

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     507.736       0.000     507.736    1243.252       0.408       0.166

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.274     642.699       0.000       0.060       0.054       0.163

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.824      30.596       1.097     664.198      20.881     311.232       2.413

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 130298.234       0.373    1392.725 1730013.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    881096.75   9417.8184    184.7755      2.0253      0.8293      3.7034      1.2704
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 100% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.036   EfDer =  0.993

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     187.286    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   85.13009

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     182.960    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  144075.984  146957.188       1.561     831.557     532.819     619.754       1.163

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   451.53    -0.16   451.53     0.41   677.10
  MEAN    17.06     0.00    -0.02   451.53    -0.16   451.53     0.41
  HUB     12.51     0.00    -0.02   451.53    -0.16   451.53     0.41

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.41    50.47     5.94   679.80   816.22    13.46   505.78     0.74
  MEAN    51.24    47.20     4.04   562.16   721.17    13.46   505.78     0.65
  HUB     42.41    38.62     3.79   412.23   611.50    13.46   505.78     0.55

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   696.53   353.95   599.90  1119.98     0.62
  MEAN    18.04   735.63   407.21   612.65  1115.28     0.66
  HUB     15.00   852.43   558.60   643.89  1104.83     0.77

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   682.68   325.85     0.61  7305.21
  MEAN   594.32   640.58   187.11     0.57  7347.16     1.24
  HUB    494.28   647.10    64.32     0.59  8380.89

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.95     1.25    14.60   561.48     1.07   520.98     0.92     0.91
  MEAN    18.98     1.26    14.17   561.70     1.07   516.53     0.92     0.91
  HUB     19.57     1.30    13.20   567.17     1.08   506.56     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     30.54    28.51    24.20     4.31     0.93     0.24     2.90
  MEAN    33.61    16.98    12.70     4.28     0.92     0.19     3.51     0.91
  HUB     40.94    -5.70    -9.30     3.60     0.92     0.05     4.78

    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.993

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     750.358     406.422     630.759    1114.793       0.673      -0.012

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      19.115      14.105     516.425      24.000      32.795      35.400       2.605

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     661.242     406.422     776.157    1126.076       0.587       0.207

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.021      15.057     526.932     528.796       0.028       0.377

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     602.933       0.000     602.933    1132.636       0.532       0.286

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.586     533.088       0.000       0.060       0.050       0.309

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.855      18.907       1.252     563.451      40.641     230.883       1.790

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 253028.312       0.548    2677.979 1898638.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.036   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    187.286    3776.000      18.907     563.451       1.000       1.000       0.980
W Kg/sec =   85.13009

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    151.761    3622.946       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 144075.984  146957.188       1.336     590.487     441.975     474.134       1.073

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   570.19    -0.20   570.19     0.50   649.69
 MEAN    18.08     0.00    -0.02   570.19    -0.20   570.19     0.50
 HUB     15.21     0.00    -0.02   570.19    -0.20   570.19     0.50

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.91    46.36     3.55   677.16   885.39    15.92   536.31     0.78
 MEAN    46.26    42.30     3.96   595.71   824.75    15.92   536.31     0.73
 HUB     41.33    37.84     3.49   501.20   759.28    15.92   536.31     0.67

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   630.01   267.39   570.45  1160.12     0.54
 MEAN    18.01   647.54   293.25   577.33  1157.22     0.56
 HUB     15.22   705.32   393.11   585.62  1154.36     0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   699.88   405.48     0.60  5464.23
 MEAN   593.46   650.71   300.21     0.56  5285.03     1.36
 HUB    501.63   595.58   108.52     0.52  5987.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.16     1.17    18.13   592.36     1.05   559.23     0.92     0.91
 MEAN    22.05     1.17    17.82   591.41     1.05   556.41     0.92     0.91
 HUB     22.49     1.19    17.48   595.13     1.06   553.60     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.11    35.41    31.50     3.91     0.93     0.26     2.90
 MEAN    26.93    27.47    23.50     3.97     0.92     0.26     3.30     0.91
 HUB     33.87    10.50     6.50     4.00     0.92     0.28     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     657.592     294.076     588.172    1157.541       0.568       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.191      17.823     556.859      46.000      26.564      30.600       4.036

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     595.103     294.076     663.799    1164.314       0.511       0.157

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.121      18.506     563.395     511.151       0.026       0.257

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     587.045       0.000     587.045    1165.136       0.504       0.160

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.530     564.191       0.000       0.060       0.044       0.163

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      22.042       1.166     592.966      29.514     277.800       2.153

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 183856.922       0.406    1945.889 1731877.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.036   EfDer =  0.989

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    187.286    3776.000      22.042     592.966       1.000       1.000       0.980
W Kg/sec =   85.13009

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    133.544    3531.630       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 144075.984  146957.188       1.402     545.479     388.942     429.765       1.105

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   548.90    -0.19   548.90     0.47   618.52
 MEAN    17.74     0.00    -0.02   548.90    -0.19   548.90     0.47
 HUB     15.05     0.00    -0.02   548.90    -0.19   548.90     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.32    46.36     3.96   661.34   859.60    18.95   567.82     0.74
 MEAN    46.81    43.40     3.41   584.52   801.98    18.95   567.82     0.69
 HUB     42.11    38.84     3.27   495.92   739.88    18.95   567.82     0.63

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   610.84   257.86   553.75  1190.33      0.51
 MEAN    17.51   627.45   284.77   559.11  1187.95      0.53
 HUB     14.85   683.32   383.10   565.82  1185.56      0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   680.14   394.92     0.57  5112.01
 MEAN   576.87   630.82   292.10     0.53  4988.67     1.37
 HUB    489.33   575.71   106.23     0.49  5691.94

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     25.38     1.15    21.20   620.00     1.05   588.86     0.92     0.90
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 MEAN    25.30     1.15    20.91   619.34     1.04   586.49     0.92     0.90
 HUB     25.78     1.17    20.58   623.06     1.05   584.10     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.97    35.50    31.50     4.00     0.93     0.26     2.90
 MEAN    26.99    27.58    23.50     4.08     0.92     0.27     3.28     0.90
 HUB     34.10    10.63     6.50     4.13     0.92     0.29     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     634.303     286.637     565.844    1188.592       0.534       0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.440      20.952     587.218      46.000      26.865      31.500       4.635

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     581.658     286.637     648.450    1193.988       0.487       0.145

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.370      21.566     592.561     471.992       0.025       0.264

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     562.996       0.000     562.996    1195.783       0.471       0.167

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.719     594.344       0.000       0.060       0.044       0.179

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854      25.284       1.147     620.801      27.835     273.631       2.121

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 173487.422       0.407    1836.141 1671671.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 4.036   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    187.286    3776.000      25.284     620.801       1.000       1.000       0.980
W Kg/sec =   85.13009

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    119.122    3451.550       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 144075.984  146957.188       1.480     513.330     346.957     401.059       1.156

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   525.03    -0.18   525.03     0.44   580.10
 MEAN    16.97     0.00    -0.02   525.03    -0.18   525.03     0.44
 HUB     14.32     0.00    -0.02   525.03    -0.18   525.03     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.41    46.36     4.05   634.65   823.82    22.16   597.80     0.69
 MEAN    46.81    43.80     3.01   559.22   767.19    22.16   597.80     0.64
 HUB     41.96    37.84     4.12   471.87   706.04    22.16   597.80     0.59

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   584.11   242.62   531.34  1217.87     0.48
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 MEAN    16.57   598.40   265.82   536.12  1215.57     0.49
 HUB     13.89   648.59   356.18   542.04  1213.25     0.53
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   652.96   379.51     0.54  4584.13
 MEAN   546.14   604.98   280.32     0.50  4408.69     1.37
 HUB    457.70   551.46   101.52     0.45  4949.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.53     1.13    24.37   645.02     1.04   616.56     0.92     0.90
 MEAN    28.40     1.12    24.06   644.10     1.04   614.22     0.92     0.90
 HUB     28.80     1.14    23.70   646.96     1.04   611.86     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.54    35.54    31.50     4.04     0.93     0.26     2.90
 MEAN    26.37    27.60    23.50     4.10     0.91     0.26     3.29     0.90
 HUB     33.31    10.61     6.50     4.11     0.91     0.28     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     587.970     267.312     523.692    1217.777       0.483       0.058

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.531      24.322     616.516      46.000      27.041      32.400       5.359

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     547.418     267.312     609.198    1221.565       0.448       0.167

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.468      24.800     620.358     456.573       0.024       0.271

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     518.526       0.000     518.526    1224.092       0.424       0.165

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.071     622.927       0.000       0.060       0.046       0.226

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.847      28.367       1.122     645.360      24.559     285.035       2.210

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 153166.641       0.396    1621.072 1666179.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 4.036   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    187.286    3776.000      28.367     645.360       1.000       1.000       0.980
W Kg/sec =   85.13009

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.257    3385.238       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 144075.984  146957.188       1.616     509.668     315.332     390.276       1.238

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   481.07    -0.17   481.07     0.39   541.19
 MEAN    15.91     0.00    -0.02   481.07    -0.17   481.07     0.39
 HUB     13.07     0.00    -0.02   481.07    -0.17   481.07     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.46    47.36     4.10   603.68   772.05    25.51   626.06     0.63
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MEAN    47.47    44.80     2.67   524.36   711.73    25.51   626.06     0.58
HUB     41.85    38.84     3.01   430.68   645.80    25.51   626.06     0.53
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   544.82   239.20   489.50  1243.83     0.44
MEAN    15.50   554.68   250.72   494.78  1240.89     0.45
HUB     12.59   595.01   321.19   500.87  1237.95     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    591.16   602.90   351.96     0.48  4294.22
MEAN   510.67   558.91   259.95     0.45  3888.24     1.39
HUB    414.86   509.56    93.67     0.41  4045.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     31.62     1.11    27.72   668.04     1.04   643.28     0.92     0.90
MEAN    31.30     1.10    27.29   665.89     1.03   640.24     0.92     0.90
HUB     31.43     1.11    26.83   666.73     1.03   637.20     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     26.04    35.72    31.50     4.22     0.93     0.27     2.90
MEAN    26.87    27.72    23.50     4.22     0.91     0.27     3.34     0.90
HUB     32.67    10.59     6.50     4.09     0.91     0.27     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.983

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      560.695     255.321     499.189    1241.283       0.452      -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.368      27.268      640.669       46.000      27.088      33.000       5.912

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      528.390     255.321     586.843    1244.122       0.425       0.079

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       31.257      27.608     643.603     440.827       0.047       0.277

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      491.471       0.000     491.471    1247.153       0.394       0.193

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       28.075      646.742       0.000       0.060       0.048       0.191

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.842      31.250       1.102     666.885      21.526     299.978       2.325

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 134334.156       0.384    1421.754 1700971.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    897873.50   9502.8350    182.9599      2.0686      0.8408      4.0364      1.2756
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 100% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.539   EfDer =  0.995

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     184.491    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   83.85950

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     180.229    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  141925.625  144763.828       1.584     831.557     524.867     619.754       1.181

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   443.47    -0.15   443.47     0.40   677.10
  MEAN    17.06     0.00    -0.02   443.47    -0.15   443.47     0.40
  HUB     12.51     0.00    -0.02   443.47    -0.15   443.47     0.40

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.89    50.47     6.42   679.80   811.79    13.52   506.38     0.74
  MEAN    51.74    47.20     4.54   562.16   716.15    13.52   506.38     0.65
  HUB     42.92    38.62     4.30   412.23   605.58    13.52   506.38     0.55

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK         AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   688.58   361.39   586.13  1121.79     0.61
  MEAN    18.04   726.78   411.33   599.18  1116.81     0.65
  HUB     15.00   840.50   557.13   629.32  1106.42     0.76

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   667.03   318.41     0.59  7458.55
  MEAN   594.32   626.51   182.99     0.56  7421.31     1.26
  HUB    494.28   632.45    62.85     0.57  8358.83

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.05     1.26    14.77   562.29     1.08   522.71     0.92     0.91
  MEAN    19.03     1.26    14.31   562.09     1.08   518.00     0.92     0.91
  HUB     19.57     1.30    13.35   567.06     1.08   508.12     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     31.66    28.51    24.20     4.31     0.93     0.26     2.90
  MEAN    34.47    16.98    12.70     4.28     0.92     0.21     3.51     0.91
  HUB     41.52    -5.70    -9.30     3.60     0.92     0.06     4.78

    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.995

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     740.566     410.528     616.364    1116.499       0.663      -0.010

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      19.166      14.262     518.007      24.000      33.666      35.400       1.734

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     643.917     410.528     763.650    1128.479       0.571       0.227

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.081      15.297     529.183     528.796       0.027       0.391

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     587.769       0.000     587.769    1134.621       0.518       0.304

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.805     534.959       0.000       0.060       0.046       0.328

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.863      18.983       1.257     563.814      41.004     227.296       1.762

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 255285.109       0.552    2661.539 1864774.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.539   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    184.491    3776.000      18.983     563.814       1.000       1.000       0.980
W Kg/sec =   83.85950

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    148.952    3621.781       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141925.625  144763.828       1.361     590.487     433.794     474.134       1.093

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   556.42    -0.19   556.42     0.49   649.48
 MEAN    18.08     0.00    -0.02   556.42    -0.19   556.42     0.49
 HUB     15.21     0.00    -0.02   556.42    -0.19   556.42     0.49

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.60    46.36     4.24   677.16   876.59    16.12   537.96     0.77
 MEAN    46.96    42.30     4.66   595.71   815.29    16.12   537.96     0.72
 HUB     42.02    37.84     4.18   501.20   748.99    16.12   537.96     0.66

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   620.85   278.72   554.77  1162.73     0.53
 MEAN    18.01   637.90   301.30   562.26  1159.44     0.55
 HUB     15.22   694.93   396.05   571.03  1156.21     0.60

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   680.54   394.15     0.59  5695.44
 MEAN   593.46   633.64   292.16     0.55  5429.85     1.39
 HUB    501.63   580.71   105.58     0.50  6031.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.41     1.18    18.45   593.94     1.05   561.77     0.92     0.91
 MEAN    22.24     1.17    18.10   592.54     1.05   558.57     0.92     0.91
 HUB     22.62     1.19    17.72   595.73     1.06   555.41     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.68    35.39    31.50     3.89     0.93     0.28     2.90
 MEAN    28.19    27.46    23.50     3.96     0.92     0.28     3.30     0.91
 HUB     34.74    10.47     6.50     3.97     0.92     0.29     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     647.403     302.145     572.572    1159.841       0.558       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.379      18.107     559.073      46.000      27.820      30.600       2.780

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     577.538     302.145     651.798    1167.229       0.495       0.182

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.321      18.878     566.219     511.151       0.023       0.277

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     569.492       0.000     569.492    1168.024       0.488       0.185

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.910     566.990       0.000       0.060       0.039       0.190

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      22.252       1.172     594.070      30.256     269.364       2.088

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188478.703       0.416    1965.032 1694878.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.539   EfDer =  0.994

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    184.491    3776.000      22.252     594.070       1.000       1.000       0.980
W Kg/sec =   83.85950

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    130.430    3528.347       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 141925.625  144763.828       1.436     545.479     379.871     429.765       1.131

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   533.17    -0.18   533.17     0.46   617.95
 MEAN    17.74      0.00    -0.02   533.17    -0.18   533.17     0.46
 HUB     15.05      0.00    -0.02   533.17    -0.18   533.17     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.13     46.36     4.77   661.34   849.64    19.30   570.34     0.73
 MEAN    47.64     43.40     4.24   584.52   791.29    19.30   570.34     0.68
 HUB     42.94     38.84     4.10   495.92   728.28    19.30   570.34     0.62

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   600.41   270.85    535.85  1193.86      0.50
 MEAN    17.51   616.50   294.06    541.84  1191.06      0.52
 HUB     14.85   671.44   386.54    549.02  1188.28      0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   658.03   381.93     0.55  5369.21
 MEAN   576.87   611.21   282.81     0.51  5151.23     1.39
 HUB    489.33   558.56   102.79     0.47  5742.92

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     25.81     1.16    21.71   622.46     1.05   592.37     0.92     0.91
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 MEAN    25.66     1.15    21.37   621.31     1.05   589.59     0.92     0.91
 HUB     26.08     1.17    20.99   624.43     1.05   586.81     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.81    35.48    31.50     3.98     0.93     0.28     2.90
 MEAN    28.49    27.56    23.50     4.06     0.92     0.28     3.28     0.91
 HUB     35.15    10.60     6.50     4.10     0.92     0.30     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     623.031     295.990     548.231    1191.741       0.523       0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.805      21.415     590.334      46.000      28.365      31.500       3.135

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     561.577     295.990     634.806    1197.859       0.469       0.175

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.749      22.147     596.410     471.992       0.022       0.287

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     543.708       0.000     543.708    1199.514       0.453       0.195

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.292     598.059       0.000       0.060       0.040       0.208

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      25.670       1.154     622.733      28.663     263.805       2.045

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 178658.469       0.419    1862.648 1633925.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 4.539   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    184.491    3776.000      25.670     622.733       1.000       1.000       0.980
W Kg/sec =   83.85950

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    115.758    3446.188       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141925.625  144763.828       1.523     513.330     337.162     401.059       1.190

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   507.70    -0.17   507.69     0.42   579.20
 MEAN    16.97     0.00    -0.02   507.70    -0.17   507.69     0.42
 HUB     14.32     0.00    -0.02   507.70    -0.17   507.69     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.35    46.36     4.99   634.65   812.87    22.71   601.23     0.68
 MEAN    47.77    43.80     3.97   559.22   755.43    22.71   601.23     0.63
 HUB     42.92    37.84     5.08   471.87   693.24    22.71   601.23     0.58

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   572.67   256.81   511.85  1222.24     0.47
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 MEAN    16.57   586.25   276.03   517.20  1219.53     0.48
 HUB     13.89   635.33   359.96   523.52  1216.82     0.52
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   628.85   365.32     0.51  4852.03
 MEAN   546.14   583.48   270.11     0.48  4577.83     1.40
 HUB    457.70   532.56    97.74     0.44  5002.32

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.18     1.14    25.10   648.37     1.04   621.01     0.92     0.91
 MEAN    28.97     1.13    24.73   646.92     1.04   618.25     0.92     0.91
 HUB     29.29     1.14    24.32   649.17     1.04   615.49     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.64    35.52    31.50     4.02     0.93     0.28     2.90
 MEAN    28.09    27.58    23.50     4.08     0.92     0.28     3.29     0.91
 HUB     34.51    10.58     6.50     4.08     0.92     0.30     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     576.620     277.581     505.411    1221.616       0.472       0.057

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.104      24.982     620.413      46.000      28.776      32.400       3.624

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     526.419     277.581     595.120    1226.156       0.429       0.198

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.056      25.596     625.033     456.573       0.021       0.297

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     498.863       0.000     498.863    1228.466       0.406       0.197

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.854     627.390       0.000       0.060       0.041       0.256

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      28.967       1.128     648.153      25.420     273.131       2.117

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 158542.359       0.410    1652.923 1626901.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 4.539   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    184.491    3776.000      28.967     648.153       1.000       1.000       0.980
W Kg/sec =   83.85950

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.659    3377.935       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141925.625  144763.828       1.672     509.668     304.854     390.276       1.280

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   463.37    -0.16   463.37     0.38   540.02
 MEAN    15.91     0.00    -0.02   463.37    -0.16   463.37     0.38
 HUB     13.07     0.00    -0.02   463.37    -0.16   463.37     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.50    47.36     5.14   603.68   761.14    26.27   630.25     0.62
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MEAN    48.54    44.80     3.74   524.36   699.88    26.27   630.25     0.57
HUB     42.92    38.84     4.08   430.68   632.72    26.27   630.25     0.51
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   533.96   253.68   469.85  1248.78     0.43
MEAN    15.50   542.52   261.21   475.50  1245.48     0.44
HUB     12.59   581.25   325.09   481.84  1242.20     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    591.16   578.49   337.48     0.46  4553.94
MEAN   510.67   536.96   249.46     0.43  4050.66     1.42
HUB    414.86   490.13    89.77     0.39  4095.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     32.52     1.12    28.67   672.20     1.04   648.42     0.92     0.91
MEAN    32.11     1.11    28.18   669.54     1.03   645.00     0.92     0.91
HUB     32.14     1.11    27.66   669.78     1.03   641.60     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     28.37    35.69    31.50     4.19     0.93     0.30     2.90
MEAN    28.78    27.68    23.50     4.18     0.92     0.29     3.34     0.91
HUB     34.01    10.55     6.50     4.05     0.92     0.29     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.991

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     548.478     265.999     479.659    1245.871       0.440       -0.005

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    32.174      28.162     645.420      46.000      29.011      33.000       3.989

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     505.587     265.999     571.292    1249.504       0.405       0.122

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      32.094      28.669     649.190     440.827       0.040       0.305

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     470.926       0.000     470.926    1252.217       0.376       0.229

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      29.098     652.012       0.000       0.060       0.042       0.227

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.861      32.084       1.108     670.506      22.353     286.178       2.218

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 139509.484       0.399    1454.491 1660407.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    920474.12   9596.6328    180.2291      2.1238      0.8533      4.5386      1.2825
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 100% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.035   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     181.737    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   82.60789

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     177.539    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  139807.359  142603.203       1.608     831.557     517.033     619.754       1.199

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   435.62    -0.15   435.62     0.39   677.10
  MEAN    17.06     0.00    -0.02   435.62    -0.15   435.62     0.39
  HUB     12.51     0.00    -0.02   435.62    -0.15   435.62     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.35    50.47     6.88   679.80   807.52    13.57   506.96     0.73
  MEAN    52.24    47.20     5.04   562.16   711.31    13.57   506.96     0.64
  HUB     43.43    38.62     4.81   412.23   599.85    13.57   506.96     0.54

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   681.30   368.46   573.06  1123.47     0.61
  MEAN    18.04   718.50   415.26   586.35  1118.24     0.64
  HUB     15.00   829.23   555.72   615.46  1107.91     0.75

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   652.17   311.33     0.58  7604.47
  MEAN   594.32   613.08   179.06     0.55  7492.25     1.29
  HUB    494.28   618.52    61.44     0.56  8337.69

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.14     1.27    14.93   563.06     1.08   524.31     0.92     0.91
  MEAN    19.08     1.26    14.45   562.47     1.08   519.37     0.92     0.91
  HUB     19.57     1.30    13.49   566.94     1.08   509.57     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     32.74    28.51    24.20     4.31     0.93     0.27     2.90
  MEAN    35.31    16.98    12.70     4.28     0.92     0.22     3.51     0.91
  HUB     42.08    -5.70    -9.30     3.60     0.92     0.07     4.78

    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.997

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     731.472     414.456     602.725    1118.075       0.654      -0.008

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      19.213      14.408     519.470      24.000      34.514      35.400       0.886

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     627.805     414.456     752.272    1130.670       0.555       0.247

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.135      15.515     531.239     528.796       0.026       0.405

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     573.677       0.000     573.677    1136.436       0.505       0.320

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.002     536.671       0.000       0.060       0.043       0.345

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      19.048       1.261     564.159      41.349     223.861       1.735

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 257435.141       0.557    2643.896 1831749.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.035   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    181.737    3776.000      19.048     564.159       1.000       1.000       0.980
W Kg/sec =   82.60789

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    146.273    3620.672       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 139807.359  142603.203       1.386     590.487     425.993     474.134       1.113

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   543.57    -0.19   543.57     0.48   649.29
 MEAN    18.08     0.00    -0.02   543.57    -0.19   543.57     0.48
 HUB     15.21     0.00    -0.02   543.57    -0.19   543.57     0.48

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.25    46.36     4.89   677.16   868.49    16.30   539.49     0.76
 MEAN    47.63    42.30     5.33   595.71   806.58    16.30   539.49     0.71
 HUB     42.69    37.84     4.85   501.20   739.50    16.30   539.49     0.65

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   612.90   289.07   540.45  1165.07     0.53
 MEAN    18.01   629.33   308.72   548.41  1161.45     0.54
 HUB     15.22   685.48   398.77   557.56  1157.90     0.59

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   662.86   383.80     0.57  5906.68
 MEAN   593.46   617.92   284.74     0.53  5563.37     1.41
 HUB    501.63   566.97   102.86     0.49  6073.30

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.63     1.19    18.73   595.41     1.06   564.05     0.92     0.91
 MEAN    22.41     1.18    18.34   593.59     1.05   560.53     0.92     0.91
 HUB     22.73     1.19    17.93   596.29     1.06   557.06     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.14    35.38    31.50     3.88     0.93     0.29     2.90
 MEAN    29.38    27.44    23.50     3.94     0.92     0.29     3.30     0.91
 HUB     35.57    10.45     6.50     3.95     0.92     0.30     3.92

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     638.369     309.584     558.277    1161.910       0.549       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.545      18.359     561.069      46.000      29.010      30.600       1.590

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     561.662     309.584     641.331    1169.841       0.480       0.205

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.494      19.208     568.755     511.151       0.022       0.295

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     553.871       0.000     553.871    1170.587       0.473       0.207

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.237     569.481       0.000       0.060       0.037       0.212

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.874      22.429       1.178     595.096      30.937     261.829       2.030

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 192719.781       0.426    1979.260 1659629.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.035   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    181.737    3776.000      22.429     595.096       1.000       1.000       0.980
W Kg/sec =   82.60789

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    127.584    3525.305       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 139807.359  142603.203       1.468     545.479     371.583     429.765       1.157

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   519.09    -0.18   519.09     0.44   617.42
 MEAN    17.74     0.00    -0.02   519.09    -0.18   519.09     0.44
 HUB     15.05     0.00    -0.02   519.09    -0.18   519.09     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.88    46.36     5.52   661.34   840.87    19.61   572.60     0.72
 MEAN    48.40    43.40     5.00   584.52   781.87    19.61   572.60     0.67
 HUB     43.70    38.84     4.86   495.92   718.04    19.61   572.60     0.61

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   591.82   282.23   520.19  1196.94     0.49
 MEAN    17.51   607.21   302.24   526.64  1193.80     0.51
 HUB     14.85   661.13   389.58   534.16  1190.70     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   638.67   370.55     0.53  5594.56
 MEAN   576.87   593.94   274.63     0.50  5294.43     1.42
 HUB    489.33   543.39    99.76     0.46  5787.90

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.18     1.17    22.15   624.68     1.05   595.44     0.92     0.91
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 MEAN    25.97     1.16    21.76   623.09     1.05   592.32     0.92     0.91
 HUB     26.32     1.17    21.34   625.70     1.05   589.22     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.48    35.46    31.50     3.96     0.93     0.30     2.90
 MEAN    29.85    27.54    23.50     4.04     0.92     0.30     3.28     0.91
 HUB     36.10    10.58     6.50     4.08     0.92     0.31     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     613.503     304.228     532.758    1194.500       0.514       0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.114      21.809     593.071      46.000      29.728      31.500       1.772

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     544.198     304.228     623.463    1201.226       0.453       0.201

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.066      22.639     599.768     471.992       0.021       0.307

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     527.047       0.000     527.047    1202.760       0.438       0.220

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.777     601.302       0.000       0.060       0.038       0.233

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      25.992       1.159     624.487      29.392     255.443       1.980

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 183201.406       0.430    1881.505 1598561.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.035   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    181.737    3776.000      25.992     624.487       1.000       1.000       0.980
W Kg/sec =   82.60789

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.780    3441.346       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 139807.359  142603.203       1.563     513.330     328.487     401.059       1.221

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   492.64    -0.17   492.64     0.41   578.39
 MEAN    16.97     0.00    -0.02   492.64    -0.17   492.64     0.41
 HUB     14.32     0.00    -0.02   492.64    -0.17   492.64     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.19    46.36     5.83   634.65   803.55    23.17   604.24     0.67
 MEAN    48.63    43.80     4.83   559.22   745.39    23.17   604.24     0.62
 HUB     43.78    37.84     5.94   471.87   682.29    23.17   604.24     0.57

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   563.58   268.91   495.29  1225.98     0.46
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 MEAN    16.57   576.28   284.75   501.02  1222.94     0.47
 HUB     13.89   624.17   363.19   507.63  1219.92     0.51
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   608.34   353.22     0.50  5080.21
 MEAN   546.14   565.11   261.39     0.46  4722.25     1.43
 HUB    457.70   516.35    94.51     0.42  5047.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.72     1.14    25.71   651.33     1.04   624.83     0.92     0.91
 MEAN    29.45     1.13    25.29   649.44     1.04   621.73     0.92     0.91
 HUB     29.70     1.14    24.84   651.15     1.04   618.65     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.50    35.50    31.50     4.00     0.93     0.30     2.90
 MEAN    29.61    27.55    23.50     4.05     0.92     0.30     3.29     0.91
 HUB     35.58    10.55     6.50     4.05     0.92     0.31     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     567.338     286.349     489.773    1224.930       0.463       0.056

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.581      25.533     623.787      46.000      30.313      32.400       2.087

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     508.713     286.349     583.768    1230.087       0.414       0.225

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.543      26.259     629.050     456.573       0.019       0.320

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     482.312       0.000     482.312    1232.219       0.391       0.223

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.503     631.233       0.000       0.060       0.038       0.282

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      29.459       1.133     650.641      26.153     263.359       2.042

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 163127.500       0.421    1675.343 1590587.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.035   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    181.737    3776.000      29.459     650.641       1.000       1.000       0.980
W Kg/sec =   82.60789

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.567    3371.471       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 139807.359  142603.203       1.723     509.668     295.850     390.276       1.319

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   448.41    -0.15   448.41     0.36   538.99
 MEAN    15.91     0.00    -0.02   448.41    -0.15   448.41     0.36
 HUB     13.07     0.00    -0.02   448.41    -0.15   448.41     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.40    47.36     6.04   603.68   752.12    26.89   633.87     0.61
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MEAN    49.47    44.80     4.67   524.36   690.07    26.89   633.87     0.56
HUB     43.85    38.84     5.01   430.68   621.85    26.89   633.87     0.50
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   525.63   265.66   453.56  1252.96     0.42
MEAN    15.50   532.86   269.93   459.42  1249.39     0.43
HUB     12.59   569.97   328.31   465.92  1245.85     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    591.16   558.26   325.49     0.45  4768.83
MEAN   510.67   518.68   240.74     0.42  4185.79     1.45
HUB    414.86   473.89    86.55     0.38  4135.47

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     33.25     1.13    29.46   675.82     1.04   652.78     0.92     0.91
MEAN    32.77     1.11    28.91   672.74     1.03   649.07     0.92     0.91
HUB     32.73     1.11    28.35   672.48     1.03   645.39     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.36    35.66    31.50     4.16     0.93     0.32     2.90
MEAN    30.44    27.65    23.50     4.15     0.92     0.31     3.34     0.91
HUB     35.17    10.52     6.50     4.02     0.92     0.30     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     538.799     274.884     463.404    1249.767       0.431      -0.005

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    32.835      28.895     649.471      46.000      30.676      33.000       2.324

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     486.971     274.884     559.198    1254.025       0.388       0.157

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      32.773      29.534     653.905     440.827       0.036       0.330

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     454.060       0.000     454.060    1256.499       0.361       0.259

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      29.932     656.487       0.000       0.060       0.038       0.256

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.872      32.761       1.112     673.679      23.038     275.198       2.133

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 143799.000       0.411    1476.836 1623193.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    940282.88   9656.8389    177.5392      2.1686      0.8612      5.0352      1.2886
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 100% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.526   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     179.025    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   81.37495

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     174.889    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  137720.719  140474.828       1.633     831.557     509.316     619.754       1.217

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   427.96    -0.15   427.96     0.39   677.10
  MEAN    17.06     0.00    -0.02   427.96    -0.15   427.96     0.39
  HUB     12.51     0.00    -0.02   427.96    -0.15   427.96     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.81    50.47     7.34   679.80   803.41    13.62   507.51     0.73
  MEAN    52.73    47.20     5.53   562.16   706.64    13.62   507.51     0.64
  HUB     43.94    38.62     5.32   412.23   594.31    13.62   507.51     0.54

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   674.60   375.20   560.64  1125.04     0.60
  MEAN    18.04   710.75   419.04   574.09  1119.58     0.63
  HUB     15.00   818.59   554.42   602.25  1109.30     0.74

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   638.04   304.60     0.57  7743.36
  MEAN   594.32   600.25   175.28     0.54  7560.35     1.31
  HUB    494.28   605.25    60.14     0.55  8318.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.23     1.27    15.08   563.80     1.08   525.80     0.92     0.91
  MEAN    19.12     1.27    14.57   562.83     1.08   520.65     0.92     0.91
  HUB     19.56     1.30    13.62   566.84     1.08   510.92     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     33.79    28.52    24.20     4.32     0.93     0.29     2.90
  MEAN    36.13    16.98    12.70     4.28     0.92     0.24     3.51     0.91
  HUB     42.63    -5.70    -9.30     3.60     0.92     0.09     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     723.002     418.227     589.761    1119.537       0.646      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.257      14.543     520.830      24.000      35.342      35.400       0.058

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     612.728     418.227     741.856    1132.682       0.541       0.265
   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.182      15.715     533.132     528.796       0.025       0.418

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     560.489       0.000     560.489    1138.107       0.492       0.336

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.182     538.251       0.000       0.060       0.041       0.360

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      19.104       1.265     564.490      41.680     220.562       1.710

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 259493.953       0.562    2625.264 1799525.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.526   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.025    3776.000      19.104     564.490       1.000       1.000       0.980
W Kg/sec =   81.37495

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    143.708    3619.612       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 137720.719  140474.828       1.411     590.487     418.521     474.134       1.133

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   531.50    -0.18   531.50     0.47   649.10
 MEAN    18.08     0.00    -0.02   531.50    -0.18   531.50     0.47
 HUB     15.21     0.00    -0.02   531.50    -0.18   531.50     0.47

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.88    46.36     5.52   677.16   860.98    16.46   540.90     0.75
 MEAN    48.27    42.30     5.97   595.71   798.49    16.46   540.90     0.70
 HUB     43.33    37.84     5.49   501.20   730.66    16.46   540.90     0.64

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   605.94   298.63   527.24  1167.19     0.52
 MEAN    18.01   621.63   315.58   535.56  1163.28     0.53
 HUB     15.22   676.81   401.30   545.01  1159.45     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   646.57   374.25     0.55  6101.69
 MEAN   593.46   603.36   277.88     0.52  5686.87     1.43
 HUB    501.63   554.17   100.33     0.48  6111.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.82     1.19    18.99   596.77     1.06   566.12     0.92     0.91
 MEAN    22.55     1.18    18.56   594.58     1.05   562.31     0.92     0.91
 HUB     22.83     1.19    18.12   596.82     1.06   558.58     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.53    35.37    31.50     3.87     0.93     0.31     2.90
 MEAN    30.51    27.42    23.50     3.92     0.92     0.30     3.30     0.91
 HUB     36.36    10.43     6.50     3.93     0.92     0.31     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     630.267     316.465     545.056    1163.791       0.542       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.692      18.584     562.887      46.000      30.140      30.600       0.460

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     547.153     316.465     632.081    1172.207       0.467       0.226

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.645      19.501     571.058     511.151       0.021       0.312

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     539.633       0.000     539.633    1172.908       0.460       0.226

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.527     571.741       0.000       0.060       0.037       0.232

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      22.581       1.182     596.056      31.566     255.023       1.977

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 196640.594       0.434    1989.385 1625903.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.526   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    179.025    3776.000      22.581     596.056       1.000       1.000       0.980
W Kg/sec =   81.37495

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    124.932    3522.465       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 137720.719  140474.828       1.499     545.479     363.860     429.765       1.181

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   506.20    -0.17   506.20     0.43   616.92
 MEAN    17.74     0.00    -0.02   506.20    -0.17   506.20     0.43
 HUB     15.05     0.00    -0.02   506.20    -0.17   506.20     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.58    46.36     6.22   661.34   832.98    19.88   574.67     0.71
 MEAN    49.12    43.40     5.72   584.52   773.37    19.88   574.67     0.66
 HUB     44.42    38.84     5.58   495.92   708.77    19.88   574.67     0.60

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   584.54    292.44    506.12  1199.68      0.49
 MEAN    17.51   599.11    309.62    512.91  1196.26      0.50
 HUB     14.85   651.93    392.30    520.69  1192.88      0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   621.29   360.34     0.52  5796.73
 MEAN   576.87   578.36   267.25     0.48  5423.52      1.45
 HUB    489.33   529.65    97.03     0.44  5828.28

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.51     1.17    22.53   626.70     1.05   598.19     0.92     0.91
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 MEAN    26.24     1.16    22.10   624.73     1.05   594.77     0.92     0.91
 HUB     26.53     1.17    21.65   626.87     1.05   591.40     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.02    35.45    31.50     3.95     0.93     0.31     2.90
 MEAN    31.12    27.52    23.50     4.02     0.92     0.31     3.28     0.91
 HUB     37.00    10.56     6.50     4.06     0.92     0.32     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     605.220     311.654     518.810    1196.971       0.506       0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.382      22.152     595.528      46.000      30.994      31.500       0.506

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     528.721     311.654     613.738    1204.225       0.439       0.225

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.339      23.069     602.768     471.992       0.020       0.327

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     512.236       0.000     512.236    1205.655       0.425       0.241

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.197     604.201       0.000       0.060       0.037       0.255

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      26.266       1.163     626.102      30.046     248.116       1.923

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 187284.141       0.440    1894.727 1565066.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.526   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.025    3776.000      26.266     626.102       1.000       1.000       0.980
W Kg/sec =   81.37495

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    110.078    3436.907       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 137720.719  140474.828       1.601     513.330     320.618     401.059       1.251

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   479.21    -0.17   479.21     0.40   577.64
 MEAN    16.97     0.00    -0.02   479.21    -0.17   479.21     0.40
 HUB     14.32     0.00    -0.02   479.21    -0.17   479.21     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.95    46.36     6.59   634.65   795.38    23.57   606.94     0.66
 MEAN    49.41    43.80     5.61   559.22   736.58    23.57   606.94     0.61
 HUB     44.57    37.84     6.73   471.87   672.65    23.57   606.94     0.56

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   556.10   279.49   480.76  1229.27     0.45
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 MEAN    16.57   567.85   292.44   486.76  1225.97     0.46
 HUB     13.89   614.50   366.05   493.57  1222.69     0.50
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   590.37   342.64     0.48  5280.03
 MEAN   546.14   548.91   253.70     0.45  4849.67     1.45
 HUB    457.70   502.01    91.65     0.41  5086.75

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.19     1.15    26.23   654.00     1.04   628.20     0.92     0.91
 MEAN    29.86     1.14    25.77   651.72     1.04   624.82     0.92     0.91
 HUB     30.04     1.14    25.28   652.98     1.04   621.48     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.17    35.48    31.50     3.98     0.93     0.32     2.90
 MEAN    31.00    27.53    23.50     4.03     0.92     0.31     3.29     0.91
 HUB     36.56    10.52     6.50     4.02     0.92     0.32     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     559.509     294.085     475.988    1227.863       0.456       0.055

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.989      26.005     626.783      46.000      31.710      32.400       0.690

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     493.278     294.085     574.291    1233.548       0.400       0.249

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.955      26.827     632.600     456.573       0.018       0.341

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     467.907       0.000     467.907    1235.530       0.379       0.246

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.057     634.634       0.000       0.060       0.037       0.303

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      29.874       1.137     652.900      26.798     255.032       1.977

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 167157.922       0.432    1691.113 1556512.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.526   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.025    3776.000      29.874     652.900       1.000       1.000       0.980
W Kg/sec =   81.37495

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     98.832    3365.633       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 137720.719  140474.828       1.770     509.668     287.883     390.276       1.356

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   435.35    -0.15   435.35     0.35   538.06
 MEAN    15.91     0.00    -0.02   435.35    -0.15   435.35     0.35
 HUB     13.07     0.00    -0.02   435.35    -0.15   435.35     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.21    47.36     6.85   603.68   744.40    27.42   637.10     0.60
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MEAN    50.31    44.80     5.51   524.36   681.65    27.42   637.10     0.55
HUB     44.70    38.84     5.86   430.68   612.49    27.42   637.10     0.49
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   519.00   275.98   439.55  1256.60     0.41
MEAN    15.50   524.87   277.46   445.55  1252.82     0.42
HUB     12.59   560.40   331.09   452.13  1249.06     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    591.16   540.87   315.18     0.43  4953.82
MEAN   510.67   502.89   233.22     0.40  4302.28     1.49
HUB    414.86   459.83    83.77     0.37  4170.41

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     33.87     1.13    30.12   679.05     1.04   656.59     0.92     0.91
MEAN    33.32     1.12    29.53   675.61     1.03   652.64     0.92     0.91
HUB     33.22     1.11    28.93   674.92     1.03   648.73     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.12    35.64    31.50     4.14     0.93     0.34     2.90
MEAN    31.91    27.63    23.50     4.13     0.92     0.32     3.34     0.91
HUB     36.22    10.50     6.50     4.00     0.92     0.31     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     530.825     282.543     449.383    1253.181       0.424      -0.005

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    33.392      29.513     653.033      46.000      32.159      33.000       0.841

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     471.146     282.543     549.372    1257.956       0.375       0.186

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      33.338      30.259     658.019     440.827       0.033       0.351

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     439.669       0.000     439.669    1260.239       0.349       0.284

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      30.633     660.410       0.000       0.060       0.037       0.281

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.878      33.325       1.116     676.529      23.629     266.047       2.062

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 147495.031       0.422    1492.187 1588439.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    958071.62   9692.6768    174.8894      2.2059      0.8660      5.5263      1.2940
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 100% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.012   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     176.353    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   80.16042

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     172.279    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  135665.203  138378.219       1.657     831.557     501.714     619.754       1.235

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   420.48    -0.14   420.48     0.38   677.10
  MEAN    17.06     0.00    -0.02   420.48    -0.14   420.48     0.38
  HUB     12.51     0.00    -0.02   420.48    -0.14   420.48     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.27    50.47     7.80   679.80   799.45    13.67   508.04     0.72
  MEAN    53.21    47.20     6.01   562.16   702.13    13.67   508.04     0.64
  HUB     44.44    38.62     5.82   412.23   588.94    13.67   508.04     0.53

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   668.44   381.63   548.79  1126.50     0.59
  MEAN    18.04   703.47   422.65   562.34  1120.84     0.63
  HUB     15.00   808.49   553.16   589.63  1110.61     0.73

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   624.55   298.16     0.55  7876.04
  MEAN   594.32   587.96   171.67     0.52  7625.47     1.33
  HUB    494.28   592.56    58.88     0.53  8299.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.31     1.28    15.21   564.50     1.08   527.19     0.92     0.91
  MEAN    19.16     1.27    14.69   563.17     1.08   521.86     0.92     0.91
  HUB     19.56     1.29    13.74   566.74     1.08   512.19     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     34.82    28.52    24.20     4.32     0.93     0.30     2.90
  MEAN    36.93    16.98    12.70     4.28     0.93     0.25     3.51     0.91
  HUB     43.17    -5.70    -9.30     3.60     0.93     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     715.078     421.833     577.402    1120.898       0.638      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.296      14.668     522.097      24.000      36.151      35.400      -0.751

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     598.555     421.833     732.264    1134.539       0.528       0.282
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      19.223      15.899     534.882     528.796       0.025       0.430

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     548.078       0.000     548.078    1139.655       0.481       0.350

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      16.346     539.716       0.000       0.060       0.040       0.375

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
    0.876      19.153       1.268     564.806      41.996     217.392       1.685

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 261458.922       0.566    2605.664 1768069.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.012   EfDer =  1.000

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   176.353    3776.000      19.153     564.806       1.000       1.000       0.980
W Kg/sec =   80.16042

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
   141.243    3618.600       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 135665.203  138378.219       1.436     590.487     411.342     474.134       1.153

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   520.10    -0.18   520.10     0.46   648.91
 MEAN    18.08     0.00    -0.02   520.10    -0.18   520.10     0.46
 HUB     15.21     0.00    -0.02   520.10    -0.18   520.10     0.46

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.48    46.36     6.12   677.16   853.98    16.61   542.22     0.75
 MEAN    48.89    42.30     6.59   595.71   790.94    16.61   542.22     0.69
 HUB     43.95    37.84     6.11   501.20   722.41    16.61   542.22     0.63

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   599.80   307.48   514.99  1169.13     0.51
 MEAN    18.01   614.66   321.99   523.58  1164.97     0.53
 HUB     15.22   668.79   403.63   533.26  1160.89     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   631.45   365.40     0.54  6282.35
 MEAN   593.46   589.77   271.47     0.51  5802.28     1.45
 HUB    501.63   542.19    97.99     0.47  6147.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.00     1.20    19.21   598.04     1.06   568.00     0.92     0.91
 MEAN    22.69     1.18    18.76   595.50     1.05   563.96     0.92     0.91
 HUB     22.91     1.20    18.29   597.33     1.06   559.99     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.84    35.36    31.50     3.86     0.93     0.32     2.90
 MEAN    31.59    27.41    23.50     3.91     0.93     0.32     3.30     0.91
 HUB     37.12    10.41     6.50     3.91     0.93     0.32     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     622.964     322.895     532.750    1165.510       0.534       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.822      18.785     564.552      46.000      31.220      30.600      -0.620

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     533.781     322.895     623.846    1174.368       0.455       0.246

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.777      19.764     573.165     511.151       0.021       0.328

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     526.540       0.000     526.540    1175.025       0.448       0.244

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.785     573.806       0.000       0.060       0.037       0.251

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      22.713       1.186     596.956      32.150     248.825       1.929

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 200283.328       0.442    1995.996 1593529.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.012   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    176.353    3776.000      22.713     596.956       1.000       1.000       0.980
W Kg/sec =   80.16042

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    122.447    3519.808       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 135665.203  138378.219       1.530     545.479     356.621     429.765       1.205

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   494.31    -0.17   494.31     0.42   616.45
 MEAN    17.74      0.00    -0.02   494.31    -0.17   494.31     0.42
 HUB     15.05      0.00    -0.02   494.31    -0.17   494.31     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.23     46.36     6.87   661.34   825.80    20.12   576.56     0.70
 MEAN    49.79     43.40     6.39   584.52   765.64    20.12   576.56     0.65
 HUB     45.10     38.84     6.26   495.92   700.32    20.12   576.56     0.59

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   578.30    301.72    493.36   1202.15      0.48
 MEAN    17.51   592.00    316.36    500.38   1198.49      0.49
 HUB     14.85   643.66    394.80    508.36   1194.87      0.54

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78    605.51    351.06     0.50   5980.44
 MEAN   576.87    564.13    260.52     0.47   5541.31      1.47
 HUB    489.33    517.07     94.53     0.43   5865.40

         Pt2       PR       Ps2      Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     26.79     1.18     22.86    628.57      1.05    600.66     0.92      0.91
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 MEAN    26.47     1.17    22.40   626.25     1.05   597.00     0.92     0.91
 HUB     26.71     1.18    21.92   627.97     1.05   593.39     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.45    35.43    31.50     3.93     0.93     0.33     2.90
 MEAN    32.30    27.50    23.50     4.00     0.93     0.33     3.28     0.91
 HUB     37.83    10.53     6.50     4.03     0.93     0.33     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     597.945     318.431     506.102    1199.205       0.499       0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.615      22.453     597.755      46.000      32.177      31.500      -0.677

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     514.759     318.431     605.290    1206.930       0.427       0.247

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.574      23.446     605.481     471.992       0.020       0.344

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     498.899       0.000     498.899    1208.266       0.413       0.260

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.563     606.823       0.000       0.060       0.037       0.274

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      26.501       1.167     627.598      30.642     241.594       1.873

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 191004.031       0.448    1903.520 1533168.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.012   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    176.353    3776.000      26.501     627.598       1.000       1.000       0.980
W Kg/sec =   80.16042

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    107.603    3432.807       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 135665.203  138378.219       1.638     513.330     313.411     401.059       1.280

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   467.07    -0.16   467.07     0.39   576.95
 MEAN    16.97     0.00    -0.02   467.07    -0.16   467.07     0.39
 HUB     14.32     0.00    -0.02   467.07    -0.16   467.07     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.66    46.36     7.30   634.65   788.13    23.91   609.40     0.65
 MEAN    50.14    43.80     6.34   559.22   728.74    23.91   609.40     0.60
 HUB     45.30    37.84     7.46   471.87   664.06    23.91   609.40     0.55

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   549.86   288.91   467.84  1232.20     0.45
 MEAN    16.57   560.60   299.29   474.02  1228.68     0.46
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 HUB     13.89   605.96   368.58   480.98  1225.18     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   574.38   333.22     0.47  5457.75
 MEAN   546.14   534.45   246.85     0.43  4963.05     1.48
 HUB    457.70   489.16    89.12     0.40  5121.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.60     1.15    26.68   656.43     1.05   631.21     0.92     0.91
 MEAN    30.21     1.14    26.19   653.82     1.04   627.60     0.92     0.91
 HUB     30.33     1.14    25.66   654.66     1.04   624.03     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.70    35.46    31.50     3.96     0.93     0.33     2.90
 MEAN    32.27    27.51    23.50     4.01     0.93     0.33     3.29     0.91
 HUB     37.46    10.50     6.50     4.00     0.93     0.33     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     552.778     300.969     463.661    1230.495       0.449       0.053

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.338      26.411     629.477      46.000      32.988      32.400      -0.588

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     479.605     300.969     566.218    1236.640       0.388       0.271

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.305      27.317     635.780     456.573       0.018       0.360

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     455.165       0.000     455.165    1238.492       0.368       0.266

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.531     637.686       0.000       0.060       0.037       0.322

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      30.225       1.141     654.970      27.372     247.807       1.921

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 170742.469       0.441    1701.596 1524276.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.012   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    176.353    3776.000      30.225     654.970       1.000       1.000       0.980
W Kg/sec =   80.16042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.379    3360.311       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 135665.203  138378.219       1.815     509.668     280.740     390.276       1.390

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   423.76    -0.15   423.76     0.34   537.20
 MEAN    15.91     0.00    -0.02   423.76    -0.15   423.76     0.34
 HUB     13.07     0.00    -0.02   423.76    -0.15   423.76     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.94    47.36     7.58   603.68   737.68    27.88   640.00     0.59
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 MEAN    51.06    44.80     6.26   524.36   674.30    27.88   640.00     0.54
 HUB     45.47    38.84     6.63   430.68   604.30    27.88   640.00     0.49
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   513.60   284.99   427.28  1259.83     0.41
 MEAN    15.50   518.15   284.04   433.36  1255.87     0.41
 HUB     12.59   552.12   333.53   439.99  1251.93     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   525.65   306.17     0.42  5115.32
 MEAN   510.67   489.04   226.63     0.39  4404.31     1.51
 HUB    414.86   447.44    81.33     0.36  4201.11

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.40     1.14    30.68   681.97     1.04   659.98     0.92     0.91
 MEAN    33.79     1.12    30.06   678.22     1.04   655.84     0.92     0.91
 HUB     33.62     1.11    29.42   677.15     1.03   651.73     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.70    35.62    31.50     4.12     0.93     0.35     2.90
 MEAN    33.24    27.61    23.50     4.11     0.93     0.34     3.34     0.91
 HUB     37.16    10.47     6.50     3.97     0.93     0.33     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     524.118     289.252     437.073    1256.216       0.417       -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.861      30.036     656.210      46.000      33.496      33.000      -0.496

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219     457.411     289.252     541.194    1261.431       0.363        0.212

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.811      30.873     661.669     440.827       0.033       0.371

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     427.145       0.000     427.145    1263.557       0.338       0.305

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      31.224     663.902       0.000       0.060       0.037       0.302

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit         Del T        Ns         Ns nondim
      0.881      33.796       1.118     679.115      24.145     258.250       2.002

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 150727.172       0.431    1502.126 1555663.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    974215.94   9708.9023    172.2791      2.2371      0.8686      6.0120      1.2990
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 100% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.492   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     173.721    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   78.96402

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     169.708    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  133640.391  136312.906       1.683     831.557     494.226     619.754       1.254

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   413.17    -0.14   413.17     0.37   677.10
  MEAN    17.06     0.00    -0.02   413.17    -0.14   413.17     0.37
  HUB     12.51     0.00    -0.02   413.17    -0.14   413.17     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.71    50.47     8.24   679.80   795.63    13.72   508.55     0.72
  MEAN    53.69    47.20     6.49   562.16   697.78    13.72   508.55     0.63
  HUB     44.94    38.62     6.32   412.23   583.75    13.72   508.55     0.53

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   662.75   387.79   537.46  1127.87     0.59
  MEAN    18.04   696.61   426.12   551.08  1122.03     0.62
  HUB     15.00   798.88   551.95   577.55  1111.84     0.72

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   611.66   292.01     0.54  8002.98
  MEAN   594.32   576.18   168.20     0.51  7687.95     1.35
  HUB    494.28   580.42    57.68     0.52  8281.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.39     1.28    15.34   565.17     1.08   528.49     0.92     0.91
  MEAN    19.20     1.27    14.80   563.51     1.08   522.99     0.92     0.91
  HUB     19.55     1.29    13.85   566.65     1.08   513.37     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     35.81    28.52    24.20     4.32     0.93     0.32     2.90
  MEAN    37.71    16.97    12.70     4.27     0.93     0.26     3.51     0.91
  HUB     43.70    -5.70    -9.30     3.60     0.93     0.11     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     707.649     425.293     565.591    1122.170       0.631      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.332      14.784     523.282      24.000      36.941      35.400      -1.541

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     585.169     425.293     723.393    1136.262       0.515       0.298
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      19.260      16.069     536.508     528.796       0.025       0.443

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     536.339       0.000     536.339    1141.096       0.470       0.363

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      16.496     541.082       0.000       0.060       0.039       0.388

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.879      19.195       1.271     565.108      42.298     214.339       1.662

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 263341.031       0.570    2585.251 1737350.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.492   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    173.721    3776.000      19.195     565.108       1.000       1.000       0.980
W Kg/sec =   78.96402

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    138.867    3617.632       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 133640.391  136312.906       1.460     590.487     404.423     474.134       1.172

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   509.28    -0.18   509.28     0.45   648.74
 MEAN    18.08     0.00    -0.02   509.28    -0.18   509.28     0.45
 HUB     15.21     0.00    -0.02   509.28    -0.18   509.28     0.45

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.06    46.36     6.70   677.16   847.44    16.75   543.45     0.74
 MEAN    49.48    42.30     7.18   595.71   783.87    16.75   543.45     0.69
 HUB     44.55    37.84     6.71   501.20   714.66    16.75   543.45     0.62

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   594.35   315.76   503.54  1170.91     0.51
 MEAN    18.01   608.32   328.00   512.32  1166.53     0.52
 HUB     15.22   661.35   405.85   522.18  1162.23     0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   617.32   357.12     0.53  6451.40
 MEAN   593.46   577.01   265.47     0.49  5910.34     1.47
 HUB    501.63   530.89    95.78     0.46  6180.87

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.15     1.21    19.42   599.24     1.06   569.74     0.92     0.91
 MEAN    22.80     1.19    18.94   596.37     1.06   565.48     0.92     0.91
 HUB     22.98     1.20    18.44   597.81     1.06   561.29     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.09    35.34    31.50     3.84     0.93     0.34     2.90
 MEAN    32.63    27.39    23.50     3.89     0.93     0.33     3.30     0.91
 HUB     37.85    10.39     6.50     3.89     0.93     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     616.320     328.915     521.215    1167.096       0.528       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.938      18.965     566.089      46.000      32.254      30.600      -1.654

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     521.354     328.915     616.438    1176.359       0.443       0.264

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.892      20.001     575.110     511.151       0.021       0.344

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     514.400       0.000     514.400    1176.974       0.437       0.260

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.016     575.712       0.000       0.060       0.038       0.268

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      22.826       1.189     597.806      32.698     243.123       1.885

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 203697.125       0.450    1999.720 1562365.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.492   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    173.721    3776.000      22.826     597.806       1.000       1.000       0.980
W Kg/sec =   78.96402

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    120.102    3517.305       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 133640.391  136312.906       1.559     545.479     349.794     429.765       1.229

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   483.25    -0.17   483.25     0.41   616.02
 MEAN    17.74     0.00    -0.02   483.25    -0.17   483.25     0.41
 HUB     15.05     0.00    -0.02   483.25    -0.17   483.25     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.85    46.36     7.49   661.34   819.22    20.33   578.31     0.69
 MEAN    50.43    43.40     7.03   584.52   758.54    20.33   578.31     0.64
 HUB     45.75    38.84     6.91   495.92   692.56    20.33   578.31     0.59

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   572.91   310.22   481.65  1204.40     0.48
 MEAN    17.51   585.67   322.55   488.85  1200.53     0.49
 HUB     14.85   636.13   397.10   496.97  1196.71     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   591.04   342.55     0.49  6148.88
 MEAN   576.87   551.05   254.33     0.46  5649.61     1.49
 HUB    489.33   505.46    92.24     0.42  5899.37

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.04     1.18    23.16   630.31     1.05   602.92     0.92     0.91
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 MEAN    26.68     1.17    22.67   627.67     1.05   599.05     0.92     0.91
 HUB     26.86     1.18    22.15   629.00     1.05   595.22     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.79    35.42    31.50     3.92     0.93     0.34     2.90
 MEAN    33.42    27.49    23.50     3.99     0.93     0.34     3.28     0.91
 HUB     38.63    10.51     6.50     4.01     0.93     0.34     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     591.482     324.662     494.415    1201.246       0.492       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.818      22.718     599.794      46.000      33.291      31.500      -1.791

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     502.025     324.662     597.858    1209.395       0.415       0.267

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.776      23.779     607.959     471.992       0.020       0.361

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     486.754       0.000     486.754    1210.647       0.402       0.278

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.885     609.219       0.000       0.060       0.038       0.292

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      26.702       1.170     628.995      31.189     235.724       1.827

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 194417.031       0.456    1908.616 1502644.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.492   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    173.721    3776.000      26.702     628.995       1.000       1.000       0.980
W Kg/sec =   78.96402

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    105.317    3428.993       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 133640.391  136312.906       1.673     513.330     306.752     401.059       1.307

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   455.99    -0.16   455.99     0.38   576.31
 MEAN    16.97     0.00    -0.02   455.99    -0.16   455.99     0.38
 HUB     14.32     0.00    -0.02   455.99    -0.16   455.99     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.31    46.36     7.95   634.65   781.61    24.22   611.65     0.64
 MEAN    50.81    43.80     7.01   559.22   721.68    24.22   611.65     0.59
 HUB     45.99    37.84     8.15   471.87   656.31    24.22   611.65     0.54

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   544.56   297.39   456.19  1234.85     0.44
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 MEAN    16.57   554.26   305.46   462.49  1231.14     0.45
 HUB     13.89   598.34   370.86   469.55  1227.46     0.49
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   559.97   324.74     0.45  5617.75
 MEAN   546.14   521.37   240.68     0.42  5065.33     1.50
 HUB    457.70   477.51    86.84     0.39  5153.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.95     1.16    27.07   658.67     1.05   633.93     0.92     0.91
 MEAN    30.51     1.14    26.54   655.76     1.04   630.13     0.92     0.91
 HUB     30.58     1.15    25.99   656.22     1.04   626.35     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.10    35.45    31.50     3.95     0.93     0.35     2.90
 MEAN    33.44    27.49    23.50     3.99     0.93     0.34     3.29     0.91
 HUB     38.30    10.48     6.50     3.98     0.93     0.34     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     546.917     307.178     452.503    1232.884       0.444       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    30.637      26.762     631.929      46.000      34.170      32.400      -1.770

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     467.321     307.178     559.239    1239.436       0.377       0.291

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      30.604      27.741     638.664     456.573       0.018       0.378

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     443.733       0.000     443.733    1241.175       0.358       0.284

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.939     640.457       0.000       0.060       0.038       0.339

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.881      30.522       1.143     656.883      27.888     241.434       1.872

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 173970.641       0.449    1707.891 1493582.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.492   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    173.721    3776.000      30.522     656.883       1.000       1.000       0.980
W Kg/sec =   78.96402

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.154    3355.413       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 133640.391  136312.906       1.858     509.668     274.259     390.276       1.423

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   413.34    -0.14   413.34     0.33   536.42
 MEAN    15.91     0.00    -0.02   413.34    -0.14   413.34     0.33
 HUB     13.07     0.00    -0.02   413.34    -0.14   413.34     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.61    47.36     8.25   603.68   731.74    28.27   642.64     0.59
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MEAN    51.76    44.80     6.96   524.36   667.80    28.27   642.64     0.54
HUB     46.19    38.84     7.35   430.68   597.04    28.27   642.64     0.48
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   509.12   292.98   416.37  1262.72     0.40
MEAN    15.50   512.38   289.91   422.48  1258.62     0.41
HUB     12.59   544.82   335.68   429.12  1254.53     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    591.16   512.13   298.18     0.41  5258.62
MEAN   510.67   476.68   220.77     0.38  4495.13     1.54
HUB    414.86   436.37    79.18     0.35  4228.10

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     34.85     1.14    31.15   684.64     1.04   663.03     0.92     0.91
MEAN    34.19     1.12    30.50   680.61     1.04   658.72     0.92     0.91
HUB     33.97     1.11    29.84   679.20     1.03   654.45     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.13    35.61    31.50     4.11     0.93     0.37     2.90
MEAN    34.46    27.59    23.50     4.09     0.93     0.35     3.34     0.91
HUB     38.03    10.45     6.50     3.95     0.93     0.34     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     518.378     295.223     426.098    1258.952       0.412      -0.005

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    34.259      30.483     659.081      46.000      34.716      33.000      -1.716

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     445.275     295.223     534.253    1264.549       0.352       0.234

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      34.209      31.396     664.955     440.827       0.033       0.390

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     416.059       0.000     416.059    1266.543       0.328       0.324

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      31.728     667.053       0.000       0.060       0.038       0.321

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.882      34.192       1.120     681.487      24.603     251.474       1.949

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 153595.625       0.440    1507.867 1524513.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    989021.44   9709.3447    169.7079      2.2633      0.8695      6.4923      1.3035
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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 100% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     171.128    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   77.78547

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     167.175    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  131645.797  134278.422       1.708     831.557     486.850     619.754       1.273

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   406.03    -0.14   406.03     0.37   677.10
  MEAN    17.06     0.00    -0.02   406.03    -0.14   406.03     0.37
  HUB     12.51     0.00    -0.02   406.03    -0.14   406.03     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.16    50.47     8.69   679.80   791.94    13.76   509.04     0.72
  MEAN    54.17    47.20     6.97   562.16   693.58    13.76   509.04     0.63
  HUB     45.44    38.62     6.82   412.23   578.71    13.76   509.04     0.52

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   657.50   393.69   526.61  1129.16     0.58
  MEAN    18.04   690.16   429.46   540.26  1123.15     0.61
  HUB     15.00   789.74   550.81   565.95  1113.01     0.71

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   599.32   286.11     0.53  8124.65
  MEAN   594.32   564.85   164.86     0.50  7748.13     1.37
  HUB    494.28   568.77    56.53     0.51  8263.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.46     1.29    15.46   565.82     1.08   529.72     0.92     0.91
  MEAN    19.24     1.27    14.91   563.82     1.08   524.05     0.92     0.91
  HUB     19.54     1.29    13.96   566.55     1.08   514.49     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     36.78    28.52    24.20     4.32     0.93     0.33     2.90
  MEAN    38.48    16.97    12.70     4.27     0.93     0.28     3.51     0.91
  HUB     44.22    -5.70    -9.30     3.60     0.93     0.13     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     700.672     428.626     554.275    1123.361       0.624      -0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.365      14.893     524.393      24.000      37.715      35.400      -2.315

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     572.477     428.626     715.157    1137.868       0.503       0.313
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.292      16.226     538.025     528.796       0.026       0.455

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     525.185       0.000     525.185    1142.444       0.460       0.376

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.634     542.361       0.000       0.060       0.039       0.401

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      19.231       1.273     565.398      42.589     211.392       1.639

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 265150.219       0.574    2564.162 1707338.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    3776.000      19.231     565.398       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    136.570    3616.702       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.485     590.487     397.735     474.134       1.192

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   498.98    -0.17   498.98     0.44   648.57
 MEAN    18.08     0.00    -0.02   498.98    -0.17   498.98     0.44
 HUB     15.21     0.00    -0.02   498.98    -0.17   498.98     0.44

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.62    46.36     7.26   677.16   841.29    16.87   544.61     0.73
 MEAN    50.06    42.30     7.76   595.71   777.21    16.87   544.61     0.68
 HUB     45.14    37.84     7.30   501.20   707.36    16.87   544.61     0.62

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   589.50   323.54   492.78  1172.55     0.50
 MEAN    18.01   602.52   333.65   501.70  1167.98     0.52
 HUB     15.22   654.39   407.92   511.69  1163.48     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   604.04   349.33     0.52  6610.27
 MEAN   593.46   564.98   259.81     0.48  6012.18     1.49
 HUB    501.63   520.20    93.71     0.45  6212.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.30     1.21    19.60   600.37     1.06   571.35     0.92     0.91
 MEAN    22.91     1.19    19.10   597.20     1.06   566.89     0.92     0.91
 HUB     23.04     1.20    18.58   598.26     1.06   562.51     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.29    35.33    31.50     3.83     0.93     0.35     2.90
 MEAN    33.63    27.38    23.50     3.88     0.93     0.34     3.30     0.91
 HUB     38.56    10.38     6.50     3.88     0.93     0.34     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     610.248     334.589     510.346    1168.566       0.522       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.041      19.128     567.517      46.000      33.249      30.600      -2.649

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     509.731     334.589     609.734    1178.204       0.433       0.281

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.993      20.215     576.917     511.151       0.022       0.359

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     503.068       0.000     503.068    1178.779       0.427       0.275

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.224     577.480       0.000       0.060       0.039       0.283

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      22.925       1.192     598.612      33.213     237.846       1.844

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 206906.594       0.457    2000.911 1532291.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    171.128    3776.000      22.925     598.612       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    117.881    3514.937       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 131645.797  134278.422       1.589     545.479     343.325     429.765       1.252

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   472.90    -0.16   472.90     0.40   615.60
 MEAN    17.74      0.00    -0.02   472.90    -0.16   472.90     0.40
 HUB     15.05      0.00    -0.02   472.90    -0.16   472.90     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.44     46.36     8.08   661.34   813.16    20.53   579.95     0.69
 MEAN    51.03     43.40     7.63   584.52   751.98    20.53   579.95     0.64
 HUB     46.37     38.84     7.53   495.92   685.37    20.53   579.95     0.58

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   568.20   318.07   470.83  1206.46      0.47
 MEAN    17.51   579.98   328.26   478.15  1202.41      0.48
 HUB     14.85   629.23   399.22   486.37  1198.41      0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   577.67   334.70     0.48  6304.32
 MEAN   576.87   538.92   248.61     0.45  5749.59      1.51
 HUB    489.33   494.65    90.12     0.41  5930.83

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     27.26     1.19    23.42   631.94     1.06   605.00     0.92     0.91
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 MEAN    26.86     1.17    22.90   629.01     1.05   600.93     0.92     0.91
 HUB     26.99     1.18    22.36   629.97     1.05   596.92     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.04    35.41    31.50     3.91     0.93     0.36     2.90
 MEAN    34.47    27.47    23.50     3.97     0.93     0.35     3.28     0.91
 HUB     39.38    10.50     6.50     4.00     0.93     0.35     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     585.682     330.414     483.580    1203.126       0.487       0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.995      22.952     601.675      46.000      34.343      31.500      -2.843

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     490.305     330.414     591.247    1211.659       0.405       0.285

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.952      24.074     610.240     471.992       0.021       0.377

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     475.591       0.000     475.591    1212.836       0.392       0.293

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.168     611.427       0.000       0.060       0.039       0.307

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      26.874       1.172     630.306      31.694     230.389       1.786

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 197568.859       0.464    1910.609 1473331.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    171.128    3776.000      26.874     630.306       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    103.188    3425.426       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 131645.797  134278.422       1.708     513.330     300.553     401.059       1.334

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   445.78    -0.15   445.78     0.37   575.71
 MEAN    16.97     0.00    -0.02   445.78    -0.15   445.78     0.37
 HUB     14.32     0.00    -0.02   445.78    -0.15   445.78     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.92    46.36     8.56   634.65   775.69    24.49   613.73     0.64
 MEAN    51.45    43.80     7.65   559.22   715.27    24.49   613.73     0.59
 HUB     46.64    37.84     8.80   471.87   649.25    24.49   613.73     0.53

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   540.02   305.10   445.57  1237.27     0.44
 MEAN    16.57   548.69   311.11   451.96  1233.39     0.44
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 HUB     13.89   591.47   372.95   459.07  1229.55     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   546.85   317.03     0.44  5763.23
 MEAN   546.14   509.41   235.02     0.41  5158.98     1.53
 HUB    457.70   466.83    84.75     0.38  5182.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.25     1.16    27.41   660.75     1.05   636.42     0.92     0.91
 MEAN    30.77     1.14    26.86   657.56     1.04   632.45     0.92     0.91
 HUB     30.79     1.15    26.28   657.68     1.04   628.50     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.40    35.43    31.50     3.93     0.93     0.36     2.90
 MEAN    34.54    27.48    23.50     3.98     0.93     0.35     3.29     0.91
 HUB     39.09    10.46     6.50     3.96     0.93     0.35     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     541.769     312.864     442.300    1235.071       0.439       0.051

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.895      27.067     634.179      46.000      35.274      32.400      -2.874

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     456.157     312.864     553.140    1241.991       0.367       0.309

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.860      28.112     641.306     456.573       0.019       0.394

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     433.354       0.000     433.354    1243.629       0.348       0.300

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.293     642.999       0.000       0.060       0.039       0.353

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      30.774       1.145     658.665      28.359     235.731       1.827

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 176914.781       0.457    1710.872 1464214.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    3776.000      30.774     658.665       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.113    3350.872       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.899     509.668     268.318     390.276       1.455

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   403.86    -0.14   403.86     0.32   535.70
 MEAN    15.91     0.00    -0.02   403.86    -0.14   403.86     0.32
 HUB     13.07     0.00    -0.02   403.86    -0.14   403.86     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.22    47.36     8.86   603.68   726.43    28.61   645.07     0.58
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 MEAN    52.40    44.80     7.60   524.36   661.97    28.61   645.07     0.53
 HUB     46.85    38.84     8.01   430.68   590.52    28.61   645.07     0.47
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   505.35   300.17   406.54  1265.36     0.40
 MEAN    15.50   507.36   295.19   412.65  1261.12     0.40
 HUB     12.59   538.32   337.62   419.29  1256.91     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   499.95   290.99     0.40  5387.60
 MEAN   510.67   465.52   215.48     0.37  4576.97     1.57
 HUB    414.86   426.34    77.24     0.34  4252.49

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     35.23     1.14    31.56   687.10     1.04   665.81     0.92     0.91
 MEAN    34.53     1.12    30.89   682.83     1.04   661.36     0.92     0.91
 HUB     34.26     1.11    30.20   681.11     1.03   656.95     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.44    35.59    31.50     4.09     0.93     0.38     2.90
 MEAN    35.58    27.57    23.50     4.07     0.93     0.36     3.34     0.91
 HUB     38.84    10.44     6.50     3.94     0.93     0.35     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      513.392     300.604     416.184    1261.445       0.407       -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.598      30.866      661.705       46.000      35.840      33.000      -2.840

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      434.394     300.604     528.262    1267.382       0.343       0.254

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       34.543       31.845     667.948     440.827       0.034       0.407

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      406.104       0.000     406.104    1269.261       0.320       0.341

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       32.159      669.930       0.000       0.060       0.039       0.337

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4       Texit         Del T       Ns         Ns nondim
      0.881       34.524        1.122     683.681       25.016     245.484       1.903

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 156178.906       0.447    1510.344 1494740.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
   1002719.38   9696.8984     167.1750      2.2853       0.8691       6.9673       1.3077
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 100% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     168.485    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   76.58430

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     164.593    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  129612.891  132204.875       1.735     831.557     479.332     619.754       1.293

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   398.82    -0.14   398.82     0.36   677.10
  MEAN    17.06     0.00    -0.02   398.82    -0.14   398.82     0.36
  HUB     12.51     0.00    -0.02   398.82    -0.14   398.82     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.61    50.47     9.14   679.80   788.27    13.81   509.53     0.71
  MEAN    54.65    47.20     7.45   562.16   689.37    13.81   509.53     0.62
  HUB     45.96    38.62     7.34   412.23   573.67    13.81   509.53     0.52

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   652.49   399.55   515.85  1130.41     0.58
  MEAN    18.04   683.85   432.77   529.49  1124.24     0.61
  HUB     15.00   780.72   549.67   554.43  1114.14     0.70

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   587.06   280.25     0.52  8245.51
  MEAN   594.32   553.58   161.55     0.49  7807.78     1.39
  HUB    494.28   557.19    55.39     0.50  8246.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.53     1.29    15.57   566.46     1.08   530.90     0.92     0.91
  MEAN    19.27     1.28    15.01   564.14     1.08   525.09     0.92     0.91
  HUB     19.53     1.29    14.06   566.46     1.08   515.58     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     37.76    28.51    24.20     4.31     0.93     0.34     2.90
  MEAN    39.26    16.97    12.70     4.27     0.93     0.29     3.51     0.91
  HUB     44.75    -5.71    -9.30     3.59     0.93     0.14     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     693.868     431.929     543.039    1124.518       0.617      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.395      14.997     525.474      24.000      38.498      35.400      -3.098

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     559.992     431.929     707.215    1139.421       0.491       0.328
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.320      16.376     539.495     528.796       0.026       0.466

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     514.344       0.000     514.344    1143.738       0.450       0.387

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.760     543.591       0.000       0.060       0.040       0.412

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      19.259       1.275     565.687      42.877     208.447       1.616

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 266944.938       0.578    2541.654 1676995.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.485    3776.000      19.259     565.687       1.000       1.000       0.980
W Kg/sec =   76.58430

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    134.302    3615.781       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129612.891  132204.875       1.510     590.487     391.129     474.134       1.212

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   488.94    -0.17   488.94     0.43   648.41
 MEAN    18.08     0.00    -0.02   488.94    -0.17   488.94     0.43
 HUB     15.21     0.00    -0.02   488.94    -0.17   488.94     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.18    46.36     7.82   677.16   835.37    16.99   545.73     0.73
 MEAN    50.63    42.30     8.33   595.71   770.80    16.99   545.73     0.67
 HUB     45.72    37.84     7.88   501.20   700.31    16.99   545.73     0.61

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   585.06   331.02   482.42  1174.11     0.50
 MEAN    18.01   597.08   339.10   491.44  1169.36     0.51
 HUB     15.22   647.74   409.92   501.53  1164.68     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   591.27   341.86     0.50  6762.84
 MEAN   593.46   553.37   254.36     0.47  6110.29     1.51
 HUB    501.63   509.84    91.70     0.44  6242.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.42     1.22    19.77   601.46     1.06   572.88     0.92     0.91
 MEAN    23.00     1.19    19.24   598.01     1.06   568.25     0.92     0.91
 HUB     23.08     1.20    18.70   598.71     1.06   563.68     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.46    35.32    31.50     3.82     0.93     0.36     2.90
 MEAN    34.61    27.36    23.50     3.86     0.93     0.35     3.30     0.91
 HUB     39.26    10.36     6.50     3.86     0.93     0.35     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     604.561     340.056     499.856    1169.966       0.517       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.129      19.274     568.878      46.000      34.228      30.600      -3.628

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     498.587     340.056     603.512    1179.961       0.423       0.298

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.078      20.408     578.639     511.151       0.023       0.374

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     492.223       0.000     492.223    1180.497       0.417       0.289

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.409     579.165       0.000       0.060       0.041       0.298

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      23.006       1.195     599.396      33.709     232.840       1.805

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 209995.422       0.464    1999.422 1502299.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.998

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    168.485    3776.000      23.006     599.396       1.000       1.000       0.980
W Kg/sec =   76.58430

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    115.726    3512.638       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 129612.891  132204.875       1.618     545.479     337.048     429.765       1.275

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   462.96    -0.16   462.96     0.39   615.20
 MEAN    17.74     0.00    -0.02   462.96    -0.16   462.96     0.39
 HUB     15.05     0.00    -0.02   462.96    -0.16   462.96     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.01    46.36     8.65   661.34   807.42    20.70   581.51     0.68
 MEAN    51.63    43.40     8.23   584.52   745.77    20.70   581.51     0.63
 HUB     46.98    38.84     8.14   495.92   678.55    20.70   581.51     0.57

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   563.98   325.50   460.56  1208.41     0.47
 MEAN    17.51   574.76   333.70   467.96  1204.20     0.48
 HUB     14.85   622.74   401.23   476.26  1200.02     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   565.00   327.28     0.47  6451.32
 MEAN   576.87   527.37   243.17     0.44  5844.84     1.54
 HUB    489.33   484.34    88.10     0.40  5960.67

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.45     1.19    23.64   633.50     1.06   606.96     0.92     0.91
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 MEAN    27.01     1.17    23.11   630.30     1.05   602.72     0.92     0.91
 HUB     27.10     1.18    22.55   630.91     1.05   598.54     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.25    35.40    31.50     3.90     0.93     0.37     2.90
 MEAN    35.49    27.46    23.50     3.96     0.93     0.36     3.28     0.91
 HUB     40.11    10.48     6.50     3.98     0.93     0.36     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     580.356     335.894     473.275    1204.902       0.482       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.147      23.158     603.456      46.000      35.364      31.500      -3.864

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     479.224     335.894     585.219    1213.798       0.395       0.302

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.100      24.336     612.400     471.992       0.022       0.393

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     465.050       0.000     465.050    1214.905       0.383       0.308

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.417     613.517       0.000       0.060       0.042       0.322

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      27.017       1.174     631.568      32.173     225.405       1.747

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 200557.594       0.471    1909.562 1444209.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.485    3776.000      27.017     631.568       1.000       1.000       0.980
W Kg/sec =   76.58430

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.155    3421.999       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129612.891  132204.875       1.742     513.330     294.632     401.059       1.361

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   436.12    -0.15   436.12     0.36   575.14
 MEAN    16.97     0.00    -0.02   436.12    -0.15   436.12     0.36
 HUB     14.32     0.00    -0.02   436.12    -0.15   436.12     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.51    46.36     9.15   634.65   770.18    24.72   615.70     0.63
 MEAN    52.06    43.80     8.26   559.22   709.29    24.72   615.70     0.58
 HUB     47.26    37.84     9.42   471.87   642.65    24.72   615.70     0.53

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   536.01   312.31   435.63  1239.53     0.43
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 MEAN    16.57   543.61   316.39   442.05  1235.52     0.44
 HUB     13.89   585.10   374.91   449.20  1231.52     0.48
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   534.56   309.82     0.43  5899.30
 MEAN   546.14   498.19   229.75     0.40  5246.37     1.55
 HUB    457.70   456.77    82.79     0.37  5209.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.51     1.17    27.71   662.73     1.05   638.77     0.92     0.91
 MEAN    30.99     1.15    27.13   659.28     1.04   634.63     0.92     0.91
 HUB     30.96     1.15    26.52   659.09     1.04   630.53     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.64    35.42    31.50     3.92     0.93     0.38     2.90
 MEAN    35.59    27.46    23.50     3.96     0.93     0.36     3.29     0.91
 HUB     39.85    10.44     6.50     3.94     0.93     0.36     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     537.089     318.170     432.703    1237.132       0.434       0.050

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.114      27.331     636.304      46.000      36.327      32.400      -3.927

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     445.716     318.170     547.627    1244.393       0.358       0.326

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.075      28.436     643.796     456.573       0.019       0.411

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     423.655       0.000     423.655    1245.938       0.340       0.315

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.600     645.396       0.000       0.060       0.042       0.367

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      30.985       1.147     660.368      28.800     230.477       1.787

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 179668.328       0.464    1710.670 1435120.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.485    3776.000      30.985     660.368       1.000       1.000       0.980
W Kg/sec =   76.58430

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     90.191    3346.547       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129612.891  132204.875       1.940     509.668     262.719     390.276       1.486

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   394.99    -0.14   394.99     0.32   535.00
 MEAN    15.91     0.00    -0.02   394.99    -0.14   394.99     0.32
 HUB     13.07     0.00    -0.02   394.99    -0.14   394.99     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.81    47.36     9.45   603.68   721.53    28.90   647.36     0.58
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MEAN    53.02    44.80     8.22   524.36   656.59    28.90   647.36     0.53
HUB     47.48    38.84     8.64   430.68   584.48    28.90   647.36     0.47
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   502.09   306.84   397.41  1267.82     0.40
MEAN    15.50   502.85   300.08   403.50  1263.48     0.40
HUB     12.59   532.36   339.44   410.11  1259.15     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    591.16   488.64   284.31     0.39  5507.23
MEAN   510.67   455.15   210.60     0.36  4652.65     1.59
HUB    414.86   416.99    75.43     0.33  4275.28

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     35.56     1.15    31.91   689.44     1.04   668.42     0.92     0.91
MEAN    34.82     1.12    31.22   684.93     1.04   663.85     0.92     0.91
HUB     34.50     1.11    30.50   682.94     1.03   659.31     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.67    35.58    31.50     4.08     0.93     0.40     2.90
MEAN    36.64    27.56    23.50     4.06     0.93     0.37     3.34     0.91
HUB     39.61    10.42     6.50     3.92     0.93     0.36     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     508.915     305.580     406.958    1263.785       0.403      -0.006

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    34.883      31.194     664.174      46.000      36.902      33.000      -3.902

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     424.332     305.580     522.912    1270.031       0.334       0.272

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      34.823      32.232     670.755     440.827       0.036       0.423

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     396.887       0.000     396.887    1271.809       0.312       0.356

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      32.528     672.634       0.000       0.060       0.042       0.351

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.879      34.802       1.123     685.767      25.398     240.016       1.861

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 158575.156       0.454    1509.836 1465261.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1015741.50   9671.1445    164.5934      2.3037      0.8673      7.4534      1.3117
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 100% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     165.780    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   75.35457

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     161.951    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  127531.688  130082.039       1.763     831.557     471.635     619.754       1.314

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   391.49    -0.13   391.49     0.35   677.10
  MEAN    17.06     0.00    -0.02   391.49    -0.13   391.49     0.35
  HUB     12.51     0.00    -0.02   391.49    -0.13   391.49     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.07    50.47     9.60   679.80   784.58    13.86   510.01     0.71
  MEAN    55.15    47.20     7.95   562.16   685.16    13.86   510.01     0.62
  HUB     46.49    38.62     7.87   412.23   568.60    13.86   510.01     0.51

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   647.67   405.39   505.11  1131.63     0.57
  MEAN    18.04   677.67   436.10   518.70  1125.31     0.60
  HUB     15.00   771.77   548.53   542.90  1115.26     0.69

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   574.84   274.40     0.51  8366.02
  MEAN   594.32   542.30   158.22     0.48  7867.78     1.42
  HUB    494.28   545.60    54.26     0.49  8229.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.59     1.30    15.69   567.09     1.08   532.06     0.92     0.91
  MEAN    19.30     1.28    15.10   564.46     1.08   526.11     0.92     0.91
  HUB     19.51     1.29    14.16   566.37     1.08   516.64     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     38.75    28.51    24.20     4.31     0.93     0.36     2.90
  MEAN    40.06    16.96    12.70     4.26     0.93     0.30     3.51     0.91
  HUB     45.30    -5.71    -9.30     3.59     0.93     0.15     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     687.226     435.251     531.823    1125.645       0.611      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.424      15.098     526.529      24.000      39.297      35.400      -3.897

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     547.630     435.251     699.530    1140.932       0.480       0.343
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.346      16.521     540.927     528.796       0.027       0.478

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     503.630       0.000     503.630    1144.999       0.440       0.397

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.879     544.790       0.000       0.060       0.042       0.423

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.878      19.281       1.276     565.975      43.165     205.488       1.593

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 268740.031       0.582    2517.659 1646176.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.996

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    165.780    3776.000      19.281     565.975       1.000       1.000       0.980
W Kg/sec =   75.35457

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    132.026    3614.860       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127531.688  130082.039       1.536     590.487     384.502     474.134       1.233

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   479.00    -0.16   479.00     0.42   648.24
 MEAN    18.08     0.00    -0.02   479.00    -0.16   479.00     0.42
 HUB     15.21     0.00    -0.02   479.00    -0.16   479.00     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.73    46.36     8.37   677.16   829.59    17.10   546.82     0.72
 MEAN    51.21    42.30     8.91   595.71   764.53    17.10   546.82     0.67
 HUB     46.31    37.84     8.47   501.20   693.40    17.10   546.82     0.60

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   580.95   338.32   472.28  1175.62     0.49
 MEAN    18.01   591.91   344.45   481.36  1170.70     0.51
 HUB     15.22   641.27   411.88   491.50  1165.85     0.55

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   578.77   334.56     0.49  6911.82
 MEAN   593.46   541.95   249.01     0.46  6206.53     1.54
 HUB    501.63   499.63    89.74     0.43  6272.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.54     1.22    19.92   602.54     1.06   574.36     0.92     0.91
 MEAN    23.08     1.20    19.38   598.81     1.06   569.56     0.92     0.91
 HUB     23.12     1.20    18.82   599.16     1.06   564.83     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.62    35.31    31.50     3.81     0.93     0.37     2.90
 MEAN    35.59    27.35    23.50     3.85     0.93     0.36     3.30     0.91
 HUB     39.96    10.35     6.50     3.85     0.93     0.36     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     599.150     345.418     489.559    1171.318       0.512       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.207      19.408     570.195      46.000      35.206      30.600      -4.606

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     487.710     345.418     597.641    1181.660       0.413       0.314

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.152      20.588     580.308     511.151       0.024       0.389

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     481.655       0.000     481.655    1182.159       0.407       0.302

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.580     580.798       0.000       0.060       0.044       0.312

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      23.076       1.197     600.169      34.194     228.005       1.767

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 213016.469       0.470    1995.620 1472152.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.996

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    165.780    3776.000      23.076     600.169       1.000       1.000       0.980
W Kg/sec =   75.35457

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    113.599    3510.375       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127531.688  130082.039       1.649     545.479     330.854     429.765       1.299

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   453.26    -0.16   453.26     0.38   614.80
 MEAN    17.74     0.00    -0.02   453.26    -0.16   453.26     0.38
 HUB     15.05     0.00    -0.02   453.26    -0.16   453.26     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.58    46.36     9.22   661.34   801.89    20.86   583.02     0.68
 MEAN    52.22    43.40     8.82   584.52   739.79    20.86   583.02     0.62
 HUB     47.58    38.84     8.74   495.92   671.97    20.86   583.02     0.57

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   560.13   332.67   450.64  1210.28      0.46
 MEAN    17.51   569.86   338.96   458.08  1205.91      0.47
 HUB     14.85   616.51   403.16   466.42  1201.58      0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   552.76   320.10     0.46  6593.35
 MEAN   576.87   516.18   237.91     0.43  5936.84     1.56
 HUB    489.33   474.32    86.17     0.39  5989.32

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.63     1.20    23.85   635.03     1.06   608.84     0.92     0.91
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 MEAN    27.15     1.18    23.29   631.55     1.05   604.45     0.92     0.91
 HUB     27.19     1.18    22.71   631.83     1.05   600.11     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.44    35.39    31.50     3.89     0.93     0.38     2.90
 MEAN    36.50    27.45    23.50     3.95     0.93     0.37     3.28     0.91
 HUB     40.84    10.47     6.50     3.97     0.93     0.37     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     575.362     341.187     463.284    1206.613       0.477       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.280      23.344     605.174      46.000      36.370      31.500      -4.870

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     468.541     341.187     579.603    1215.855       0.385       0.319

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.229      24.575     614.481     471.992       0.023       0.408

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     454.898       0.000     454.898    1216.895       0.374       0.322

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.642     615.533       0.000       0.060       0.045       0.336

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      27.140       1.176     632.804      32.635     220.653       1.710

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 203443.469       0.477    1905.936 1415027.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    165.780    3776.000      27.140     632.804       1.000       1.000       0.980
W Kg/sec =   75.35457

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     99.177    3418.657       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127531.688  130082.039       1.777     513.330     288.871     401.059       1.388

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   426.80    -0.15   426.80     0.35   574.57
 MEAN    16.97     0.00    -0.02   426.80    -0.15   426.80     0.35
 HUB     14.32     0.00    -0.02   426.80    -0.15   426.80     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.09    46.36     9.73   634.65   764.94    24.93   617.61     0.63
 MEAN    52.66    43.80     8.86   559.22   703.59    24.93   617.61     0.58
 HUB     47.88    37.84    10.04   471.87   636.36    24.93   617.61     0.52

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   532.41   319.21   426.11  1241.70     0.43
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 MEAN    16.57   538.92   321.45   432.55  1237.55     0.44
 HUB     13.89   579.06   376.77   439.71  1233.43     0.47
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   522.81   302.92     0.42  6029.54
 MEAN   546.14   487.43   224.69     0.39  5330.11     1.57
 HUB    457.70   447.10    80.93     0.36  5235.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.74     1.17    27.97   664.66     1.05   641.01     0.92     0.91
 MEAN    31.18     1.15    27.37   660.96     1.04   636.73     0.92     0.91
 HUB     31.11     1.15    26.74   660.46     1.04   632.49     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.84    35.41    31.50     3.91     0.93     0.39     2.90
 MEAN    36.62    27.45    23.50     3.95     0.93     0.38     3.29     0.91
 HUB     40.59    10.43     6.50     3.93     0.93     0.37     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     532.766     323.254     423.493    1239.110       0.430       0.049

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.304      27.565     638.348      46.000      37.355      32.400      -4.955

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     435.742     323.254     542.554    1246.695       0.350       0.343

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.261      28.726     646.187     456.573       0.021       0.426

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     414.396       0.000     414.396    1248.154       0.332       0.328

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.873     647.701       0.000       0.060       0.045       0.380

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.875      31.165       1.148     662.025      29.221     225.524       1.748

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 182303.250       0.471    1707.886 1406027.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    165.780    3776.000      31.165     662.025       1.000       1.000       0.980
W Kg/sec =   75.35457

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.342    3342.356       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127531.688  130082.039       1.981     509.668     257.334     390.276       1.517

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   386.51    -0.13   386.51     0.31   534.33
 MEAN    15.91     0.00    -0.02   386.51    -0.13   386.51     0.31
 HUB     13.07     0.00    -0.02   386.51    -0.13   386.51     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.38    47.36    10.02   603.68   716.92    29.16   649.57     0.57
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MEAN    53.61    44.80     8.81   524.36   651.52    29.16   649.57     0.52
HUB     48.10    38.84     9.26   430.68   578.78    29.16   649.57     0.46

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   499.19   313.16   388.75  1270.18     0.39
MEAN    15.50   498.72   304.72   394.80  1265.73     0.39
HUB     12.59   526.75   341.14   401.37  1261.30     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    591.16   477.92   278.00     0.38  5620.52
MEAN   510.67   445.29   205.95     0.35  4724.58     1.62
HUB    414.86   408.08    73.73     0.32  4296.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     35.84     1.15    32.22   691.69     1.04   670.92     0.92     0.91
MEAN    35.07     1.13    31.51   686.96     1.04   666.23     0.92     0.91
HUB     34.70     1.11    30.77   684.70     1.03   661.57     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.85    35.57    31.50     4.07     0.93     0.41     2.90
MEAN    37.66    27.55    23.50     4.05     0.93     0.39     3.34     0.91
HUB     40.36    10.41     6.50     3.91     0.93     0.37     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     504.819     310.309     398.183    1266.023       0.399      -0.006

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    35.129      31.481     666.540      46.000      37.930      33.000      -4.930

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     414.812     310.309     518.036    1272.560       0.326       0.290

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      35.061      32.572     673.441     440.827       0.038       0.439

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    14.701     388.157       0.000     388.157    1274.245       0.305       0.370

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      32.852     675.225       0.000       0.060       0.045       0.365

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.876      35.037       1.124     687.786      25.760     234.908       1.821

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 160844.297       0.460    1506.851 1435785.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1028347.56   9633.9521    161.9505      2.3192      0.8645      7.9532      1.3156
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 100% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.513   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     162.762    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   73.98255

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     159.002    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  125209.648  127713.570       1.796     831.557     463.048     619.754       1.338

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   383.38    -0.13   383.38     0.35   677.10
  MEAN    17.06     0.00    -0.02   383.38    -0.13   383.38     0.35
  HUB     12.51     0.00    -0.02   383.38    -0.13   383.38     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.58    50.47    10.11   679.80   780.56    13.91   510.53     0.70
  MEAN    55.71    47.20     8.51   562.16   680.55    13.91   510.53     0.61
  HUB     47.09    38.62     8.47   412.23   563.04    13.91   510.53     0.51

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   642.67   411.75   493.44  1132.93     0.57
  MEAN    18.04   671.07   439.70   506.95  1126.46     0.60
  HUB     15.00   762.09   547.28   530.34  1116.45     0.68

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   561.55   268.05     0.50  8497.07
  MEAN   594.32   530.00   154.62     0.47  7932.72     1.44
  HUB    494.28   532.99    53.00     0.48  8210.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.66     1.30    15.80   567.79     1.09   533.30     0.92     0.91
  MEAN    19.33     1.28    15.20   564.80     1.08   527.19     0.92     0.91
  HUB     19.49     1.29    14.27   566.27     1.08   517.78     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     39.84    28.51    24.20     4.31     0.93     0.37     2.90
  MEAN    40.94    16.96    12.70     4.26     0.93     0.32     3.51     0.91
  HUB     45.90    -5.71    -9.30     3.59     0.93     0.16     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     680.138     438.848     519.616    1126.844       0.604       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.452      15.203     527.651      24.000      40.183      35.400      -4.783

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     534.287     438.848     691.412    1142.532       0.468       0.359
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.370      16.671     542.445     528.796       0.029       0.492

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     492.029       0.000     492.029    1146.341       0.429       0.408

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.002     546.067       0.000       0.060       0.044       0.434

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.875      19.301       1.278     566.288      43.478     202.251       1.568

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 270686.000       0.586    2489.717 1612073.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.513   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    162.762    3776.000      19.301     566.288       1.000       1.000       0.980
W Kg/sec =   73.98255

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    129.525    3613.862       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125209.648  127713.570       1.565     590.487     377.217     474.134       1.257

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   468.22    -0.16   468.22     0.41   648.06
 MEAN    18.08     0.00    -0.02   468.22    -0.16   468.22     0.41
 HUB     15.21     0.00    -0.02   468.22    -0.16   468.22     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.34    46.36     8.98   677.16   823.40    17.21   547.98     0.72
 MEAN    51.84    42.30     9.54   595.71   757.82    17.21   547.98     0.66
 HUB     46.96    37.84     9.12   501.20   685.99    17.21   547.98     0.60

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   576.80   346.15   461.39  1177.21     0.49
 MEAN    18.01   586.52   350.20   470.50  1172.12     0.50
 HUB     15.22   634.36   413.97   480.67  1167.09     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   565.36   326.73     0.48  7071.69
 MEAN   593.46   529.66   243.26     0.45  6309.93     1.56
 HUB    501.63   488.60    87.66     0.42  6304.30

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.66     1.23    20.07   603.70     1.07   575.92     0.92     0.91
 MEAN    23.16     1.20    19.51   599.67     1.06   570.95     0.92     0.91
 HUB     23.15     1.20    18.93   599.64     1.06   566.04     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.88    35.30    31.50     3.80     0.93     0.39     2.90
 MEAN    36.66    27.34    23.50     3.84     0.94     0.37     3.30     0.91
 HUB     40.74    10.34     6.50     3.84     0.94     0.36     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     593.519     351.179     478.474    1172.747       0.506       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.283      19.544     571.588      46.000      36.277      30.600      -5.677

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     476.066     351.179     591.579    1183.459       0.402       0.332

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.223      20.770     582.078     511.151       0.026       0.406

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     470.357       0.000     470.357    1183.918       0.397       0.317

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.752     582.529       0.000       0.060       0.047       0.327

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      23.140       1.199     601.001      34.714     222.885       1.728

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 216256.562       0.478    1989.086 1439096.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.513   EfDer =  0.994

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    162.762    3776.000      23.140     601.001       1.000       1.000       0.980
W Kg/sec =   73.98255

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    111.296    3507.942       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 125209.648  127713.570       1.683     545.479     324.150     429.765       1.326

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   442.87    -0.15   442.87     0.37   614.38
 MEAN    17.74      0.00    -0.02   442.87    -0.15   442.87     0.37
 HUB     15.05      0.00    -0.02   442.87    -0.15   442.87     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.20     46.36     9.84   661.34   796.06    21.01   584.63     0.67
 MEAN    52.86     43.40     9.46   584.52   733.47    21.01   584.63     0.62
 HUB     48.24     38.84     9.40   495.92   665.00    21.01   584.63     0.56

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   556.31   340.27   440.10  1212.24      0.46
 MEAN    17.51   564.82   344.53   447.57  1207.72      0.47
 HUB     14.85   609.98   405.22   455.92  1203.24      0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   539.77   312.50     0.45  6743.85
 MEAN   576.87   504.28   232.35     0.42  6034.18      1.58
 HUB    489.33   463.62    84.11     0.39  6019.82

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     27.80     1.20    24.06   636.65     1.06   610.82     0.92     0.91
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 MEAN    27.28     1.18    23.48   632.90     1.05   606.28     0.92     0.91
 HUB     27.27     1.18    22.88   632.83     1.05   601.77     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.71    35.38    31.50     3.88     0.93     0.40     2.90
 MEAN    37.59    27.44    23.50     3.94     0.94     0.38     3.28     0.91
 HUB     41.63    10.45     6.50     3.95     0.94     0.38     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     570.225     346.788     452.653    1208.416       0.472       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.408      23.528     606.988      46.000      37.457      31.500      -5.957

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     457.232     346.788     573.867    1218.022       0.375       0.337

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.350      24.812     616.678     471.992       0.025       0.425

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     444.159       0.000     444.159    1218.993       0.364       0.336

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.864     617.661       0.000       0.060       0.049       0.350

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      27.255       1.178     634.127      33.125     215.683       1.672

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 206501.188       0.485    1899.358 1383104.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.513   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    162.762    3776.000      27.255     634.127       1.000       1.000       0.980
W Kg/sec =   73.98255

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.063    3415.090       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125209.648  127713.570       1.816     513.330     282.717     401.059       1.419

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   416.92    -0.14   416.92     0.34   573.98
 MEAN    16.97     0.00    -0.02   416.92    -0.14   416.92     0.34
 HUB     14.32     0.00    -0.02   416.92    -0.14   416.92     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.70    46.36    10.34   634.65   759.46    25.14   619.63     0.62
 MEAN    53.30    43.80     9.50   559.22   697.64    25.14   619.63     0.57
 HUB     48.55    37.84    10.71   471.87   629.78    25.14   619.63     0.52

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   528.86   326.42   416.10  1243.97     0.43
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 MEAN    16.57   534.15   326.77   422.54  1239.69     0.43
 HUB     13.89   572.75   378.70   429.69  1235.43     0.46
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   510.47   295.71     0.41  6165.64
 MEAN   546.14   476.09   219.37     0.38  5418.23     1.60
 HUB    457.70   436.89    79.00     0.35  5262.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.96     1.17    28.23   666.70     1.05   643.37     0.92     0.91
 MEAN    31.36     1.15    27.60   662.75     1.05   638.95     0.92     0.91
 HUB     31.24     1.15    26.96   661.92     1.04   634.56     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.11    35.40    31.50     3.90     0.93     0.40     2.90
 MEAN    37.72    27.44    23.50     3.94     0.94     0.39     3.29     0.91
 HUB     41.39    10.42     6.50     3.92     0.94     0.38     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     528.392     328.604     413.784    1241.188       0.426       0.048

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.483      27.792     640.499      46.000      38.455      32.400      -6.055

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     425.273     328.604     537.437    1249.111       0.340       0.360

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.435      29.010     648.703     456.573       0.022       0.443

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     404.682       0.000     404.682    1250.482       0.324       0.342

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.136     650.128       0.000       0.060       0.049       0.392

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      31.331       1.150     663.789      29.662     220.404       1.709

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 185059.625       0.478    1702.142 1374252.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.513   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    162.762    3776.000      31.331     663.789       1.000       1.000       0.980
W Kg/sec =   73.98255

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.389    3337.914       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125209.648  127713.570       2.025     509.668     251.646     390.276       1.551

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   377.60    -0.13   377.60     0.30   533.62
 MEAN    15.91     0.00    -0.02   377.60    -0.13   377.60     0.30
 HUB     13.07     0.00    -0.02   377.60    -0.13   377.60     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.98    47.36    10.62   603.68   712.15    29.41   651.90     0.57
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 MEAN    54.25    44.80     9.45   524.36   646.27    29.41   651.90     0.52
 HUB     48.77    38.84     9.93   430.68   572.87    29.41   651.90     0.46
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   496.38   319.73   379.70  1272.64     0.39
 MEAN    15.50   494.56   309.57   385.69  1268.09     0.39
 HUB     12.59   520.95   342.88   392.20  1263.56     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   466.74   271.43     0.37  5738.29
 MEAN   510.67   434.98   201.11     0.34  4799.60     1.64
 HUB    414.86   398.75    71.98     0.32  4318.56

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     36.11     1.15    32.51   694.08     1.05   673.53     0.92     0.91
 MEAN    35.30     1.13    31.78   689.12     1.04   668.73     0.92     0.91
 HUB     34.88     1.11    31.03   686.58     1.03   663.96     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.10    35.56    31.50     4.06     0.93     0.42     2.90
 MEAN    38.75    27.54    23.50     4.04     0.94     0.40     3.34     0.91
 HUB     41.16    10.40     6.50     3.90     0.94     0.38     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      500.705     315.242     389.008    1268.369       0.395       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     35.358      31.755      669.026      46.000      39.020      33.000      -6.020

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      404.904     315.242     513.152    1275.206       0.318        0.307

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      35.281       32.898     676.259     440.827       0.041       0.456

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     379.063       0.000     379.063    1276.797       0.297       0.384

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      33.160      677.948       0.000       0.060       0.049       0.379

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      35.253       1.125     689.926      26.137     229.662       1.780

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 163203.906       0.467    1501.118 1403591.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1041707.25   9581.4219     159.0018      2.3336      0.8604      8.5135      1.3196
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 100% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.966   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     160.332    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   72.87835

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     156.629    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  123340.875  125807.422       1.823     831.557     456.137     619.754       1.359

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   376.90    -0.13   376.90     0.34   677.10
  MEAN    17.06     0.00    -0.02   376.90    -0.13   376.90     0.34
  HUB     12.51     0.00    -0.02   376.90    -0.13   376.90     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.00    50.47    10.53   679.80   777.40    13.94   510.95     0.70
  MEAN    56.17    47.20     8.97   562.16   676.92    13.94   510.95     0.61
  HUB     47.57    38.62     8.95   412.23   558.65    13.94   510.95     0.50

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   638.88   416.73   484.26  1133.93     0.56
  MEAN    18.04   665.98   442.55   497.68  1127.34     0.59
  HUB     15.00   754.52   546.29   520.45  1117.37     0.68

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   551.10   263.07     0.49  8599.78
  MEAN   594.32   520.30   151.77     0.46  7984.09     1.46
  HUB    494.28   523.04    52.01     0.47  8195.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.72     1.31    15.89   568.33     1.09   534.24     0.92     0.91
  MEAN    19.36     1.28    15.28   565.07     1.08   528.03     0.92     0.91
  HUB     19.48     1.29    14.35   566.19     1.08   518.66     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     40.71    28.51    24.20     4.31     0.93     0.38     2.90
  MEAN    41.64    16.96    12.70     4.26     0.93     0.33     3.51     0.91
  HUB     46.39    -5.71    -9.30     3.59     0.93     0.18     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     674.687     441.692     510.011    1127.765       0.598       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.473      15.283     528.513      24.000      40.894      35.400      -5.494

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     523.856     441.692     685.213    1143.761       0.458       0.371
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.386      16.786     543.612     528.796       0.030       0.503

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     482.934       0.000     482.934    1147.375       0.421       0.417

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.095     547.053       0.000       0.060       0.047       0.443

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.873      19.313       1.278     566.533      43.723     199.689       1.548

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 272215.094       0.589    2466.412 1584834.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.966   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    160.332    3776.000      19.313     566.533       1.000       1.000       0.980
W Kg/sec =   72.87835

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    127.537    3613.079       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123340.875  125807.422       1.590     590.487     371.429     474.134       1.277

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   459.74    -0.16   459.74     0.40   647.92
 MEAN    18.08     0.00    -0.02   459.74    -0.16   459.74     0.40
 HUB     15.21     0.00    -0.02   459.74    -0.16   459.74     0.40

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.83    46.36     9.47   677.16   818.61    17.29   548.89     0.71
 MEAN    52.35    42.30    10.05   595.71   752.61    17.29   548.89     0.65
 HUB     47.48    37.84     9.64   501.20   680.24    17.29   548.89     0.59

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   573.76   352.24   452.91  1178.43     0.49
 MEAN    18.01   582.45   354.66   462.01  1173.21     0.50
 HUB     15.22   629.03   415.60   472.19  1168.05     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   554.92   320.64     0.47  7195.91
 MEAN   593.46   520.08   238.80     0.44  6390.33     1.58
 HUB    501.63   479.96    86.03     0.41  6329.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.74     1.23    20.18   604.60     1.07   577.11     0.92     0.91
 MEAN    23.21     1.20    19.61   600.34     1.06   572.01     0.92     0.91
 HUB     23.17     1.20    19.02   600.01     1.06   566.98     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.87    35.30    31.50     3.80     0.93     0.40     2.90
 MEAN    37.51    27.33    23.50     3.83     0.94     0.38     3.30     0.91
 HUB     41.35    10.33     6.50     3.83     0.94     0.37     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     589.262     355.659     469.826    1173.844       0.502       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.337      19.643     572.659      46.000      37.126      30.600      -6.526

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     467.023     355.659     587.030    1184.842       0.394       0.345

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.272      20.905     583.440     511.151       0.027       0.419

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     461.594       0.000     461.594    1185.269       0.389       0.327

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.878     583.861       0.000       0.060       0.051       0.338

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      23.183       1.200     601.651      35.118     218.948       1.697

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 218776.641       0.483    1982.232 1412895.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.966   EfDer =  0.992

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    160.332    3776.000      23.183     601.651       1.000       1.000       0.980
W Kg/sec =   72.87835

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    109.491    3506.047       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 123340.875  125807.422       1.711     545.479     318.892     429.765       1.348

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   434.79    -0.15   434.79     0.37   614.04
 MEAN    17.74      0.00    -0.02   434.79    -0.15   434.79     0.37
 HUB     15.05      0.00    -0.02   434.79    -0.15   434.79     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.68     46.36    10.32   661.34   791.59    21.13   585.87     0.67
 MEAN    53.36     43.40     9.96   584.52   728.61    21.13   585.87     0.61
 HUB     48.77     38.84     9.93   495.92   659.65    21.13   585.87     0.56

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   553.54    346.11    431.98  1213.74      0.46
 MEAN    17.51   561.06    348.83    439.44  1209.11      0.46
 HUB     14.85   604.98    406.80    447.79  1204.51      0.50

       U2        W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78    529.77   306.67     0.44  6859.45
 MEAN   576.87    495.09   228.05     0.41  6109.40      1.60
 HUB    489.33    455.33    82.54     0.38  6043.19

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     27.92     1.20     24.20   637.91     1.06   612.34     0.92     0.91
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 MEAN    27.37     1.18    23.61   633.95     1.05   607.68     0.92     0.91
 HUB     27.32     1.18    22.99   633.60     1.05   603.05     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.70    35.37    31.50     3.87     0.93     0.41     2.90
 MEAN    38.44    27.43    23.50     3.93     0.94     0.39     3.28     0.91
 HUB     42.25    10.44     6.50     3.94     0.94     0.39     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     566.399     351.115     444.440    1209.795       0.468       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.497      23.659     608.379      46.000      38.309      31.500      -6.809

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     448.530     351.115     569.615    1219.682       0.368       0.351

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.433      24.984     618.363     471.992       0.026       0.439

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     435.902       0.000     435.902    1220.601       0.357       0.347

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.023     619.295       0.000       0.060       0.052       0.361

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      27.331       1.179     635.154      33.502     211.899       1.643

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 208854.188       0.490    1892.329 1357846.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.966   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    160.332    3776.000      27.331     635.154       1.000       1.000       0.980
W Kg/sec =   72.87835

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.424    3412.327       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123340.875  125807.422       1.847     513.330     277.945     401.059       1.443

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   409.31    -0.14   409.31     0.33   573.51
 MEAN    16.97     0.00    -0.02   409.31    -0.14   409.31     0.33
 HUB     14.32     0.00    -0.02   409.31    -0.14   409.31     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.19    46.36    10.83   634.65   755.31    25.29   621.18     0.62
 MEAN    53.81    43.80    10.01   559.22   693.12    25.29   621.18     0.57
 HUB     49.07    37.84    11.23   471.87   624.76    25.29   621.18     0.51

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   526.32   331.94   408.44  1245.70     0.42
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 MEAN    16.57   530.61   330.81   414.86  1241.33     0.43
 HUB     13.89   567.99   380.18   421.99  1236.97     0.46
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   501.04   290.19     0.40  6269.72
 MEAN   546.14   467.42   215.33     0.38  5485.14     1.62
 HUB    457.70   429.05    77.52     0.35  5282.78

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.12     1.18    28.40   668.27     1.05   645.17     0.92     0.91
 MEAN    31.49     1.15    27.77   664.13     1.05   640.64     0.92     0.91
 HUB     31.33     1.15    27.11   663.06     1.04   636.15     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.10    35.39    31.50     3.89     0.93     0.41     2.90
 MEAN    38.57    27.43    23.50     3.93     0.94     0.40     3.29     0.91
 HUB     42.02    10.41     6.50     3.91     0.94     0.39     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.991

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     525.142     332.667     406.333    1242.778       0.423       0.047

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    31.606      27.951     642.149      46.000      39.307      32.400      -6.907

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     417.272     332.667     533.651    1250.957       0.334       0.374

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      31.553      29.212     650.629     456.573       0.024       0.457

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     397.259       0.000     397.259    1252.264       0.317       0.353

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      29.321     651.989       0.000       0.060       0.052       0.402

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.867      31.441       1.150     665.153      29.999     216.539       1.679

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 187164.359       0.484    1695.808 1349137.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.966   EfDer =  0.992

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   160.332    3776.000      31.441     665.153       1.000       1.000       0.980
W Kg/sec =   72.87835

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    84.887    3334.490       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123340.875  125807.422       2.061     509.668     247.274     390.276       1.578

    ROTOR LEADING EDGE CONDITIONS, STAGE            5
       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   370.78    -0.13   370.78     0.30   533.08
 MEAN    15.91     0.00    -0.02   370.78    -0.13   370.78     0.30
 HUB     13.07     0.00    -0.02   370.78    -0.13   370.78     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.45    47.36    11.09   603.68   708.56    29.59   653.69     0.57
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MEAN    54.74    44.80     9.94   524.36   642.31    29.59   653.69     0.51
HUB     49.28    38.84    10.44   430.68   568.39    29.59   653.69     0.45
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   494.39   324.70   372.81  1274.51     0.39
MEAN    15.50   491.51   313.25   378.75  1269.90     0.39
HUB     12.59   516.60   344.24   385.20  1265.29     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    591.16   458.24   266.45     0.36  5827.47
MEAN   510.67   427.12   197.42     0.34  4856.67     1.66
HUB    414.86   391.62    70.63     0.31  4335.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     36.30     1.15    32.72   695.91     1.05   675.53     0.92     0.91
MEAN    35.45     1.13    31.97   690.78     1.04   670.65     0.92     0.91
HUB     35.01     1.11    31.21   688.03     1.03   665.79     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.05    35.55    31.50     4.05     0.93     0.43     2.90
MEAN    39.59    27.53    23.50     4.03     0.94     0.41     3.34     0.91
HUB     41.79    10.39     6.50     3.89     0.94     0.38     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     497.688     318.995     382.014    1270.159       0.392      -0.007

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    35.514      31.944     670.928      46.000      39.863      33.000      -6.863

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     397.381     318.995     509.578    1277.224       0.311       0.321

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      35.427      33.126     678.412     440.827       0.044       0.469

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     372.152       0.000     372.152    1278.746       0.291       0.395

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      33.374     680.031       0.000       0.060       0.052       0.389

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.868      35.397       1.126     691.576      26.423     225.721       1.750

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 164997.344       0.472    1494.963 1378140.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1052007.62   9531.7441    156.6287      2.3430      0.8566      8.9664      1.3228
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 100% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.991

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     154.804    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   70.36555

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     151.228    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  119088.148  121469.656       1.888     831.557     440.409     619.754       1.407

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   362.31    -0.12   362.31     0.33   677.10
  MEAN    17.06     0.00    -0.02   362.31    -0.12   362.31     0.33
  HUB     12.51     0.00    -0.02   362.31    -0.12   362.31     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.95    50.47    11.48   679.80   770.43    14.03   511.85     0.69
  MEAN    57.20    47.20    10.00   562.16   668.91    14.03   511.85     0.60
  HUB     48.70    38.62    10.08   412.23   548.91    14.03   511.85     0.49

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   631.06   427.71   464.01  1136.06     0.56
  MEAN    18.04   655.05   448.80   477.15  1129.24     0.58
  HUB     15.00   737.95   544.07   498.56  1119.36     0.66

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   528.07   252.09     0.46  8826.17
  MEAN   594.32   498.84   145.52     0.44  8096.73     1.51
  HUB    494.28   501.04    49.79     0.45  8162.58

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.83     1.31    16.07   569.53     1.09   536.27     0.92     0.91
  MEAN    19.40     1.28    15.44   565.67     1.08   529.83     0.92     0.91
  HUB     19.44     1.29    14.52   566.02     1.08   520.54     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     42.67    28.51    24.20     4.31     0.93     0.41     2.90
  MEAN    43.25    16.96    12.70     4.26     0.94     0.35     3.51     0.91
  HUB     47.50    -5.70    -9.30     3.60     0.94     0.20     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     662.986     447.930     488.783    1129.733       0.587       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.513      15.451     530.360      24.000      42.503      35.400      -7.103

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     501.002     447.930     672.045    1146.383       0.437       0.399
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      19.414      17.024     546.108     528.796       0.034       0.527

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     462.934       0.000     462.934    1149.596       0.403       0.435

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      17.285     549.173       0.000       0.060       0.053       0.461

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
    0.865      19.331       1.280     567.073      44.263     193.995       1.504

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 275572.750       0.596    2410.745 1523501.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.985

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   154.804    3776.000      19.331     567.073       1.000       1.000       0.980
W Kg/sec =   70.36555

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
   123.086    3611.360       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119088.148  121469.656       1.647     590.487     358.468     474.134       1.323

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   441.06    -0.15   441.06     0.38   647.62
 MEAN    18.08     0.00    -0.02   441.06    -0.15   441.06     0.38
 HUB     15.21     0.00    -0.02   441.06    -0.15   441.06     0.38

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.93    46.36    10.57   677.16   808.26    17.47   550.83     0.70
 MEAN    53.49    42.30    11.19   595.71   741.34    17.47   550.83     0.64
 HUB     48.66    37.84    10.82   501.20   667.75    17.47   550.83     0.58

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   567.70   365.43   434.44  1181.01     0.48
 MEAN    18.01   573.96   364.39   443.46  1175.54     0.49
 HUB     15.22   617.57   419.14   453.55  1170.11     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   532.22   307.45     0.45  7465.20
 MEAN   593.46   499.13   229.08     0.42  6565.30     1.62
 HUB    501.63   460.99    82.49     0.39  6382.85

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.91     1.24    20.41   606.56     1.07   579.66     0.92     0.90
 MEAN    23.32     1.21    19.81   601.80     1.06   574.30     0.92     0.90
 HUB     23.20     1.20    19.19   600.84     1.06   569.00     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.07    35.29    31.50     3.79     0.93     0.42     2.90
 MEAN    39.41    27.32    23.50     3.82     0.94     0.40     3.30     0.90
 HUB     42.74    10.31     6.50     3.81     0.94     0.39     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     580.390     365.408     450.921    1176.180       0.493       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.437      19.840     574.943      46.000      39.020      30.600      -8.420

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     447.368     365.408     577.634    1187.798       0.377       0.375

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.358      21.177     586.358     511.151       0.032       0.448

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     442.569       0.000     442.569    1188.160       0.372       0.350

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.128     586.715       0.000       0.060       0.060       0.362

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      23.255       1.203     603.069      35.996     210.518       1.632

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 224247.969       0.495    1961.749 1354479.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.986

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    154.804    3776.000      23.255     603.069       1.000       1.000       0.980
W Kg/sec =   70.36555

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    105.515    3501.925       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 119088.148  121469.656       1.775     545.479     307.314     429.765       1.398

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   417.22    -0.14   417.22     0.35   613.32
 MEAN    17.74     0.00    -0.02   417.22    -0.14   417.22     0.35
 HUB     15.05     0.00    -0.02   417.22    -0.14   417.22     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.76    46.36    11.40   661.34   782.07    21.36   588.54     0.66
 MEAN    54.49    43.40    11.09   584.52   718.26    21.36   588.54     0.60
 HUB     49.93    38.84    11.09   495.92   648.19    21.36   588.54     0.54

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   548.11   358.64   414.48  1216.92     0.45
 MEAN    17.51   553.34   358.07   421.87  1212.07     0.46
 HUB     14.85   594.35   410.15   430.15  1207.23     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   508.24   294.13     0.42  7107.57
 MEAN   576.87   475.23   218.80     0.39  6271.14     1.65
 HUB    489.33   437.37    79.18     0.36  6092.96

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.14     1.21    24.48   640.64     1.06   615.57     0.92     0.90
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 MEAN    27.53     1.18    23.86   636.22     1.05   610.67     0.92     0.90
 HUB     27.41     1.18    23.22   635.28     1.05   605.80     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.87    35.36    31.50     3.86     0.93     0.43     2.90
 MEAN    40.32    27.41    23.50     3.91     0.94     0.41     3.28     0.90
 HUB     43.64    10.43     6.50     3.93     0.94     0.41     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     558.538     360.420     426.687    1212.731       0.461       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.656      23.910     611.344      46.000      40.188      31.500      -8.688

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     429.820     360.420     560.935    1223.217       0.351       0.381

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.579      25.319     621.962     471.992       0.030       0.468

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     418.154       0.000     418.154    1224.028       0.342       0.369

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.327     622.787       0.000       0.060       0.061       0.384

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      27.460       1.181     637.380      34.312     203.886       1.581

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 213902.969       0.502    1871.250 1301626.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    154.804    3776.000      27.460     637.380       1.000       1.000       0.980
W Kg/sec =   70.36555

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.864    3406.363       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119088.148  121469.656       1.918     513.330     267.575     401.059       1.499

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   392.93    -0.14   392.93     0.32   572.51
 MEAN    16.97     0.00    -0.02   392.93    -0.14   392.93     0.32
 HUB     14.32     0.00    -0.02   392.93    -0.14   392.93     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.24    46.36    11.88   634.65   746.56    25.57   624.50     0.61
 MEAN    54.91    43.80    11.11   559.22   683.57    25.57   624.50     0.56
 HUB     50.22    37.84    12.38   471.87   614.15    25.57   624.50     0.50

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   521.37   343.65   392.09  1249.37     0.42
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 MEAN    16.57   523.41   339.44   398.42  1244.81     0.42
 HUB     13.89   557.96   383.31   405.45  1240.25     0.45
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   480.92   278.48     0.38  6490.77
 MEAN   546.14   448.84   206.70     0.36  5628.18     1.67
 HUB    457.70   412.22    74.39     0.33  5326.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.40     1.18    28.74   671.66     1.05   648.99     0.92     0.90
 MEAN    31.71     1.15    28.08   667.11     1.05   644.26     0.92     0.90
 HUB     31.47     1.15    27.39   665.51     1.04   639.55     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.23    35.38    31.50     3.88     0.93     0.43     2.90
 MEAN    40.43    27.42    23.50     3.92     0.94     0.42     3.29     0.90
 HUB     43.39    10.40     6.50     3.90     0.94     0.41     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.986

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     518.561     341.351     390.365    1246.160       0.416       0.045

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    31.822      28.245     645.666      46.000      41.168      32.400      -8.768

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     400.198     341.351     526.003    1254.883       0.319       0.402

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      31.756      29.593     654.737     456.573       0.027       0.486

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     381.419       0.000     381.419    1256.056       0.304       0.375

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      29.666     655.961       0.000       0.060       0.062       0.421

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.857      31.627       1.152     668.095      30.715     208.433       1.616

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 191641.047       0.495    1676.500 1293292.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.986

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   154.804    3776.000      31.627     668.095       1.000       1.000       0.980
W Kg/sec =   70.36555

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    81.659    3327.139       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119088.148  121469.656       2.143     509.668     237.875     390.276       1.641

    ROTOR LEADING EDGE CONDITIONS, STAGE            5
       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   356.20    -0.12   356.20     0.28   531.90
 MEAN    15.91     0.00    -0.02   356.20    -0.12   356.20     0.28
 HUB     13.07     0.00    -0.02   356.20    -0.12   356.20     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.46    47.36    12.10   603.68   701.04    29.91   657.52     0.56
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MEAN    55.82    44.80    11.02   524.36   634.01    29.91   657.52     0.50
HUB     50.41    38.84    11.57   430.68   558.99    29.91   657.52     0.44

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   490.60   335.25   358.19  1278.49     0.38
MEAN    15.50   485.33   321.03   363.98  1273.73     0.38
HUB     12.59   507.49   347.04   370.28  1268.97     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    591.16   440.22   255.91     0.34  6016.56
MEAN   510.67   410.43   189.64     0.32  4977.14     1.71
HUB    414.86   376.44    67.83     0.30  4370.78

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     36.63     1.16    33.09   699.85     1.05   679.78     0.92     0.90
MEAN    35.72     1.13    32.32   694.36     1.04   674.73     0.92     0.90
HUB     35.21     1.11    31.53   691.16     1.03   669.69     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.10    35.54    31.50     4.04     0.93     0.45     2.90
MEAN    41.41    27.52    23.50     4.02     0.94     0.43     3.34     0.90
HUB     43.14    10.38     6.50     3.88     0.94     0.40     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.986

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      491.590     326.916     367.132    1273.963       0.386       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     35.781      32.287      674.980      46.000      41.684      33.000      -8.684

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      381.445     326.916     502.369    1281.505       0.298        0.348

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      35.673      33.545     682.995     440.827       0.051       0.497

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     357.498       0.000     357.498    1282.887       0.279       0.417

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      33.763      684.470       0.000       0.060       0.061       0.410

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      35.636       1.127     695.123      27.028     217.506       1.686

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 168784.516       0.483    1476.548 1321514.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1074149.25   9396.7930    151.2282      2.3589      0.8465     10.0040      1.3296
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 100% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.015   EfDer =  0.986

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     149.467    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   67.93939

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     146.014    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  114982.070  117281.461       1.956     831.557     425.224     619.754       1.457

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   348.42    -0.12   348.42     0.31   677.10
  MEAN    17.06     0.00    -0.02   348.42    -0.12   348.42     0.31
  HUB     12.51     0.00    -0.02   348.42    -0.12   348.42     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.87    50.47    12.40   679.80   763.99    14.11   512.67     0.69
  MEAN    58.22    47.20    11.02   562.16   661.48    14.11   512.67     0.60
  HUB     49.80    38.62    11.18   412.23   539.84    14.11   512.67     0.49

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   624.43   437.86   445.19  1137.96     0.55
  MEAN    18.04   645.29   454.60   457.98  1130.94     0.57
  HUB     15.00   722.74   541.97   478.15  1121.14     0.64

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   506.68   241.94     0.45  9035.51
  MEAN   594.32   478.82   139.72     0.42  8201.17     1.56
  HUB    494.28   480.52    47.69     0.43  8131.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.92     1.32    16.23   570.64     1.09   538.07     0.92     0.90
  MEAN    19.44     1.29    15.58   566.22     1.08   531.45     0.92     0.90
  HUB     19.40     1.28    14.66   565.85     1.08   522.23     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     44.52    28.52    24.20     4.32     0.93     0.44     2.90
  MEAN    44.79    16.97    12.70     4.27     0.94     0.38     3.51     0.90
  HUB     48.58    -5.70    -9.30     3.60     0.94     0.22     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     652.557     453.714     469.013    1131.483       0.577       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.544      15.595     532.004      24.000      44.050      35.400      -8.650

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     479.922     453.714     660.440    1148.716       0.418       0.424
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.431      17.229     548.333     528.796       0.038       0.551

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     444.397       0.000     444.397    1151.585       0.386       0.452

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.445     551.076       0.000       0.060       0.061       0.477

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.856      19.335       1.280     567.571      44.761     188.651       1.462

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 278673.156       0.603    2353.812 1465094.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.015   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    149.467    3776.000      19.335     567.571       1.000       1.000       0.980
W Kg/sec =   67.93939

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.867    3609.776       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 114982.070  117281.461       1.706     590.487     346.179     474.134       1.370

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   423.70    -0.15   423.70     0.37   647.33
 MEAN    18.08     0.00    -0.02   423.70    -0.15   423.70     0.37
 HUB     15.21     0.00    -0.02   423.70    -0.15   423.70     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.97    46.36    11.61   677.16   798.92    17.61   552.58     0.69
 MEAN    54.58    42.30    12.28   595.71   731.14    17.61   552.58     0.63
 HUB     49.80    37.84    11.96   501.20   656.41    17.61   552.58     0.57

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   562.83   377.46   417.49  1183.30     0.48
 MEAN    18.01   566.65   373.26   426.35  1177.62     0.48
 HUB     15.22   607.22   422.34   436.29  1171.96     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   511.44   295.42     0.43  7710.74
 MEAN   593.46   479.85   220.20     0.41  6725.02     1.67
 HUB    501.63   443.44    79.29     0.38  6431.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.03     1.24    20.58   608.36     1.07   581.91     0.92     0.90
 MEAN    23.39     1.21    19.96   603.15     1.06   576.34     0.92     0.90
 HUB     23.20     1.20    19.32   601.59     1.06   570.81     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.12    35.28    31.50     3.78     0.93     0.44     2.90
 MEAN    41.20    27.32    23.50     3.82     0.94     0.42     3.30     0.90
 HUB     44.07    10.30     6.50     3.80     0.94     0.41     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     572.742     374.307     433.507    1178.256       0.486       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.508      19.996     576.978      46.000      40.809      30.600     -10.209

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     429.382     374.307     569.626    1190.441       0.361       0.402

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.414      21.398     588.973     511.151       0.036       0.476

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     425.173       0.000     425.173    1190.744       0.357       0.371

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.327     589.273       0.000       0.060       0.070       0.382

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.846      23.294       1.205     604.367      36.796     202.958       1.573

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 229233.406       0.506    1936.219 1299477.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.015   EfDer =  0.979

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    149.467    3776.000      23.294     604.367       1.000       1.000       0.980
W Kg/sec =   67.93939

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    101.815    3498.162       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 114982.070  117281.461       1.839     545.479     296.539     429.765       1.449

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   401.10    -0.14   401.10     0.34   612.66
 MEAN    17.74     0.00    -0.02   401.10    -0.14   401.10     0.34
 HUB     15.05     0.00    -0.02   401.10    -0.14   401.10     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.77    46.36    12.41   661.34   773.59    21.54   590.94     0.65
 MEAN    55.55    43.40    12.15   584.52   709.02    21.54   590.94     0.59
 HUB     51.04    38.84    12.20   495.92   637.94    21.54   590.94     0.54

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   543.82   369.94   398.61  1219.75     0.45
 MEAN    17.51   546.79   366.40   405.87  1214.71     0.45
 HUB     14.85   584.91   413.17   414.02  1209.67     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   488.76   282.84     0.40  7331.20
 MEAN   576.87   457.19   210.47     0.38  6416.89     1.70
 HUB    489.33   420.96    76.17     0.35  6137.61

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     28.31     1.22    24.70   643.12     1.06   618.44     0.92     0.90
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 MEAN    27.65     1.19    24.05   638.29     1.06   613.34     0.92     0.90
 HUB     27.45     1.18    23.38   636.81     1.05   608.26     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.86    35.36    31.50     3.86     0.93     0.45     2.90
 MEAN    42.07    27.41    23.50     3.91     0.94     0.43     3.28     0.90
 HUB     44.94    10.42     6.50     3.92     0.94     0.42     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     551.860     368.806     410.526    1215.344       0.454       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.763      24.098     613.991      46.000      41.936      31.500     -10.436

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     412.890     368.806     553.621    1226.368       0.337       0.409

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.671      25.581     625.180     471.992       0.035       0.496

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     402.094       0.000     402.094    1227.088       0.328       0.389

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.558     625.914       0.000       0.060       0.071       0.403

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.846      27.534       1.182     639.407      35.040     196.780       1.525

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 218451.141       0.513    1845.147 1248768.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =11.015   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    149.467    3776.000      27.534     639.407       1.000       1.000       0.980
W Kg/sec =   67.93939

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.598    3400.959       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 114982.070  117281.461       1.989     513.330     258.067     401.059       1.554

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   378.06    -0.13   378.06     0.31   571.60
 MEAN    16.97     0.00    -0.02   378.06    -0.13   378.06     0.31
 HUB     14.32     0.00    -0.02   378.06    -0.13   378.06     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.22    46.36    12.86   634.65   738.84    25.78   627.49     0.60
 MEAN    55.95    43.80    12.15   559.22   675.13    25.78   627.49     0.55
 HUB     51.31    37.84    13.47   471.87   604.74    25.78   627.49     0.49

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   517.50   354.11   377.39  1252.62     0.41
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 MEAN    16.57   517.36   347.17   383.58  1247.90     0.41
 HUB     13.89   549.12   386.08   390.48  1243.18     0.44
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   462.88   268.03     0.37  6688.01
 MEAN   546.14   432.12   198.97     0.35  5756.11     1.72
 HUB    457.70   397.00    71.62     0.32  5364.54

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.60     1.18    28.98   674.73     1.06   652.40     0.92     0.90
 MEAN    31.85     1.16    28.30   669.81     1.05   647.49     0.92     0.90
 HUB     31.55     1.15    27.59   667.74     1.04   642.59     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.18    35.38    31.50     3.88     0.93     0.46     2.90
 MEAN    42.15    27.42    23.50     3.92     0.94     0.44     3.29     0.90
 HUB     44.68    10.39     6.50     3.89     0.94     0.42     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     513.052     349.119     375.950    1249.171       0.411       0.042

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.961      28.454     648.808      46.000      42.881      32.400     -10.481

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     384.866     349.119     519.621    1258.378       0.306       0.428

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.882      29.878     658.407     456.573       0.031       0.513

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     367.186       0.000     367.186    1259.438       0.292       0.394

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.914     659.516       0.000       0.060       0.071       0.438

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.846      31.734       1.153     670.761      31.354     201.314       1.561

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 195634.672       0.505    1652.427 1240820.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =11.015   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    149.467    3776.000      31.734     670.761       1.000       1.000       0.980
W Kg/sec =   67.93939

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     78.734    3320.521       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 114982.070  117281.461       2.222     509.668     229.357     390.276       1.702

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   343.08    -0.12   343.08     0.27   530.84
 MEAN    15.91     0.00    -0.02   343.08    -0.12   343.08     0.27
 HUB     13.07     0.00    -0.02   343.08    -0.12   343.08     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.39    47.36    13.03   603.68   694.46    30.14   660.95     0.55
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MEAN    56.81    44.80    12.01   524.36   626.72    30.14   660.95     0.50
HUB     51.47    38.84    12.63   430.68   550.72    30.14   660.95     0.44
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   487.69   344.58   345.12  1282.02     0.38
MEAN    15.50   480.17   327.93   350.75  1277.14     0.38
HUB     12.59   499.52   349.51   356.87  1272.25     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    591.16   424.15   246.57     0.33  6184.01
MEAN   510.67   395.50   182.74     0.31  5084.06     1.76
HUB    414.86   362.81    65.35     0.29  4401.89

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     36.84     1.16    33.34   703.39     1.05   683.57     0.92     0.90
MEAN    35.89     1.13    32.56   697.59     1.04   678.37     0.92     0.90
HUB     35.31     1.11    31.75   693.99     1.03   673.19     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.96    35.54    31.50     4.04     0.93     0.47     2.90
MEAN    43.07    27.52    23.50     4.02     0.94     0.45     3.34     0.90
HUB     44.40    10.38     6.50     3.88     0.94     0.42     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.980

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     486.510     333.946     353.797    1277.346       0.381      -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     35.948      32.522     678.597      46.000      43.347      33.000     -10.347

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219     367.237     333.946     496.370    1285.309       0.286       0.373

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      35.818      33.843     687.084     440.827       0.058       0.524

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     344.415       0.000     344.415    1286.574       0.268       0.436

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      34.034     688.438       0.000       0.060       0.070       0.428

    STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.849      35.773       1.127     698.324      27.563     210.334       1.630

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 172139.828       0.493    1453.979 1268258.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1094132.25   9241.5840    146.0140      2.3680      0.8352     11.0152      1.3357
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 100% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =12.000   EfDer =  0.980

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     144.313    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   65.59689

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     140.979    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  111017.570  113237.688       2.025     831.557     410.563     619.754       1.510

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   335.18    -0.12   335.18     0.30   677.10
  MEAN    17.06     0.00    -0.02   335.18    -0.12   335.18     0.30
  HUB     12.51     0.00    -0.02   335.18    -0.12   335.18     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.76    50.47    13.29   679.80   758.04    14.18   513.43     0.68
  MEAN    59.20    47.20    12.00   562.16   654.60    14.18   513.43     0.59
  HUB     50.89    38.62    12.27   412.23   531.39    14.18   513.43     0.48

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   618.80   447.30   427.60  1139.65     0.54
  MEAN    18.04   636.54   459.99   440.00  1132.47     0.56
  HUB     15.00   708.69   539.96   459.01  1122.74     0.63

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   486.72   232.50     0.43  9230.09
  MEAN   594.32   460.05   134.33     0.41  8298.31     1.62
  HUB    494.28   461.28    45.68     0.41  8100.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.00     1.32    16.36   571.67     1.09   539.69     0.92     0.90
  MEAN    19.46     1.29    15.70   566.74     1.08   532.90     0.92     0.90
  HUB     19.35     1.28    14.79   565.69     1.08   523.75     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     46.29    28.53    24.20     4.33     0.93     0.46     2.90
  MEAN    46.27    16.98    12.70     4.28     0.94     0.40     3.51     0.90
  HUB     49.63    -5.68    -9.30     3.62     0.94     0.25     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     643.207     459.094     450.498    1133.048       0.568       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.566      15.720     533.477      24.000      45.541      35.400     -10.141

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     460.320     459.094     650.124    1150.810       0.400       0.448
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.438      17.407     550.334     528.796       0.042       0.574

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     427.085       0.000     427.085    1153.383       0.370       0.467

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.581     552.797       0.000       0.060       0.069       0.492

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.847      19.330       1.280     568.032      45.222     183.613       1.423

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 281545.531       0.609    2296.079 1409401.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =12.000   EfDer =  0.971

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    144.313    3776.000      19.330     568.032       1.000       1.000       0.980
W Kg/sec =   65.59689

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    114.847    3608.309       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111017.570  113237.688       1.765     590.487     334.472     474.134       1.418

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   407.44    -0.14   407.44     0.35   647.07
 MEAN    18.08     0.00    -0.02   407.44    -0.14   407.44     0.35
 HUB     15.21     0.00    -0.02   407.44    -0.14   407.44     0.35

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.97    46.36    12.61   677.16   790.41    17.73   554.17     0.68
 MEAN    55.64    42.30    13.34   595.71   721.84    17.73   554.17     0.63
 HUB     50.90    37.84    13.06   501.20   646.03    17.73   554.17     0.56

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   558.92   388.53   401.79  1185.35     0.47
 MEAN    18.01   560.32   381.45   410.43  1179.49     0.48
 HUB     15.22   597.81   425.25   420.17  1173.64     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   492.23   284.35     0.42  7936.59
 MEAN   593.46   461.95   212.01     0.39  6872.52     1.72
 HUB    501.63   427.05    76.37     0.36  6475.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.13     1.25    20.72   610.02     1.07   583.93     0.92     0.89
 MEAN    23.45     1.21    20.09   604.39     1.06   578.17     0.92     0.89
 HUB     23.19     1.20    19.42   602.29     1.06   572.45     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.04    35.29    31.50     3.79     0.93     0.46     2.90
 MEAN    42.90    27.32    23.50     3.82     0.94     0.44     3.30     0.89
 HUB     45.34    10.30     6.50     3.80     0.94     0.42     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     566.108     382.525     417.316    1180.118       0.480       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.555      20.119     578.807      46.000      42.509      30.600     -11.909

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     412.738     382.525     562.742    1192.828       0.346       0.428

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.446      21.580     591.341     511.151       0.041       0.504

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     409.075       0.000     409.075    1193.082       0.343       0.389

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.486     591.592       0.000       0.060       0.080       0.401

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.834      23.309       1.206     605.564      37.532     196.090       1.520

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 233821.703       0.516    1906.878 1247507.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =12.000   EfDer =  0.973

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    144.313    3776.000      23.309     605.564       1.000       1.000       0.980
W Kg/sec =   65.59689

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     98.339    3494.700       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 111017.570  113237.688       1.905     545.479     286.415     429.765       1.500

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   386.15    -0.13   386.15     0.32   612.06
 MEAN    17.74      0.00    -0.02   386.15    -0.13   386.15     0.32
 HUB     15.05      0.00    -0.02   386.15    -0.13   386.15     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.72     46.36    13.36   661.34   765.94    21.68   593.12     0.64
 MEAN    56.56     43.40    13.16   584.52   700.66    21.68   593.12     0.59
 HUB     52.10     38.84    13.26   495.92   628.64    21.68   593.12     0.53

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   540.41   380.24   384.01  1222.28      0.44
 MEAN    17.51   541.15   374.02   391.10  1217.08      0.44
 HUB     14.85   576.40   415.90   399.08  1211.88      0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   470.89   272.54     0.39  7535.20
 MEAN   576.87   440.58   202.86     0.36  6550.10     1.74
 HUB    489.33   405.78    73.44     0.33  6178.10

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     28.43     1.22    24.85   645.40     1.07   621.03     0.92     0.89
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 MEAN    27.72     1.19    24.20   640.19     1.06   615.75     0.92     0.89
 HUB     27.45     1.18    23.51   638.22     1.05   610.50     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.72    35.36    31.50     3.86     0.93     0.47     2.90
 MEAN    43.72    27.42    23.50     3.92     0.94     0.45     3.28     0.89
 HUB     46.18    10.43     6.50     3.93     0.94     0.44     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     546.114     376.470     395.614    1217.698       0.448       0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.830      24.238     616.381      46.000      43.580      31.500     -12.080

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     397.339     376.470     547.365    1229.214       0.323       0.434

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.723      25.785     628.095     471.992       0.039       0.522

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     387.329       0.000     387.329    1229.855       0.315       0.407

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.734     628.750       0.000       0.060       0.081       0.420

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.835      27.567       1.183     641.270      35.705     190.372       1.476

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 222600.438       0.522    1815.366 1198849.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =12.000   EfDer =  0.973

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    144.313    3776.000      27.567     641.270       1.000       1.000       0.980
W Kg/sec =   65.59689

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     85.564    3396.016       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111017.570  113237.688       2.060     513.330     249.230     401.059       1.609

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   364.37    -0.13   364.37     0.30   570.77
 MEAN    16.97     0.00    -0.02   364.37    -0.13   364.37     0.30
 HUB     14.32     0.00    -0.02   364.37    -0.13   364.37     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.14    46.36    13.78   634.65   731.92    25.94   630.20     0.59
 MEAN    56.92    43.80    13.12   559.22   667.55    25.94   630.20     0.54
 HUB     52.33    37.84    14.49   471.87   596.27    25.94   630.20     0.48

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   514.45   363.61   363.93  1255.55     0.41
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 MEAN    16.57   512.18   354.19   369.97  1250.70     0.41
 HUB     13.89   541.20   388.57   376.71  1245.83     0.43
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   446.41   258.52     0.36  6867.36
 MEAN   546.14   416.81   191.95     0.33  5872.39     1.76
 HUB    457.70   383.00    69.13     0.31  5399.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.73     1.19    29.15   677.54     1.06   655.47     0.92     0.89
 MEAN    31.94     1.16    28.45   672.29     1.05   650.41     0.92     0.89
 HUB     31.57     1.15    27.73   669.79     1.04   645.36     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.97    35.39    31.50     3.89     0.93     0.47     2.90
 MEAN    43.75    27.42    23.50     3.92     0.94     0.46     3.29     0.89
 HUB     45.89    10.40     6.50     3.90     0.94     0.44     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     508.356     356.179     362.715    1251.889       0.406       0.040

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.043      28.601     651.652      46.000      44.479      32.400     -12.079

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     370.847     356.179     514.190    1261.537       0.294       0.453

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.951      30.089     661.734     456.573       0.035       0.539

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     354.155       0.000     354.155    1262.498       0.281       0.410

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.092     662.744       0.000       0.060       0.081       0.453

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.835      31.784       1.153     673.204      31.934     194.931       1.511

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 199261.266       0.515    1625.029 1191271.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =12.000   EfDer =  0.974

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    144.313    3776.000      31.784     673.204       1.000       1.000       0.980
W Kg/sec =   65.59689

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     76.038    3314.491       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111017.570  113237.688       2.301     509.668     221.506     390.276       1.762

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   331.05    -0.11   331.05     0.26   529.88
 MEAN    15.91     0.00    -0.02   331.05    -0.11   331.05     0.26
 HUB     13.07     0.00    -0.02   331.05    -0.11   331.05     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.26    47.36    13.90   603.68   688.59    30.30   664.07     0.54
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 MEAN    57.74    44.80    12.94   524.36   620.22    30.30   664.07     0.49
 HUB     52.46    38.84    13.62   430.68   543.30    30.30   664.07     0.43
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   485.45   353.04   333.20  1285.20     0.38
 MEAN    15.50   475.78   334.19   338.65  1280.22     0.37
 HUB     12.59   492.39   351.71   344.59  1275.23     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   409.53   238.11     0.32  6335.69
 MEAN   510.67   381.87   176.48     0.30  5181.01     1.81
 HUB    414.86   350.33    63.15     0.27  4429.53

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     36.98     1.16    33.51   706.63     1.05   687.00     0.92     0.89
 MEAN    35.99     1.13    32.71   700.54     1.04   681.68     0.92     0.89
 HUB     35.36     1.11    31.90   696.58     1.03   676.37     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.66    35.55    31.50     4.05     0.93     0.49     2.90
 MEAN    44.62    27.53    23.50     4.03     0.94     0.46     3.34     0.89
 HUB     45.59    10.39     6.50     3.89     0.94     0.43     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     482.200     340.321     341.611    1280.401       0.377       -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.041      32.678     681.874      46.000      44.892      33.000     -11.892

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219     354.298     340.321     491.270    1288.745       0.275        0.395

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      35.889      34.052     690.790     440.827       0.065       0.549

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     332.484       0.000     332.484    1289.909       0.258        0.453

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      34.218     692.039       0.000       0.060       0.080        0.444

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.838      35.836       1.127     701.251      28.048     203.922        1.581

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 175174.859       0.501    1428.598 1217918.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1112403.75   9071.9502    140.9795      2.3722      0.8234     12.0004      1.3413
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 100% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =12.960   EfDer =  0.974

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     139.337    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   63.33516

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     136.119    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  107189.766  109333.328       2.098     831.557     396.407     619.754       1.563

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   322.54    -0.11   322.54     0.29   677.10
  MEAN    17.06     0.00    -0.02   322.54    -0.11   322.54     0.29
  HUB     12.51     0.00    -0.02   322.54    -0.11   322.54     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.62    50.47    14.15   679.80   752.53    14.25   514.12     0.68
  MEAN    60.16    47.20    12.96   562.16   648.21    14.25   514.12     0.58
  HUB     51.97    38.62    13.35   412.23   523.50    14.25   514.12     0.47

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   614.00   456.08   411.08  1141.18     0.54
  MEAN    18.04   628.64   464.99   423.05  1133.85     0.55
  HUB     15.00   695.63   537.99   440.98  1124.20     0.62

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   468.01   223.72     0.41  9411.22
  MEAN   594.32   442.38   129.33     0.39  8388.45     1.67
  HUB    494.28   443.15    43.72     0.39  8071.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.07     1.33    16.48   572.63     1.10   541.14     0.92     0.89
  MEAN    19.48     1.29    15.81   567.21     1.08   534.21     0.92     0.89
  HUB     19.30     1.28    14.91   565.53     1.08   525.12     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     47.97    28.56    24.20     4.36     0.93     0.48     2.90
  MEAN    47.70    17.00    12.70     4.30     0.94     0.42     3.51     0.89
  HUB     50.66    -5.66    -9.30     3.64     0.94     0.27     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     634.768     464.086     433.076    1134.457       0.560       0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.582      15.828     534.804      24.000      46.980      35.400     -11.580

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     441.982     464.086     640.877    1152.700       0.383       0.471
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.439      17.561     552.142     528.796       0.047       0.597

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     410.819       0.000     410.819    1155.014       0.356       0.481

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.697     554.362       0.000       0.060       0.078       0.505

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.836      19.317       1.279     568.459      45.649     178.852       1.386

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 284201.719       0.615    2237.827 1356237.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =12.960   EfDer =  0.964

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    139.337    3776.000      19.317     568.459       1.000       1.000       0.980
W Kg/sec =   63.33516

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.003    3606.955       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107189.766  109333.328       1.827     590.487     323.279     474.134       1.467

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   392.14    -0.14   392.14     0.34   646.83
 MEAN    18.08     0.00    -0.02   392.14    -0.14   392.14     0.34
 HUB     15.21     0.00    -0.02   392.14    -0.14   392.14     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.93    46.36    13.57   677.16   782.62    17.84   555.62     0.68
 MEAN    56.65    42.30    14.35   595.71   713.30    17.84   555.62     0.62
 HUB     51.97    37.84    14.13   501.20   636.48    17.84   555.62     0.55

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   555.76   398.76   387.12  1187.19     0.47
 MEAN    18.01   554.78   389.04   395.51  1181.18     0.47
 HUB     15.22   589.18   427.91   405.00  1175.16     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   474.34   274.12     0.40  8145.46
 MEAN   593.46   445.21   204.42     0.38  7009.09     1.76
 HUB    501.63   411.66    73.71     0.35  6516.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.21     1.25    20.83   611.55     1.08   585.76     0.92     0.88
 MEAN    23.48     1.22    20.18   605.54     1.07   579.84     0.92     0.88
 HUB     23.17     1.20    19.51   602.93     1.06   573.95     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.85    35.30    31.50     3.80     0.93     0.48     2.90
 MEAN    44.53    27.33    23.50     3.83     0.95     0.46     3.30     0.88
 HUB     46.58    10.32     6.50     3.82     0.95     0.44     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.964

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     560.297     390.135     402.153    1181.800       0.474       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.583      20.216     580.461      46.000      44.131      30.600     -13.531

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     397.209     390.135     556.759    1194.998       0.332       0.452

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.459      21.729     593.498     511.151       0.046       0.530

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     394.040       0.000     394.040    1195.209       0.330       0.406

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.614     593.708       0.000       0.060       0.091       0.418

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.822      23.305       1.206     606.671      38.213     189.796       1.471

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 238060.281       0.526    1874.505 1198265.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =12.960   EfDer =  0.965

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    139.337    3776.000      23.305     606.671       1.000       1.000       0.980
W Kg/sec =   63.33516

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     95.049    3491.511       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 107189.766  109333.328       1.970     545.479     276.836     429.765       1.552

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   372.16    -0.13   372.16     0.31   611.50
 MEAN    17.74     0.00    -0.02   372.16    -0.13   372.16     0.31
 HUB     15.05     0.00    -0.02   372.16    -0.13   372.16     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.64    46.36    14.28   661.34   758.98    21.79   595.11     0.63
 MEAN    57.52    43.40    14.12   584.52   693.04    21.79   595.11     0.58
 HUB     53.12    38.84    14.28   495.92   620.14    21.79   595.11     0.52

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   537.69   389.73   370.44  1224.58      0.44
 MEAN    17.51   536.25   381.04   377.33  1219.24      0.44
 HUB     14.85   568.64   418.37   385.11  1213.90      0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   454.33   263.04     0.37  7723.17
 MEAN   576.87   425.12   195.83     0.35  6672.95      1.79
 HUB    489.33   391.60    70.96     0.32  6214.74

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.51     1.22    24.97   647.50     1.07   623.37     0.92     0.88
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 MEAN    27.76     1.19    24.30   641.95     1.06   617.95     0.92     0.88
 HUB     27.43     1.18    23.60   639.52     1.05   612.54     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.45    35.38    31.50     3.88     0.93     0.49     2.90
 MEAN    45.28    27.43    23.50     3.93     0.95     0.47     3.28     0.88
 HUB     47.37    10.44     6.50     3.94     0.95     0.46     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.965

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     541.118     383.539     381.715    1219.833       0.444       0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.865      24.340     618.554      46.000      45.137      31.500     -13.637

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     382.896     383.539     541.952    1231.804       0.311       0.458

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.744      25.944     630.754     471.992       0.043       0.548

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     373.597       0.000     373.597    1232.377       0.303       0.423

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.866     631.341       0.000       0.060       0.091       0.436

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.824      27.571       1.183     642.988      36.317     184.522       1.430

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 226417.531       0.531    1782.830 1151559.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =12.960   EfDer =  0.966

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    139.337    3776.000      27.571     642.988       1.000       1.000       0.980
W Kg/sec =   63.33516

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     82.715    3391.474       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107189.766  109333.328       2.131     513.330     240.934     401.059       1.665

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   351.61    -0.12   351.61     0.29   570.01
 MEAN    16.97     0.00    -0.02   351.61    -0.12   351.61     0.29
 HUB     14.32     0.00    -0.02   351.61    -0.12   351.61     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.02    46.36    14.66   634.65   725.65    26.06   632.68     0.59
 MEAN    57.85    43.80    14.05   559.22   660.67    26.06   632.68     0.54
 HUB     53.32    37.84    15.48   471.87   588.56    26.06   632.68     0.48

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   512.01   372.33   351.47  1258.21     0.41
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 MEAN    16.57   507.68   360.62   357.34  1253.24     0.41
 HUB     13.89   534.03   390.86   363.90  1248.26     0.43
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   431.20   249.80     0.34  7031.88
 MEAN   546.14   402.63   185.52     0.32  5978.89     1.81
 HUB    457.70   369.98    66.84     0.30  5430.78

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.81     1.19    29.27   680.13     1.06   658.27     0.92     0.88
 MEAN    31.98     1.16    28.56   674.57     1.05   653.07     0.92     0.88
 HUB     31.56     1.14    27.82   671.67     1.04   647.89     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.65    35.40    31.50     3.90     0.93     0.49     2.90
 MEAN    45.26    27.44    23.50     3.94     0.95     0.47     3.29     0.88
 HUB     47.05    10.41     6.50     3.91     0.95     0.46     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     504.283     362.646     350.413    1254.363       0.402       0.038

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.080      28.698     654.248      46.000      45.983      32.400     -13.583

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     357.859     362.646     509.485    1264.415       0.283       0.475

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.976      30.245     664.775     456.573       0.039       0.564

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     342.062       0.000     342.062    1265.291       0.270       0.426

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.216     665.697       0.000       0.060       0.091       0.467

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.824      31.791       1.153     675.454      32.466     189.125       1.466

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 202587.156       0.523    1595.187 1144326.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =12.960   EfDer =  0.968

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    139.337    3776.000      31.791     675.454       1.000       1.000       0.980
W Kg/sec =   63.33516

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     73.522    3308.965       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107189.766  109333.328       2.380     509.668     214.179     390.276       1.822

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   319.86    -0.11   319.86     0.25   529.00
 MEAN    15.91     0.00    -0.02   319.86    -0.11   319.86     0.25
 HUB     13.07     0.00    -0.02   319.86    -0.11   319.86     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.09    47.36    14.73   603.68   683.28    30.41   666.93     0.54
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 MEAN    58.62    44.80    13.82   524.36   614.32    30.41   666.93     0.49
 HUB     53.41    38.84    14.57   430.68   536.56    30.41   666.93     0.42
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   483.71   360.81   322.16  1288.10     0.38
 MEAN    15.50   471.98   339.93   327.43  1283.03     0.37
 HUB     12.59   485.93   353.71   333.19  1277.94     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   396.04   230.34     0.31  6475.02
 MEAN   510.67   369.28   170.74     0.29  5269.91     1.86
 HUB    414.86   338.76    61.15     0.27  4454.63

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     37.05     1.17    33.61   709.62     1.05   690.12     0.92     0.89
 MEAN    36.03     1.13    32.81   703.26     1.04   684.70     0.92     0.89
 HUB     35.35     1.11    31.99   698.96     1.03   679.28     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.24    35.56    31.50     4.06     0.93     0.51     2.90
 MEAN    46.07    27.54    23.50     4.04     0.94     0.48     3.34     0.89
 HUB     46.71    10.40     6.50     3.90     0.94     0.45     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.968

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     478.476     346.167     330.314    1283.185       0.373       -0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.077      32.774     684.869      46.000      46.342      33.000     -13.342

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219     342.334     346.167     486.851    1291.879       0.265        0.416

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      35.905      34.194     694.181     440.827       0.072       0.572

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     321.437       0.000     321.437    1292.954       0.249        0.468

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      34.336     695.337       0.000       0.060       0.090        0.458

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.828      35.845       1.128     703.946      28.492     198.092        1.536

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 177957.922       0.509    1401.255 1170178.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1129224.50   8891.6045    136.1186      2.3728      0.8114     12.9602      1.3465
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 100% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.497   EfDer =  0.970

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     136.571    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   62.07791

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     133.417    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  105061.984  107163.000       2.140     831.557     388.538     619.754       1.595

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   315.57    -0.11   315.57     0.28   677.10
  MEAN    17.06     0.00    -0.02   315.57    -0.11   315.57     0.28
  HUB     12.51     0.00    -0.02   315.57    -0.11   315.57     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     65.10    50.47    14.63   679.80   749.57    14.29   514.49     0.67
  MEAN    60.70    47.20    13.50   562.16   644.77    14.29   514.49     0.58
  HUB     52.57    38.62    13.95   412.23   519.23    14.29   514.49     0.47

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   611.59   460.84   402.07  1141.99     0.54
  MEAN    18.04   624.48   467.70   413.79  1134.59     0.55
  HUB     15.00   688.58   536.91   431.14  1124.97     0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   457.82   218.95     0.40  9509.46
  MEAN   594.32   432.73   126.62     0.38  8437.36     1.70
  HUB    494.28   433.24    42.63     0.39  8054.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.11     1.33    16.54   573.15     1.10   541.91     0.92     0.89
  MEAN    19.49     1.29    15.86   567.47     1.09   534.90     0.92     0.89
  HUB     19.28     1.28    14.96   565.45     1.08   525.85     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     48.90    28.57    24.20     4.37     0.93     0.50     2.90
  MEAN    48.50    17.01    12.70     4.31     0.94     0.44     3.51     0.89
  HUB     51.24    -5.65    -9.30     3.65     0.94     0.28     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     630.320     466.795     423.564    1135.200       0.555       0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.588      15.883     535.505      24.000      47.780      35.400     -12.380

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     432.002     466.795     636.021    1153.700       0.374       0.483
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      19.436      17.641     553.102     528.796       0.049       0.609

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     401.937       0.000     401.937    1155.883       0.348       0.488

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      17.756     555.196       0.000       0.060       0.083       0.513

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
    0.830      19.307       1.278     568.689      45.879     176.241       1.366

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 285638.469       0.618    2204.493 1326929.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.497   EfDer =  0.959

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   136.571    3776.000      19.307     568.689       1.000       1.000       0.980
W Kg/sec =   62.07791

  W cor      RPM cor        GAMMA       Cp          R           Blades       THK
   108.878    3606.223       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 105061.984  107163.000       1.862     590.487     317.090     474.134       1.495

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   383.77    -0.13   383.77     0.33   646.69
 MEAN    18.08     0.00    -0.02   383.77    -0.13   383.77     0.33
 HUB     15.21     0.00    -0.02   383.77    -0.13   383.77     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.46    46.36    14.10   677.16   778.46    17.89   556.39     0.67
 MEAN    57.22    42.30    14.92   595.71   708.74    17.89   556.39     0.61
 HUB     52.57    37.84    14.73   501.20   631.35    17.89   556.39     0.55

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   554.26   404.29   379.15  1188.17     0.47
 MEAN    18.01   551.93   393.14   387.38  1182.07     0.47
 HUB     15.22   584.56   429.34   396.72  1175.98     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   464.64   268.58     0.39  8258.37
 MEAN   593.46   436.11   200.32     0.37  7082.90     1.79
 HUB    501.63   403.25    72.29     0.34  6537.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.24     1.26    20.88   612.38     1.08   586.73     0.92     0.88
 MEAN    23.49     1.22    20.23   606.16     1.07   580.72     0.92     0.88
 HUB     23.15     1.20    19.55   603.27     1.06   574.74     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.84    35.31    31.50     3.81     0.93     0.49     2.90
 MEAN    45.42    27.34    23.50     3.84     0.95     0.47     3.30     0.88
 HUB     47.26    10.33     6.50     3.83     0.95     0.45     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.959

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     557.299     394.248     393.892    1182.691       0.471       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.593      20.261     581.339      46.000      45.026      30.600     -14.426

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     388.767     394.248     553.689    1196.156       0.325       0.465

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.460      21.803     594.651     511.151       0.049       0.544

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     385.856       0.000     385.856    1196.345       0.323       0.415

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.675     594.839       0.000       0.060       0.097       0.427

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.815      23.297       1.207     607.269      38.580     186.417       1.445

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 240349.141       0.531    1854.960 1171253.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.497   EfDer =  0.961

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    136.571    3776.000      23.297     607.269       1.000       1.000       0.980
W Kg/sec =   62.07791

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     93.242    3489.791       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 105061.984  107163.000       2.009     545.479     271.573     429.765       1.583

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   364.53    -0.13   364.53     0.30   611.20
 MEAN    17.74     0.00    -0.02   364.53    -0.13   364.53     0.30
 HUB     15.05     0.00    -0.02   364.53    -0.13   364.53     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.14    46.36    14.78   661.34   755.26    21.85   596.18     0.63
 MEAN    58.06    43.40    14.66   584.52   688.97    21.85   596.18     0.58
 HUB     53.69    38.84    14.85   495.92   615.59    21.85   596.18     0.51

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   536.41   394.87   363.07  1225.80     0.44
 MEAN    17.51   533.75   384.84   369.85  1220.39     0.44
 HUB     14.85   564.49   419.69   377.51  1214.97     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   445.35   257.91     0.36  7824.80
 MEAN   576.87   416.73   192.04     0.34  6739.40     1.82
 HUB    489.33   383.88    69.64     0.32  6234.30

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     28.54     1.23    25.02   648.63     1.07   624.62     0.92     0.88
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 MEAN    27.77     1.19    24.35   642.89     1.06   619.12     0.92     0.88
 HUB     27.41     1.18    23.64   640.22     1.05   613.63     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.40    35.39    31.50     3.89     0.93     0.50     2.90
 MEAN    46.14    27.44    23.50     3.94     0.95     0.48     3.28     0.88
 HUB     48.03    10.45     6.50     3.95     0.95     0.46     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.961

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     538.559     387.362     374.160    1220.971       0.441       0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.873      24.384     619.714      46.000      45.993      31.500     -14.493

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     375.061     387.362     539.185    1233.188       0.304       0.471

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.745      26.019     632.178     471.992       0.046       0.562

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     366.136       0.000     366.136    1233.727       0.297       0.432

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.926     632.731       0.000       0.060       0.097       0.445

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.818      27.562       1.183     643.917      36.647     181.384       1.406

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 228478.578       0.536    1763.346 1125614.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =13.497   EfDer =  0.962

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    136.571    3776.000      27.562     643.917       1.000       1.000       0.980
W Kg/sec =   62.07791

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.157    3389.028       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 105061.984  107163.000       2.171     513.330     236.397     401.059       1.697

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   344.67    -0.12   344.67     0.28   569.59
 MEAN    16.97     0.00    -0.02   344.67    -0.12   344.67     0.28
 HUB     14.32     0.00    -0.02   344.67    -0.12   344.67     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.50    46.36    15.14   634.65   722.31    26.11   634.01     0.58
 MEAN    58.36    43.80    14.56   559.22   657.00    26.11   634.01     0.53
 HUB     53.86    37.84    16.02   471.87   584.44    26.11   634.01     0.47

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   510.86   377.03   344.71  1259.63     0.41
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 MEAN    16.57   505.37   364.10   350.48  1254.60     0.40
 HUB     13.89   530.19   392.06   356.93  1249.55     0.42
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   422.97   245.10     0.34  7120.57
 MEAN   546.14   394.93   182.04     0.31  6036.55     1.84
 HUB    457.70   362.91    65.64     0.29  5447.38

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.84     1.19    29.32   681.52     1.06   659.76     0.92     0.88
 MEAN    31.99     1.16    28.61   675.80     1.05   654.50     0.92     0.88
 HUB     31.54     1.14    27.86   672.69     1.04   649.25     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.56    35.41    31.50     3.91     0.93     0.50     2.90
 MEAN    46.09    27.45    23.50     3.95     0.95     0.48     3.29     0.88
 HUB     47.69    10.42     6.50     3.92     0.95     0.46     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.962

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     502.211     366.147     343.734    1255.685       0.400       0.037

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.086      28.736     655.637      46.000      46.808      32.400     -14.408

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     350.820     366.147     507.088    1265.955       0.277       0.487

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.976      30.313     666.406     456.573       0.041       0.577

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     335.498       0.000     335.498    1266.788       0.265       0.434

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.267     667.283       0.000       0.060       0.097       0.474

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.818      31.781       1.153     676.669      32.752     186.018       1.442

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 204376.828       0.528    1577.334 1118564.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =13.497   EfDer =  0.964

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    136.571    3776.000      31.781     676.669       1.000       1.000       0.980
W Kg/sec =   62.07791

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     72.151    3305.993       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 105061.984  107163.000       2.425     509.668     210.186     390.276       1.857

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   313.79    -0.11   313.79     0.25   528.52
 MEAN    15.91     0.00    -0.02   313.79    -0.11   313.79     0.25
 HUB     13.07     0.00    -0.02   313.79    -0.11   313.79     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.54    47.36    15.18   603.68   680.45    30.45   668.46     0.54
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MEAN    59.11    44.80    14.31   524.36   611.17    30.45   668.47     0.48
HUB     53.93    38.84    15.09   430.68   532.95    30.45   668.46     0.42

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   482.90   364.99   316.18  1289.65     0.37
MEAN    15.50   470.02   343.01   321.35  1284.53     0.37
HUB     12.59   482.50   354.79   327.00  1279.40     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    591.16   388.74   226.16     0.30  6549.96
MEAN   510.67   362.46   167.67     0.28  5317.50     1.88
HUB    414.86   332.47    60.08     0.26  4468.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     37.07     1.17    33.65   711.23     1.05   691.80     0.92     0.88
MEAN    36.03     1.13    32.85   704.73     1.04   686.32     0.92     0.88
HUB     35.33     1.11    32.02   700.24     1.03   680.85     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     49.10    35.58    31.50     4.08     0.93     0.52     2.90
MEAN    46.87    27.55    23.50     4.05     0.95     0.49     3.34     0.88
HUB     47.33    10.41     6.50     3.91     0.95     0.46     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.964

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     476.555     349.297     324.185    1284.676       0.371      -0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.079      32.807     686.476      46.000      47.135      33.000     -14.135

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     335.853     349.297     484.567    1293.557       0.260       0.427

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      35.896      34.252     696.001     440.827       0.075       0.586

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    14.701     315.447       0.000     315.447    1294.586       0.244       0.476

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      34.381     697.108       0.000       0.060       0.095       0.466

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.822      35.832       1.127     705.399      28.730     194.975       1.511

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 179452.781       0.514    1384.976 1143960.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1138295.75   8785.1094    133.4166      2.3719      0.8046     13.4974      1.3492
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 95% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 2.953   EfDer =  0.985

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     185.302    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   84.22825

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     181.022    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  142549.688  145400.375       1.577     831.557     527.174     619.754       1.176

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   445.80    -0.15   445.80     0.40   643.21
  MEAN    17.06     0.00    -0.02   445.80    -0.15   445.80     0.40
  HUB     12.51     0.00    -0.02   445.80    -0.15   445.80     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.39    50.47     4.92   645.77   784.83    13.50   506.21     0.71
  MEAN    50.15    47.20     2.95   534.02   695.76    13.50   506.21     0.63
  HUB     41.31    38.62     2.69   391.59   593.47    13.50   506.21     0.54

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   682.90   318.12   604.28  1115.59     0.61
  MEAN    18.04   720.57   377.32   613.88  1112.22     0.65
  HUB     15.00   834.88   533.68   642.04  1103.00     0.76

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   687.39   327.65     0.62  6565.97
  MEAN   564.57   641.80   187.25     0.58  6808.05     1.19
  HUB    469.54   645.24    64.14     0.58  8007.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.32     1.21    14.22   555.83     1.06   516.90     0.92     0.90
  MEAN    18.45     1.22    13.91   557.04     1.07   513.71     0.92     0.90
  HUB     19.09     1.26    13.05   563.07     1.08   504.93     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     27.76    28.47    24.20     4.27     0.93     0.19     2.90
  MEAN    31.58    16.96    12.70     4.26     0.91     0.16     3.51     0.90
  HUB     39.73    -5.70    -9.30     3.60     0.91     0.02     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     736.223     376.591     632.616    1111.497       0.662      -0.016

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.574      13.832     513.376      24.000      30.765      35.400       4.635

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     673.311     376.591     771.472    1119.487       0.601       0.149
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.470      14.460     520.783     528.796       0.031       0.337

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     613.854       0.000     613.854    1126.337       0.545       0.234

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      14.978     527.175       0.000       0.060       0.059       0.255

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.833      18.336       1.214     558.648      35.838     239.491       1.857

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 223122.203       0.535    2336.445 1874567.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 2.953   EfDer =  0.976

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    185.302    3587.000      18.336     558.648       1.000       1.000       0.980
W Kg/sec =   84.22825

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    154.175    3456.371       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 142549.688  145400.375       1.315     590.487     449.004     474.134       1.056

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   579.95    -0.20   579.95     0.51   619.82
 MEAN    18.08     0.00    -0.02   579.95    -0.20   579.95     0.51
 HUB     15.21     0.00    -0.02   579.95    -0.20   579.95     0.51

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.97    46.36     1.61   643.27   866.25    15.32   530.56     0.77
 MEAN    44.31    42.30     2.01   565.89   810.43    15.32   530.56     0.72
 HUB     39.40    37.84     1.56   476.11   750.48    15.32   530.56     0.66

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   632.84   216.89   594.51  1147.95     0.55
 MEAN    18.01   648.96   252.87   597.67  1146.82     0.57
 HUB     15.22   704.46   364.50   602.83  1145.55     0.61

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   729.24   422.31     0.64  4432.96
 MEAN   563.76   673.69   310.88     0.59  4557.86     1.29
 HUB    476.52   613.14   112.01     0.54  5551.88

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.72     1.13    16.85   580.93     1.04   547.50     0.92     0.89
 MEAN    20.79     1.13    16.72   581.56     1.04   546.40     0.92     0.89
 HUB     21.35     1.16    16.54   586.55     1.05   545.13     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.04    35.39    31.50     3.89     0.93     0.20     2.90
 MEAN    22.93    27.48    23.50     3.98     0.91     0.22     3.30     0.89
 HUB     31.16    10.53     6.50     4.03     0.91     0.25     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.976

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     660.388     253.584     609.760    1146.831       0.576      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.910      16.697     546.597      46.000      22.581      30.600       8.019

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     625.821     253.584     675.246    1150.719       0.544       0.071

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.801      17.007     550.309     511.151       0.036       0.191

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     619.167       0.000     619.167    1151.443       0.538       0.066

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.977     551.001       0.000       0.060       0.066       0.064

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.802      20.673       1.127     583.012      24.364     307.334       2.382

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 151760.312       0.371    1589.172 1733928.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 2.953   EfDer =  0.957

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    185.302    3587.000      20.673     583.012       1.000       1.000       0.980
W Kg/sec =   84.22825

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    139.692    3383.380       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 142549.688  145400.375       1.341     545.479     406.842     429.765       1.056

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   577.24    -0.20   577.24     0.50   592.56
 MEAN    17.74     0.00    -0.02   577.24    -0.20   577.24     0.50
 HUB     15.05     0.00    -0.02   577.24    -0.20   577.24     0.50

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.43    46.36     1.07   628.24   853.31    17.43   555.20     0.74
 MEAN    43.90    43.40     0.50   555.26   801.09    17.43   555.20     0.69
 HUB     39.23    38.84     0.39   471.10   745.21    17.43   555.20     0.64

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   628.87   193.19   598.46  1170.45     0.54
 MEAN    17.51   643.66   234.27   599.52  1170.26     0.55
 HUB     14.85   697.63   350.95   602.92  1169.83     0.60

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   735.13   426.92     0.63  3831.02
 MEAN   548.00   676.65   313.73     0.58  4104.75     1.26
 HUB    464.84   613.59   113.90     0.52  5214.55

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.84     1.10    18.76   602.26     1.03   569.26     0.92     0.88
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 MEAN    23.00     1.11    18.72   603.63     1.04   569.06     0.92     0.88
 HUB     23.65     1.14    18.59   609.21     1.04   568.60     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.89    35.50    31.50     4.00     0.93     0.18     2.90
 MEAN    21.34    27.62    23.50     4.12     0.90     0.20     3.28     0.88
 HUB     30.20    10.70     6.50     4.20     0.90     0.24     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.957

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     651.779     235.805     607.628    1170.617       0.557       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.118      18.724     569.573      46.000      21.210      31.500      10.290

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     636.479     235.805     678.756    1172.307       0.543       0.024

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.975      18.797     571.218     471.992       0.042       0.173

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     617.895       0.000     617.895    1174.302       0.526       0.035

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.882     573.164       0.000       0.060       0.080       0.043

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.756      22.806       1.103     605.034      22.022     317.804       2.464

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 137230.219       0.357    1437.019 1698160.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 2.953   EfDer =  0.934

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    185.302    3587.000      22.806     605.034       1.000       1.000       0.980
W Kg/sec =   84.22825

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    128.995    3321.234       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 142549.688  145400.375       1.366     513.330     375.707     401.059       1.067

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   573.54    -0.20   573.54     0.49   558.20
 MEAN    16.97     0.00    -0.02   573.54    -0.20   573.54     0.49
 HUB     14.32     0.00    -0.02   573.54    -0.20   573.54     0.49

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.44    46.36     0.08   602.89   832.26    19.39   577.59     0.71
 MEAN    42.82    43.80    -0.98   531.23   781.89    19.39   577.59     0.66
 HUB     38.02    37.84     0.18   448.25   728.05    19.39   577.59     0.62

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   619.96   163.18   598.10  1189.92     0.52
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 MEAN    16.57   632.25   205.11   598.05  1190.24     0.53
 HUB     13.89   681.02   321.18   600.53  1190.26     0.57
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   735.35   427.81     0.62  3084.70
 MEAN   518.80   675.33   313.70     0.57  3402.77     1.23
 HUB    434.79   611.18   113.61     0.51  4463.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.60     1.08    20.44   620.53     1.03   588.46     0.92     0.85
 MEAN    24.79     1.09    20.45   622.12     1.03   588.77     0.92     0.85
 HUB     25.43     1.11    20.36   627.45     1.04   588.76     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.26    35.58    31.50     4.08     0.93     0.15     2.90
 MEAN    18.93    27.68    23.50     4.18     0.90     0.18     3.29     0.85
 HUB     28.14    10.71     6.50     4.21     0.90     0.22     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.934

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     619.046     206.260     583.673    1192.740       0.519       0.058

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.891      20.711     591.389      46.000      19.463      32.400      12.937

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     623.914     206.260     657.124    1192.231       0.523       0.020

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.718      20.506     590.884     456.573       0.048       0.156

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     591.704       0.000     591.704    1195.522       0.495       0.005

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.733     594.151       0.000       0.060       0.093       0.070

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.690      24.515       1.075     623.366      18.332     352.509       2.733

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 114283.617       0.327    1196.731 1717114.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 2.953   EfDer =  0.906

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    185.302    3587.000      24.515     623.366       1.000       1.000       0.980
W Kg/sec =   84.22825

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    121.807    3272.034       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 142549.688  145400.375       1.437     509.668     354.788     390.276       1.100

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   545.83    -0.19   545.83     0.45   523.09
 MEAN    15.91     0.00    -0.02   545.83    -0.19   545.83     0.45
 HUB     13.07     0.00    -0.02   545.83    -0.19   545.83     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.42    47.36    -0.94   573.46   791.84    21.27   598.51     0.66
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MEAN    42.39    44.80    -2.41   498.12   739.08    21.27   598.51     0.62
HUB     36.87    38.84    -1.97   409.12   682.25    21.27   598.51     0.57
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   591.60   148.65   572.62  1208.95      0.49
MEAN    15.50   601.83   182.27   573.56  1208.73      0.50
HUB     12.59   643.10   284.74   576.62  1208.28      0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    561.57   705.97   412.92     0.58  2670.23
MEAN   485.11   648.60   302.84     0.54  2827.80     1.22
HUB    394.10   586.90   109.36     0.49  3587.38

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.08     1.06    22.13   636.77     1.02   607.58     0.92     0.83
MEAN    26.17     1.07    22.09   637.56     1.02   607.35     0.92     0.83
HUB     26.63     1.09    21.95   641.37     1.03   606.88     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     14.55    35.80    31.50     4.30     0.93     0.14     2.90
MEAN    17.63    27.83    23.50     4.33     0.89     0.16     3.34     0.83
HUB     26.28    10.74     6.50     4.24     0.89     0.19     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.906

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     608.582     185.616     579.585    1208.961       0.503      -0.012

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.207      22.040     607.674      46.000      17.758      33.000      15.242

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     634.388     185.616     660.986    1206.297       0.526      -0.159

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.825      21.387     604.999     440.827       0.110       0.142

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     584.964       0.000     584.964    1211.298       0.483      -0.006

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      22.013     610.026       0.000       0.060       0.110      -0.011

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.615      25.825       1.053     638.569      15.202     394.194       3.056

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94810.602       0.301     992.818 1772166.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    721206.94   7552.1851    181.0216      1.7094      0.7505      2.9530      1.2214
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 95% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.268   EfDer =  0.988

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     183.568    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   83.44021

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     179.328    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  141216.000  144040.016       1.592     831.557     522.242     619.754       1.187

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   440.83    -0.15   440.83     0.40   643.21
  MEAN    17.06     0.00    -0.02   440.83    -0.15   440.83     0.40
  HUB     12.51     0.00    -0.02   440.83    -0.15   440.83     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.69    50.47     5.22   645.77   782.02    13.53   506.58     0.71
  MEAN    50.47    47.20     3.27   534.02   692.59    13.53   506.58     0.63
  HUB     41.63    38.62     3.01   391.59   589.75    13.53   506.58     0.53

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   677.28   322.93   595.33  1116.78     0.61
  MEAN    18.04   714.62   379.97   605.23  1113.21     0.64
  HUB     15.00   827.13   532.73   632.73  1104.03     0.75

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   677.24   322.84     0.61  6665.10
  MEAN   564.57   632.76   184.61     0.57  6855.69     1.21
  HUB    469.54   635.87    63.20     0.58  7992.88

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.39     1.22    14.34   556.33     1.06   518.03     0.92     0.90
  MEAN    18.49     1.22    14.01   557.28     1.07   514.66     0.92     0.90
  HUB     19.09     1.26    13.15   563.00     1.08   505.92     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     28.48    28.47    24.20     4.27     0.93     0.21     2.90
  MEAN    32.12    16.96    12.70     4.26     0.92     0.17     3.51     0.90
  HUB     40.10    -5.70    -9.30     3.60     0.92     0.02     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     729.621     379.229     623.323    1112.612       0.656      -0.015

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.607      13.935     514.407      24.000      31.316      35.400       4.084

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     661.583     379.229     762.566    1121.130       0.590       0.164
  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.512      14.621     522.313     528.796       0.030       0.346

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     603.474       0.000     603.474    1127.701       0.535       0.248

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.130     528.453       0.000       0.060       0.055       0.269

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.841      18.391       1.217     558.870      36.060     237.051       1.838

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 224505.766       0.538    2328.938 1853674.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.268   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    183.568    3587.000      18.391     558.870       1.000       1.000       0.980
W Kg/sec =   83.44021

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    152.302    3455.684       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141216.000  144040.016       1.331     590.487     443.549     474.134       1.069

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   570.58    -0.20   570.58     0.50   619.70
 MEAN    18.08     0.00    -0.02   570.58    -0.20   570.58     0.50
 HUB     15.21     0.00    -0.02   570.58    -0.20   570.58     0.50

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.44    46.36     2.08   643.27   860.00    15.45   531.69     0.76
 MEAN    44.77    42.30     2.47   565.89   803.75    15.45   531.69     0.71
 HUB     39.85    37.84     2.01   476.11   743.25    15.45   531.69     0.66

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   624.94   225.17   582.96  1149.92     0.54
 MEAN    18.01   641.28   258.66   586.80  1148.44     0.56
 HUB     15.22   696.67   366.58   592.43  1146.87     0.61

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   715.03   414.03     0.62  4602.02
 MEAN   563.76   661.37   305.09     0.58  4662.08     1.30
 HUB    476.52   602.54   109.93     0.53  5583.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.89     1.14    17.08   582.00     1.04   549.40     0.92     0.90
 MEAN    20.92     1.14    16.92   582.30     1.04   547.97     0.92     0.90
 HUB     21.45     1.17    16.71   586.93     1.05   546.42     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.12    35.38    31.50     3.88     0.93     0.21     2.90
 MEAN    23.79    27.47    23.50     3.97     0.91     0.23     3.30     0.90
 HUB     31.75    10.51     6.50     4.01     0.91     0.25     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     652.198     259.390     598.397    1148.542       0.568      -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.043      16.905     548.227      46.000      23.435      30.600       7.165

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     612.398     259.390     665.067    1152.936       0.531       0.090

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.949      17.283     552.430     511.151       0.033       0.205

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     605.241       0.000     605.241    1153.695       0.525       0.088

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.272     553.157       0.000       0.060       0.059       0.088

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.820      20.839       1.133     583.745      24.875     300.133       2.327

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 154942.312       0.379    1607.313 1709878.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.268   EfDer =  0.966

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    183.568    3587.000      20.839     583.745       1.000       1.000       0.980
W Kg/sec =   83.44021

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    137.367    3381.255       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141216.000  144040.016       1.363     545.479     400.070     429.765       1.074

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   564.93    -0.19   564.93     0.49   592.19
 MEAN    17.74     0.00    -0.02   564.93    -0.19   564.93     0.49
 HUB     15.05     0.00    -0.02   564.93    -0.19   564.93     0.49

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.05    46.36     1.69   628.24   845.03    17.70   557.10     0.73
 MEAN    44.52    43.40     1.12   555.26   792.26    17.70   557.10     0.68
 HUB     39.84    38.84     1.00   471.10   735.71    17.70   557.10     0.64

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   617.81   204.27   583.06  1173.48     0.53
 MEAN    17.51   633.12   242.03   585.03  1172.83     0.54
 HUB     14.85   687.08   353.77   589.01  1172.01     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   716.15   415.83     0.61  4050.52
 MEAN   548.00   660.21   305.97     0.56  4240.51     1.28
 HUB    464.84   599.39   111.08     0.51  5256.36

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.17     1.11    19.18   604.09     1.03   572.24     0.92     0.88
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 MEAN    23.28     1.12    19.09   605.05     1.04   571.60     0.92     0.88
 HUB     23.89     1.15    18.93   610.15     1.05   570.76     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.31    35.50    31.50     4.00     0.93     0.19     2.90
 MEAN    22.47    27.61    23.50     4.11     0.91     0.21     3.28     0.88
 HUB     30.99    10.68     6.50     4.18     0.91     0.25     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     640.799     243.615     592.684    1173.269       0.546       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.403      19.103     572.155      46.000      22.344      31.500       9.156

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     618.238     243.615     664.505    1175.698       0.526       0.049

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.284      19.282     574.526     471.992       0.037       0.192

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     599.453       0.000     599.453    1177.650       0.509       0.066

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.391     576.435       0.000       0.060       0.069       0.074

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.786      23.146       1.111     606.432      22.687     307.459       2.383

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 141373.625       0.368    1466.556 1671633.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.268   EfDer =  0.947

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    183.568    3587.000      23.146     606.432       1.000       1.000       0.980
W Kg/sec =   83.44021

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    126.058    3317.406       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141216.000  144040.016       1.398     513.330     367.153     401.059       1.092

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   557.29    -0.19   557.29     0.47   557.56
 MEAN    16.97     0.00    -0.02   557.29    -0.19   557.29     0.47
 HUB     14.32     0.00    -0.02   557.29    -0.19   557.29     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.26    46.36     0.90   602.89   821.14    19.87   580.52     0.69
 MEAN    43.64    43.80    -0.16   531.23   770.05    19.87   580.52     0.65
 HUB     38.82    37.84     0.98   448.25   715.32    19.87   580.52     0.61

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   604.58   177.82   577.83  1194.28     0.51
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 MEAN    16.57   617.69   215.36   578.93  1194.01     0.52
 HUB     13.89   666.62   324.92   582.07  1193.53     0.56
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   710.35   413.17     0.59  3361.00
 MEAN   518.80   653.63   303.44     0.55  3572.62     1.26
 HUB    434.79   592.35   109.87     0.50  4515.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.15     1.09    21.11   623.31     1.03   592.81     0.92     0.87
 MEAN    25.29     1.09    21.06   624.37     1.03   592.54     0.92     0.87
 HUB     25.87     1.12    20.93   629.11     1.04   592.04     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.11    35.57    31.50     4.07     0.93     0.17     2.90
 MEAN    20.41    27.66    23.50     4.16     0.90     0.19     3.29     0.87
 HUB     29.17    10.69     6.50     4.19     0.90     0.23     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.947

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     605.247     216.572     565.172    1196.407       0.506       0.058

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.393      21.319     595.028      46.000      20.967      32.400      11.433

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     600.874     216.572     638.712    1196.849       0.502       0.050

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.253      21.257     595.469     456.573       0.042       0.180

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     569.215       0.000     569.215    1199.952       0.474       0.043

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.509     598.560       0.000       0.060       0.078       0.108

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.742      25.096       1.084     625.597      19.165     336.079       2.605

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 119482.055       0.342    1239.462 1686515.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 3.268   EfDer =  0.927

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    183.568    3587.000      25.096     625.597       1.000       1.000       0.980
W Kg/sec =   83.44021

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.087    3266.196       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141216.000  144040.016       1.482     509.668     343.953     390.276       1.135

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   526.04    -0.18   526.04     0.44   522.16
 MEAN    15.91     0.00    -0.02   526.04    -0.18   526.04     0.44
 HUB     13.07     0.00    -0.02   526.04    -0.18   526.04     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.48    47.36     0.12   573.46   778.32    22.01   602.51     0.65
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MEAN    43.45    44.80    -1.35   498.12   724.58    22.01   602.51     0.60
HUB     37.89    38.84    -0.95   409.12   666.52    22.01   602.51     0.55
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   573.03   166.37   548.34  1214.51     0.47
MEAN    15.50   583.82   194.82   550.35  1213.65     0.48
HUB     12.59   625.02   289.32   554.02  1212.65     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    561.57   675.91   395.19     0.56  2988.06
MEAN   485.11   622.22   290.29     0.51  3022.11     1.25
HUB    394.10   563.84   104.77     0.46  3644.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.92     1.07    23.11   640.60     1.02   613.21     0.92     0.85
MEAN    26.94     1.07    23.00   640.77     1.02   612.34     0.92     0.85
HUB     27.34     1.09    22.80   643.89     1.03   611.31     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     16.88    35.78    31.50     4.28     0.93     0.17     2.90
MEAN    19.49    27.81    23.50     4.31     0.90     0.18     3.34     0.85
HUB     27.57    10.71     6.50     4.21     0.90     0.21     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.927

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219      590.164     198.391     555.819    1213.950       0.486       -0.010

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.987      22.956      612.698      46.000      19.643      33.000      13.357

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
    15.219      602.676     198.391     634.490    1212.717       0.497       -0.105

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.686      22.539     611.453     440.827       0.093       0.170

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     556.852       0.000     556.852    1217.104       0.458       0.042

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      23.128     615.885       0.000       0.060       0.090       0.038

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.694      26.701       1.064     641.751      16.154     369.727       2.866

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 100755.836       0.319    1045.203 1737471.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    741059.56   7687.4707    179.3280      1.7675      0.7798      3.2685      1.2275
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 95% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.989

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     182.555    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   82.97945

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     178.338    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  140436.203  143244.625       1.601     831.557     519.358     619.754       1.193

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   437.94    -0.15   437.94     0.40   643.21
  MEAN    17.06     0.00    -0.02   437.94    -0.15   437.94     0.40
  HUB     12.51     0.00    -0.02   437.94    -0.15   437.94     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.86    50.47     5.39   645.77   780.39    13.55   506.79     0.71
  MEAN    50.65    47.20     3.45   534.02   690.75    13.55   506.79     0.63
  HUB     41.81    38.62     3.19   391.59   587.59    13.55   506.79     0.53

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   674.10   325.68   590.21  1117.46     0.60
  MEAN    18.04   711.22   381.48   600.26  1113.77     0.64
  HUB     15.00   822.69   532.18   627.38  1104.61     0.74

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   671.41   320.09     0.60  6721.99
  MEAN   564.57   627.56   183.09     0.56  6882.97     1.21
  HUB    469.54   630.50    62.64     0.57  7984.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.42     1.22    14.40   556.61     1.06   518.67     0.92     0.90
  MEAN    18.51     1.22    14.06   557.42     1.07   515.20     0.92     0.90
  HUB     19.10     1.26    13.21   562.96     1.08   506.49     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     28.89    28.47    24.20     4.27     0.93     0.21     2.90
  MEAN    32.44    16.96    12.70     4.26     0.92     0.17     3.51     0.90
  HUB     40.31    -5.70    -9.30     3.60     0.92     0.03     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     725.869     380.740     617.999    1113.243       0.652      -0.014

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.626      13.993     514.990      24.000      31.637      35.400       3.763

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     654.948     380.740     757.575    1122.049       0.584       0.172
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.535      14.712     523.169     528.796       0.029       0.352

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     597.613       0.000     597.613    1128.464       0.530       0.255

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.215     529.168       0.000       0.060       0.053       0.277

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.846      18.421       1.219     558.997      36.187     235.650       1.827

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 225297.688       0.540    2324.247 1841520.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    182.555    3587.000      18.421     558.997       1.000       1.000       0.980
W Kg/sec =   82.97945

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    151.228    3455.291       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 140436.203  143244.625       1.341     590.487     440.422     474.134       1.077

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   565.27    -0.19   565.27     0.50   619.63
 MEAN    18.08     0.00    -0.02   565.27    -0.19   565.27     0.50
 HUB     15.21     0.00    -0.02   565.27    -0.19   565.27     0.50

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.70    46.36     2.34   643.27   856.49    15.53   532.32     0.76
 MEAN    45.04    42.30     2.74   565.89   799.99    15.53   532.32     0.71
 HUB     40.12    37.84     2.28   476.11   739.19    15.53   532.32     0.65

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   620.63   229.80   576.51  1151.00     0.54
 MEAN    18.01   637.03   261.91   580.70  1149.35     0.55
 HUB     15.22   692.33   367.77   586.57  1147.61     0.60

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   707.08   409.39     0.61  4696.59
 MEAN   563.76   654.47   301.85     0.57  4720.52     1.31
 HUB    476.52   596.57   108.75     0.52  5601.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.98     1.14    17.21   582.60     1.04   550.45     0.92     0.90
 MEAN    20.99     1.14    17.04   582.72     1.04   548.85     0.92     0.90
 HUB     21.50     1.17    16.81   587.15     1.05   547.14     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.73    35.38    31.50     3.88     0.93     0.22     2.90
 MEAN    24.28    27.47    23.50     3.97     0.91     0.23     3.30     0.90
 HUB     32.09    10.50     6.50     4.00     0.91     0.26     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.983

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     647.682     262.646     592.038    1149.488       0.563      -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.118      17.020     549.131      46.000      23.924      30.600       6.676

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     604.967     262.646     659.521    1154.155       0.524       0.101

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.030      17.436     553.599     511.151       0.031       0.213

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     597.595       0.000     597.595    1154.927       0.517       0.100

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.434     554.339       0.000       0.060       0.055       0.100

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.828      20.930       1.136     584.159      25.161     296.179       2.296

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 156726.734       0.384    1616.846 1696101.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.970

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    182.555    3587.000      20.930     584.159       1.000       1.000       0.980
W Kg/sec =   82.97945

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    136.065    3380.058       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 140436.203  143244.625       1.377     545.479     396.279     429.765       1.085

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   558.14    -0.19   558.14     0.48   591.98
 MEAN    17.74      0.00    -0.02   558.14    -0.19   558.14     0.48
 HUB     15.05      0.00    -0.02   558.14    -0.19   558.14     0.48

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.39     46.36     2.03   628.24   840.50    17.85   558.15     0.73
 MEAN    44.86     43.40     1.46   555.26   787.43    17.85   558.15     0.68
 HUB     40.18     38.84     1.34   471.10   730.50    17.85   558.15     0.63

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   611.97   210.30   574.70  1175.12      0.52
 MEAN    17.51   627.47   246.27   577.13  1174.23      0.53
 HUB     14.85   681.37   355.30   581.40  1173.21      0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   705.85   409.80     0.60  4169.89
 MEAN   548.00   651.24   301.73     0.55  4314.68      1.29
 HUB    464.84   591.63   109.54     0.50  5279.13

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     23.35     1.12    19.40   605.11     1.04   573.85     0.92     0.89
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 MEAN    23.44     1.12    19.29   605.83     1.04   572.98     0.92     0.89
 HUB     24.02     1.15    19.11   610.68     1.05   571.94     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.10    35.49    31.50     3.99     0.93     0.20     2.90
 MEAN    23.11    27.60    23.50     4.10     0.91     0.22     3.28     0.89
 HUB     31.43    10.67     6.50     4.17     0.91     0.25     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     634.943     247.882     584.558    1174.703       0.541       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.559      19.309     573.554      46.000      22.979      31.500       8.521

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     608.462     247.882     657.018    1177.515       0.517       0.063

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.452      19.544     576.302     471.992       0.035       0.202

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     589.669       0.000     589.669    1179.433       0.500       0.082

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.663     578.182       0.000       0.060       0.063       0.091

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.800      23.328       1.115     607.207      23.049     301.996       2.341

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 143631.172       0.374    1481.748 1656674.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.954

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    182.555    3587.000      23.328     607.207       1.000       1.000       0.980
W Kg/sec =   82.97945

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    124.462    3315.286       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 140436.203  143244.625       1.416     513.330     362.503     401.059       1.106

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   548.63    -0.19   548.63     0.46   557.20
 MEAN    16.97     0.00    -0.02   548.63    -0.19   548.63     0.46
 HUB     14.32     0.00    -0.02   548.63    -0.19   548.63     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.71    46.36     1.35   602.89   815.29    20.13   582.09     0.69
 MEAN    44.09    43.80     0.29   531.23   763.80    20.13   582.09     0.65
 HUB     39.26    37.84     1.42   448.25   708.58    20.13   582.09     0.60

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   596.78   185.50   567.22  1196.56     0.50
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 MEAN    16.57   610.19   220.76   568.85  1196.00     0.51
 HUB     13.89   659.10   326.90   572.32  1195.27     0.55
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   697.25   405.49     0.58  3505.89
 MEAN   518.80   642.20   298.04     0.54  3662.07     1.27
 HUB    434.79   582.40   107.89     0.49  4543.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.46     1.09    21.47   624.81     1.03   595.10     0.92     0.87
 MEAN    25.55     1.10    21.39   625.60     1.03   594.53     0.92     0.87
 HUB     26.11     1.12    21.23   630.02     1.04   593.78     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.11    35.56    31.50     4.06     0.93     0.18     2.90
 MEAN    21.21    27.65    23.50     4.15     0.90     0.20     3.29     0.87
 HUB     29.73    10.68     6.50     4.18     0.90     0.24     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.954

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     598.148     222.002     555.424    1198.342       0.499       0.058

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.663      21.644     596.954      46.000      21.787      32.400      10.613

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     588.949     222.002     629.402    1199.256       0.491       0.066

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.540      21.654     597.866     456.573       0.039       0.192

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     557.927       0.000     557.927    1202.230       0.464       0.060

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.906     600.835       0.000       0.060       0.072       0.124

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.762      25.394       1.089     626.810      19.603     327.850       2.541

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 122213.750       0.350    1260.798 1669639.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.937

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    182.555    3587.000      25.394     626.810       1.000       1.000       0.980
W Kg/sec =   82.97945

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    116.169    3263.033       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 140436.203  143244.625       1.506     509.668     338.366     390.276       1.153

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   516.05    -0.18   516.05     0.43   521.65
 MEAN    15.91     0.00    -0.02   516.05    -0.18   516.05     0.43
 HUB     13.07     0.00    -0.02   516.05    -0.18   516.05     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.03    47.36     0.67   573.46   771.60    22.39   604.60     0.64
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MEAN    44.00    44.80    -0.80   498.12   717.36    22.39   604.60     0.59
HUB     38.42    38.84    -0.42   409.12   658.66    22.39   604.60     0.55
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   564.17   175.19   536.28  1217.32     0.46
MEAN    15.50   575.07   201.09   538.77  1216.16     0.47
HUB     12.59   616.10   291.63   542.71  1214.90     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    561.57   660.97   386.37     0.54  3146.22
MEAN   485.11   609.05   284.02     0.50  3119.29     1.27
HUB    394.10   552.30   102.47     0.45  3673.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     27.36     1.08    23.61   642.60     1.03   616.05     0.92     0.86
MEAN    27.34     1.08    23.46   642.47     1.02   614.88     0.92     0.86
HUB     27.70     1.09    23.24   645.25     1.03   613.59     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     18.09    35.77    31.50     4.27     0.93     0.18     2.90
MEAN    20.47    27.80    23.50     4.30     0.90     0.19     3.34     0.86
HUB     28.25    10.69     6.50     4.19     0.90     0.21     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.937

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219      581.259     204.780     543.992    1216.482       0.478      -0.009

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    27.388      23.423      615.257      46.000      20.628      33.000      12.372

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219      587.366     204.780     622.040    1215.894       0.483      -0.079

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.125      23.120     614.661     440.827       0.085       0.184

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     543.565       0.000     543.565    1219.974       0.446       0.062

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      23.674     618.793       0.000       0.060       0.083       0.059

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.722      27.133       1.068     643.440      16.629     358.315       2.778

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 103722.570       0.329    1070.037 1718885.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    751591.94   7753.6763    178.3378      1.7961      0.7924      3.4534      1.2307
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 95% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     179.821    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   81.73685

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     175.667    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  138333.188  141099.562       1.625     831.557     511.581     619.754       1.211

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   430.20    -0.15   430.20     0.39   643.21
  MEAN    17.06     0.00    -0.02   430.20    -0.15   430.20     0.39
  HUB     12.51     0.00    -0.02   430.20    -0.15   430.20     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.34    50.47     5.87   645.77   776.07    13.61   507.35     0.70
  MEAN    51.15    47.20     3.95   534.02   685.87    13.61   507.35     0.62
  HUB     42.32    38.62     3.70   391.59   581.84    13.61   507.35     0.53

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   665.93   332.95   576.73  1119.21     0.60
  MEAN    18.04   702.38   385.50   587.14  1115.24     0.63
  HUB     15.00   811.08   530.76   613.30  1106.12     0.73

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   656.10   312.82     0.59  6871.84
  MEAN   564.57   613.84   179.07     0.55  6955.39     1.23
  HUB    469.54   616.35    61.22     0.56  7963.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.51     1.23    14.57   557.36     1.07   520.34     0.92     0.91
  MEAN    18.56     1.23    14.20   557.78     1.07   516.60     0.92     0.91
  HUB     19.10     1.26    13.35   562.85     1.08   507.96     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     30.00    28.48    24.20     4.28     0.93     0.23     2.90
  MEAN    33.29    16.96    12.70     4.26     0.92     0.19     3.51     0.91
  HUB     40.87    -5.70    -9.30     3.60     0.92     0.04     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.992

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     716.149     384.750     604.017    1114.871       0.642      -0.012

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      18.675      14.144     516.498      24.000      32.497      35.400       2.903

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     637.774     384.750     744.841    1124.396       0.567       0.193
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.594      14.944     525.361     528.796       0.027       0.366

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     582.474       0.000     582.474    1130.412       0.515       0.275

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.430     530.997       0.000       0.060       0.048       0.297

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.856      18.497       1.224     559.334      36.524     231.939       1.798

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 227394.891       0.545    2310.753 1808952.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.821    3587.000      18.497     559.334       1.000       1.000       0.980
W Kg/sec =   81.73685

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    148.400    3454.250       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 138333.188  141099.562       1.366     590.487     432.185     474.134       1.097

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   551.51    -0.19   551.51     0.49   619.44
 MEAN    18.08     0.00    -0.02   551.51    -0.19   551.51     0.49
 HUB     15.21     0.00    -0.02   551.51    -0.19   551.51     0.49

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.40    46.36     3.04   643.27   847.47    15.73   533.94     0.75
 MEAN    45.75    42.30     3.45   565.89   790.33    15.73   533.94     0.70
 HUB     40.81    37.84     2.97   476.11   728.72    15.73   533.94     0.64

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   609.97   241.64   560.06  1153.74     0.53
 MEAN    18.01   626.37   270.25   565.07  1151.63     0.54
 HUB     15.22   681.27   370.79   571.53  1149.50     0.59

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   686.82   397.56     0.60  4938.14
 MEAN   563.76   636.75   293.51     0.55  4870.54     1.33
 HUB    476.52   581.23   105.73     0.51  5647.36

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.22     1.15    17.54   584.15     1.04   553.09     0.92     0.90
 MEAN    21.18     1.15    17.32   583.81     1.04   551.06     0.92     0.90
 HUB     21.63     1.17    17.05   587.72     1.05   548.97     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.34    35.37    31.50     3.87     0.93     0.24     2.90
 MEAN    25.56    27.45    23.50     3.95     0.92     0.25     3.30     0.90
 HUB     32.97    10.48     6.50     3.98     0.92     0.27     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     636.383     271.004     575.796    1151.874       0.552      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.304      17.310     551.411      46.000      25.204      30.600       5.396

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     586.223     271.004     645.833    1157.210       0.507       0.127

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.233      17.818     556.532     511.151       0.027       0.234

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     578.487       0.000     578.487    1157.993       0.500       0.130

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.834     557.285       0.000       0.060       0.047       0.132

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.847      21.153       1.144     585.228      25.894     286.321       2.220

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 161291.594       0.395    1639.021 1659861.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.980

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    179.821    3587.000      21.153     585.228       1.000       1.000       0.980
W Kg/sec =   81.73685

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    132.736    3376.968       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 138333.188  141099.562       1.411     545.479     386.582     429.765       1.112

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   541.09    -0.19   541.09     0.47   591.44
 MEAN    17.74      0.00    -0.02   541.09    -0.19   541.09     0.47
 HUB     15.05      0.00    -0.02   541.09    -0.19   541.09     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.27     46.36     2.91   628.24   829.27    18.23   560.79     0.71
 MEAN    45.75     43.40     2.35   555.26   775.43    18.23   560.79     0.67
 HUB     41.06     38.84     2.22   471.10   717.56    18.23   560.79     0.62

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   598.12   225.17   554.12  1179.12      0.51
 MEAN    17.51   613.83   256.77   557.54  1177.69      0.52
 HUB     14.85   667.36   359.15   562.48  1176.17      0.57

       U2        W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   680.46   394.94     0.58  4464.26
 MEAN   548.00   629.02   291.23     0.53  4498.52      1.32
 HUB    464.84   572.33   105.69     0.49  5336.21

         Pt2       PR       Ps2     Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     23.80     1.13    19.96   607.65     1.04   577.80     0.92     0.90
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 MEAN    23.82     1.13    19.79   607.83     1.04   576.38     0.92     0.90
 HUB     24.34     1.15    19.56   612.04     1.05   574.86     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.11    35.48    31.50     3.98     0.93     0.23     2.90
 MEAN    24.73    27.58    23.50     4.08     0.91     0.24     3.28     0.90
 HUB     32.56    10.64     6.50     4.14     0.91     0.27     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     620.834     258.458     564.477    1178.226       0.527       0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.945      19.814     576.998      46.000      24.602      31.500       6.898

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     584.707     258.458     639.283    1181.932       0.495       0.098

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.863      20.184     580.633     471.992       0.030       0.228

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     566.243       0.000     566.243    1183.736       0.478       0.119

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.317     582.407       0.000       0.060       0.052       0.130

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.830      23.766       1.124     609.172      23.944     288.959       2.240

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 149217.234       0.388    1516.323 1618007.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.969

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.821    3587.000      23.766     609.172       1.000       1.000       0.980
W Kg/sec =   81.73685

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.534    3309.935       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 138333.188  141099.562       1.462     513.330     351.062     401.059       1.142

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   527.76    -0.18   527.76     0.44   556.30
 MEAN    16.97     0.00    -0.02   527.76    -0.18   527.76     0.44
 HUB     14.32     0.00    -0.02   527.76    -0.18   527.76     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.81    46.36     2.45   602.89   801.38    20.75   585.93     0.68
 MEAN    45.20    43.80     1.40   531.23   748.95    20.75   585.93     0.63
 HUB     40.35    37.84     2.51   448.25   692.55    20.75   585.93     0.58

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   579.15   203.69   542.15  1201.97     0.48
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 MEAN    16.57   592.89   233.65   544.91  1200.76     0.49
 HUB     13.89   641.46   331.61   549.09  1199.46     0.53
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   666.28   387.30     0.55  3849.20
 MEAN   518.80   615.02   285.15     0.51  3875.56     1.31
 HUB    434.79   558.71   103.18     0.47  4608.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.18     1.10    22.33   628.50     1.03   600.51     0.92     0.89
 MEAN    26.20     1.10    22.18   628.63     1.03   599.30     0.92     0.89
 HUB     26.68     1.12    21.96   632.31     1.04   597.98     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.59    35.54    31.50     4.04     0.93     0.21     2.90
 MEAN    23.21    27.62    23.50     4.12     0.91     0.23     3.29     0.89
 HUB     31.13    10.64     6.50     4.14     0.91     0.25     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.969

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     581.834     234.963     532.281    1202.963       0.484       0.058

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.313      22.418     601.566      46.000      23.818      32.400       8.582

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     561.161     234.963     608.366    1204.932       0.466       0.105

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.223      22.598     603.538     456.573       0.031       0.222

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     531.740       0.000     531.740    1207.608       0.440       0.101

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.844     606.221       0.000       0.060       0.061       0.164

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.803      26.101       1.098     629.815      20.643     309.312       2.398

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 128705.305       0.368    1307.884 1627071.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.958

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.821    3587.000      26.101     629.815       1.000       1.000       0.980
W Kg/sec =   81.73685

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.597    3255.240       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 138333.188  141099.562       1.568     509.668     325.051     390.276       1.201

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   492.74    -0.17   492.74     0.41   520.41
 MEAN    15.91     0.00    -0.02   492.74    -0.17   492.74     0.41
 HUB     13.07     0.00    -0.02   492.74    -0.17   492.74     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.34    47.36     1.98   573.46   756.21    23.29   609.56     0.62
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 MEAN    45.32    44.80     0.52   498.12   700.77    23.29   609.56     0.58
 HUB     39.71    38.84     0.87   409.12   640.56    23.29   609.56     0.53
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   544.93   195.44   508.67  1223.81     0.45
 MEAN    15.50   555.62   215.55   512.10  1222.03     0.45
 HUB     12.59   595.88   296.95   516.62  1220.19     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   626.73   366.12     0.51  3509.37
 MEAN   485.11   578.71   269.56     0.47  3343.28     1.31
 HUB    394.10   525.67    97.14     0.43  3740.86

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.40     1.09    24.79   647.43     1.03   622.66     0.92     0.88
 MEAN    28.29     1.08    24.55   646.59     1.03   620.84     0.92     0.88
 HUB     28.56     1.09    24.26   648.59     1.03   618.97     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.02    35.74    31.50     4.24     0.93     0.22     2.90
 MEAN    22.83    27.76    23.50     4.26     0.90     0.22     3.34     0.88
 HUB     29.89    10.65     6.50     4.15     0.90     0.24     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.958

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     561.516     219.507     516.833    1222.379       0.459       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.341      24.520     621.237      46.000      23.012      33.000       9.988

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     553.255     219.507     595.209    1223.134       0.452       -0.017

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.157      24.466     622.005     440.827       0.067       0.217

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     513.548       0.000     513.548    1226.603       0.419       0.111

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.952     625.538       0.000       0.060       0.068       0.108

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.779      28.153       1.079     647.537      17.722     333.785       2.587

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 110548.828       0.351    1123.381 1672862.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    777157.88   7897.3628    175.6672      1.8635      0.8190      3.9536      1.2386
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 95% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.454   EfDer =  0.995

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     177.102    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   80.50081

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     173.011    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  136241.297  138965.828       1.650     831.557     503.845     619.754       1.230

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   422.57    -0.15   422.57     0.38   643.21
  MEAN    17.06     0.00    -0.02   422.57    -0.15   422.57     0.38
  HUB     12.51     0.00    -0.02   422.57    -0.15   422.57     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.81    50.47     6.34   645.77   771.86    13.66   507.90     0.70
  MEAN    51.65    47.20     4.45   534.02   681.10    13.66   507.90     0.62
  HUB     42.83    38.62     4.21   391.59   576.21    13.66   507.90     0.52

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   658.35   339.96   563.78  1120.86     0.59
  MEAN    18.04   694.01   389.37   574.49  1116.63     0.62
  HUB     15.00   800.00   529.41   599.77  1107.55     0.72

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   641.38   305.81     0.57  7016.36
  MEAN   564.57   600.62   175.20     0.54  7025.13     1.26
  HUB    469.54   602.75    59.87     0.54  7942.90

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.60     1.23    14.72   558.09     1.07   521.90     0.92     0.91
  MEAN    18.60     1.23    14.33   558.14     1.07   517.92     0.92     0.91
  HUB     19.10     1.26    13.49   562.75     1.08   509.34     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     31.09    28.48    24.20     4.28     0.93     0.25     2.90
  MEAN    34.13    16.96    12.70     4.26     0.92     0.20     3.51     0.91
  HUB     41.43    -5.70    -9.30     3.60     0.92     0.06     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     706.989     388.611     590.605    1116.396       0.633      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.721      14.286     517.911      24.000      33.344      35.400       2.056

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     621.619     388.611     733.096    1126.560       0.552       0.213
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.648      15.159     527.385     528.796       0.026       0.380

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     568.259       0.000     568.259    1132.210       0.502       0.292

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.626     532.688       0.000       0.060       0.044       0.315

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.863      18.563       1.229     559.659      36.849     228.350       1.770

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 229417.984       0.550    2296.057 1776857.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.454   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.102    3587.000      18.563     559.659       1.000       1.000       0.980
W Kg/sec =   80.50081

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    145.675    3453.247       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 136241.297  138965.828       1.392     590.487     424.249     474.134       1.118

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   538.54    -0.19   538.54     0.47   619.26
 MEAN    18.08     0.00    -0.02   538.54    -0.19   538.54     0.47
 HUB     15.21     0.00    -0.02   538.54    -0.19   538.54     0.47

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.07    46.36     3.71   643.27   839.08    15.91   535.44     0.74
 MEAN    46.43    42.30     4.13   565.89   781.33    15.91   535.44     0.69
 HUB     41.49    37.84     3.65   476.11   718.94    15.91   535.44     0.63

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   600.59   252.55   544.91  1156.21     0.52
 MEAN    18.01   616.76   277.99   550.56  1153.72     0.53
 HUB     15.22   671.11   373.60   557.51  1151.23     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   668.15   386.65     0.58  5160.89
 MEAN   563.76   620.31   285.77     0.54  5009.89     1.36
 HUB    476.52   566.93   102.92     0.49  5690.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.44     1.15    17.83   585.60     1.05   555.48     0.92     0.91
 MEAN    21.35     1.15    17.57   584.84     1.04   553.08     0.92     0.91
 HUB     21.75     1.17    17.27   588.26     1.05   550.66     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.87    35.36    31.50     3.86     0.93     0.26     2.90
 MEAN    26.79    27.43    23.50     3.93     0.92     0.26     3.30     0.91
 HUB     33.83    10.46     6.50     3.96     0.92     0.28     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     626.244     278.767     560.776    1154.037       0.543       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.472      17.570     553.483      46.000      26.432      30.600       4.168

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     569.172     278.767     633.773    1159.961       0.491       0.152

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.413      18.160     559.180     511.151       0.025       0.252

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     561.448       0.000     561.448    1160.717       0.484       0.155

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.183     559.909       0.000       0.060       0.043       0.158

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.860      21.343       1.150     586.231      26.572     277.498       2.151

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 165516.891       0.405    1656.523 1624989.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.454   EfDer =  0.987

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    177.102    3587.000      21.343     586.231       1.000       1.000       0.980
W Kg/sec =   80.50081

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    129.676    3374.078       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 136241.297  138965.828       1.444     545.479     377.670     429.765       1.138

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   525.79    -0.18   525.79     0.45   590.93
 MEAN    17.74      0.00    -0.02   525.79    -0.18   525.79     0.45
 HUB     15.05      0.00    -0.02   525.79    -0.18   525.79     0.45

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     50.08     46.36     3.72   628.24   819.37     18.55   563.15      0.70
 MEAN    46.57     43.40     3.17   555.26   764.83     18.55   563.15      0.66
 HUB     41.87     38.84     3.03   471.10   706.09     18.55   563.15      0.61

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   586.65    238.21    536.11  1182.60      0.50
 MEAN    17.51   602.23    266.03    540.29  1180.72      0.51
 HUB     14.85   655.21    362.57    545.74  1178.80      0.56

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10    658.22    381.89     0.56  4722.55
 MEAN   548.00    609.44    281.97     0.52  4660.45     1.35
 HUB    464.84    555.24    102.27     0.47  5386.89

         Pt2       PR       Ps2      Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     24.19     1.13     20.44    609.95     1.04    581.23     0.92      0.90
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 MEAN    24.15     1.13    20.22   609.64     1.04   579.37     0.92     0.90
 HUB     24.61     1.15    19.95   613.29     1.05   577.46     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.96    35.46    31.50     3.96     0.93     0.25     2.90
 MEAN    26.21    27.56    23.50     4.06     0.91     0.26     3.28     0.90
 HUB     33.60    10.61     6.50     4.11     0.91     0.28     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     608.881     267.774     546.840    1181.304       0.515       0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.277      20.250     580.016      46.000      26.090      31.500       5.410

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     564.264     267.774     624.577    1185.745       0.476       0.128

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.213      20.732     584.385     471.992       0.026       0.250

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     546.493       0.000     546.493    1187.415       0.460       0.149

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.862     586.033       0.000       0.060       0.046       0.160

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.848      24.127       1.130     610.963      24.732     278.006       2.155

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 154131.375       0.401    1542.575 1581650.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 4.454   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.102    3587.000      24.127     610.963       1.000       1.000       0.980
W Kg/sec =   80.50081

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    117.109    3305.080       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 136241.297  138965.828       1.505     513.330     341.086     401.059       1.176

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   510.04    -0.18   510.04     0.43   555.49
 MEAN    16.97     0.00    -0.02   510.04    -0.18   510.04     0.43
 HUB     14.32     0.00    -0.02   510.04    -0.18   510.04     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.78    46.36     3.42   602.89   789.83    21.26   589.26     0.66
 MEAN    46.18    43.80     2.38   531.23   736.57    21.26   589.26     0.62
 HUB     41.32    37.84     3.48   448.25   679.14    21.26   589.26     0.57

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   565.46   218.76   521.43  1206.47     0.47
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 MEAN    16.57   579.07   244.38   524.97  1204.78     0.48
 HUB     13.89   627.02   335.56   529.67  1203.03     0.52
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   640.66   372.23     0.53  4133.52
 MEAN   518.80   592.37   274.43     0.49  4053.27     1.34
 HUB    434.79   538.89    99.23     0.45  4663.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.79     1.11    23.04   631.72     1.03   605.04     0.92     0.90
 MEAN    26.74     1.11    22.82   631.31     1.03   603.34     0.92     0.90
 HUB     27.15     1.13    22.55   634.38     1.04   601.57     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.76    35.52    31.50     4.02     0.93     0.24     2.90
 MEAN    24.96    27.60    23.50     4.10     0.91     0.25     3.29     0.90
 HUB     32.36    10.61     6.50     4.11     0.91     0.27     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     568.823     245.752     512.997    1206.859       0.471       0.057

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.851      23.058     605.470      46.000      25.597      32.400       6.803

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     538.518     245.752     591.942    1209.647       0.445       0.139

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.785      23.374     608.271     456.573       0.026       0.248

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     510.408       0.000     510.408    1212.091       0.421       0.136

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.613     610.731       0.000       0.060       0.052       0.197

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.830      26.679       1.106     632.470      21.507     294.856       2.286

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 134099.359       0.384    1342.091 1588153.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 4.454   EfDer =  0.972

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.102    3587.000      26.679     632.470       1.000       1.000       0.980
W Kg/sec =   80.50081

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    107.752    3248.400       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 136241.297  138965.828       1.624     509.668     313.851     390.276       1.244

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   473.62    -0.16   473.62     0.39   519.31
 MEAN    15.91     0.00    -0.02   473.62    -0.16   473.62     0.39
 HUB     13.07     0.00    -0.02   473.62    -0.16   473.62     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.45    47.36     3.09   573.46   743.88    24.02   613.76     0.61
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 MEAN    46.45    44.80     1.65   498.12   687.46    24.02   613.76     0.57
 HUB     40.83    38.84     1.99   409.12   625.97    24.02   613.76     0.52
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   530.62   211.70   486.56  1229.09     0.43
 MEAN    15.50   540.68   227.24   490.61  1226.85     0.44
 HUB     12.59   579.91   301.25   495.52  1224.59     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   599.29   349.86     0.49  3800.92
 MEAN   485.11   554.26   257.88     0.45  3524.20     1.35
 HUB    394.10   504.15    92.85     0.41  3794.83

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.26     1.10    25.74   651.54     1.03   628.06     0.92     0.89
 MEAN    29.07     1.09    25.44   650.16     1.03   625.77     0.92     0.89
 HUB     29.26     1.10    25.09   651.51     1.03   623.46     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.51    35.72    31.50     4.22     0.93     0.24     2.90
 MEAN    24.85    27.73    23.50     4.23     0.91     0.24     3.34     0.89
 HUB     31.30    10.61     6.50     4.11     0.91     0.25     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.972

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      546.429     231.402      495.013    1227.215       0.445       -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.122      25.414      626.165       46.000      25.055      33.000       7.945

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      526.771     231.402     575.356    1228.938       0.429        0.033

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       28.991      25.549     627.925     440.827       0.055        0.246

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      489.912       0.000     489.912    1231.993       0.398        0.152

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       25.987      631.051       0.000       0.060       0.057        0.149

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.815       28.982        1.086      651.071       18.601     315.556        2.446

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 116042.086       0.368    1161.370 1631558.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    799207.69    7998.6167     173.0107      1.9184       0.8372       4.4535       1.2453
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    P&W Fan Hub + 4 Stage LPC 95% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     174.397    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   79.27158

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     170.369    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  134160.906  136843.844       1.676     831.557     496.151     619.754       1.249

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   415.04    -0.14   415.04     0.38   643.21
  MEAN    17.06     0.00    -0.02   415.04    -0.14   415.04     0.38
  HUB     12.51     0.00    -0.02   415.04    -0.14   415.04     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.28    50.47     6.81   645.77   767.77    13.71   508.42     0.69
  MEAN    52.15    47.20     4.95   534.02   676.46    13.71   508.42     0.61
  HUB     43.35    38.62     4.73   391.59   570.72    13.71   508.42     0.52

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   651.28   346.69   551.34  1122.41     0.58
  MEAN    18.04   686.09   393.14   562.28  1117.95     0.61
  HUB     15.00   789.41   528.12   586.73  1108.90     0.71

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   627.23   299.08     0.56  7155.26
  MEAN   564.57   587.83   171.44     0.53  7093.05     1.28
  HUB    469.54   589.65    58.58     0.53  7923.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.68     1.24    14.87   558.79     1.07   523.37     0.92     0.91
  MEAN    18.65     1.23    14.46   558.48     1.07   519.18     0.92     0.91
  HUB     19.10     1.26    13.62   562.65     1.08   510.64     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     32.16    28.48    24.20     4.28     0.93     0.26     2.90
  MEAN    34.96    16.96    12.70     4.26     0.92     0.22     3.51     0.91
  HUB     41.99    -5.70    -9.30     3.60     0.92     0.07     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     698.366     392.372     577.718    1117.825       0.625      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.763      14.418     519.238      24.000      34.183      35.400       1.217

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     606.348     392.372     722.228    1128.567       0.537       0.232
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.696      15.358     529.265     528.796       0.025       0.393

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     554.830       0.000     554.830    1133.882       0.489       0.309

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.806     534.262       0.000       0.060       0.041       0.332

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      18.622       1.233     559.974      37.164     224.871       1.743

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 231374.969       0.555    2280.283 1745222.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.397    3587.000      18.622     559.974       1.000       1.000       0.980
W Kg/sec =   79.27158

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    143.040    3452.278       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134160.906  136843.844       1.417     590.487     416.576     474.134       1.138

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   526.23    -0.18   526.23     0.46   619.09
 MEAN    18.08     0.00    -0.02   526.23    -0.18   526.23     0.46
 HUB     15.21     0.00    -0.02   526.23    -0.18   526.23     0.46

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.72    46.36     4.36   643.27   831.23    16.07   536.85     0.73
 MEAN    47.09    42.30     4.79   565.89   772.89    16.07   536.85     0.68
 HUB     42.15    37.84     4.31   476.11   709.77    16.07   536.85     0.62

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   592.28   262.71   530.83  1158.46     0.51
 MEAN    18.01   608.04   285.22   537.00  1155.64     0.53
 HUB     15.22   661.71   376.23   544.34  1152.84     0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   650.79   376.49     0.56  5368.17
 MEAN   563.76   604.94   278.54     0.52  5140.04     1.38
 HUB    476.52   553.50   100.29     0.48  5730.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.63     1.16    18.10   586.95     1.05   557.67     0.92     0.91
 MEAN    21.50     1.15    17.80   585.81     1.05   554.94     0.92     0.91
 HUB     21.85     1.17    17.47   588.77     1.05   552.22     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.33    35.35    31.50     3.85     0.93     0.27     2.90
 MEAN    27.97    27.42    23.50     3.92     0.92     0.27     3.30     0.91
 HUB     34.65    10.44     6.50     3.94     0.92     0.29     3.92


  blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     617.070     286.019     546.780    1156.015       0.534       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.622      17.806     555.382      46.000      27.614      30.600       2.986

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     553.500     286.019     623.032    1162.464       0.476       0.175

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.573      18.468     561.596     511.151       0.023       0.270

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     545.954       0.000     545.954    1163.181       0.469       0.177

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.491     562.288       0.000       0.060       0.040       0.181

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.868      21.507       1.155     587.177      27.204     269.516       2.089

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 169454.297       0.415    1670.033 1591309.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.992

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    174.397    3587.000      21.507     587.177       1.000       1.000       0.980
W Kg/sec =   79.27158

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    126.822    3371.358       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 134160.906  136843.844       1.477     545.479     369.359     429.765       1.164

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   511.81    -0.18   511.81     0.44   590.45
 MEAN    17.74     0.00    -0.02   511.81    -0.18   511.81     0.44
 HUB     15.05     0.00    -0.02   511.81    -0.18   511.81     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.84    46.36     4.48   628.24   810.47    18.84   565.31     0.69
 MEAN    47.34    43.40     3.94   555.26   755.28    18.84   565.31     0.65
 HUB     42.64    38.84     3.80   471.10   695.74    18.84   565.31     0.60

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   576.93    249.88    520.01  1185.69      0.49
 MEAN    17.51   592.16    274.37    524.76  1183.43      0.50
 HUB     14.85   644.41    365.64    530.63  1181.17      0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   638.34   370.23     0.54  4953.58
 MEAN   548.00   591.82   273.63     0.50  4806.39     1.37
 HUB    464.84   539.83    99.20     0.46  5432.44

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     24.54     1.14    20.86   612.06     1.04   584.28     0.92     0.91
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 MEAN    24.44     1.14    20.60   611.32     1.04   582.05     0.92     0.91
 HUB     24.84     1.16    20.29   614.47     1.05   579.81     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.67    35.45    31.50     3.95     0.93     0.27     2.90
 MEAN    27.60    27.54    23.50     4.04     0.92     0.27     3.28     0.91
 HUB     34.57    10.59     6.50     4.09     0.92     0.29     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     598.539     276.170     531.017    1184.045       0.506       0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.567      20.630     582.711      46.000      27.478      31.500       4.022

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     546.218     276.170     612.065    1189.114       0.459       0.156

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.515      21.210     587.711     471.992       0.023       0.271

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     529.087       0.000     529.087    1190.669       0.444       0.175

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.336     589.249       0.000       0.060       0.042       0.187

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.860      24.437       1.136     612.616      25.439     268.544       2.082

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 158540.203       0.412    1562.471 1547095.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.397    3587.000      24.437     612.616       1.000       1.000       0.980
W Kg/sec =   79.27158

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    114.009    3300.617       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134160.906  136843.844       1.546     513.330     332.059     401.059       1.208

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   494.34    -0.17   494.34     0.41   554.74
 MEAN    16.97     0.00    -0.02   494.34    -0.17   494.34     0.41
 HUB     14.32     0.00    -0.02   494.34    -0.17   494.34     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.66    46.36     4.30   602.89   779.78    21.71   592.22     0.65
 MEAN    47.07    43.80     3.27   531.23   725.78    21.71   592.22     0.61
 HUB     42.21    37.84     4.37   448.25   667.43    21.71   592.22     0.56

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   554.29   231.83   503.48  1210.37     0.46
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 MEAN    16.57   567.48   253.76   507.59  1208.29     0.47
 HUB     13.89   614.64   339.03   512.68  1206.19     0.51
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   618.45   359.16     0.51  4380.24
 MEAN   518.80   572.62   265.05     0.47  4208.63     1.37
 HUB    434.79   521.54    95.76     0.43  4711.58

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.32     1.12    23.66   634.61     1.04   608.97     0.92     0.90
 MEAN    27.20     1.11    23.38   633.75     1.03   606.88     0.92     0.90
 HUB     27.55     1.13    23.07   636.27     1.04   604.75     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.72    35.50    31.50     4.00     0.93     0.26     2.90
 MEAN    26.56    27.57    23.50     4.07     0.92     0.26     3.29     0.90
 HUB     33.48    10.58     6.50     4.08     0.92     0.28     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     557.953     255.184     496.178    1210.268       0.461       0.057

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.315      23.608     608.898      46.000      27.217      32.400       5.183

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     519.098     255.184     578.430    1213.734       0.428       0.168

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.265      24.040     612.390     456.573       0.023       0.272

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     492.135       0.000     492.135    1215.986       0.405       0.166

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.271     614.665       0.000       0.060       0.046       0.226

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.849      27.173       1.112     634.876      22.259     282.884       2.193

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 138796.719       0.397    1367.892 1551750.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.397    3587.000      27.173     634.876       1.000       1.000       0.980
W Kg/sec =   79.27158

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.378    3242.240       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134160.906  136843.844       1.676     509.668     304.023     390.276       1.284

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   457.16    -0.16   457.16     0.38   518.33
 MEAN    15.91     0.00    -0.02   457.16    -0.16   457.16     0.38
 HUB     13.07     0.00    -0.02   457.16    -0.16   457.16     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.45    47.36     4.09   573.46   733.51    24.66   617.44     0.60
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MEAN    47.46    44.80     2.66   498.12   676.22    24.66   617.44     0.55
HUB     41.84    38.84     3.00   409.12   613.60    24.66   617.44     0.50
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   519.38   225.41   467.92  1233.59     0.42
MEAN    15.50   528.57   237.14   472.39  1231.00     0.43
HUB     12.59   566.61   304.90   477.58  1228.41     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    561.57   576.15   336.15     0.47  4046.82
MEAN   485.11   533.52   247.98     0.43  3677.58     1.38
HUB    394.10   485.84    89.19     0.40  3840.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     30.00     1.10    26.55   655.18     1.03   632.68     0.92     0.90
MEAN    29.73     1.09    26.19   653.33     1.03   630.03     0.92     0.90
HUB     29.85     1.10    25.80   654.15     1.03   627.37     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.72    35.69    31.50     4.19     0.93     0.27     2.90
MEAN    26.66    27.70    23.50     4.20     0.91     0.26     3.34     0.90
HUB     32.56    10.58     6.50     4.08     0.91     0.27     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.983

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219      534.237     241.486     476.544    1231.366       0.434      -0.006

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    29.789      26.172      630.413      46.000      26.873      33.000       6.127

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219      504.912     241.486     559.689    1233.846       0.409       0.075

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      29.694      26.458     632.955     440.827       0.046       0.272

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     470.231       0.000     470.231    1236.593       0.380       0.187

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      26.861     635.776       0.000       0.060       0.049       0.184

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.841      29.682       1.092     654.220      19.344     301.029       2.334

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 120688.594       0.383    1189.429 1593373.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    818854.75   8070.1084    170.3689      1.9648      0.8501      4.9531      1.2514
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 95% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     171.704    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   78.04749

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     167.738    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  132089.219  134730.734       1.702     831.557     488.490     619.754       1.269

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   407.62    -0.14   407.62     0.37   643.21
  MEAN    17.06     0.00    -0.02   407.62    -0.14   407.62     0.37
  HUB     12.51     0.00    -0.02   407.62    -0.14   407.62     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.75    50.47     7.28   645.77   763.77    13.75   508.93     0.69
  MEAN    52.65    47.20     5.45   534.02   671.92    13.75   508.93     0.61
  HUB     43.86    38.62     5.24   391.59   565.34    13.75   508.93     0.51

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   644.70   353.22   539.33  1123.88     0.57
  MEAN    18.04   678.55   396.77   550.45  1119.20     0.61
  HUB     15.00   779.25   526.87   574.13  1110.19     0.70

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   613.57   292.55     0.55  7289.83
  MEAN   564.57   575.46   167.80     0.51  7158.59     1.30
  HUB    469.54   576.99    57.33     0.52  7904.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.76     1.24    15.00   559.47     1.07   524.76     0.92     0.91
  MEAN    18.69     1.24    14.57   558.81     1.07   520.36     0.92     0.91
  HUB     19.09     1.26    13.74   562.56     1.08   511.87     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     33.22    28.48    24.20     4.28     0.93     0.28     2.90
  MEAN    35.78    16.95    12.70     4.25     0.92     0.23     3.51     0.91
  HUB     42.54    -5.70    -9.30     3.60     0.92     0.09     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     690.191     396.002     565.284    1119.172       0.617      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.803      14.543     520.490      24.000      35.013      35.400       0.387

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     591.831     396.002     712.096    1130.438       0.524       0.251
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.740      15.543     531.022     528.796       0.024       0.406

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     542.063       0.000     542.063    1135.444       0.477       0.324

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.973     535.735       0.000       0.060       0.039       0.348

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.874      18.673       1.236     560.277      37.467     221.493       1.717

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 233266.969       0.559    2263.430 1713990.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.704    3587.000      18.673     560.277       1.000       1.000       0.980
W Kg/sec =   78.04749

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    140.482    3451.342       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132089.219  134730.734       1.443     590.487     409.124     474.134       1.159

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   514.50    -0.18   514.50     0.45   618.92
 MEAN    18.08     0.00    -0.02   514.50    -0.18   514.50     0.45
 HUB     15.21     0.00    -0.02   514.50    -0.18   514.50     0.45

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.35    46.36     4.99   643.27   823.85    16.23   538.17     0.72
 MEAN    47.73    42.30     5.43   565.89   764.95    16.23   538.17     0.67
 HUB     42.79    37.84     4.95   476.11   701.11    16.23   538.17     0.62

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   584.86   272.22   517.64  1160.53     0.50
 MEAN    18.01   600.08   292.03   524.23  1157.42     0.52
 HUB     15.22   652.95   378.72   531.90  1154.33     0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   634.53   366.98     0.55  5562.40
 MEAN   563.76   590.46   271.72     0.51  5262.71     1.40
 HUB    476.52   540.81    97.79     0.47  5768.01

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.81     1.17    18.34   588.23     1.05   559.67     0.92     0.91
 MEAN    21.64     1.16    18.01   586.73     1.05   556.66     0.92     0.91
 HUB     21.94     1.17    17.65   589.27     1.05   553.67     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.74    35.33    31.50     3.83     0.93     0.29     2.90
 MEAN    29.12    27.40    23.50     3.90     0.92     0.29     3.30     0.91
 HUB     35.45    10.42     6.50     3.92     0.92     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     608.712     292.853     533.636    1157.839       0.526       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.758      18.019     557.136      46.000      28.757      30.600       1.843

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     538.954     292.853     613.379    1164.765       0.463       0.197

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.715      18.748     563.821     511.151       0.021       0.288

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     531.610       0.000     531.610    1165.443       0.456       0.198

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.770     564.477       0.000       0.060       0.038       0.203

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      21.653       1.160     588.075      27.798     262.207       2.033

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 173157.406       0.424    1680.177 1558638.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.996

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    171.704    3587.000      21.653     588.075       1.000       1.000       0.980
W Kg/sec =   78.04749

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    124.122    3368.783       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 132089.219  134730.734       1.509     545.479     361.494     429.765       1.189

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   498.81    -0.17   498.81     0.43   590.00
 MEAN    17.74      0.00    -0.02   498.81    -0.17   498.81     0.43
 HUB     15.05      0.00    -0.02   498.81    -0.17   498.81     0.43

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     51.56     46.36     5.20   628.24   802.32     19.10   567.31     0.69
 MEAN    48.07     43.40     4.67   555.26   746.53     19.10   567.31     0.64
 HUB     43.37     38.84     4.53   471.10   686.23     19.10   567.31     0.59

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   568.55    260.52    505.34   1188.47      0.48
 MEAN    17.51   583.25    282.03    510.53   1185.90      0.49
 HUB     14.85   634.66    368.47    516.74   1183.34      0.54

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10    620.22    359.58     0.52   5164.42
 MEAN   548.00    575.66    265.97     0.49   4940.34     1.40
 HUB    464.84    525.64     96.37     0.44   5474.40

         Pt2       PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     24.84     1.15     21.24    614.02      1.04    587.04      0.92      0.91
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 MEAN    24.70     1.14    20.93   612.89     1.04   584.50     0.92     0.91
 HUB     25.05     1.16    20.59   615.58     1.05   581.96     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.27    35.43    31.50     3.93     0.93     0.28     2.90
 MEAN    28.92    27.52    23.50     4.02     0.92     0.29     3.28     0.91
 HUB     35.49    10.56     6.50     4.06     0.92     0.30     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     589.407     283.876     516.542    1186.532       0.497       0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.824      20.968     585.162      46.000      28.792      31.500       2.708

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     529.924     283.876     601.169    1192.153       0.445       0.181

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.781      21.634     590.720     471.992       0.021       0.291

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     513.402       0.000     513.402    1193.604       0.430       0.200

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.755     592.159       0.000       0.060       0.039       0.212

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      24.709       1.141     614.162      26.086     260.161       2.017

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 162576.109       0.423    1577.504 1513942.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.704    3587.000      24.709     614.162       1.000       1.000       0.980
W Kg/sec =   78.04749

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.154    3296.463       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132089.219  134730.734       1.586     513.330     323.744     401.059       1.239

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   480.14    -0.17   480.14     0.40   554.04
 MEAN    16.97     0.00    -0.02   480.14    -0.17   480.14     0.40
 HUB     14.32     0.00    -0.02   480.14    -0.17   480.14     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.47    46.36     5.11   602.89   770.85    22.11   594.92     0.64
 MEAN    47.90    43.80     4.10   531.23   716.18    22.11   594.92     0.60
 HUB     43.04    37.84     5.20   448.25   656.97    22.11   594.92     0.55

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   544.94   243.44   487.54  1213.84     0.45
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 MEAN    16.57   557.53   262.13   492.07  1211.44     0.46
 HUB     13.89   603.75   342.12   497.46  1209.03     0.50
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   598.73   347.55     0.49  4599.42
 MEAN   518.80   554.99   256.67     0.46  4347.36     1.39
 HUB    434.79   506.02    92.67     0.42  4754.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.78     1.12    24.19   637.25     1.04   612.47     0.92     0.91
 MEAN    27.61     1.12    23.87   635.99     1.04   610.05     0.92     0.91
 HUB     27.89     1.13    23.52   638.03     1.04   607.62     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.53    35.48    31.50     3.98     0.93     0.28     2.90
 MEAN    28.04    27.55    23.50     4.05     0.92     0.28     3.29     0.91
 HUB     34.52    10.55     6.50     4.05     0.92     0.30     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     548.641     263.607     481.163    1213.318       0.452       0.056

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.722      24.090     611.973      46.000      28.716      32.400       3.684

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     501.994     263.607     566.998    1217.365       0.412       0.195

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.683      24.622     616.063     456.573       0.020       0.294

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     476.067       0.000     476.067    1219.454       0.390       0.193

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.844     618.179       0.000       0.060       0.041       0.252

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.863      27.600       1.117     637.091      22.929     272.650       2.114

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 142979.328       0.409    1387.354 1517230.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.704    3587.000      27.600     637.091       1.000       1.000       0.980
W Kg/sec =   78.04749

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.352    3236.599       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132089.219  134730.734       1.726     509.668     295.212     390.276       1.322

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   442.63    -0.15   442.63     0.36   517.43
 MEAN    15.91     0.00    -0.02   442.63    -0.15   442.63     0.36
 HUB     13.07     0.00    -0.02   442.63    -0.15   442.63     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.34    47.36     4.98   573.46   724.54    25.21   620.75     0.59
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MEAN    48.38    44.80     3.58   498.12   666.48    25.21   620.75     0.55
HUB     42.76    38.84     3.92   409.12   602.85    25.21   620.75     0.49
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   510.29   237.32   451.75  1237.54     0.41
MEAN    15.50   518.45   245.75   456.51  1234.67     0.42
HUB     12.59   555.23   308.09   461.91  1231.80     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    561.57   556.07   324.24     0.45  4260.38
MEAN   485.11   515.46   239.36     0.42  3810.96     1.41
HUB    394.10   469.85    86.01     0.38  3880.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     30.64     1.11    27.25   658.47     1.03   636.75     0.92     0.91
MEAN    30.31     1.10    26.85   656.21     1.03   633.79     0.92     0.91
HUB     30.36     1.10    26.41   656.56     1.03   630.85     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     27.72    35.67    31.50     4.17     0.93     0.29     2.90
MEAN    28.29    27.67    23.50     4.17     0.92     0.28     3.34     0.91
HUB     33.70    10.55     6.50     4.05     0.92     0.28     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.990

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219      524.083     250.256     460.472    1235.025       0.424      -0.005

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    30.366      26.826      634.171      46.000      28.523      33.000       4.477

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
    15.219      486.258     250.256     546.878    1238.125       0.393        0.111

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      30.296      27.237     637.359     440.827       0.039       0.296

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     453.335       0.000     453.335    1240.629       0.365       0.218

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      27.611     639.939       0.000       0.060       0.043       0.215

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.857      30.282       1.097     657.081      19.990     288.983       2.240

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 124727.430       0.396    1210.252 1557458.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    836707.25   8118.7168    167.7381      2.0045      0.8591      5.4531      1.2568
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    P&W Fan Hub + 4 Stage LPC 95% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.038   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     168.574    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   76.62451

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     164.680    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  129680.953  132274.297       1.734     831.557     479.584     619.754       1.292

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   399.06    -0.14   399.06     0.36   643.21
  MEAN    17.06     0.00    -0.02   399.06    -0.14   399.06     0.36
  HUB     12.51     0.00    -0.02   399.06    -0.14   399.06     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.29    50.47     7.82   645.77   759.24    13.81   509.51     0.69
  MEAN    53.24    47.20     6.04   534.02   666.77    13.81   509.51     0.60
  HUB     44.47    38.62     5.85   391.59   559.20    13.81   509.51     0.51

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   637.57   360.56   525.82  1125.49     0.57
  MEAN    18.04   670.21   400.90   537.09  1120.58     0.60
  HUB     15.00   767.88   525.47   559.93  1111.61     0.69

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   598.19   285.21     0.53  7441.09
  MEAN   564.57   561.48   163.68     0.50  7232.93     1.32
  HUB    469.54   562.71    55.93     0.51  7883.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.84     1.25    15.15   560.23     1.07   526.28     0.92     0.91
  MEAN    18.73     1.24    14.70   559.18     1.07   521.67     0.92     0.91
  HUB     19.09     1.26    13.87   562.45     1.08   513.23     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     34.44    28.48    24.20     4.28     0.93     0.29     2.90
  MEAN    36.74    16.95    12.70     4.25     0.93     0.25     3.51     0.91
  HUB     43.18    -5.70    -9.30     3.60     0.93     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     681.186     400.118     551.289    1120.648       0.608      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.845      14.679     521.864      24.000      35.972      35.400      -0.572

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     575.712     400.118     701.099    1132.475       0.508       0.271
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.785      15.744     532.937     528.796       0.024       0.421

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     527.874       0.000     527.874    1137.150       0.464       0.341

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.151     537.346       0.000       0.060       0.038       0.366

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.878      18.726       1.240     560.620      37.810     217.663       1.687

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 235402.172       0.564    2242.503 1678007.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.038   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    3587.000      18.726     560.620       1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    137.578    3450.286       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       1.474     590.487     400.669     474.134       1.183

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   501.41    -0.17   501.41     0.44   618.73
 MEAN    18.08     0.00    -0.02   501.41    -0.17   501.41     0.44
 HUB     15.21     0.00    -0.02   501.41    -0.17   501.41     0.44

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.07    46.36     5.71   643.27   815.74    16.39   539.63     0.72
 MEAN    48.47    42.30     6.17   565.89   756.20    16.39   539.63     0.66
 HUB     43.53    37.84     5.69   476.11   691.56    16.39   539.63     0.61

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   577.16   282.64   503.21  1162.76     0.50
 MEAN    18.01   591.60   299.53   510.17  1159.34     0.51
 HUB     15.22   643.42   381.47   518.15  1155.96     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   616.73   356.56     0.53  5775.08
 MEAN   563.76   574.53   264.22     0.50  5397.71     1.42
 HUB    476.52   526.79    95.05     0.46  5809.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.01     1.18    18.59   589.64     1.05   561.83     0.92     0.91
 MEAN    21.78     1.16    18.23   587.75     1.05   558.53     0.92     0.91
 HUB     22.03     1.18    17.84   589.82     1.05   555.25     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.32    35.32    31.50     3.82     0.93     0.30     2.90
 MEAN    30.42    27.38    23.50     3.88     0.93     0.30     3.30     0.91
 HUB     36.36    10.39     6.50     3.89     0.93     0.31     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     599.828     300.374     519.201    1159.803       0.517       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.900      18.244     559.027      46.000      30.051      30.600       0.549

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     523.152     300.374     603.252    1167.238       0.448       0.221

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.861      19.043     566.217     511.151       0.020       0.307

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     516.073       0.000     516.073    1167.871       0.442       0.220

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.062     566.831       0.000       0.060       0.037       0.226

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      21.800       1.164     589.071      28.450     254.386       1.972

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 177221.141       0.434    1688.256 1521611.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.038   EfDer =  0.998

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    168.574    3587.000      21.800     589.071       1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    121.135    3365.936       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 129680.953  132274.297       1.546     545.479     352.796     429.765       1.218

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   484.68    -0.17   484.68     0.41   589.51
 MEAN    17.74      0.00    -0.02   484.68    -0.17   484.68     0.41
 HUB     15.05      0.00    -0.02   484.68    -0.17   484.68     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.36     46.36     6.00   628.24   793.60    19.37   569.46     0.68
 MEAN    48.89     43.40     5.49   555.26   737.16    19.37   569.46     0.63
 HUB     44.20     38.84     5.36   471.10   676.02    19.37   569.46     0.58

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   560.11   271.89   489.69  1191.41     0.47
 MEAN    17.51   574.04   290.22   495.27  1188.53     0.48
 HUB     14.85   624.33   371.50   501.77  1185.67     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   600.88   348.22     0.50  5389.41
 MEAN   548.00   558.34   257.78     0.47  5083.63     1.43
 HUB    464.84   510.38    93.34     0.43  5519.26

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     25.16     1.15    21.63   616.14     1.05   589.96     0.92     0.91
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 MEAN    24.96     1.15    21.28   614.61     1.04   587.10     0.92     0.91
 HUB     25.25     1.16    20.90   616.79     1.05   584.26     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.04    35.42    31.50     3.92     0.93     0.30     2.90
 MEAN    30.37    27.50    23.50     4.00     0.92     0.30     3.28     0.91
 HUB     36.52    10.54     6.50     4.04     0.92     0.32     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     579.977     292.119     501.038    1189.170       0.488       0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.088      21.318     587.769      46.000      30.243      31.500       1.257

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     512.684     292.119     590.067    1195.363       0.429       0.209

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.052      22.073     593.907     471.992       0.019       0.312

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     496.841       0.000     496.841    1196.706       0.415       0.225

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.186     595.242       0.000       0.060       0.037       0.238

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      24.983       1.146     615.848      26.777     251.464       1.949

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 166887.422       0.434    1589.814 1476728.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.038   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    3587.000      24.983     615.848       1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.079    3291.946       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       1.631     513.330     314.788     401.059       1.274

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   465.08    -0.16   465.08     0.39   553.28
 MEAN    16.97     0.00    -0.02   465.08    -0.16   465.08     0.39
 HUB     14.32     0.00    -0.02   465.08    -0.16   465.08     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.36    46.36     6.00   602.89   761.56    22.52   597.80     0.64
 MEAN    48.81    43.80     5.01   531.23   706.17    22.52   597.80     0.59
 HUB     43.95    37.84     6.11   448.25   646.05    22.52   597.80     0.54

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   535.80   255.52   470.95  1217.44     0.44
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 MEAN    16.57   547.53   270.87   475.84  1214.73     0.45
 HUB     13.89   592.55   345.36   481.50  1212.03     0.49
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   578.22   335.47     0.47  4827.27
 MEAN   518.80   536.56   247.93     0.44  4492.07     1.42
 HUB    434.79   489.74    89.43     0.40  4799.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.26     1.13    24.73   640.08     1.04   616.13     0.92     0.91
 MEAN    28.02     1.12    24.37   638.40     1.04   613.38     0.92     0.91
 HUB     28.24     1.13    23.98   639.94     1.04   610.64     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.48    35.46    31.50     3.96     0.93     0.30     2.90
 MEAN    29.65    27.52    23.50     4.02     0.92     0.30     3.29     0.91
 HUB     35.65    10.52     6.50     4.02     0.92     0.31     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     539.298     272.392     465.452    1216.514       0.443       0.055

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.133      24.578     615.206      46.000      30.337      32.400       2.063

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     484.310     272.392     555.656    1221.149       0.397       0.224

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.102      25.212     619.902     456.573       0.018       0.318

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     459.486       0.000     459.486    1223.073       0.376       0.221

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.422     621.857       0.000       0.060       0.038       0.279

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      28.026       1.122     639.474      23.626     262.369       2.034

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 147335.438       0.422    1403.557 1478857.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.038   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    3587.000      28.026     639.474       1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     98.175    3230.561       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       1.782     509.668     285.960     390.276       1.365

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   427.59    -0.15   427.59     0.35   516.46
 MEAN    15.91     0.00    -0.02   427.59    -0.15   427.59     0.35
 HUB     13.07     0.00    -0.02   427.59    -0.15   427.59     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.30    47.36     5.94   573.46   715.44    25.76   624.22     0.58
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 MEAN    49.37    44.80     4.57   498.12   656.58    25.76   624.22     0.54
 HUB     43.75    38.84     4.91   409.12   591.89    25.76   624.22     0.48
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   501.68   249.44   435.27  1241.61     0.40
 MEAN    15.50   508.56   254.56   440.27  1238.47     0.41
 HUB     12.59   543.78   311.35   445.83  1235.34     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   535.62   312.12     0.43  4477.69
 MEAN   485.11   496.98   230.56     0.40  3947.35     1.44
 HUB    394.10   453.44    82.74     0.37  3921.88

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.28     1.12    27.95   661.94     1.04   640.95     0.92     0.91
 MEAN    30.88     1.10    27.50   659.28     1.03   637.71     0.92     0.91
 HUB     30.87     1.10    27.02   659.15     1.03   634.49     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.82    35.64    31.50     4.14     0.93     0.31     2.90
 MEAN    30.04    27.64    23.50     4.14     0.92     0.30     3.34     0.91
 HUB     34.93    10.51     6.50     4.01     0.92     0.30     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      514.177     259.224     444.050    1238.811       0.415       -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.941      27.479      638.072      46.000      30.275      33.000       2.725

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      467.506     259.224     534.565    1242.515       0.376        0.148

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.889      28.011     641.894     440.827       0.035       0.322

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     436.277       0.000     436.277    1244.791       0.350       0.249

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      28.357     644.248       0.000       0.060       0.039       0.246

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      30.874       1.102     660.124      20.649     277.191       2.149

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 128846.492       0.409    1227.426 1517778.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    855692.69   8151.5552    164.6798      2.0437      0.8660      6.0376      1.2626
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    P&W Fan Hub + 4 Stage LPC 95% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.977   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     163.580    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   74.35432

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     159.801    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  125838.836  128355.344       1.787     831.557     465.375     619.754       1.332

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   385.57    -0.13   385.57     0.35   643.21
  MEAN    17.06     0.00    -0.02   385.57    -0.13   385.57     0.35
  HUB     12.51     0.00    -0.02   385.57    -0.13   385.57     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.17    50.47     8.70   645.77   752.23    13.89   510.39     0.68
  MEAN    54.18    47.20     6.98   534.02   658.78    13.89   510.39     0.59
  HUB     45.45    38.62     6.83   391.59   549.65    13.89   510.39     0.50

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   627.23   371.81   505.15  1127.87     0.56
  MEAN    18.04   657.76   407.22   516.55  1122.64     0.59
  HUB     15.00   750.64   523.34   538.13  1113.73     0.67

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   574.66   273.96     0.51  7673.11
  MEAN   564.57   539.98   157.35     0.48  7346.94     1.36
  HUB    469.54   540.81    53.80     0.49  7851.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.97     1.26    15.37   561.39     1.07   528.54     0.92     0.91
  MEAN    18.80     1.24    14.89   559.75     1.07   523.62     0.92     0.91
  HUB     19.07     1.26    14.06   562.29     1.08   515.25     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     36.35    28.47    24.20     4.27     0.93     0.32     2.90
  MEAN    38.25    16.94    12.70     4.24     0.93     0.27     3.51     0.91
  HUB     44.20    -5.71    -9.30     3.59     0.93     0.12     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     667.784     406.432     529.858    1122.833       0.595      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.904      14.878     523.900      24.000      37.490      35.400      -2.090

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     551.432     406.432     685.029    1135.458       0.486       0.302
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      18.845      16.034     535.749     528.796       0.024       0.444

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     506.677       0.000     506.677    1139.642       0.445       0.365

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      16.400     539.704       0.000       0.060       0.038       0.389

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
    0.880      18.787       1.244     561.147      38.337     211.747       1.641

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 238678.125       0.572    2206.347 1621285.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.977   EfDer =  1.000

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   163.580    3587.000      18.787     561.147       1.000       1.000       0.980
W Kg/sec =   74.35432

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
   133.126    3448.668       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.523     590.487     387.703     474.134       1.223

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   481.78    -0.17   481.78     0.42   618.44
 MEAN    18.08     0.00    -0.02   481.78    -0.17   481.78     0.42
 HUB     15.21     0.00    -0.02   481.78    -0.17   481.78     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.18    46.36     6.82   643.27   803.82    16.62   541.76     0.70
 MEAN    49.60    42.30     7.30   565.89   743.33    16.62   541.76     0.65
 HUB     44.67    37.84     6.83   476.11   677.46    16.62   541.76     0.59

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   566.68   297.90   482.06  1165.94     0.49
 MEAN    18.01   579.65   310.58   489.42  1162.12     0.50
 HUB     15.22   629.57   385.49   497.75  1158.34     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   590.65   341.30     0.51  6086.52
 MEAN   563.76   551.03   253.18     0.47  5596.44     1.46
 HUB    476.52   506.00    91.02     0.44  5870.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.26     1.18    18.94   591.74     1.05   564.92     0.92     0.91
 MEAN    21.97     1.17    18.53   589.27     1.05   561.22     0.92     0.91
 HUB     22.13     1.18    18.10   590.65     1.05   557.56     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.71    35.30    31.50     3.80     0.93     0.33     2.90
 MEAN    32.40    27.35    23.50     3.85     0.93     0.32     3.30     0.91
 HUB     37.76    10.36     6.50     3.86     0.93     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     587.325     311.447     497.947    1162.623       0.505       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.084      18.549     561.750      46.000      32.024      30.600      -1.424

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     500.183     311.447     589.221    1170.783       0.427       0.256

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.048      19.445     569.663     511.151       0.020       0.337

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     493.568       0.000     493.568    1171.347       0.421       0.252

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.456     570.212       0.000       0.060       0.037       0.259

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      21.986       1.170     590.554      29.407     243.246       1.886

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 183183.578       0.448    1693.354 1464472.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.977   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    163.580    3587.000      21.986     590.554       1.000       1.000       0.980
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    116.699    3361.707       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 125838.836  128355.344       1.605     545.479     339.878     429.765       1.264

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   464.11    -0.16   464.11     0.40   588.76
 MEAN    17.74     0.00    -0.02   464.11    -0.16   464.11     0.40
 HUB     15.05     0.00    -0.02   464.11    -0.16   464.11     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.55    46.36     7.19   628.24   781.21    19.74   572.57     0.67
 MEAN    50.12    43.40     6.72   555.26   723.80    19.74   572.57     0.62
 HUB     45.44    38.84     6.60   471.10   661.43    19.74   572.57     0.56

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   549.04   288.03   467.43  1195.54     0.46
 MEAN    17.51   561.50   301.92   473.42  1192.26     0.47
 HUB     14.85   609.83   375.83   480.26  1188.99     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   573.38   332.07     0.48  5709.08
 MEAN   548.00   533.55   246.08     0.45  5288.47     1.47
 HUB    464.84   488.44    89.01     0.41  5583.50

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.59     1.16    22.14   619.23     1.05   594.07     0.92     0.91
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 MEAN    25.31     1.15    21.74   617.12     1.04   590.80     0.92     0.91
 HUB     25.50     1.16    21.31   618.60     1.05   587.56     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.64    35.39    31.50     3.89     0.93     0.33     2.90
 MEAN    32.53    27.46    23.50     3.96     0.93     0.33     3.28     0.91
 HUB     38.05    10.50     6.50     4.00     0.93     0.33     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     567.174     303.904     478.882    1192.898       0.475       0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.429      21.779     591.463      46.000      32.400      31.500      -0.900

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     488.375     303.904     575.211    1199.879       0.407       0.248

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.396      22.655     598.406     471.992       0.019       0.345

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     473.556       0.000     473.556    1201.071       0.394       0.260

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.752     599.596       0.000       0.060       0.037       0.274

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      25.329       1.152     618.316      27.762     239.489       1.857

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 173031.312       0.450    1599.506 1419891.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.977   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.580    3587.000      25.329     618.316       1.000       1.000       0.980
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.653    3285.370       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.700     513.330     301.899     401.059       1.328

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   443.82    -0.15   443.82     0.37   552.17
 MEAN    16.97     0.00    -0.02   443.82    -0.15   443.82     0.37
 HUB     14.32     0.00    -0.02   443.82    -0.15   443.82     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.65    46.36     7.29   602.89   748.75    23.05   601.88     0.62
 MEAN    50.13    43.80     6.33   531.23   692.34    23.05   601.88     0.58
 HUB     45.29    37.84     7.45   448.25   630.91    23.05   601.88     0.52

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   524.24   272.22   448.02  1222.43     0.43
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 MEAN    16.57   534.36   282.99   453.27  1219.33     0.44
 HUB     13.89   577.30   349.86   459.22  1216.24     0.47
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   549.86   318.77     0.45  5142.42
 MEAN   518.80   510.95   235.82     0.42  4692.77     1.47
 HUB    434.79   467.00    84.94     0.38  4861.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.87     1.14    25.44   644.13     1.04   621.20     0.92     0.91
 MEAN    28.55     1.13    25.02   641.87     1.04   618.05     0.92     0.91
 HUB     28.67     1.13    24.57   642.72     1.04   614.91     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.28    35.43    31.50     3.93     0.93     0.33     2.90
 MEAN    31.98    27.49    23.50     3.99     0.93     0.32     3.29     0.91
 HUB     37.30    10.48     6.50     3.98     0.93     0.33     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     527.025     284.577     443.589    1220.973       0.432       0.053

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.657      25.210     619.732      46.000      32.682      32.400      -0.282

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     460.022     284.577     540.930    1226.397       0.375       0.264

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.632      25.979     625.251     456.573       0.017       0.353

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     436.768       0.000     436.768    1228.102       0.356       0.259

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.166     626.991       0.000       0.060       0.037       0.314

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.880      28.559       1.128     642.908      24.592     248.701       1.928

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 153369.375       0.439    1417.751 1420815.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.977   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.580    3587.000      28.559     642.908       1.000       1.000       0.980
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.738    3221.921       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.867     509.668     273.038     390.276       1.429

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   406.89    -0.14   406.89     0.33   515.08
 MEAN    15.91     0.00    -0.02   406.89    -0.14   406.89     0.33
 HUB     13.07     0.00    -0.02   406.89    -0.14   406.89     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.65    47.36     7.29   573.46   703.26    26.47   629.10     0.57
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 MEAN    50.76    44.80     5.96   498.12   643.29    26.47   629.10     0.52
 HUB     45.17    38.84     6.33   409.12   577.11    26.47   629.10     0.47
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   491.17   265.78   413.05  1247.17     0.39
 MEAN    15.50   495.92   266.48   418.24  1243.70     0.40
 HUB     12.59   528.60   315.75   423.94  1240.24     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   508.03   295.79     0.41  4770.66
 MEAN   485.11   471.94   218.63     0.38  4132.06     1.50
 HUB    394.10   431.12    78.35     0.35  3977.11

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.10     1.12    28.84   666.84     1.04   646.72     0.92     0.91
 MEAN    31.61     1.11    28.33   663.64     1.03   643.13     0.92     0.91
 HUB     31.49     1.10    27.79   662.86     1.03   639.56     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.76    35.61    31.50     4.11     0.93     0.34     2.90
 MEAN    32.50    27.60    23.50     4.10     0.92     0.33     3.34     0.91
 HUB     36.68    10.47     6.50     3.97     0.92     0.32     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      501.559     271.368      421.806    1244.021       0.403      -0.005

     Pt3          Ps3         Ts3          Vane No.     Alpha3     Vane A3      Incid3
     31.666       28.309      643.466       46.000      32.755      33.000       0.245

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth         Cmth          Aoth         Machth      cp 2-Th
     15.219      442.541     271.368      519.118    1248.505       0.354       0.197

   BlockageThr  PtTh         PsTh        TsTh         AreaTh         w 2-Th  DiffFact4
      0.950       31.626       28.993     648.113      440.827       0.032       0.358

    VANED DIFFUSER EXIT:
   R4           C4           Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701      413.475       0.000      413.475    1250.502       0.331       0.291

   Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       29.302      650.188       0.000        0.060       0.037       0.288

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.880       31.609        1.107      664.447       21.538     261.966       2.031

Del Enthalpy   Del_H/U^2    GHP       Reynolds#
 134407.531       0.426    1242.467 1458081.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc   TR
    882669.88   8159.4243     159.8008      2.0923       0.8702       6.9773      1.2709
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    P&W Fan Hub + 4 Stage LPC 95% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     158.444    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   72.01982

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     154.784    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  121887.875  124325.375       1.845     831.557     450.763     619.754       1.375

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   371.89    -0.13   371.89     0.34   643.21
  MEAN    17.06     0.00    -0.02   371.89    -0.13   371.89     0.34
  HUB     12.51     0.00    -0.02   371.89    -0.13   371.89     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.07    50.47     9.60   645.77   745.31    13.97   511.26     0.67
  MEAN    55.15    47.20     7.95   534.02   650.86    13.97   511.26     0.59
  HUB     46.49    38.62     7.87   391.59   540.14    13.97   511.26     0.49

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   617.80   382.83   484.90  1130.11     0.55
  MEAN    18.04   645.96   413.47   496.29  1124.60     0.57
  HUB     15.00   733.92   521.23   516.68  1115.74     0.66

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   551.60   262.94     0.49  7900.33
  MEAN   564.57   518.78   151.10     0.46  7459.54     1.41
  HUB    469.54   519.26    51.69     0.47  7820.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.09     1.26    15.58   562.54     1.08   530.66     0.92     0.91
  MEAN    18.85     1.25    15.07   560.32     1.07   525.47     0.92     0.91
  HUB     19.05     1.26    14.24   562.13     1.08   517.16     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     38.29    28.47    24.20     4.27     0.93     0.35     2.90
  MEAN    39.80    16.93    12.70     4.23     0.93     0.30     3.51     0.91
  HUB     45.25    -5.71    -9.30     3.59     0.93     0.15     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.998

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     655.126     412.667     508.818    1124.883       0.582      -0.002

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      18.956      15.061     525.816      24.000      39.043      35.400      -3.643

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     527.994     412.667     670.128    1138.242       0.464       0.331
   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.893      16.300     538.379     528.796       0.026       0.468

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     486.234       0.000     486.234    1141.975       0.426       0.387

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.621     541.916       0.000       0.060       0.041       0.411

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      18.831       1.246     561.663      38.853     205.880       1.596

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 241894.422       0.580    2165.872 1563779.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.444    3587.000      18.831     561.663       1.000       1.000       0.980
W Kg/sec =   72.01982

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    128.707    3447.081       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 121887.875  124325.375       1.575     590.487     374.834     474.134       1.265

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   462.78    -0.16   462.78     0.40   618.16
 MEAN    18.08     0.00    -0.02   462.78    -0.16   462.78     0.40
 HUB     15.21     0.00    -0.02   462.78    -0.16   462.78     0.40

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.27    46.36     7.91   643.27   792.56    16.82   543.78     0.69
 MEAN    50.73    42.30     8.43   565.89   731.15    16.82   543.78     0.64
 HUB     45.82    37.84     7.98   476.11   664.07    16.82   543.78     0.58

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   557.71   312.29   462.07  1168.85     0.48
 MEAN    18.01   568.92   321.06   469.66  1164.68     0.49
 HUB     15.22   616.65   389.33   478.21  1160.56     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   566.02   326.90     0.48  6380.32
 MEAN   563.76   528.66   242.69     0.45  5785.20     1.50
 HUB    476.52   486.09    87.19     0.42  5929.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.48     1.19    19.23   593.73     1.06   567.76     0.92     0.91
 MEAN    22.12     1.17    18.79   590.74     1.05   563.71     0.92     0.91
 HUB     22.21     1.18    18.32   591.46     1.05   559.71     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.05    35.28    31.50     3.78     0.93     0.35     2.90
 MEAN    34.36    27.33    23.50     3.83     0.93     0.34     3.30     0.91
 HUB     39.15    10.33     6.50     3.83     0.93     0.34     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     576.117     321.964     477.755    1165.218       0.494       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.235      18.810     564.261      46.000      33.976      30.600      -3.376

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     478.640     321.964     576.851    1174.048       0.408       0.290

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.195      19.792     572.846     511.151       0.021       0.367

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     472.546       0.000     472.546    1174.544       0.402       0.281

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.791     573.330       0.000       0.060       0.041       0.290

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      22.128       1.175     591.976      30.313     233.035       1.806

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188827.203       0.462    1690.719 1407704.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    158.444    3587.000      22.128     591.976       1.000       1.000       0.980
W Kg/sec =   72.01982

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    112.444    3357.666       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 121887.875  124325.375       1.666     545.479     327.486     429.765       1.312

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   444.81    -0.15   444.81     0.38   588.06
 MEAN    17.74      0.00    -0.02   444.81    -0.15   444.81     0.38
 HUB     15.05      0.00    -0.02   444.81    -0.15   444.81     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.71     46.36      8.35   628.24   769.89     20.05   575.46      0.65
 MEAN    51.31     43.40      7.91   555.26   711.58     20.05   575.46      0.60
 HUB     46.65     38.84      7.81   471.10   648.03     20.05   575.46      0.55

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   539.92    302.80    447.02  1199.27       0.45
 MEAN    17.51   550.65    312.69    453.26  1195.64       0.46
 HUB     14.85   596.77    379.81    460.30  1192.04       0.50

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10    548.18    317.30     0.46  6001.63
 MEAN   548.00    510.70    235.30     0.43  5476.91      1.51
 HUB    464.84    468.09     85.03     0.39  5642.51

         Pt2       PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     25.93      1.17     22.56   622.12      1.05   597.79      0.92      0.91
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 MEAN    25.58     1.16    22.12   619.49     1.05   594.18     0.92     0.91
 HUB     25.69     1.16    21.65   620.32     1.05   590.59     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.11    35.37    31.50     3.87     0.93     0.36     2.90
 MEAN    34.60    27.44    23.50     3.94     0.93     0.35     3.28     0.91
 HUB     39.53    10.47     6.50     3.97     0.93     0.35     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     556.109     314.746     458.467    1196.280       0.465       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.701      22.160     594.827      46.000      34.470      31.500      -2.970

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     466.273     314.746     562.561    1203.965       0.387       0.284

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.666      23.141     602.494     471.992       0.020       0.376

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     452.449       0.000     452.449    1205.024       0.375       0.292

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.218     603.554       0.000       0.060       0.040       0.305

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      25.594       1.157     620.642      28.666     228.888       1.774

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 178666.969       0.465    1599.747 1363921.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.444    3587.000      25.594     620.642       1.000       1.000       0.980
W Kg/sec =   72.01982

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     99.545    3279.208       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 121887.875  124325.375       1.771     513.330     289.934     401.059       1.383

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   424.46    -0.15   424.46     0.35   551.14
 MEAN    16.97     0.00    -0.02   424.46    -0.15   424.46     0.35
 HUB     14.32     0.00    -0.02   424.46    -0.15   424.46     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.86    46.36     8.50   602.89   737.44    23.49   605.61     0.61
 MEAN    51.38    43.80     7.58   531.23   680.09    23.49   605.61     0.56
 HUB     46.57    37.84     8.73   448.25   617.44    23.49   605.61     0.51

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   515.02   287.05   427.60  1226.86     0.42
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 MEAN    16.57   523.32   293.83   433.05  1223.45     0.43
 HUB     13.89   563.97   353.85   439.15  1220.04     0.46
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   524.62   303.94     0.43  5422.26
 MEAN   518.80   488.00   224.98     0.40  4872.32     1.52
 HUB    434.79   446.55    80.94     0.37  4917.04

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.36     1.15    26.00   647.86     1.04   625.73     0.92     0.91
 MEAN    28.96     1.13    25.53   645.10     1.04   622.25     0.92     0.91
 HUB     28.99     1.13    25.04   645.32     1.04   618.79     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.87    35.41    31.50     3.91     0.93     0.36     2.90
 MEAN    34.16    27.45    23.50     3.95     0.93     0.35     3.29     0.91
 HUB     38.86    10.44     6.50     3.94     0.93     0.35     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     516.787     295.479     423.982    1224.973       0.422       0.051

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.068      25.716     623.811      46.000      34.873      32.400      -2.473

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     438.513     295.479     528.773    1231.084       0.356       0.300

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.041      26.600     630.050     456.573       0.017       0.386

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     416.702       0.000     416.702    1232.603       0.338       0.292

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.760     631.606       0.000       0.060       0.039       0.345

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      28.965       1.132     646.094      25.452     237.018       1.837

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 158740.844       0.454    1421.333 1364113.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.444    3587.000      28.965     646.094       1.000       1.000       0.980
W Kg/sec =   72.01982

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.744    3213.968       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 121887.875  124325.375       1.950     509.668     261.405     390.276       1.493

     ROTOR LEADING EDGE CONDITIONS, STAGE             5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   388.54    -0.13   388.54     0.31   513.81
 MEAN    15.91     0.00    -0.02   388.54    -0.13   388.54     0.31
 HUB     13.07     0.00    -0.02   388.54    -0.13   388.54     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.89    47.36     8.53   573.46   692.80    27.04   633.50     0.56
 MEAN    52.05    44.80     7.25   498.12   631.84    27.04   633.50     0.51
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HUB     46.49    38.84     7.65   409.12   564.32    27.04   633.50     0.46

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   483.09   279.93   393.72  1252.07     0.39
MEAN    15.50   485.63   276.84   398.99  1248.34     0.39
HUB     12.59   515.68   319.58   404.72  1244.63     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    561.57   484.08   281.63     0.39  5024.43
MEAN   485.11   450.07   208.27     0.36  4292.55     1.54
HUB    394.10   411.52    74.52     0.33  4025.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     32.74     1.13    29.54   671.30     1.04   651.84     0.92     0.91
MEAN    32.17     1.11    28.98   667.63     1.03   647.96     0.92     0.91
HUB     31.96     1.10    28.40   666.29     1.03   644.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.41    35.58    31.50     4.08     0.93     0.37     2.90
MEAN    34.76    27.56    23.50     4.06     0.93     0.35     3.34     0.91
HUB     38.30    10.43     6.50     3.93     0.93     0.34     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     491.310     281.921     402.376    1248.642       0.393      -0.006

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    32.223      28.959     648.273      46.000      35.017      33.000      -2.017

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     421.084     281.921     506.746    1253.777       0.336       0.239

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      32.183      29.764     653.616     440.827       0.032       0.392

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     393.816       0.000     393.816    1255.553       0.314       0.326

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      30.041     655.470       0.000       0.060       0.038       0.322

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.881      32.163       1.110     668.404      22.310     249.308       1.933

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 139232.812       0.442    1246.662 1399973.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    907362.31   8124.3330    154.7835      2.1290      0.8688      7.9532      1.2785
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 95% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     153.237    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   69.65320

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     149.697    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  117882.562  120239.961       1.907     831.557     435.951     619.754       1.422

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   358.22    -0.12   358.22     0.32   643.21
  MEAN    17.06     0.00    -0.02   358.22    -0.12   358.22     0.32
  HUB     12.51     0.00    -0.02   358.22    -0.12   358.22     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.99    50.47    10.52   645.77   738.58    14.05   512.09     0.67
  MEAN    56.15    47.20     8.95   534.02   643.14    14.05   512.09     0.58
  HUB     47.56    38.62     8.94   391.59   530.81    14.05   512.09     0.48

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   609.34   393.50   465.24  1132.20     0.54
  MEAN    18.04   634.89   419.53   476.53  1126.43     0.56
  HUB     15.00   717.86   519.15   495.79  1117.62     0.64

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   529.23   252.27     0.47  8120.49
  MEAN   564.57   498.12   145.05     0.44  7568.69     1.45
  HUB    469.54   498.27    49.61     0.45  7788.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.20     1.27    15.76   563.64     1.08   532.63     0.92     0.91
  MEAN    18.90     1.25    15.23   560.87     1.07   527.21     0.92     0.91
  HUB     19.02     1.26    14.41   561.98     1.07   518.94     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     40.22    28.47    24.20     4.27     0.93     0.38     2.90
  MEAN    41.36    16.93    12.70     4.23     0.93     0.32     3.51     0.91
  HUB     46.32    -5.71    -9.30     3.59     0.93     0.17     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     643.284     418.711     488.360    1126.789       0.571       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.000      15.228     527.600      24.000      40.609      35.400      -5.209

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     505.523     418.711     656.409    1140.818       0.443       0.360
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      18.930      16.539     540.818     528.796       0.028       0.492

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     466.539       0.000     466.539    1144.151       0.408       0.407

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      16.817     543.983       0.000       0.060       0.046       0.431

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
    0.873      18.860       1.248     562.163      39.353     200.132       1.551

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 245004.688       0.588    2121.634 1506272.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.993

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   153.237    3587.000      18.860     562.163       1.000       1.000       0.980
W Kg/sec =   69.65320

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
   124.338    3445.549       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.631     590.487     362.111     474.134       1.309

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   444.40    -0.15   444.40     0.39   617.88
 MEAN    18.08     0.00    -0.02   444.40    -0.15   444.40     0.39
 HUB     15.21     0.00    -0.02   444.40    -0.15   444.40     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.37    46.36     9.01   643.27   781.97    17.00   545.67     0.68
 MEAN    51.86    42.30     9.56   565.89   719.65    17.00   545.67     0.63
 HUB     46.98    37.84     9.14   476.11   651.40    17.00   545.67     0.57

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   550.07   325.90   443.13  1171.51     0.47
 MEAN    18.01   559.29   331.00   450.83  1167.05     0.48
 HUB     15.22   604.60   392.97   459.47  1162.62     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   542.70   313.30     0.46  6658.02
 MEAN   563.76   507.37   232.76     0.43  5964.04     1.55
 HUB    476.52   467.01    83.55     0.40  5984.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.67     1.20    19.49   595.62     1.06   570.36     0.92     0.91
 MEAN    22.25     1.18    19.01   592.14     1.05   566.02     0.92     0.91
 HUB     22.26     1.18    18.51   592.24     1.05   561.72     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.33    35.26    31.50     3.76     0.93     0.38     2.90
 MEAN    36.29    27.31    23.50     3.81     0.94     0.36     3.30     0.91
 HUB     40.54    10.31     6.50     3.81     0.94     0.36     3.92


  blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     566.067     331.928     458.537    1167.604       0.485       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.356      19.032     566.577      46.000      35.900      30.600      -5.300

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     458.354     331.928     565.919    1177.059       0.389       0.322

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.309      20.091     575.790     511.151       0.024       0.396

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     452.814       0.000     452.814    1177.490       0.385       0.308

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.075     576.212       0.000       0.060       0.046       0.317

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      22.234       1.179     593.333      31.170     223.634       1.734

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 194168.406       0.475    1681.414 1351830.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.995

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    153.237    3587.000      22.234     593.333       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    108.357    3353.824       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 117882.562  120239.961       1.728     545.479     315.585     429.765       1.362

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   426.63    -0.15   426.63     0.36   587.38
 MEAN    17.74     0.00    -0.02   426.63    -0.15   426.63     0.36
 HUB     15.05     0.00    -0.02   426.63    -0.15   426.63     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.83    46.36     9.47   628.24   759.53    20.31   578.14     0.64
 MEAN    52.47    43.40     9.07   555.26   700.35    20.31   578.14     0.59
 HUB     47.85    38.84     9.01   471.10   635.68    20.31   578.14     0.54

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   532.39   316.41   428.17  1202.65     0.44
 MEAN    17.51   541.21   322.64   434.52  1198.74     0.45
 HUB     14.85   584.91   383.48   441.66  1194.85     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   524.94   303.69     0.44  6270.98
 MEAN   548.00   489.48   225.35     0.41  5650.98     1.56
 HUB    464.84   449.09    81.37     0.38  5696.82

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     26.22     1.18    22.91   624.83     1.05   601.17     0.92     0.91
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 MEAN    25.80     1.16    22.43   621.72     1.05   597.27     0.92     0.91
 HUB     25.83     1.16    21.92   621.95     1.05   593.39     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.46    35.35    31.50     3.85     0.93     0.38     2.90
 MEAN    36.60    27.41    23.50     3.91     0.93     0.37     3.28     0.91
 HUB     40.97    10.44     6.50     3.94     0.93     0.37     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     546.480     324.760     439.512    1199.363       0.456       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.915      22.472     597.904      46.000      36.461      31.500      -4.961

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     445.969     324.760     551.686    1207.685       0.369       0.318

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.872      23.545     606.230     471.992       0.022       0.407

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     433.106       0.000     433.106    1208.625       0.358       0.319

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.599     607.174       0.000       0.060       0.045       0.333

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      25.791       1.160     622.831      29.498     219.394       1.701

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 183860.938       0.478    1592.156 1309161.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3587.000      25.791     622.831       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.705    3273.439       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.842     513.330     278.753     401.059       1.439

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   406.66    -0.14   406.66     0.34   550.17
 MEAN    16.97     0.00    -0.02   406.66    -0.14   406.66     0.34
 HUB     14.32     0.00    -0.02   406.66    -0.14   406.66     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.01    46.36     9.65   602.89   727.33    23.85   609.03     0.60
 MEAN    52.57    43.80     8.77   531.23   669.12    23.85   609.03     0.55
 HUB     47.79    37.84     9.95   448.25   605.33    23.85   609.03     0.50

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   507.60   300.41   409.16  1230.85     0.41
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 MEAN    16.57   513.94   303.59   414.69  1227.18     0.42
 HUB     13.89   552.16   357.45   420.85  1223.51     0.45
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   501.84   290.58     0.41  5674.49
 MEAN   518.80   467.20   215.21     0.38  5034.08     1.56
 HUB    434.79   427.89    77.34     0.35  4966.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.74     1.15    26.46   651.31     1.05   629.82     0.92     0.91
 MEAN    29.28     1.14    25.95   648.10     1.04   626.06     0.92     0.91
 HUB     29.23     1.13    25.41   647.76     1.04   622.33     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.29    35.38    31.50     3.88     0.93     0.38     2.90
 MEAN    36.21    27.43    23.50     3.93     0.93     0.37     3.29     0.91
 HUB     40.34    10.41     6.50     3.91     0.93     0.37     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     508.107     305.300     406.158    1228.596       0.414       0.049

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.382      26.116     627.519      46.000      36.931      32.400      -4.531

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     419.154     305.300     518.554    1235.314       0.339       0.334

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.350      27.100     634.400     456.573       0.019       0.418

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     398.676       0.000     398.676    1236.674       0.322       0.320

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.231     635.798       0.000       0.060       0.044       0.371

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      29.266       1.135     649.059      26.227     226.825       1.758

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 163582.328       0.468    1416.552 1308913.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3587.000      29.266     649.059       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.101    3206.620       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       2.032     509.668     250.796     390.276       1.556

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   372.01    -0.13   372.01     0.30   512.63
 MEAN    15.91     0.00    -0.02   372.01    -0.13   372.01     0.30
 HUB     13.07     0.00    -0.02   372.01    -0.13   372.01     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.03    47.36     9.67   573.46   683.67    27.49   637.52     0.55
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MEAN    53.25    44.80     8.45   498.12   621.80    27.49   637.52     0.50
HUB     47.73    38.84     8.89   409.12   553.06    27.49   637.52     0.45
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   476.79   292.44   376.57  1256.45     0.38
MEAN    15.50   477.08   286.03   381.83  1252.52     0.38
HUB     12.59   504.44   322.93   387.53  1248.60     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    561.57   462.86   269.13     0.37  5248.68
MEAN   485.11   430.61   199.09     0.34  4434.77     1.59
HUB    394.10   394.01    71.17     0.32  4067.33

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     33.23     1.14    30.08   675.39     1.04   656.43     0.92     0.91
MEAN    32.59     1.11    29.48   671.30     1.03   652.32     0.92     0.91
HUB     32.30     1.10    28.87   669.46     1.03   648.24     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.83    35.55    31.50     4.05     0.93     0.40     2.90
MEAN    36.84    27.54    23.50     4.04     0.93     0.38     3.34     0.91
HUB     39.80    10.41     6.50     3.91     0.93     0.36     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     482.825     291.271     385.072    1252.792       0.385       -0.007

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    32.642      29.461     652.609      46.000      37.104      33.000      -4.104

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     402.202     291.271     496.594    1258.490       0.320       0.275

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      32.594      30.365     658.560     440.827       0.035       0.424

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     376.480       0.000     376.480    1260.085       0.299       0.356

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      30.613     660.230       0.000       0.060       0.042       0.352

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.878      32.570       1.113     672.050      22.991     238.490       1.849

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 143496.406       0.455    1242.616 1343503.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    930112.75   8054.3711    149.6973      2.1560      0.8632      8.9529      1.2855
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 95% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.974   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     147.976    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   67.26170

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     144.557    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  113835.133  116111.594       1.975     831.557     420.983     619.754       1.472

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   344.58    -0.12   344.58     0.31   643.21
  MEAN    17.06     0.00    -0.02   344.58    -0.12   344.58     0.31
  HUB     12.51     0.00    -0.02   344.58    -0.12   344.58     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.92    50.47    11.45   645.77   732.06    14.13   512.89     0.66
  MEAN    57.17    47.20     9.97   534.02   635.64    14.13   512.89     0.57
  HUB     48.66    38.62    10.04   391.59   521.70    14.13   512.89     0.47

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   601.77   403.83   446.14  1134.14     0.53
  MEAN    18.04   624.53   425.40   457.24  1128.14     0.55
  HUB     15.00   702.43   517.10   475.41  1119.39     0.63

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   507.52   241.94     0.45  8333.52
  MEAN   564.57   477.95   139.17     0.42  7674.57     1.50
  HUB    469.54   477.78    47.56     0.43  7757.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.30     1.28    15.93   564.71     1.08   534.47     0.92     0.91
  MEAN    18.94     1.25    15.38   561.40     1.07   528.83     0.92     0.91
  HUB     18.98     1.26    14.56   561.82     1.07   520.62     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     42.15    28.47    24.20     4.27     0.93     0.40     2.90
  MEAN    42.93    16.93    12.70     4.23     0.94     0.35     3.51     0.91
  HUB     47.41    -5.71    -9.30     3.59     0.94     0.20     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     632.218     424.575     468.440    1128.562       0.560       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.036      15.379     529.261      24.000      42.188      35.400      -6.788

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     483.893     424.575     643.752    1143.209       0.423       0.388
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.956      16.755     543.088     528.796       0.031       0.516

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     447.501       0.000     447.501    1146.185       0.390       0.426

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.991     545.919       0.000       0.060       0.052       0.450

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.866      18.877       1.250     562.646      39.836     194.498       1.508

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 248010.453       0.595    2073.924 1448913.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.974   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3587.000      18.877     562.646       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.015    3444.071       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.689     590.487     349.520     474.134       1.357

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   426.58    -0.15   426.58     0.37   617.62
 MEAN    18.08     0.00    -0.02   426.58    -0.15   426.58     0.37
 HUB     15.21     0.00    -0.02   426.58    -0.15   426.58     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.46    46.36    10.10   643.27   771.98    17.16   547.45     0.67
 MEAN    53.00    42.30    10.70   565.89   708.78    17.16   547.45     0.62
 HUB     48.15    37.84    10.31   476.11   639.37    17.16   547.45     0.56

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   543.58   338.79   425.08  1173.97     0.46
 MEAN    18.01   550.66   340.48   432.78  1169.25     0.47
 HUB     15.22   593.28   396.39   441.42  1164.55     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   520.52   300.41     0.44  6921.09
 MEAN   563.76   486.98   223.28     0.42  6134.65     1.59
 HUB    476.52   448.63    80.12     0.39  6036.55

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.82     1.21    19.70   597.43     1.06   572.76     0.92     0.90
 MEAN    22.35     1.18    19.19   593.48     1.05   568.16     0.92     0.90
 HUB     22.29     1.18    18.66   592.98     1.05   563.59     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.55    35.25    31.50     3.75     0.93     0.40     2.90
 MEAN    38.19    27.29    23.50     3.79     0.94     0.39     3.30     0.90
 HUB     41.92    10.29     6.50     3.79     0.94     0.38     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     557.047     341.434     440.141    1169.807       0.476       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.451      19.219     568.719      46.000      37.802      30.600      -7.202

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     439.100     341.434     556.225    1179.853       0.372       0.353

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.393      20.349     578.530     511.151       0.027       0.426

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     434.131       0.000     434.131    1180.223       0.368       0.332

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.314     578.892       0.000       0.060       0.054       0.342

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      22.306       1.182     594.629      31.984     214.910       1.666

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 199237.484       0.488    1666.072 1296830.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 9.974   EfDer =  0.990

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    147.976    3587.000      22.306     594.629       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    104.410    3350.167       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.794     545.479     304.090     429.765       1.413

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   409.35    -0.14   409.35     0.35   586.74
 MEAN    17.74     0.00    -0.02   409.35    -0.14   409.35     0.35
 HUB     15.05     0.00    -0.02   409.35    -0.14   409.35     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.92    46.36    10.56   628.24   749.96    20.53   580.64     0.63
 MEAN    53.61    43.40    10.21   555.26   689.96    20.53   580.64     0.58
 HUB     49.02    38.84    10.18   471.10   624.21    20.53   580.64     0.53

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   526.14   329.06   410.54  1205.74     0.44
 MEAN    17.51   532.92   331.95   416.91  1201.59     0.44
 HUB     14.85   574.02   386.87   424.07  1197.45     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   503.24   291.04     0.42  6521.54
 MEAN   548.00   469.57   216.05     0.39  5813.82     1.60
 HUB    464.84   431.17    77.97     0.36  5747.19

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.44     1.19    23.19   627.38     1.06   604.28     0.92     0.91
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 MEAN    25.97     1.16    22.68   623.83     1.05   600.13     0.92     0.91
 HUB     25.92     1.16    22.15   623.50     1.05   595.99     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.71    35.33    31.50     3.83     0.93     0.40     2.90
 MEAN    38.53    27.39    23.50     3.89     0.94     0.39     3.28     0.91
 HUB     42.37    10.42     6.50     3.92     0.94     0.39     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     538.039     334.129     421.716    1202.198       0.448       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.076      22.723     600.741      46.000      38.390      31.500      -6.890

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     427.066     334.129     542.243    1211.110       0.353       0.350

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.024      23.878     609.680     471.992       0.025       0.437

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     415.127       0.000     415.127    1211.943       0.343       0.344

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.906     610.519       0.000       0.060       0.052       0.358

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      25.930       1.162     624.904      30.274     210.759       1.634

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188700.797       0.491    1577.962 1255474.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 9.974   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3587.000      25.930     624.904       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.077    3268.008       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.914     513.330     268.187     401.059       1.495

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   390.06    -0.13   390.06     0.32   549.25
 MEAN    16.97     0.00    -0.02   390.06    -0.13   390.06     0.32
 HUB     14.32     0.00    -0.02   390.06    -0.13   390.06     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.10    46.36    10.74   602.89   718.18    24.14   612.21     0.59
 MEAN    53.72    43.80     9.92   531.23   659.16    24.14   612.21     0.54
 HUB     48.98    37.84    11.14   448.25   594.31    24.14   612.21     0.49

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   501.54   312.61   392.20  1234.48     0.41
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 MEAN    16.57   505.86   312.57   397.73  1230.59     0.41
 HUB     13.89   541.51   360.70   403.88  1226.71     0.44
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   480.96   278.38     0.39  5904.61
 MEAN   518.80   448.02   206.23     0.36  5182.77     1.61
 HUB    434.79   410.62    74.09     0.33  5012.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.04     1.16    26.81   654.54     1.05   633.55     0.92     0.91
 MEAN    29.51     1.14    26.27   650.92     1.04   629.57     0.92     0.91
 HUB     29.39     1.13    25.71   650.06     1.04   625.60     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.56    35.37    31.50     3.87     0.93     0.40     2.90
 MEAN    38.16    27.41    23.50     3.91     0.94     0.39     3.29     0.91
 HUB     41.77    10.39     6.50     3.89     0.94     0.39     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     500.662     314.328     389.693    1231.914       0.406       0.046

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.615      26.428     630.927      46.000      38.890      32.400      -6.490

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     401.410     314.328     509.835    1239.185       0.324       0.365

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.574      27.499     638.396     456.573       0.022       0.448

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     382.173       0.000     382.173    1240.405       0.308       0.345

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.598     639.654       0.000       0.060       0.051       0.394

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.868      29.477       1.137     651.839      26.936     217.746       1.688

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 168006.469       0.481    1404.911 1254963.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 9.974   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3587.000      29.477     651.839       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     82.724    3199.774       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       2.115     509.668     240.965     390.276       1.620

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   356.84    -0.12   356.84     0.29   511.54
 MEAN    15.91     0.00    -0.02   356.84    -0.12   356.84     0.29
 HUB     13.07     0.00    -0.02   356.84    -0.12   356.84     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.11    47.36    10.75   573.46   675.52    27.83   641.22     0.54
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MEAN    54.39    44.80     9.59   498.12   612.84    27.83   641.22     0.49
HUB     48.91    38.84    10.07   409.12   542.97    27.83   641.22     0.44
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   471.80   303.73   361.03  1260.44     0.37
MEAN    15.50   469.83   294.34   366.21  1256.33     0.37
HUB     12.59   494.48   325.95   371.84  1252.23     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    561.57   443.64   257.83     0.35  5451.24
MEAN   485.11   412.92   190.78     0.33  4563.45     1.64
HUB    394.10   378.03    68.14     0.30  4105.36

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     33.59     1.14    30.49   679.18     1.04   660.62     0.92     0.91
MEAN    32.90     1.12    29.87   674.73     1.04   656.32     0.92     0.91
HUB     32.54     1.10    29.22   672.43     1.03   652.04     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.07    35.53    31.50     4.03     0.93     0.42     2.90
MEAN    38.79    27.52    23.50     4.02     0.94     0.40     3.34     0.91
HUB     41.24    10.39     6.50     3.89     0.94     0.38     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.993

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     475.652     299.733     369.331    1256.577       0.379       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.947      29.843     656.581      46.000      39.061      33.000      -6.061

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     385.178     299.733     488.059    1262.776       0.305       0.307

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      32.885      30.829     663.075     440.827       0.040       0.454

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     360.826       0.000     360.826    1264.217       0.285       0.383

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      31.048     664.590       0.000       0.060       0.049       0.377

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      32.856       1.115     675.446      23.607     228.979       1.775

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 147349.781       0.467    1232.175 1288345.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    951305.00   7955.0439    144.5575      2.1749      0.8547      9.9739      1.2920
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 95% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.975   EfDer =  0.986

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     142.874    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   64.94257

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     139.573    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  109910.180  112108.148       2.046     831.557     406.468     619.754       1.525

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   331.51    -0.11   331.51     0.30   643.21
  MEAN    17.06     0.00    -0.02   331.51    -0.11   331.51     0.30
  HUB     12.51     0.00    -0.02   331.51    -0.11   331.51     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.83    50.47    12.36   645.77   725.99    14.20   513.63     0.65
  MEAN    58.17    47.20    10.97   534.02   628.65    14.20   513.63     0.57
  HUB     49.76    38.62    11.14   391.59   513.16    14.20   513.63     0.46

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   595.28   413.47   428.25  1135.88     0.52
  MEAN    18.04   615.20   430.89   439.09  1129.69     0.54
  HUB     15.00   688.13   515.13   456.25  1120.99     0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   487.20   232.30     0.43  8532.29
  MEAN   564.57   458.99   133.69     0.41  7773.43     1.55
  HUB    469.54   458.52    45.60     0.41  7728.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.38     1.28    16.07   565.71     1.08   536.12     0.92     0.90
  MEAN    18.97     1.26    15.50   561.90     1.07   530.29     0.92     0.90
  HUB     18.95     1.25    14.69   561.67     1.07   522.13     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     43.99    28.48    24.20     4.28     0.93     0.43     2.90
  MEAN    44.46    16.93    12.70     4.23     0.94     0.37     3.51     0.90
  HUB     48.47    -5.71    -9.30     3.59     0.94     0.22     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     622.256     430.050     449.733    1130.153       0.551       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.063      15.510     530.754      24.000      43.718      35.400      -8.318

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     463.767     430.050     632.474    1145.357       0.405       0.414
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.972      16.943     545.131     528.796       0.035       0.540

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     429.716       0.000     429.716    1148.024       0.374       0.443

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.139     547.672       0.000       0.060       0.059       0.467

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.857      18.882       1.250     563.095      40.285     189.175       1.466

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 250808.750       0.601    2025.010 1393961.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.975   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    142.874    3587.000      18.882     563.095       1.000       1.000       0.980
W Kg/sec =   64.94257

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    115.891    3442.696       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109910.180  112108.148       1.750     590.487     337.510     474.134       1.405

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   409.89    -0.14   409.89     0.36   617.37
 MEAN    18.08     0.00    -0.02   409.89    -0.14   409.89     0.36
 HUB     15.21     0.00    -0.02   409.89    -0.14   409.89     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.50    46.36    11.14   643.27   762.88    17.29   549.07     0.66
 MEAN    54.09    42.30    11.79   565.89   698.86    17.29   549.07     0.61
 HUB     49.28    37.84    11.44   476.11   628.35    17.29   549.07     0.55

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   538.28   350.63   408.41  1176.15     0.46
 MEAN    18.01   543.14   349.18   416.02  1171.22     0.46
 HUB     15.22   583.00   399.52   424.59  1166.29     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   500.07   288.57     0.43  7162.77
 MEAN   563.76   468.10   214.58     0.40  6291.25     1.64
 HUB    476.52   431.51    77.00     0.37  6083.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.94     1.22    19.87   599.09     1.06   574.90     0.92     0.90
 MEAN    22.42     1.19    19.34   594.71     1.06   570.08     0.92     0.90
 HUB     22.29     1.18    18.79   593.67     1.05   565.29     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.65    35.24    31.50     3.74     0.93     0.42     2.90
 MEAN    40.01    27.28    23.50     3.78     0.94     0.41     3.30     0.90
 HUB     43.26    10.28     6.50     3.78     0.94     0.39     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     549.188     350.159     423.080    1171.779       0.469       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.520      19.370     570.642      46.000      39.613      30.600      -9.013

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     421.368     350.159     547.871    1182.367       0.356       0.381

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.450      20.561     581.000     511.151       0.032       0.454

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     416.950       0.000     416.950    1182.681       0.353       0.353

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.507     581.309       0.000       0.060       0.063       0.364

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.852      22.350       1.184     595.825      32.730     207.049       1.605

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 203888.938       0.499    1646.183 1244706.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.975   EfDer =  0.985

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    142.874    3587.000      22.350     595.825       1.000       1.000       0.980
W Kg/sec =   64.94257

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    100.716    3346.802       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109910.180  112108.148       1.860     545.479     293.334     429.765       1.465

     ROTOR LEADING EDGE CONDITIONS, STAGE             3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   393.42    -0.14   393.42     0.33   586.15
 MEAN    17.74     0.00    -0.02   393.42    -0.14   393.42     0.33
 HUB     15.05     0.00    -0.02   393.42    -0.14   393.42     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.95    46.36    11.59   628.24   741.38    20.70   582.91     0.63
 MEAN    54.69    43.40    11.29   555.26   680.62    20.70   582.91     0.57
 HUB     50.14    38.84    11.30   471.10   613.88    20.70   582.91     0.52

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   521.13   340.52   394.50  1208.50      0.43
 MEAN    17.51   525.84   340.38   400.81  1204.14      0.44
 HUB     14.85   564.30   389.93   407.91  1199.80      0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   483.52   279.59     0.40  6748.36
 MEAN   548.00   451.39   207.62     0.37  5961.24      1.65
 HUB    464.84   414.74    74.91     0.35  5792.50

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     26.61     1.19    23.41   629.72     1.06   607.05     0.92     0.90
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 MEAN    26.08     1.17    22.88   625.77     1.05   602.69     0.92     0.90
 HUB     25.97     1.16    22.32   624.92     1.05   598.34     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.80    35.33    31.50     3.83     0.93     0.43     2.90
 MEAN    40.34    27.38    23.50     3.88     0.94     0.41     3.28     0.90
 HUB     43.71    10.41     6.50     3.91     0.94     0.41     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     530.821     342.611     405.448    1204.732       0.441       0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.189      22.917     603.283      46.000      40.198      31.500      -8.698

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     409.905     342.611     534.232    1214.174       0.338       0.379

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.126      24.142     612.777     471.992       0.029       0.465

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     398.818       0.000     398.818    1214.915       0.328       0.366

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.144     613.526       0.000       0.060       0.061       0.380

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.856      26.017       1.164     626.801      30.976     203.093       1.574

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 193078.703       0.502    1558.902 1204726.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.975   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    142.874    3587.000      26.017     626.801       1.000       1.000       0.980
W Kg/sec =   64.94257

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.739    3263.056       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109910.180  112108.148       1.986     513.330     258.468     401.059       1.552

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   374.97    -0.13   374.97     0.31   548.42
 MEAN    16.97     0.00    -0.02   374.97    -0.13   374.97     0.31
 HUB     14.32     0.00    -0.02   374.97    -0.13   374.97     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.13    46.36    11.77   602.89   710.09    24.36   615.07     0.58
 MEAN    54.79    43.80    10.99   531.23   650.34    24.36   615.07     0.53
 HUB     50.10    37.84    12.26   448.25   584.51    24.36   615.07     0.48

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   496.76   323.53   376.96  1237.71     0.40
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 MEAN    16.57   499.03   320.60   382.43  1233.64     0.40
 HUB     13.89   532.13   363.62   388.52  1229.57     0.43
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   462.20   267.46     0.37  6110.73
 MEAN   518.80   430.74   198.21     0.35  5315.72     1.65
 HUB    434.79   394.99    71.17     0.32  5052.49

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.25     1.16    27.07   657.47     1.05   636.89     0.92     0.90
 MEAN    29.68     1.14    26.51   653.48     1.04   632.71     0.92     0.90
 HUB     29.49     1.13    25.92   652.16     1.04   628.54     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.64    35.36    31.50     3.86     0.93     0.43     2.90
 MEAN    39.97    27.40    23.50     3.90     0.94     0.41     3.29     0.90
 HUB     43.10    10.38     6.50     3.88     0.94     0.40     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     494.399     322.400     374.818    1234.877       0.400       0.044

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.774      26.658     633.980      46.000      40.700      32.400      -8.300

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     385.479     322.400     502.529    1242.639       0.310       0.393

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.723      27.803     641.975     456.573       0.025       0.476

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     367.361       0.000     367.361    1243.740       0.295       0.367

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.870     643.112       0.000       0.060       0.059       0.414

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      29.611       1.138     654.371      27.569     209.795       1.626

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 171965.859       0.492    1388.438 1204060.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =10.975   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    142.874    3587.000      29.611     654.371       1.000       1.000       0.980
W Kg/sec =   64.94257

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     79.664    3193.578       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109910.180  112108.148       2.196     509.668     232.054     390.276       1.682

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   343.19    -0.12   343.19     0.28   510.55
 MEAN    15.91     0.00    -0.02   343.19    -0.12   343.19     0.28
 HUB     13.07     0.00    -0.02   343.19    -0.12   343.19     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.11    47.36    11.75   573.46   668.41    28.09   644.55     0.54
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 MEAN    55.44    44.80    10.64   498.12   604.99    28.09   644.55     0.49
 HUB     50.02    38.84    11.18   409.12   534.10    28.09   644.55     0.43
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   467.92   313.71   347.17  1263.97     0.37
 MEAN    15.50   463.80   301.71   352.25  1259.72     0.37
 HUB     12.59   485.79   328.63   357.77  1255.48     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   426.57   247.85     0.34  5630.15
 MEAN   485.11   397.14   183.41     0.32  4677.62     1.69
 HUB    394.10   363.71    65.47     0.29  4138.97

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     33.85     1.14    30.79   682.61     1.04   664.35     0.92     0.90
 MEAN    33.10     1.12    30.14   677.83     1.04   659.90     0.92     0.90
 HUB     32.69     1.10    29.48   675.13     1.03   655.45     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.10    35.52    31.50     4.02     0.93     0.44     2.90
 MEAN    40.58    27.50    23.50     4.00     0.94     0.42     3.34     0.90
 HUB     42.57    10.37     6.50     3.87     0.94     0.39     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      469.694     307.240      355.269    1259.946       0.373       -0.009

     Pt3          Ps3         Ts3          Vane No.     Alpha3     Vane A3      Incid3
     33.151       30.116      660.128       46.000      40.854      33.000      -7.854

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth         Cmth          Aoth         Machth       cp 2-Th
     15.219      370.072     307.240      480.988    1266.585       0.292        0.336

   BlockageThr  PtTh         PsTh        TsTh         AreaTh         w 2-Th  DiffFact4
      0.950       33.073       31.169      667.104     440.827       0.045       0.482

    VANED DIFFUSER EXIT:
   R4           C4           Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701      346.917       0.000      346.917    1267.898       0.274       0.405

   Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       31.362      668.488        0.000       0.060       0.057       0.398

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.863       33.038        1.116      678.522       24.151     220.738       1.711

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 150758.906       0.478    1217.215 1236300.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    970501.12   7835.7480     139.5732      2.1869       0.8445      10.9747      1.2978
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 95% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.981

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     137.937    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   62.69868

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     134.751    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  106112.586  108234.609       2.119     831.557     392.423     619.754       1.579

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   319.00    -0.11   319.00     0.29   643.21
  MEAN    17.06     0.00    -0.02   319.00    -0.11   319.00     0.29
  HUB     12.51     0.00    -0.02   319.00    -0.11   319.00     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.72    50.47    13.25   645.77   720.36    14.27   514.31     0.65
  MEAN    59.15    47.20    11.95   534.02   622.14    14.27   514.31     0.56
  HUB     50.84    38.62    12.22   391.59   505.17    14.27   514.31     0.45

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   589.72   422.47   411.44  1137.44     0.52
  MEAN    18.04   606.77   436.01   421.98  1131.09     0.54
  HUB     15.00   674.84   513.23   438.19  1122.45     0.60

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   468.13   223.30     0.41  8717.87
  MEAN   564.57   441.13   128.57     0.39  7865.69     1.60
  HUB    469.54   440.36    43.69     0.39  7699.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.46     1.29    16.19   566.65     1.08   537.60     0.92     0.90
  MEAN    19.00     1.26    15.61   562.36     1.08   531.61     0.92     0.90
  HUB     18.91     1.25    14.80   561.53     1.07   523.49     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     45.76    28.49    24.20     4.29     0.93     0.45     2.90
  MEAN    45.94    16.94    12.70     4.24     0.94     0.39     3.51     0.90
  HUB     49.51    -5.69    -9.30     3.61     0.94     0.24     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     613.265     435.159     432.123    1131.585       0.542       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.084      15.624     532.100      24.000      45.201      35.400      -9.801

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	444.958	435.159	622.375	1147.294	0.388	0.438

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.980	17.107	546.976	528.796	0.039	0.563

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	413.032	0.000	413.032	1149.691	0.359	0.458

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.265	549.264	0.000	0.060	0.067	0.482

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.848	18.878	1.250	563.513	40.703	184.143	1.427

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
253409.453	0.608	1975.314	1341379.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =11.953 EfDer = 0.975

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
137.937	3587.000	18.878	563.513	1.000	1.000	0.980

W Kg/sec = 62.69868

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
111.950	3441.420	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
106112.586	108234.609	1.811	590.487	326.035	474.134	1.454

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	394.20	-0.14	394.20	0.34	617.14
MEAN	18.08	0.00	-0.02	394.20	-0.14	394.20	0.34	
HUB	15.21	0.00	-0.02	394.20	-0.14	394.20	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.51	46.36	12.15	643.27	754.56	17.40	550.54	0.66
MEAN	55.15	42.30	12.85	565.89	689.77	17.40	550.54	0.60
HUB	50.38	37.84	12.54	476.11	618.23	17.40	550.54	0.54

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	533.96	361.57	392.90	1178.12	0.45
MEAN	18.01	536.60	357.26	400.38	1172.99	0.46
HUB	15.22	573.62	402.38	408.81	1167.88	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	481.09	277.62	0.41	7386.09	
MEAN	563.76	450.49	206.50	0.38	6436.62	1.68
HUB	476.52	415.47	74.13	0.36	6127.55	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.04	1.22	20.01	600.63	1.07	576.83	0.92	0.89
MEAN	22.47	1.19	19.46	595.86	1.06	571.82	0.92	0.89
HUB	22.29	1.18	18.90	594.31	1.05	566.83	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.62	35.24	31.50	3.74	0.93	0.44	2.90	
MEAN	41.74	27.28	23.50	3.78	0.94	0.43	3.30	0.89
HUB	44.55	10.28	6.50	3.78	0.94	0.41	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.975
    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     542.337     358.259     407.160    1173.554       0.462       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.568      19.491     572.375      46.000      41.344      30.600     -10.744

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     404.907     358.259     540.647    1184.645       0.342       0.408

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.486      20.738     583.244     511.151       0.036       0.482

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     401.009       0.000     401.009    1184.911       0.338       0.373

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.663     583.506       0.000       0.060       0.073       0.384

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.840      22.370       1.185     596.934      33.421     199.892       1.550

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 208191.156       0.510    1622.840 1195271.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.978

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    137.937    3587.000      22.370     596.934       1.000       1.000       0.980
W Kg/sec =   62.69868

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     97.238    3343.694       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 106112.586  108234.609       1.926     545.479     283.204     429.765       1.518

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   378.60    -0.13   378.60     0.32   585.61
 MEAN    17.74     0.00    -0.02   378.60    -0.13   378.60     0.32
 HUB     15.05     0.00    -0.02   378.60    -0.13   378.60     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.93    46.36    12.57   628.24   733.62    20.84   584.97     0.62
 MEAN    55.72    43.40    12.32   555.26   672.16    20.84   584.97     0.57
 HUB     51.22    38.84    12.38   471.10   604.48    20.84   584.97     0.51

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   517.09   350.99   379.72  1210.97     0.43
 MEAN    17.51   519.72   348.09   385.94  1206.45     0.43
 HUB     14.85   555.53   392.70   392.94  1201.92     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   465.41   269.11     0.38  6955.80
 MEAN   548.00   434.64   199.91     0.36  6096.15     1.69
 HUB    464.84   399.50    72.14     0.33  5833.57

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.73     1.20    23.58   631.87     1.06   609.55     0.92     0.90
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 MEAN    26.16     1.17    23.03   627.55     1.05   605.01     0.92     0.90
 HUB     25.99     1.16    22.45   626.23     1.05   600.48     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.75    35.33    31.50     3.83     0.93     0.45     2.90
 MEAN    42.05    27.38    23.50     3.88     0.94     0.43     3.28     0.90
 HUB     44.98    10.40     6.50     3.90     0.94     0.42     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     524.584     350.373     390.419    1207.018       0.435       0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.264      23.064     605.583      46.000      41.906      31.500     -10.406

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     394.134     350.373     527.354    1216.945       0.324       0.406

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.189      24.351     615.586     471.992       0.033       0.493

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     383.830       0.000     383.830    1217.606       0.315       0.386

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.328     616.255       0.000       0.060       0.071       0.399

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.845      26.065       1.165     628.551      31.618     196.191       1.521

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 197079.594       0.513    1536.226 1156668.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.937    3587.000      26.065     628.551       1.000       1.000       0.980
W Kg/sec =   62.69868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     85.636    3258.511       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106112.586  108234.609       2.058     513.330     249.433     401.059       1.608

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   361.07    -0.12   361.07     0.30   547.66
 MEAN    16.97     0.00    -0.02   361.07    -0.12   361.07     0.30
 HUB     14.32     0.00    -0.02   361.07    -0.12   361.07     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.09    46.36    12.73   602.89   702.85    24.52   617.68     0.58
 MEAN    55.80    43.80    12.00   531.23   642.42    24.52   617.68     0.53
 HUB     51.16    37.84    13.32   448.25   575.68    24.52   617.68     0.47

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   492.91   333.41   363.04  1240.61     0.40
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 MEAN    16.57   493.18   327.87   368.42  1236.39     0.40
 HUB     13.89   523.75   366.25   374.41  1232.17     0.43
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   445.13   257.58     0.36  6297.24
 MEAN   518.80   414.95   190.93     0.34  5436.19     1.70
 HUB    434.79   380.63    68.54     0.31  5088.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.41     1.17    27.27   660.16     1.05   639.89     0.92     0.90
 MEAN    29.78     1.14    26.69   655.83     1.04   635.54     0.92     0.90
 HUB     29.54     1.13    26.08   654.09     1.04   631.21     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.56    35.36    31.50     3.86     0.93     0.45     2.90
 MEAN    41.67    27.40    23.50     3.90     0.94     0.43     3.29     0.90
 HUB     44.37    10.37     6.50     3.87     0.94     0.42     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     489.046     329.714     361.185    1237.551       0.395       0.042

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.876      26.825     636.743      46.000      42.392      32.400      -9.992

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     370.951     329.714     496.302    1245.757       0.298       0.420

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.815      28.034     645.215     456.573       0.029       0.503

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     353.849       0.000     353.849    1246.755       0.284       0.386

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.071     646.249       0.000       0.060       0.068       0.431

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.848      29.688       1.139     656.694      28.143     202.709       1.571

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 175550.109       0.503    1368.404 1155906.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.937    3587.000      29.688     656.694       1.000       1.000       0.980
W Kg/sec =   62.69868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     76.851    3187.924       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106112.586  108234.609       2.277     509.668     223.861     390.276       1.743

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   330.72    -0.11   330.72     0.27   509.65
 MEAN    15.91     0.00    -0.02   330.72    -0.11   330.72     0.27
 HUB     13.07     0.00    -0.02   330.72    -0.11   330.72     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.03    47.36    12.67   573.46   662.09    28.27   647.58     0.53
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 MEAN    56.42    44.80    11.62   498.12   598.00    28.27   647.58     0.48
 HUB     51.06    38.84    12.22   409.12   526.17    28.27   647.58     0.42
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   464.88   322.72   334.61  1267.15     0.37
 MEAN    15.50   458.66   308.33   339.56  1262.79     0.36
 HUB     12.59   478.06   330.99   344.95  1258.42     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   411.11   238.85     0.32  5791.69
 MEAN   485.11   382.82   176.79     0.30  4780.15     1.74
 HUB    394.10   350.67    63.11     0.28  4168.63

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.02     1.15    31.00   685.74     1.04   667.72     0.92     0.90
 MEAN    33.23     1.12    30.34   680.67     1.04   663.13     0.92     0.90
 HUB     32.76     1.10    29.66   677.60     1.03   658.55     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.96    35.52    31.50     4.02     0.93     0.46     2.90
 MEAN    42.24    27.50    23.50     4.00     0.94     0.44     3.34     0.90
 HUB     43.82    10.37     6.50     3.87     0.94     0.41     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.983

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     464.626     313.981     342.481    1262.983       0.368       -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.280      30.308     663.338      46.000      42.514      33.000      -9.514

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     356.403     313.981     474.982    1270.016       0.281       0.361

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.184      31.417     670.745     440.827       0.052       0.509

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     334.318       0.000     334.318    1271.219       0.263       0.425

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      31.585     672.017       0.000       0.060       0.066       0.417

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.853      33.142       1.116     681.335      24.641     213.444       1.655

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 153824.031       0.488    1199.051 1187048.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    988054.38   7701.8345    134.7507      2.1938      0.8333     11.9530      1.3032
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 95% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.037   EfDer =  0.973

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     132.525    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   60.23870

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     129.464    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  101949.258  103988.031       2.206     831.557     377.027     619.754       1.644

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   305.44    -0.11   305.44     0.27   643.21
  MEAN    17.06     0.00    -0.02   305.44    -0.11   305.44     0.27
  HUB     12.51     0.00    -0.02   305.44    -0.11   305.44     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.69    50.47    14.22   645.77   714.46    14.34   515.02     0.64
  MEAN    60.24    47.20    13.04   534.02   615.30    14.34   515.02     0.55
  HUB     52.05    38.62    13.43   391.59   496.71    14.34   515.02     0.45

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   584.35   432.00   393.50  1139.04     0.51
  MEAN    18.04   598.15   441.40   403.66  1132.53     0.53
  HUB     15.00   660.83   511.13   418.85  1123.94     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   447.82   213.77     0.39  8914.36
  MEAN   564.57   422.04   123.17     0.37  7962.92     1.66
  HUB    469.54   420.91    41.59     0.37  7668.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.53     1.29    16.31   567.64     1.09   539.12     0.92     0.89
  MEAN    19.02     1.26    15.72   562.85     1.08   532.97     0.92     0.89
  HUB     18.86     1.25    14.92   561.37     1.07   524.90     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     47.67    28.51    24.20     4.31     0.93     0.48     2.90
  MEAN    47.56    16.97    12.70     4.27     0.94     0.42     3.51     0.89
  HUB     50.67    -5.67    -9.30     3.63     0.94     0.27     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     604.059     440.544     413.289    1133.047       0.533       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.100      15.735     533.475      24.000      46.828      35.400     -11.428

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     424.962     440.544     612.104    1149.277       0.370       0.464
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.981      17.269     548.868     528.796       0.044       0.589

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     395.226       0.000     395.226    1151.408       0.343       0.474

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.387     550.905       0.000       0.060       0.077       0.498

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.836      18.866       1.249     563.952      41.142     178.741       1.386

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 256145.047       0.614    1918.300 1284351.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.037   EfDer =  0.966

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    132.525    3587.000      18.866     563.952       1.000       1.000       0.980
W Kg/sec =   60.23870

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    107.671    3440.079       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 101949.258  103988.031       1.883     590.487     313.573     474.134       1.512

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   377.42    -0.13   377.42     0.33   616.90
 MEAN    18.08     0.00    -0.02   377.42    -0.13   377.42     0.33
 HUB     15.21     0.00    -0.02   377.42    -0.13   377.42     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.60    46.36    13.24   643.27   745.92    17.51   552.06     0.65
 MEAN    56.31    42.30    14.01   565.89   680.31    17.51   552.06     0.59
 HUB     51.60    37.84    13.76   476.11   607.66    17.51   552.06     0.53

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   530.01   373.06   376.48  1180.12     0.45
 MEAN    18.01   530.12   365.74   383.74  1174.82     0.45
 HUB     15.22   563.89   405.38   391.96  1169.51     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   461.04   266.13     0.39  7620.60
 MEAN   563.76   431.82   198.02     0.37  6589.31     1.73
 HUB    476.52   398.37    71.14     0.34  6173.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.12     1.23    20.13   602.25     1.07   578.80     0.92     0.88
 MEAN    22.51     1.19    19.57   597.07     1.06   573.60     0.92     0.88
 HUB     22.27     1.18    18.99   594.98     1.06   568.43     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.74    35.26    31.50     3.76     0.93     0.47     2.90
 MEAN    43.62    27.29    23.50     3.79     0.95     0.45     3.30     0.88
 HUB     45.96    10.29     6.50     3.79     0.95     0.43     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     535.542     366.766     390.240    1175.370       0.456       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.602      19.599     574.151      46.000      43.224      30.600     -12.624

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     387.489     366.766     533.540    1186.992       0.326       0.436

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.505      20.902     585.561     511.151       0.041       0.512

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     384.134       0.000     384.134    1187.211       0.324       0.393

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.805     585.777       0.000       0.060       0.085       0.405

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.827      22.372       1.186     598.098      34.146     192.468       1.492

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 212706.531       0.521    1592.984 1142074.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.037   EfDer =  0.971

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    132.525    3587.000      22.372     598.098       1.000       1.000       0.980
W Kg/sec =   60.23870

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     93.505    3340.438       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 101949.258  103988.031       2.003     545.479     272.332     429.765       1.578

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   362.89    -0.12   362.89     0.31   585.04
 MEAN    17.74     0.00    -0.02   362.89    -0.12   362.89     0.31
 HUB     15.05     0.00    -0.02   362.89    -0.12   362.89     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.99    46.36    13.63   628.24   725.62    20.97   587.11     0.61
 MEAN    56.84    43.40    13.44   555.26   663.43    20.97   587.11     0.56
 HUB     52.40    38.84    13.56   471.10   594.76    20.97   587.11     0.50

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   513.43   361.92   364.17  1213.51     0.42
 MEAN    17.51   513.73   356.15   370.23  1208.82     0.42
 HUB     14.85   546.50   395.56   377.08  1204.12     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   446.41   258.18     0.37  7172.15
 MEAN   548.00   416.99   191.85     0.34  6237.22     1.75
 HUB    464.84   383.39    69.28     0.32  5876.02

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.83     1.20    23.72   634.12     1.06   612.12     0.92     0.89
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 MEAN    26.22     1.17    23.15   629.42     1.05   607.40     0.92     0.89
 HUB     25.98     1.16    22.56   627.61     1.05   602.68     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.82    35.34    31.50     3.84     0.93     0.47     2.90
 MEAN    43.89    27.39    23.50     3.89     0.94     0.45     3.28     0.89
 HUB     46.37    10.41     6.50     3.91     0.94     0.44     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     518.469     358.490     374.560    1209.364       0.429       0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.314      23.188     607.950      46.000      43.744      31.500     -12.244

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     377.564     358.490     520.643    1219.800       0.310       0.435

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.225      24.538     618.487     471.992       0.038       0.522

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     368.071       0.000     368.071    1220.382       0.302       0.406

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.486     619.078       0.000       0.060       0.082       0.419

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.833      26.083       1.166     630.384      32.287     189.081       1.466

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 201252.453       0.523    1507.203 1105001.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =13.037   EfDer =  0.973

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    132.525    3587.000      26.083     630.384       1.000       1.000       0.980
W Kg/sec =   60.23870

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     82.340    3253.770       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 101949.258  103988.031       2.140     513.330     239.833     401.059       1.672

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   346.43    -0.12   346.43     0.28   546.86
 MEAN    16.97     0.00    -0.02   346.43    -0.12   346.43     0.28
 HUB     14.32     0.00    -0.02   346.43    -0.12   346.43     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.12    46.36    13.76   602.89   695.43    24.66   620.37     0.57
 MEAN    56.90    43.80    13.10   531.23   634.30    24.66   620.37     0.52
 HUB     52.31    37.84    14.47   448.25   566.61    24.66   620.37     0.46

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   489.44   343.68   348.48  1243.58     0.39
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 MEAN    16.57   487.49   335.45   353.72  1239.22     0.39
 HUB     13.89   515.15   368.91   359.57  1234.84     0.42
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   427.32   247.32     0.34  6490.88
 MEAN   518.80   398.41   183.35     0.32  5561.75     1.75
 HUB    434.79   365.55    65.88     0.30  5125.88

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.52     1.17    27.43   662.96     1.05   642.98     0.92     0.89
 MEAN    29.85     1.14    26.83   658.30     1.04   638.47     0.92     0.89
 HUB     29.54     1.13    26.21   656.11     1.04   633.97     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.60    35.36    31.50     3.86     0.93     0.47     2.90
 MEAN    43.48    27.40    23.50     3.90     0.94     0.45     3.29     0.89
 HUB     45.73    10.38     6.50     3.88     0.94     0.44     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     483.860     337.338     346.878    1240.302       0.390       0.040

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.941      26.955     639.594      46.000      44.201      32.400     -11.801

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     355.765     337.338     490.271    1248.970       0.285       0.447

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.867      28.230     648.565     456.573       0.033       0.533

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     339.712       0.000     339.712    1249.866       0.272       0.406

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.233     649.496       0.000       0.060       0.079       0.448

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.836      29.722       1.140     659.122      28.738     195.460       1.515

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 179266.609       0.513    1342.548 1104166.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.037   EfDer =  0.976

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    132.525    3587.000      29.722     659.122       1.000       1.000       0.980
W Kg/sec =   60.23870

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     73.887    3182.046       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 101949.258  103988.031       2.368     509.668     215.230     390.276       1.813

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   317.65    -0.11   317.65     0.25   508.71
 MEAN    15.91     0.00    -0.02   317.65    -0.11   317.65     0.25
 HUB     13.07     0.00    -0.02   317.65    -0.11   317.65     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.02    47.36    13.66   573.46   655.66    28.42   650.71     0.52
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 MEAN    57.48    44.80    12.68   498.12   590.87    28.42   650.71     0.47
 HUB     52.18    38.84    13.34   409.12   518.05    28.42   650.71     0.41
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   462.17   332.01   321.51  1270.42     0.36
 MEAN    15.50   453.67   315.18   326.31  1265.94     0.36
 HUB     12.59   470.20   333.43   331.53  1261.45     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   395.06   229.56     0.31  5958.20
 MEAN   485.11   367.90   169.93     0.29  4886.33     1.79
 HUB    394.10   337.04    60.67     0.27  4199.31

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.14     1.15    31.16   689.00     1.05   671.20     0.92     0.89
 MEAN    33.31     1.12    30.48   683.63     1.04   666.47     0.92     0.89
 HUB     32.79     1.10    29.79   680.18     1.03   661.75     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.92    35.53    31.50     4.03     0.93     0.48     2.90
 MEAN    44.01    27.51    23.50     4.01     0.94     0.46     3.34     0.89
 HUB     45.16    10.37     6.50     3.87     0.94     0.43     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.976

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     459.723     320.963     329.132    1266.110       0.363       -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.357      30.451     666.651      46.000      44.280      33.000     -11.280

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219     342.190     320.963     469.161    1273.549       0.269        0.387

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.242      31.614     674.508     440.827       0.059       0.537

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     321.201       0.000     321.201    1274.644       0.252        0.444

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      31.757     675.669       0.000       0.060       0.076        0.436

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.842      33.192       1.117     684.269      25.147     206.012        1.597

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 156990.156       0.498    1175.718 1134099.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1006360.75   7536.7529    129.4638      2.1971      0.8199     13.0371      1.3088
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 95% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.962   EfDer =  0.967

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     127.956    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   58.16170

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     125.000    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   98434.109  100402.578       2.284     831.557     364.027     619.754       1.702

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   294.10    -0.10   294.10     0.26   643.21
  MEAN    17.06     0.00    -0.02   294.10    -0.10   294.10     0.26
  HUB     12.51     0.00    -0.02   294.10    -0.10   294.10     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     65.52    50.47    15.05   645.77   709.68    14.39   515.59     0.64
  MEAN    61.16    47.20    13.96   534.02   609.74    14.39   515.59     0.55
  HUB     53.10    38.62    14.48   391.59   489.82    14.39   515.59     0.44

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   580.37   439.79   378.70  1140.29     0.51
  MEAN    18.04   591.34   445.81   388.51  1133.67     0.52
  HUB     15.00   649.41   509.34   402.86  1125.12     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   431.10   205.98     0.38  9074.98
  MEAN   564.57   406.25   118.76     0.36  8042.37     1.71
  HUB    469.54   404.83    39.81     0.36  7641.41

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.58     1.30    16.40   568.44     1.09   540.31     0.92     0.88
  MEAN    19.03     1.26    15.80   563.25     1.08   534.04     0.92     0.88
  HUB     18.82     1.25    15.01   561.23     1.07   526.01     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     49.27    28.54    24.20     4.34     0.93     0.50     2.90
  MEAN    48.93    17.00    12.70     4.30     0.95     0.44     3.51     0.88
  HUB     51.66    -5.64    -9.30     3.66     0.95     0.29     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     596.792     444.944     397.725    1134.200       0.526       0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.108      15.819     534.562      24.000      48.207      35.400     -12.807

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     408.512     444.944     604.034    1150.849       0.355       0.486
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      18.977      17.392     550.371     528.796       0.048       0.611

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     380.518       0.000     380.518    1152.776       0.330       0.487

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      17.478     552.216       0.000       0.060       0.086       0.511

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
    0.825      18.850       1.248     564.310      41.500     174.258       1.351

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 258370.312       0.620    1868.249 1236673.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.962   EfDer =  0.958

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   127.956    3587.000      18.850     564.310       1.000       1.000       0.980
W Kg/sec =   58.16170

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
   104.082    3438.989       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 98434.109  100402.578       1.948     590.487     303.120     474.134       1.564

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   363.53    -0.13   363.53     0.32   616.70
 MEAN    18.08     0.00    -0.02   363.53    -0.13   363.53     0.32
 HUB     15.21     0.00    -0.02   363.53    -0.13   363.53     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.53    46.36    14.17   643.27   738.99    17.59   553.28     0.64
 MEAN    57.29    42.30    14.99   565.89   672.70    17.59   553.28     0.58
 HUB     52.64    37.84    14.80   476.11   599.13    17.59   553.28     0.52

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   527.25   382.40   362.99  1181.71     0.45
 MEAN    18.01   525.16   372.64   370.04  1176.26     0.45
 HUB     15.22   556.04   407.76   378.05  1170.81     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   444.64   256.80     0.38  7811.19
 MEAN   563.76   416.48   191.12     0.35  6713.43     1.78
 HUB    476.52   384.25    68.76     0.33  6209.20

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.18     1.23    20.21   603.57     1.07   580.35     0.92     0.88
 MEAN    22.53     1.20    19.64   598.05     1.06   575.02     0.92     0.88
 HUB     22.24     1.18    19.05   595.51     1.06   569.70     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.49    35.28    31.50     3.78     0.93     0.49     2.90
 MEAN    45.20    27.32    23.50     3.82     0.95     0.46     3.30     0.88
 HUB     47.17    10.31     6.50     3.81     0.95     0.45     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.958

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     530.330     373.683     376.313    1176.808       0.451       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.617      19.672     575.560      46.000      44.799      30.600     -14.199

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     373.200     373.683     528.126    1188.865       0.314       0.460

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.508      21.021     587.414     511.151       0.046       0.538

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     370.273       0.000     370.273    1189.049       0.311       0.409

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.905     587.596       0.000       0.060       0.095       0.421

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.815      22.360       1.186     599.043      34.733     186.491       1.446

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 216368.188       0.530    1564.536 1097888.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.962   EfDer =  0.963

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    127.956    3587.000      22.360     599.043       1.000       1.000       0.980
W Kg/sec =   58.16170

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     90.401    3337.802       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  98434.109  100402.578       2.072     545.479     263.294     429.765       1.632

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   349.95    -0.12   349.95     0.29   584.58
 MEAN    17.74     0.00    -0.02   349.95    -0.12   349.95     0.29
 HUB     15.05     0.00    -0.02   349.95    -0.12   349.95     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.89    46.36    14.53   628.24   719.24    21.06   588.82     0.60
 MEAN    57.78    43.40    14.38   555.26   656.44    21.06   588.82     0.55
 HUB     53.40    38.84    14.56   471.10   586.96    21.06   588.82     0.49

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   510.89   370.78   351.46  1215.52      0.42
 MEAN    17.51   509.17   362.68   357.37  1210.71      0.42
 HUB     14.85   539.27   397.86   364.04  1205.88      0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   430.91   249.32     0.35  7347.63
 MEAN   548.00   402.56   185.32     0.33  6351.47      1.79
 HUB    464.84   370.15    66.99     0.31  5909.97

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     26.89     1.20    23.81   635.95     1.06   614.16     0.92     0.88
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 MEAN    26.24     1.17    23.23   630.94     1.05   609.31     0.92     0.88
 HUB     25.96     1.16    22.63   628.73     1.05   604.45     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.53    35.35    31.50     3.85     0.93     0.49     2.90
 MEAN    45.42    27.41    23.50     3.91     0.95     0.47     3.28     0.88
 HUB     47.54    10.43     6.50     3.93     0.95     0.46     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.963

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     513.808     365.063     361.563    1211.234       0.424       0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.333      23.265     609.839      46.000      45.276      31.500     -13.776

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     364.031     365.063     515.548    1222.082       0.298       0.459

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.233      24.665     620.812     471.992       0.042       0.547

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     355.181       0.000     355.181    1222.605       0.291       0.422

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.589     621.343       0.000       0.060       0.092       0.435

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.821      26.074       1.166     631.871      32.828     183.376       1.422

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 204630.688       0.532    1479.663 1062112.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =13.962   EfDer =  0.966

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    127.956    3587.000      26.074     631.871       1.000       1.000       0.980
W Kg/sec =   58.16170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     79.619    3249.939       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  98434.109  100402.578       2.213     513.330     231.911     401.059       1.729

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   334.43    -0.12   334.43     0.27   546.22
 MEAN    16.97     0.00    -0.02   334.43    -0.12   334.43     0.27
 HUB     14.32     0.00    -0.02   334.43    -0.12   334.43     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.99    46.36    14.63   602.89   689.53    24.75   622.54     0.56
 MEAN    57.81    43.80    14.01   531.23   627.83    24.75   622.54     0.51
 HUB     53.28    37.84    15.44   448.25   559.35    24.75   622.54     0.46

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   487.03   351.98   336.62  1245.95     0.39
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 MEAN    16.57   483.15   341.55   341.72  1241.48     0.39
 HUB     13.89   508.32   371.06   347.42  1236.99     0.41
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   412.84   239.01     0.33  6647.60
 MEAN   518.80   384.95   177.25     0.31  5662.81     1.80
 HUB    434.79   353.22    63.73     0.29  5155.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.58     1.17    27.52   665.23     1.05   645.45     0.92     0.88
 MEAN    29.88     1.15    26.91   660.29     1.04   640.82     0.92     0.88
 HUB     29.52     1.13    26.28   657.75     1.04   636.19     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.28    35.38    31.50     3.88     0.93     0.49     2.90
 MEAN    44.99    27.42    23.50     3.92     0.95     0.47     3.29     0.88
 HUB     46.88    10.40     6.50     3.90     0.95     0.45     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     479.921     343.474     335.186    1242.501       0.386       0.038

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.962      27.030     641.878      46.000      45.700      32.400     -13.300

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     343.399     343.474     485.692    1251.542       0.274       0.470

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.879      28.355     651.254     456.573       0.037       0.557

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     328.181       0.000     328.181    1252.361       0.262       0.421

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.331     652.106       0.000       0.060       0.089       0.462

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.825      29.717       1.140     661.089      29.218     189.670       1.470

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 182267.062       0.522    1317.954 1061228.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.962   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    127.956    3587.000      29.717     661.089       1.000       1.000       0.980
W Kg/sec =   58.16170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     71.456    3177.309       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  98434.109  100402.578       2.449     509.668     208.151     390.276       1.875

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   306.97    -0.11   306.97     0.24   507.95
 MEAN    15.91     0.00    -0.02   306.97    -0.11   306.97     0.24
 HUB     13.07     0.00    -0.02   306.97    -0.11   306.97     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.84    47.36    14.48   573.46   650.55    28.50   653.23     0.52
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 MEAN    58.36    44.80    13.56   498.12   585.20    28.50   653.23     0.47
 HUB     53.13    38.84    14.29   409.12   511.57    28.50   653.23     0.41
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   460.33   339.51   310.87  1273.03     0.36
 MEAN    15.50   449.91   320.73   315.51  1268.46     0.35
 HUB     12.59   463.95   335.37   320.59  1263.88     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   382.03   222.05     0.30  6092.78
 MEAN   485.11   355.77   164.38     0.28  4972.25     1.83
 HUB    394.10   325.92    58.73     0.26  4223.66

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.20     1.15    31.24   691.64     1.05   673.98     0.92     0.89
 MEAN    33.34     1.12    30.56   686.02     1.04   669.15     0.92     0.89
 HUB     32.78     1.10    29.86   682.27     1.03   664.33     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.52    35.54    31.50     4.04     0.93     0.50     2.90
 MEAN    45.47    27.52    23.50     4.02     0.94     0.47     3.34     0.89
 HUB     46.29    10.38     6.50     3.88     0.94     0.44     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     456.032     326.612     318.261    1268.611       0.359       -0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.380      30.527     669.310      46.000      45.742      33.000     -12.742

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219     330.648     326.612     464.762    1276.379       0.259        0.408

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.248      31.731     677.532     440.827       0.066       0.561

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     310.536       0.000     310.536    1277.391       0.243        0.460

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      31.853     678.607       0.000       0.060       0.086        0.450

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.831       33.191       1.117     686.645      25.555     200.083        1.551

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 159545.109       0.506    1153.654 1090131.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1021181.38   7384.0552    125.0000      2.1971      0.8079     13.9618      1.3134
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 95% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =14.990   EfDer =  0.958

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     122.926    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   55.87555

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     120.087    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   94564.961   96456.062       2.378     831.557     349.718     619.754       1.772

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   281.73    -0.10   281.73     0.25   643.21
  MEAN    17.06     0.00    -0.02   281.73    -0.10   281.73     0.25
  HUB     12.51     0.00    -0.02   281.73    -0.10   281.73     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     66.43    50.47    15.96   645.77   704.64    14.45   516.18     0.63
  MEAN    62.19    47.20    14.99   534.02   603.87    14.45   516.18     0.54
  HUB     54.27    38.62    15.65   391.59   482.49    14.45   516.18     0.43

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   576.53   448.10   362.75  1141.59     0.51
  MEAN    18.04   584.31   450.50   372.12  1134.85     0.51
  HUB     15.00   637.25   507.36   385.58  1126.35     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   413.11   197.67     0.36  9246.41
  MEAN   564.57   389.22   114.08     0.34  8126.80     1.78
  HUB    469.54   387.43    37.82     0.34  7611.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.63     1.30    16.49   569.31     1.09   541.54     0.92     0.88
  MEAN    19.04     1.26    15.88   563.68     1.08   535.16     0.92     0.88
  HUB     18.77     1.24    15.10   561.08     1.07   527.17     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     51.01    28.59    24.20     4.39     0.93     0.52     2.90
  MEAN    50.44    17.04    12.70     4.34     0.95     0.46     3.51     0.88
  HUB     52.77    -5.60    -9.30     3.70     0.95     0.32     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.958

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     589.281     449.620     380.911    1135.390       0.519       0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.112      15.902     535.685      24.000      49.729      35.400     -14.329

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     390.803     449.620     595.723    1152.480       0.339       0.509
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.968      17.515     551.932     528.796       0.053       0.636

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     364.619       0.000     364.619    1154.204       0.316       0.501

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.567     553.584       0.000       0.060       0.096       0.524

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.813      18.826       1.246     564.688      41.878     169.395       1.313

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 260728.938       0.625    1811.198 1184660.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =14.990   EfDer =  0.949

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    122.926    3587.000      18.826     564.688       1.000       1.000       0.980
W Kg/sec =   55.87555

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.148    3437.835       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  94564.961   96456.062       2.025     590.487     291.664     474.134       1.626

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   348.49    -0.12   348.49     0.30   616.50
 MEAN    18.08     0.00    -0.02   348.49    -0.12   348.49     0.30
 HUB     15.21     0.00    -0.02   348.49    -0.12   348.49     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.56    46.36    15.20   643.27   731.70    17.67   554.55     0.63
 MEAN    58.38    42.30    16.08   565.89   664.69    17.67   554.55     0.58
 HUB     53.80    37.84    15.96   476.11   590.12    17.67   554.55     0.51

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   524.77   392.35   348.49  1183.35     0.44
 MEAN    18.01   520.21   379.99   355.28  1177.77     0.44
 HUB     15.22   547.81   410.27   363.00  1172.17     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   427.06   246.85     0.36  8014.19
 MEAN   563.76   399.99   183.76     0.34  6845.84     1.84
 HUB    476.52   369.00    66.25     0.31  6247.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.22     1.23    20.28   604.96     1.07   581.97     0.92     0.87
 MEAN    22.54     1.20    19.71   599.09     1.06   576.50     0.92     0.87
 HUB     22.19     1.18    19.10   596.09     1.06   571.03     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.39    35.31    31.50     3.81     0.93     0.51     2.90
 MEAN    46.93    27.35    23.50     3.85     0.95     0.48     3.30     0.87
 HUB     48.50    10.34     6.50     3.84     0.95     0.46     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.949

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     525.118     381.060     361.307    1178.301       0.446       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.619      19.733     577.024      46.000      46.524      30.600     -15.924

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     357.839     381.060     522.739    1190.825       0.300       0.485

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.499      21.131     589.356     511.151       0.051       0.566

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     355.345       0.000     355.345    1190.975       0.298       0.427

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.995     589.505       0.000       0.060       0.107       0.439

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.802      22.334       1.186     600.048      35.359     180.164       1.397

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 220266.609       0.539    1530.120 1049950.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =14.990   EfDer =  0.955

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    122.926    3587.000      22.334     600.048       1.000       1.000       0.980
W Kg/sec =   55.87555

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     87.022    3335.007       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  94564.961   96456.062       2.152     545.479     253.455     429.765       1.696

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   336.00    -0.12   336.00     0.28   584.09
 MEAN    17.74      0.00    -0.02   336.00    -0.12   336.00     0.28
 HUB     15.05      0.00    -0.02   336.00    -0.12   336.00     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.87     46.36    15.51   628.24   712.55    21.13   590.63     0.60
 MEAN    58.83     43.40    15.43   555.26   649.10    21.13   590.63     0.54
 HUB     54.51     38.84    15.67   471.10   578.74    21.13   590.63     0.49

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   508.60    380.19    337.83  1217.62       0.42
 MEAN    17.51   504.62    369.63    343.53  1212.68       0.42
 HUB     14.85   531.70    400.25    350.00  1207.72       0.44

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   414.35    239.92     0.34   7533.83
 MEAN   548.00   387.08    178.36     0.32   6473.08      1.85
 HUB    464.84   355.91     64.59     0.29   5945.52

         Pt2       PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     26.93      1.21    23.88    637.89      1.06    616.30      0.92      0.87
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 MEAN    26.25     1.18    23.30   632.56     1.05   611.31     0.92     0.87
 HUB     25.91     1.16    22.68   629.91     1.05   606.32     0.92     0.87
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.38    35.38    31.50     3.88     0.93     0.51     2.90
 MEAN    47.10    27.44    23.50     3.94     0.95     0.49     3.28     0.87
 HUB     48.83    10.46     6.50     3.96     0.95     0.47     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.955

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     509.165     372.060     347.593    1213.185       0.420       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.332      23.324     611.815      46.000      46.947      31.500     -15.447

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     349.523     372.060     510.485    1224.475       0.285       0.484

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.220      24.776     623.255     471.992       0.047       0.575

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     341.335       0.000     341.335    1224.939       0.279       0.439

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.675     623.727       0.000       0.060       0.104       0.452

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.809      26.044       1.166     633.450      33.403     177.359       1.375

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 208213.578       0.541    1446.391 1015595.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =14.990   EfDer =  0.958

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    122.926    3587.000       26.044     633.450       1.000       1.000       0.980
W Kg/sec =   55.87555

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     76.674    3245.886        1.401       0.249      53.349      56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 94564.961   96456.062        2.298     513.330     223.334     401.059       1.796

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   321.53    -0.11   321.53     0.26   545.54
 MEAN    16.97      0.00    -0.02   321.53    -0.11   321.53     0.26
 HUB     14.32      0.00    -0.02   321.53    -0.11   321.53     0.26

       BetaFlo   BetaBlade Incid   U1        W1       Ps1      Ts1     Rel Mach
 TIP     61.93    46.36    15.57   602.89   683.36    24.83   624.83     0.56
 MEAN    58.82    43.80    15.02   531.23   621.04    24.83   624.83     0.51
 HUB     54.36    37.84    16.52   448.25   551.73    24.83   624.83     0.45

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   484.85   360.77   323.92  1248.43     0.39
 MEAN    16.57   478.82   348.04   328.85  1243.85     0.38
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 HUB     13.89   501.14   373.29   334.37  1239.24     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   397.40   230.22     0.32  6813.43
 MEAN   518.80   370.54   170.77     0.30  5770.18     1.85
 HUB    434.79   339.98    61.50     0.27  5186.56

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.61     1.18    27.58   667.64     1.05   648.04     0.92     0.88
 MEAN    29.88     1.15    26.97   662.41     1.05   643.29     0.92     0.88
 HUB     29.47     1.13    26.33   659.48     1.04   638.53     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.08    35.40    31.50     3.90     0.93     0.51     2.90
 MEAN    46.62    27.44    23.50     3.94     0.95     0.49     3.29     0.88
 HUB     48.15    10.42     6.50     3.92     0.95     0.47     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.958

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     476.016     349.993     322.639    1244.805       0.382       0.036

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.955      27.078     644.278      46.000      47.329      32.400     -14.929

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     330.162     349.993     481.146    1254.243       0.263       0.494

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.861      28.456     654.085     456.573       0.041       0.584

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     315.814       0.000     315.814    1254.984       0.252       0.438

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.402     654.858       0.000       0.060       0.100       0.477

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.813      29.683       1.140     663.177      29.726     183.582       1.423

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 185440.922       0.531    1288.197 1014665.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =14.990   EfDer =  0.962

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    122.926    3587.000      29.683     663.177       1.000       1.000       0.980
W Kg/sec =   55.87555

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      68.836    3172.305       1.401       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  94564.961   96456.062       2.542     509.668     200.522     390.276       1.946

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   295.51    -0.10   295.51     0.24   507.15
 MEAN    15.91     0.00    -0.02   295.51    -0.10   295.51     0.24
 HUB     13.07     0.00    -0.02   295.51    -0.10   295.51     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.74    47.36    15.38   573.46   645.21    28.56   655.90     0.51
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MEAN    59.33    44.80    14.53   498.12   579.26    28.56   655.90     0.46
HUB     54.17    38.84    15.33   409.12   504.77    28.56   655.90     0.40
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   458.71   347.46   299.48  1275.77     0.36
MEAN    15.50   446.16   326.60   303.95  1271.11     0.35
HUB     12.59   457.38   337.37   308.84  1266.44     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    561.57   368.15   214.11     0.29  6235.21
MEAN   485.11   342.80   158.51     0.27  5063.18     1.89
HUB    394.10   314.01    56.73     0.25  4248.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     34.22     1.15    31.29   694.44     1.05   676.90     0.92     0.88
MEAN    33.33     1.12    30.61   688.57     1.04   671.97     0.92     0.88
HUB     32.72     1.10    29.90   684.48     1.03   667.05     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     49.24    35.56    31.50     4.06     0.93     0.52     2.90
MEAN    47.06    27.54    23.50     4.04     0.95     0.49     3.34     0.88
HUB     47.53    10.41     6.50     3.91     0.95     0.46     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.962

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     452.360     332.592     306.614    1271.236       0.356      -0.013

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    33.366      30.568     672.107      46.000      47.327      33.000     -14.327

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     318.307     332.592     460.366    1279.353       0.249       0.431

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      33.215      31.815     680.718     440.827       0.073       0.587

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     299.117       0.000     299.117    1280.281       0.234       0.477

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      31.914     681.706       0.000       0.060       0.096       0.466

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.820      33.151       1.117     689.163      25.986     193.858       1.503

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 162242.656       0.514    1127.046 1042425.438

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1036892.75   7202.9526    120.0866      2.1944      0.7943     14.9898      1.3182
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 90% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.241   EfDer =  0.987

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     175.471    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   79.75962

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     171.418    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  134986.875  137686.328       1.666     831.557     499.206     619.754       1.241

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   418.02    -0.14   418.02     0.38   609.32
  MEAN    17.06     0.00    -0.02   418.02    -0.14   418.02     0.38
  HUB     12.51     0.00    -0.02   418.02    -0.14   418.02     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.66    50.47     5.19   611.74   741.05    13.69   508.21     0.67
  MEAN    50.44    47.20     3.24   505.89   656.36    13.69   508.21     0.59
  HUB     41.60    38.62     2.98   370.96   558.98    13.69   508.21     0.51

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   644.32   303.98   568.11  1116.70     0.58
  MEAN    18.04   678.96   359.25   576.13  1113.69     0.61
  HUB     15.00   782.99   504.51   598.78  1105.75     0.71

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   646.12   307.77     0.58  6274.00
  MEAN   534.83   602.28   175.57     0.54  6481.91     1.20
  HUB    444.80   601.75    59.71     0.54  7569.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.01     1.19    14.37   552.70     1.06   518.03     0.92     0.90
  MEAN    18.11     1.20    14.09   553.69     1.06   515.20     0.92     0.90
  HUB     18.65     1.23    13.34   558.87     1.07   507.70     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     28.15    28.45    24.20     4.25     0.93     0.20     2.90
  MEAN    31.95    16.95    12.70     4.25     0.92     0.16     3.51     0.90
  HUB     40.12    -5.69    -9.30     3.61     0.92     0.03     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     692.754     358.553     592.746    1113.253       0.622      -0.014

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.213      14.024     515.000      24.000      31.170      35.400       4.230

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     632.370     358.553     726.947    1120.454       0.564       0.155
  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.133      14.604     521.683     528.796       0.028       0.338

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     577.937       0.000     577.937    1126.348       0.513       0.241

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.066     527.185       0.000       0.060       0.051       0.262

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.844      18.034       1.194     555.083      32.273     237.648       1.842

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 200928.891       0.537    1992.418 1757749.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.241   EfDer =  0.977

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    175.471    3398.000      18.034     555.083       1.000       1.000       0.980
W Kg/sec =   79.75962

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    147.964    3284.751       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134986.875  137686.328       1.370     590.487     430.913     474.134       1.100

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   547.30    -0.19   547.30     0.48   589.05
 MEAN    18.08     0.00    -0.02   547.30    -0.19   547.30     0.48
 HUB     15.21     0.00    -0.02   547.30    -0.19   547.30     0.48

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.08    46.36     1.72   609.37   819.21    15.35   530.07     0.73
 MEAN    44.42    42.30     2.12   536.08   766.23    15.35   530.07     0.68
 HUB     39.50    37.84     1.66   451.02   709.31    15.35   530.07     0.63

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   601.80   203.88   566.21  1144.96     0.53
 MEAN    18.01   616.75   238.69   568.68  1144.05     0.54
 HUB     15.22   668.91   345.28   572.91  1142.99     0.59

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   694.20   401.64     0.61  4167.09
 MEAN   534.05   640.81   295.36     0.56  4302.19     1.28
 HUB    451.41   582.65   106.13     0.51  5259.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.13     1.12    16.67   574.92     1.04   544.69     0.92     0.89
 MEAN    20.20     1.12    16.57   575.57     1.04   543.81     0.92     0.89
 HUB     20.70     1.15    16.41   580.12     1.05   542.77     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.80    35.35    31.50     3.85     0.93     0.20     2.90
 MEAN    22.77    27.45    23.50     3.95     0.91     0.21     3.30     0.89
 HUB     31.08    10.49     6.50     3.99     0.91     0.24     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     627.339     239.359     579.881    1144.123       0.548      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.304      16.547     544.009      46.000      22.430      30.600       8.170

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     596.134     239.359     642.393    1147.471       0.520       0.069

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.211      16.811     547.197     511.151       0.034       0.188

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     589.248       0.000     589.248    1148.186       0.513       0.066

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.796     547.879       0.000       0.060       0.062       0.065

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.807      20.107       1.115     576.872      21.789     307.553       2.384

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 135713.609       0.370    1345.741 1627429.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.241   EfDer =  0.955

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    175.471    3398.000      20.107     576.872       1.000       1.000       0.980
W Kg/sec =   79.75962

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    135.289    3222.120       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 134986.875  137686.328       1.384     545.479     394.014     429.765       1.091

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   550.54    -0.19   550.54     0.48   564.32
 MEAN    17.74      0.00    -0.02   550.54    -0.19   550.54     0.48
 HUB     15.05      0.00    -0.02   550.54    -0.19   550.54     0.48

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.24     46.36     0.88   595.14   810.87    17.19   551.57     0.70
 MEAN    43.70     43.40     0.30   526.00   761.56    17.19   551.57     0.66
 HUB     39.04     38.84     0.20   446.28   708.82    17.19   551.57     0.62

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   602.34    177.12    575.71  1164.30      0.52
 MEAN    17.51   615.95    217.93    576.11  1164.38      0.53
 HUB     14.85   666.77    331.22    578.68  1164.22      0.57

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43    706.96    410.31     0.61  3512.57
 MEAN   519.12    650.09    301.19     0.56  3818.59      1.25
 HUB    440.35    588.88    109.13     0.51  4921.52

         Pt2       PR       Ps2      Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     21.94     1.09     18.28    593.59      1.03    563.31     0.92      0.87
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 MEAN    22.10     1.10    18.26   595.05     1.03   563.38     0.92     0.87
 HUB     22.71     1.13    18.17   600.30     1.04   563.19     0.92     0.87
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.10    35.48    31.50     3.98     0.93     0.17     2.90
 MEAN    20.72    27.60    23.50     4.10     0.90     0.19     3.28     0.87
 HUB     29.79    10.68     6.50     4.18     0.90     0.23     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.955

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     623.664     219.362     583.813    1164.733       0.535       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.210      18.268     563.841      46.000      20.593      31.500      10.907

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     612.675     219.362     650.762    1165.904       0.525       0.013

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.080      18.289     564.975     471.992       0.042       0.164

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     594.756       0.000     594.756    1167.766       0.509       0.025

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.369     566.782       0.000       0.060       0.080       0.033

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.748      21.931       1.091     596.312      19.440     322.869       2.503

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 121125.656       0.351    1201.086 1604539.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.241   EfDer =  0.924

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    175.471    3398.000      21.931     596.312       1.000       1.000       0.980
W Kg/sec =   79.75962

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    126.110    3169.164       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134986.875  137686.328       1.398     513.330     367.296     401.059       1.092

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   552.91    -0.19   552.91     0.47   532.64
 MEAN    16.97     0.00    -0.02   552.91    -0.19   552.91     0.47
 HUB     14.32     0.00    -0.02   552.91    -0.19   552.91     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.94    46.36    -0.42   571.12   795.05    18.83   570.80     0.68
 MEAN    42.32    43.80    -1.48   503.23   747.76    18.83   570.80     0.64
 HUB     37.54    37.84    -0.30   424.63   697.27    18.83   570.80     0.60

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   599.01   144.21   581.39  1180.68     0.51
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 MEAN    16.57   609.94   187.05   580.56  1181.38     0.52
 HUB     13.89   655.75   301.77   582.19  1181.77     0.55
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   714.68   415.64     0.61  2726.38
 MEAN   491.47   655.53   304.42     0.55  3103.36     1.22
 HUB    411.88   592.51   110.11     0.50  4194.38

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.37     1.07    19.60   609.28     1.02   579.34     0.92     0.85
 MEAN    23.58     1.08    19.65   611.08     1.02   580.04     0.92     0.85
 HUB     24.18     1.10    19.61   616.27     1.03   580.39     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     13.93    35.56    31.50     4.06     0.93     0.13     2.90
 MEAN    17.86    27.67    23.50     4.17     0.90     0.16     3.29     0.85
 HUB     27.40    10.71     6.50     4.21     0.90     0.20     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.924

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     597.291     188.101     566.899    1183.713       0.505       0.057

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.667      19.887     582.437      46.000      18.356      32.400      14.044

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     607.400     188.101     635.859    1182.680       0.514       0.001

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.500      19.626     581.420     456.573       0.051       0.141

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     576.435       0.000     576.435    1185.787       0.486      -0.015

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.825     584.480       0.000       0.060       0.098       0.050

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.660      23.307       1.063     612.211      15.899     364.886       2.829

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  99095.117       0.316     982.631 1632591.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.241   EfDer =  0.889

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    175.471    3398.000      23.307     612.211       1.000       1.000       0.980
W Kg/sec =   79.75962

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.234    3127.743       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134986.875  137686.328       1.455     509.668     350.199     390.276       1.114

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   532.17    -0.18   532.17     0.45   500.02
 MEAN    15.91     0.00    -0.02   532.17    -0.18   532.17     0.45
 HUB     13.07     0.00    -0.02   532.17    -0.18   532.17     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.60    47.36    -1.76   543.25   760.61    20.31   588.58     0.64
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 MEAN    41.57    44.80    -3.23   471.87   711.36    20.31   588.58     0.60
 HUB     36.08    38.84    -2.76   387.57   658.45    20.31   588.58     0.55
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   576.85   126.10   562.90  1196.64     0.48
 MEAN    15.50   585.73   162.34   562.78  1196.99     0.49
 HUB     12.59   624.42   266.10   564.88  1197.07     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   693.97   405.87     0.58  2265.66
 MEAN   459.55   636.44   297.22     0.53  2518.72     1.20
 HUB    373.33   574.97   107.24     0.48  3352.55

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.49     1.05    20.89   622.99     1.02   595.23     0.92     0.81
 MEAN    24.63     1.06    20.91   624.19     1.02   595.57     0.92     0.81
 HUB     25.08     1.08    20.83   628.16     1.03   595.63     0.92     0.81

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     12.63    35.79    31.50     4.29     0.93     0.12     2.90
 MEAN    16.09    27.84    23.50     4.34     0.89     0.14     3.34     0.81
 HUB     25.22    10.75     6.50     4.25     0.89     0.18     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.889

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      592.257     165.312     568.718    1197.188       0.495       -0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.656      20.855      595.847       46.000      16.208      33.000      16.792

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      624.904     165.312     646.400    1193.852       0.523       -0.192

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       24.273       20.136     592.532     440.827       0.119       0.121

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      576.509       0.000     576.509    1198.729       0.481       -0.037

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       20.713      597.383       0.000       0.060       0.121       -0.042

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.552       24.268        1.041      625.112       12.901     417.100        3.233

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  80439.039       0.284     797.636 1695212.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    637302.31   6319.5112     171.4177      1.6064       0.7440       3.2406       1.1957
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 90% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.989

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     174.336    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   79.24384

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     170.309    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  134113.953  136795.953       1.677     831.557     495.977     619.754       1.250

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   414.87    -0.14   414.87     0.38   609.32
  MEAN    17.06     0.00    -0.02   414.87    -0.14   414.87     0.38
  HUB     12.51     0.00    -0.02   414.87    -0.14   414.87     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.86    50.47     5.39   611.74   739.27    13.71   508.43     0.67
  MEAN    50.65    47.20     3.45   505.89   654.36    13.71   508.43     0.59
  HUB     41.81    38.62     3.19   370.96   556.63    13.71   508.43     0.50

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   640.91   306.93   562.64  1117.39     0.57
  MEAN    18.04   675.32   360.89   570.80  1114.27     0.61
  HUB     15.00   778.30   503.94   593.13  1106.34     0.70

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   639.90   304.82     0.57  6334.82
  MEAN   534.83   596.72   173.93     0.54  6511.55     1.21
  HUB    444.80   596.07    59.14     0.54  7560.88

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.04     1.19    14.43   552.99     1.06   518.69     0.92     0.90
  MEAN    18.13     1.20    14.14   553.83     1.06   515.75     0.92     0.90
  HUB     18.65     1.23    13.40   558.83     1.07   508.27     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     28.61    28.45    24.20     4.25     0.93     0.21     2.90
  MEAN    32.30    16.95    12.70     4.25     0.92     0.17     3.51     0.90
  HUB     40.35    -5.69    -9.30     3.61     0.92     0.03     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     688.795     360.194     587.111    1113.888       0.618      -0.014

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.232      14.083     515.587      24.000      31.529      35.400       3.871

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     625.413     360.194     721.721    1121.378       0.558       0.164
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.157      14.696     522.544     528.796       0.028       0.344

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     571.768       0.000     571.768    1127.119       0.507       0.249

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.150     527.908       0.000       0.060       0.049       0.271

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.849      18.064       1.196     555.213      32.403     236.039       1.830

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 201738.656       0.539    1987.511 1744511.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.336    3398.000      18.064     555.213       1.000       1.000       0.980
W Kg/sec =   79.24384

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    146.781    3284.366       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134113.953  136795.953       1.381     590.487     427.468     474.134       1.109

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   541.67    -0.19   541.67     0.48   588.98
 MEAN    18.08     0.00    -0.02   541.67    -0.19   541.67     0.48
 HUB     15.21     0.00    -0.02   541.67    -0.19   541.67     0.48

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.37    46.36     2.01   609.37   815.46    15.43   530.71     0.72
 MEAN    44.71    42.30     2.41   536.08   762.22    15.43   530.71     0.67
 HUB     39.79    37.84     1.95   451.02   704.98    15.43   530.71     0.62

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   597.02   208.84   559.30  1146.09     0.52
 MEAN    18.01   612.09   242.18   562.14  1144.99     0.53
 HUB     15.22   664.19   346.55   566.62  1143.76     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   685.69   396.68     0.60  4268.27
 MEAN   534.05   633.40   291.88     0.55  4364.94     1.29
 HUB    451.41   576.24   104.86     0.50  5278.33

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.22     1.12    16.80   575.54     1.04   545.78     0.92     0.90
 MEAN    20.27     1.12    16.68   576.00     1.04   544.72     0.92     0.90
 HUB     20.75     1.15    16.51   580.35     1.05   543.52     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.48    35.35    31.50     3.85     0.93     0.20     2.90
 MEAN    23.31    27.44    23.50     3.94     0.91     0.22     3.30     0.90
 HUB     31.45    10.48     6.50     3.98     0.91     0.25     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     622.410     242.855     573.076    1145.107       0.544      -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.377      16.664     544.944      46.000      22.966      30.600       7.634

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     588.190     242.855     636.353    1148.736       0.512       0.080

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.292      16.965     548.403     511.151       0.033       0.197

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     581.076       0.000     581.076    1149.463       0.506       0.079

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.960     549.098       0.000       0.060       0.058       0.079

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.818      20.197       1.118     577.293      22.080     302.941       2.348

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 137524.453       0.375    1354.879 1612702.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.960

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    174.336    3398.000      20.197     577.293       1.000       1.000       0.980
W Kg/sec =   79.24384

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    133.861    3220.945       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 134113.953  136795.953       1.399     545.479     389.855     429.765       1.102

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   543.25    -0.19   543.25     0.47   564.11
 MEAN    17.74     0.00    -0.02   543.25    -0.19   543.25     0.47
 HUB     15.05     0.00    -0.02   543.25    -0.19   543.25     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.62    46.36     1.26   595.14   805.93    17.35   552.66     0.70
 MEAN    44.09    43.40     0.69   526.00   756.30    17.35   552.66     0.66
 HUB     39.42    38.84     0.58   446.28   703.17    17.35   552.66     0.61

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   595.60   183.70   566.57  1166.05      0.51
 MEAN    17.51   609.56   222.54   567.49  1165.87      0.52
 HUB     14.85   660.41   332.88   570.38  1165.49      0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   695.70   403.73     0.60  3642.75
 MEAN   519.12   640.32   296.59     0.55  3899.16      1.26
 HUB    440.35   580.41   107.47     0.50  4946.11

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     22.12     1.10    18.51   594.63     1.03   565.02     0.92     0.88
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 MEAN    22.26     1.10    18.47   595.85     1.03   564.84     0.92     0.88
 HUB     22.84     1.13    18.36   600.84     1.04   564.43     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.96    35.47    31.50     3.97     0.93     0.18     2.90
 MEAN    21.41    27.59    23.50     4.09     0.90     0.20     3.28     0.88
 HUB     30.27    10.67     6.50     4.17     0.90     0.24     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.960

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     617.035     223.996     574.941    1166.262       0.529       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.365      18.479     565.322      46.000      21.286      31.500      10.214

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     601.926     223.996     642.253    1167.847       0.515       0.028

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.248      18.557     566.859     471.992       0.040       0.176

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     583.912       0.000     583.912    1169.683       0.499       0.043

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.650     568.642       0.000       0.060       0.073       0.051

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.768      22.116       1.095     597.106      19.813     316.180       2.451

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 123452.242       0.358    1216.240 1588393.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.934

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    174.336    3398.000      22.116     597.106       1.000       1.000       0.980
W Kg/sec =   79.24384

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    124.330    3167.056       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 134113.953  136795.953       1.418     513.330     362.110     401.059       1.108

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   543.30    -0.19   543.30     0.46   532.29
 MEAN    16.97     0.00    -0.02   543.30    -0.19   543.30     0.46
 HUB     14.32     0.00    -0.02   543.30    -0.19   543.30     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.44    46.36     0.08   571.12   788.40    19.09   572.47     0.67
 MEAN    42.82    43.80    -0.98   503.23   740.68    19.09   572.47     0.63
 HUB     38.02    37.84     0.18   424.63   689.67    19.09   572.47     0.59

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   589.51   152.90   569.34  1183.22     0.50
 MEAN    16.57   601.05   193.15   569.17  1183.58     0.51
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 HUB     13.89   647.04   303.98   571.18  1183.67     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   699.82   406.95     0.59  2890.39
 MEAN   491.47   642.61   298.32     0.54  3204.37     1.23
 HUB    411.88   581.29   107.90     0.49  4225.03

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.67     1.07    19.98   610.86     1.02   581.86     0.92     0.85
 MEAN    23.85     1.08    19.99   612.35     1.03   582.21     0.92     0.85
 HUB     24.42     1.10    19.92   617.21     1.03   582.28     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.03    35.56    31.50     4.06     0.93     0.15     2.90
 MEAN    18.74    27.66    23.50     4.16     0.90     0.17     3.29     0.85
 HUB     28.02    10.70     6.50     4.20     0.90     0.21     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.934

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     588.832     194.233     555.875    1185.846       0.497       0.057

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.938      20.223     584.536      46.000      19.260      32.400      13.140

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     593.693     194.233     624.658    1185.359       0.501       0.019

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.790      20.040     584.057     456.573       0.047       0.155

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     563.011       0.000     563.011    1188.361       0.474       0.008

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.254     587.018       0.000       0.060       0.088       0.072

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.696      23.623       1.068     613.473      16.367     353.902       2.743

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102017.812       0.325    1005.070 1613999.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.903

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.336    3398.000      23.623     613.473       1.000       1.000       0.980
W Kg/sec =   79.24384

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    117.980    3124.523       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134113.953  136795.953       1.483     509.668     343.632     390.276       1.136

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   520.34    -0.18   520.34     0.44   499.51
 MEAN    15.91     0.00    -0.02   520.34    -0.18   520.34     0.44
 HUB     13.07     0.00    -0.02   520.34    -0.18   520.34     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.24    47.36    -1.12   543.25   752.37    20.72   590.88     0.63
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MEAN    42.21    44.80    -2.59   471.87   702.55    20.72   590.88     0.59
HUB     36.69    38.84    -2.15   387.57   648.92    20.72   590.88     0.54
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   565.06   136.78   548.26  1199.93     0.47
MEAN    15.50   574.50   169.88   548.81  1199.89     0.48
HUB     12.59   613.33   268.85   551.27  1199.63     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    531.98   675.85   395.20     0.56  2457.04
MEAN   459.55   620.56   289.67     0.52  2635.57     1.22
HUB    373.33   561.08   104.48     0.47  3387.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.95     1.06    21.43   625.16     1.02   598.52     0.92     0.83
MEAN    25.04     1.06    21.40   626.01     1.02   598.48     0.92     0.83
HUB     25.46     1.08    21.30   629.58     1.03   598.20     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     14.01    35.79    31.50     4.29     0.93     0.13     2.90
MEAN    17.20    27.83    23.50     4.33     0.89     0.15     3.34     0.83
HUB     26.00    10.73     6.50     4.23     0.89     0.19     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.903

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     580.763     172.994     554.399    1200.129       0.484      -0.012

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.075      21.360     598.777      46.000      17.330      33.000      15.670

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     605.650     172.994     629.872    1197.658       0.506      -0.160

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.740      20.773     596.314     440.827       0.109       0.137

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     559.330       0.000     559.330    1202.171       0.465      -0.007

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      21.333     600.816       0.000       0.060       0.107      -0.012

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.612      24.747       1.048     626.918      13.444     399.863       3.100

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  83828.719       0.296     825.873 1673957.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    648561.88   6389.5732    170.3092      1.6381      0.7634      3.4530      1.1991
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 90% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     171.674    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   78.03383

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     167.709    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  132066.109  134707.141       1.703     831.557     488.404     619.754       1.269

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   407.53    -0.14   407.53     0.37   609.32
  MEAN    17.06     0.00    -0.02   407.53    -0.14   407.53     0.37
  HUB     12.51     0.00    -0.02   407.53    -0.14   407.53     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.34    50.47     5.87   611.74   735.18    13.75   508.94     0.66
  MEAN    51.15    47.20     3.95   505.89   649.73    13.75   508.94     0.59
  HUB     42.32    38.62     3.70   370.96   551.18    13.75   508.94     0.50

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   633.26   313.72   550.09  1118.96     0.57
  MEAN    18.04   667.07   364.64   558.58  1115.58     0.60
  HUB     15.00   767.63   502.67   580.16  1107.67     0.69

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   625.63   298.02     0.56  6474.96
  MEAN   534.83   583.93   170.18     0.52  6579.13     1.23
  HUB    444.80   583.04    57.87     0.53  7541.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.12     1.20    14.58   553.65     1.06   520.17     0.92     0.91
  MEAN    18.17     1.20    14.27   554.15     1.06   517.00     0.92     0.91
  HUB     18.66     1.23    13.53   558.74     1.07   509.55     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     29.70    28.45    24.20     4.25     0.93     0.22     2.90
  MEAN    33.14    16.94    12.70     4.24     0.92     0.18     3.51     0.91
  HUB     40.91    -5.70    -9.30     3.60     0.92     0.05     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     679.811     363.936     574.189    1115.320       0.610      -0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.275      14.216     516.913      24.000      32.368      35.400       3.032

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     609.676     363.936     710.038    1123.439       0.543       0.185
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.208      14.899     524.467     528.796       0.026       0.358

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     557.834       0.000     557.834    1128.841       0.494       0.268

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.338     529.522       0.000       0.060       0.045       0.290

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.858      18.128       1.200     555.513      32.703     232.332       1.801

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 203604.062       0.544    1975.260 1713642.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.674    3398.000      18.128     555.513       1.000       1.000       0.980
W Kg/sec =   78.03383

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    144.063    3283.480       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132066.109  134707.141       1.407     590.487     419.553     474.134       1.130

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   528.92    -0.18   528.92     0.47   588.82
 MEAN    18.08     0.00    -0.02   528.92    -0.18   528.92     0.47
 HUB     15.21     0.00    -0.02   528.92    -0.18   528.92     0.47

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.05    46.36     2.69   609.37   807.04    15.61   532.15     0.71
 MEAN    45.39    42.30     3.09   536.08   753.21    15.61   532.15     0.67
 HUB     40.47    37.84     2.63   451.02   695.23    15.61   532.15     0.61

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   586.65   219.91   543.88  1148.59     0.51
 MEAN    18.01   601.85   249.98   547.48  1147.07     0.52
 HUB     15.22   653.68   349.37   552.49  1145.48     0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   666.71   385.61     0.58  4494.24
 MEAN   534.05   616.78   284.07     0.54  4505.50     1.31
 HUB    451.41   561.83   102.04     0.49  5321.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.42     1.13    17.09   576.91     1.04   548.18     0.92     0.90
 MEAN    20.43     1.13    16.93   576.97     1.04   546.72     0.92     0.90
 HUB     20.87     1.15    16.73   580.85     1.05   545.18     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.01    35.34    31.50     3.84     0.93     0.22     2.90
 MEAN    24.54    27.42    23.50     3.92     0.91     0.23     3.30     0.90
 HUB     32.31    10.46     6.50     3.96     0.91     0.26     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     611.607     250.686     557.871    1147.272       0.533      -0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.537      16.920     547.006      46.000      24.197      30.600       6.403

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     570.647     250.686     623.283    1151.505       0.496       0.106

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.468      17.303     551.050     511.151       0.029       0.216

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     563.277       0.000     563.277    1152.234       0.489       0.107

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.312     551.748       0.000       0.060       0.050       0.108

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.838      20.389       1.125     578.242      22.729     292.913       2.271

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 141572.047       0.386    1373.458 1578894.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.971

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    171.674    3398.000      20.389     578.242       1.000       1.000       0.980
W Kg/sec =   78.03383

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    130.682    3218.300       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 132066.109  134707.141       1.433     545.479     380.594     429.765       1.129

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   527.29    -0.18   527.29     0.46   563.65
 MEAN    17.74     0.00    -0.02   527.29    -0.18   527.29     0.46
 HUB     15.05     0.00    -0.02   527.29    -0.18   527.29     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.47    46.36     2.11   595.14   795.26    17.67   555.03     0.69
 MEAN    44.94    43.40     1.54   526.00   744.92    17.67   555.03     0.64
 HUB     40.25    38.84     1.41   446.28   690.92    17.67   555.03     0.60

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   581.62   197.85   546.94  1169.80      0.50
 MEAN    17.51   596.08   232.53   548.86  1169.08      0.51
 HUB     14.85   646.83   336.55   552.38  1168.23      0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   671.50   389.58     0.57  3923.11
 MEAN   519.12   619.18   286.60     0.53  4073.95      1.29
 HUB    440.35   562.05   103.80     0.48  5000.50

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     22.50     1.10    19.00   596.91     1.03   568.68     0.92     0.89
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 MEAN    22.59     1.11    18.91   597.63     1.03   567.97     0.92     0.89
 HUB     23.11     1.13    18.76   602.04     1.04   567.12     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.89    35.46    31.50     3.96     0.93     0.20     2.90
 MEAN    22.96    27.57    23.50     4.07     0.91     0.22     3.28     0.89
 HUB     31.35    10.64     6.50     4.14     0.91     0.25     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     603.095     234.052     555.826    1169.536       0.516       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.697      18.928     568.498      46.000      22.835      31.500       8.665

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     579.135     234.052     624.642    1171.966       0.494       0.061

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.606      19.127     570.863     471.992       0.034       0.200

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     561.303       0.000     561.303    1173.707       0.478       0.080

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.237     572.561       0.000       0.060       0.061       0.090

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.803      22.501       1.104     598.863      20.621     302.298       2.343

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 128489.555       0.372    1246.538 1551977.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.951

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.674    3398.000      22.501     598.863       1.000       1.000       0.980
W Kg/sec =   78.03383

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.513    3162.406       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132066.109  134707.141       1.463     513.330     350.995     401.059       1.143

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   523.16    -0.18   523.16     0.44   531.51
 MEAN    16.97     0.00    -0.02   523.16    -0.18   523.16     0.44
 HUB     14.32     0.00    -0.02   523.16    -0.18   523.16     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.52    46.36     1.16   571.12   774.65    19.64   576.02     0.66
 MEAN    43.90    43.80     0.10   503.23   726.03    19.64   576.02     0.62
 HUB     39.08    37.84     1.24   424.63   673.91    19.64   576.02     0.57

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   570.72   170.84   544.54  1188.45     0.48
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 MEAN    16.57   583.13   205.80   545.61  1188.14     0.49
 HUB     13.89   629.23   308.62   548.35  1187.65     0.53
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   669.22   389.01     0.56  3229.00
 MEAN   491.47   615.87   285.66     0.52  3414.03     1.26
 HUB    411.88   557.98   103.26     0.47  4289.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.30     1.08    20.75   614.23     1.03   587.05     0.92     0.87
 MEAN    24.41     1.08    20.70   615.11     1.03   586.73     0.92     0.87
 HUB     24.92     1.11    20.58   619.27     1.03   586.23     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.42    35.54    31.50     4.04     0.93     0.17     2.90
 MEAN    20.67    27.64    23.50     4.14     0.90     0.19     3.29     0.87
 HUB     29.37    10.66     6.50     4.16     0.90     0.23     3.90

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.951

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     571.828     206.961     533.062    1190.276       0.480       0.057

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.505      20.922     588.911      46.000      21.219      32.400      11.181

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     565.883     206.961     602.542    1190.847       0.475       0.057

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.394      20.896     589.476     456.573       0.039       0.183

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     536.680       0.000     536.680    1193.558       0.450       0.048

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      21.107     592.163       0.000       0.060       0.076       0.111

   STAGE EXIT CONDITIONS, STAGE             4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.750      24.252       1.078     616.201      17.338     332.578       2.578

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 108073.977       0.345    1048.477 1573119.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.928

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.674    3398.000      24.252     616.201       1.000       1.000       0.980
W Kg/sec =   78.03383

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    113.418    3117.599       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132066.109  134707.141       1.543     509.668     330.345     390.276       1.181

    ROTOR LEADING EDGE CONDITIONS, STAGE             5
       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   496.97    -0.17   496.97     0.42   498.40
 MEAN    15.91     0.00    -0.02   496.97    -0.17   496.97     0.42
 HUB     13.07     0.00    -0.02   496.97    -0.17   496.97     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.56    47.36     0.20   543.25   736.40    21.54   595.60     0.62
 MEAN    43.53    44.80    -1.27   471.87   685.42    21.54   595.60     0.57
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HUB     37.96    38.84    -0.88   387.57   630.33    21.54   595.60     0.53

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   543.21   157.54   519.87  1206.43     0.45
MEAN    15.50   553.27   184.63   521.55  1205.68     0.46
HUB     12.59   592.01   274.26   524.65  1204.80     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    531.98   640.68   374.44     0.53  2829.38
MEAN   459.55   589.57   274.92     0.49  2864.05     1.25
HUB    373.33   533.92    99.07     0.44  3455.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.86     1.07    22.50   629.66     1.02   605.04     0.92     0.85
MEAN    25.88     1.07    22.40   629.82     1.02   604.29     0.92     0.85
HUB     26.22     1.08    22.23   632.63     1.03   603.40     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     16.86    35.76    31.50     4.26     0.93     0.17     2.90
MEAN    19.49    27.79    23.50     4.29     0.90     0.18     3.34     0.85
HUB     27.60    10.69     6.50     4.19     0.90     0.21     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.928

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     559.120     188.016     526.559    1205.974       0.464      -0.010

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.915      22.362     604.622      46.000      19.650      33.000      13.350

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     569.475     188.016     599.710    1205.001       0.473      -0.098

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.666      22.023     603.647     440.827       0.089       0.170

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     527.720       0.000     527.720    1208.810       0.437       0.041

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      22.512     607.470       0.000       0.060       0.090       0.038

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.694      25.664       1.058     630.705      14.503     369.155       2.862

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  90439.828       0.320     877.400 1628660.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    672179.50   6521.1333    167.7087      1.6988      0.7951      3.9535      1.2064
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 90% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.540   EfDer =  0.995

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     168.574    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   76.62451

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     164.680    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  129680.953  132274.297       1.734     831.557     479.584     619.754       1.292

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   399.06    -0.14   399.06     0.36   609.32
  MEAN    17.06     0.00    -0.02   399.06    -0.14   399.06     0.36
  HUB     12.51     0.00    -0.02   399.06    -0.14   399.06     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.89    50.47     6.42   611.74   730.51    13.81   509.51     0.66
  MEAN    51.74    47.20     4.54   505.89   644.44    13.81   509.51     0.58
  HUB     42.92    38.62     4.30   370.96   544.94    13.81   509.51     0.49

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   624.93   321.38   535.96  1120.69     0.56
  MEAN    18.04   657.91   368.90   544.76  1117.04     0.59
  HUB     15.00   755.68   501.23   565.53  1109.15     0.68

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   609.56   290.36     0.54  6632.90
  MEAN   534.83   569.46   165.92     0.51  6655.90     1.25
  HUB    444.80   568.34    56.44     0.51  7520.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.21     1.21    14.74   554.41     1.06   521.79     0.92     0.91
  MEAN    18.22     1.21    14.40   554.52     1.06   518.37     0.92     0.91
  HUB     18.66     1.24    13.67   558.63     1.07   510.96     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     30.95    28.45    24.20     4.25     0.93     0.24     2.90
  MEAN    34.11    16.94    12.70     4.24     0.92     0.20     3.51     0.91
  HUB     41.55    -5.70    -9.30     3.60     0.92     0.06     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     669.900     368.187     559.646    1116.889       0.600      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.322      14.363     518.369      24.000      33.341      35.400       2.059

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     592.269     368.187     697.384    1125.671       0.526       0.207
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      18.263      15.120     526.553     528.796       0.024       0.374

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     542.441       0.000     542.441    1130.708       0.480       0.288

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      15.540     531.275       0.000       0.060       0.041       0.310

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
    0.867      18.195       1.204     555.851      33.041     228.136       1.768

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 205710.375       0.550    1959.652 1678007.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.540   EfDer =  0.992

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   168.574    3398.000      18.195     555.851       1.000       1.000       0.980
W Kg/sec =   76.62451

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
   140.988    3282.481       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       1.438     590.487     410.596     474.134       1.155

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   514.78    -0.18   514.78     0.45   588.64
 MEAN    18.08     0.00    -0.02   514.78    -0.18   514.78     0.45
 HUB     15.21     0.00    -0.02   514.78    -0.18   514.78     0.45

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.82    46.36     3.46   609.37   797.84    15.79   533.72     0.70
 MEAN    46.17    42.30     3.87   536.08   743.35    15.79   533.72     0.66
 HUB     41.23    37.84     3.39   451.02   684.53    15.79   533.72     0.60

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   575.92   231.94   527.15  1151.23     0.50
 MEAN    18.01   591.00   258.52   531.46  1149.31     0.51
 HUB     15.22   642.33   352.45   537.00  1147.33     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   646.10   373.57     0.56  4739.94
 MEAN   534.05   598.64   275.53     0.52  4659.21     1.34
 HUB    451.41   546.04    98.96     0.48  5368.10

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.64     1.13    17.40   578.42     1.04   550.73     0.92     0.91
 MEAN    20.60     1.13    17.20   578.04     1.04   548.87     0.92     0.91
 HUB     20.98     1.15    16.96   581.41     1.05   546.96     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.75    35.32    31.50     3.82     0.93     0.24     2.90
 MEAN    25.94    27.40    23.50     3.90     0.92     0.25     3.30     0.91
 HUB     33.28    10.44     6.50     3.94     0.92     0.27     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     600.205     259.250     541.327    1149.578       0.522      -0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.706      17.191     549.207      46.000      25.590      30.600       5.010

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     551.857     259.250     609.718    1154.436       0.478       0.134

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.652      17.658     553.858     511.151       0.025       0.237

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     544.581       0.000     544.581    1155.130       0.471       0.135

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.672     554.524       0.000       0.060       0.045       0.137

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.853      20.581       1.131     579.289      23.438     282.396       2.189

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 145984.344       0.398    1390.686 1540687.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.540   EfDer =  0.981

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    168.574    3398.000      20.581     579.289       1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    127.242    3215.392       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 129680.953  132274.297       1.472     545.479     370.578     429.765       1.160

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   510.44    -0.18   510.44     0.44   563.14
 MEAN    17.74     0.00    -0.02   510.44    -0.18   510.44     0.44
 HUB     15.05     0.00    -0.02   510.44    -0.18   510.44     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.39    46.36     3.03   595.14   784.19    18.01   557.54     0.68
 MEAN    45.87    43.40     2.47   526.00   733.09    18.01   557.54     0.63
 HUB     41.17    38.84     2.33   446.28   678.14    18.01   557.54     0.59

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   567.95   212.48   526.71  1173.61      0.48
 MEAN    17.51   582.57   242.89   529.52  1172.39      0.50
 HUB     14.85   632.93   340.34   533.64  1171.08      0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   646.54   374.95     0.55  4212.69
 MEAN   519.12   597.24   276.24     0.51  4255.24      1.32
 HUB    440.35   542.93   100.01     0.46  5056.75

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     22.90     1.11    19.51   599.34     1.03   572.41     0.92     0.90
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 MEAN    22.92     1.11    19.36   599.54     1.03   571.21     0.92     0.90
 HUB     23.39     1.14    19.17   603.36     1.04   569.92     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.97    35.45    31.50     3.95     0.93     0.22     2.90
 MEAN    24.64    27.55    23.50     4.05     0.91     0.24     3.28     0.90
 HUB     32.53    10.61     6.50     4.11     0.91     0.26     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     589.174     244.481     536.055    1172.893       0.502       0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.032      19.383     571.766      46.000      24.517      31.500       6.983

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     556.052     244.481     607.425    1176.136       0.473       0.096

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.964      19.701     574.933     471.992       0.028       0.225

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     538.888       0.000     538.888    1177.740       0.458       0.115

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.811     576.502       0.000       0.060       0.053       0.125

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.829      22.873       1.111     600.746      21.457     288.692       2.238

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 133700.297       0.387    1273.665 1511716.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 4.540   EfDer =  0.967

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    3398.000      22.873     600.746       1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    116.594    3157.448       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       1.512     513.330     339.581     401.059       1.181

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   503.04    -0.17   503.04     0.43   530.67
 MEAN    16.97     0.00    -0.02   503.04    -0.17   503.04     0.43
 HUB     14.32     0.00    -0.02   503.04    -0.17   503.04     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.64    46.36     2.28   571.12   761.20    20.19   579.63     0.64
 MEAN    45.02    43.80     1.22   503.23   711.67    20.19   579.63     0.60
 HUB     40.18    37.84     2.34   424.63   658.41    20.19   579.63     0.56

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   553.46   188.34   520.43  1193.55     0.46
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 MEAN    16.57   566.25   218.24   522.50  1192.64     0.47
 HUB     13.89   612.08   313.19   525.88  1191.63     0.51
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   639.43   371.51     0.54  3559.19
 MEAN   491.47   589.63   273.23     0.49  3619.99     1.29
 HUB    411.88   535.06    98.69     0.45  4352.75

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.93     1.09    21.51   617.68     1.03   592.12     0.92     0.88
 MEAN    24.96     1.09    21.39   617.97     1.03   591.21     0.92     0.88
 HUB     25.40     1.11    21.21   621.45     1.03   590.19     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.89    35.52    31.50     4.02     0.93     0.20     2.90
 MEAN    22.67    27.61    23.50     4.11     0.91     0.22     3.29     0.88
 HUB     30.78    10.63     6.50     4.13     0.91     0.25     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     555.856     219.465     510.697    1194.650       0.465       0.057

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.060      21.601     593.246      46.000      23.255      32.400       9.145

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     539.273     219.465     582.220    1196.175       0.451       0.095

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.979      21.724     594.762     456.573       0.032       0.213

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     511.487       0.000     511.487    1198.622       0.427       0.089

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.932     597.199       0.000       0.060       0.064       0.151

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.794      24.860       1.087     619.033      18.288     313.321       2.429

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 114000.734       0.364    1086.001 1529248.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 4.540   EfDer =  0.951

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    3398.000      24.860     619.033       1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.894    3110.459       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       1.607     509.668     317.168     390.276       1.231

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   474.44    -0.16   474.44     0.39   497.26
 MEAN    15.91     0.00    -0.02   474.44    -0.16   474.44     0.39
 HUB     13.07     0.00    -0.02   474.44    -0.16   474.44     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.88    47.36     1.52   543.25   721.38    22.32   600.25     0.60
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MEAN    44.85    44.80     0.05   471.87   669.26    22.32   600.25     0.56
HUB     39.26    38.84     0.42   387.57   612.72    22.32   600.25     0.51

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   523.99   177.15   493.13  1212.59     0.43
MEAN    15.50   534.03   198.66   495.71  1211.24     0.44
HUB     12.59   572.20   279.40   499.34  1209.82     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    531.98   607.52   354.82     0.50  3181.15
MEAN   459.55   560.17   260.90     0.46  3081.30     1.29
HUB    373.33   508.10    93.93     0.42  3519.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.75     1.08    23.53   634.16     1.02   611.25     0.92     0.87
MEAN    26.69     1.07    23.36   633.69     1.02   609.89     0.92     0.87
HUB     26.96     1.08    23.13   635.77     1.03   608.46     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     19.76    35.74    31.50     4.24     0.93     0.20     2.90
MEAN    21.84    27.76    23.50     4.26     0.90     0.21     3.34     0.87
HUB     29.23    10.65     6.50     4.15     0.90     0.23     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.951

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     539.615     202.299     500.259    1211.568       0.445      -0.008

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.734      23.328     610.246      46.000      22.018      33.000      10.982

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     536.642     202.299     573.506    1211.832       0.443      -0.037

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.558      23.209     610.513     440.827       0.071       0.202

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     498.654       0.000     498.654    1215.085       0.410       0.089

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      23.637     613.794       0.000       0.060       0.074       0.086

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.757      26.546       1.068     634.540      15.507     343.020       2.659

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96704.219       0.342     921.230 1581104.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    696100.00   6631.2329     164.6798      1.7572      0.8209      4.5402      1.2137
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 90% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.019   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     166.058    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   75.48089

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     162.222    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  127745.469  130300.102       1.760     831.557     472.426     619.754       1.312

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   392.24    -0.14   392.24     0.35   609.32
  MEAN    17.06     0.00    -0.02   392.24    -0.14   392.24     0.35
  HUB     12.51     0.00    -0.02   392.24    -0.14   392.24     0.35

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.34    50.47     6.87   611.74   726.81    13.85   509.96     0.66
  MEAN    52.22    47.20     5.02   505.89   640.24    13.85   509.96     0.58
  HUB     43.41    38.62     4.79   370.96   539.97    13.85   509.96     0.49

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   618.61   327.42   524.85  1122.01     0.55
  MEAN    18.04   650.82   372.26   533.85  1118.16     0.58
  HUB     15.00   746.34   500.09   554.01  1110.30     0.67

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   596.92   284.32     0.53  6757.48
  MEAN   534.83   558.05   162.56     0.50  6716.47     1.27
  HUB    444.80   556.76    55.30     0.50  7503.09

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.28     1.21    14.86   555.00     1.06   523.04     0.92     0.91
  MEAN    18.26     1.21    14.51   554.80     1.06   519.43     0.92     0.91
  HUB     18.66     1.23    13.78   558.55     1.07   512.05     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     31.96    28.45    24.20     4.25     0.93     0.26     2.90
  MEAN    34.89    16.94    12.70     4.24     0.92     0.21     3.51     0.91
  HUB     42.07    -5.70    -9.30     3.60     0.92     0.07     4.78

    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.997

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     662.249     371.541     548.207    1118.093       0.592      -0.009

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      18.358      14.475     519.487      24.000      34.127      35.400       1.273

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	578.782	371.541	687.773	1127.365	0.513	0.225

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.303	15.287	528.139	528.796	0.024	0.386

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	530.520	0.000	530.520	1132.128	0.469	0.303

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.692	532.610	0.000	0.060	0.039	0.326

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.872	18.242	1.208	556.118	33.308	224.817	1.743

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
207371.734	0.554	1945.994	1649330.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 5.019 EfDer = 0.995

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
166.058	3398.000	18.242	556.118	1.000	1.000	0.980

W Kg/sec = 75.48089

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
138.554	3281.693	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
127745.469	130300.102	1.463	590.487	403.508	474.134	1.175

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	503.80	-0.17	503.80	0.44	588.50
MEAN	18.08	0.00	-0.02	503.80	-0.17	503.80	0.44	
HUB	15.21	0.00	-0.02	503.80	-0.17	503.80	0.44	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.43	46.36	4.07	609.37	790.80	15.93	534.92	0.70
MEAN	46.79	42.30	4.49	536.08	735.78	15.93	534.92	0.65
HUB	41.85	37.84	4.01	451.02	676.31	15.93	534.92	0.60

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	568.12	241.12	514.42	1153.21	0.49
MEAN	18.01	582.94	265.06	519.19	1150.98	0.51
HUB	15.22	633.74	354.84	525.08	1148.74	0.55

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	630.40	364.39	0.55	4927.28	
MEAN	534.05	584.74	268.99	0.51	4776.85	1.36
HUB	451.41	533.89	96.57	0.46	5404.33	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.81	1.14	17.62	579.58	1.04	552.63	0.92	0.91
MEAN	20.72	1.14	17.39	578.86	1.04	550.49	0.92	0.91
HUB	21.07	1.15	17.13	581.85	1.05	548.32	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.11	35.31	31.50	3.81	0.93	0.26	2.90	
MEAN	27.05	27.39	23.50	3.89	0.92	0.26	3.30	0.91
HUB	34.05	10.42	6.50	3.92	0.92	0.28	3.92	

blockage3	Cor/U1	Cor/Incid

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      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     591.743     265.804     528.685    1151.305       0.514       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.830      17.392     550.857      46.000      26.692      30.600       3.908

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     537.690     265.804     599.801    1156.620       0.465       0.155

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.785      17.920     555.955     511.151       0.023       0.254

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     530.525       0.000     530.525    1157.284       0.458       0.156

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.936     556.594       0.000       0.060       0.042       0.160

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      20.719       1.136     580.097      23.979     274.621       2.129

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 149356.984       0.407    1401.579 1510490.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.019   EfDer =  0.987

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    166.058    3398.000      20.719     580.097       1.000       1.000       0.980
W Kg/sec =   75.48089

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    124.593    3213.151       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127745.469  130300.102       1.503     545.479     362.861     429.765       1.184

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   497.71    -0.17   497.71     0.43   562.75
 MEAN    17.74     0.00    -0.02   497.71    -0.17   497.71     0.43
 HUB     15.05     0.00    -0.02   497.71    -0.17   497.71     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.10    46.36     3.74   595.14   775.96    18.25   559.42     0.67
 MEAN    46.59    43.40     3.19   526.00   724.28    18.25   559.42     0.62
 HUB     41.89    38.84     3.05   446.28   668.61    18.25   559.42     0.58

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   558.36   223.31   511.76  1176.39     0.47
 MEAN    17.51   572.86   250.61   515.14  1174.82     0.49
 HUB     14.85   622.76   343.20   519.66  1173.19     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   628.08   364.12     0.53  4427.23
 MEAN   519.12   580.92   268.51     0.49  4390.41     1.34
 HUB    440.35   528.66    97.15     0.45  5099.04

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.19     1.12    19.87   601.17     1.04   575.14     0.92     0.90
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 MEAN    23.17     1.12    19.69   600.99     1.04   573.60     0.92     0.90
 HUB     23.58     1.14    19.46   604.37     1.04   571.99     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.57    35.43    31.50     3.93     0.93     0.24     2.90
 MEAN    25.94    27.53    23.50     4.03     0.92     0.25     3.28     0.90
 HUB     33.44    10.59     6.50     4.09     0.92     0.28     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     579.207     252.257     521.389    1175.354       0.493       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.277      19.713     574.168      46.000      25.819      31.500       5.681

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     539.212     252.257     595.301    1179.169       0.457       0.122

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.222      20.116     577.902     471.992       0.025       0.244

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     522.562       0.000     522.562    1180.674       0.443       0.141

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.225     579.378       0.000       0.060       0.047       0.152

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.845      23.140       1.117     602.175      22.078     279.026       2.163

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 137575.047       0.399    1291.016 1480329.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.019   EfDer =  0.977

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    166.058    3398.000      23.140     602.175       1.000       1.000       0.980
W Kg/sec =   75.48089

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    113.661    3153.698       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127745.469  130300.102       1.551     513.330     331.038     401.059       1.212

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   488.31    -0.17   488.30     0.41   530.04
 MEAN    16.97     0.00    -0.02   488.31    -0.17   488.30     0.41
 HUB     14.32     0.00    -0.02   488.31    -0.17   488.30     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.48    46.36     3.12   571.12   751.54    20.58   582.28     0.63
 MEAN    45.87    43.80     2.07   503.23   701.32    20.58   582.28     0.59
 HUB     41.02    37.84     3.18   424.63   647.22    20.58   582.28     0.55

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   541.78   200.90   503.16  1197.19     0.45
 MEAN    16.57   554.53   227.20   505.85  1195.89     0.46
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 HUB     13.89   599.92   316.50   509.64  1194.51     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   618.07   358.95     0.52  3796.21
 MEAN   491.47   570.72   264.27     0.48  3768.43     1.32
 HUB    411.88   518.49    95.38     0.43  4398.62

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.38     1.10    22.05   620.23     1.03   595.74     0.92     0.89
 MEAN    25.36     1.10    21.88   620.10     1.03   594.44     0.92     0.89
 HUB     25.75     1.11    21.67   623.10     1.03   593.07     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.77    35.50    31.50     4.00     0.93     0.22     2.90
 MEAN    24.19    27.58    23.50     4.08     0.91     0.23     3.29     0.89
 HUB     31.84    10.60     6.50     4.10     0.91     0.26     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     544.798     228.477     494.573    1197.795       0.455       0.057

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.460      22.089     596.375      46.000      24.795      32.400       7.605

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     520.444     228.477     568.387    1199.967       0.434       0.123

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.398      22.315     598.540     456.573       0.027       0.235

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     493.672       0.000     493.672    1202.236       0.411       0.119

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.519     600.806       0.000       0.060       0.056       0.180

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.820      25.294       1.093     621.146      18.971     300.313       2.328

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 118264.461       0.377    1109.804 1495610.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.019   EfDer =  0.965

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    166.058    3398.000      25.294     621.146       1.000       1.000       0.980
W Kg/sec =   75.48089

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    105.608    3105.165       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127745.469  130300.102       1.657     509.668     307.597     390.276       1.269

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   458.41    -0.16   458.41     0.38   496.41
 MEAN    15.91     0.00    -0.02   458.41    -0.16   458.41     0.38
 HUB     13.07     0.00    -0.02   458.41    -0.16   458.41     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.85    47.36     2.49   543.25   710.94    22.89   603.61     0.59
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 MEAN    45.84    44.80     1.04   471.87   657.99    22.89   603.61     0.55
 HUB     40.22    38.84     1.38   387.57   600.39    22.89   603.61     0.50
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   511.44   190.85   474.50  1216.90     0.42
 MEAN    15.50   521.12   208.49   477.60  1215.17     0.43
 HUB     12.59   558.57   283.02   481.57  1213.40     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   584.40   341.13     0.48  3426.70
 MEAN   459.55   539.57   251.06     0.44  3233.58     1.32
 HUB    373.33   489.96    90.32     0.40  3565.23

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.40     1.08    24.26   637.44     1.03   615.62     0.92     0.88
 MEAN    27.28     1.08    24.03   636.52     1.02   613.87     0.92     0.88
 HUB     27.49     1.09    23.77   638.10     1.03   612.07     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.91    35.71    31.50     4.21     0.93     0.22     2.90
 MEAN    23.58    27.73    23.50     4.23     0.91     0.23     3.34     0.88
 HUB     30.44    10.62     6.50     4.12     0.91     0.24     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.965

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      526.576     212.311     481.878    1215.504       0.433      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.320      24.012      614.220      46.000      23.778      33.000       9.222

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      514.365     212.311     556.460    1216.553       0.423       0.005

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.187      24.039     615.281     440.827       0.059       0.227

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     478.691       0.000     478.691    1219.472       0.393       0.125

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.431     618.236       0.000       0.060       0.064       0.122

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.794      27.172       1.074     637.354      16.208     326.156       2.528

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 101085.719       0.357     948.597 1545154.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    713653.88   6696.9897    162.2220      1.7986      0.8367      5.0193      1.2191
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 90% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.964   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     161.138    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   73.24458

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     157.416    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  123960.672  126439.617       1.814     831.557     458.429     619.754       1.352

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   379.04    -0.13   379.04     0.34   609.32
  MEAN    17.06     0.00    -0.02   379.04    -0.13   379.04     0.34
  HUB     12.51     0.00    -0.02   379.04    -0.13   379.04     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.22    50.47     7.75   611.74   719.77    13.93   510.81     0.65
  MEAN    53.16    47.20     5.96   505.89   632.24    13.93   510.81     0.57
  HUB     44.39    38.62     5.77   370.96   530.46    13.93   510.81     0.48

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   607.24   338.78   503.96  1124.43     0.54
  MEAN    18.04   637.78   378.63   513.23  1120.23     0.57
  HUB     15.00   728.91   497.98   532.28  1112.39     0.66

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   573.14   272.97     0.51  6991.64
  MEAN   534.83   536.47   156.19     0.48  6831.22     1.31
  HUB    444.80   534.93    53.18     0.48  7471.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.40     1.22    15.09   556.11     1.06   525.32     0.92     0.91
  MEAN    18.32     1.21    14.70   555.35     1.06   521.38     0.92     0.91
  HUB     18.65     1.23    13.97   558.40     1.07   514.04     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     33.91    28.44    24.20     4.24     0.93     0.28     2.90
  MEAN    36.42    16.93    12.70     4.23     0.92     0.24     3.51     0.91
  HUB     43.09    -5.71    -9.30     3.59     0.92     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     648.223     377.896     526.676    1120.285       0.579      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.420      14.677     521.526      24.000      35.660      35.400      -0.260

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     553.824     377.896     670.467    1130.418       0.490       0.258
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.371      15.587     531.003     528.796       0.023       0.410

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     508.589       0.000     508.589    1134.683       0.448       0.330

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.955     535.017       0.000       0.060       0.037       0.353

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.878      18.317       1.212     556.622      33.812     218.530       1.694

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 210507.453       0.563    1916.893 1593848.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.964   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.138    3398.000      18.317     556.622       1.000       1.000       0.980
W Kg/sec =   73.24458

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    133.962    3280.208       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123960.672  126439.617       1.514     590.487     390.134     474.134       1.215

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   483.51    -0.17   483.51     0.43   588.23
 MEAN    18.08     0.00    -0.02   483.51    -0.17   483.51     0.43
 HUB     15.21     0.00    -0.02   483.51    -0.17   483.51     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.58    46.36     5.22   609.37   778.02    16.17   537.10     0.68
 MEAN    47.96    42.30     5.66   536.08   722.04    16.17   537.10     0.64
 HUB     43.02    37.84     5.18   451.02   661.33    16.17   537.10     0.58

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   554.90   257.69   491.44  1156.69     0.48
 MEAN    18.01   568.87   276.92   496.92  1153.96     0.49
 HUB     15.22   618.36   359.17   503.35  1151.25     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   602.08   347.83     0.52  5265.37
 MEAN   534.05   559.50   257.13     0.48  4990.33     1.39
 HUB    451.41   511.73    92.24     0.44  5470.25

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.08     1.15    18.01   581.69     1.05   555.98     0.92     0.91
 MEAN    20.93     1.14    17.73   580.38     1.04   553.36     0.92     0.91
 HUB     21.20     1.16    17.41   582.67     1.05   550.74     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.67    35.29    31.50     3.79     0.93     0.28     2.90
 MEAN    29.13    27.36    23.50     3.86     0.92     0.28     3.30     0.91
 HUB     35.51    10.38     6.50     3.88     0.92     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
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```
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     577.013     277.697     505.794    1154.353       0.500       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.038      17.734     553.778      46.000      28.768      30.600       1.832

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     512.407     277.697     582.818    1160.463       0.442       0.194

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.004      18.369     559.655     511.151       0.020       0.285

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     505.535       0.000     505.535    1161.068       0.435       0.194

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.384     560.239       0.000       0.060       0.038       0.199

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      20.945       1.143     581.580      24.959     261.073       2.024

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 155461.078       0.424    1415.638 1453297.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.964   EfDer =  0.995

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    161.138    3398.000      20.945     581.580       1.000       1.000       0.980
W Kg/sec =   73.24458

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    119.751    3209.051       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 123960.672  126439.617       1.564     545.479     348.760     429.765       1.232

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   474.97    -0.16   474.97     0.41   562.03
 MEAN    17.74      0.00    -0.02   474.97    -0.16   474.97     0.41
 HUB     15.05      0.00    -0.02   474.97    -0.16   474.97     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.42     46.36     5.06   595.14   761.56    18.67   562.75     0.65
 MEAN    47.93     43.40     4.53   526.00   708.83    18.67   562.75     0.61
 HUB     43.23     38.84     4.39   446.28   651.85    18.67   562.75     0.56

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   542.76    242.19    485.72  1181.17       0.46
 MEAN    17.51   556.59    264.17    489.91  1179.04       0.47
 HUB     14.85   605.22    348.20    495.02  1176.89       0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   595.92   345.24     0.50  4801.10
 MEAN   519.12   552.28   254.96     0.47  4627.57      1.38
 HUB    440.35   503.53    92.15     0.43  5173.22

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     23.68     1.13    20.48   604.43     1.04   579.84     0.92     0.91
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 MEAN    23.58     1.13    20.23   603.60     1.04   577.74     0.92     0.91
 HUB     23.90     1.14    19.95   606.20     1.04   575.62     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.50    35.40    31.50     3.90     0.93     0.27     2.90
 MEAN    28.33    27.49    23.50     3.99     0.92     0.28     3.28     0.91
 HUB     35.12    10.55     6.50     4.05     0.92     0.30     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     562.535     265.901     495.724    1179.601       0.477       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.683      20.265     578.327      46.000      28.209      31.500       3.291

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     510.250     265.901     575.377    1184.367       0.431       0.168

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.646      20.811     583.010     471.992       0.021       0.280

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     494.562       0.000     494.562    1185.703       0.417       0.186

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      20.914     584.326       0.000       0.060       0.040       0.198

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.866      23.577       1.126     604.745      23.164     262.925       2.038

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 144348.938       0.418    1314.450 1421730.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.964   EfDer =  0.990

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    161.138    3398.000       23.577     604.745       1.000       1.000       0.980
W Kg/sec =   73.24458

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
    108.482    3146.990        1.402       0.249      53.349      56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 123960.672  126439.617        1.625     513.330     315.954     401.059       1.269

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   462.89    -0.16   462.89      0.39   528.92
 MEAN    16.97      0.00    -0.02   462.89    -0.16   462.89      0.39
 HUB     14.32      0.00    -0.02   462.89    -0.16   462.89      0.39

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     50.98    46.36     4.62   571.12   735.28     21.23   586.86      0.62
 MEAN    47.40    43.80     3.60   503.23   683.87     21.23   586.86      0.58
 HUB     42.54    37.84     4.70   424.63   628.27     21.23   586.86      0.53

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   523.54   222.05   474.11  1203.27      0.44
 MEAN    16.57   535.64   242.39   477.66  1201.37      0.45
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 HUB     13.89   579.74   322.09   482.04  1199.44     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   582.14   337.80     0.48  4195.44
 MEAN   491.47   538.70   249.08     0.45  4020.07     1.37
 HUB    411.88   490.33    89.79     0.41  4476.13

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.13     1.11    22.94   624.70     1.03   601.83     0.92     0.91
 MEAN    26.02     1.10    22.70   623.87     1.03   599.92     0.92     0.91
 HUB     26.31     1.12    22.42   626.04     1.04   597.99     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.10    35.47    31.50     3.97     0.93     0.26     2.90
 MEAN    26.91    27.54    23.50     4.04     0.92     0.27     3.29     0.91
 HUB     33.75    10.55     6.50     4.05     0.92     0.28     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     527.019     243.754     467.261    1203.116       0.438       0.055

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.117      22.889     601.689      46.000      27.550      32.400       4.850

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     489.138     243.754     546.509    1206.323       0.405       0.173

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.080      23.285     604.902     456.573       0.021       0.275

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     464.110       0.000     464.110    1208.307       0.384       0.170

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.479     606.893       0.000       0.060       0.045       0.229

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.853      25.998       1.103     624.869      20.125     279.716       2.168

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 125465.344       0.400    1142.495 1433836.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.964   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.138    3398.000      25.998     624.869       1.000       1.000       0.980
W Kg/sec =   73.24458

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.004    3095.900       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123960.672  126439.617       1.750     509.668     291.277     390.276       1.340

     ROTOR LEADING EDGE CONDITIONS, STAGE             5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   431.68    -0.15   431.68     0.36   494.93
 MEAN    15.91     0.00    -0.02   431.68    -0.15   431.68     0.36
 HUB     13.07     0.00    -0.02   431.68    -0.15   431.68     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.54    47.36     4.18   543.25   693.99    23.81   609.32     0.57
 MEAN    47.56    44.80     2.76   471.87   639.65    23.81   609.32     0.53
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HUB     41.93    38.84     3.09   387.57   580.23    23.81   609.32     0.48

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   492.64   213.19   444.12  1223.99     0.40
MEAN    15.50   501.08   224.63   447.91  1221.69     0.41
HUB     12.59   536.75   288.98   452.32  1219.39     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    531.98   546.69   318.78     0.45  3827.44
MEAN   459.55   505.77   234.92     0.41  3483.63     1.38
HUB    373.33   460.12    84.35     0.38  3640.22

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     28.46     1.09    25.45   643.07     1.03   622.82     0.92     0.90
MEAN    28.23     1.09    25.14   641.43     1.03   620.49     0.92     0.90
HUB     28.33     1.09    24.80   642.18     1.03   618.14     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.64    35.67    31.50     4.17     0.93     0.26     2.90
MEAN    26.63    27.68    23.50     4.18     0.91     0.26     3.34     0.90
HUB     32.57    10.56     6.50     4.06     0.91     0.27     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.983

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     506.402     228.752     451.791    1222.021       0.414      -0.006

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    28.274      25.119     620.831      46.000      26.854      33.000       6.146

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     478.923     228.752     530.749    1224.243       0.391       0.076

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      28.198      25.371     623.090     440.827       0.044       0.271

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     446.620       0.000     446.620    1226.691       0.364       0.184

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      25.712     625.585       0.000       0.060       0.049       0.182

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.841      28.180       1.084     642.226      17.357     300.637       2.331

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 108260.383       0.383     985.825 1479969.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    744043.19   6775.3003    157.4157      1.8653      0.8569      5.9641      1.2284
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 90% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.044   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     155.582    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   70.71914

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     151.988    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  119686.578  122080.047       1.879     831.557     442.622     619.754       1.400

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   364.35    -0.13   364.35     0.33   609.32
  MEAN    17.06     0.00    -0.02   364.35    -0.13   364.35     0.33
  HUB     12.51     0.00    -0.02   364.35    -0.13   364.35     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.23    50.47     8.76   611.74   712.14    14.02   511.72     0.64
  MEAN    54.24    47.20     7.04   505.89   623.54    14.02   511.72     0.56
  HUB     45.52    38.62     6.90   370.96   520.06    14.02   511.72     0.47

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   595.87   351.00   481.52  1126.91     0.53
  MEAN    18.04   624.23   385.51   490.96  1122.36     0.56
  HUB     15.00   710.41   495.70   508.88  1114.57     0.64

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   547.59   260.75     0.49  7243.62
  MEAN   534.83   513.16   149.32     0.46  6955.19     1.36
  HUB    444.80   511.42    50.90     0.46  7437.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.53     1.23    15.32   557.32     1.07   527.66     0.92     0.91
  MEAN    18.39     1.22    14.90   555.94     1.06   523.40     0.92     0.91
  HUB     18.63     1.23    14.17   558.24     1.07   516.09     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     36.09    28.44    24.20     4.24     0.93     0.32     2.90
  MEAN    38.14    16.92    12.70     4.22     0.93     0.27     3.51     0.91
  HUB     44.25    -5.71    -9.30     3.59     0.93     0.13     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     633.699     384.760     503.522    1122.536       0.565      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.481      14.883     523.623      24.000      37.385      35.400      -1.985

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     527.515     384.760     652.926    1133.521       0.465       0.293
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      18.432      15.887     533.922     528.796       0.023       0.436

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     485.568       0.000     485.568    1137.282       0.427       0.356

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      16.209     537.471       0.000       0.060       0.038       0.380

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.879      18.377       1.216     557.164      34.354     211.711       1.641

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 213884.875       0.572    1880.494 1532079.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.044   EfDer =  1.000

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   155.582    3398.000      18.377     557.164       1.000       1.000       0.980
W Kg/sec =   70.71914

  W cor      RPM cor        GAMMA       Cp          R           Blades       THK
   128.986    3278.611       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.572     590.487     375.645     474.134       1.262

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   462.12    -0.16   462.12     0.41   587.94
 MEAN    18.08     0.00    -0.02   462.12    -0.16   462.12     0.41
 HUB     15.21     0.00    -0.02   462.12    -0.16   462.12     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.83    46.36     6.47   609.37   764.90    16.41   539.33     0.67
 MEAN    49.25    42.30     6.95   536.08   707.88    16.41   539.33     0.62
 HUB     44.31    37.84     6.47   451.02   645.85    16.41   539.33     0.57

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   542.57   274.63   467.92  1160.12     0.47
 MEAN    18.01   555.16   289.17   473.91  1156.95     0.48
 HUB     15.22   602.80   363.63   480.77  1153.79     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   573.10   330.88     0.49  5611.27
 MEAN   534.05   533.44   244.88     0.46  5210.81     1.44
 HUB    451.41   488.72    87.78     0.42  5537.97

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.35     1.16    18.37   583.88     1.05   559.30     0.92     0.91
 MEAN    21.12     1.15    18.04   581.97     1.04   556.24     0.92     0.91
 HUB     21.30     1.16    17.68   583.53     1.05   553.19     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.41    35.27    31.50     3.77     0.93     0.31     2.90
 MEAN    31.39    27.33    23.50     3.83     0.93     0.31     3.30     0.91
 HUB     37.10    10.35     6.50     3.85     0.93     0.32     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     562.703     289.981     482.230    1157.382       0.486       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.225      18.053     556.689      46.000      31.020      30.600      -0.420

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     486.813     289.981     566.635    1164.275       0.418       0.235

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.196      18.791     563.340     511.151       0.019       0.319

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     480.364       0.000     480.364    1164.813       0.412       0.232

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.801     563.860       0.000       0.060       0.037       0.239

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      21.139       1.150     583.129      25.965     247.776       1.921

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 161729.703       0.441    1421.941 1391148.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.044   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    155.582    3398.000      21.139     583.129       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    114.712    3204.787       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 119686.578  122080.047       1.633     545.479     334.086     429.765       1.286

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   451.92    -0.16   451.92     0.39   561.28
 MEAN    17.74     0.00    -0.02   451.92    -0.16   451.92     0.39
 HUB     15.05     0.00    -0.02   451.92    -0.16   451.92     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.80    46.36     6.44   595.14   747.40    19.06   566.08     0.64
 MEAN    49.34    43.40     5.94   526.00   693.60    19.06   566.08     0.59
 HUB     44.65    38.84     5.81   446.28   635.25    19.06   566.08     0.54

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   528.88   260.74   460.14  1185.77      0.45
 MEAN    17.51   541.47   277.56   464.92  1183.15      0.46
 HUB     14.85   588.27   353.13   470.49  1180.53      0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   564.32   326.69     0.48  5168.33
 MEAN   519.12   523.93   241.56     0.44  4861.94     1.43
 HUB    440.35   478.50    87.22     0.41  5246.35

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     24.12     1.14    21.04   607.73     1.04   584.37     0.92     0.91
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 MEAN    23.94     1.13    20.73   606.27     1.04   581.79     0.92     0.91
 HUB     24.17     1.14    20.40   608.10     1.04   579.21     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.54    35.37    31.50     3.87     0.93     0.30     2.90
 MEAN    30.84    27.46    23.50     3.96     0.92     0.31     3.28     0.91
 HUB     36.89    10.50     6.50     4.00     0.92     0.32     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     547.079     279.385     470.361    1183.721       0.462       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.044      20.766     582.377      46.000      30.709      31.500       0.791

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     482.181     279.385     557.274    1189.375       0.405       0.215

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.016      21.443     587.954     471.992       0.018       0.317

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     467.534       0.000     467.534    1190.549       0.393       0.229

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.535     589.115       0.000       0.060       0.037       0.242

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      23.954       1.133     607.363      24.234     247.924       1.922

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 151019.172       0.438    1327.774 1358984.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.044   EfDer =  0.997

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    155.582    3398.000      23.954     607.363       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    103.316    3140.200       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.706     513.330     300.909     401.059       1.333

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   438.21    -0.15   438.21     0.37   527.77
 MEAN    16.97     0.00    -0.02   438.21    -0.15   438.21     0.37
 HUB     14.32     0.00    -0.02   438.21    -0.15   438.21     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.51    46.36     6.15   571.12   719.99    21.82   591.34     0.60
 MEAN    48.96    43.80     5.16   503.23   667.40    21.82   591.34     0.56
 HUB     44.11    37.84     6.27   424.63   610.31    21.82   591.34     0.51

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   508.08   241.98   446.75  1208.98     0.42
 MEAN    16.57   518.89   256.80   450.89  1206.58     0.43
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 HUB     13.89   561.14   327.44   455.70  1204.17     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   548.30   317.87     0.45  4571.46
 MEAN   491.47   508.30   234.67     0.42  4258.68     1.42
 HUB    411.88   463.45    84.44     0.38  4550.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.80     1.12    23.73   629.11     1.04   607.57     0.92     0.91
 MEAN    26.60     1.11    23.42   627.62     1.03   605.15     0.92     0.91
 HUB     26.79     1.12    23.08   629.01     1.04   602.73     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.44    35.43    31.50     3.93     0.93     0.30     2.90
 MEAN    29.66    27.50    23.50     4.00     0.92     0.30     3.29     0.91
 HUB     35.70    10.50     6.50     4.00     0.92     0.31     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     511.305     258.241     441.299    1208.168       0.423       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.694      23.597     606.761      46.000      30.335      32.400       2.065

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     459.975     258.241     527.509    1212.304       0.379       0.222

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.670      24.145     610.921     456.573       0.017       0.316

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     436.669       0.000     436.669    1214.033       0.360       0.219

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.323     612.665       0.000       0.060       0.038       0.276

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      26.601       1.111     628.579      21.215     261.580       2.028

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 132274.797       0.422    1162.971 1368746.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.044   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3398.000      26.601     628.579       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.646    3086.752       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.849     509.668     275.672     390.276       1.416

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   406.71    -0.14   406.71     0.33   493.47
 MEAN    15.91     0.00    -0.02   406.71    -0.14   406.71     0.33
 HUB     13.07     0.00    -0.02   406.71    -0.14   406.71     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.19    47.36     5.83   543.25   678.74    24.62   614.78     0.56
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 MEAN    49.25    44.80     4.45   471.87   623.06    24.62   614.78     0.51
 HUB     43.63    38.84     4.79   387.57   561.90    24.62   614.78     0.46
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   477.53   233.51   416.54  1230.50     0.39
 MEAN    15.50   484.07   239.36   420.75  1227.76     0.39
 HUB     12.59   517.42   294.45   425.46  1225.01     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   512.43   298.47     0.42  4191.73
 MEAN   459.55   474.88   220.19     0.39  3711.71     1.43
 HUB    373.33   432.71    78.88     0.35  3708.98

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.38     1.10    26.48   648.51     1.03   629.48     0.92     0.91
 MEAN    29.05     1.09    26.10   646.22     1.03   626.68     0.92     0.91
 HUB     29.05     1.09    25.69   646.21     1.03   623.88     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.27    35.62    31.50     4.12     0.93     0.30     2.90
 MEAN    29.64    27.62    23.50     4.12     0.92     0.29     3.34     0.91
 HUB     34.69    10.50     6.50     4.00     0.92     0.29     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     489.355     243.748     424.329    1228.070       0.398       -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.098      26.080     627.004      46.000      29.874      33.000       3.126

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219     447.514     243.748     509.590    1231.268       0.363        0.140

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.055      26.518     630.274     440.827       0.034       0.314

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     417.965       0.000     417.965    1233.350       0.339        0.240

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      26.816     632.407       0.000       0.060       0.040        0.237

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.868      29.037       1.092     646.981      18.403     279.262        2.165

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 114796.242       0.406    1009.298 1412061.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    773704.81   6802.4790    151.9881      1.9221      0.8676      7.0442      1.2375
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 90% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     150.961    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   68.61877

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     147.474    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  116131.867  118454.250       1.936     831.557     429.477     619.754       1.443

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   352.30    -0.12   352.30     0.32   609.32
  MEAN    17.06     0.00    -0.02   352.30    -0.12   352.30     0.32
  HUB     12.51     0.00    -0.02   352.30    -0.12   352.30     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.07    50.47     9.60   611.74   706.04    14.09   512.44     0.64
  MEAN    55.15    47.20     7.95   505.89   616.57    14.09   512.44     0.56
  HUB     46.49    38.62     7.87   370.96   511.68    14.09   512.44     0.46

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   587.46   360.70   463.68  1128.80     0.52
  MEAN    18.04   613.80   391.00   473.15  1124.01     0.55
  HUB     15.00   695.84   493.88   490.19  1116.24     0.62

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   527.27   251.04     0.47  7443.83
  MEAN   534.83   494.53   143.82     0.44  7054.16     1.40
  HUB    444.80   492.64    49.08     0.44  7409.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.63     1.23    15.49   558.27     1.07   529.45     0.92     0.91
  MEAN    18.43     1.22    15.05   556.41     1.06   524.95     0.92     0.91
  HUB     18.61     1.23    14.32   558.11     1.07   517.67     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     37.88    28.43    24.20     4.23     0.93     0.34     2.90
  MEAN    39.57    16.91    12.70     4.21     0.93     0.29     3.51     0.91
  HUB     45.21    -5.72    -9.30     3.58     0.93     0.15     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     622.556     390.241     485.065    1124.250       0.554      -0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.523      15.036     525.224      24.000      38.817      35.400      -3.417

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     506.874     390.241     639.694    1135.869       0.446       0.321
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      18.472      16.110     536.137     528.796       0.024       0.458

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     467.421       0.000     467.421    1139.265       0.410       0.377

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      16.395     539.347       0.000       0.060       0.041       0.400

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
    0.877      18.413       1.219     557.596      34.786     206.238       1.599

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 216571.438       0.579    1847.562 1481373.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   150.961    3398.000      18.413     557.596       1.000       1.000       0.980
W Kg/sec =   68.61877

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
   124.958    3277.342       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 116131.867  118454.250       1.623     590.487     363.912     474.134       1.303

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   445.19    -0.15   445.19     0.39   587.72
 MEAN    18.08     0.00    -0.02   445.19    -0.15   445.19     0.39
 HUB     15.21     0.00    -0.02   445.19    -0.15   445.19     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.86    46.36     7.50   609.37   754.79    16.58   541.05     0.66
 MEAN    50.30    42.30     8.00   536.08   696.95    16.58   541.05     0.61
 HUB     45.38    37.84     7.54   451.02   633.84    16.58   541.05     0.56

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   533.91   287.70   449.77  1162.68     0.46
 MEAN    18.01   545.11   298.65   456.02  1159.19     0.47
 HUB     15.22   590.96   367.09   463.11  1155.71     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   550.72   317.81     0.47  5878.04
 MEAN   534.05   513.19   235.41     0.44  5381.38     1.48
 HUB    451.41   470.72    84.32     0.41  5590.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.53     1.17    18.63   585.58     1.05   561.78     0.92     0.91
 MEAN    21.25     1.15    18.26   583.22     1.05   558.41     0.92     0.91
 HUB     21.37     1.16    17.87   584.21     1.05   555.05     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.61    35.25    31.50     3.75     0.93     0.34     2.90
 MEAN    33.22    27.30    23.50     3.80     0.93     0.33     3.30     0.91
 HUB     38.40    10.32     6.50     3.82     0.93     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     552.208     299.484     463.943    1159.651       0.476       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.353      18.279     558.875      46.000      32.843      30.600      -2.243

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     467.212     299.484     554.957    1167.134       0.400       0.267

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.323      19.091     566.110     511.151       0.020       0.346

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     461.173       0.000     461.173    1167.616       0.395       0.260

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.094     566.578       0.000       0.060       0.038       0.268

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      21.264       1.155     584.338      26.742     237.872       1.844

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 166573.438       0.454    1421.031 1341027.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    150.961    3398.000      21.264     584.338       1.000       1.000       0.980
W Kg/sec =   68.61877

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    110.767    3201.470       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 116131.867  118454.250       1.691     545.479     322.597     429.765       1.332

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   434.27    -0.15   434.27     0.37   560.70
 MEAN    17.74      0.00    -0.02   434.27    -0.15   434.27     0.37
 HUB     15.05      0.00    -0.02   434.27    -0.15   434.27     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.89     46.36     7.53   595.14   736.86    19.33   568.59     0.63
 MEAN    50.46     43.40     7.06   526.00   682.22    19.33   568.59     0.58
 HUB     45.79     38.84     6.95   446.28   622.81    19.33   568.59     0.53

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   519.53   274.57   441.04  1189.13      0.44
 MEAN    17.51   530.80   287.61   446.12  1186.19      0.45
 HUB     14.85   575.84   356.85   451.94  1183.24      0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   540.74   312.86     0.45  5442.25
 MEAN   519.12   502.62   231.51     0.42  5037.79     1.47
 HUB    440.35   459.59    83.50     0.39  5301.47

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     24.43     1.15    21.42   610.24     1.04   587.71     0.92     0.91
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 MEAN    24.18     1.14    21.07   608.31     1.04   584.79     0.92     0.91
 HUB     24.34     1.14    20.70   609.57     1.04   581.89     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.90    35.35    31.50     3.85     0.93     0.33     2.90
 MEAN    32.81    27.43    23.50     3.93     0.93     0.33     3.28     0.91
 HUB     38.29    10.47     6.50     3.97     0.93     0.34     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     536.189     289.502     451.317    1186.757       0.452       0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.284      21.107     585.372      46.000      32.679      31.500      -1.179

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     461.407     289.502     544.709    1193.053       0.387       0.250

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.258      21.878     591.600     471.992       0.018       0.346

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     447.606       0.000     447.606    1194.109       0.375       0.261

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.957     592.647       0.000       0.060       0.037       0.274

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      24.196       1.138     609.372      25.035     237.179       1.839

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 156010.609       0.452    1330.920 1308881.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    150.961    3398.000      24.196     609.372       1.000       1.000       0.980
W Kg/sec =   68.61877

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     99.408    3135.018       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 116131.867  118454.250       1.773     513.330     289.529     401.059       1.385

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   419.93    -0.14   419.93     0.35   526.90
 MEAN    16.97     0.00    -0.02   419.93    -0.14   419.93     0.35
 HUB     14.32     0.00    -0.02   419.93    -0.14   419.93     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.68    46.36     7.32   571.12   709.00    22.22   594.66     0.59
 MEAN    50.16    43.80     6.36   503.23   655.54    22.22   594.66     0.55
 HUB     45.33    37.84     7.49   424.63   597.31    22.22   594.66     0.50

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   498.02   256.36   426.97  1213.09     0.41
 MEAN    16.57   507.48   267.26   431.40  1210.36     0.42
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 HUB     13.89   547.95   331.31   436.44  1207.63     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   523.84   303.49     0.43  4842.91
 MEAN   491.47   486.18   224.20     0.40  4432.06     1.46
 HUB    411.88   443.82    80.57     0.37  4603.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.24     1.13    24.26   632.41     1.04   611.71     0.92     0.91
 MEAN    26.98     1.11    23.90   630.45     1.03   608.96     0.92     0.91
 HUB     27.09     1.12    23.52   631.27     1.04   606.22     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.98    35.40    31.50     3.90     0.93     0.32     2.90
 MEAN    31.78    27.46    23.50     3.96     0.93     0.32     3.29     0.91
 HUB     37.20    10.46     6.50     3.96     0.93     0.33     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     500.652     268.767     422.395    1211.838       0.413       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.071      24.067     610.460      46.000      32.468      32.400      -0.068

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     439.049     268.767     514.781    1216.623       0.361       0.258

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.051      24.720     615.291     456.573       0.016       0.348

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     417.044       0.000     417.044    1218.177       0.342       0.253

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.881     616.863       0.000       0.060       0.037       0.308

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      26.985       1.115     631.377      22.005     249.137       1.931

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 137201.828       0.438    1170.463 1317290.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.961    3398.000      26.985     631.377       1.000       1.000       0.980
W Kg/sec =   68.61877

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     90.729    3079.903       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 116131.867  118454.250       1.929     509.668     264.264     390.276       1.477

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   388.78    -0.13   388.78     0.32   492.38
 MEAN    15.91     0.00    -0.02   388.78    -0.13   388.78     0.32
 HUB     13.07     0.00    -0.02   388.78    -0.13   388.78     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.42    47.36     7.06   543.25   668.14    25.15   618.77     0.55
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 MEAN    50.52    44.80     5.72   471.87   611.51    25.15   618.77     0.50
 HUB     44.92    38.84     6.08   387.57   549.06    25.15   618.77     0.45
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   468.09   247.73   397.16  1235.13     0.38
 MEAN    15.50   472.88   249.73   401.56  1232.10     0.38
 HUB     12.59   504.12   298.28   406.41  1229.08     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   488.40   284.24     0.40  4446.78
 MEAN   459.55   453.08   209.82     0.37  3872.32     1.48
 HUB    373.33   413.28    75.05     0.34  3757.08

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.98     1.11    27.15   652.52     1.03   634.24     0.92     0.91
 MEAN    29.58     1.10    26.72   649.79     1.03   631.13     0.92     0.91
 HUB     29.50     1.09    26.27   649.24     1.03   628.04     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.95    35.59    31.50     4.09     0.93     0.33     2.90
 MEAN    31.88    27.59    23.50     4.09     0.92     0.32     3.34     0.91
 HUB     36.28    10.46     6.50     3.96     0.92     0.31     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     478.185     254.307     404.955    1232.393       0.388       -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.628      26.703     631.438      46.000      32.128      33.000       0.872

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     425.802     254.307     495.963    1236.242       0.344       0.184

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.596      27.262     635.389     440.827       0.031       0.347

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     398.071       0.000     398.071    1238.095       0.322       0.278

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.532     637.294       0.000       0.060       0.037       0.275

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.878      29.578       1.096     650.513      19.136     265.134       2.055

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 119380.711       0.422    1018.432 1358713.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    795738.00   6788.4087    147.4741      1.9579      0.8697      7.9534      1.2443
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 90% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     145.767    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   66.25780

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     142.400    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  112136.125  114378.609       2.005     831.557     414.700     619.754       1.494

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   338.90    -0.12   338.90     0.30   609.32
  MEAN    17.06     0.00    -0.02   338.90    -0.12   338.90     0.30
  HUB     12.51     0.00    -0.02   338.90    -0.12   338.90     0.30

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.02    50.47    10.55   611.74   699.45    14.16   513.22     0.63
  MEAN    56.19    47.20     8.99   505.89   609.01    14.16   513.22     0.55
  HUB     47.59    38.62     8.97   370.96   502.55    14.16   513.22     0.45

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   579.00   371.18   444.37  1130.76     0.51
  MEAN    18.04   602.89   396.93   453.79  1125.72     0.54
  HUB     15.00   680.25   491.88   469.89  1117.99     0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   505.31   240.56     0.45  7659.92
  MEAN   534.83   474.28   137.89     0.42  7161.06     1.45
  HUB    444.80   472.24    47.08     0.42  7379.62

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.73     1.24    15.66   559.30     1.07   531.30     0.92     0.91
  MEAN    18.48     1.22    15.20   556.92     1.07   526.56     0.92     0.91
  HUB     18.59     1.23    14.47   557.96     1.07   519.32     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     39.87    28.43    24.20     4.23     0.93     0.37     2.90
  MEAN    41.18    16.90    12.70     4.20     0.93     0.32     3.51     0.91
  HUB     46.31    -5.72    -9.30     3.58     0.93     0.17     4.78

    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.996

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     610.915     396.160     465.053    1126.030       0.543      -0.001

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      18.563      15.191     526.888      24.000      40.426      35.400      -5.026

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     484.775     396.160     626.059    1138.298       0.426       0.351

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.507      16.334     538.432     528.796       0.026       0.483

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     447.921       0.000     447.921    1141.329       0.392       0.398

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.580     541.303       0.000       0.060       0.045       0.422

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      18.441       1.221     558.061      35.251     200.274       1.553

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 219467.391       0.586    1807.848 1425047.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3398.000      18.441     558.061       1.000       1.000       0.980
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.527    3275.976       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 112136.125  114378.609       1.682     590.487     351.010     474.134       1.351

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   426.95    -0.15   426.95     0.37   587.47
 MEAN    18.08     0.00    -0.02   426.95    -0.15   426.95     0.37
 HUB     15.21     0.00    -0.02   426.95    -0.15   426.95     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.99    46.36     8.63   609.37   744.17    16.74   542.84     0.65
 MEAN    51.47    42.30     9.17   536.08   685.43    16.74   542.84     0.60
 HUB     46.58    37.84     8.74   451.02   621.16    16.74   542.84     0.54

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   525.63   301.47   430.58  1165.29     0.45
 MEAN    18.01   535.03   308.69   437.00  1161.50     0.46
 HUB     15.22   578.63   370.76   444.24  1157.71     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   527.11   304.05     0.45  6159.03
 MEAN   534.05   491.69   225.36     0.42  5562.21     1.52
 HUB    451.41   451.51    80.65     0.39  5646.30

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.71     1.18    18.87   587.39     1.05   564.32     0.92     0.91
 MEAN    21.37     1.16    18.48   584.54     1.05   560.64     0.92     0.91
 HUB     21.42     1.16    18.06   584.94     1.05   556.99     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.00    35.23    31.50     3.73     0.93     0.36     2.90
 MEAN    35.24    27.28    23.50     3.78     0.93     0.35     3.30     0.91
 HUB     39.85    10.29     6.50     3.79     0.93     0.35     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     541.700     309.560     444.535    1161.978       0.466       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.469      18.495     561.121      46.000      34.852      30.600      -4.252

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     446.618     309.560     543.411    1170.074       0.382       0.301

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.434      19.382     568.968     511.151       0.021       0.377

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     441.081       0.000     441.081    1170.496       0.377       0.289

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.372     569.379       0.000       0.060       0.043       0.298

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      21.369       1.159     585.624      27.563     227.722       1.765

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 171689.312       0.468    1414.280 1286138.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  0.998

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    145.767    3398.000      21.369     585.624       1.000       1.000       0.980
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    106.546    3197.952       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 112136.125  114378.609       1.758     545.479     310.306     429.765       1.385

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   415.73    -0.14   415.73     0.35   560.08
 MEAN    17.74      0.00    -0.02   415.73    -0.14   415.73     0.35
 HUB     15.05      0.00    -0.02   415.73    -0.14   415.73     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.07     46.36     8.71   595.14   726.08     19.59   571.20     0.62
 MEAN    51.69     43.40     8.29   526.00   670.57     19.59   571.20     0.57
 HUB     47.04     38.84     8.20   446.28   610.02     19.59   571.20     0.52

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   510.82    288.77    421.37  1192.53      0.43
 MEAN    17.51   520.41    297.97    426.66  1189.27      0.44
 HUB     14.85   563.27    360.67    432.65  1186.02      0.47

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43    516.48    298.66     0.43  5723.41
 MEAN   519.12    480.57    221.16     0.40  5218.91      1.52
 HUB    440.35    439.93     79.68     0.37  5358.10

         Pt2       PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     24.71     1.16     21.78    612.86      1.05    591.08      0.92      0.91
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 MEAN    24.40     1.14    21.39   610.46     1.04   587.85     0.92     0.91
 HUB     24.48     1.15    20.98   611.12     1.04   584.64     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.42    35.33    31.50     3.83     0.93     0.36     2.90
 MEAN    34.93    27.40    23.50     3.90     0.93     0.35     3.28     0.91
 HUB     39.82    10.44     6.50     3.94     0.93     0.35     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     525.589     299.922     431.615    1189.838       0.442       0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.498      21.422     588.421      46.000      34.795      31.500      -3.295

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     440.152     299.922     532.623    1196.782       0.368       0.287

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.469      22.284     595.309     471.992       0.019       0.379

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     427.275       0.000     427.275    1197.719       0.357       0.293

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.345     596.241       0.000       0.060       0.040       0.306

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      24.402       1.142     611.481      25.857     226.497       1.756

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 161140.250       0.467    1327.382 1254374.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3398.000      24.402     611.481       1.000       1.000       0.980
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.342    3129.607       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 112136.125  114378.609       1.849     513.330     277.688     401.059       1.444

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   401.22    -0.14   401.22     0.33   525.99
 MEAN    16.97     0.00    -0.02   401.22    -0.14   401.22     0.33
 HUB     14.32     0.00    -0.02   401.22    -0.14   401.22     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.92    46.36     8.56   571.12   698.08    22.58   598.05     0.58
 MEAN    51.44    43.80     7.64   503.23   643.71    22.58   598.05     0.54
 HUB     46.63    37.84     8.79   424.63   584.30    22.58   598.05     0.49

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   488.94   270.79   407.11  1217.18     0.40
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 MEAN    16.57   496.67   277.77   411.73  1214.16     0.41
 HUB     13.89   534.94   335.17   416.92  1211.14     0.44
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   499.30   289.07     0.41  5115.11
 MEAN   491.47   463.88   213.69     0.38  4606.14     1.51
 HUB    411.88   423.92    76.71     0.35  4657.49

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.64     1.13    24.73   635.81     1.04   615.86     0.92     0.91
 MEAN    27.31     1.12    24.33   633.39     1.04   612.80     0.92     0.91
 HUB     27.34     1.12    23.91   633.63     1.04   609.75     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.63    35.38    31.50     3.88     0.93     0.35     2.90
 MEAN    34.01    27.43    23.50     3.93     0.93     0.34     3.29     0.91
 HUB     38.80    10.43     6.50     3.93     0.93     0.35     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     490.585     279.336     403.293    1215.528       0.404       0.050

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.400      24.489     614.194      46.000      34.708      32.400      -2.308

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     418.133     279.336     502.856    1220.953       0.342       0.296

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.379      25.243     619.688     456.573       0.017       0.381

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     397.480       0.000     397.480    1222.337       0.325       0.287

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.380     621.094       0.000       0.060       0.038       0.340

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      27.311       1.119     634.278      22.796     237.145       1.838

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 142143.281       0.454    1170.896 1261670.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3398.000      27.311     634.278       1.000       1.000       0.980
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.760    3072.853       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 112136.125  114378.609       2.017     509.668     252.706     390.276       1.544

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   370.85    -0.13   370.85     0.30   491.25
 MEAN    15.91     0.00    -0.02   370.85    -0.13   370.85     0.30
 HUB     13.07     0.00    -0.02   370.85    -0.13   370.85     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.69    47.36     8.33   543.25   657.86    25.62   622.81     0.54
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 MEAN    51.84    44.80     7.04   471.87   600.26    25.62   622.81     0.49
 HUB     46.27    38.84     7.43   387.57   536.50    25.62   622.81     0.44
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   459.85   261.69   378.12  1239.70     0.37
 MEAN    15.50   462.56   259.94   382.62  1236.42     0.37
 HUB     12.59   491.32   302.03   387.52  1233.15     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   464.79   270.29     0.37  4697.09
 MEAN   459.55   431.55   199.61     0.35  4030.55     1.53
 HUB    373.33   394.03    71.30     0.32  3804.24

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.51     1.12    27.74   656.61     1.04   638.97     0.92     0.91
 MEAN    30.04     1.10    27.27   653.44     1.03   635.59     0.92     0.91
 HUB     29.88     1.09    26.78   652.36     1.03   632.23     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.69    35.56    31.50     4.06     0.93     0.36     2.90
 MEAN    34.19    27.55    23.50     4.05     0.93     0.35     3.34     0.91
 HUB     37.93    10.43     6.50     3.93     0.93     0.33     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     467.915     264.711     385.840    1236.696       0.378       -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.085      27.252     635.871      46.000      34.453      33.000      -1.453

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219     404.682     264.711     483.569    1241.164       0.326       0.228

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.055      27.920     640.474     440.827       0.030       0.382

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     378.671       0.000     378.671    1242.809       0.305       0.316

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      28.160     642.173       0.000       0.060       0.037       0.311

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.881      30.035       1.100     654.135      19.857     251.853       1.952

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 123885.680       0.438    1020.500 1301242.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    818325.94   6740.9067    142.3999      1.9881      0.8670      8.9875      1.2512
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 90% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.991

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     140.741    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   63.97328

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     137.490    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  108269.750  110434.914       2.077     831.557     400.401     619.754       1.548

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   326.09    -0.11   326.09     0.29   609.32
  MEAN    17.06     0.00    -0.02   326.09    -0.11   326.09     0.29
  HUB     12.51     0.00    -0.02   326.09    -0.11   326.09     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.94    50.47    11.47   611.74   693.33    14.23   513.93     0.62
  MEAN    57.20    47.20    10.00   505.89   601.97    14.23   513.93     0.54
  HUB     48.69    38.62    10.07   370.96   493.99    14.23   513.93     0.44

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   571.73   380.93   426.35  1132.52     0.50
  MEAN    18.04   593.09   402.46   435.64  1127.27     0.53
  HUB     15.00   665.84   489.96   450.87  1119.56     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   484.82   230.81     0.43  7860.93
  MEAN   534.83   455.30   132.36     0.40  7260.77     1.49
  HUB    444.80   453.12    45.16     0.40  7350.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.82     1.25    15.81   560.26     1.07   532.95     0.92     0.91
  MEAN    18.51     1.23    15.33   557.40     1.07   528.02     0.92     0.91
  HUB     18.56     1.23    14.60   557.83     1.07   520.80     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     41.78    28.43    24.20     4.23     0.93     0.40     2.90
  MEAN    42.73    16.90    12.70     4.20     0.94     0.34     3.51     0.91
  HUB     47.38    -5.72    -9.30     3.58     0.94     0.20     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     600.463     401.682     446.326    1127.620       0.533       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.595      15.326     528.378      24.000      41.986      35.400      -6.586

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     464.316     401.682     613.953    1140.467       0.407       0.379
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.530      16.529     540.486     528.796       0.029       0.507

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     429.806       0.000     429.806    1143.183       0.376       0.417

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.738     543.063       0.000       0.060       0.051       0.441

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.866      18.456       1.222     558.493      35.683     194.667       1.509

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 222155.500       0.594    1766.895 1371179.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.990

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   140.741    3398.000      18.456     558.493       1.000       1.000       0.980
W Kg/sec =   63.97328

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
   116.321    3274.709       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 108269.750  110434.914       1.743     590.487     338.761     474.134       1.400

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   409.95    -0.14   409.95     0.36   587.24
 MEAN    18.08     0.00    -0.02   409.95    -0.14   409.95     0.36
 HUB     15.21     0.00    -0.02   409.95    -0.14   409.95     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.08    46.36     9.72   609.37   734.55    16.89   544.46     0.64
 MEAN    52.60    42.30    10.30   536.08   674.97    16.89   544.46     0.59
 HUB     47.74    37.84     9.90   451.02   609.60    16.89   544.46     0.53

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   518.83   314.01   413.02  1167.60     0.44
 MEAN    18.01   526.33   317.88   419.50  1163.55     0.45
 HUB     15.22   567.53   374.08   426.79  1159.51     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   505.53   291.51     0.43  6415.00
 MEAN   534.05   471.92   216.18     0.41  5727.49     1.56
 HUB    451.41   433.74    77.33     0.37  5696.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.85     1.18    19.07   589.04     1.05   566.56     0.92     0.91
 MEAN    21.46     1.16    18.65   585.76     1.05   562.63     0.92     0.91
 HUB     21.45     1.16    18.20   585.62     1.05   558.72     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.24    35.21    31.50     3.71     0.93     0.39     2.90
 MEAN    37.15    27.26    23.50     3.76     0.94     0.37     3.30     0.91
 HUB     41.23    10.27     6.50     3.77     0.94     0.37     3.92


  blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     532.616     318.768     426.692    1164.040       0.458       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.556      18.670     563.117      46.000      36.762      30.600      -6.162

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     427.850     318.768     533.544    1172.692       0.365       0.333

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.514      19.622     571.519     511.151       0.024       0.406

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     422.823       0.000     422.823    1173.058       0.360       0.315

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.597     571.876       0.000       0.060       0.049       0.324

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      21.440       1.162     586.805      28.312     218.703       1.695

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 176352.969       0.481    1402.608 1234287.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.994

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    140.741    3398.000      21.440     586.805       1.000       1.000       0.980
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    102.635    3194.734       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 108269.750  110434.914       1.825     545.479     298.916     429.765       1.438

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   398.82    -0.14   398.82     0.34   559.52
 MEAN    17.74     0.00    -0.02   398.82    -0.14   398.82     0.34
 HUB     15.05     0.00    -0.02   398.82    -0.14   398.82     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.18    46.36     9.82   595.14   716.53    19.79   573.53     0.61
 MEAN    52.84    43.40     9.44   526.00   660.21    19.79   573.53     0.56
 HUB     48.22    38.84     9.38   446.28   598.62    19.79   573.53     0.51

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   503.87   301.45   403.75  1195.51     0.42
 MEAN    17.51   511.66   307.25   409.13  1192.00     0.43
 HUB     14.85   552.22   364.07   415.20  1188.50     0.46

       U2        W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   494.77   285.98     0.41  5974.41
 MEAN   519.12   460.74   211.87     0.39  5381.38     1.56
 HUB    440.35   422.15    76.27     0.36  5408.57

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     24.92     1.16    22.05   615.24     1.05   594.04     0.92     0.91
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 MEAN    24.56     1.15    21.63   612.41     1.04   590.56     0.92     0.91
 HUB     24.58     1.15    21.19   612.54     1.04   587.09     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.75    35.31    31.50     3.81     0.93     0.38     2.90
 MEAN    36.91    27.38    23.50     3.88     0.94     0.37     3.28     0.91
 HUB     41.25    10.41     6.50     3.91     0.94     0.37     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     516.672     309.269     413.887    1192.551       0.433       0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.655      21.668     591.113      46.000      36.768      31.500      -5.268

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     421.201     309.269     522.549    1200.067       0.351       0.321

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.620      22.608     598.588     471.992       0.021       0.409

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     409.191       0.000     409.191    1200.901       0.341       0.320

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.648     599.420       0.000       0.060       0.046       0.334

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      24.545       1.145     613.397      26.593     217.223       1.684

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 165726.625       0.480    1318.093 1203140.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.741    3398.000      24.545     613.397       1.000       1.000       0.980
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.662    3124.716       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 108269.750  110434.914       1.923     513.330     266.972     401.059       1.502

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   384.52    -0.13   384.52     0.32   525.17
 MEAN    16.97     0.00    -0.02   384.52    -0.13   384.52     0.32
 HUB     14.32     0.00    -0.02   384.52    -0.13   384.52     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.06    46.36     9.70   571.12   688.61    22.86   601.06     0.57
 MEAN    52.62    43.80     8.82   503.23   633.43    22.86   601.06     0.53
 HUB     47.85    37.84    10.01   424.63   572.96    22.86   601.06     0.48

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   481.82   283.37   389.68  1220.74     0.39
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 MEAN    16.57   487.76   287.00   394.38  1217.49     0.40
 HUB     13.89   523.77   338.55   399.64  1214.22     0.43
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   477.80   276.48     0.39  5352.57
 MEAN   491.47   444.23   204.46     0.36  4759.00     1.56
 HUB    411.88   406.31    73.33     0.33  4704.41

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.94     1.14    25.09   638.85     1.04   619.48     0.92     0.91
 MEAN    27.55     1.12    24.66   636.03     1.04   616.18     0.92     0.91
 HUB     27.51     1.12    24.21   635.77     1.04   612.88     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.02    35.36    31.50     3.86     0.93     0.38     2.90
 MEAN    36.04    27.40    23.50     3.90     0.93     0.37     3.29     0.91
 HUB     40.27    10.40     6.50     3.90     0.93     0.37     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     482.320     288.617     386.436    1218.759       0.396       0.048

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.638      24.807     617.474      46.000      36.755      32.400      -4.355

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     399.839     288.617     493.123    1224.736       0.326       0.329

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.613      25.646     623.545     456.573       0.018       0.413

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     380.404       0.000     380.404    1225.978       0.310       0.316

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.758     624.811       0.000       0.060       0.043       0.366

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      27.539       1.122     636.886      23.489     226.999       1.760

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 146465.641       0.467    1164.902 1209621.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.741    3398.000      27.539     636.886       1.000       1.000       0.980
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.247    3066.555       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 108269.750  110434.914       2.102     509.668     242.478     390.276       1.610

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   355.15    -0.12   355.15     0.29   490.24
 MEAN    15.91     0.00    -0.02   355.15    -0.12   355.15     0.29
 HUB     13.07     0.00    -0.02   355.15    -0.12   355.15     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.83    47.36     9.47   543.25   649.14    25.98   626.36     0.53
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 MEAN    53.04    44.80     8.24   471.87   590.69    25.98   626.36     0.48
 HUB     47.51    38.84     8.67   387.57   525.77    25.98   626.36     0.43
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   453.56   273.65   361.70  1243.66     0.36
 MEAN    15.50   454.23   268.73   366.21  1240.19     0.37
 HUB     12.59   480.51   305.23   371.11  1236.71     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   444.48   258.32     0.36  4911.61
 MEAN   459.55   412.94   190.82     0.33  4166.65     1.58
 HUB    373.33   377.31    68.11     0.31  3844.42

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.89     1.12    28.18   660.23     1.04   643.07     0.92     0.91
 MEAN    30.37     1.10    27.68   656.69     1.03   639.48     0.92     0.91
 HUB     30.14     1.09    27.16   655.16     1.03   635.90     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.11    35.53    31.50     4.03     0.93     0.39     2.90
 MEAN    36.27    27.52    23.50     4.02     0.93     0.37     3.34     0.91
 HUB     39.44    10.40     6.50     3.90     0.93     0.35     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     459.642     273.660     369.298    1240.434       0.371       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.411      27.658     639.738      46.000      36.539      33.000      -3.539

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     386.610     273.660     473.663    1245.422       0.310       0.265

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.377      28.412     644.894     440.827       0.032       0.413

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     362.043       0.000     362.043    1246.902       0.290       0.346

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.626     646.428       0.000       0.060       0.041       0.341

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      30.353       1.102     657.361      20.475     240.854       1.867

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 127748.977       0.451    1016.041 1247566.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    838449.75   6668.5381    137.4901      2.0092      0.8606     10.0004      1.2574
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 90% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.990   EfDer =  0.986

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     135.889    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   61.76752

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     132.749    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  104536.672  106627.180       2.151     831.557     386.595     619.754       1.603

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   313.85    -0.11   313.85     0.28   609.32
  MEAN    17.06     0.00    -0.02   313.85    -0.11   313.85     0.28
  HUB     12.51     0.00    -0.02   313.85    -0.11   313.85     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.84    50.47    12.37   611.74   687.65    14.29   514.58     0.62
  MEAN    58.19    47.20    10.99   505.89   595.43    14.29   514.58     0.54
  HUB     49.78    38.62    11.16   370.96   486.00    14.29   514.58     0.44

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   565.48   390.01   409.47  1134.09     0.50
  MEAN    18.04   584.25   407.60   418.57  1128.66     0.52
  HUB     15.00   652.49   488.12   432.99  1120.98     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   465.65   221.74     0.41  8048.08
  MEAN   534.83   437.48   127.22     0.39  7353.39     1.54
  HUB    444.80   435.15    43.33     0.39  7323.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.89     1.25    15.94   561.15     1.07   534.44     0.92     0.90
  MEAN    18.54     1.23    15.44   557.84     1.07   529.33     0.92     0.90
  HUB     18.52     1.23    14.72   557.69     1.07   522.14     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     43.61    28.44    24.20     4.24     0.93     0.42     2.90
  MEAN    44.24    16.91    12.70     4.21     0.94     0.37     3.51     0.90
  HUB     48.43    -5.71    -9.30     3.59     0.94     0.22     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     591.035     406.812     428.750    1129.048       0.523       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.619      15.443     529.716      24.000      43.496      35.400      -8.096

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     445.280     406.812     603.133    1142.414       0.390       0.405
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      18.545      16.698     542.333     528.796       0.033       0.531

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     412.897       0.000     412.897    1144.856       0.361       0.435

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      16.872     544.654       0.000       0.060       0.058       0.458

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
    0.857      18.461       1.222     558.893      36.083     189.388       1.468

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 224648.266       0.600    1725.116 1319719.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.990   EfDer =  0.984

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   135.889    3398.000      18.461     558.893       1.000       1.000       0.980
W Kg/sec =   61.76752

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
   112.320    3273.536       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104536.672  106627.180       1.805     590.487     327.109     474.134       1.449

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   394.05    -0.14   394.05     0.34   587.03
 MEAN    18.08     0.00    -0.02   394.05    -0.14   394.05     0.34
 HUB     15.21     0.00    -0.02   394.05    -0.14   394.05     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.12    46.36    10.76   609.37   725.79    17.01   545.93     0.63
 MEAN    53.69    42.30    11.39   536.08   665.43    17.01   545.93     0.58
 HUB     48.87    37.84    11.03   451.02   599.02    17.01   545.93     0.52

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   513.25   325.52   396.82  1169.66     0.44
 MEAN    18.01   518.76   326.32   403.27  1165.39     0.45
 HUB     15.22   557.46   377.11   410.55  1161.12     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   485.66   280.00     0.42  6649.94
 MEAN   534.05   453.63   207.73     0.39  5879.49     1.61
 HUB    451.41   417.22    74.30     0.36  5742.85

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.96     1.19    19.24   590.55     1.06   568.56     0.92     0.90
 MEAN    21.53     1.17    18.79   586.89     1.05   564.42     0.92     0.90
 HUB     21.46     1.16    18.32   586.24     1.05   560.29     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.36    35.21    31.50     3.71     0.93     0.41     2.90
 MEAN    38.98    27.25    23.50     3.75     0.94     0.39     3.30     0.90
 HUB     42.57    10.26     6.50     3.76     0.94     0.38     3.92


  blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     524.711     327.238     410.168    1165.881       0.450       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.621      18.812     564.902      46.000      38.583      30.600      -7.983

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     410.589     327.238     525.041    1175.043       0.349       0.362

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.570      19.821     573.815     511.151       0.028       0.435

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     406.063       0.000     406.063    1175.359       0.345       0.338

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.780     574.124       0.000       0.060       0.058       0.348

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.856      21.484       1.164     587.892      28.999     210.597       1.633

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 180633.234       0.493    1387.116 1185255.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.990   EfDer =  0.989

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    135.889    3398.000      21.484     587.892       1.000       1.000       0.980
W Kg/sec =   61.76752

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     98.984    3191.778       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 104536.672  106627.180       1.892     545.479     288.284     429.765       1.491

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   383.26    -0.13   383.26     0.33   559.00
 MEAN    17.74     0.00    -0.02   383.26    -0.13   383.26     0.33
 HUB     15.05     0.00    -0.02   383.26    -0.13   383.26     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.22    46.36    10.86   595.14   707.98    19.96   575.63     0.60
 MEAN    53.93    43.40    10.53   526.00   650.93    19.96   575.63     0.55
 HUB     49.35    38.84    10.51   446.28   588.37    19.96   575.63     0.50

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   498.25   312.89    387.76  1198.15      0.42
 MEAN    17.51   504.18   315.65    393.15  1194.43      0.42
 HUB     14.85   542.36   367.11    399.23  1190.71      0.46

       U2        W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   475.10   274.53     0.40  6201.09
 MEAN   519.12   442.69   203.48     0.37  5528.22      1.60
 HUB    440.35   405.89    73.24     0.34  5453.63

         Pt2       PR       Ps2     Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     25.09     1.17    22.27   617.40     1.05   596.68     0.92     0.90
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 MEAN    24.68     1.15    21.83   614.20     1.04   592.98     0.92     0.90
 HUB     24.63     1.15    21.36   613.84     1.04   589.29     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.90    35.30    31.50     3.80     0.93     0.40     2.90
 MEAN    38.76    27.36    23.50     3.86     0.94     0.39     3.28     0.90
 HUB     42.60    10.39     6.50     3.89     0.94     0.39     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     509.053     317.717     397.732    1194.967       0.426       0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.768      21.859     593.517      46.000      38.619      31.500      -7.119

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     404.057     317.717     514.010    1202.996       0.336       0.351

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.725      22.866     601.520     471.992       0.024       0.438

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     392.856       0.000     392.856    1203.741       0.326       0.344

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.884     602.265       0.000       0.060       0.053       0.358

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864      24.639       1.147     615.148      27.256     209.041       1.620

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 169864.578       0.492    1304.422 1154851.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.990   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.889    3398.000      24.639     615.148       1.000       1.000       0.980
W Kg/sec =   61.76752

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.291    3120.266       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104536.672  106627.180       1.996     513.330     257.154     401.059       1.560

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   369.39    -0.13   369.39     0.31   524.42
 MEAN    16.97     0.00    -0.02   369.39    -0.13   369.39     0.31
 HUB     14.32     0.00    -0.02   369.39    -0.13   369.39     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.11    46.36    10.75   571.12   680.28    23.08   603.76     0.56
 MEAN    53.73    43.80     9.93   503.23   624.36    23.08   603.76     0.52
 HUB     48.99    37.84    11.15   424.63   562.91    23.08   603.76     0.47

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   476.16   294.58   374.10  1223.89     0.39
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 MEAN    16.57   480.26   295.22   378.82  1220.44     0.39
 HUB     13.89   513.98   341.56   384.08  1216.98     0.42
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   458.61   265.28     0.37  5564.03
 MEAN   491.47   426.63   196.25     0.35  4895.06     1.60
 HUB    411.88   390.46    70.33     0.32  4746.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.16     1.14    25.37   641.61     1.04   622.69     0.92     0.91
 MEAN    27.72     1.13    24.91   638.43     1.04   619.18     0.92     0.91
 HUB     27.62     1.12    24.43   637.72     1.04   615.68     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.22    35.34    31.50     3.84     0.93     0.40     2.90
 MEAN    37.93    27.39    23.50     3.89     0.94     0.39     3.29     0.91
 HUB     41.65    10.38     6.50     3.88     0.94     0.38     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     475.391     296.878     371.296    1221.627       0.389       0.046

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.807      25.047     620.396      46.000      38.645      32.400      -6.245

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     383.522     296.878     485.001    1228.093       0.312       0.359

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.775      25.958     626.980     456.573       0.021       0.442

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     365.193       0.000     365.193    1229.214       0.297       0.340

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.044     628.125       0.000       0.060       0.050       0.389

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.868      27.690       1.124     639.253      24.105     218.206       1.692

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 150312.906       0.480    1154.281 1160705.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =10.990   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.889    3398.000      27.690     639.253       1.000       1.000       0.980
W Kg/sec =   61.76752

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.085    3060.872       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104536.672  106627.180       2.185     509.668     233.268     390.276       1.673

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   341.14    -0.12   341.14     0.28   489.33
 MEAN    15.91     0.00    -0.02   341.14    -0.12   341.14     0.28
 HUB     13.07     0.00    -0.02   341.14    -0.12   341.14     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.88    47.36    10.52   543.25   641.58    26.25   629.55     0.52
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 MEAN    54.14    44.80     9.34   471.87   582.37    26.25   629.55     0.47
 HUB     48.65    38.84     9.81   387.57   516.41    26.25   629.55     0.42
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   448.68   284.18   347.21  1247.15     0.36
 MEAN    15.50   447.33   276.46   351.68  1243.51     0.36
 HUB     12.59   471.19   308.06   356.54  1239.87     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   426.57   247.80     0.34  5100.30
 MEAN   459.55   396.49   183.09     0.32  4286.31     1.62
 HUB    373.33   362.46    65.27     0.29  3880.00

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.17     1.13    28.50   663.49     1.04   646.70     0.92     0.91
 MEAN    30.60     1.10    27.98   659.63     1.03   642.94     0.92     0.91
 HUB     30.31     1.09    27.44   657.69     1.03   639.18     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.30    35.51    31.50     4.01     0.93     0.41     2.90
 MEAN    38.17    27.50    23.50     4.00     0.93     0.39     3.34     0.91
 HUB     40.83    10.37     6.50     3.87     0.93     0.37     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     452.809     281.528     354.652    1243.740       0.364       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.640      27.956      643.171      46.000      38.443      33.000      -5.443

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     370.744     281.528     465.520    1249.178       0.297       0.297

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.595      28.780     648.808     440.827       0.036       0.443

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     347.428       0.000     347.428    1250.522       0.278       0.372

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      28.970     650.204       0.000       0.060       0.047       0.367

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.873      30.567       1.104     660.272      21.019     231.450       1.794

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 131149.312       0.463    1007.120 1197167.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    856608.31   6578.0537    132.7495      2.0234      0.8517     10.9901      1.2629
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 90% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.957   EfDer =  0.981

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     131.203    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   59.63782

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     128.172    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  100932.312  102950.742       2.228     831.557     373.266     619.754       1.660

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   302.15    -0.10   302.15     0.27   609.32
  MEAN    17.06     0.00    -0.02   302.15    -0.10   302.15     0.27
  HUB     12.51     0.00    -0.02   302.15    -0.10   302.15     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.72    50.47    13.25   611.74   682.39    14.35   515.18     0.61
  MEAN    59.16    47.20    11.96   505.89   589.34    14.35   515.18     0.53
  HUB     50.84    38.62    12.22   370.96   478.52    14.35   515.18     0.43

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   560.11   398.49   393.60  1135.50     0.49
  MEAN    18.04   576.25   412.41   402.47  1129.92     0.51
  HUB     15.00   640.08   486.36   416.12  1122.27     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   447.66   213.25     0.39  8223.08
  MEAN   534.83   420.68   122.42     0.37  7439.98     1.59
  HUB    444.80   418.19    41.56     0.37  7296.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.95     1.25    16.05   561.98     1.07   535.78     0.92     0.90
  MEAN    18.56     1.23    15.54   558.25     1.07   530.52     0.92     0.90
  HUB     18.49     1.22    14.83   557.57     1.07   523.35     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     45.35    28.45    24.20     4.25     0.93     0.44     2.90
  MEAN    45.70    16.92    12.70     4.22     0.94     0.39     3.51     0.90
  HUB     49.45    -5.70    -9.30     3.60     0.94     0.24     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     582.510     411.607     412.186    1130.335       0.515       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.637      15.545     530.925      24.000      44.960      35.400      -9.560

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     427.461     411.607     593.417    1144.173       0.374       0.430
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      18.552      16.846     544.005     528.796       0.036       0.554

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     397.020       0.000     397.020    1146.376       0.346       0.451

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      16.986     546.101       0.000       0.060       0.066       0.474

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.848      18.458       1.222     559.266      36.456     184.395       1.429

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 226971.953       0.607    1682.864 1270515.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.957   EfDer =  0.977

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   131.203    3398.000      18.458     559.266       1.000       1.000       0.980
W Kg/sec =   59.63782

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
   108.500    3272.444       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100932.312  102950.742       1.869     590.487     315.984     474.134       1.501

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   379.09    -0.13   379.09     0.33   586.84
 MEAN    18.08     0.00    -0.02   379.09    -0.13   379.09     0.33
 HUB     15.21     0.00    -0.02   379.09    -0.13   379.09     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.12    46.36    11.76   609.37   717.78    17.11   547.27     0.63
 MEAN    54.74    42.30    12.44   536.08   656.68    17.11   547.27     0.57
 HUB     49.96    37.84    12.12   451.02   589.28    17.11   547.27     0.51

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   508.67   336.17   381.75  1171.50     0.43
 MEAN    18.01   512.14   334.15   388.12  1167.05     0.44
 HUB     15.22   548.26   379.90   395.31  1162.59     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   467.20   269.35     0.40  6867.29
 MEAN   534.05   436.57   199.90     0.37  6020.35     1.65
 HUB    451.41   401.73    71.51     0.35  5785.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.05     1.19    19.37   591.96     1.06   570.36     0.92     0.89
 MEAN    21.58     1.17    18.90   587.93     1.05   566.03     0.92     0.89
 HUB     21.45     1.16    18.42   586.81     1.05   561.71     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.37    35.21    31.50     3.71     0.93     0.43     2.90
 MEAN    40.73    27.25    23.50     3.75     0.94     0.41     3.30     0.89
 HUB     43.86    10.25     6.50     3.75     0.94     0.40     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     517.788     335.086     394.743    1167.541       0.443       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.667      18.927     566.514      46.000      40.327      30.600      -9.727

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     394.563     335.086     517.651    1177.174       0.335       0.390

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.606      19.987     575.902     511.151       0.032       0.462

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     390.519       0.000     390.519    1177.445       0.332       0.358

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.929     576.167       0.000       0.060       0.067       0.369

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.846      21.508       1.165     588.901      29.635     203.229       1.575

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 184592.844       0.503    1368.647 1138761.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.957   EfDer =  0.983

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    131.203    3398.000      21.508     588.901       1.000       1.000       0.980
W Kg/sec =   59.63782

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     95.549    3189.043       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 100932.312  102950.742       1.960     545.479     278.282     429.765       1.544

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   368.80    -0.13   368.80     0.31   558.52
 MEAN    17.74     0.00    -0.02   368.80    -0.13   368.80     0.31
 HUB     15.05     0.00    -0.02   368.80    -0.13   368.80     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.22    46.36    11.86   595.14   700.25    20.10   577.55     0.59
 MEAN    54.97    43.40    11.57   526.00   642.51    20.10   577.55     0.55
 HUB     50.44    38.84    11.60   446.28   579.04    20.10   577.55     0.49

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   493.68   323.35   373.05  1200.52      0.41
 MEAN    17.51   497.73   323.34   378.40  1196.63      0.42
 HUB     14.85   533.49   369.89   384.44  1192.72      0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   457.06   264.07     0.38  6408.21
 MEAN   519.12   426.05   195.78     0.36  5662.82     1.65
 HUB    440.35   390.85    70.46     0.33  5494.73

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.21     1.17    22.44   619.40     1.05   599.05     0.92     0.90
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 MEAN    24.76     1.15    21.98   615.85     1.05   595.17     0.92     0.90
 HUB     24.66     1.15    21.49   615.05     1.04   591.29     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.92    35.29    31.50     3.79     0.93     0.43     2.90
 MEAN    40.51    27.36    23.50     3.86     0.94     0.41     3.28     0.90
 HUB     43.89    10.39     6.50     3.89     0.94     0.41     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.983

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     502.478     325.461     382.830    1197.144       0.420       0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.847      22.008     595.689      46.000      40.369      31.500      -8.869

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     388.331     325.461     506.681    1205.643       0.322       0.380

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.794      23.073     604.176     471.992       0.028       0.465

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     377.884       0.000     377.884    1206.309       0.313       0.365

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.069     604.844       0.000       0.060       0.062       0.379

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854      24.695       1.148     616.764      27.863     201.698       1.564

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 173648.859       0.503    1287.504 1109163.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =11.957   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.203    3398.000      24.695     616.764       1.000       1.000       0.980
W Kg/sec =   59.63782

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     85.164    3116.176       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100932.312  102950.742       2.069     513.330     248.048     401.059       1.617

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   355.50    -0.12   355.50     0.29   523.74
 MEAN    16.97     0.00    -0.02   355.50    -0.12   355.50     0.29
 HUB     14.32     0.00    -0.02   355.50    -0.12   355.50     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.10    46.36    11.74   571.12   672.83    23.25   606.22     0.56
 MEAN    54.77    43.80    10.97   503.23   616.24    23.25   606.22     0.51
 HUB     50.07    37.84    12.23   424.63   553.90    23.25   606.22     0.46

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   471.59   304.70   359.93  1226.71     0.38
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 MEAN    16.57   473.86   302.65   364.61  1223.09     0.39
 HUB     13.89   505.25   344.23   369.83  1219.47     0.41
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   441.19   255.15     0.36  5755.10
 MEAN   491.47   410.60   188.82     0.34  5018.18     1.64
 HUB    411.88   375.97    67.65     0.31  4783.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.32     1.15    25.58   644.13     1.04   625.58     0.92     0.90
 MEAN    27.84     1.13    25.10   640.63     1.04   621.89     0.92     0.90
 HUB     27.69     1.12    24.60   639.51     1.04   618.21     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.25    35.33    31.50     3.83     0.93     0.42     2.90
 MEAN    39.69    27.38    23.50     3.88     0.94     0.41     3.29     0.90
 HUB     42.95    10.37     6.50     3.87     0.94     0.40     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     469.488     304.353     357.474    1224.210       0.384       0.044

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.921      25.225     623.034      46.000      40.411      32.400      -8.011

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     368.710     304.353     478.098    1231.115       0.299       0.387

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.882      26.198     630.082     456.573       0.024       0.470

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     351.391       0.000     351.391    1232.131       0.285       0.361

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.258     631.122       0.000       0.060       0.058       0.408

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      27.785       1.125     641.425      24.661     210.429       1.631

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 153785.562       0.491    1140.229 1114509.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =11.957   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.203    3398.000      27.785     641.425       1.000       1.000       0.980
W Kg/sec =   59.63782

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.190    3055.685       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100932.312  102950.742       2.267     509.668     224.839     390.276       1.736

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   328.40    -0.11   328.40     0.27   488.50
 MEAN    15.91     0.00    -0.02   328.40    -0.11   328.40     0.27
 HUB     13.07     0.00    -0.02   328.40    -0.11   328.40     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.85    47.36    11.49   543.25   634.89    26.45   632.43     0.51
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MEAN    55.17    44.80    10.37   471.87   574.99    26.45   632.43     0.47
HUB     49.73    38.84    10.89   387.57   508.08    26.45   632.43     0.41
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   444.82   293.60   334.16  1250.28     0.36
MEAN    15.50   441.50   283.39   338.55  1246.50     0.35
HUB     12.59   462.94   310.54   343.33  1242.73     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    531.98   410.47   238.38     0.33  5269.24
MEAN   459.55   381.65   176.17     0.31  4393.60     1.67
HUB    373.33   349.03    62.79     0.28  3911.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     31.37     1.13    28.74   666.47     1.04   649.97     0.92     0.91
MEAN    30.75     1.11    28.20   662.31     1.03   646.05     0.92     0.91
HUB     30.42     1.09    27.64   660.01     1.03   642.14     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.30    35.50    31.50     4.00     0.93     0.43     2.90
MEAN    39.93    27.49    23.50     3.99     0.94     0.41     3.34     0.91
HUB     42.13    10.36     6.50     3.86     0.94     0.39     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.990

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     447.047     288.582     341.426    1246.708       0.359       -0.009

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    30.793      28.173     646.262      46.000      40.205      33.000      -7.205

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
    15.219     356.505     288.582     458.667    1252.547       0.285       0.325

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      30.737      29.054     652.330     440.827       0.041       0.470

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     334.299       0.000     334.299    1253.775       0.267       0.395

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      29.222     653.609       0.000       0.060       0.054       0.388

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.865      30.704       1.105     662.930      21.505     223.219       1.730

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 134188.406       0.474     994.928 1149587.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    873187.62   6474.1724    128.1724      2.0324      0.8414     11.9567      1.2680
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 90% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.033   EfDer =  0.973

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     126.046    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   57.29363

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     123.134    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       2.319     831.557     358.594     619.754       1.728

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   289.39    -0.10   289.39     0.26   609.32
  MEAN    17.06     0.00    -0.02   289.39    -0.10   289.39     0.26
  HUB     12.51     0.00    -0.02   289.39    -0.10   289.39     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.69    50.47    14.22   611.74   676.83    14.41   515.82     0.61
  MEAN    60.23    47.20    13.03   505.89   582.90    14.41   515.82     0.52
  HUB     52.05    38.62    13.43   370.96   470.57    14.41   515.82     0.42

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   554.86   407.53   376.55  1136.96     0.49
  MEAN    18.04   568.02   417.53   385.12  1131.22     0.50
  HUB     15.00   626.90   484.40   397.95  1123.61     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   428.36   204.21     0.38  8409.49
  MEAN   534.83   402.59   117.30     0.36  7532.21     1.65
  HUB    444.80   399.91    39.60     0.36  7267.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.02     1.26    16.16   562.87     1.08   537.15     0.92     0.89
  MEAN    18.58     1.23    15.64   558.69     1.07   531.74     0.92     0.89
  HUB     18.45     1.22    14.93   557.43     1.07   524.60     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     47.26    28.47    24.20     4.27     0.93     0.47     2.90
  MEAN    47.31    16.94    12.70     4.24     0.94     0.41     3.51     0.89
  HUB     50.60    -5.68    -9.30     3.62     0.94     0.27     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     573.730     416.715     394.353    1131.658       0.507       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.651      15.646     532.169      24.000      46.579      35.400     -11.179

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     408.387     416.715     583.465    1145.989       0.356       0.457
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.555      16.993     545.732     528.796       0.041       0.580

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     379.968       0.000     379.968    1147.952       0.331       0.467

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.098     547.603       0.000       0.060       0.076       0.490

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.836      18.448       1.221     559.662      36.852     179.005       1.388

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 229435.094       0.613    1634.260 1216867.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.033   EfDer =  0.969

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    126.046    3398.000      18.448     559.662       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.331    3271.287       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       1.943     590.487     303.844     474.134       1.560

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   362.99    -0.13   362.99     0.32   586.63
 MEAN    18.08     0.00    -0.02   362.99    -0.13   362.99     0.32
 HUB     15.21     0.00    -0.02   362.99    -0.13   362.99     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.22    46.36    12.86   609.37   709.40    17.21   548.66     0.62
 MEAN    55.90    42.30    13.60   536.08   647.51    17.21   548.66     0.56
 HUB     51.18    37.84    13.34   451.02   579.05    17.21   548.66     0.50

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   504.40   347.42   365.68  1173.39     0.43
 MEAN    18.01   505.53   342.41   371.91  1168.76     0.43
 HUB     15.22   538.66   382.81   378.96  1164.11     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   447.59   258.10     0.38  7096.87
 MEAN   534.05   418.38   191.64     0.36  6169.09     1.70
 HUB    451.41   385.12    68.60     0.33  5829.36

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.13     1.20    19.49   593.45     1.06   572.21     0.92     0.89
 MEAN    21.62     1.17    19.01   589.03     1.05   567.69     0.92     0.89
 HUB     21.44     1.16    18.51   587.42     1.05   563.19     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.53    35.21    31.50     3.71     0.93     0.45     2.90
 MEAN    42.64    27.26    23.50     3.76     0.94     0.43     3.30     0.89
 HUB     45.29    10.26     6.50     3.76     0.94     0.42     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.969

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     510.863     343.373     378.253    1169.248       0.437       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.702      19.031     568.175      46.000      42.233      30.600     -11.633

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     377.511     343.373     510.314    1179.382       0.320       0.419

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.629      20.145     578.067     511.151       0.037       0.493

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     373.982       0.000     373.982    1179.608       0.317       0.379

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.065     578.289       0.000       0.060       0.078       0.390

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.832      21.515       1.166     589.967      30.305     195.557       1.516

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188769.812       0.515    1344.602 1088445.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.033   EfDer =  0.976

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    126.046    3398.000      21.515     589.967       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     91.846    3186.160       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  96964.961   98904.055       2.039     545.479     267.498     429.765       1.607

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   353.38    -0.12   353.38     0.30   558.02
 MEAN    17.74     0.00    -0.02   353.38    -0.12   353.38     0.30
 HUB     15.05     0.00    -0.02   353.38    -0.12   353.38     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.30    46.36    12.94   595.14   692.25    20.22   579.54     0.59
 MEAN    56.11    43.40    12.71   526.00   633.79    20.22   579.54     0.54
 HUB     51.63    38.84    12.79   446.28   569.34    20.22   579.54     0.48

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   489.48    334.33    357.51  1202.96      0.41
 MEAN    17.51   491.36    331.41    362.78  1198.89      0.41
 HUB     14.85   524.31    372.76    368.72  1194.81      0.44

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43    438.04    253.10     0.36  6625.46
 MEAN   519.12    408.47    187.72     0.34  5803.94     1.70
 HUB    440.35    374.86     67.59     0.31  5537.38

         Pt2       PR       Ps2      Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     25.31     1.18     22.58    621.49     1.05    601.50     0.92      0.89
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 MEAN    24.82     1.15    22.11   617.59     1.05   597.43     0.92     0.89
 HUB     24.66     1.15    21.60   616.32     1.04   593.37     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.08    35.30    31.50     3.80     0.93     0.45     2.90
 MEAN    42.41    27.36    23.50     3.86     0.94     0.43     3.28     0.89
 HUB     45.31    10.39     6.50     3.89     0.94     0.43     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.976

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     495.978     333.581     367.040    1199.389       0.414       0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.903      22.135     597.933      46.000      42.266      31.500     -10.766

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     371.749     333.581     499.473    1208.380       0.308       0.410

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.840      23.260     606.931     471.992       0.032       0.496

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     362.097       0.000     362.097    1208.968       0.300       0.387

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.231     607.522       0.000       0.060       0.073       0.400

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.841      24.725       1.149     618.466      28.499     194.122       1.505

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 177613.062       0.515    1265.133 1059801.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =13.033   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3398.000      24.725     618.466       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.831    3111.886       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       2.154     513.330     238.343     401.059       1.683

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   340.83    -0.12   340.83     0.28   523.02
 MEAN    16.97     0.00    -0.02   340.83    -0.12   340.83     0.28
 HUB     14.32     0.00    -0.02   340.83    -0.12   340.83     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.18    46.36    12.82   571.12   665.19    23.40   608.77     0.55
 MEAN    55.90    43.80    12.10   503.23   607.89    23.40   608.77     0.50
 HUB     51.26    37.84    13.42   424.63   544.59    23.40   608.77     0.45

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   467.40   315.24   345.09  1229.61     0.38
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 MEAN    16.57   467.58   310.40   349.69  1225.83     0.38
 HUB     13.89   496.31   347.02   354.83  1222.05     0.41
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   422.99   244.61     0.34  5953.96
 MEAN   491.47   393.79   181.07     0.32  5146.49     1.69
 HUB    411.88   360.71    64.86     0.30  4821.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.45     1.15    25.75   646.78     1.05   628.55     0.92     0.90
 MEAN    27.92     1.13    25.26   642.94     1.04   624.70     0.92     0.90
 HUB     27.71     1.12    24.74   641.40     1.04   620.85     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.41    35.33    31.50     3.83     0.93     0.45     2.90
 MEAN    41.59    27.37    23.50     3.87     0.94     0.43     3.29     0.90
 HUB     44.36    10.36     6.50     3.86     0.94     0.42     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     463.728     312.144     342.943    1226.876       0.378       0.042

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.003      25.371     625.764      46.000      42.308      32.400      -9.908

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     353.209     312.144     471.371    1234.238       0.286       0.417

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.954      26.407     633.297     456.573       0.027       0.500

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     336.946       0.000     336.946    1235.150       0.273       0.383

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.437     634.234       0.000       0.060       0.068       0.428

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.848      27.841       1.126     643.706      25.240     202.480       1.570

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 157401.500       0.502    1121.167 1064662.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.033   EfDer =  0.984

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3398.000      27.841     643.706       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     74.138    3050.266       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       2.360     509.668     215.950     390.276       1.807

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   315.05    -0.11   315.05     0.25   487.64
 MEAN    15.91     0.00    -0.02   315.05    -0.11   315.05     0.25
 HUB     13.07     0.00    -0.02   315.05    -0.11   315.05     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.89    47.36    12.53   543.25   628.08    26.61   635.43     0.51
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 MEAN    56.28    44.80    11.48   471.87   567.47    26.61   635.43     0.46
 HUB     50.90    38.84    12.06   387.57   499.55    26.61   635.43     0.40
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   441.33   303.32   320.58  1253.49     0.35
 MEAN    15.50   435.84   290.55   324.86  1249.59     0.35
 HUB     12.59   454.57   313.13   329.53  1245.68     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   393.77   228.66     0.31  5443.50
 MEAN   459.55   366.19   169.00     0.29  4504.59     1.72
 HUB    373.33   334.98    60.21     0.27  3943.68

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.52     1.13    28.93   669.58     1.04   653.33     0.92     0.90
 MEAN    30.86     1.11    28.37   665.11     1.03   649.27     0.92     0.90
 HUB     30.47     1.09    27.79   662.45     1.03   645.22     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.42    35.50    31.50     4.00     0.93     0.46     2.90
 MEAN    41.81    27.48    23.50     3.98     0.94     0.43     3.34     0.90
 HUB     43.54    10.35     6.50     3.85     0.94     0.41     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      441.460     295.880     327.631    1249.769       0.353       -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.901      28.345      649.461      46.000      42.085      33.000      -9.085

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      341.728     295.880     452.021    1256.021       0.272       0.354

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.829      29.282     655.975     440.827       0.048       0.500

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     320.661       0.000     320.661    1257.134       0.255       0.418

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.426     657.139       0.000       0.060       0.063       0.410

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.855      30.789       1.106     665.713      22.007     214.873       1.666

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 137329.125       0.485     978.192 1098245.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    890548.62   6343.3535    123.1343      2.0380      0.8286     13.0332      1.2733
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 90% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.967

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     121.688    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   55.31266

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     118.877    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   93612.320   95484.359       2.402     831.557     346.195     619.754       1.790

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   278.70    -0.10   278.70     0.25   609.32
  MEAN    17.06     0.00    -0.02   278.70    -0.10   278.70     0.25
  HUB     12.51     0.00    -0.02   278.70    -0.10   278.70     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     65.51    50.47    15.04   611.74   672.33    14.46   516.32     0.60
  MEAN    61.15    47.20    13.95   505.89   577.66    14.46   516.32     0.52
  HUB     53.09    38.62    14.47   370.96   464.07    14.46   516.32     0.42

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   550.94   414.94   362.44  1138.11     0.48
  MEAN    18.04   561.49   421.71   370.72  1132.25     0.50
  HUB     15.00   616.10   482.70   382.86  1124.67     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   412.42   196.80     0.36  8562.19
  MEAN   534.83   387.60   113.11     0.34  7607.63     1.70
  HUB    444.80   384.73    37.90     0.34  7241.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.07     1.26    16.24   563.60     1.08   538.24     0.92     0.88
  MEAN    18.59     1.23    15.71   559.05     1.07   532.72     0.92     0.88
  HUB     18.41     1.22    15.01   557.31     1.07   525.60     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     48.86    28.50    24.20     4.30     0.93     0.49     2.90
  MEAN    48.68    16.97    12.70     4.27     0.95     0.44     3.51     0.88
  HUB     51.58    -5.65    -9.30     3.65     0.95     0.29     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     566.767     420.892     379.572    1132.705       0.500       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.659      15.723     533.154      24.000      47.955      35.400     -12.555

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     392.648     420.892     575.606    1147.431       0.342       0.479
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      18.552      17.106     547.107     528.796       0.045       0.602

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     365.847       0.000     365.847    1149.210       0.318       0.481

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      17.182     548.804       0.000       0.060       0.084       0.503

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
    0.826      18.433       1.220     559.984      37.174     174.527       1.353

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 231437.672       0.618    1591.525 1171925.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.962

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   121.688    3398.000      18.433     559.984       1.000       1.000       0.980
W Kg/sec =   55.31266

  W cor      RPM cor        GAMMA       Cp          R           Blades       THK
   100.830    3270.347       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 93612.320   95484.359       2.011     590.487     293.648     474.134       1.615

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   349.64    -0.12   349.64     0.30   586.46
 MEAN    18.08     0.00    -0.02   349.64    -0.12   349.64     0.30
 HUB     15.21     0.00    -0.02   349.64    -0.12   349.64     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.16    46.36    13.80   609.37   702.66    17.29   549.78     0.61
 MEAN    56.89    42.30    14.59   536.08   640.12    17.29   549.78     0.56
 HUB     52.22    37.84    14.38   451.02   570.77    17.29   549.78     0.50

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   501.38   356.58   352.46  1174.89     0.43
 MEAN    18.01   500.47   349.18   358.54  1170.12     0.43
 HUB     15.22   530.92   385.15   365.42  1165.33     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   431.51   248.94     0.37  7283.82
 MEAN   534.05   403.39   184.88     0.34  6290.80     1.75
 HUB    451.41   371.38    66.26     0.32  5864.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.18     1.20    19.57   594.66     1.06   573.67     0.92     0.88
 MEAN    21.64     1.17    19.08   589.93     1.05   569.02     0.92     0.88
 HUB     21.41     1.16    18.57   587.91     1.05   564.37     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.33    35.23    31.50     3.73     0.93     0.47     2.90
 MEAN    44.24    27.28    23.50     3.78     0.95     0.45     3.30     0.88
 HUB     46.51    10.28     6.50     3.78     0.95     0.44     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.962

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     505.549     350.155     364.653    1170.602       0.432       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.719      19.103     569.495      46.000      43.838      30.600     -13.238

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     363.495     350.155     504.715    1181.148       0.308       0.444

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.636      20.259     579.802     511.151       0.041       0.519

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     360.380       0.000     360.380    1181.340       0.305       0.396

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.162     579.991       0.000       0.060       0.089       0.408

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.821      21.508       1.167     590.835      30.851     189.373       1.468

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 192172.609       0.524    1321.511 1046561.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.969

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    121.688    3398.000      21.508     590.835       1.000       1.000       0.980
W Kg/sec =   55.31266

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     88.765    3183.819       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  93612.320   95484.359       2.110     545.479     258.523     429.765       1.662

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   340.68    -0.12   340.68     0.29   557.61
 MEAN    17.74     0.00    -0.02   340.68    -0.12   340.68     0.29
 HUB     15.05     0.00    -0.02   340.68    -0.12   340.68     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.22    46.36    13.86   595.14   685.85    20.30   581.15     0.58
 MEAN    57.08    43.40    13.68   526.00   626.79    20.30   581.15     0.53
 HUB     52.65    38.84    13.81   446.28   561.54    20.30   581.15     0.47

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   486.51   343.22   344.81  1204.90      0.40
 MEAN    17.51   486.50   337.95   349.96  1200.70      0.41
 HUB     14.85   516.97   375.07   355.79  1196.48      0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   422.53   244.21     0.35  6801.50
 MEAN   519.12   394.08   181.17     0.33  5918.49      1.75
 HUB    440.35   361.72    65.28     0.30  5571.58

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     25.38     1.18    22.68   623.20     1.05   603.44     0.92     0.89
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 MEAN    24.85     1.16    22.19   619.00     1.05   599.24     0.92     0.89
 HUB     24.64     1.15    21.67   617.35     1.04   595.04     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.87    35.31    31.50     3.81     0.93     0.47     2.90
 MEAN    44.00    27.37    23.50     3.87     0.94     0.45     3.28     0.89
 HUB     46.51    10.40     6.50     3.90     0.94     0.44     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.969

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     491.017     340.171     354.091    1201.178       0.409       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.930      22.218     599.725      46.000      43.851      31.500     -12.351

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     358.204     340.171     493.991    1210.569       0.296       0.435

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.857      23.390     609.139     471.992       0.036       0.521

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     349.191       0.000     349.191    1211.098       0.288       0.404

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.339     609.671       0.000       0.060       0.083       0.417

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4         PR4        Texit        Del T       Ns        Ns nondim
      0.830      24.727       1.150     619.849      29.014     188.056       1.458

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 180824.375       0.524    1243.473 1018758.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.973

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    121.688    3398.000      24.727     619.849       1.000       1.000       0.980
W Kg/sec =   55.31266

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     79.081    3108.412       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  93612.320   95484.359       2.229     513.330     230.336     401.059       1.741

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   328.82    -0.11   328.82     0.27   522.43
 MEAN    16.97     0.00    -0.02   328.82    -0.11   328.82     0.27
 HUB     14.32     0.00    -0.02   328.82    -0.11   328.82     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.07    46.36    13.71   571.12   659.11    23.49   610.83     0.54
 MEAN    56.85    43.80    13.05   503.23   601.23    23.49   610.83     0.50
 HUB     52.25    37.84    14.41   424.63   537.15    23.49   610.83     0.44

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   464.44   323.74   333.02  1231.92      0.38
 MEAN    16.57   462.81   316.65   337.53  1228.02      0.38
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 HUB     13.89   489.19   349.23   342.56  1224.11     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   408.23   236.11     0.33  6114.35
 MEAN   491.47   380.11   174.81     0.31  5250.12     1.74
 HUB    411.88   348.24    62.65     0.28  4852.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.53     1.15    25.86   648.93     1.05   630.93     0.92     0.89
 MEAN    27.97     1.13    25.35   644.82     1.04   626.95     0.92     0.89
 HUB     27.71     1.12    24.82   642.92     1.04   622.96     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.19    35.34    31.50     3.84     0.93     0.46     2.90
 MEAN    43.17    27.38    23.50     3.88     0.94     0.45     3.29     0.89
 HUB     45.55    10.36     6.50     3.86     0.94     0.43     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     459.369     318.436     331.088    1229.005       0.374       0.040

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.040      25.459     627.951      46.000      43.884      32.400     -11.484

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     340.611     318.436     466.280    1236.737       0.275       0.441

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.983      26.545     635.877     456.573       0.031       0.525

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     325.197       0.000     325.197    1237.569       0.263       0.400

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.549     636.733       0.000       0.060       0.077       0.443

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.837      27.856       1.127     645.556      25.707     196.162       1.521

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 160314.703       0.511    1102.435 1023249.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.978

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.688    3398.000      27.856     645.556       1.000       1.000       0.980
W Kg/sec =   55.31266

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     71.639    3045.893       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93612.320   95484.359       2.442     509.668     208.675     390.276       1.870

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   304.17    -0.10   304.17     0.25   486.94
 MEAN    15.91     0.00    -0.02   304.17    -0.10   304.17     0.25
 HUB     13.07     0.00    -0.02   304.17    -0.10   304.17     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.76    47.36    13.40   543.25   622.70    26.71   637.84     0.50
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 MEAN    57.20    44.80    12.40   471.87   561.50    26.71   637.84     0.45
 HUB     51.88    38.84    13.04   387.57   492.76    26.71   637.84     0.40
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   438.91   311.14   309.58  1256.05     0.35
 MEAN    15.50   431.55   296.30   313.75  1252.05     0.34
 HUB     12.59   447.92   315.14   318.30  1248.04     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   380.27   220.84     0.30  5583.77
 MEAN   459.55   353.68   163.26     0.28  4593.57     1.77
 HUB    373.33   323.58    58.19     0.26  3969.03

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.60     1.13    29.04   672.09     1.04   656.03     0.92     0.89
 MEAN    30.91     1.11    28.47   667.39     1.03   651.86     0.92     0.89
 HUB     30.48     1.09    27.89   664.42     1.03   647.69     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.14    35.50    31.50     4.00     0.93     0.47     2.90
 MEAN    43.36    27.49    23.50     3.99     0.94     0.45     3.34     0.89
 HUB     44.71    10.36     6.50     3.86     0.94     0.42     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     437.235     301.731     316.438    1252.215       0.349       -0.011

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.949      28.444     652.024      46.000      43.637      33.000     -10.637

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     329.786     301.731     446.990    1258.797       0.262       0.378

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.863      29.423     658.896     440.827       0.054       0.525

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     309.627       0.000     309.627    1259.823       0.246       0.435

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.547     659.971       0.000       0.060       0.072       0.427

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.845      30.817       1.106     667.965      22.410     208.275       1.615

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 139846.312       0.494     961.680 1055584.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    904595.62   6220.6240    118.8768      2.0399      0.8169     13.9533      1.2776
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 90% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =14.972   EfDer =  0.959

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     116.916    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   53.14380

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     114.216    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   89941.703   91740.344       2.500     831.557     332.621     619.754       1.863

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   267.09    -0.09   267.09     0.24   609.32
  MEAN    17.06     0.00    -0.02   267.09    -0.09   267.09     0.24
  HUB     12.51     0.00    -0.02   267.09    -0.09   267.09     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     66.42    50.47    15.95   611.74   667.59    14.51   516.85     0.60
  MEAN    62.17    47.20    14.97   505.89   572.15    14.51   516.85     0.51
  HUB     54.25    38.62    15.63   370.96   457.19    14.51   516.85     0.41

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   547.16   422.84   347.27  1139.29     0.48
  MEAN    18.04   554.77   426.13   355.21  1133.32     0.49
  HUB     15.00   604.65   480.82   366.62  1125.77     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   395.33   188.91     0.35  8725.01
  MEAN   534.83   371.47   108.69     0.33  7687.30     1.76
  HUB    444.80   368.38    36.03     0.33  7213.49

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.11     1.27    16.32   564.37     1.08   539.37     0.92     0.88
  MEAN    18.60     1.23    15.78   559.43     1.07   533.72     0.92     0.88
  HUB     18.37     1.22    15.09   557.17     1.07   526.64     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     50.60    28.55    24.20     4.35     0.93     0.52     2.90
  MEAN    50.19    17.01    12.70     4.31     0.95     0.46     3.51     0.88
  HUB     52.68    -5.61    -9.30     3.69     0.95     0.31     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.959

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     559.580     425.305     363.656    1133.784       0.494       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.663      15.797     534.170      24.000      49.468      35.400     -14.068

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     375.762     425.305     567.522    1148.923       0.327       0.502
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.545      17.219     548.531     528.796       0.050       0.627

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     350.643       0.000     350.643    1150.518       0.305       0.495

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.263     550.055       0.000       0.060       0.094       0.517

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.814      18.413       1.219     560.324      37.514     169.689       1.315

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 233556.531       0.624    1543.120 1123107.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =14.972   EfDer =  0.953

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    116.916    3398.000      18.413     560.324       1.000       1.000       0.980
W Kg/sec =   53.14380

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.012    3269.354       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  89941.703   91740.344       2.090     590.487     282.529     474.134       1.678

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   335.24    -0.12   335.24     0.29   586.28
 MEAN    18.08     0.00    -0.02   335.24    -0.12   335.24     0.29
 HUB     15.21     0.00    -0.02   335.24    -0.12   335.24     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.19    46.36    14.83   609.37   695.60    17.36   550.94     0.60
 MEAN    57.99    42.30    15.69   536.08   632.37    17.36   550.94     0.55
 HUB     53.38    37.84    15.54   451.02   562.06    17.36   550.94     0.49

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   498.63   366.30   338.31  1176.44     0.42
 MEAN    18.01   495.42   356.35   344.18  1171.53     0.42
 HUB     15.22   522.80   387.59   350.85  1166.60     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   414.34   239.22     0.35  7482.23
 MEAN   534.05   387.35   177.70     0.33  6419.87     1.80
 HUB    451.41   356.61    63.82     0.31  5902.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.23     1.21    19.64   595.95     1.06   575.19     0.92     0.87
 MEAN    21.65     1.18    19.14   590.89     1.05   570.40     0.92     0.87
 HUB     21.38     1.16    18.62   588.42     1.05   565.60     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.27    35.26    31.50     3.76     0.93     0.49     2.90
 MEAN    46.00    27.31    23.50     3.81     0.95     0.47     3.30     0.87
 HUB     47.85    10.31     6.50     3.81     0.95     0.45     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.953

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     500.236     357.347     350.057    1172.001       0.427       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.725      19.165     570.860      46.000      45.590      30.600     -14.990

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     348.495     357.347     499.144    1182.988       0.295       0.470

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.631      20.365     581.613     511.151       0.046       0.548

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     345.801       0.000     345.801    1183.147       0.292       0.415

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.250     581.770       0.000       0.060       0.101       0.426

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.807      21.489       1.167     591.754      31.430     182.867       1.418

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 195776.828       0.534    1293.507 1001311.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =14.972   EfDer =  0.961

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    116.916    3398.000      21.489     591.754       1.000       1.000       0.980
W Kg/sec =   53.14380

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     85.427    3181.346       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  89941.703   91740.344       2.192     545.479     248.806     429.765       1.727

     ROTOR LEADING EDGE CONDITIONS, STAGE             3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   327.04    -0.11   327.04     0.28   557.18
 MEAN    17.74     0.00    -0.02   327.04    -0.11   327.04     0.28
 HUB     15.05     0.00    -0.02   327.04    -0.11   327.04     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.22    46.36    14.86   595.14   679.17    20.38   582.83     0.57
 MEAN    58.13    43.40    14.73   526.00   619.48    20.38   582.83     0.52
 HUB     53.77    38.84    14.93   446.28   553.37    20.38   582.83     0.47

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   483.82   352.63   331.25  1206.91     0.40
 MEAN    17.51   481.67   344.88   336.26  1202.58     0.40
 HUB     14.85   509.32   377.49   341.92  1198.23     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   406.03   234.80     0.34  6987.86
 MEAN   519.12   378.72   174.25     0.31  6039.59     1.80
 HUB    440.35   347.65    62.86     0.29  5607.45

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     25.43     1.18    22.76   625.01     1.06   605.47     0.92     0.88
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 MEAN    24.86     1.16    22.26   620.49     1.05   601.13     0.92     0.88
 HUB     24.61     1.15    21.73   618.44     1.05   596.79     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.79    35.33    31.50     3.83     0.93     0.49     2.90
 MEAN    45.73    27.39    23.50     3.89     0.95     0.47     3.28     0.88
 HUB     47.83    10.42     6.50     3.92     0.95     0.46     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.961

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     486.078     347.139     340.244    1203.038       0.404       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.940      22.284     601.592      46.000      45.575      31.500     -14.075

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     343.764     347.139     488.548    1212.854       0.283       0.462

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.856      23.506     611.449     471.992       0.041       0.550

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     335.412       0.000     335.412    1213.323       0.276       0.422

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.431     611.922       0.000       0.060       0.094       0.435

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4         PR4        Texit        Del T       Ns        Ns nondim
      0.818      24.710       1.150     621.312      29.558     181.702       1.409

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 184218.609       0.534    1217.141  974453.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =14.972   EfDer =  0.966

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    116.916    3398.000      24.710     621.312       1.000       1.000       0.980
W Kg/sec =   53.14380

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     76.122    3104.750       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 89941.703   91740.344       2.315     513.330     221.719     401.059       1.809

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   315.97    -0.11   315.97     0.26   521.82
 MEAN    16.97     0.00    -0.02   315.97    -0.11   315.97     0.26
 HUB     14.32     0.00    -0.02   315.97    -0.11   315.97     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.05    46.36    14.69   571.12   652.79    23.57   612.98     0.54
 MEAN    57.88    43.80    14.08   503.23   594.30    23.57   612.98     0.49
 HUB     53.35    37.84    15.51   424.63   529.38    23.57   612.98     0.44

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   461.75   332.71   320.18  1234.32     0.37
 MEAN    16.57   458.07   323.25   324.56  1230.31     0.37
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 HUB     13.89   481.78   351.52   329.46  1226.27     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   392.57   227.14     0.32  6283.65
 MEAN   491.47   365.57   168.22     0.30  5359.36     1.79
 HUB    411.88   334.95    60.37     0.27  4884.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.58     1.16    25.94   651.19     1.05   633.41     0.92     0.88
 MEAN    27.98     1.13    25.43   646.80     1.04   629.29     0.92     0.88
 HUB     27.68     1.12    24.88   644.54     1.04   625.17     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.10    35.35    31.50     3.85     0.93     0.49     2.90
 MEAN    44.88    27.40    23.50     3.90     0.95     0.47     3.29     0.88
 HUB     46.85    10.38     6.50     3.88     0.95     0.45     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     455.058     325.069     318.447    1231.224       0.370       0.037

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.052      25.525     630.235      46.000      45.590      32.400     -13.190

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     327.221     325.069     461.241    1239.347       0.264       0.467

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.986      26.660     638.578     456.573       0.035       0.553

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     312.692       0.000     312.692    1240.099       0.252       0.418

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.638     639.353       0.000       0.060       0.088       0.459

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.825      27.843       1.127     647.510      26.198     189.579       1.470

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 163381.484       0.521    1079.470  978568.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =14.972   EfDer =  0.971

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    116.916    3398.000      27.843     647.510       1.000       1.000       0.980
W Kg/sec =   53.14380

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     68.967    3041.292       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  89941.703   91740.344       2.537     509.668     200.892     390.276       1.943

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   292.58    -0.10   292.58     0.24   486.20
 MEAN    15.91     0.00    -0.02   292.58    -0.10   292.58     0.24
 HUB     13.07     0.00    -0.02   292.58    -0.10   292.58     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.70    47.36    14.34   543.25   617.11    26.79   640.37     0.50
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MEAN    58.20    44.80    13.40   471.87   555.30    26.79   640.37     0.45
HUB     52.96    38.84    14.12   387.57   485.69    26.79   640.37     0.39
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   436.75   319.37   297.91  1258.73     0.35
MEAN    15.50   427.32   302.38   301.95  1254.63     0.34
HUB     12.59   441.04   317.28   306.35  1250.52     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    531.98   365.99   212.60     0.29  5731.41
MEAN   459.55   340.40   157.18     0.27  4687.73     1.82
HUB    373.33   311.44    56.05     0.25  3995.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     31.65     1.14    29.12   674.75     1.04   658.84     0.92     0.89
MEAN    30.93     1.11    28.54   669.79     1.03   654.56     0.92     0.89
HUB     30.46     1.09    27.95   666.50     1.03   650.28     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.99    35.51    31.50     4.01     0.93     0.50     2.90
MEAN    45.04    27.50    23.50     4.00     0.94     0.47     3.34     0.89
HUB     46.00    10.37     6.50     3.87     0.94     0.44     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.971

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     433.087     307.922     304.546    1254.767       0.345       -0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.964      28.513     654.706      46.000      45.316      33.000     -12.316

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     317.132     307.922     442.028    1261.699       0.251       0.403

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      30.862      29.534     661.959     440.827       0.061       0.552

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     297.923       0.000     297.923    1262.637       0.236       0.454

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      29.637     662.944       0.000       0.060       0.083       0.444

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.834      30.809       1.107     670.345      22.834     201.407       1.561

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 142501.344       0.504     941.513 1009545.312

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    919434.88   6074.7520    114.2156      2.0394      0.8034     14.9715      1.2822
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 90% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =15.963   EfDer =  0.950

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     112.321    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   51.05489

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     109.726    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  86406.375   88134.312       2.602     831.557     319.546     619.754       1.939

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   256.00    -0.09   256.00     0.23   609.32
  MEAN    17.06     0.00    -0.02   256.00    -0.09   256.00     0.23
  HUB     12.51     0.00    -0.02   256.00    -0.09   256.00     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     67.30    50.47    16.83   611.74   663.23    14.56   517.34     0.59
  MEAN    63.16    47.20    15.96   505.89   567.05    14.56   517.34     0.51
  HUB     55.40    38.62    16.78   370.96   450.79    14.56   517.34     0.40

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   543.99   430.22   332.92  1140.36     0.48
  MEAN    18.04   548.70   430.26   340.51  1134.29     0.48
  HUB     15.00   593.95   478.98   351.21  1126.77     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   379.19   181.53     0.33  8877.21
  MEAN   534.83   356.20   104.57     0.31  7761.68     1.83
  HUB    444.80   352.87    34.18     0.31  7185.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.15     1.27    16.38   565.10     1.08   540.38     0.92     0.87
  MEAN    18.60     1.23    15.85   559.78     1.07   534.64     0.92     0.87
  HUB     18.32     1.21    15.16   557.04     1.07   527.58     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     52.27    28.60    24.20     4.40     0.93     0.54     2.90
  MEAN    51.64    17.07    12.70     4.37     0.95     0.48     3.51     0.87
  HUB     53.75    -5.56    -9.30     3.74     0.95     0.34     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.950

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     553.092     429.424     348.577    1134.759       0.487       0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.662      15.860     535.089      24.000      50.933      35.400     -15.533

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     359.807     429.424     560.238    1150.280       0.313       0.525
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.533      17.316     549.827     528.796       0.054       0.651

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     336.219       0.000     336.219    1151.713       0.292       0.508

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.332     551.198       0.000       0.060       0.104       0.530

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.802      18.389       1.217     560.640      37.830     165.086       1.280

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 235522.641       0.629    1494.944 1076448.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =15.963   EfDer =  0.943

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    112.321    3398.000      18.389     560.640       1.000       1.000       0.980
W Kg/sec =   51.05489

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.345    3268.433       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  86406.375   88134.312       2.172     590.487     271.852     474.134       1.744

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   321.57    -0.11   321.57     0.28   586.12
 MEAN    18.08     0.00    -0.02   321.57    -0.11   321.57     0.28
 HUB     15.21     0.00    -0.02   321.57    -0.11   321.57     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.18    46.36    15.82   609.37   689.11    17.42   552.01     0.60
 MEAN    59.05    42.30    16.75   536.08   625.22    17.42   552.01     0.54
 HUB     54.52    37.84    16.68   451.02   554.01    17.42   552.01     0.48

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   496.50   375.38   324.97  1177.84     0.42
 MEAN    18.01   491.02   363.04   330.61  1172.81     0.42
 HUB     15.22   515.34   389.84   337.04  1167.75     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   398.21   230.14     0.34  7667.46
 MEAN   534.05   372.22   171.01     0.32  6540.28     1.86
 HUB    451.41   342.62    61.57     0.29  5936.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.25     1.21    19.69   597.15     1.07   576.56     0.92     0.86
 MEAN    21.65     1.18    19.19   591.78     1.06   571.65     0.92     0.86
 HUB     21.33     1.16    18.66   588.90     1.05   566.73     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.12    35.31    31.50     3.81     0.93     0.52     2.90
 MEAN    47.68    27.35    23.50     3.85     0.95     0.49     3.30     0.86
 HUB     49.15    10.35     6.50     3.85     0.95     0.47     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.943

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     495.589     364.056     336.262    1173.272       0.422       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.720      19.209     572.102      46.000      47.273      30.600     -16.673

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     334.348     364.056     494.292    1184.674       0.282       0.496

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.616      20.451     583.275     511.151       0.051       0.576

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     332.022       0.000     332.022    1184.805       0.280       0.432

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.318     583.405       0.000       0.060       0.112       0.444

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.793      21.459       1.167     592.609      31.969     176.827       1.371

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 199136.094       0.543    1263.986  958281.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =15.963   EfDer =  0.952

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    112.321    3398.000      21.459     592.609       1.000       1.000       0.980
W Kg/sec =   51.05489

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     82.243    3179.050       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  86406.375   88134.312       2.277     545.479     239.531     429.765       1.794

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   314.13    -0.11   314.13     0.26   556.77
 MEAN    17.74      0.00    -0.02   314.13    -0.11   314.13     0.26
 HUB     15.05      0.00    -0.02   314.13    -0.11   314.13     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.18     46.36     15.82   595.14   673.05     20.44   584.37     0.57
 MEAN    59.16     43.40     15.76   526.00   612.76     20.44   584.37     0.52
 HUB     54.87     38.84     16.03   446.28   545.84     20.44   584.37     0.46

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   481.71    361.39    318.50  1208.74      0.40
 MEAN    17.51   477.47    351.34    323.33  1204.30      0.40
 HUB     14.85   502.28    379.69    328.81  1199.83      0.42

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43    390.56    226.04     0.32  7161.36
 MEAN   519.12    364.27    167.78     0.30  6152.66      1.85
 HUB    440.35    334.36     60.66     0.28  5640.01

         Pt2       PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     25.45      1.19     22.81    626.69      1.06    607.32      0.92      0.87
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 MEAN    24.86     1.16    22.30   621.89     1.05   602.86     0.92     0.87
 HUB     24.56     1.14    21.77   619.45     1.05   598.39     0.92     0.87
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.61    35.36    31.50     3.86     0.93     0.51     2.90
 MEAN    47.38    27.43    23.50     3.93     0.95     0.49     3.28     0.87
 HUB     49.11    10.45     6.50     3.95     0.95     0.48     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.952

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     481.785     353.645     327.188    1204.737       0.400       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.930      22.326     603.300      46.000      47.225      31.500     -15.725

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     330.181     353.645     483.822    1214.952       0.272       0.488

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.836      23.592     613.574     471.992       0.045       0.577

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     322.426       0.000     322.426    1215.370       0.265       0.439

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.496     613.997       0.000       0.060       0.105       0.452

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.805      24.676       1.150     622.673      30.064     175.826       1.363

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 187373.016       0.543    1189.322  932349.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =15.963   EfDer =  0.958

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    112.321    3398.000       24.676     622.673       1.000       1.000       0.980
W Kg/sec =   51.05489

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     73.313    3101.355        1.401       0.249      53.349      56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  86406.375   88134.312        2.404     513.330     213.538     401.059       1.878

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   303.85    -0.10   303.85      0.25   521.25
 MEAN    16.97      0.00    -0.02   303.85    -0.10   303.85      0.25
 HUB     14.32      0.00    -0.02   303.85    -0.10   303.85      0.25

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     61.99     46.36    15.63   571.12   647.01     23.63   614.97      0.53
 MEAN    58.88     43.80    15.08   503.23   587.94     23.63   614.97      0.48
 HUB     54.42     37.84    16.58   424.63   522.23     23.63   614.97      0.43

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2      Ao2          Mach2
 TIP     18.88   459.62   341.04   308.13  1236.52      0.37
 MEAN    16.57   453.95   329.40   312.37  1232.40      0.37
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 HUB     13.89   474.98   353.62   317.11  1228.26     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   377.92   218.82     0.31  6440.78
 MEAN   491.47   351.91   162.07     0.29  5461.14     1.84
 HUB    411.88   322.42    58.26     0.26  4913.32

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.59     1.16    25.99   653.30     1.05   635.68     0.92     0.88
 MEAN    27.97     1.13    25.47   648.64     1.04   631.45     0.92     0.88
 HUB     27.63     1.12    24.92   646.04     1.04   627.22     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.90    35.38    31.50     3.88     0.93     0.51     2.90
 MEAN    46.52    27.42    23.50     3.92     0.95     0.49     3.29     0.88
 HUB     48.12    10.41     6.50     3.91     0.95     0.47     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.958

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     451.327     331.248     306.547    1233.261       0.366       0.035

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.038      25.558     632.335      46.000      47.218      32.400     -14.818

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     314.647     331.248     456.868    1241.748       0.253       0.492

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.962      26.740     641.069     456.573       0.039       0.580

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     300.928       0.000     300.928    1242.430       0.242       0.435

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.692     641.773       0.000       0.060       0.099       0.473

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.813      27.805       1.127     649.327      26.654     183.512       1.423

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 166229.797       0.530    1055.118  936127.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =15.963   EfDer =  0.963

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    112.321    3398.000      27.805     649.327       1.000       1.000       0.980
W Kg/sec =   51.05489

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      66.440    3037.034       1.401       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  86406.375   88134.312       2.633     509.668     193.534     390.276       2.017

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   281.67    -0.10   281.67     0.23   485.52
 MEAN    15.91     0.00    -0.02   281.67    -0.10   281.67     0.23
 HUB     13.07     0.00    -0.02   281.67    -0.10   281.67     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.60    47.36    15.24   543.25   612.01    26.83   642.71     0.49
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 MEAN    59.17    44.80    14.37   471.87   549.63    26.83   642.71     0.44
 HUB     54.00    38.84    15.16   387.57   479.19    26.83   642.71     0.39
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   435.07   327.02   286.96  1261.18     0.34
 MEAN    15.50   423.62   307.99   290.85  1257.00     0.34
 HUB     12.59   434.73   319.21   295.11  1252.80     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   352.64   204.95     0.28  5868.57
 MEAN   459.55   327.98   151.57     0.26  4774.58     1.87
 HUB    373.33   300.03    54.12     0.24  4020.17

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.66     1.14    29.16   677.22     1.04   661.43     0.92     0.88
 MEAN    30.91     1.11    28.58   672.02     1.03   657.06     0.92     0.88
 HUB     30.41     1.09    27.98   668.43     1.03   652.68     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.73    35.54    31.50     4.04     0.93     0.51     2.90
 MEAN    46.64    27.52    23.50     4.02     0.95     0.49     3.34     0.88
 HUB     47.25    10.39     6.50     3.89     0.95     0.45     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.963

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     429.456     313.633     293.372    1257.114       0.342      -0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.945      28.543     657.178      46.000      46.912      33.000     -13.912

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     305.271     313.633     437.671    1264.369       0.241       0.426

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.828      29.602     664.785     440.827       0.068       0.578

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     286.939       0.000     286.939    1265.230       0.227       0.471

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.684     665.690       0.000       0.060       0.093       0.460

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.822      30.768       1.107     672.554      23.227     195.099       1.512

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 144956.406       0.512     920.089  965798.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    933218.00   5923.4580    109.7261      2.0366      0.7899     15.9629      1.2864
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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 85% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.989

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     165.938    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   75.42619

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     162.104    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  127652.898  130205.680       1.761     831.557     472.083     619.754       1.313

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   391.91    -0.13   391.91     0.35   575.61
  MEAN    17.06     0.00    -0.02   391.91    -0.13   391.91     0.35
  HUB     12.51     0.00    -0.02   391.91    -0.13   391.91     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.86    50.47     5.39   577.90   698.37    13.85   509.98     0.63
  MEAN    50.65    47.20     3.45   477.90   618.15    13.85   509.98     0.56
  HUB     41.81    38.62     3.19   350.44   525.83    13.85   509.98     0.47

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   607.29   288.69   534.28  1117.49     0.54
  MEAN    18.04   639.16   340.54   540.88  1114.84     0.57
  HUB     15.00   734.20   475.86   559.11  1108.01     0.66

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   607.53   289.20     0.54  5958.55
  MEAN   505.23   565.40   164.70     0.51  6144.29     1.21
  HUB    420.19   561.88    55.67     0.51  7139.62

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.70     1.17    14.47   549.62     1.05   518.83     0.92     0.90
  MEAN    17.78     1.18    14.23   550.46     1.05   516.35     0.92     0.90
  HUB     18.25     1.21    13.58   554.94     1.06   509.93     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     28.38    28.43    24.20     4.23     0.93     0.20     2.90
  MEAN    32.19    16.94    12.70     4.24     0.92     0.17     3.51     0.90
  HUB     40.40    -5.69    -9.30     3.61     0.92     0.03     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     651.573     339.878     555.905    1114.565       0.585      -0.014

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.870      14.174     516.214      24.000      31.441      35.400       3.959

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     594.734     339.878     685.001    1120.934       0.531       0.158
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      17.808      14.697     522.130     528.796       0.026       0.338

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     544.771       0.000     544.771    1126.027       0.484       0.244

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      15.106     526.886       0.000       0.060       0.046       0.265

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
    0.852      17.733       1.174     551.673      28.863     236.365       1.832

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 179699.609       0.538    1685.094 1647965.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.977

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   165.938    3210.000      17.733     551.673       1.000       1.000       0.980
W Kg/sec =   75.42619

  W cor      RPM cor        GAMMA       Cp          R           Blades       THK
   141.863    3112.592       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127652.898  130205.680       1.429     590.487     413.143     474.134       1.148

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   516.87    -0.18   516.87     0.46   558.17
 MEAN    18.08     0.00    -0.02   516.87    -0.18   516.87     0.46
 HUB     15.21     0.00    -0.02   516.87    -0.18   516.87     0.46

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.09    46.36     1.73   575.66   773.78    15.35   529.36     0.69
 MEAN    44.43    42.30     2.13   506.42   723.73    15.35   529.36     0.64
 HUB     39.51    37.84     1.67   426.07   669.95    15.35   529.36     0.59

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   571.75   189.91   539.28  1141.93     0.50
 MEAN    18.01   585.57   223.82   541.11  1141.25     0.51
 HUB     15.22   634.52   325.82   544.48  1140.42     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   660.93   382.11     0.58  3881.64
 MEAN   504.50   609.58   280.68     0.53  4034.19     1.27
 HUB    426.43   553.70   100.62     0.49  4962.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.55     1.10    16.47   569.13     1.03   541.84     0.92     0.89
 MEAN    19.62     1.11    16.39   569.82     1.03   541.19     0.92     0.89
 HUB     20.07     1.13    16.26   574.00     1.04   540.38     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.40    35.32    31.50     3.82     0.93     0.19     2.90
 MEAN    22.47    27.42    23.50     3.92     0.91     0.20     3.30     0.89
 HUB     30.90    10.47     6.50     3.97     0.91     0.24     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     595.489     224.447     551.571    1141.355       0.522      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.713      16.371     541.372      46.000      22.143      30.600       8.457

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     568.047     224.447     610.781    1144.162       0.496       0.063

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.634      16.587     544.038     511.151       0.033       0.184

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     561.209       0.000     561.209    1144.840       0.490       0.062

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.580     544.683       0.000       0.060       0.060       0.061

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.808      19.545       1.102     570.984      19.310     309.124       2.396

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 120268.672       0.368    1127.794 1527595.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.950

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    165.938    3210.000      19.545     570.984       1.000       1.000       0.980
W Kg/sec =   75.42619

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    130.944    3059.506       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 127652.898  130205.680       1.430     545.479     381.356     429.765       1.127

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   525.30    -0.18   525.30     0.46   535.84
 MEAN    17.74     0.00    -0.02   525.30    -0.18   525.30     0.46
 HUB     15.05     0.00    -0.02   525.30    -0.18   525.30     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.95    46.36     0.59   562.21   769.56    16.93   547.95     0.67
 MEAN    43.42    43.40     0.02   496.90   723.21    16.93   547.95     0.63
 HUB     38.76    38.84    -0.08   421.59   673.67    16.93   547.95     0.59

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   576.53    160.57    553.72  1158.33      0.50
 MEAN    17.51   588.98    201.20    553.55  1158.67      0.51
 HUB     14.85   636.72    311.36    555.39  1158.76      0.55

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93    679.80    394.36     0.59  3184.47
 MEAN   490.40    624.55    289.21     0.54  3525.48     1.23
 HUB    415.99    565.16    104.63     0.49  4626.40

         Pt2       PR       Ps2      Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     21.07     1.08     17.79    585.30      1.03    557.56     0.92      0.87
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 MEAN    21.24     1.09    17.80   586.84     1.03   557.88     0.92     0.87
 HUB     21.79     1.11    17.74   591.79     1.04   557.95     0.92     0.87
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.17    35.46    31.50     3.96     0.93     0.15     2.90
 MEAN    19.97    27.58    23.50     4.08     0.90     0.18     3.28     0.87
 HUB     29.28    10.67     6.50     4.17     0.90     0.22     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.950

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     596.345     202.518     560.905    1158.998       0.515       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.332      17.804     558.285      46.000      19.852      31.500      11.648

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     589.708     202.518     623.514    1159.680       0.509       0.000

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.213      17.777     558.943     471.992       0.043       0.154

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     572.483       0.000     572.483    1161.413       0.493       0.013

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.850     560.614       0.000       0.060       0.081       0.020

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.736      21.079       1.079     587.976      16.993     329.592       2.555

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 105866.742       0.344     992.743 1515042.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.913

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    165.938    3210.000      21.079     587.976       1.000       1.000       0.980
W Kg/sec =   75.42619

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    123.204    3014.972       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127652.898  130205.680       1.431     513.330     358.827     401.059       1.118

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   532.95    -0.18   532.95     0.46   506.73
 MEAN    16.97     0.00    -0.02   532.95    -0.18   532.95     0.46
 HUB     14.32     0.00    -0.02   532.95    -0.18   532.95     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.36    46.36    -1.00   539.52   758.49    18.26   564.27     0.65
 MEAN    41.74    43.80    -2.06   475.39   714.29    18.26   564.27     0.61
 HUB     36.98    37.84    -0.86   401.14   667.15    18.26   564.27     0.57

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   578.40   125.32   564.66  1171.85     0.49
 MEAN    16.57   588.00   169.03   563.18  1172.90     0.50
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HUB     13.89   630.84   282.39   564.11  1173.62     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    528.88   694.05   403.56     0.59  2369.57
MEAN   464.28   635.88   295.25     0.54  2804.53     1.20
HUB    389.09   574.11   106.71     0.49  3924.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.21     1.05    18.80   598.63     1.02   570.71     0.92     0.84
MEAN    22.43     1.06    18.89   600.58     1.02   571.73     0.92     0.84
HUB     22.98     1.09    18.88   605.62     1.03   572.41     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     12.51    35.55    31.50     4.05     0.93     0.11     2.90
MEAN    16.71    27.67    23.50     4.17     0.89     0.15     3.29     0.84
HUB     26.59    10.71     6.50     4.21     0.89     0.19     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.913

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     575.885     169.977     550.229    1175.066       0.490       0.056

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.505      19.093     573.930      46.000      17.167      32.400      15.233

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     590.726     169.977     614.694    1173.586       0.503      -0.018

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.344      18.791     572.485     456.573       0.054       0.125

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     560.965       0.000     560.965    1176.514       0.477      -0.035

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.964     575.346       0.000       0.060       0.103       0.029

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.623      22.161       1.051     601.612      13.635     379.778       2.944

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  84973.711       0.304     796.823 1550121.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.870

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   165.938    3210.000      22.161     601.612       1.000       1.000       0.980
W Kg/sec =   75.42619

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
   118.541    2980.610       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127652.898  130205.680       1.476     509.668     345.258     390.276       1.130

    ROTOR LEADING EDGE CONDITIONS, STAGE            5
       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   518.31    -0.18   518.31     0.44   476.50
 MEAN    15.91     0.00    -0.02   518.31    -0.18   518.31     0.44
 HUB     13.07     0.00    -0.02   518.31    -0.18   518.31     0.44

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.73    47.36    -2.63   513.19   729.51    19.41   579.19     0.62
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 MEAN    40.71    44.80    -4.09   445.76   683.75    19.41   579.19     0.58
 HUB     35.25    38.84    -3.59   366.12   634.68    19.41   579.19     0.54
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   562.04   104.32   552.28  1185.01     0.47
 MEAN    15.50   569.50   142.89   551.29  1185.86     0.48
 HUB     12.59   605.52   247.63   552.57  1186.41     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   680.88   398.22     0.57  1874.80
 MEAN   434.13   623.49   291.24     0.53  2217.30     1.17
 HUB    352.68   562.47   105.05     0.47  3120.02

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.04     1.04    19.74   610.04     1.01   583.68     0.92     0.80
 MEAN    23.20     1.05    19.81   611.58     1.02   584.52     0.92     0.80
 HUB     23.63     1.07    19.78   615.63     1.02   585.04     0.92     0.80

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     10.70    35.79    31.50     4.29     0.93     0.09     2.90
 MEAN    14.53    27.85    23.50     4.35     0.88     0.12     3.34     0.80
 HUB     24.14    10.76     6.50     4.26     0.88     0.16     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.870

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      575.808     145.511     557.119    1186.028       0.485       -0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.218      19.758      584.749       46.000      14.638      33.000      18.362

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      613.995     145.511     631.002    1182.177       0.519       -0.221

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       22.842       19.001     580.958     440.827       0.127       0.101

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      566.779       0.000     566.779    1186.901       0.478       -0.065

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       19.531      585.610       0.000       0.060       0.129       -0.070

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4       Texit         Del T       Ns         Ns nondim
      0.479       22.834        1.030     612.416       10.805     444.250       3.444

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  67351.922       0.267     631.578 1618427.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    558160.69   5234.0317     162.1044      1.5115       0.7336       3.4535       1.1714
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 85% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     163.363    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   74.25586

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     159.589    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  125672.203  128185.375       1.789     831.557     464.758     619.754       1.333

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   384.99    -0.13   384.99     0.35   575.61
  MEAN    17.06     0.00    -0.02   384.99    -0.13   384.99     0.35
  HUB     12.51     0.00    -0.02   384.99    -0.13   384.99     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.34    50.47     5.87   577.90   694.50    13.90   510.43     0.63
  MEAN    51.15    47.20     3.95   477.90   613.78    13.90   510.43     0.55
  HUB     42.32    38.62     3.70   350.44   520.69    13.90   510.43     0.47

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   600.18   295.01   522.67  1118.87     0.54
  MEAN    18.04   631.50   344.05   529.55  1116.00     0.57
  HUB     15.00   724.42   474.71   547.20  1109.18     0.65

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   594.31   282.89     0.53  6088.79
  MEAN   505.23   553.53   161.19     0.50  6207.48     1.23
  HUB    420.19   549.91    54.52     0.50  7122.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.77     1.18    14.60   550.21     1.05   520.13     0.92     0.91
  MEAN    17.82     1.18    14.34   550.74     1.05   517.44     0.92     0.91
  HUB     18.25     1.21    13.70   554.86     1.06   511.05     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     29.44    28.42    24.20     4.22     0.93     0.22     2.90
  MEAN    33.01    16.93    12.70     4.23     0.92     0.18     3.51     0.91
  HUB     40.94    -5.69    -9.30     3.61     0.92     0.05     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     643.312     343.378     544.006    1115.814       0.577      -0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.907      14.291     517.371      24.000      32.260      35.400       3.140

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     580.378     343.378     674.349    1122.729       0.517       0.178
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.852      14.875     523.804     528.796       0.025       0.351

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     532.003       0.000     532.003    1127.535       0.472       0.262

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.269     528.298       0.000       0.060       0.042       0.283

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.861      17.788       1.177     551.938      29.128     232.671       1.804

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 181345.000       0.543    1674.138 1618843.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.984

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.363    3210.000      17.788     551.938       1.000       1.000       0.980
W Kg/sec =   74.25586

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    139.264    3111.846       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125672.203  128185.375       1.456     590.487     405.575     474.134       1.169

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   505.11    -0.17   505.11     0.45   558.04
 MEAN    18.08     0.00    -0.02   505.11    -0.17   505.11     0.45
 HUB     15.21     0.00    -0.02   505.11    -0.17   505.11     0.45

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.74    46.36     2.38   575.66   765.98    15.51   530.63     0.68
 MEAN    45.08    42.30     2.78   506.42   715.38    15.51   530.63     0.63
 HUB     40.16    37.84     2.32   426.07   660.92    15.51   530.63     0.58

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   561.86   200.18   524.99  1144.17     0.49
 MEAN    18.01   575.87   231.05   527.49  1143.12     0.50
 HUB     15.22   624.65   328.45   531.33  1141.97     0.55

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   643.33   371.83     0.56  4091.32
 MEAN   504.50   594.16   273.45     0.52  4164.36     1.29
 HUB    426.43   540.29    97.98     0.47  5002.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.72     1.11    16.72   570.34     1.03   543.98     0.92     0.90
 MEAN    19.76     1.11    16.61   570.67     1.03   542.98     0.92     0.90
 HUB     20.17     1.13    16.45   574.44     1.04   541.86     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.87    35.31    31.50     3.81     0.93     0.21     2.90
 MEAN    23.65    27.40    23.50     3.90     0.91     0.22     3.30     0.90
 HUB     31.72    10.45     6.50     3.95     0.91     0.25     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     585.293     231.699     537.479    1143.292       0.512      -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.850      16.596     543.211      46.000      23.320      30.600       7.280

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     551.854     231.699     598.521    1146.629       0.481       0.087

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.785      16.881     546.386     511.151       0.030       0.201

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     545.000       0.000     545.000    1147.288       0.475       0.087

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.880     547.014       0.000       0.060       0.054       0.087

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.827      19.704       1.108     571.817      19.880     298.998       2.318

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 123815.883       0.378    1143.042 1496219.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.962

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    163.363    3210.000      19.704     571.817       1.000       1.000       0.980
W Kg/sec =   74.25586

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    127.961    3057.275       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 125672.203  128185.375       1.464     545.479     372.669     429.765       1.153

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   510.70    -0.18   510.70     0.44   535.45
 MEAN    17.74      0.00    -0.02   510.70    -0.18   510.70     0.44
 HUB     15.05      0.00    -0.02   510.70    -0.18   510.70     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.76     46.36     1.40   562.21   759.67    17.21   550.04     0.66
 MEAN    44.23     43.40     0.83   496.90   712.67    17.21   550.04     0.62
 HUB     39.55     38.84     0.71   421.59   662.35    17.21   550.04     0.58

     ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2      Ao2          Mach2
 TIP     19.81   563.02   173.65   535.57  1161.71      0.48
 MEAN    17.51   576.13   210.43   536.33  1161.56      0.50
 HUB     14.85   623.93   314.74   538.73  1161.23      0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   657.42   381.28     0.57  3443.54
 MEAN   490.40   605.00   279.97     0.52  3687.02      1.26
 HUB    415.99   548.17   101.25     0.47  4676.48

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     21.39     1.09    18.21   587.30     1.03   560.84     0.92     0.88
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 MEAN    21.52     1.09    18.18   588.40     1.03   560.69     0.92     0.88
 HUB     22.02     1.12    18.09   592.85     1.04   560.35     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.96    35.45    31.50     3.95     0.93     0.17     2.90
 MEAN    21.42    27.57    23.50     4.07     0.91     0.20     3.28     0.88
 HUB     30.29    10.64     6.50     4.14     0.91     0.23     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.962

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     583.068     211.811     543.235    1161.950       0.502       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.608      18.190     561.132      46.000      21.301      31.500      10.199

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     568.616     211.811     606.785    1163.388       0.489       0.030

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.513      18.267     562.521     471.992       0.037       0.176

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     551.627       0.000     551.627    1165.030       0.473       0.046

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.352     564.110       0.000       0.060       0.070       0.055

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.774      21.401       1.086     589.515      17.698     315.213       2.444

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 110262.961       0.358    1017.924 1481192.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.933

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    163.363    3210.000       21.401     589.515       1.000       1.000       0.980
W Kg/sec =   74.25586

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
    119.629    3011.034        1.402       0.249      53.349      56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 125672.203  128185.375        1.473     513.330     348.414     401.059       1.151

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   514.32    -0.18   514.32      0.44   506.07
 MEAN    16.97      0.00    -0.02   514.32    -0.18   514.32      0.44
 HUB     14.32      0.00    -0.02   514.32    -0.18   514.32      0.44

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     46.38    46.36      0.02   539.52   745.52     18.73   567.44      0.64
 MEAN    42.76    43.80     -1.04   475.39   700.50     18.73   567.44      0.60
 HUB     37.96    37.84      0.12   401.14   652.37     18.73   567.44      0.56

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   559.78   142.08   541.45  1176.67      0.48
 MEAN    16.57   570.56   180.82   541.15  1177.08      0.48
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 HUB     13.89   613.81   286.70   542.75  1177.25     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   665.41   386.79     0.57  2685.93
 MEAN   464.28   610.90   283.46     0.52  2999.81     1.22
 HUB    389.09   552.32   102.40     0.47  3984.75

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.73     1.06    19.47   601.59     1.02   575.44     0.92     0.85
 MEAN    22.89     1.07    19.49   603.00     1.02   575.83     0.92     0.85
 HUB     23.40     1.09    19.44   607.43     1.03   575.98     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     14.70    35.54    31.50     4.04     0.93     0.14     2.90
 MEAN    18.48    27.65    23.50     4.15     0.90     0.17     3.29     0.85
 HUB     27.84    10.68     6.50     4.18     0.90     0.21     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.933

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     559.261     181.832     528.876    1179.124       0.474       0.056

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.974      19.691     577.899      46.000      18.973      32.400      13.427

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     564.523     181.832     593.084    1178.620       0.479       0.016

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.847      19.524     577.406     456.573       0.046       0.151

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     535.986       0.000     535.986    1181.293       0.454       0.002

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.699     580.027       0.000       0.060       0.090       0.066

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.688      22.690       1.060     604.006      14.491     356.424       2.763

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  90310.039       0.323     833.723 1511834.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.897

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.363    3210.000      22.690     604.006       1.000       1.000       0.980
W Kg/sec =   74.25586

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    114.207    2974.695       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125672.203  128185.375       1.532     509.668     332.634     390.276       1.173

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   496.17    -0.17   496.17     0.42   475.56
 MEAN    15.91     0.00    -0.02   496.17    -0.17   496.17     0.42
 HUB     13.07     0.00    -0.02   496.17    -0.17   496.17     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.98    47.36    -1.38   513.19   713.95    20.11   583.46     0.60
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MEAN    41.95    44.80    -2.85   445.76   667.11    20.11   583.46     0.56
HUB     36.44    38.84    -2.40   366.12   616.73    20.11   583.46     0.52
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   539.50   124.21   525.01  1191.13     0.45
MEAN    15.50   548.16   156.98   525.20  1191.27     0.46
HUB     12.59   584.60   252.80   527.11  1191.20     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    502.54   647.13   378.34     0.54  2231.45
MEAN   434.13   593.84   277.15     0.50  2435.48     1.21
HUB    352.68   536.49    99.88     0.45  3185.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.79     1.05    20.66   614.03     1.02   589.75     0.92     0.82
MEAN    23.89     1.05    20.66   614.95     1.02   589.88     0.92     0.82
HUB     24.27     1.07    20.58   618.32     1.02   589.80     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     13.31    35.78    31.50     4.28     0.93     0.12     2.90
MEAN    16.64    27.82    23.50     4.32     0.89     0.14     3.34     0.82
HUB     25.62    10.73     6.50     4.23     0.89     0.18     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.897

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      553.981     159.855     530.416    1191.503       0.465       -0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.916      20.620      590.159       46.000      16.772      33.000      16.228

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      578.604     159.855     600.280    1189.152       0.487       -0.164

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       23.620       20.086     587.832     440.827       0.108       0.131

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      535.531       0.000     535.531    1193.196       0.449       -0.016

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950       20.566      591.837       0.000       0.060       0.109       -0.020

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.593       23.618       1.041     615.769      11.763     407.814       3.161

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  73327.109       0.290     676.940 1575322.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    579061.00   5345.7671     159.5892      1.5634       0.7688       3.9533       1.1778
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   P&W Fan Hub + 4 Stage LPC 85% Design RPM (corrected) 2-21-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 4.546   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    160.332    3210.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   72.87835

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    156.629    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123340.875  125807.422       1.823     831.557     456.137     619.754       1.359

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   376.90    -0.13   376.90     0.34   575.61
 MEAN    17.06     0.00    -0.02   376.90    -0.13   376.90     0.34
 HUB     12.51     0.00    -0.02   376.90    -0.13   376.90     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.89    50.47     6.42   577.90   690.05    13.94   510.95     0.62
 MEAN    51.75    47.20     4.55   477.90   608.74    13.94   510.95     0.55
 HUB     42.93    38.62     4.31   350.44   514.73    13.94   510.95     0.46

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   592.30   302.21   509.40  1120.42     0.53
 MEAN    18.04   622.87   348.07   516.55  1117.31     0.56
 HUB     15.00   713.30   473.40   533.57  1110.49     0.64

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    577.90   579.22   275.68     0.52  6237.36
 MEAN   505.23   539.93   157.17     0.48  6279.96     1.25
 HUB    420.19   536.22    53.21     0.48  7102.55

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.84     1.18    14.75   550.88     1.05   521.58     0.92     0.91
 MEAN    17.86     1.18    14.46   551.07     1.05   518.67     0.92     0.91
 HUB     18.25     1.21    13.82   554.77     1.06   512.29     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.68    28.42    24.20     4.22     0.93     0.24     2.90
 MEAN    33.97    16.92    12.70     4.22     0.92     0.20     3.51     0.91
 HUB     41.58    -5.69    -9.30     3.61     0.92     0.06     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     634.044     347.391     530.406    1117.205       0.568      -0.011

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.948      14.422     518.662      24.000      33.223      35.400       2.177

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     564.209     347.391     662.580    1124.707       0.502       0.200
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.900      15.070     525.651     528.796       0.023       0.366

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     517.635       0.000     517.635    1129.201       0.458       0.282

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.447     529.860       0.000       0.060       0.038       0.303

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      17.845       1.181     552.240      29.430     228.441       1.771

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 183224.469       0.549    1660.110 1584834.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.546   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    160.332    3210.000      17.845     552.240       1.000       1.000       0.980
W Kg/sec =   72.87835

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    136.279    3110.996       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123340.875  125807.422       1.488     590.487     396.880     474.134       1.195

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   491.84    -0.17   491.84     0.43   557.89
 MEAN    18.08     0.00    -0.02   491.84    -0.17   491.84     0.43
 HUB     15.21     0.00    -0.02   491.84    -0.17   491.84     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.50    46.36     3.14   575.66   757.29    15.67   532.04     0.67
 MEAN    45.85    42.30     3.55   506.42   706.07    15.67   532.04     0.62
 HUB     40.91    37.84     3.07   426.07   650.84    15.67   532.04     0.58

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   551.37   211.57   509.17  1146.59     0.48
 MEAN    18.01   565.39   239.14   512.33  1145.16     0.49
 HUB     15.22   613.78   331.38   516.64  1143.66     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   623.84   360.45     0.54  4323.65
 MEAN   504.50   576.97   265.36     0.50  4309.95     1.32
 HUB    426.43   525.31    95.05     0.46  5047.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.91     1.12    16.99   571.69     1.04   546.30     0.92     0.91
 MEAN    19.90     1.12    16.85   571.63     1.04   544.93     0.92     0.91
 HUB     20.27     1.14    16.66   574.94     1.04   543.49     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.56    35.30    31.50     3.80     0.93     0.22     2.90
 MEAN    25.02    27.38    23.50     3.88     0.92     0.23     3.30     0.91
 HUB     32.68    10.43     6.50     3.93     0.92     0.26     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     574.303     239.811     521.837    1145.395       0.501      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.996      16.838     545.210      46.000      24.681      30.600       5.919

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     534.124     239.811     585.489    1149.295       0.465       0.114

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.945      17.198     548.929     511.151       0.026       0.222

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     527.300       0.000     527.300    1149.928       0.459       0.114

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.202     549.534       0.000       0.060       0.048       0.116

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.844      19.874       1.114     572.753      20.513     288.184       2.234

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 127761.211       0.390    1157.584 1460211.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.546   EfDer =  0.973

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    160.332    3210.000      19.874     572.753       1.000       1.000       0.980
W Kg/sec =   72.87835

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    124.620    3054.778       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 123340.875  125807.422       1.503     545.479     362.936     429.765       1.184

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   494.68    -0.17   494.68     0.43   535.01
 MEAN    17.74     0.00    -0.02   494.68    -0.17   494.68     0.43
 HUB     15.05     0.00    -0.02   494.68    -0.17   494.68     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.66     46.36     2.30   562.21   748.99    17.51   552.32     0.65
 MEAN    45.14     43.40     1.74   496.90   701.28    17.51   552.32     0.61
 HUB     40.45     38.84     1.61   421.59   650.07    17.51   552.32     0.56

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   549.17   187.72   516.09  1165.29     0.47
 MEAN    17.51   562.68   220.40   517.71  1164.64     0.48
 HUB     14.85   610.32   318.40   520.68  1163.88     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   633.40   367.21     0.54  3722.20
 MEAN   490.40   583.89   270.01     0.50  3861.42     1.29
 HUB    415.99   529.75    97.58     0.46  4730.86

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     21.74     1.09    18.67   589.49     1.03   564.31     0.92     0.89
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 MEAN    21.81     1.10    18.59   590.12     1.03   563.69     0.92     0.89
 HUB     22.26     1.12    18.46   594.03     1.04   562.93     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.99    35.43    31.50     3.93     0.93     0.20     2.90
 MEAN    23.06    27.54    23.50     4.04     0.91     0.21     3.28     0.89
 HUB     31.45    10.61     6.50     4.11     0.91     0.25     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     569.214     221.843     524.204    1165.081       0.489       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.903      18.601     564.160      46.000      22.938      31.500       8.562

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     546.329     221.843     589.652    1167.280       0.468       0.064

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.830      18.785     566.291     471.992       0.032       0.200

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     529.882       0.000     529.882    1168.802       0.453       0.080

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.872     567.769       0.000       0.060       0.060       0.090

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.806      21.733       1.094     591.211      18.458     300.592       2.330

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 115001.422       0.373    1041.974 1442935.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 4.546   EfDer =  0.951

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    160.332    3210.000       21.733     591.211       1.000       1.000       0.980
W Kg/sec =   72.87835

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
    115.779    3006.714        1.402       0.249      53.349      56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 123340.875  125807.422        1.522     513.330     337.201     401.059       1.189

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   494.78    -0.17   494.78      0.42   505.34
 MEAN    16.97      0.00    -0.02   494.78    -0.17   494.78      0.42
 HUB     14.32      0.00    -0.02   494.78    -0.17   494.78      0.42

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     47.49     46.36     1.13   539.52   732.17     19.22   570.78     0.62
 MEAN    43.87     43.80     0.07   475.39   686.27     19.22   570.78     0.59
 HUB     39.05     37.84     1.21   401.14   637.07     19.22   570.78     0.54

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   541.60   159.35   517.63  1181.58      0.46
 MEAN    16.57   553.18   193.06   518.39  1181.38      0.47
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 HUB     13.89   596.51   291.18   520.61  1181.02     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   636.00   369.53     0.54  3011.78
 MEAN   464.28   585.06   271.21     0.50  3202.67     1.25
 HUB    389.09   529.74    97.91     0.45  4046.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.28     1.07    20.16   604.75     1.02   580.27     0.92     0.87
 MEAN    23.38     1.08    20.12   605.61     1.02   580.07     0.92     0.87
 HUB     23.83     1.10    20.02   609.40     1.03   579.71     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.11    35.52    31.50     4.02     0.93     0.17     2.90
 MEAN    20.43    27.62    23.50     4.12     0.90     0.19     3.29     0.87
 HUB     29.22    10.65     6.50     4.15     0.90     0.23     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.951

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     542.730     194.147     506.817    1183.300       0.459       0.056

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.465      20.310     582.000      46.000      20.960      32.400      11.440

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     538.060     194.147     572.016    1183.729       0.455       0.053

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.370      20.279     582.421     456.573       0.038       0.179

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     510.832       0.000     510.832    1186.149       0.431       0.042

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.453     584.805       0.000       0.060       0.077       0.104

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.744      23.237       1.069     606.586      15.376     334.377       2.592

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  95828.141       0.343     868.254 1469603.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 4.546   EfDer =  0.924

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    160.332    3210.000      23.237     606.586       1.000       1.000       0.980
W Kg/sec =   72.87835

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    109.686    2968.362       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123340.875  125807.422       1.595     509.668     319.468     390.276       1.222

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   473.70    -0.16   473.70     0.40   474.54
 MEAN    15.91     0.00    -0.02   473.70    -0.16   473.70     0.40
 HUB     13.07     0.00    -0.02   473.70    -0.16   473.70     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.30    47.36    -0.06   513.19   698.51    20.83   587.86     0.59
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 MEAN    43.27    44.80    -1.53   445.76   650.57    20.83   587.86     0.55
 HUB     37.71    38.84    -1.13   366.12   598.79    20.83   587.86     0.50
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   518.32   144.05   497.90  1197.21     0.43
 MEAN    15.50   527.60   171.12   499.08  1196.70     0.44
 HUB     12.59   564.01   257.97   501.56  1196.06     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   613.53   358.49     0.51  2587.26
 MEAN   434.13   564.14   263.00     0.47  2654.58     1.24
 HUB    352.68   510.42    94.71     0.43  3249.94

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.58     1.06    21.60   618.21     1.02   595.80     0.92     0.85
 MEAN    24.61     1.06    21.53   618.52     1.02   595.29     0.92     0.85
 HUB     24.93     1.07    21.40   621.19     1.02   594.65     0.92     0.85

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.14    35.75    31.50     4.25     0.93     0.16     2.90
 MEAN    18.93    27.79    23.50     4.29     0.89     0.17     3.34     0.85
 HUB     27.22    10.69     6.50     4.19     0.89     0.20     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.924

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      533.076     174.260     503.790    1196.977       0.445       -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.643      21.503      595.593       46.000      19.080      33.000      13.920

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      544.672     174.260     571.869    1195.928       0.455       -0.105

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       24.422       21.181     594.550     440.827       0.089       0.162

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      505.713       0.000     505.713    1199.358       0.422       0.029

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       21.596      597.965       0.000       0.060       0.093       0.026

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.677       24.408        1.050      619.306       12.720     375.735       2.913

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79302.328       0.314     718.521 1528777.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    601117.56   5446.4424     156.6287      1.6157       0.7990       4.5460       1.1846
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 85% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.018   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     157.939    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   71.79063

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     154.291    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  121499.984  123929.727       1.851     831.557     449.329     619.754       1.379

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   370.56    -0.13   370.56     0.33   575.61
  MEAN    17.06     0.00    -0.02   370.56    -0.13   370.56     0.33
  HUB     12.51     0.00    -0.02   370.56    -0.13   370.56     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.34    50.47     6.87   577.90   686.61    13.98   511.34     0.62
  MEAN    52.22    47.20     5.02   477.90   604.83    13.98   511.34     0.55
  HUB     43.41    38.62     4.79   350.44   510.11    13.98   511.34     0.46

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   586.46   307.77   499.21  1121.58     0.52
  MEAN    18.04   616.35   351.17   506.53  1118.29     0.55
  HUB     15.00   704.83   472.39   523.09  1111.48     0.63

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   567.60   270.13     0.51  6352.00
  MEAN   505.23   529.44   154.07     0.47  6335.80     1.27
  HUB    420.19   525.69    52.21     0.47  7087.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.90     1.19    14.85   551.39     1.05   522.67     0.92     0.91
  MEAN    17.89     1.18    14.55   551.32     1.05   519.60     0.92     0.91
  HUB     18.25     1.21    13.92   554.70     1.06   513.22     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     31.65    28.42    24.20     4.22     0.93     0.25     2.90
  MEAN    34.73    16.92    12.70     4.22     0.92     0.21     3.51     0.91
  HUB     42.08    -5.70    -9.30     3.60     0.92     0.08     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     627.045     350.483     519.949    1118.250       0.561      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.979      14.519     519.633      24.000      33.983      35.400       1.417

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     551.935     350.483     653.812    1126.180       0.490       0.217
  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.935      15.215     527.029     528.796       0.022       0.378

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     506.867       0.000     506.867    1130.430       0.448       0.295

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.574     531.014       0.000       0.060       0.037       0.317

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.873      17.881       1.184     552.473      29.663     225.175       1.746

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 184676.047       0.553    1648.289 1558176.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.018   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    157.939    3210.000      17.881     552.473       1.000       1.000       0.980
W Kg/sec =   71.79063

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    133.999    3110.339       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 121499.984  123929.727       1.513     590.487     390.242     474.134       1.215

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   481.87    -0.17   481.87     0.43   557.77
 MEAN    18.08     0.00    -0.02   481.87    -0.17   481.87     0.43
 HUB     15.21     0.00    -0.02   481.87    -0.17   481.87     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.08    46.36     3.72   575.66   750.85    15.79   533.08     0.66
 MEAN    46.43    42.30     4.13   506.42   699.16    15.79   533.08     0.62
 HUB     41.49    37.84     3.65   426.07   643.33    15.79   533.08     0.57

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   543.95   219.97   497.49  1148.35     0.47
 MEAN    18.01   557.82   245.13   501.07  1146.65     0.49
 HUB     15.22   605.79   333.55   505.70  1144.90     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   609.46   352.05     0.53  4495.16
 MEAN   504.50   564.22   259.37     0.49  4417.86     1.33
 HUB    426.43   514.16    92.89     0.45  5080.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.04     1.12    17.19   572.69     1.04   547.99     0.92     0.91
 MEAN    20.00     1.12    17.01   572.34     1.04   546.36     0.92     0.91
 HUB     20.34     1.14    16.80   575.32     1.04   544.68     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.85    35.28    31.50     3.78     0.93     0.24     2.90
 MEAN    26.07    27.37    23.50     3.87     0.92     0.25     3.30     0.91
 HUB     33.41    10.41     6.50     3.91     0.92     0.27     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     566.386     245.823     510.259    1146.923       0.494      -0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.097      17.008     546.665      46.000      25.723      30.600       4.877

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     521.153     245.823     576.220    1151.224       0.453       0.135

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.055      17.421     550.773     511.151       0.024       0.237

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     514.388       0.000     514.388    1151.836       0.447       0.134

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.428     551.358       0.000       0.060       0.045       0.137

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.855      19.989       1.118     573.454      20.981     280.460       2.174

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 130677.555       0.399    1166.336 1432473.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.018   EfDer =  0.980

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    157.939    3210.000      19.989     573.454       1.000       1.000       0.980
W Kg/sec =   71.79063

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    122.127    3052.910       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 121499.984  123929.727       1.534     545.479     355.678     429.765       1.208

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   482.95    -0.17   482.95     0.42   534.68
 MEAN    17.74     0.00    -0.02   482.95    -0.17   482.95     0.42
 HUB     15.05     0.00    -0.02   482.95    -0.17   482.95     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.35    46.36     2.99   562.21   741.29    17.72   553.98     0.64
 MEAN    45.83    43.40     2.43   496.90   693.05    17.72   553.98     0.60
 HUB     41.13    38.84     2.29   421.59   641.18    17.72   553.98     0.56

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   539.67   197.85   502.10  1167.82     0.46
 MEAN    17.51   553.26   227.60   504.27  1166.85     0.47
 HUB     14.85   600.62   321.06   507.61  1165.79     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   616.13   357.08     0.53  3922.68
 MEAN   490.40   568.65   262.80     0.49  3987.47     1.31
 HUB    415.99   516.41    94.93     0.44  4770.20

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     21.98     1.10    18.98   591.09     1.03   566.78     0.92     0.90
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 MEAN    22.01     1.10    18.87   591.38     1.03   565.83     0.92     0.90
 HUB     22.43     1.12    18.71   594.90     1.04   564.79     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.51    35.42    31.50     3.92     0.93     0.21     2.90
 MEAN    24.29    27.53    23.50     4.03     0.91     0.23     3.28     0.90
 HUB     32.31    10.59     6.50     4.09     0.91     0.26     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     559.541     229.095     510.492    1167.311       0.479       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.108      18.888     566.320      46.000      24.169      31.500       7.331

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     530.518     229.095     577.870    1170.030       0.453       0.089

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.049      19.146     568.962     471.992       0.028       0.218

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     514.479       0.000     514.479    1171.468       0.439       0.105

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      19.234     570.361       0.000       0.060       0.054       0.116

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.825      21.962       1.099     592.460      19.006     290.554       2.252

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 118418.211       0.385    1056.918 1413844.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.018   EfDer =  0.963

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    157.939    3210.000       21.962     592.460       1.000        1.000        0.980
W Kg/sec =   71.79063

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    112.980    3003.542        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 121499.984  123929.727        1.560     513.330     329.050     401.059       1.219

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   480.86    -0.17   480.86      0.41   504.81
 MEAN    16.97      0.00    -0.02   480.86    -0.17   480.86      0.41
 HUB     14.32      0.00    -0.02   480.86    -0.17   480.86      0.41

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     48.30     46.36     1.94   539.52   722.83     19.56   573.16      0.62
 MEAN    44.68     43.80     0.88   475.39   676.30     19.56   573.16      0.58
 HUB     39.85     37.84     2.01   401.14   626.32     19.56   573.16      0.53

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2      Ao2          Mach2
 TIP     18.88   529.52   171.42   501.01  1184.98      0.45
 MEAN    16.57   541.37   201.65   502.42  1184.38      0.46
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 HUB     13.89   584.55   294.34   505.04  1183.68     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   615.46   357.46     0.52  3239.52
 MEAN   464.28   566.92   262.63     0.48  3344.88     1.28
 HUB    389.09   513.85    94.75     0.43  4090.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.67     1.08    20.63   607.02     1.02   583.62     0.92     0.88
 MEAN    23.72     1.08    20.55   607.50     1.03   583.03     0.92     0.88
 HUB     24.13     1.10    20.42   610.85     1.03   582.33     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.89    35.51    31.50     4.01     0.93     0.19     2.90
 MEAN    21.87    27.60    23.50     4.10     0.91     0.21     3.29     0.88
 HUB     30.23    10.63     6.50     4.13     0.91     0.24     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.963

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     531.530     202.781     491.329    1186.218       0.448       0.056

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.807      20.739     584.873      46.000      22.427      32.400       9.973

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     519.817     202.781     557.969    1187.260       0.438       0.080

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.732      20.801     585.901     456.573       0.033       0.200

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     493.487       0.000     493.487    1189.514       0.415       0.071

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.974     588.128       0.000       0.060       0.068       0.133

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.778      23.615       1.075     608.455      15.995     320.009       2.481

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  99692.891       0.356     889.789 1438022.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.018   EfDer =  0.941

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    157.939    3210.000      23.615     608.455       1.000       1.000       0.980
W Kg/sec =   71.79063

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.484    2963.800       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 121499.984  123929.727       1.643     509.668     310.140     390.276       1.258

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   458.11    -0.16   458.11     0.38   473.82
 MEAN    15.91     0.00    -0.02   458.11    -0.16   458.11     0.38
 HUB     13.07     0.00    -0.02   458.11    -0.16   458.11     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.25    47.36     0.89   513.19   688.04    21.33   590.94     0.58
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MEAN    44.23    44.80    -0.57   445.76   639.31    21.33   590.94     0.54
HUB     38.64    38.84    -0.20   366.12   586.54    21.33   590.94     0.49
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   504.67   157.62   479.42  1201.34     0.42
MEAN    15.50   514.05   180.82   481.20  1200.42     0.43
HUB     12.59   550.16   261.53   484.02  1199.42     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    502.54   590.61   344.92     0.49  2830.65
MEAN   434.13   543.80   253.31     0.45  2804.77     1.27
HUB    352.68   492.53    91.14     0.41  3294.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.13     1.06    22.26   621.17     1.02   599.92     0.92     0.86
MEAN    25.12     1.06    22.14   621.06     1.02   599.01     0.92     0.86
HUB     25.39     1.08    21.97   623.26     1.02   598.00     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     18.20    35.73    31.50     4.23     0.93     0.18     2.90
MEAN    20.59    27.76    23.50     4.26     0.90     0.19     3.34     0.86
HUB     28.38    10.66     6.50     4.16     0.90     0.21     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.941

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      519.341     184.134     485.603    1200.719       0.433       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.150      22.113      599.324       46.000      20.766      33.000      12.234

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      522.181     184.134     553.696    1200.472       0.435       -0.063

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       24.976      21.929     599.077     440.827       0.076       0.185

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      485.664       0.000     485.664    1203.545       0.404       0.063

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950       22.307      602.148       0.000       0.060       0.082       0.060

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.727       24.958       1.057      621.831       13.376     355.813       2.758

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  83396.312       0.330     744.337 1494484.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    616861.00   5505.6680     154.2909      1.6521       0.8174       5.0175       1.1894
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    P&W Fan Hub + 4 Stage LPC 85% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.485   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     155.582    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   70.71914

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     151.988    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  119686.578  122080.047       1.879     831.557     442.622     619.754       1.400

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   364.35    -0.13   364.35     0.33   575.61
  MEAN    17.06     0.00    -0.02   364.35    -0.13   364.35     0.33
  HUB     12.51     0.00    -0.02   364.35    -0.13   364.35     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.77    50.47     7.30   577.90   683.28    14.02   511.72     0.62
  MEAN    52.68    47.20     5.48   477.90   601.05    14.02   511.72     0.54
  HUB     43.89    38.62     5.27   350.44   505.62    14.02   511.72     0.46

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   580.98   313.11   489.39  1122.67     0.52
  MEAN    18.04   610.17   354.17   496.86  1119.22     0.55
  HUB     15.00   696.70   471.42   512.98  1112.42     0.63

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   556.43   264.79     0.50  6462.03
  MEAN   505.23   519.31   151.06     0.46  6389.98     1.29
  HUB    420.19   515.53    51.23     0.46  7072.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.96     1.19    14.96   551.89     1.06   523.70     0.92     0.91
  MEAN    17.92     1.19    14.64   551.56     1.06   520.47     0.92     0.91
  HUB     18.25     1.21    14.00   554.64     1.06   514.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     32.61    28.42    24.20     4.22     0.93     0.26     2.90
  MEAN    35.48    16.91    12.70     4.21     0.92     0.22     3.51     0.91
  HUB     42.58    -5.70    -9.30     3.60     0.92     0.09     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     620.425     353.483     509.879    1119.233       0.554      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.007      14.611     520.547      24.000      34.732      35.400       0.668

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     540.228     353.483     645.598    1127.560       0.479       0.233
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      17.966      15.350     528.321     528.796       0.022       0.390

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     496.594       0.000     496.594    1131.585       0.439       0.308

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      15.691     532.100       0.000       0.060       0.037       0.330

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
    0.876      17.913       1.186     552.697      29.887     222.023       1.721

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 186072.547       0.557    1635.966 1532079.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.485   EfDer =  0.996

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   155.582    3210.000      17.913     552.697       1.000       1.000       0.980
W Kg/sec =   70.71914

  W cor      RPM cor        GAMMA       Cp          R           Blades       THK
   131.792    3109.708       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.538     590.487     383.813     474.134       1.235

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   472.33    -0.16   472.33     0.42   557.66
 MEAN    18.08     0.00    -0.02   472.33    -0.16   472.33     0.42
 HUB     15.21     0.00    -0.02   472.33    -0.16   472.33     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.64    46.36     4.28   575.66   744.76    15.89   534.07     0.66
 MEAN    47.00    42.30     4.70   506.42   692.62    15.89   534.07     0.61
 HUB     42.06    37.84     4.22   426.07   636.22    15.89   534.07     0.56

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   537.22   227.89   486.49  1149.97     0.47
 MEAN    18.01   550.83   250.80   490.43  1148.04     0.48
 HUB     15.22   598.32   335.61   495.33  1146.07     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   595.90   344.12     0.52  4656.88
 MEAN   504.50   552.17   253.71     0.48  4519.76     1.35
 HUB    426.43   503.59    90.83     0.44  5111.45

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.17     1.13    17.36   573.64     1.04   549.55     0.92     0.91
 MEAN    20.10     1.12    17.16   573.03     1.04   547.69     0.92     0.91
 HUB     20.40     1.14    16.93   575.69     1.04   545.80     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.10    35.27    31.50     3.77     0.93     0.25     2.90
 MEAN    27.08    27.35    23.50     3.85     0.92     0.26     3.30     0.91
 HUB     34.12    10.39     6.50     3.89     0.92     0.28     3.92


  blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     559.082     251.499     499.320    1148.342       0.487       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.189      17.164     548.018      46.000      26.734      30.600       3.866

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     509.009     251.499     567.752    1153.011       0.441       0.154

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.153      17.625     552.484     511.151       0.022       0.252

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     502.329       0.000     502.329    1153.600       0.435       0.153

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.634     553.049       0.000       0.060       0.042       0.157

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.863      20.091       1.122     574.120      21.423     273.360       2.119

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 133432.328       0.408    1173.148 1405627.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.485   EfDer =  0.986

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    155.582    3210.000      20.091     574.120       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    119.760    3051.137       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 119686.578  122080.047       1.564     545.479     348.783     429.765       1.232

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   471.95    -0.16   471.95     0.41   534.37
 MEAN    17.74      0.00    -0.02   471.95    -0.16   471.95     0.41
 HUB     15.05      0.00    -0.02   471.95    -0.16   471.95     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.00     46.36     3.64   562.21   734.17    17.91   555.52     0.64
 MEAN    46.48     43.40     3.08   496.90   685.43    17.91   555.52     0.59
 HUB     41.78     38.84     2.94   421.59   632.94    17.91   555.52     0.55

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   531.27   207.20   489.20  1170.13      0.45
 MEAN    17.51   544.78   234.29   491.83  1168.87      0.47
 HUB     14.85   591.75   323.52   495.48  1167.54      0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   600.19   347.73     0.51  4107.83
 MEAN   490.40   554.52   256.12     0.47  4104.44     1.33
 HUB    415.99   504.04    92.47     0.43  4806.67

         Pt2       PR       Ps2     Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     22.20     1.11    19.27   592.59     1.03   569.03     0.92     0.90
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 MEAN    22.20     1.10    19.13   592.58     1.03   567.80     0.92     0.90
 HUB     22.58     1.12    18.94   595.73     1.04   566.50     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.95    35.41    31.50     3.91     0.93     0.23     2.90
 MEAN    25.47    27.51    23.50     4.01     0.91     0.24     3.28     0.90
 HUB     33.14    10.57     6.50     4.07     0.91     0.27     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     550.846     235.824     497.814    1169.349       0.471       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.293      19.146     568.300      46.000      25.348      31.500       6.152

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     516.064     235.824     567.394    1172.532       0.440       0.112

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.245      19.471     571.399     471.992       0.025       0.235

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     500.423       0.000     500.423    1173.893       0.426       0.129

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.560     572.726       0.000       0.060       0.049       0.139

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.841      22.167       1.103     593.634      19.513     281.607       2.183

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 121580.156       0.395    1068.943 1385942.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.485   EfDer =  0.972

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    155.582    3210.000      22.167     593.634       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    110.376    3000.571       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.597     513.330     321.466     401.059       1.248

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   468.11    -0.16   468.11     0.40   504.31
 MEAN    16.97     0.00    -0.02   468.11    -0.16   468.11     0.40
 HUB     14.32     0.00    -0.02   468.11    -0.16   468.11     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.06    46.36     2.70   539.52   714.41    19.87   575.34     0.61
 MEAN    45.45    43.80     1.65   475.39   667.29    19.87   575.34     0.57
 HUB     40.61    37.84     2.77   401.14   616.58    19.87   575.34     0.52

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   519.10   182.30   486.03  1188.02     0.44
 MEAN    16.57   531.00   209.44   487.95  1187.10     0.45
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 HUB     13.89   573.87   297.22   490.91  1186.09     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   596.94   346.57     0.50  3445.00
 MEAN   464.28   550.49   254.84     0.46  3473.95     1.30
 HUB    389.09   499.43    91.88     0.42  4130.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.01     1.08    21.06   609.12     1.03   586.63     0.92     0.89
 MEAN    24.03     1.08    20.94   609.25     1.03   585.71     0.92     0.89
 HUB     24.39     1.10    20.78   612.20     1.03   584.71     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.56    35.49    31.50     3.99     0.93     0.21     2.90
 MEAN    23.23    27.58    23.50     4.08     0.91     0.22     3.29     0.89
 HUB     31.19    10.60     6.50     4.10     0.91     0.25     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.972

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     521.706     210.617     477.303    1188.848       0.439       0.056

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.114      21.124     587.471      46.000      23.810      32.400       8.590

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     503.508     210.617     545.783    1190.423       0.423       0.105

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.055      21.267     589.028     456.573       0.029       0.220

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     477.993       0.000     477.993    1192.533       0.401       0.098

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.439     591.119       0.000       0.060       0.061       0.159

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.805      23.952       1.081     610.189      16.556     307.681       2.385

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 103188.961       0.369     907.246 1408069.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.485   EfDer =  0.955

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3210.000      23.952     610.189       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.566    2959.585       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.690     509.668     301.643     390.276       1.294

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   444.13    -0.15   444.13     0.37   473.14
 MEAN    15.91     0.00    -0.02   444.13    -0.15   444.13     0.37
 HUB     13.07     0.00    -0.02   444.13    -0.15   444.13     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.13    47.36     1.77   513.19   678.81    21.77   593.73     0.57
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 MEAN    45.11    44.80     0.31   445.76   629.36    21.77   593.73     0.53
 HUB     39.51    38.84     0.67   366.12   575.69    21.77   593.73     0.48
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   493.18   169.62   463.09  1204.99     0.41
 MEAN    15.50   502.42   189.45   465.33  1203.74     0.42
 HUB     12.59   538.06   264.72   468.44  1202.43     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   570.35   332.93     0.47  3045.70
 MEAN   434.13   525.73   244.67     0.44  2938.53     1.29
 HUB    352.68   476.62    87.96     0.40  3334.80

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.63     1.07    22.84   623.87     1.02   603.58     0.92     0.87
 MEAN    25.57     1.07    22.68   623.39     1.02   602.33     0.92     0.87
 HUB     25.79     1.08    22.48   625.17     1.02   601.02     0.92     0.87

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.12    35.71    31.50     4.21     0.93     0.20     2.90
 MEAN    22.15    27.74    23.50     4.24     0.90     0.21     3.34     0.87
 HUB     29.47    10.63     6.50     4.13     0.90     0.23     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.955

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      507.585     192.929     469.490    1204.042       0.422       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.604      22.655      602.648       46.000      22.339      33.000      10.661

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      502.671     192.929     538.423    1204.456       0.417       -0.025

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       25.468       22.589     603.062     440.827       0.065       0.206

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      468.118       0.000     468.118    1207.248       0.388       0.094

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       22.938      605.861       0.000       0.060       0.072       0.091

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.765       25.447        1.062      624.147       13.958     339.321       2.630

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  87027.539       0.345     765.154 1462275.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    631301.56   5550.4575     151.9881      1.6845       0.8320       5.4850       1.1938
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 85% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     153.237    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   69.65320

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     149.697    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  117882.562  120239.961       1.907     831.557     435.951     619.754       1.422

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   358.22    -0.12   358.22     0.32   575.61
  MEAN    17.06     0.00    -0.02   358.22    -0.12   358.22     0.32
  HUB     12.51     0.00    -0.02   358.22    -0.12   358.22     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.21    50.47     7.74   577.90   680.02    14.05   512.09     0.61
  MEAN    53.15    47.20     5.95   477.90   597.35    14.05   512.09     0.54
  HUB     44.38    38.62     5.76   350.44   501.21    14.05   512.09     0.45

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   575.83   318.33   479.84  1123.72     0.51
  MEAN    18.04   604.23   357.10   487.42  1120.12     0.54
  HUB     15.00   688.82   470.47   503.13  1113.31     0.62

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   545.55   259.57     0.49  6569.64
  MEAN   505.23   509.43   148.14     0.45  6442.69     1.31
  HUB    420.19   505.63    50.28     0.45  7058.54

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.01     1.19    15.05   552.37     1.06   524.68     0.92     0.91
  MEAN    17.95     1.19    14.72   551.80     1.06   521.31     0.92     0.91
  HUB     18.24     1.21    14.09   554.57     1.06   514.95     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     33.56    28.41    24.20     4.21     0.93     0.28     2.90
  MEAN    36.23    16.91    12.70     4.21     0.92     0.23     3.51     0.91
  HUB     43.08    -5.71    -9.30     3.59     0.92     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     614.075     356.402     500.066    1120.172       0.548      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.033      14.697     521.420      24.000      35.478      35.400      -0.078

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     528.924     356.402     637.795    1128.870       0.469       0.249
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      17.994      15.478     529.549     528.796       0.021       0.401

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     486.649       0.000     486.649    1132.685       0.430       0.320

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      15.801     533.135       0.000       0.060       0.037       0.342

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.878      17.942       1.188     552.916      30.106     218.943       1.697

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 187435.969       0.561    1623.114 1506272.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.998

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   153.237    3210.000      17.942     552.916       1.000       1.000       0.980
W Kg/sec =   69.65320

  W cor      RPM cor        GAMMA       Cp          R           Blades       THK
   129.626    3109.092       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.564     590.487     377.504     474.134       1.256

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   463.08    -0.16   463.08     0.41   557.55
 MEAN    18.08     0.00    -0.02   463.08    -0.16   463.08     0.41
 HUB     15.21     0.00    -0.02   463.08    -0.16   463.08     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.19    46.36     4.83   575.66   738.93    15.99   535.01     0.65
 MEAN    47.57    42.30     5.27   506.42   686.34    15.99   535.01     0.60
 HUB     42.63    37.84     4.79   426.07   629.38    15.99   535.01     0.55

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   531.02   235.48   475.96  1151.50     0.46
 MEAN    18.01   544.29   256.23   480.20  1149.35     0.47
 HUB     15.22   591.21   337.61   485.34  1147.17     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   582.92   336.54     0.51  4811.71
 MEAN   504.50   540.58   248.27     0.47  4617.65     1.37
 HUB    426.43   493.40    88.82     0.43  5141.87

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.28     1.13    17.53   574.56     1.04   551.01     0.92     0.91
 MEAN    20.18     1.12    17.31   573.69     1.04   548.95     0.92     0.91
 HUB     20.45     1.14    17.06   576.04     1.04   546.86     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.32    35.26    31.50     3.76     0.93     0.27     2.90
 MEAN    28.08    27.34    23.50     3.84     0.92     0.27     3.30     0.91
 HUB     34.82    10.37     6.50     3.87     0.92     0.28     3.92


  blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     552.247     256.953     488.827    1149.679       0.480       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.273      17.308     549.296      46.000      27.729      30.600       2.871

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     497.454     256.953     559.898    1154.695       0.431       0.173

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.242      17.815     554.099     511.151       0.020       0.267

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     490.882       0.000     490.882    1155.260       0.425       0.172

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.825     554.641       0.000       0.060       0.039       0.176

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      20.184       1.125     574.764      21.848     266.717       2.068

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 136076.438       0.416    1178.363 1379340.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.991

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    153.237    3210.000      20.184     574.764       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    117.477    3049.429       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 117882.562  120239.961       1.594     545.479     342.136     429.765       1.256

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   461.49    -0.16   461.49     0.40   534.07
 MEAN    17.74     0.00    -0.02   461.49    -0.16   461.49     0.40
 HUB     15.05     0.00    -0.02   461.49    -0.16   461.49     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.63    46.36     4.27   562.21   727.48    18.09   556.98     0.63
 MEAN    47.13    43.40     3.73   496.90   678.26    18.09   556.98     0.59
 HUB     42.42    38.84     3.58   421.59   625.17    18.09   556.98     0.54

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   523.70   215.96   477.10  1172.27     0.45
 MEAN    17.51   537.01   240.57   480.11  1170.75     0.46
 HUB     14.85   583.48   325.83   484.03  1169.19     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   585.26   338.97     0.50  4281.27
 MEAN   490.40   541.22   249.83     0.46  4214.37     1.35
 HUB    415.99   492.36    90.16     0.42  4840.93

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     22.40     1.11    19.53   594.01     1.03   571.12     0.92     0.91
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 MEAN    22.37     1.11    19.36   593.71     1.03   569.64     0.92     0.91
 HUB     22.71     1.12    19.15   596.53     1.04   568.11     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.35    35.39    31.50     3.89     0.93     0.25     2.90
 MEAN    26.61    27.49    23.50     3.99     0.92     0.26     3.28     0.91
 HUB     33.95    10.55     6.50     4.05     0.92     0.28     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     542.887     242.148     485.892    1171.246       0.464       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.462      19.383     570.146      46.000      26.490      31.500       5.010

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     502.609     242.148     557.900    1174.852       0.428       0.134

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.423      19.769     573.662     471.992       0.022       0.252

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     487.362       0.000     487.362    1176.141       0.414       0.151

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.858     574.922       0.000       0.060       0.045       0.162

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.853      22.352       1.107     594.753      19.989     273.479       2.120

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 124546.188       0.404    1078.516 1358825.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.980

   W act       RPM act        Pt          Tt           POTS        POTH       AeroBl
    153.237    3210.000      22.352     594.753       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor       RPM cor        GAMMA       Cp          R           Blades       THK
    107.915    2997.746       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 117882.562  120239.961       1.633     513.330     314.298     401.059       1.276

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   456.23    -0.16   456.23     0.39   503.83
 MEAN    16.97      0.00    -0.02   456.23    -0.16   456.23     0.39
 HUB     14.32      0.00    -0.02   456.23    -0.16   456.23     0.39

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     49.79    46.36     3.43   539.52   706.68     20.15   577.38     0.60
 MEAN    46.19    43.80     2.39   475.39   659.01     20.15   577.38     0.56
 HUB     41.33    37.84     3.49   401.14   607.61     20.15   577.38     0.52

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   509.93   192.33   472.27  1190.80      0.43
 MEAN    16.57   521.71   216.63   474.61  1189.59      0.44
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 HUB     13.89   564.16   299.89   477.86  1188.32     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   579.91   336.55     0.49  3634.13
 MEAN   464.28   535.34   247.65     0.45  3593.08     1.32
 HUB    389.09   486.11    89.20     0.41  4167.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.33     1.09    21.45   611.09     1.03   589.38     0.92     0.90
 MEAN    24.31     1.09    21.30   610.90     1.03   588.18     0.92     0.90
 HUB     24.63     1.10    21.11   613.49     1.03   586.92     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.16    35.47    31.50     3.97     0.93     0.23     2.90
 MEAN    24.53    27.55    23.50     4.05     0.91     0.24     3.29     0.90
 HUB     32.11    10.57     6.50     4.07     0.91     0.26     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     512.924     217.849     464.363    1191.268       0.431       0.056

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.394      21.472     589.866      46.000      25.133      32.400       7.267

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     488.628     217.849     534.991    1193.317       0.409       0.129

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.347      21.690     591.897     456.573       0.025       0.239

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     463.875       0.000     463.875    1195.299       0.388       0.123

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.860     593.865       0.000       0.060       0.054       0.183

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.826      24.255       1.085     611.825      17.073     296.820       2.301

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 106414.141       0.380     921.500 1379230.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.966

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3210.000      24.255     611.825       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.863    2955.625       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.735     509.668     293.769     390.276       1.329

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   431.35    -0.15   431.35     0.36   472.51
 MEAN    15.91     0.00    -0.02   431.35    -0.15   431.35     0.36
 HUB     13.07     0.00    -0.02   431.35    -0.15   431.35     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.96    47.36     2.60   513.19   670.51    22.17   596.30     0.56
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MEAN    45.95    44.80     1.15   445.76   620.41    22.17   596.30     0.52
HUB     40.34    38.84     1.50   366.12   565.88    22.17   596.30     0.47
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   483.31   180.47   448.35  1208.28     0.40
MEAN    15.50   492.21   197.25   450.96  1206.75     0.41
HUB     12.59   527.26   267.60   454.30  1205.18     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    502.54   552.05   322.08     0.46  3240.27
MEAN   434.13   509.39   236.88     0.42  3059.22     1.32
HUB    352.68   462.20    85.08     0.38  3371.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.08     1.08    23.36   626.38     1.02   606.89     0.92     0.88
MEAN    25.98     1.07    23.16   625.57     1.02   605.35     0.92     0.88
HUB     26.16     1.08    22.93   626.97     1.02   603.77     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     21.93    35.69    31.50     4.19     0.93     0.22     2.90
MEAN    23.62    27.71    23.50     4.21     0.91     0.23     3.34     0.88
HUB     30.50    10.61     6.50     4.11     0.91     0.24     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.966

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      497.293     200.864     454.922    1207.059       0.412      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.016      23.144      605.673       46.000      23.823      33.000       9.177

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      485.342     200.864     525.265    1208.035       0.402       0.010

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       25.910      23.180     606.653     440.827       0.056       0.227

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      452.433       0.000     452.433    1210.596       0.374       0.124

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950       23.506      609.228       0.000       0.060       0.064       0.121

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.796       25.888       1.067     626.309      14.484     325.245       2.521

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  90310.195       0.358     782.047 1431499.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    644782.94   5583.5391     149.6973      1.7136       0.8436       5.9530       1.1980
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    P&W Fan Hub + 4 Stage LPC 85% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.014   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     147.976    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   67.26170

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     144.557    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  113835.133  116111.594       1.975     831.557     420.983     619.754       1.472

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   344.58    -0.12   344.58     0.31   575.61
  MEAN    17.06     0.00    -0.02   344.58    -0.12   344.58     0.31
  HUB     12.51     0.00    -0.02   344.58    -0.12   344.58     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.20    50.47     8.73   577.90   672.93    14.13   512.89     0.61
  MEAN    54.21    47.20     7.01   477.90   589.26    14.13   512.89     0.53
  HUB     45.49    38.62     6.87   350.44   491.55    14.13   512.89     0.44

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   565.18   329.62   459.10  1125.91     0.50
  MEAN    18.04   591.64   363.44   466.85  1122.00     0.53
  HUB     15.00   671.88   468.41   481.68  1115.21     0.60

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   521.93   248.28     0.46  6802.58
  MEAN   505.23   487.91   141.80     0.43  6557.03     1.35
  HUB    420.19   484.09    48.22     0.43  7027.58

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.12     1.20    15.25   553.42     1.06   526.74     0.92     0.91
  MEAN    18.01     1.19    14.90   552.32     1.06   523.08     0.92     0.91
  HUB     18.23     1.21    14.26   554.43     1.06   516.73     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     35.68    28.40    24.20     4.20     0.93     0.31     2.90
  MEAN    37.90    16.90    12.70     4.20     0.93     0.26     3.51     0.91
  HUB     44.20    -5.72    -9.30     3.58     0.93     0.12     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     600.633     362.733     478.732    1122.145       0.535      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.086      14.878     523.259      24.000      37.151      35.400      -1.751

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     504.663     362.733     621.498    1131.605       0.446       0.283
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.047      15.741     532.118     528.796       0.022       0.427

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     465.238       0.000     465.238    1134.995       0.410       0.346

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.026     535.312       0.000       0.060       0.038       0.369

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.879      17.994       1.191     553.391      30.581     212.230       1.645

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 190390.438       0.570    1592.091 1448913.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.014   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3210.000      17.994     553.391       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    124.864    3107.759       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.624     590.487     363.639     474.134       1.304

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   443.12    -0.15   443.12     0.39   557.31
 MEAN    18.08     0.00    -0.02   443.12    -0.15   443.12     0.39
 HUB     15.21     0.00    -0.02   443.12    -0.15   443.12     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.42    46.36     6.06   575.66   726.57    16.20   536.99     0.64
 MEAN    48.82    42.30     6.52   506.42   673.03    16.20   536.99     0.59
 HUB     43.89    37.84     6.05   426.07   614.83    16.20   536.99     0.54

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   518.74   251.53   453.67  1154.65     0.45
 MEAN    18.01   530.93   267.82   458.43  1152.07     0.46
 HUB     15.22   576.31   341.82   463.99  1149.48     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   555.46   320.49     0.48  5139.35
 MEAN   504.50   515.93   236.68     0.45  4826.20     1.41
 HUB    426.43   471.65    84.62     0.41  5205.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.51     1.14    17.85   576.51     1.04   554.04     0.92     0.91
 MEAN    20.35     1.13    17.59   575.10     1.04   551.56     0.92     0.91
 HUB     20.54     1.14    17.30   576.81     1.04   549.07     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.01    35.24    31.50     3.74     0.93     0.30     2.90
 MEAN    30.29    27.31    23.50     3.81     0.93     0.29     3.30     0.91
 HUB     36.38    10.34     6.50     3.84     0.93     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     538.322     268.573     466.540    1152.441       0.467       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.438      17.597     551.938      46.000      29.928      30.600       0.672

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     473.180     268.573     544.087    1158.171       0.409       0.213

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.414      18.195     557.441     511.151       0.018       0.300

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     466.927       0.000     466.927    1158.681       0.403       0.210

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.203     557.932       0.000       0.060       0.037       0.216

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      20.361       1.132     576.138      22.747     253.125       1.962

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 141680.609       0.433    1184.768 1321738.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.014   EfDer =  0.997

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    147.976    3210.000      20.361     576.138       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    112.595    3045.790       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 113835.133  116111.594       1.663     545.479     327.917     429.765       1.311

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   439.51    -0.15   439.51     0.38   533.44
 MEAN    17.74     0.00    -0.02   439.51    -0.15   439.51     0.38
 HUB     15.05     0.00    -0.02   439.51    -0.15   439.51     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.99    46.36     5.63   562.21   713.74    18.44   560.01     0.61
 MEAN    48.52    43.40     5.12   496.90   663.50    18.44   560.01     0.57
 HUB     43.82    38.84     4.98   421.59   609.12    18.44   560.01     0.52

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   509.17   234.01   452.22  1176.59     0.43
 MEAN    17.51   521.65   253.59   455.86  1174.59     0.44
 HUB     14.85   566.71   330.62   460.28  1172.57     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   554.52   320.92     0.47  4638.71
 MEAN   490.40   513.71   236.81     0.44  4442.14     1.39
 HUB    415.99   468.13    85.37     0.40  4911.97

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     22.81     1.12    20.05   597.00     1.04   575.35     0.92     0.91
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 MEAN    22.70     1.11    19.82   596.11     1.03   573.39     0.92     0.91
 HUB     22.96     1.13    19.56   598.22     1.04   571.41     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.36    35.36    31.50     3.86     0.93     0.28     2.90
 MEAN    29.09    27.45    23.50     3.95     0.92     0.28     3.28     0.91
 HUB     35.69    10.51     6.50     4.01     0.92     0.30     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     527.190     255.252     461.276    1175.099       0.449       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.790      19.846     573.906      46.000      28.958      31.500       2.542

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     475.199     255.252     539.414    1179.545       0.403       0.180

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.764      20.353     578.257     471.992       0.019       0.288

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     460.836       0.000     460.836    1180.689       0.390       0.196

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      20.437     579.380       0.000       0.060       0.039       0.208

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.871      22.703       1.115     597.110      20.972     257.443       1.996

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 130674.766       0.424    1092.734 1299995.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.014   EfDer =  0.992

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    147.976    3210.000       22.703     597.110       1.000        1.000        0.980
W Kg/sec =   67.26170

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    102.799    2991.823        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 113835.133  116111.594        1.715     513.330     299.399     401.059       1.340

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   431.99    -0.15   431.99      0.37   502.84
 MEAN    16.97      0.00    -0.02   431.99    -0.15   431.99      0.37
 HUB     14.32      0.00    -0.02   431.99    -0.15   431.99      0.37

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     51.32    46.36     4.96   539.52   691.27     20.70   581.53      0.58
 MEAN    47.75    43.80     3.95   475.39   642.46     20.70   581.53      0.54
 HUB     42.89    37.84     5.05   401.14   589.62     20.70   581.53      0.50

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   492.87   212.35   444.78  1196.31      0.41
 MEAN    16.57   503.92   231.06   447.83  1194.58      0.42
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 HUB     13.89   545.05   305.23   451.57  1192.81     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   545.91   316.52     0.46  4012.10
 MEAN   464.28   504.92   233.22     0.42  3832.04     1.37
 HUB    389.09   459.29    83.87     0.39  4241.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.95     1.10    22.20   615.14     1.03   594.87     0.92     0.91
 MEAN    24.85     1.09    21.98   614.33     1.03   593.14     0.92     0.91
 HUB     25.08     1.10    21.73   616.17     1.03   591.38     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.52    35.44    31.50     3.94     0.93     0.26     2.90
 MEAN    27.29    27.51    23.50     4.01     0.92     0.27     3.29     0.91
 HUB     34.06    10.52     6.50     4.02     0.92     0.29     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     496.143     232.357     438.369    1196.105       0.415       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.930      22.143     594.671      46.000      27.926      32.400       4.474

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     459.176     232.357     514.618    1199.066       0.383       0.178

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.903      22.504     597.619     456.573       0.019       0.279

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     435.999       0.000     435.999    1200.802       0.363       0.175

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.666     599.350       0.000       0.060       0.043       0.233

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      24.830       1.094     615.217      18.107     276.353       2.142

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 112866.578       0.404     943.818 1317381.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.014   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3210.000      24.830     615.217       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.407    2947.468       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.834     509.668     277.880     390.276       1.404

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   406.01    -0.14   406.01     0.34   471.20
 MEAN    15.91     0.00    -0.02   406.01    -0.14   406.01     0.34
 HUB     13.07     0.00    -0.02   406.01    -0.14   406.01     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.66    47.36     4.30   513.19   654.49    22.95   601.46     0.54
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 MEAN    47.68    44.80     2.88   445.76   603.06    22.95   601.46     0.50
 HUB     42.05    38.84     3.21   366.12   546.80    22.95   601.46     0.45
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   465.59   201.57   419.69  1214.72     0.38
 MEAN    15.50   473.27   212.50   422.88  1212.68     0.39
 HUB     12.59   506.62   273.25   426.61  1210.63     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   516.46   300.98     0.43  3618.72
 MEAN   434.13   477.44   221.63     0.39  3295.49     1.38
 HUB    352.68   433.94    79.43     0.36  3442.05

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.96     1.09    24.36   631.47     1.03   613.39     0.92     0.90
 MEAN    26.76     1.08    24.09   630.02     1.02   611.33     0.92     0.90
 HUB     26.85     1.08    23.80   630.68     1.03   609.26     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.65    35.65    31.50     4.15     0.93     0.26     2.90
 MEAN    26.68    27.66    23.50     4.16     0.91     0.26     3.34     0.90
 HUB     32.64    10.55     6.50     4.05     0.91     0.27     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     478.254     216.398     426.496    1212.983       0.394      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.800      24.074     611.640      46.000      26.903      33.000       6.097

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     452.277     216.398     501.381    1214.982       0.372       0.078

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.740      24.298     613.657     440.827       0.041       0.270

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     422.300       0.000     422.300    1217.145       0.347       0.183

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.582     615.845       0.000       0.060       0.049       0.181

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.842      26.719       1.076     630.726      15.509     299.742       2.324

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96714.258       0.383     808.748 1366104.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    672326.62   5622.1587     144.5575      1.7687      0.8605      7.0142      1.2064
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 85% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     143.384    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   65.17433

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     140.071    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  110302.430  112508.234       2.039     831.557     407.918     619.754       1.519

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   332.81    -0.11   332.81     0.30   575.61
  MEAN    17.06     0.00    -0.02   332.81    -0.11   332.81     0.30
  HUB     12.51     0.00    -0.02   332.81    -0.11   332.81     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.07    50.47     9.60   577.90   666.98    14.19   513.56     0.60
  MEAN    55.15    47.20     7.95   477.90   582.46    14.19   513.56     0.52
  HUB     46.49    38.62     7.87   350.44   483.37    14.19   513.56     0.43

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   556.85   339.08   441.70  1127.67     0.49
  MEAN    18.04   581.43   368.78   449.51  1123.53     0.52
  HUB     15.00   657.81   466.65   463.63  1116.75     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   502.13   238.81     0.45  6997.68
  MEAN   505.23   469.76   136.45     0.42  6653.37     1.39
  HUB    420.19   465.95    46.46     0.42  7001.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.21     1.21    15.41   554.30     1.06   528.40     0.92     0.91
  MEAN    18.05     1.19    15.03   552.75     1.06   524.52     0.92     0.91
  HUB     18.21     1.21    14.40   554.32     1.06   518.18     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     37.51    28.40    24.20     4.20     0.93     0.33     2.90
  MEAN    39.37    16.89    12.70     4.19     0.93     0.29     3.51     0.91
  HUB     45.19    -5.72    -9.30     3.58     0.93     0.15     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     589.753     368.069     460.798    1123.730       0.525      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.124      15.019     524.738      24.000      38.617      35.400      -3.217

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     484.552     368.069     608.494    1133.792       0.427       0.312
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.084      15.947     534.178     528.796       0.023       0.450

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     447.429       0.000     447.429    1136.855       0.394       0.368

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.199     537.067       0.000       0.060       0.040       0.390

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      18.028       1.193     553.788      30.978     206.564       1.601

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 192865.359       0.577    1562.737 1399425.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    143.384    3210.000      18.028     553.788       1.000       1.000       0.980
W Kg/sec =   65.17433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.807    3106.643       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 110302.430  112508.234       1.678     590.487     351.823     474.134       1.348

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   426.46    -0.15   426.46     0.37   557.11
 MEAN    18.08     0.00    -0.02   426.46    -0.15   426.46     0.37
 HUB     15.21     0.00    -0.02   426.46    -0.15   426.46     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.48    46.36     7.12   575.66   716.53    16.36   538.60     0.63
 MEAN    49.91    42.30     7.61   506.42   662.17    16.36   538.60     0.58
 HUB     44.98    37.84     7.14   426.07   602.93    16.36   538.60     0.53

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   509.59   264.60   435.51  1157.12     0.44
 MEAN    18.01   520.57   277.29   440.57  1154.23     0.45
 HUB     15.22   564.34   345.28   446.39  1151.32     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   533.08   307.42     0.46  5406.14
 MEAN   504.50   495.71   227.21     0.43  4996.63     1.45
 HUB    426.43   453.71    81.16     0.39  5258.37

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.68     1.15    18.10   578.11     1.04   556.42     0.92     0.91
 MEAN    20.47     1.14    17.80   576.26     1.04   553.63     0.92     0.91
 HUB     20.60     1.14    17.48   577.44     1.04   550.85     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.28    35.22    31.50     3.72     0.93     0.32     2.90
 MEAN    32.19    27.28    23.50     3.78     0.93     0.31     3.30     0.91
 HUB     37.72    10.30     6.50     3.80     0.93     0.32     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     527.522     278.068     448.283    1154.623       0.457       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.557      17.812     554.032      46.000      31.811      30.600      -1.211

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     453.543     278.068     531.999    1160.921       0.391       0.246

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.535      18.481     560.092     511.151       0.018       0.328

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     447.638       0.000     447.638    1161.382       0.385       0.241

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.484     560.537       0.000       0.060       0.037       0.248

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      20.482       1.136     577.270      23.482     242.472       1.880

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 146255.062       0.447    1185.066 1272825.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    143.384    3210.000      20.482     577.270       1.000       1.000       0.980
W Kg/sec =   65.17433

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    108.563    3042.803       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 110302.430  112508.234       1.725     545.479     316.176     429.765       1.359

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   421.73    -0.15   421.73     0.36   532.91
 MEAN    17.74     0.00    -0.02   421.73    -0.15   421.73     0.36
 HUB     15.05     0.00    -0.02   421.73    -0.15   421.73     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.13    46.36     6.77   562.21   702.92    18.70   562.42     0.60
 MEAN    49.69    43.40     6.29   496.90   651.85    18.70   562.42     0.56
 HUB     45.00    38.84     6.16   421.59   596.42    18.70   562.42     0.51

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   498.75   248.23   432.59  1179.93     0.42
 MEAN    17.51   510.17   263.89   436.62  1177.58     0.43
 HUB     14.85   553.73   334.43   441.33  1175.22     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   530.28   306.70     0.45  4920.37
 MEAN   490.40   491.88   226.52     0.42  4622.34     1.43
 HUB    415.99   448.80    81.56     0.38  4968.41

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.10     1.13    20.42   599.39     1.04   578.63     0.92     0.91
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 MEAN    22.93     1.12    20.15   598.05     1.04   576.32     0.92     0.91
 HUB     23.12     1.13    19.86   599.61     1.04   574.01     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.85    35.34    31.50     3.84     0.93     0.31     2.90
 MEAN    31.15    27.42    23.50     3.92     0.93     0.31     3.28     0.91
 HUB     37.15    10.47     6.50     3.97     0.93     0.32     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     515.467     265.619     441.762    1178.091       0.438       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.023      20.183     576.835      46.000      31.017      31.500       0.483

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     453.786     265.619     525.809    1183.177       0.384       0.218

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.002      20.780     581.826     471.992       0.017       0.319

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     440.196       0.000     440.196    1184.208       0.372       0.231

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      20.855     582.841       0.000       0.060       0.037       0.244

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.878      22.945       1.120     599.018      21.749     245.397       1.902

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 135514.984       0.440    1098.042 1250540.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

   W act       RPM act        Pt          Tt           POTS        POTH       AeroBl
    143.384    3210.000      22.945     599.018       1.000       1.000       0.980
W Kg/sec =   65.17433

   W cor       RPM cor        GAMMA       Cp          R           Blades       THK
     98.716    2987.054       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 110302.430  112508.234       1.785     513.330     287.507     401.059       1.395

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   413.04    -0.14   413.04      0.35   502.04
 MEAN    16.97      0.00    -0.02   413.04    -0.14   413.04      0.35
 HUB     14.32      0.00    -0.02   413.04    -0.14   413.04      0.35

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     52.57    46.36      6.21   539.52   679.59     21.10   584.78      0.57
 MEAN    49.02    43.80      5.22   475.39   629.87     21.10   584.78      0.53
 HUB     44.17    37.84      6.33   401.14   575.88     21.10   584.78      0.49

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   481.07   227.60   423.82  1200.48      0.40
 MEAN    16.57   491.10   242.11   427.27  1198.38      0.41
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 HUB     13.89   530.75   309.31   431.31  1196.27     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   519.99   301.28     0.43  4299.85
 MEAN   464.28   481.58   222.17     0.40  4015.09     1.42
 HUB    389.09   438.63    79.79     0.37  4298.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.39     1.11    22.73   618.34     1.03   599.03     0.92     0.91
 MEAN    25.22     1.10    22.47   617.06     1.03   596.93     0.92     0.91
 HUB     25.39     1.11    22.18   618.34     1.03   594.82     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.24    35.41    31.50     3.91     0.93     0.29     2.90
 MEAN    29.54    27.47    23.50     3.97     0.92     0.29     3.29     0.91
 HUB     35.65    10.48     6.50     3.98     0.92     0.31     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     484.089     243.470     418.407    1199.799       0.403       0.053

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.306      22.619     598.355      46.000      30.195      32.400       2.205

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     436.906     243.470     500.164    1203.430       0.363       0.218

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.288      23.084     601.982     456.573       0.017       0.312

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     414.996       0.000     414.996    1204.986       0.344       0.214

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.236     603.540       0.000       0.060       0.038       0.270

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      25.225       1.099     617.914      18.896     261.706       2.029

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 117791.617       0.421     954.434 1265974.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    143.384    3210.000      25.225     617.914       1.000       1.000       0.980
W Kg/sec =   65.17433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.199    2941.027       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 110302.430  112508.234       1.919     509.668     265.625     390.276       1.469

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   386.83    -0.13   386.83     0.32   470.17
 MEAN    15.91     0.00    -0.02   386.83    -0.13   386.83     0.32
 HUB     13.07     0.00    -0.02   386.83    -0.13   386.83     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.00    47.36     5.64   513.19   642.76    23.49   605.43     0.53
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 MEAN    49.06    44.80     4.26   445.76   590.31    23.49   605.43     0.49
 HUB     43.44    38.84     4.60   366.12   532.71    23.49   605.43     0.44
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   453.82   217.16   398.49  1219.51     0.37
 MEAN    15.50   460.11   223.86   401.99  1217.14     0.38
 HUB     12.59   491.69   277.44   405.94  1214.77     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   490.14   285.38     0.40  3898.37
 MEAN   434.13   453.66   210.27     0.37  3471.36     1.42
 HUB    352.68   412.85    75.24     0.34  3494.73

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.57     1.09    25.05   635.43     1.03   618.24     0.92     0.91
 MEAN    27.30     1.08    24.74   633.51     1.03   615.84     0.92     0.91
 HUB     27.32     1.08    24.40   633.61     1.03   613.44     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.59    35.61    31.50     4.11     0.93     0.30     2.90
 MEAN    29.11    27.61    23.50     4.11     0.92     0.29     3.34     0.91
 HUB     34.35    10.50     6.50     4.00     0.92     0.29     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     465.081     227.962     405.381    1217.424       0.382       -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.344      24.722     616.135      46.000      29.351      33.000       3.649

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     428.274     227.962     485.165    1220.131       0.351       0.129

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.308      25.075     618.879     440.827       0.034       0.305

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     400.300       0.000     400.300    1222.036       0.328       0.228

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.331     620.813       0.000       0.060       0.041       0.225

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      27.288       1.082     634.183      16.269     282.251       2.188

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 101459.844       0.402     822.102 1312196.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    693886.88   5622.3804    140.0713      1.8063      0.8673      7.9532      1.2130
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 85% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     138.557    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   62.98067

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     135.357    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  106589.836  108721.398       2.110     831.557     394.188     619.754       1.572

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   320.57    -0.11   320.57     0.29   575.61
  MEAN    17.06     0.00    -0.02   320.57    -0.11   320.57     0.29
  HUB     12.51     0.00    -0.02   320.57    -0.11   320.57     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.99    50.47    10.52   577.90   660.95    14.26   514.23     0.59
  MEAN    56.15    47.20     8.95   477.90   575.55    14.26   514.23     0.52
  HUB     47.56    38.62     8.94   350.44   475.02    14.26   514.23     0.43

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   548.98   348.69   424.03  1129.39     0.49
  MEAN    18.04   571.41   374.21   431.83  1125.02     0.51
  HUB     15.00   643.66   464.84   445.22  1118.25     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   482.01   229.21     0.43  7195.72
  MEAN   505.23   451.27   131.02     0.40  6751.20     1.44
  HUB    420.19   447.46    44.65     0.40  6973.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.29     1.21    15.56   555.19     1.06   530.02     0.92     0.91
  MEAN    18.08     1.20    15.16   553.19     1.06   525.92     0.92     0.91
  HUB     18.19     1.20    14.53   554.19     1.06   519.59     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     39.43    28.39    24.20     4.19     0.93     0.36     2.90
  MEAN    40.91    16.88    12.70     4.18     0.93     0.31     3.51     0.91
  HUB     46.23    -5.73    -9.30     3.57     0.93     0.17     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     579.080     373.486     442.540    1125.276       0.515      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.159      15.154     526.183      24.000      40.163      35.400      -4.763

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     464.308     373.486     595.881    1135.920       0.409       0.341
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      18.114      16.143     536.185     528.796       0.024       0.474

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     429.451       0.000     429.451    1138.673       0.377       0.389

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      16.362     538.787       0.000       0.060       0.044       0.412

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
    0.873      18.052       1.195     554.191      31.381     200.774       1.556

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 195373.719       0.585    1529.778 1347956.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   138.557    3210.000      18.052     554.191       1.000       1.000       0.980
W Kg/sec =   62.98067

  W cor      RPM cor        GAMMA       Cp          R           Blades       THK
   116.625    3105.514       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106589.836  108721.398       1.739     590.487     339.644     474.134       1.396

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   409.59    -0.14   409.59     0.36   556.90
 MEAN    18.08     0.00    -0.02   409.59    -0.14   409.59     0.36
 HUB     15.21     0.00    -0.02   409.59    -0.14   409.59     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.57    46.36     8.21   575.66   706.62    16.51   540.18     0.62
 MEAN    51.04    42.30     8.74   506.42   651.44    16.51   540.18     0.57
 HUB     46.14    37.84     8.30   426.07   591.12    16.51   540.18     0.52

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   501.31   277.55   417.47  1159.50     0.43
 MEAN    18.01   510.79   286.70   422.74  1156.31     0.44
 HUB     15.22   552.63   348.69   428.73  1153.12     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   510.88   294.47     0.44  5670.38
 MEAN   504.50   475.55   217.81     0.41  5165.94     1.49
 HUB    426.43   435.72    77.74     0.38  5310.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.84     1.15    18.32   579.70     1.05   558.71     0.92     0.91
 MEAN    20.58     1.14    17.99   577.43     1.04   555.64     0.92     0.91
 HUB     20.65     1.14    17.64   578.08     1.04   552.58     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.62    35.20    31.50     3.70     0.93     0.34     2.90
 MEAN    34.14    27.26    23.50     3.76     0.93     0.34     3.30     0.91
 HUB     39.12    10.28     6.50     3.78     0.93     0.34     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     517.326     287.501     430.081    1156.725       0.447       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.660      18.007     556.052      46.000      33.762      30.600      -3.162

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     434.157     287.501     520.720    1163.578       0.373       0.280

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.635      18.742     562.660     511.151       0.019       0.357

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     428.666       0.000     428.666    1163.987       0.368       0.270

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.736     563.056       0.000       0.060       0.040       0.278

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      20.579       1.140     578.400      24.209     232.251       1.800

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 150788.750       0.461    1180.677 1222602.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    138.557    3210.000      20.579     578.400       1.000       1.000       0.980
W Kg/sec =   62.98067

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    104.516    3039.827       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 106589.836  108721.398       1.792     545.479     304.388     429.765       1.412

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   404.19    -0.14   404.19     0.35   532.39
 MEAN    17.74      0.00    -0.02   404.19    -0.14   404.19     0.35
 HUB     15.05      0.00    -0.02   404.19    -0.14   404.19     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.29     46.36     7.93   562.21   692.54    18.93   564.76     0.59
 MEAN    50.88     43.40     7.48   496.90   640.64    18.93   564.76     0.55
 HUB     46.22     38.84     7.38   421.59   584.14    18.93   564.76     0.50

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   489.58   261.95   413.61  1183.09      0.41
 MEAN    17.51   499.64   273.85   417.90  1180.43      0.42
 HUB     14.85   541.40   338.12   422.83  1177.77      0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   506.86   292.98     0.43  5192.07
 MEAN   490.40   470.68   216.55     0.40  4796.71      1.48
 HUB    415.99   429.94    77.86     0.37  5023.23

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     23.35     1.13    20.75   601.74     1.04   581.73     0.92     0.91
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 MEAN    23.13     1.12    20.45   599.97     1.04   579.13     0.92     0.91
 HUB     23.26     1.13    20.12   600.99     1.04   576.52     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.35    35.31    31.50     3.81     0.93     0.33     2.90
 MEAN    33.24    27.39    23.50     3.89     0.93     0.33     3.28     0.91
 HUB     38.65    10.43     6.50     3.93     0.93     0.34     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     504.727     275.651     422.806    1180.939       0.427       0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.220      20.476     579.631      46.000      33.103      31.500      -1.603

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     433.219     275.651     513.480    1186.629       0.365       0.255

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.200      21.157     585.231     471.992       0.017       0.350

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     420.439       0.000     420.439    1187.552       0.354       0.265

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.219     586.142       0.000       0.060       0.037       0.278

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      23.143       1.125     600.899      22.499     234.201       1.816

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 140193.109       0.455    1097.713 1200121.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    138.557    3210.000      23.143     600.899       1.000       1.000       0.980
W Kg/sec =   62.98067

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.728    2982.375       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106589.836  108721.398       1.861     513.330     275.893     401.059       1.454

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   394.85    -0.14   394.85     0.33   501.25
 MEAN    16.97     0.00    -0.02   394.85    -0.14   394.85     0.33
 HUB     14.32     0.00    -0.02   394.85    -0.14   394.85     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.81    46.36     7.45   539.52   668.68    21.44   587.89     0.56
 MEAN    50.30    43.80     6.50   475.39   618.09    21.44   587.89     0.52
 HUB     45.46    37.84     7.62   401.14   562.96    21.44   587.89     0.47

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   470.99   241.95   404.09  1204.37     0.39
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 MEAN    16.57   479.68   252.55   407.81  1201.96     0.40
 HUB     13.89   517.57   313.18   412.07  1199.54     0.43
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   495.60   286.93     0.41  4570.63
 MEAN   464.28   459.50   211.73     0.38  4188.03     1.46
 HUB    389.09   419.00    75.92     0.35  4351.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.77     1.11    23.19   621.44     1.03   602.93     0.92     0.91
 MEAN    25.54     1.10    22.88   619.72     1.03   600.52     0.92     0.91
 HUB     25.64     1.11    22.56   620.46     1.03   598.10     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.91    35.38    31.50     3.88     0.93     0.32     2.90
 MEAN    31.77    27.44    23.50     3.94     0.93     0.32     3.29     0.91
 HUB     37.24    10.44     6.50     3.94     0.93     0.33     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     473.391     253.969     399.498    1203.277       0.393       0.051

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.621      23.026     601.836      46.000      32.445      32.400      -0.045

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     416.053     253.969     487.443    1207.524       0.345       0.256

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.606      23.585     606.092     456.573       0.015       0.345

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     395.392       0.000     395.392    1208.917       0.327       0.251

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.721     607.492       0.000       0.060       0.037       0.305

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      25.548       1.104     620.540      19.640     248.561       1.927

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 122436.211       0.438     958.677 1213953.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    138.557    3210.000      25.548     620.540       1.000       1.000       0.980
W Kg/sec =   62.98067

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.202    2934.799       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106589.836  108721.398       2.007     509.668     253.984     390.276       1.537

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   368.87    -0.13   368.87     0.30   469.18
 MEAN    15.91     0.00    -0.02   368.87    -0.13   368.87     0.30
 HUB     13.07     0.00    -0.02   368.87    -0.13   368.87     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.30    47.36     6.94   513.19   632.11    23.95   609.19     0.52
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 MEAN    50.40    44.80     5.60   445.76   578.69    23.95   609.19     0.48
 HUB     44.80    38.84     5.96   366.12   519.81    23.95   609.19     0.43
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   444.09   231.48   378.99  1223.93     0.36
 MEAN    15.50   448.71   234.29   382.69  1221.29     0.37
 HUB     12.59   478.24   281.28   386.78  1218.64     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   465.95   271.06     0.38  4155.15
 MEAN   434.13   431.72   199.83     0.35  3633.00     1.47
 HUB    352.68   393.31    71.40     0.32  3543.01

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.08     1.10    25.64   639.21     1.03   622.75     0.92     0.91
 MEAN    27.76     1.09    25.28   636.86     1.03   620.06     0.92     0.91
 HUB     27.70     1.08    24.91   636.46     1.03   617.37     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.42    35.57    31.50     4.07     0.93     0.33     2.90
 MEAN    31.48    27.57    23.50     4.07     0.92     0.31     3.34     0.91
 HUB     36.03    10.46     6.50     3.96     0.92     0.31     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     453.695     238.589     385.895    1221.552       0.371      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.795      25.267     620.332      46.000      31.727      33.000       1.273

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     406.486     238.589     471.334    1224.884       0.332       0.176

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.771      25.730     623.720     440.827       0.030       0.339

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     380.270       0.000     380.270    1226.572       0.310       0.270

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.960     625.441       0.000       0.060       0.037       0.266

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      27.751       1.086     637.507      16.967     267.061       2.070

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 105818.320       0.419     828.558 1257911.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    714610.06   5595.4038    135.3568      1.8370      0.8683      8.9530      1.2194
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 85% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     133.793    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   60.81521

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     130.703    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  102924.961  104983.242       2.185     831.557     380.635     619.754       1.628

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   308.61    -0.11   308.61     0.28   575.61
  MEAN    17.06     0.00    -0.02   308.61    -0.11   308.61     0.28
  HUB     12.51     0.00    -0.02   308.61    -0.11   308.61     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.90    50.47    11.43   577.90   655.23    14.32   514.86     0.59
  MEAN    57.15    47.20     9.95   477.90   568.97    14.32   514.86     0.51
  HUB     48.64    38.62    10.02   350.44   467.03    14.32   514.86     0.42

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   542.01   357.81   407.12  1130.96     0.48
  MEAN    18.04   562.16   379.38   414.84  1126.40     0.50
  HUB     15.00   630.27   463.08   427.55  1119.64     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   462.80   220.08     0.41  7383.91
  MEAN   505.23   433.51   125.85     0.38  6844.35     1.48
  HUB    420.19   429.70    42.90     0.38  6947.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.37     1.22    15.69   556.04     1.06   531.50     0.92     0.91
  MEAN    18.12     1.20    15.28   553.61     1.06   527.21     0.92     0.91
  HUB     18.16     1.20    14.64   554.07     1.06   520.90     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     41.31    28.40    24.20     4.20     0.93     0.39     2.90
  MEAN    42.44    16.88    12.70     4.18     0.94     0.34     3.51     0.91
  HUB     47.28    -5.73    -9.30     3.57     0.94     0.19     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     569.231     378.645     425.031    1126.694       0.505      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.186      15.274     527.510      24.000      41.697      35.400      -6.297

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     445.082     378.645     584.354    1137.871       0.391       0.369
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.135      16.317     538.028     528.796       0.027       0.498

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     412.333       0.000     412.333    1140.348       0.362       0.408

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.504     540.373       0.000       0.060       0.050       0.431

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.866      18.066       1.196     554.573      31.763     195.211       1.513

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 197755.156       0.592    1495.185 1297660.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    133.793    3210.000      18.066     554.573       1.000       1.000       0.980
W Kg/sec =   60.81521

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.566    3104.443       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 102924.961  104983.242       1.801     590.487     327.823     474.134       1.446

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   393.50    -0.14   393.50     0.34   556.71
 MEAN    18.08     0.00    -0.02   393.50    -0.14   393.50     0.34
 HUB     15.21     0.00    -0.02   393.50    -0.14   393.50     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.65    46.36     9.29   575.66   697.41    16.64   541.64     0.61
 MEAN    52.16    42.30     9.86   506.42   641.43    16.64   541.64     0.56
 HUB     47.29    37.84     9.45   426.07   580.08    16.64   541.64     0.51

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   494.29   289.64   400.54  1161.65     0.43
 MEAN    18.01   502.10   295.54   405.92  1158.21     0.43
 HUB     15.22   541.83   351.90   412.00  1154.77     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   490.08   282.38     0.42  5917.15
 MEAN   504.50   456.55   208.97     0.39  5325.02     1.53
 HUB    426.43   418.69    74.54     0.36  5359.03

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.96     1.16    18.51   581.19     1.05   560.79     0.92     0.91
 MEAN    20.66     1.14    18.15   578.53     1.04   557.47     0.92     0.91
 HUB     20.68     1.14    17.78   578.68     1.04   554.16     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.87    35.18    31.50     3.68     0.93     0.37     2.90
 MEAN    36.06    27.24    23.50     3.74     0.94     0.36     3.30     0.91
 HUB     40.50    10.25     6.50     3.75     0.94     0.36     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     508.274     296.364     412.929    1158.635       0.439       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.741      18.170     557.891      46.000      35.668      30.600      -5.068

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     416.039     296.364     510.804    1166.004       0.357       0.312

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.711      18.964     565.011     511.151       0.021       0.387

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     410.992       0.000     410.992    1166.363       0.352       0.297

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.947     565.359       0.000       0.060       0.045       0.306

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      20.648       1.143     579.464      24.891     222.951       1.728

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 155033.750       0.474    1172.178 1174067.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.997

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    133.793    3210.000      20.648     579.464       1.000       1.000       0.980
W Kg/sec =   60.81521

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    100.675    3037.035       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 102924.961  104983.242       1.860     545.479     293.204     429.765       1.466

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   387.80    -0.13   387.80     0.33   531.90
 MEAN    17.74     0.00    -0.02   387.80    -0.13   387.80     0.33
 HUB     15.05     0.00    -0.02   387.80    -0.13   387.80     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.41    46.36     9.05   562.21   683.10    19.13   566.91     0.58
 MEAN    52.04    43.40     8.64   496.90   630.42    19.13   566.91     0.54
 HUB     47.40    38.84     8.56   421.59   572.92    19.13   566.91     0.49

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   481.99    274.50   396.19  1185.92      0.41
 MEAN    17.51   490.53    283.03   400.64  1183.01      0.41
 HUB     14.85   530.27    341.47   405.70  1180.09      0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   485.39   280.43     0.41  5440.56
 MEAN   490.40   451.13   207.38     0.38  4957.19      1.52
 HUB    415.99   412.48    74.52     0.35  5072.84

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     23.56     1.14    21.02   603.93     1.04   584.53     0.92     0.91
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 MEAN    23.29     1.13    20.69   601.75     1.04   581.67     0.92     0.91
 HUB     23.35     1.13    20.33   602.27     1.04   578.80     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.72    35.29    31.50     3.79     0.93     0.36     2.90
 MEAN    35.24    27.37    23.50     3.87     0.93     0.35     3.28     0.91
 HUB     40.09    10.41     6.50     3.91     0.93     0.36     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     495.435     284.884     405.336    1183.505       0.419       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.372      20.715     582.159      46.000      35.101      31.500      -3.601

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     414.435     284.884     502.907    1189.743       0.348       0.290

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.349      21.467     588.311     471.992       0.018       0.381

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     402.448       0.000     402.448    1190.569       0.338       0.294

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.515     589.129       0.000       0.060       0.041       0.307

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.877      23.288       1.128     602.650      23.186     224.285       1.739

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 144475.453       0.469    1092.349 1151654.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.999

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    133.793    3210.000       23.288     602.650       1.000       1.000       0.980
W Kg/sec =   60.81521

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     91.034    2978.040        1.402       0.249      53.349      56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 102924.961  104983.242        1.936     513.330     265.135     401.059       1.513

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   378.22    -0.13   378.22      0.32   500.52
 MEAN    16.97      0.00    -0.02   378.22    -0.13   378.22      0.32
 HUB     14.32      0.00    -0.02   378.22    -0.13   378.22      0.32

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     54.97    46.36     8.61   539.52   659.00     21.72   590.71      0.55
 MEAN    51.50    43.80     7.70   475.39   607.60     21.72   590.71      0.51
 HUB     46.69    37.84     8.85   401.14   551.43     21.72   590.71      0.46

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   462.83   254.79   386.38  1207.83      0.38
 MEAN    16.57   470.00   261.91   390.26  1205.17      0.39
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 HUB     13.89   505.95   316.60   394.65  1202.50     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   473.72   274.09     0.39  4812.97
 MEAN   464.28   439.61   202.36     0.36  4343.12     1.50
 HUB    389.09   401.25    72.49     0.33  4399.47

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.06     1.12    23.55   624.28     1.04   606.40     0.92     0.91
 MEAN    25.78     1.11    23.21   622.17     1.03   603.73     0.92     0.91
 HUB     25.82     1.11    22.85   622.42     1.03   601.06     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.40    35.35    31.50     3.85     0.93     0.35     2.90
 MEAN    33.87    27.41    23.50     3.91     0.93     0.34     3.29     0.91
 HUB     38.74    10.41     6.50     3.91     0.93     0.34     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     464.356     263.385     382.433    1206.387       0.385       0.049

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.862      23.347     604.960      46.000      34.556      32.400      -2.156

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     397.413     263.385     476.769    1211.179       0.328       0.291

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.846      23.987     609.775     456.573       0.016       0.377

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     377.916       0.000     377.916    1212.431       0.312       0.283

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.105     611.037       0.000       0.060       0.038       0.335

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      25.786       1.107     622.956      20.306     237.259       1.839

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 126591.531       0.453     957.132 1164217.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    133.793    3210.000      25.786     622.956       1.000       1.000       0.980
W Kg/sec =   60.81521

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.586    2929.101       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 102924.961  104983.242       2.093     509.668     243.456     390.276       1.603

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   352.81    -0.12   352.81     0.29   468.27
 MEAN    15.91     0.00    -0.02   352.81    -0.12   352.81     0.29
 HUB     13.07     0.00    -0.02   352.81    -0.12   352.81     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.50    47.36     8.14   513.19   622.87    24.32   612.57     0.51
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 MEAN    51.65    44.80     6.85   445.76   568.58    24.32   612.57     0.47
 HUB     46.07    38.84     7.23   366.12   508.54    24.32   612.57     0.42
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   436.46   244.06   361.84  1227.83     0.36
 MEAN    15.50   439.28   243.47   365.63  1224.97     0.36
 HUB     12.59   466.67   284.67   369.79  1222.09     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   444.68   258.48     0.36  4380.75
 MEAN   434.13   412.36   190.65     0.34  3775.18     1.52
 HUB    352.68   375.99    68.01     0.31  3585.56

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.48     1.10    26.10   642.63     1.03   626.74     0.92     0.91
 MEAN    28.10     1.09    25.71   639.91     1.03   623.81     0.92     0.91
 HUB     27.98     1.09    25.30   639.06     1.03   620.89     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.00    35.54    31.50     4.04     0.93     0.35     2.90
 MEAN    33.66    27.54    23.50     4.04     0.93     0.34     3.34     0.91
 HUB     37.59    10.42     6.50     3.92     0.93     0.33     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     444.303     247.937     368.690    1225.211       0.363       -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.137      25.691      624.067      46.000      33.920      33.000      -0.920

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     387.494     247.937     460.027    1229.075       0.315       0.218

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.116      26.242     628.009     440.827       0.029       0.372

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     362.779       0.000     362.779    1230.588       0.295       0.305

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.449     629.556       0.000       0.060       0.037       0.301

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      28.095       1.090     640.537      17.580     254.307       1.971

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 109650.305       0.434     829.043 1206173.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    733506.19   5545.8867    130.7028      1.8597      0.8646      9.9532      1.2252
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 85% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.987

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     129.093    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   58.67873

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     126.111    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   99309.141  101295.109       2.264     831.557     367.263     619.754       1.687

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   296.92    -0.10   296.92     0.27   575.61
  MEAN    17.06     0.00    -0.02   296.92    -0.10   296.92     0.27
  HUB     12.51     0.00    -0.02   296.92    -0.10   296.92     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.81    50.47    12.34   577.90   649.80    14.38   515.45     0.58
  MEAN    58.15    47.20    10.95   477.90   562.71    14.38   515.45     0.51
  HUB     49.73    38.62    11.11   350.44   459.39    14.38   515.45     0.41

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   535.87   366.54   390.89  1132.41     0.47
  MEAN    18.04   553.62   384.33   398.48  1127.67     0.49
  HUB     15.00   617.54   461.33   410.53  1120.93     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   444.37   211.36     0.39  7563.90
  MEAN   505.23   416.42   120.90     0.37  6933.53     1.53
  HUB    420.19   412.58    41.14     0.37  6921.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.44     1.22    15.81   556.85     1.07   532.86     0.92     0.90
  MEAN    18.14     1.20    15.38   554.01     1.06   528.41     0.92     0.90
  HUB     18.13     1.20    14.75   553.96     1.06   522.10     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     43.16    28.40    24.20     4.20     0.93     0.41     2.90
  MEAN    43.96    16.88    12.70     4.18     0.94     0.36     3.51     0.90
  HUB     48.33    -5.72    -9.30     3.58     0.94     0.22     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     560.139     383.584     408.190    1127.998       0.497       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.208      15.381     528.732      24.000      43.220      35.400      -7.820

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     426.733     383.584     573.793    1139.667       0.374       0.396
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.149      16.473     539.728     528.796       0.030       0.522

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     395.956       0.000     395.956    1141.898       0.347       0.426

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.627     541.843       0.000       0.060       0.057       0.449

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.858      18.072       1.196     554.938      32.128     189.848       1.472

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 200022.594       0.599    1459.200 1248503.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    129.093    3210.000      18.072     554.938       1.000       1.000       0.980
W Kg/sec =   58.67873

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.615    3103.424       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  99309.141  101295.109       1.867     590.487     316.316     474.134       1.499

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   378.07    -0.13   378.07     0.33   556.53
 MEAN    18.08     0.00    -0.02   378.07    -0.13   378.07     0.33
 HUB     15.21     0.00    -0.02   378.07    -0.13   378.07     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.71    46.36    10.35   575.66   688.81    16.75   543.00     0.60
 MEAN    53.26    42.30    10.96   506.42   632.08    16.75   543.00     0.55
 HUB     48.42    37.84    10.58   426.07   569.72    16.75   543.00     0.50

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   488.34   301.01   384.54  1163.60     0.42
 MEAN    18.01   494.35   303.85   389.94  1159.95     0.43
 HUB     15.22   531.78   354.87   396.05  1156.29     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   470.44   271.01     0.40  6149.25
 MEAN   504.50   438.54   200.65     0.38  5474.71     1.58
 HUB    426.43   402.46    71.56     0.35  5404.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.07     1.17    18.66   582.60     1.05   562.68     0.92     0.90
 MEAN    20.73     1.15    18.29   579.56     1.04   559.16     0.92     0.90
 HUB     20.69     1.14    17.89   579.25     1.04   555.63     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.05    35.17    31.50     3.67     0.93     0.39     2.90
 MEAN    37.93    27.23    23.50     3.73     0.94     0.38     3.30     0.90
 HUB     41.86    10.24     6.50     3.74     0.94     0.37     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     500.180     304.704     396.655    1160.382       0.431       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.803      18.306     559.578      46.000      37.531      30.600      -6.931

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     398.967     304.704     502.015    1168.235       0.342       0.343

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.766      19.154     567.177     511.151       0.024       0.415

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     394.377       0.000     394.377    1168.548       0.337       0.321

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.124     567.481       0.000       0.060       0.053       0.331

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.861      20.694       1.145     580.469      25.531     214.413       1.662

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 159021.297       0.486    1160.088 1127074.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.993

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    129.093    3210.000      20.694     580.469       1.000       1.000       0.980
W Kg/sec =   58.67873

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     97.007    3034.406       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  99309.141  101295.109       1.931     545.479     282.521     429.765       1.521

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   372.36    -0.13   372.36     0.32   531.44
 MEAN    17.74      0.00    -0.02   372.36    -0.13   372.36     0.32
 HUB     15.05      0.00    -0.02   372.36    -0.13   372.36     0.32

       BetaFlo   BetaBlade Incid   U1        W1       Ps1      Ts1     Rel Mach
 TIP     56.49     46.36    10.13   562.21   674.44    19.29   568.89     0.58
 MEAN    53.16     43.40     9.76   496.90   621.04    19.29   568.89     0.53
 HUB     48.56     38.84     9.72   421.59   562.58    19.29   568.89     0.48

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   475.67   286.10   380.01  1188.49      0.40
 MEAN    17.51   482.54   291.52   384.53  1185.36      0.41
 HUB     14.85   520.15   344.57   389.65  1182.22      0.44

       U2        W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   465.49   268.83     0.39  5670.24
 MEAN   490.40   432.92   198.89     0.37  5105.72      1.56
 HUB    415.99   396.14    71.42     0.34  5118.79

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     23.72     1.15    21.24   605.96     1.04   587.07     0.92     0.91
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 MEAN    23.41     1.13    20.88   603.42     1.04   583.99     0.92     0.91
 HUB     23.41     1.13    20.50   603.48     1.04   580.90     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.98    35.28    31.50     3.78     0.93     0.38     2.90
 MEAN    37.17    27.35    23.50     3.85     0.94     0.37     3.28     0.91
 HUB     41.49    10.39     6.50     3.89     0.94     0.37     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     487.297     293.429     389.048    1185.843       0.411       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.487      20.906     584.466      46.000      37.024      31.500      -5.524

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     397.056     293.429     493.714    1192.583       0.333       0.323

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.458      21.723     591.129     471.992       0.021       0.410

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     385.838       0.000     385.838    1193.322       0.323       0.321

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.753     591.862       0.000       0.060       0.047       0.334

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.870      23.389       1.130     604.290      23.821     215.360       1.669

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 148436.578       0.482    1082.871 1104912.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.996

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    129.093    3210.000       23.389     604.290       1.000       1.000       0.980
W Kg/sec =   58.67873

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     87.573    2973.996        1.402       0.249      53.349      56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 99309.141  101295.109        2.013     513.330     255.059     401.059       1.572

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   362.84    -0.12   362.84      0.30   499.84
 MEAN    16.97      0.00    -0.02   362.84    -0.12   362.84      0.30
 HUB     14.32      0.00    -0.02   362.84    -0.12   362.84      0.30

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     56.08    46.36     9.72   539.52   650.29     21.94    593.30     0.54
 MEAN    52.65    43.80     8.85   475.39   598.14     21.94    593.30     0.50
 HUB     47.88    37.84    10.04   401.14   540.99     21.94    593.30     0.45

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   456.14   266.46   370.22  1210.94      0.38
 MEAN    16.57   461.69   270.44   374.19  1208.07      0.38
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 HUB     13.89   495.57   319.72   378.63  1205.18     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   453.79   262.42     0.37  5033.17
 MEAN   464.28   421.41   193.83     0.35  4484.44     1.55
 HUB    389.09   384.93    69.37     0.32  4442.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.29     1.12    23.84   626.91     1.04   609.54     0.92     0.91
 MEAN    25.97     1.11    23.47   624.44     1.03   606.65     0.92     0.91
 HUB     25.94     1.11    23.09   624.26     1.03   603.76     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.74    35.33    31.50     3.83     0.93     0.37     2.90
 MEAN    35.86    27.38    23.50     3.88     0.93     0.36     3.29     0.91
 HUB     40.18    10.38     6.50     3.88     0.93     0.36     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     456.616     271.966     366.788    1209.207       0.378       0.048

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.041      23.598     607.802      46.000      36.556      32.400      -4.156

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     380.453     271.966     467.664    1214.488       0.313       0.324

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.022      24.309     613.122     456.573       0.017       0.408

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     362.048       0.000     362.048    1215.617       0.298       0.311

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.405     614.263       0.000       0.060       0.042       0.361

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      25.956       1.110     625.202      20.912     227.311       1.762

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 130371.719       0.466     951.084 1116430.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    129.093    3210.000      25.956     625.202       1.000       1.000       0.980
W Kg/sec =   58.67873

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.265    2923.836       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  99309.141  101295.109       2.180     509.668     233.785     390.276       1.669

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   338.19    -0.12   338.19     0.28   467.43
 MEAN    15.91     0.00    -0.02   338.19    -0.12   338.19     0.28
 HUB     13.07     0.00    -0.02   338.19    -0.12   338.19     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.62    47.36     9.26   513.19   614.70    24.60   615.66     0.51
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 MEAN    52.82    44.80     8.02   445.76   559.63    24.60   615.66     0.46
 HUB     47.28    38.84     8.44   366.12   498.50    24.60   615.66     0.41
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   430.34   255.30   346.44  1231.33     0.35
 MEAN    15.50   431.32   251.70   350.26  1228.28     0.35
 HUB     12.59   456.49   287.68   354.44  1225.22     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   425.62   247.25     0.35  4582.15
 MEAN   434.13   394.92   182.42     0.32  3902.67     1.56
 HUB    352.68   360.35    65.00     0.29  3623.45

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.79     1.11    26.45   645.78     1.03   630.33     0.92     0.91
 MEAN    28.35     1.09    26.03   642.73     1.03   627.21     0.92     0.91
 HUB     28.18     1.09    25.60   641.48     1.03   624.09     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.39    35.51    31.50     4.01     0.93     0.38     2.90
 MEAN    35.70    27.51    23.50     4.01     0.93     0.36     3.34     0.91
 HUB     39.06    10.39     6.50     3.89     0.93     0.35     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     436.398     256.320     353.190    1228.506       0.355       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.390      26.016     627.442      46.000      35.969      33.000      -2.969

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     370.554     256.320     450.566    1232.838       0.301       0.254

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.365      26.641     631.875     440.827       0.030       0.403

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     347.158       0.000     347.158    1234.204       0.281       0.336

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.826     633.276       0.000       0.060       0.040       0.331

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      28.343       1.092     643.331      18.129     243.306       1.886

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 113075.328       0.448     824.904 1156557.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    750927.44   5478.1475    126.1111      1.8761      0.8577     10.9531      1.2305
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 85% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =12.015   EfDer =  0.980

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     124.165    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   56.43852

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     121.297    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   95517.758   97427.906       2.354     831.557     353.242     619.754       1.754

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   284.77    -0.10   284.77     0.26   575.61
  MEAN    17.06     0.00    -0.02   284.77    -0.10   284.77     0.26
  HUB     12.51     0.00    -0.02   284.77    -0.10   284.77     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.77    50.47    13.30   577.90   644.34    14.44   516.04     0.58
  MEAN    59.22    47.20    12.02   477.90   556.39    14.44   516.04     0.50
  HUB     50.91    38.62    12.29   350.44   451.63    14.44   516.04     0.41

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   530.12   375.40   374.30  1133.82     0.47
  MEAN    18.04   545.22   389.34   381.69  1128.92     0.48
  HUB     15.00   604.68   459.50   393.06  1122.20     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   425.56   202.50     0.38  7746.57
  MEAN   505.23   398.90   115.90     0.35  7023.73     1.59
  HUB    420.19   395.02    39.32     0.35  6893.78

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.50     1.22    15.92   557.67     1.07   534.20     0.92     0.90
  MEAN    18.16     1.20    15.48   554.42     1.06   529.59     0.92     0.90
  HUB     18.10     1.20    14.85   553.83     1.06   523.29     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     45.08    28.41    24.20     4.21     0.93     0.44     2.90
  MEAN    45.57    16.89    12.70     4.19     0.94     0.39     3.51     0.90
  HUB     49.46    -5.71    -9.30     3.59     0.94     0.24     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     551.196     388.579     390.927    1129.275       0.488       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.226      15.482     529.930      24.000      44.827      35.400      -9.427

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     408.055     388.579     563.473    1141.430       0.357       0.424
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      18.157      16.620     541.398     528.796       0.034       0.547

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     379.239       0.000     379.239    1143.425       0.332       0.444

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      16.742     543.293       0.000       0.060       0.065       0.467

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.848      18.069       1.196     555.306      32.496     184.342       1.429

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 202314.734       0.606    1419.574 1197425.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =12.015   EfDer =  0.980

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   124.165    3210.000      18.069     555.306       1.000       1.000       0.980
W Kg/sec =   56.43852

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
   104.516    3102.395       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 95517.758   97427.906       1.940     590.487     304.380     474.134       1.558

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   362.29    -0.12   362.29     0.32   556.34
 MEAN    18.08     0.00    -0.02   362.29    -0.12   362.29     0.32
 HUB     15.21     0.00    -0.02   362.29    -0.12   362.29     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.82    46.36    11.46   575.66   680.28    16.86   544.35     0.59
 MEAN    54.43    42.30    12.13   506.42   622.77    16.86   544.35     0.54
 HUB     49.63    37.84    11.79   426.07   559.37    16.86   544.35     0.49

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   483.03   312.44   368.37  1165.51     0.41
 MEAN    18.01   487.00   312.24   373.73  1161.66     0.42
 HUB     15.22   521.83   357.86   379.80  1157.79     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   450.64   259.57     0.39  6382.63
 MEAN   504.50   420.29   192.27     0.36  5625.61     1.62
 HUB    426.43   385.94    68.57     0.33  5449.61

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.16     1.17    18.80   584.01     1.05   564.53     0.92     0.90
 MEAN    20.78     1.15    18.41   580.61     1.05   560.81     0.92     0.90
 HUB     20.69     1.14    17.99   579.82     1.04   557.08     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.30    35.17    31.50     3.67     0.93     0.42     2.90
 MEAN    39.88    27.22    23.50     3.72     0.94     0.40     3.30     0.90
 HUB     43.30    10.23     6.50     3.73     0.94     0.39     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     492.498     313.112     380.151    1162.088       0.424       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.851      18.425     561.227      46.000      39.477      30.600      -8.877

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     381.752     313.112     493.735    1170.428       0.326       0.374

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.806      19.326     569.312     511.151       0.028       0.446

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     377.650       0.000     377.650    1170.696       0.323       0.345

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.279     569.572       0.000       0.060       0.062       0.355

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.850      20.722       1.147     581.481      26.175     206.004       1.597

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 163033.812       0.498    1143.953 1078647.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =12.015   EfDer =  0.987

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    124.165    3210.000      20.722     581.481       1.000       1.000       0.980
W Kg/sec =   56.43852

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     93.259    3031.764       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  95517.758   97427.906       2.008     545.479     271.608     429.765       1.582

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   356.77    -0.12   356.77     0.30   530.98
 MEAN    17.74     0.00    -0.02   356.77    -0.12   356.77     0.30
 HUB     15.05     0.00    -0.02   356.77    -0.12   356.77     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.61    46.36    11.25   562.21   665.96    19.43   570.86     0.57
 MEAN    54.33    43.40    10.93   496.90   611.82    19.43   570.86     0.52
 HUB     49.77    38.84    10.93   421.59   552.38    19.43   570.86     0.47

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   470.08   297.60   363.89  1190.99      0.39
 MEAN    17.51   475.08   299.94   368.42  1187.66      0.40
 HUB     14.85   510.27   347.61   373.55  1184.32      0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   445.68   257.33     0.37  5897.88
 MEAN   490.40   414.74   190.47     0.35  5253.06     1.61
 HUB    415.99   379.75    68.37     0.32  5163.92

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     23.85     1.15    21.42   608.00     1.05   589.55     0.92     0.90
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 MEAN    23.50     1.13    21.04   605.10     1.04   586.26     0.92     0.90
 HUB     23.45     1.13    20.64   604.70     1.04   582.96     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.28    35.27    31.50     3.77     0.93     0.41     2.90
 MEAN    39.15    27.34    23.50     3.84     0.94     0.40     3.28     0.90
 HUB     42.94    10.37     6.50     3.87     0.94     0.39     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     479.683     301.906     372.758    1188.124       0.404       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.574      21.068     586.723      46.000      39.005      31.500      -7.505

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     379.785     301.906     485.164    1195.359       0.318       0.356

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.539      21.946     593.891     471.992       0.024       0.441

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     369.356       0.000     369.356    1196.016       0.309       0.346

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.955     594.543       0.000       0.060       0.055       0.359

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.860      23.458       1.132     605.932      24.451     206.721       1.602

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 152359.922       0.495    1069.058 1056881.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =12.015   EfDer =  0.991

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    124.165    3210.000      23.458     605.932       1.000       1.000       0.980
W Kg/sec =   56.43852

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     84.096    2969.965       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 95517.758   97427.906       2.096     513.330     244.932     401.059       1.637

     ROTOR LEADING EDGE CONDITIONS, STAGE           4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   347.54    -0.12   347.54     0.29   499.16
 MEAN    16.97     0.00    -0.02   347.54    -0.12   347.54     0.29
 HUB     14.32     0.00    -0.02   347.54    -0.12   347.54     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.22    46.36    10.86   539.52   641.87    22.12   595.85     0.54
 MEAN    53.84    43.80    10.04   475.39   588.98    22.12   595.85     0.49
 HUB     49.10    37.84    11.26   401.14   530.84    22.12   595.85     0.44

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   450.29   277.85   354.34  1213.96     0.37
 MEAN    16.57   454.02   278.81   358.33  1210.89     0.37
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 HUB     13.89   485.58   322.76   362.79  1207.81     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   434.25   251.03     0.36  5248.11
 MEAN   464.28   403.48   185.47     0.33  4622.99     1.60
 HUB    389.09   368.80    66.33     0.31  4484.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.48     1.13    24.08   629.52     1.04   612.59     0.92     0.91
 MEAN    26.10     1.11    23.69   626.71     1.03   609.50     0.92     0.91
 HUB     26.02     1.11    23.28   626.09     1.03   606.41     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.10    35.31    31.50     3.81     0.93     0.40     2.90
 MEAN    37.89    27.37    23.50     3.87     0.94     0.39     3.29     0.91
 HUB     41.66    10.36     6.50     3.86     0.94     0.38     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     449.509     280.378     351.350    1211.951       0.371       0.045

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.177      23.802     610.573      46.000      38.590      32.400      -6.190

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     363.823     280.378     459.324    1217.709       0.299       0.357

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.152      24.580     616.389     456.573       0.020       0.439

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     346.510       0.000     346.510    1218.722       0.284       0.337

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.652     617.416       0.000       0.060       0.049       0.385

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      26.077       1.112     627.436      21.504     217.853       1.689

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 134066.609       0.479     940.700 1067457.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =12.015   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    124.165    3210.000      26.077     627.436       1.000       1.000       0.980
W Kg/sec =   56.43852

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     76.981    2918.627       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95517.758   97427.906       2.273     509.668     224.220     390.276       1.741

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   323.85    -0.11   323.85     0.27   466.59
 MEAN    15.91     0.00    -0.02   323.85    -0.11   323.85     0.27
 HUB     13.07     0.00    -0.02   323.85    -0.11   323.85     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.75    47.36    10.39   513.19   606.93    24.83   618.69     0.50
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 MEAN    54.01    44.80     9.21   445.76   551.08    24.83   618.69     0.45
 HUB     48.51    38.84     9.67   366.12   488.89    24.83   618.69     0.40
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   425.11   266.14   331.49  1234.71     0.34
 MEAN    15.50   424.09   259.66   335.30  1231.49     0.34
 HUB     12.59   446.82   290.57   339.44  1228.27     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   407.16   236.41     0.33  4776.53
 MEAN   434.13   377.97   174.46     0.31  4025.93     1.61
 HUB    352.68   345.08    62.11     0.28  3659.69

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.02     1.11    26.74   648.89     1.03   633.81     0.92     0.91
 MEAN    28.54     1.09    26.29   645.52     1.03   630.51     0.92     0.91
 HUB     28.31     1.09    25.84   643.87     1.03   627.22     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.76    35.49    31.50     3.99     0.93     0.40     2.90
 MEAN    37.75    27.49    23.50     3.99     0.93     0.38     3.34     0.91
 HUB     40.56    10.37     6.50     3.87     0.93     0.37     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     429.229     264.424     338.109    1231.698       0.348       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.580      26.276     630.724      46.000      38.028      33.000      -5.028

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     354.200     264.424     442.016    1236.477       0.286       0.289

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.548      26.966     635.627     440.827       0.034       0.434

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     332.065       0.000     332.065    1237.709       0.268       0.365

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.129     636.895       0.000       0.060       0.045       0.359

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      28.522       1.094     646.093      18.658     233.003       1.806

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 116379.977       0.461     816.599 1105764.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    768155.12   5389.8848    121.2965      1.8880      0.8476     12.0155      1.2358
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 85% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =12.953   EfDer =  0.974

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     119.869    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   54.48574

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     117.100    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92212.828   94056.891       2.438     831.557     341.020     619.754       1.817

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   274.27    -0.09   274.27     0.25   575.61
  MEAN    17.06     0.00    -0.02   274.27    -0.09   274.27     0.25
  HUB     12.51     0.00    -0.02   274.27    -0.09   274.27     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.61    50.47    14.14   577.90   639.76    14.48   516.53     0.57
  MEAN    60.15    47.20    12.95   477.90   551.09    14.48   516.53     0.49
  HUB     51.96    38.62    13.34   350.44   445.08    14.48   516.53     0.40

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   525.65   382.90   360.14  1134.98     0.46
  MEAN    18.04   538.34   393.55   367.32  1129.95     0.48
  HUB     15.00   593.81   457.87   378.11  1123.24     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   409.54   195.00     0.36  7901.24
  MEAN   505.23   383.93   111.68     0.34  7099.73     1.64
  HUB    420.19   379.98    37.69     0.34  6869.28

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.55     1.23    16.01   558.37     1.07   535.29     0.92     0.89
  MEAN    18.18     1.20    15.56   554.76     1.06   530.55     0.92     0.89
  HUB     18.07     1.20    14.93   553.72     1.06   524.27     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     46.76    28.43    24.20     4.23     0.93     0.46     2.90
  MEAN    46.97    16.91    12.70     4.21     0.94     0.41     3.51     0.89
  HUB     50.45    -5.69    -9.30     3.61     0.94     0.26     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     543.861     392.788     376.168    1130.319       0.481       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.237      15.562     530.910      24.000      46.238      35.400     -10.838

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     392.172     392.788     555.051    1142.874       0.343       0.448
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.160      16.737     542.769     528.796       0.038       0.570

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     364.984       0.000     364.984    1144.682       0.319       0.459

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.831     544.489       0.000       0.060       0.073       0.482

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.838      18.062       1.196     555.615      32.805     179.630       1.392

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 204239.797       0.612    1383.497 1153266.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =12.953   EfDer =  0.973

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.869    3210.000      18.062     555.615       1.000       1.000       0.980
W Kg/sec =   54.48574

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.971    3101.531       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92212.828   94056.891       2.008     590.487     294.056     474.134       1.612

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   348.81    -0.12   348.81     0.30   556.19
 MEAN    18.08     0.00    -0.02   348.81    -0.12   348.81     0.30
 HUB     15.21     0.00    -0.02   348.81    -0.12   348.81     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.79    46.36    12.43   575.66   673.19    16.94   545.46     0.59
 MEAN    55.45    42.30    13.15   506.42   615.02    16.94   545.46     0.54
 HUB     50.70    37.84    12.86   426.07   550.73    16.94   545.46     0.48

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   479.06   322.01   354.69  1167.06     0.41
 MEAN    18.01   481.16   319.28   359.97  1163.05     0.41
 HUB     15.22   513.59   360.35   365.96  1159.03     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   433.94   250.00     0.37  6578.01
 MEAN   504.50   404.83   185.23     0.35  5752.34     1.67
 HUB    426.43   371.88    66.09     0.32  5487.39

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.23     1.18    18.90   585.20     1.05   566.04     0.92     0.89
 MEAN    20.81     1.15    18.49   581.49     1.05   562.16     0.92     0.89
 HUB     20.68     1.14    18.07   580.30     1.04   558.27     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.24    35.18    31.50     3.68     0.93     0.44     2.90
 MEAN    41.57    27.23    23.50     3.73     0.94     0.42     3.30     0.89
 HUB     44.56    10.24     6.50     3.74     0.94     0.41     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     486.393     320.173     366.151    1163.480       0.418       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.881      18.512     562.575      46.000      41.167      30.600     -10.567

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     367.216     320.173     487.195    1172.232       0.313       0.401

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.827      19.456     571.070     511.151       0.032       0.473

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     363.534       0.000     363.534    1172.462       0.310       0.364

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.393     571.294       0.000       0.060       0.072       0.375

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.838      20.732       1.148     582.330      26.715     199.066       1.543

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 166394.594       0.509    1127.138 1037072.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =12.953   EfDer =  0.981

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    119.869    3210.000      20.732     582.330       1.000       1.000       0.980
W Kg/sec =   54.48574

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     90.057    3029.554       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  92212.828   94056.891       2.080     545.479     262.283     429.765       1.639

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   343.60    -0.12   343.60     0.29   530.59
 MEAN    17.74     0.00    -0.02   343.60    -0.12   343.60     0.29
 HUB     15.05     0.00    -0.02   343.60    -0.12   343.60     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.57    46.36    12.21   562.21   658.99    19.53   572.47     0.56
 MEAN    55.34    43.40    11.94   496.90   604.22    19.53   572.47     0.51
 HUB     50.83    38.84    11.99   421.59   543.96    19.53   572.47     0.46

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   465.97   307.17   350.39  1193.02      0.39
 MEAN    17.51   469.23   306.97   354.89  1189.54      0.39
 HUB     14.85   502.17   350.13   359.97  1186.04      0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   429.13   247.76     0.36  6087.46
 MEAN   490.40   399.49   183.43     0.34  5376.16      1.65
 HUB    415.99   365.95    65.86     0.31  5201.22

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.95     1.16    21.55   609.70     1.05   591.57     0.92     0.90
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 MEAN    23.55     1.14    21.16   606.50     1.04   588.12     0.92     0.90
 HUB     23.46     1.13    20.73   605.71     1.04   584.66     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.24    35.26    31.50     3.76     0.93     0.43     2.90
 MEAN    40.86    27.33    23.50     3.83     0.94     0.42     3.28     0.90
 HUB     44.21    10.37     6.50     3.87     0.94     0.41     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     473.721     308.989     359.078    1189.988       0.398       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.627      21.180     588.571      46.000      40.712      31.500      -9.212

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     365.354     308.989     478.495    1197.637       0.305       0.384

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.584      22.108     596.162     471.992       0.027       0.468

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     355.592       0.000     355.592    1198.227       0.297       0.366

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.098     596.749       0.000       0.060       0.064       0.379

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.850      23.492       1.133     607.305      24.975     199.664       1.548

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 155628.344       0.505    1054.209 1015732.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =12.953   EfDer =  0.986

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    119.869    3210.000      23.492     607.305       1.000       1.000       0.980
W Kg/sec =   54.48574

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     81.161    2966.606       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92212.828   94056.891       2.172     513.330     236.386     401.059       1.697

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   334.74    -0.12   334.74     0.28   498.60
 MEAN    16.97     0.00    -0.02   334.74    -0.12   334.74     0.28
 HUB     14.32     0.00    -0.02   334.74    -0.12   334.74     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.19    46.36    11.83   539.52   635.03    22.25   597.95     0.53
 MEAN    54.86    43.80    11.06   475.39   581.52    22.25   597.95     0.48
 HUB     50.16    37.84    12.32   401.14   522.55    22.25   597.95     0.44

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   446.00   287.24   341.18  1216.41     0.37
 MEAN    16.57   448.05   285.69   345.15  1213.20     0.37
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 HUB     13.89   477.49   325.25   349.58  1209.97     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   418.08   241.63     0.34  5425.39
 MEAN   464.28   388.62   178.59     0.32  4736.92     1.64
 HUB    389.09   355.36    63.84     0.29  4519.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.60     1.13    24.24   631.68     1.04   615.09     0.92     0.90
 MEAN    26.19     1.11    23.83   628.59     1.04   611.84     0.92     0.90
 HUB     26.06     1.11    23.41   627.61     1.03   608.59     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.09    35.31    31.50     3.81     0.93     0.42     2.90
 MEAN    39.62    27.36    23.50     3.86     0.94     0.41     3.29     0.90
 HUB     42.94    10.35     6.50     3.85     0.94     0.40     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     443.989     287.295     338.509    1214.194       0.366       0.043

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.258      23.939     612.846      46.000      40.321      32.400      -7.921

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     350.063     287.295     452.860    1220.344       0.287       0.384

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.227      24.770     619.070     456.573       0.022       0.466

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     333.662       0.000     333.662    1221.266       0.273       0.358

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.819     620.006       0.000       0.060       0.057       0.405

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      26.142       1.113     629.296      21.992     210.236       1.630

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 137108.641       0.490     928.758 1025577.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =12.953   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.869    3210.000      26.142     629.296       1.000       1.000       0.980
W Kg/sec =   54.48574

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     74.243    2914.309       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92212.828   94056.891       2.357     509.668     216.247     390.276       1.805

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   311.97    -0.11   311.97     0.26   465.90
 MEAN    15.91     0.00    -0.02   311.97    -0.11   311.97     0.26
 HUB     13.07     0.00    -0.02   311.97    -0.11   311.97     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.71    47.36    11.35   513.19   600.67    24.98   621.18     0.49
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 MEAN    55.02    44.80    10.22   445.76   544.18    24.98   621.18     0.45
 HUB     49.57    38.84    10.73   366.12   481.10    24.98   621.18     0.39
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   421.34   274.99   319.22  1237.46     0.34
 MEAN    15.50   418.52   266.17   322.98  1234.12     0.34
 HUB     12.59   439.06   292.92   327.07  1230.77     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   392.03   227.55     0.32  4935.31
 MEAN   434.13   364.04   167.96     0.29  4126.67     1.66
 HUB    352.68   332.49    59.76     0.27  3689.22

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.17     1.12    26.92   651.46     1.04   636.65     0.92     0.91
 MEAN    28.66     1.10    26.47   647.83     1.03   633.22     0.92     0.91
 HUB     28.39     1.09    25.99   645.87     1.03   629.78     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.74    35.48    31.50     3.98     0.93     0.43     2.90
 MEAN    39.49    27.48    23.50     3.98     0.94     0.40     3.34     0.91
 HUB     41.85    10.35     6.50     3.85     0.94     0.38     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     423.727     271.049     325.695    1234.303       0.343       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.694      26.446     633.409      46.000      39.768      33.000      -6.768

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     340.821     271.049     435.461    1239.444       0.275       0.318

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.653      27.185     638.696     440.827       0.038       0.461

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     319.708       0.000     319.708    1240.572       0.258       0.387

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.329     639.860       0.000       0.060       0.052       0.381

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      28.622       1.095     648.386      19.090     224.790       1.743

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 119079.992       0.472     806.634 1062354.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    782451.38   5300.2358    117.0996      1.8946      0.8372     12.9533      1.2402
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 85% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.991   EfDer =  0.966

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     115.171    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   52.35062

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     112.511    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   88599.312   90371.109       2.538     831.557     327.656     619.754       1.891

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   262.87    -0.09   262.87     0.24   575.61
  MEAN    17.06     0.00    -0.02   262.87    -0.09   262.87     0.24
  HUB     12.51     0.00    -0.02   262.87    -0.09   262.87     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     65.54    50.47    15.07   577.90   634.96    14.53   517.04     0.57
  MEAN    61.19    47.20    13.99   477.90   545.50    14.53   517.04     0.49
  HUB     53.13    38.62    14.51   350.44   438.14    14.53   517.04     0.39

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   521.31   390.88   344.94  1136.16     0.46
  MEAN    18.04   531.27   398.03   351.87  1131.00     0.47
  HUB     15.00   582.30   456.08   362.02  1124.32     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   392.38   187.02     0.35  8065.68
  MEAN   505.23   367.84   107.20     0.33  7180.46     1.69
  HUB    420.19   363.80    35.89     0.32  6842.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.60     1.23    16.09   559.11     1.07   536.41     0.92     0.88
  MEAN    18.19     1.20    15.63   555.12     1.06   531.55     0.92     0.88
  HUB     18.03     1.19    15.02   553.60     1.06   525.28     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     48.57    28.47    24.20     4.27     0.93     0.49     2.90
  MEAN    48.52    16.94    12.70     4.24     0.95     0.43     3.51     0.88
  HUB     51.56    -5.66    -9.30     3.64     0.95     0.29     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     536.314     397.259     360.303    1131.392       0.474       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.245      15.640     531.918      24.000      47.793      35.400     -12.393

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     375.173     397.259     546.415    1144.364       0.328       0.473
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.158      16.854     544.186     528.796       0.042       0.595

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     349.682       0.000     349.682    1145.986       0.305       0.475

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.918     545.729       0.000       0.060       0.083       0.497

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.826      18.048       1.195     555.942      33.132     174.554       1.353

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 206278.094       0.618    1342.548 1105350.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.991   EfDer =  0.964

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.171    3210.000      18.048     555.942       1.000       1.000       0.980
W Kg/sec =   52.35062

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.116    3100.618       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88599.312   90371.109       2.088     590.487     282.829     474.134       1.676

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   334.32    -0.12   334.32     0.29   556.03
 MEAN    18.08     0.00    -0.02   334.32    -0.12   334.32     0.29
 HUB     15.21     0.00    -0.02   334.32    -0.12   334.32     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.86    46.36    13.50   575.66   665.80    17.01   546.61     0.58
 MEAN    56.57    42.30    14.27   506.42   606.91    17.01   546.61     0.53
 HUB     51.89    37.84    14.05   426.07   541.67    17.01   546.61     0.47

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   475.39   332.16   340.10  1168.66     0.41
 MEAN    18.01   475.34   326.72   345.26  1164.49     0.41
 HUB     15.22   504.97   362.93   351.11  1160.31     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   416.17   239.86     0.36  6785.03
 MEAN   504.50   388.34   177.78     0.33  5886.31     1.72
 HUB    426.43   356.81    63.51     0.31  5526.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.29     1.18    18.99   586.46     1.05   567.59     0.92     0.88
 MEAN    20.83     1.15    18.57   582.42     1.05   563.55     0.92     0.88
 HUB     20.66     1.14    18.13   580.80     1.04   559.51     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.32    35.19    31.50     3.69     0.93     0.46     2.90
 MEAN    43.42    27.25    23.50     3.75     0.95     0.44     3.30     0.88
 HUB     45.95    10.25     6.50     3.75     0.95     0.43     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.964

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     480.287     327.638     351.182    1164.915       0.412       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.902      18.591     563.965      46.000      43.014      30.600     -12.414

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     351.731     327.638     480.688    1174.103       0.300       0.429

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.839      19.579     572.897     511.151       0.037       0.503

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     348.493       0.000     348.493    1174.297       0.297       0.384

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.498     573.086       0.000       0.060       0.083       0.395

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.825      20.729       1.149     583.227      27.285     191.826       1.487

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 169945.438       0.519    1106.079  992227.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.991   EfDer =  0.973

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    115.171    3210.000      20.729     583.227       1.000       1.000       0.980
W Kg/sec =   52.35062

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     86.607    3027.222       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  88599.312   90371.109       2.163     545.479     252.235     429.765       1.704

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   329.53    -0.11   329.53     0.28   530.18
 MEAN    17.74     0.00    -0.02   329.53    -0.11   329.53     0.28
 HUB     15.05     0.00    -0.02   329.53    -0.11   329.53     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.63    46.36    13.27   562.21   651.77    19.63   574.16     0.55
 MEAN    56.45    43.40    13.05   496.90   596.33    19.63   574.16     0.51
 HUB     51.99    38.84    13.15   421.59   535.19    19.63   574.16     0.46

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   462.16   317.22   336.10  1195.12     0.39
 MEAN    17.51   463.43   314.35   340.52  1191.48     0.39
 HUB     14.85   493.78   352.75   345.52  1187.82     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   411.66   237.71     0.34  6286.38
 MEAN   490.40   383.34   176.06     0.32  5505.14     1.71
 HUB    415.99   351.26    63.24     0.30  5240.06

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     24.02     1.16    21.66   611.49     1.05   593.66     0.92     0.89
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 MEAN    23.59     1.14    21.25   607.98     1.04   590.05     0.92     0.89
 HUB     23.45     1.13    20.82   606.79     1.04   586.43     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.34    35.27    31.50     3.77     0.93     0.45     2.90
 MEAN    42.71    27.34    23.50     3.84     0.94     0.44     3.28     0.89
 HUB     45.59    10.37     6.50     3.87     0.94     0.43     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     467.795     316.409     344.554    1191.913       0.392       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.664      21.277     590.484      46.000      42.562      31.500     -11.062

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     350.097     316.409     471.892    1199.996       0.292       0.413

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.611      22.255     598.520     471.992       0.031       0.498

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     341.040       0.000     341.040    1200.520       0.284       0.387

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.223     599.043       0.000       0.060       0.075       0.400

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.838      23.505       1.134     608.751      25.524     192.369       1.491

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 159053.047       0.516    1035.187  971417.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =13.991   EfDer =  0.979

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    115.171    3210.000      23.505     608.751       1.000       1.000       0.980
W Kg/sec =   52.35062

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     78.029    2963.078       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  88599.312   90371.109       2.259     513.330     227.266     401.059       1.765

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   321.19    -0.11   321.19     0.27   498.01
 MEAN    16.97     0.00    -0.02   321.19    -0.11   321.19     0.27
 HUB     14.32     0.00    -0.02   321.19    -0.11   321.19     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.24    46.36    12.88   539.52   627.98    22.37   600.14     0.52
 MEAN    55.96    43.80    12.16   475.39   573.82    22.37   600.14     0.48
 HUB     51.32    37.84    13.48   401.14   513.97    22.37   600.14     0.43

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   442.03   297.04   327.36  1218.94     0.36
 MEAN    16.57   442.18   292.90   331.26  1215.58     0.36
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 HUB     13.89   469.16   327.82   335.63  1212.21     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   401.14   231.84     0.33  5610.22
 MEAN   464.28   372.97   171.37     0.31  4856.39     1.69
 HUB    389.09   341.18    61.27     0.28  4555.03

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.69     1.14    24.37   633.96     1.04   617.66     0.92     0.90
 MEAN    26.25     1.12    23.95   630.57     1.04   614.26     0.92     0.90
 HUB     26.07     1.11    23.51   629.22     1.03   610.85     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.22    35.31    31.50     3.81     0.93     0.44     2.90
 MEAN    41.48    27.35    23.50     3.85     0.94     0.43     3.29     0.90
 HUB     44.33    10.35     6.50     3.85     0.94     0.42     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     438.595     294.549     324.971    1216.511       0.361       0.041

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.314      24.051     615.200      46.000      42.189      32.400      -9.789

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     335.615     294.549     446.538    1223.072       0.274       0.414

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.276      24.935     621.853     456.573       0.026       0.496

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     320.171       0.000     320.171    1223.902       0.262       0.380

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.959     622.698       0.000       0.060       0.067       0.424

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.847      26.177       1.114     631.252      22.500     202.431       1.569

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 140282.828       0.502     913.022  980534.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.991   EfDer =  0.985

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.171    3210.000      26.177     631.252       1.000       1.000       0.980
W Kg/sec =   52.35062

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     71.349    2909.792       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88599.312   90371.109       2.452     509.668     207.819     390.276       1.878

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   299.48    -0.10   299.48     0.24   465.18
 MEAN    15.91     0.00    -0.02   299.48    -0.10   299.48     0.24
 HUB     13.07     0.00    -0.02   299.48    -0.10   299.48     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.74    47.36    12.38   513.19   594.27    25.11   623.77     0.49
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 MEAN    56.11    44.80    11.31   445.76   537.11    25.11   623.77     0.44
 HUB     50.73    38.84    11.89   366.12   473.09    25.11   623.77     0.39
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   417.90   284.17   306.41  1240.29     0.34
 MEAN    15.50   413.08   272.91   310.09  1236.83     0.33
 HUB     12.59   431.14   295.34   314.09  1233.35     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   376.27   218.38     0.30  5099.84
 MEAN   434.13   349.50   161.22     0.28  4231.03     1.71
 HUB    352.68   319.28    57.34     0.26  3719.67

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.29     1.12    27.07   654.16     1.04   639.59     0.92     0.90
 MEAN    28.74     1.10    26.60   650.25     1.03   636.02     0.92     0.90
 HUB     28.42     1.09    26.12   647.96     1.03   632.45     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.84    35.48    31.50     3.98     0.93     0.45     2.90
 MEAN    41.35    27.47    23.50     3.97     0.94     0.42     3.34     0.90
 HUB     43.24    10.35     6.50     3.85     0.94     0.40     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     418.352     277.910     312.705    1236.993       0.338       -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.773      26.581     636.190      46.000      41.628      33.000      -8.628

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     326.887     277.910     429.056    1242.508       0.263       0.347

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.719      27.369     641.876     440.827       0.044       0.491

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     306.829       0.000     306.829    1243.534       0.247       0.410

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.492     642.936       0.000       0.060       0.061       0.403

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      28.682       1.096     650.789      19.537     216.445       1.678

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 121875.367       0.483     793.218 1015677.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    797434.75   5190.0552    112.5109      1.8986      0.8244     13.9913      1.2448
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 85% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =15.004   EfDer =  0.958

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     110.644    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   50.29289

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     108.088    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   85116.758   86818.906       2.642     831.557     314.777     619.754       1.969

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   251.97    -0.09   251.97     0.23   575.61
  MEAN    17.06     0.00    -0.02   251.97    -0.09   251.97     0.23
  HUB     12.51     0.00    -0.02   251.97    -0.09   251.97     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     66.45    50.47    15.98   577.90   630.52    14.58   517.51     0.57
  MEAN    62.20    47.20    15.00   477.90   540.33    14.58   517.51     0.48
  HUB     54.29    38.62    15.67   350.44   431.69    14.58   517.51     0.39

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   517.64   398.35   330.55  1137.23     0.46
  MEAN    18.04   524.87   402.22   337.21  1131.96     0.46
  HUB     15.00   571.52   454.31   346.75  1125.30     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   376.17   179.55     0.33  8219.77
  MEAN   505.23   352.59   103.01     0.31  7255.95     1.76
  HUB    420.19   348.43    34.13     0.31  6815.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.64     1.23    16.16   559.80     1.07   537.42     0.92     0.88
  MEAN    18.19     1.20    15.70   555.46     1.06   532.45     0.92     0.88
  HUB     18.00     1.19    15.09   553.48     1.06   526.20     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     50.31    28.51    24.20     4.31     0.93     0.51     2.90
  MEAN    50.02    16.99    12.70     4.29     0.95     0.46     3.51     0.88
  HUB     52.65    -5.62    -9.30     3.68     0.95     0.31     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.958

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     529.487     401.440     345.257    1132.362       0.468       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.249      15.707     532.831      24.000      49.303      35.400     -13.903

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     359.110     401.440     538.622    1145.720       0.313       0.497
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      18.153      16.956     545.476     528.796       0.047       0.620

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     335.173       0.000     335.173    1147.176       0.292       0.489

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      16.992     546.864       0.000       0.060       0.093       0.511

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.814      18.030       1.194     556.247      33.437     169.728       1.316

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 208174.281       0.623    1301.633 1059510.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =15.004   EfDer =  0.955

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   110.644    3210.000      18.030     556.247       1.000       1.000       0.980
W Kg/sec =   50.29289

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    93.415    3099.769       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 85116.758   86818.906       2.170     590.487     272.053     474.134       1.743

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   320.56    -0.11   320.56     0.28   555.87
 MEAN    18.08     0.00    -0.02   320.56    -0.11   320.56     0.28
 HUB     15.21     0.00    -0.02   320.56    -0.11   320.56     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.89    46.36    14.53   575.66   658.99    17.08   547.67     0.57
 MEAN    57.67    42.30    15.37   506.42   599.44    17.08   547.67     0.52
 HUB     53.05    37.84    15.21   426.07   533.28    17.08   547.67     0.46

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   472.46   341.63   326.35  1170.10     0.40
 MEAN    18.01   470.25   333.68   331.35  1165.80     0.40
 HUB     15.22   497.04   365.31   337.04  1161.48     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   399.48   230.38     0.34  6978.39
 MEAN   504.50   372.79   170.82     0.32  6011.60     1.77
 HUB    426.43   342.54    61.12     0.29  5562.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.33     1.18    19.06   587.64     1.06   569.00     0.92     0.87
 MEAN    20.85     1.16    18.63   583.29     1.05   564.82     0.92     0.87
 HUB     20.63     1.14    18.18   581.27     1.04   560.64     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.31    35.22    31.50     3.72     0.93     0.48     2.90
 MEAN    45.20    27.27    23.50     3.77     0.95     0.46     3.30     0.87
 HUB     47.30    10.28     6.50     3.78     0.95     0.45     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.955

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     474.937     334.619     337.040    1166.216       0.407       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.911      18.651     565.229      46.000      44.794      30.600     -14.194

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     337.146     334.619     475.012    1175.816       0.287       0.457

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.838      19.681     574.573     511.151       0.042       0.532

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     334.312       0.000     334.312    1175.978       0.284       0.403

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.582     574.731       0.000       0.060       0.095       0.414

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.811      20.714       1.149     584.064      27.817     185.137       1.435

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 173258.922       0.530    1083.321  949564.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =15.004   EfDer =  0.965

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    110.644    3210.000      20.714     584.064       1.000       1.000       0.980
W Kg/sec =   50.29289

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     83.320    3025.053       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  85116.758   86818.906       2.248     545.479     242.663     429.765       1.771

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   316.26    -0.11   316.26     0.27   529.80
 MEAN    17.74     0.00    -0.02   316.26    -0.11   316.26     0.27
 HUB     15.05     0.00    -0.02   316.26    -0.11   316.26     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.65    46.36    14.29   562.21   645.15    19.70   575.71     0.55
 MEAN    57.53    43.40    14.13   496.90   589.10    19.70   575.72     0.50
 HUB     53.13    38.84    14.29   421.59   527.11    19.70   575.71     0.45

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   459.09   326.54   322.69  1197.02      0.38
 MEAN    17.51   458.39   321.23   327.01  1193.25      0.38
 HUB     14.85   486.11   355.17   331.90  1189.46      0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   395.33   228.38     0.33  6471.04
 MEAN   490.40   368.18   169.18     0.31  5625.50      1.76
 HUB    415.99   337.42    60.82     0.28  5275.88

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     24.07     1.16    21.75   613.16     1.05   595.56     0.92     0.88
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 MEAN    23.61     1.14    21.33   609.36     1.04   591.82     0.92     0.88
 HUB     23.43     1.13    20.88   607.78     1.04   588.06     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.34    35.29    31.50     3.79     0.93     0.47     2.90
 MEAN    44.49    27.35    23.50     3.85     0.95     0.46     3.28     0.88
 HUB     46.94    10.38     6.50     3.88     0.95     0.45     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.965

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     462.646     323.334     330.902    1193.669       0.388       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.680      21.347     592.232      46.000      44.337      31.500     -12.837

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     335.804     323.334     466.164    1202.158       0.279       0.442

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.618      22.371     600.686     471.992       0.036       0.527

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     327.396       0.000     327.396    1202.624       0.272       0.407

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.317     601.151       0.000       0.060       0.086       0.419

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.825      23.498       1.134     610.099      26.035     185.674       1.439

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 162235.703       0.527    1014.397  929309.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =15.004   EfDer =  0.972

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    110.644    3210.000       23.498     610.099       1.000       1.000       0.980
W Kg/sec =   50.29289

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     75.068    2959.805        1.401       0.249      53.349      56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  85116.758   86818.906        2.348     513.330     218.642     401.059       1.834

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   308.46    -0.11   308.46      0.26   497.46
 MEAN    16.97      0.00    -0.02   308.46    -0.11   308.46      0.26
 HUB     14.32      0.00    -0.02   308.46    -0.11   308.46      0.26

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     60.25    46.36    13.89   539.52   621.57     22.45   602.16      0.52
 MEAN    57.03    43.80    13.23   475.39   566.79     22.45   602.16      0.47
 HUB     52.45    37.84    14.61   401.14   506.11     22.45   602.16      0.42

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2      Ao2          Mach2
 TIP     18.88   438.84    306.09   314.46  1221.24      0.36
 MEAN    16.57   437.07    299.55   318.28  1217.76      0.36
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 HUB     13.89   461.56   330.15   322.55  1214.26     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   385.38   222.78     0.32  5781.11
 MEAN   464.28   358.38   164.73     0.29  4966.43     1.74
 HUB    389.09   327.89    58.95     0.27  4587.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.75     1.14    24.47   636.08     1.04   620.01     0.92     0.89
 MEAN    26.28     1.12    24.04   632.42     1.04   616.48     0.92     0.89
 HUB     26.06     1.11    23.58   630.71     1.03   612.94     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.23    35.32    31.50     3.82     0.93     0.46     2.90
 MEAN    43.26    27.36    23.50     3.86     0.94     0.45     3.29     0.89
 HUB     45.67    10.36     6.50     3.86     0.94     0.43     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.972

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     433.905     301.230     312.305    1218.631       0.356       0.039

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.339      24.127     617.358      46.000      43.966      32.400     -11.566

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     322.148     301.230     441.043    1225.570       0.263       0.441

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.293      25.059     624.408     456.573       0.030       0.525

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     307.588       0.000     307.588    1226.321       0.251       0.399

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.059     625.173       0.000       0.060       0.078       0.441

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.835      26.181       1.114     633.068      22.969     195.333       1.514

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 143207.484       0.512     895.421  937777.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =15.004   EfDer =  0.978

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    110.644    3210.000      26.181     633.068       1.000       1.000       0.980
W Kg/sec =   50.29289

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     68.633    2905.615       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85116.758   86818.906       2.549     509.668     199.911     390.276       1.952

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   287.82    -0.10   287.82     0.23   464.51
 MEAN    15.91     0.00    -0.02   287.82    -0.10   287.82     0.23
 HUB     13.07     0.00    -0.02   287.82    -0.10   287.82     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.72    47.36    13.36   513.19   588.48    25.20   626.16     0.48
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MEAN    57.16    44.80    12.36   445.76   530.69    25.20   626.16     0.43
HUB     51.84    38.84    13.00   366.12   465.79    25.20   626.16     0.38
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   415.16   292.61   294.52  1242.88     0.33
MEAN    15.50   408.38   279.13   298.10  1239.31     0.33
HUB     12.59   423.95   297.55   302.00  1235.73     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    502.54   361.68   209.94     0.29  5251.24
MEAN   434.13   335.98   154.99     0.27  4327.46     1.76
HUB    352.68   306.99    55.13     0.25  3747.39

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     29.36     1.12    27.17   656.65     1.04   642.27     0.92     0.89
MEAN    28.78     1.10    26.69   652.50     1.03   638.59     0.92     0.89
HUB     28.42     1.09    26.20   649.90     1.03   634.91     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.81    35.48    31.50     3.98     0.93     0.47     2.90
MEAN    43.12    27.47    23.50     3.97     0.94     0.44     3.34     0.89
HUB     44.57    10.35     6.50     3.85     0.94     0.42     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.978

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     413.730     284.251     300.622    1239.452       0.334      -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.810      26.669     638.740      46.000      43.397      33.000     -10.397

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     313.975     284.251     423.531    1245.313       0.252       0.375

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      28.743      27.499     644.795     440.827       0.051       0.519

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     294.884       0.000     294.884    1246.248       0.237       0.431

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      27.602     645.764       0.000       0.060       0.071       0.422

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.846      28.700       1.096     653.017      19.949     208.888       1.619

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 124448.477       0.493     778.128  971373.812

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    811324.88   5072.9004    108.0884      1.8997      0.8111     15.0041      1.2491
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 85% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =15.988   EfDer =  0.950

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     106.295    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   48.31603

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     103.840    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   81771.078   83406.328       2.750     831.557     302.404     619.754       2.049

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   241.57    -0.08   241.57     0.22   575.61
  MEAN    17.06     0.00    -0.02   241.57    -0.08   241.57     0.22
  HUB     12.51     0.00    -0.02   241.57    -0.08   241.57     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     67.32    50.47    16.85   577.90   626.43    14.62   517.94     0.56
  MEAN    63.19    47.20    15.99   477.90   535.56    14.62   517.94     0.48
  HUB     55.43    38.62    16.81   350.44   425.70    14.62   517.94     0.38

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   514.54   405.33   316.95  1138.20     0.45
  MEAN    18.04   519.09   406.10   323.32  1132.83     0.46
  HUB     15.00   561.48   452.60   332.29  1126.19     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   360.88   172.57     0.32  8363.64
  MEAN   505.23   338.17    99.13     0.30  7325.90     1.82
  HUB    420.19   333.86    32.41     0.30  6789.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.67     1.24    16.22   560.45     1.07   538.33     0.92     0.87
  MEAN    18.20     1.20    15.75   555.78     1.06   533.27     0.92     0.87
  HUB     17.96     1.19    15.15   553.36     1.06   527.03     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     51.98    28.57    24.20     4.37     0.93     0.54     2.90
  MEAN    51.48    17.05    12.70     4.35     0.95     0.48     3.51     0.87
  HUB     53.71    -5.57    -9.30     3.73     0.95     0.34     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.950

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     523.304     405.314     331.011    1133.239       0.462       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.248      15.763     533.656      24.000      50.762      35.400     -15.362

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     343.944     405.314     531.580    1146.950       0.300       0.521
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.143      17.044     546.648     528.796       0.051       0.644

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     321.426       0.000     321.426    1148.262       0.280       0.503

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.054     547.900       0.000       0.060       0.103       0.525

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.801      18.009       1.192     556.529      33.719     165.144       1.280

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 209929.859       0.629    1261.016 1015769.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =15.988   EfDer =  0.946

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    106.295    3210.000      18.009     556.529       1.000       1.000       0.980
W Kg/sec =   48.31603

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.870    3098.984       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  81771.078   83406.328       2.256     590.487     261.730     474.134       1.812

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   307.51    -0.11   307.51     0.27   555.73
 MEAN    18.08     0.00    -0.02   307.51    -0.11   307.51     0.27
 HUB     15.21     0.00    -0.02   307.51    -0.11   307.51     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.89    46.36    15.53   575.66   652.74    17.13   548.63     0.57
 MEAN    58.74    42.30    16.44   506.42   592.56    17.13   548.63     0.52
 HUB     54.19    37.84    16.35   426.07   525.54    17.13   548.63     0.46

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   470.14   350.45   313.40  1171.40     0.40
 MEAN    18.01   465.81   340.17   318.22  1166.99     0.40
 HUB     15.22   489.73   367.48   323.72  1162.54     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   383.81   221.57     0.33  7158.28
 MEAN   504.50   358.15   164.34     0.31  6128.28     1.83
 HUB    426.43   329.05    58.96     0.28  5595.75

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.36     1.19    19.11   588.73     1.06   570.27     0.92     0.87
 MEAN    20.85     1.16    18.68   584.09     1.05   565.98     0.92     0.87
 HUB     20.59     1.14    18.22   581.70     1.05   561.67     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.19    35.26    31.50     3.76     0.93     0.50     2.90
 MEAN    46.91    27.31    23.50     3.81     0.95     0.48     3.30     0.87
 HUB     48.62    10.32     6.50     3.82     0.95     0.46     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.946

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     470.253     341.120     323.689    1167.395       0.403       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.909      18.695     566.375      46.000      46.502      30.600     -15.902

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     323.410     341.120     470.061    1177.381       0.275       0.483

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.828      19.763     576.106     511.151       0.046       0.560

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     320.934       0.000     320.934    1177.517       0.273       0.421

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.648     576.240       0.000       0.060       0.107       0.433

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.798      20.691       1.149     584.840      28.311     178.951       1.387

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 176336.609       0.539    1059.226  909051.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =15.988   EfDer =  0.957

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    106.295    3210.000      20.691     584.840       1.000       1.000       0.980
W Kg/sec =   48.31603

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     80.190    3023.045       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  81771.078   83406.328       2.336     545.479     233.548     429.765       1.840

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   303.71    -0.10   303.71     0.26   529.45
 MEAN    17.74     0.00    -0.02   303.71    -0.10   303.71     0.26
 HUB     15.05     0.00    -0.02   303.71    -0.10   303.71     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.63    46.36    15.27   562.21   639.09    19.76   577.14     0.54
 MEAN    58.57    43.40    15.17   496.90   582.46    19.76   577.14     0.49
 HUB     54.24    38.84    15.40   421.59   519.68    19.76   577.14     0.44

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   456.67   335.24   310.10  1198.76      0.38
 MEAN    17.51   453.99   327.61   314.29  1194.87      0.38
 HUB     14.85   479.05   357.35   319.04  1190.96      0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   380.04   219.69     0.32  6643.21
 MEAN   490.40   353.95   162.80     0.30  5737.14      1.81
 HUB    415.99   324.39    58.64     0.27  5308.19

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.10     1.16    21.80   614.71     1.05   597.30     0.92     0.88
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 MEAN    23.62     1.14    21.37   610.63     1.04   593.43     0.92     0.88
 HUB     23.39     1.13    20.92   608.70     1.04   589.55     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.23    35.31    31.50     3.81     0.93     0.50     2.90
 MEAN    46.19    27.38    23.50     3.88     0.95     0.48     3.28     0.88
 HUB     48.24    10.41     6.50     3.91     0.95     0.46     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.957

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     458.145     329.757     318.053    1195.270       0.383       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.679      21.394     593.828      46.000      46.035      31.500     -14.535

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     322.391     329.757     461.168    1204.138       0.268       0.468

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.609      22.460     602.673     471.992       0.040       0.555

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     314.573       0.000     314.573    1204.553       0.261       0.425

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.386     603.088       0.000       0.060       0.097       0.437

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.813      23.474       1.135     611.348      26.508     179.510       1.392

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 165188.062       0.536     992.258  889366.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =15.988   EfDer =  0.964

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    106.295    3210.000      23.474     611.348       1.000       1.000       0.980
W Kg/sec =   48.31603

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     72.264    2956.779       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
  81771.078   83406.328       2.439     513.330     210.478     401.059       1.905

     ROTOR LEADING EDGE CONDITIONS, STAGE           4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   296.48    -0.10   296.48     0.25   496.95
 MEAN    16.97     0.00    -0.02   296.48    -0.10   296.48     0.25
 HUB     14.32     0.00    -0.02   296.48    -0.10   296.48     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.21    46.36    14.85   539.52   615.71    22.51   604.01     0.51
 MEAN    58.06    43.80    14.26   475.39   560.36    22.51   604.01     0.46
 HUB     53.54    37.84    15.70   401.14   498.90    22.51   604.01     0.41

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   436.29   314.51   302.39  1223.35     0.36
 MEAN    16.57   432.64   305.74   306.10  1219.76     0.35
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 HUB     13.89   454.62   332.29   310.26  1216.14     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   370.66   214.37     0.30  5939.88
 MEAN   464.28   344.72   158.54     0.28  5069.03     1.79
 HUB    389.09   315.42    56.80     0.26  4617.01

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.79     1.14    24.53   638.04     1.04   622.16     0.92     0.88
 MEAN    26.28     1.12    24.09   634.13     1.04   618.51     0.92     0.88
 HUB     26.02     1.11    23.63   632.09     1.03   614.85     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.13    35.33    31.50     3.83     0.93     0.49     2.90
 MEAN    44.97    27.38    23.50     3.88     0.95     0.47     3.29     0.88
 HUB     46.96    10.37     6.50     3.87     0.95     0.45     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.964

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     429.864     307.460     300.419    1220.570       0.352       0.037

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.340      24.173     619.335      46.000      45.664      32.400     -13.264

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     309.546     307.460     436.292    1227.863       0.252       0.468

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.286      25.148     626.758     456.573       0.034       0.553

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     295.799       0.000     295.799    1228.542       0.241       0.417

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.124     627.452       0.000       0.060       0.089       0.457

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.823      26.160       1.114     634.753      23.405     188.822       1.464

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 145926.047       0.522     876.555  897248.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =15.988   EfDer =  0.971

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    106.295    3210.000      26.160     634.753       1.000       1.000       0.980
W Kg/sec =   48.31603

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     66.076    2901.755       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  81771.078   83406.328       2.648     509.668     192.465     390.276       2.028

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   276.88    -0.10   276.88     0.23   463.90
 MEAN    15.91     0.00    -0.02   276.88    -0.10   276.88     0.23
 HUB     13.07     0.00    -0.02   276.88    -0.10   276.88     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.66    47.36    14.30   513.19   583.20    25.25   628.36     0.47
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MEAN    58.16    44.80    13.36   445.76   524.83    25.25   628.36     0.43
HUB     52.91    38.84    14.07   366.12   459.11    25.25   628.36     0.37
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   413.02   300.44   283.41  1245.24     0.33
MEAN    15.50   404.31   284.89   286.88  1241.58     0.33
HUB     12.59   417.38   299.54   290.66  1237.91     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    502.54   348.09   202.10     0.28  5391.67
MEAN   434.13   323.37   149.23     0.26  4416.67     1.81
HUB    352.68   295.48    53.14     0.24  3772.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     29.39     1.12    27.23   658.97     1.04   644.74     0.92     0.89
MEAN    28.79     1.10    26.75   654.59     1.03   640.95     0.92     0.89
HUB     28.39     1.09    26.24   651.69     1.03   637.17     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.67    35.49    31.50     3.99     0.93     0.49     2.90
MEAN    44.80    27.48    23.50     3.98     0.94     0.46     3.34     0.89
HUB     45.86    10.36     6.50     3.86     0.94     0.44     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.971

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     409.726     290.116     289.323    1241.706       0.330       -0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.813      26.719     641.082      46.000      45.078      33.000     -12.078

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     301.935     290.116     418.727    1247.886       0.242       0.400

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      28.734      27.586     647.480     440.827       0.057       0.547

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     283.735       0.000     283.735    1248.742       0.227       0.449

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      27.670     648.369       0.000       0.060       0.081       0.440

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.834      28.684       1.096     655.083      20.330     201.991       1.566

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 126827.094       0.502     761.830  929376.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    824207.62   4950.8848    103.8398      1.8987      0.7977     15.9884      1.2530
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 85% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =16.953   EfDer =  0.941

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     102.079    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   46.39946

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      99.721    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   78527.438   80097.820       2.863     831.557     290.409     619.754       2.134

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   231.54    -0.08   231.54     0.21   575.61
  MEAN    17.06     0.00    -0.02   231.54    -0.08   231.54     0.21
  HUB     12.51     0.00    -0.02   231.54    -0.08   231.54     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.17    50.47    17.70   577.90   622.63    14.66   518.33     0.56
  MEAN    64.15    47.20    16.95   477.90   531.11    14.66   518.33     0.48
  HUB     56.55    38.62    17.93   350.44   420.09    14.66   518.33     0.38

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   511.92   411.92   303.96  1139.08     0.45
  MEAN    18.04   513.82   409.74   310.03  1133.63     0.45
  HUB     15.00   551.98   450.86   318.45  1127.01     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   346.32   165.98     0.30  8499.45
  MEAN   505.23   324.40    95.49     0.29  7391.52     1.89
  HUB    420.19   319.92    30.67     0.28  6763.94

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.69     1.24    16.27   561.06     1.07   539.17     0.92     0.86
  MEAN    18.19     1.20    15.80   556.07     1.06   534.02     0.92     0.86
  HUB     17.92     1.19    15.20   553.25     1.06   527.80     0.92     0.86

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     53.58    28.64    24.20     4.44     0.93     0.56     2.90
  MEAN    52.89    17.12    12.70     4.42     0.95     0.50     3.51     0.86
  HUB     54.77    -5.50    -9.30     3.80     0.95     0.36     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.941

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     517.661     408.948     317.387    1134.039       0.456       0.004

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      18.242      15.810     534.410      24.000      52.185      35.400     -16.785

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     329.473     408.948     525.158    1148.080       0.287       0.543
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.130      17.121     547.725     528.796       0.055       0.668

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     308.259       0.000     308.259    1149.263       0.268       0.517

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.107     548.855       0.000       0.060       0.112       0.538

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.789      17.985       1.191     556.792      33.982     160.742       1.246

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 211567.656       0.633    1220.442  973623.812


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =16.953   EfDer =  0.935

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    102.079    3210.000      17.985     556.792       1.000       1.000       0.980
W Kg/sec =   46.39946

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.441    3098.251       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  78527.438   80097.820       2.346     590.487     251.743     474.134       1.883

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   295.00    -0.10   295.00     0.26   555.60
 MEAN    18.08     0.00    -0.02   295.00    -0.10   295.00     0.26
 HUB     15.21     0.00    -0.02   295.00    -0.10   295.00     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.87    46.36    16.51   575.66   646.94    17.18   549.53     0.56
 MEAN    59.78    42.30    17.48   506.42   586.16    17.18   549.53     0.51
 HUB     55.31    37.84    17.47   426.07   518.31    17.18   549.53     0.45

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   468.34   358.74   301.08  1172.60     0.40
 MEAN    18.01   461.91   346.29   305.70  1168.08     0.40
 HUB     15.22   482.95   369.50   310.99  1163.52     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   368.96   213.28     0.31  7327.56
 MEAN   504.50   344.21   158.22     0.29  6238.44     1.89
 HUB    426.43   316.15    56.94     0.27  5626.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.37     1.19    19.14   589.75     1.06   571.44     0.92     0.86
 MEAN    20.84     1.16    18.71   584.85     1.05   567.04     0.92     0.86
 HUB     20.55     1.14    18.25   582.10     1.05   562.62     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.99    35.31    31.50     3.81     0.93     0.53     2.90
 MEAN    48.56    27.36    23.50     3.86     0.95     0.50     3.30     0.86
 HUB     49.91    10.37     6.50     3.87     0.95     0.48     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.935

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     466.136     347.259     310.957    1168.474       0.399       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.896      18.723     567.425      46.000      48.157      30.600     -17.557

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     310.332     347.259     465.719    1178.829       0.263       0.508

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.807      19.827     577.527     511.151       0.050       0.588

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     308.166       0.000     308.166    1178.943       0.261       0.439

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.698     577.638       0.000       0.060       0.117       0.450

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.784      20.658       1.149     585.568      28.776     173.144       1.342

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 179232.594       0.548    1033.915  870187.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =16.953   EfDer =  0.948

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    102.079    3210.000      20.658     585.568       1.000       1.000       0.980
W Kg/sec =   46.39946

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     77.178    3021.166       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  78527.438   80097.820       2.427     545.479     224.778     429.765       1.912

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   291.73    -0.10   291.73     0.25   529.12
 MEAN    17.74     0.00    -0.02   291.73    -0.10   291.73     0.25
 HUB     15.05     0.00    -0.02   291.73    -0.10   291.73     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.58    46.36    16.22   562.21   633.48    19.80   578.46     0.54
 MEAN    59.59    43.40    16.19   496.90   576.29    19.80   578.46     0.49
 HUB     55.32    38.84    16.48   421.59   512.76    19.80   578.46     0.43

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   454.78   343.41   298.14  1200.36     0.38
 MEAN    17.51   450.12   333.61   302.19  1196.36     0.38
 HUB     14.85   472.51   359.38   306.78  1192.35     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   365.55   211.51     0.30  6805.04
 MEAN   490.40   340.44   156.79     0.28  5842.12     1.87
 HUB    415.99   311.96    56.61     0.26  5338.25

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.11     1.17    21.84   616.16     1.05   598.90     0.92     0.87
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 MEAN    23.60     1.14    21.40   611.83     1.04   594.92     0.92     0.87
 HUB     23.34     1.13    20.94   609.57     1.04   590.93     0.92     0.87
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.04    35.35    31.50     3.85     0.93     0.52     2.90
 MEAN    47.83    27.42    23.50     3.92     0.95     0.50     3.28     0.87
 HUB     49.51    10.46     6.50     3.96     0.95     0.48     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.948

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     454.186     335.797     305.819    1196.746       0.380       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.661      21.420     595.303      46.000      47.675      31.500     -16.175

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     309.650     335.797     456.775    1205.973       0.257       0.494

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.583      22.525     604.518     471.992       0.044       0.582

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     302.368       0.000     302.368    1206.344       0.251       0.442

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.433     604.890       0.000       0.060       0.108       0.454

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.800      23.436       1.134     612.521      26.953     173.749       1.347

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 167960.766       0.545     968.893  851080.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =16.953   EfDer =  0.956

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    102.079    3210.000      23.436     612.521       1.000       1.000       0.980
W Kg/sec =   46.39946

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     69.578    2953.946       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  78527.438   80097.820       2.533     513.330     202.656     401.059       1.979

     ROTOR LEADING EDGE CONDITIONS, STAGE           4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   285.07    -0.10   285.07     0.24   496.47
 MEAN    16.97     0.00    -0.02   285.07    -0.10   285.07     0.24
 HUB     14.32     0.00    -0.02   285.07    -0.10   285.07     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.15    46.36    15.79   539.52   610.29    22.54   605.74     0.51
 MEAN    59.06    43.80    15.26   475.39   554.40    22.54   605.74     0.46
 HUB     54.61    37.84    16.77   401.14   492.20    22.54   605.74     0.41

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   434.27   322.40   290.93  1225.29     0.35
 MEAN    16.57   428.72   311.53   294.53  1221.60     0.35
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 HUB     13.89   448.20   334.28   298.56  1217.89     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   356.75   206.47     0.29  6088.88
 MEAN   464.28   331.78   152.75     0.27  5164.91     1.85
 HUB    389.09   303.55    54.81     0.25  4644.57

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.79     1.14    24.56   639.88     1.04   624.15     0.92     0.87
 MEAN    26.26     1.12    24.12   635.73     1.04   620.39     0.92     0.87
 HUB     25.97     1.11    23.65   633.39     1.03   616.63     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.94    35.36    31.50     3.86     0.93     0.51     2.90
 MEAN    46.61    27.41    23.50     3.91     0.95     0.49     3.29     0.87
 HUB     48.23    10.40     6.50     3.90     0.95     0.47     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.956

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     426.302     313.281     289.117    1222.366       0.349       0.034

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.318      24.193     621.171      46.000      47.297      32.400     -14.897

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     297.596     313.281     432.097    1229.991       0.242       0.493

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.257      25.208     628.944     456.573       0.037       0.580

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     284.599       0.000     284.599    1230.608       0.231       0.434

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.162     629.576       0.000       0.060       0.100       0.472

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.811      26.118       1.114     636.333      23.812     182.767       1.417

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 148470.109       0.531     856.460  858426.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =16.953   EfDer =  0.964

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    102.079    3210.000      26.118     636.333       1.000       1.000       0.980
W Kg/sec =   46.39946

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     63.636    2898.149       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  78527.438   80097.820       2.750     509.668     185.360     390.276       2.106

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   266.47    -0.09   266.47     0.22   463.32
 MEAN    15.91     0.00    -0.02   266.47    -0.09   266.47     0.22
 HUB     13.07     0.00    -0.02   266.47    -0.09   266.47     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.56    47.36    15.20   513.19   578.33    25.28   630.41     0.47
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MEAN    59.13    44.80    14.33   445.76   519.42    25.28   630.41     0.42
HUB     53.96    38.84    15.12   366.12   452.90    25.28   630.41     0.37

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   411.35   307.79   272.89  1247.43     0.33
MEAN    15.50   400.72   290.29   276.24  1243.69     0.32
HUB     12.59   411.33   301.42   279.89  1239.93     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    502.54   335.26   194.75     0.27  5523.51
MEAN   434.13   311.44   143.84     0.25  4500.30     1.86
HUB    352.68   284.55    51.25     0.23  3796.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     29.39     1.13    27.26   661.14     1.04   647.03     0.92     0.88
MEAN    28.76     1.10    26.77   656.54     1.03   643.15     0.92     0.88
HUB     28.34     1.08    26.26   653.38     1.03   639.27     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     48.44    35.51    31.50     4.01     0.93     0.51     2.90
MEAN    46.42    27.51    23.50     4.01     0.95     0.48     3.34     0.88
HUB     47.12    10.38     6.50     3.88     0.95     0.45     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.964

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     406.211     295.615     278.602    1243.797       0.327       -0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.789      26.737     643.260      46.000      46.697      33.000     -13.697

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219     290.537     295.615     414.488    1250.278       0.232       0.424

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      28.697      27.637     649.981     440.827       0.064       0.573

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     273.168       0.000     273.168    1251.063       0.218       0.467

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      27.704     650.798       0.000       0.060       0.092       0.456

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.823      28.640       1.097     657.021      20.687     195.581       1.516

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 129060.438       0.511     744.494  889144.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    836291.56   4824.2036     99.7208      1.8958      0.7841     16.9533      1.2567
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 80% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.481   EfDer =  0.989

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     157.150    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   71.43167

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     153.519    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  120892.477  123310.062       1.860     831.557     447.082     619.754       1.386

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   368.48    -0.13   368.48     0.33   541.71
  MEAN    17.06     0.00    -0.02   368.48    -0.13   368.48     0.33
  HUB     12.51     0.00    -0.02   368.48    -0.13   368.48     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.89    50.47     5.42   543.87   657.05    13.99   511.47     0.59
  MEAN    50.68    47.20     3.48   449.76   581.53    13.99   511.47     0.52
  HUB     41.84    38.62     3.22   329.80   494.60    13.99   511.47     0.45

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   572.65   271.03   504.45  1117.76     0.51
  MEAN    18.04   602.08   320.39   509.75  1115.51     0.54
  HUB     15.00   689.50   447.61   524.45  1109.67     0.62

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   573.51   272.85     0.51  5593.89
  MEAN   475.49   532.83   155.10     0.48  5780.69     1.21
  HUB    395.45   527.04    52.16     0.47  6715.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.38     1.15    14.53   546.50     1.05   519.11     0.92     0.91
  MEAN    17.46     1.16    14.32   547.29     1.05   517.02     0.92     0.91
  HUB     17.86     1.18    13.76   551.25     1.05   511.55     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     28.25    28.41    24.20     4.21     0.93     0.20     2.90
  MEAN    32.15    16.92    12.70     4.22     0.92     0.16     3.51     0.91
  HUB     40.48    -5.68    -9.30     3.62     0.92     0.04     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     613.499     319.766     523.576    1115.317       0.550      -0.014

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.534      14.271     516.911      24.000      31.414      35.400       3.986

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     562.143     319.766     646.726    1120.745       0.502       0.154
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      17.485      14.721     521.954     528.796       0.025       0.333

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     515.921       0.000     515.921    1125.204       0.459       0.241

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      15.084     526.116       0.000       0.060       0.042       0.262

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.856      17.426       1.154     548.348      25.538     236.437       1.833

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 158993.609       0.538    1411.970 1549415.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.481   EfDer =  0.975

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    157.150    3021.000      17.426     548.348       1.000       1.000       0.980
W Kg/sec =   71.43167

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    136.302    2938.197       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 120892.477  123310.062       1.488     590.487     396.948     474.134       1.194

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   490.21    -0.17   490.21     0.43   526.90
 MEAN    18.08     0.00    -0.02   490.21    -0.17   490.21     0.43
 HUB     15.21     0.00    -0.02   490.21    -0.17   490.21     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.87    46.36     1.51   541.76   730.75    15.30   528.28     0.65
 MEAN    44.20    42.30     1.90   476.60   683.82    15.30   528.28     0.61
 HUB     39.29    37.84     1.45   400.98   633.43    15.30   528.28     0.56

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   544.16   173.13   515.89  1138.49     0.48
 MEAN    18.01   556.85   206.83   517.02  1138.11     0.49
 HUB     15.22   602.69   305.47   519.54  1137.58     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   632.08   365.21     0.56  3538.70
 MEAN   474.80   582.34   267.97     0.51  3727.96     1.26
 HUB    401.33   528.31    95.86     0.46  4652.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.95     1.09    16.21   563.33     1.03   538.60     0.92     0.89
 MEAN    19.04     1.09    16.16   564.13     1.03   538.24     0.92     0.89
 HUB     19.45     1.12    16.06   568.05     1.04   537.72     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.55    35.30    31.50     3.80     0.93     0.18     2.90
 MEAN    21.80    27.40    23.50     3.90     0.91     0.19     3.30     0.89
 HUB     30.45    10.45     6.50     3.95     0.91     0.23     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.975

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     566.267     207.406     526.916    1138.215       0.498      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.118      16.140     538.390      46.000      21.486      30.600       9.114

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     543.963     207.406     582.162    1140.398       0.477       0.051

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.046      16.296     540.458     511.151       0.034       0.173

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     537.665       0.000     537.665    1140.999       0.471       0.046

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.280     541.027       0.000       0.060       0.063       0.045

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.797      18.957       1.088     565.168      16.821     314.234       2.436

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 104758.086       0.361     930.322 1438824.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.481   EfDer =  0.941

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    157.150    3021.000      18.957     565.168       1.000       1.000       0.980
W Kg/sec =   71.43167

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    127.199    2894.143       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 120892.477  123310.062       1.472     545.479     370.445     429.765       1.160

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   503.97    -0.17   503.97     0.44   506.88
 MEAN    17.74     0.00    -0.02   503.97    -0.17   503.97     0.44
 HUB     15.05     0.00    -0.02   503.97    -0.17   503.97     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.40    46.36     0.04   529.11   730.84    16.59   543.96     0.64
 MEAN    42.87    43.40    -0.53   467.64   687.63    16.59   543.96     0.60
 HUB     38.23    38.84    -0.61   396.77   641.52    16.59   543.96     0.56

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   553.94    140.88    535.72  1151.89      0.48
 MEAN    17.51   565.07    182.15    534.90  1152.56      0.49
 HUB     14.85   609.69    290.56    536.00  1152.98      0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   657.61   381.37     0.57  2794.33
 MEAN   461.53   603.47   279.38     0.52  3191.87      1.21
 HUB    391.49   545.42   100.93     0.47  4317.45

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     20.18     1.06    17.22   577.00     1.02   551.38     0.92     0.86
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 MEAN    20.35     1.07    17.27   578.68     1.02   552.02     0.92     0.86
 HUB     20.86     1.10    17.24   583.44     1.03   552.41     0.92     0.86
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     14.73    35.45    31.50     3.95     0.93     0.13     2.90
 MEAN    18.81    27.58    23.50     4.08     0.90     0.16     3.28     0.86
 HUB     28.46    10.66     6.50     4.16     0.90     0.21     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.941

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     572.190     183.344     542.021    1152.855       0.496      -0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.433      17.264     552.369      46.000      18.689      31.500      12.811

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     571.338     183.344     600.035    1152.940       0.496      -0.021

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.318      17.175     552.450     471.992       0.046       0.138

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     554.980       0.000     554.980    1154.544       0.481      -0.010

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.232     553.989       0.000       0.060       0.086      -0.003

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.707      20.188       1.065     579.705      14.537     341.582       2.648

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  90557.414       0.332     804.211 1435189.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.481   EfDer =  0.896

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    157.150    3021.000       20.188     579.705       1.000       1.000       0.980
W Kg/sec =   71.43167

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
    120.972    2857.625        1.402       0.249      53.349      56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 120892.477  123310.062        1.457     513.330     352.320     401.059       1.138

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   517.16    -0.18   517.16      0.45   480.28
 MEAN    16.97      0.00    -0.02   517.16    -0.18   517.16      0.45
 HUB     14.32      0.00    -0.02   517.16    -0.18   517.16      0.45

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     44.48    46.36    -1.88   507.76   724.88     17.60    557.38      0.63
 MEAN    40.87    43.80    -2.93   447.40   683.95     17.60    557.38      0.59
 HUB     36.14    37.84    -1.70   377.52   640.40     17.60    557.38      0.55

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2      Ao2          Mach2
 TIP     18.88   561.96   102.91   552.46  1162.46      0.48
 MEAN    16.57   569.89   148.41   550.22  1163.94      0.49
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 HUB     13.89   609.59   261.97   550.43  1165.07     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   679.04   394.83     0.58  1946.36
 MEAN   436.94   621.29   288.53     0.53  2462.72     1.17
 HUB    366.18   560.21   104.21     0.48  3641.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.02     1.04    17.91   587.94     1.01   561.58     0.92     0.82
 MEAN    21.24     1.05    18.03   590.13     1.02   563.02     0.92     0.82
 HUB     21.76     1.08    18.06   595.11     1.03   564.10     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     10.55    35.55    31.50     4.05     0.93     0.09     2.90
 MEAN    15.09    27.67    23.50     4.17     0.89     0.12     3.29     0.82
 HUB     25.45    10.72     6.50     4.22     0.89     0.18     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.896

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     558.140     149.243     537.817    1165.970       0.479       0.055

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.310      18.213     565.056      46.000      15.509      32.400      16.891

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     579.063     149.243     597.986    1163.919       0.498      -0.043

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.149      17.855     563.070     456.573       0.058       0.104

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     550.474       0.000     550.474    1166.702       0.472      -0.065

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.997     565.765       0.000       0.060       0.113      -0.001

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.556      20.965       1.038     591.060      11.355     403.920       3.131

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  70754.188       0.286     628.345 1476587.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.481   EfDer =  0.844

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    157.150    3021.000      20.965     591.060       1.000       1.000       0.980
W Kg/sec =   71.43167

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    117.623    2830.042       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 120892.477  123310.062       1.488     509.668     342.579     390.276       1.139

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   508.83    -0.18   508.83     0.43   452.43
 MEAN    15.91     0.00    -0.02   508.83    -0.18   508.83     0.43
 HUB     13.07     0.00    -0.02   508.83    -0.18   508.83     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.52    47.36    -3.84   482.97   701.67    18.41   569.45     0.60
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 MEAN    39.52    44.80    -5.28   419.52   659.58    18.41   569.45     0.56
 HUB     34.12    38.84    -4.72   344.57   614.62    18.41   569.45     0.53
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   552.16    78.75   546.51  1172.72     0.47
 MEAN    15.50   557.76   120.70   544.54  1174.18     0.48
 HUB     12.59   590.82   228.09   545.01  1175.28     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   673.85   394.20     0.57  1416.03
 MEAN   408.57   615.95   287.87     0.52  1873.36     1.14
 HUB    331.91   554.81   103.82     0.47  2873.95

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.54     1.03    18.51   597.05     1.01   571.61     0.92     0.77
 MEAN    21.73     1.04    18.62   598.99     1.01   573.03     0.92     0.77
 HUB     22.15     1.06    18.64   603.22     1.02   574.09     0.92     0.77

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP      8.20    35.80    31.50     4.30     0.93     0.06     2.90
 MEAN    12.50    27.86    23.50     4.36     0.88     0.09     3.34     0.77
 HUB     22.71    10.79     6.50     4.29     0.88     0.14     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.844

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      563.953     122.914     550.395    1174.300       0.480       -0.016

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.744      18.566      573.209       46.000      12.589      33.000      20.411

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      609.210     122.914     621.486    1169.752       0.521       -0.258

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       21.366       17.756     568.778     440.827       0.137       0.076

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      562.531       0.000     562.531    1174.437       0.479       -0.099

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       18.246     573.343       0.000       0.060       0.142       -0.106

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4       Texit         Del T       Ns         Ns nondim
      0.357       21.351        1.018     599.752       8.692     487.770       3.781

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  54169.000       0.242     481.057 1550138.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    479232.28   4255.9043     153.5195      1.4133       0.7086       3.4810       1.1472
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 80% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     154.804    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   70.36555

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     151.228    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  119088.148  121469.656       1.888     831.557     440.409     619.754       1.407

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   362.31    -0.12   362.31     0.33   541.71
  MEAN    17.06     0.00    -0.02   362.31    -0.12   362.31     0.33
  HUB     12.51     0.00    -0.02   362.31    -0.12   362.31     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.34    50.47     5.87   543.87   653.61    14.03   511.85     0.59
  MEAN    51.15    47.20     3.95   449.76   577.64    14.03   511.85     0.52
  HUB     42.32    38.62     3.70   329.80   490.02    14.03   511.85     0.44

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   566.42   276.55   494.32  1118.90     0.51
  MEAN    18.04   595.37   323.45   499.84  1116.48     0.53
  HUB     15.00   681.03   446.62   514.13  1110.63     0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   561.98   267.32     0.50  5707.82
  MEAN   475.49   522.45   152.03     0.47  5835.97     1.22
  HUB    395.45   516.67    51.17     0.47  6700.85

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.44     1.15    14.63   546.98     1.05   520.19     0.92     0.91
  MEAN    17.49     1.16    14.41   547.53     1.05   517.92     0.92     0.91
  HUB     17.87     1.18    13.86   551.19     1.05   512.46     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     29.22    28.40    24.20     4.20     0.93     0.21     2.90
  MEAN    32.91    16.92    12.70     4.22     0.92     0.18     3.51     0.91
  HUB     40.98    -5.68    -9.30     3.62     0.92     0.05     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     606.316     322.827     513.227    1116.341       0.543      -0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.565      14.368     517.861      24.000      32.170      35.400       3.230

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     549.792     322.827     637.564    1122.209       0.490       0.172
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.521      14.866     523.319     528.796       0.023       0.345

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     505.031       0.000     505.031    1126.429       0.448       0.256

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.212     527.262       0.000       0.060       0.040       0.276

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.862      17.466       1.156     548.565      25.755     232.962       1.806

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 160349.812       0.542    1402.760 1523501.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    154.804    3021.000      17.466     548.565       1.000       1.000       0.980
W Kg/sec =   70.36555

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    133.991    2937.613       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119088.148  121469.656       1.513     590.487     390.216     474.134       1.215

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   480.12    -0.17   480.12     0.43   526.79
 MEAN    18.08     0.00    -0.02   480.12    -0.17   480.12     0.43
 HUB     15.21     0.00    -0.02   480.12    -0.17   480.12     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.46    46.36     2.10   541.76   724.02    15.42   529.32     0.64
 MEAN    44.80    42.30     2.50   476.60   676.63    15.42   529.32     0.60
 HUB     39.88    37.84     2.04   400.98   625.65    15.42   529.32     0.55

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   535.49   181.92   503.64  1140.34     0.47
 MEAN    18.01   548.38   213.06   505.30  1139.66     0.48
 HUB     15.22   594.09   307.72   508.19  1138.86     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   616.99   356.41     0.54  3718.27
 MEAN   474.80   569.06   261.74     0.50  3840.25     1.28
 HUB    401.33   516.74    93.61     0.45  4686.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.09     1.09    16.41   564.31     1.03   540.36     0.92     0.90
 MEAN    19.14     1.10    16.33   564.82     1.03   539.71     0.92     0.90
 HUB     19.53     1.12    16.22   568.41     1.04   538.94     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.86    35.29    31.50     3.79     0.93     0.19     2.90
 MEAN    22.86    27.38    23.50     3.88     0.91     0.21     3.30     0.90
 HUB     31.20    10.44     6.50     3.94     0.91     0.24     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     557.399     213.661     514.823    1139.810       0.489      -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.221      16.318     539.900      46.000      22.539      30.600       8.061

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     530.164     213.661     571.598    1142.418       0.464       0.072

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.162      16.529     542.374     511.151       0.030       0.189

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     523.815       0.000     523.815    1143.007       0.458       0.068

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.519     542.933       0.000       0.060       0.058       0.068

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.815      19.081       1.092     565.846      17.281     304.753       2.362

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 107623.609       0.371     941.505 1411440.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.953

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    154.804    3021.000      19.081     565.846       1.000       1.000       0.980
W Kg/sec =   70.36555

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    124.564    2892.409       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 119088.148  121469.656       1.504     545.479     362.772     429.765       1.185

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   491.42    -0.17   491.42     0.43   506.57
 MEAN    17.74     0.00    -0.02   491.42    -0.17   491.42     0.43
 HUB     15.05     0.00    -0.02   491.42    -0.17   491.42     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.12    46.36     0.76   529.11   722.24    16.81   545.68     0.63
 MEAN    43.59    43.40     0.19   467.64   678.49    16.81   545.68     0.59
 HUB     38.93    38.84     0.09   396.77   631.71    16.81   545.68     0.55

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   541.90   152.12   520.11  1154.71     0.47
 MEAN    17.51   553.70   190.10   520.04  1154.98     0.48
 HUB     14.85   598.48   293.47   521.59  1155.04     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   638.36   370.13     0.55  3016.94
 MEAN   461.53   586.61   271.43     0.51  3331.04     1.23
 HUB    391.49   530.72    98.02     0.46  4360.56

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     20.42     1.07    17.56   578.62     1.02   554.10     0.92     0.87
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 MEAN    20.57     1.08    17.57   579.94     1.02   554.35     0.92     0.87
 HUB     21.04     1.10    17.52   584.30     1.03   554.40     0.92     0.87
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.30    35.44    31.50     3.94     0.93     0.15     2.90
 MEAN    20.08    27.56    23.50     4.06     0.90     0.18     3.28     0.87
 HUB     29.36    10.64     6.50     4.14     0.90     0.22     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.953

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     560.467     191.350     526.791    1155.313       0.485       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.646      17.573     554.726      46.000      19.963      31.500      11.537

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     553.248     191.350     585.404    1156.012       0.479       0.005

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.551      17.566     555.398     471.992       0.040       0.156

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     537.244       0.000     537.244    1157.528       0.464       0.017

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.626     556.855       0.000       0.060       0.078       0.025

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.743      20.434       1.071     580.954      15.108     327.693       2.540

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94115.906       0.345     823.338 1405639.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.914

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    154.804    3021.000      20.434     580.954       1.000       1.000       0.980
W Kg/sec =   70.36555

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    117.859    2854.552       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119088.148  121469.656       1.495     513.330     343.254     401.059       1.168

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   501.26    -0.17   501.26     0.43   479.77
 MEAN    16.97     0.00    -0.02   501.26    -0.17   501.26     0.43
 HUB     14.32     0.00    -0.02   501.26    -0.17   501.26     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.38    46.36    -0.98   507.76   713.62    17.97   559.98     0.61
 MEAN    41.76    43.80    -2.04   447.40   672.00    17.97   559.98     0.58
 HUB     37.00    37.84    -0.84   377.52   627.63    17.97   559.98     0.54

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   545.34   117.25   532.58  1166.50     0.47
 MEAN    16.57   554.49   158.54   531.34  1167.44     0.47
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HUB     13.89   594.72   265.65   532.09  1168.10     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    497.74   654.53   380.48     0.56  2217.06
MEAN   436.94   599.86   278.40     0.51  2630.50     1.19
HUB    366.18   541.50   100.53     0.46  3692.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.41     1.05    18.43   590.34     1.02   565.51     0.92     0.84
MEAN    21.60     1.06    18.50   592.08     1.02   566.42     0.92     0.84
HUB     22.08     1.08    18.50   596.58     1.03   567.06     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     12.42    35.54    31.50     4.04     0.93     0.11     2.90
MEAN    16.61    27.65    23.50     4.15     0.89     0.14     3.29     0.84
HUB     26.53    10.70     6.50     4.20     0.89     0.19     3.90

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.914

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     543.411     159.429     519.498    1169.364       0.465       0.055

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.666      18.682     568.349      46.000      17.061      32.400      15.339

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     556.627     159.429     579.009    1168.115       0.477      -0.015

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.533      18.430     567.135     456.573       0.051       0.125

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     529.137       0.000     529.137    1170.678       0.452      -0.035

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.570     569.627       0.000       0.060       0.103       0.028

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.621      21.367       1.046     592.999      12.045     380.442       2.949

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  75056.453       0.303     656.603 1443204.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.868

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    154.804    3021.000      21.367     592.999       1.000       1.000       0.980
W Kg/sec =   70.36555

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    113.875    2825.412       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119088.148  121469.656       1.537     509.668     331.661     390.276       1.177

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   489.89    -0.17   489.89     0.42   451.69
 MEAN    15.91     0.00    -0.02   489.89    -0.17   489.89     0.42
 HUB     13.07     0.00    -0.02   489.89    -0.17   489.89     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.60    47.36    -2.76   482.97   688.06    18.95   572.97     0.59
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MEAN    40.59    44.80    -4.21   419.52   645.08    18.95   572.97     0.55
HUB     35.13    38.84    -3.71   344.57   599.03    18.95   572.97     0.51
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   531.82    95.81   523.12  1177.90     0.45
MEAN    15.50   538.79   132.77   522.18  1178.72     0.46
HUB     12.59   572.51   232.48   523.18  1179.29     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    472.96   644.90   377.15     0.55  1721.85
MEAN   408.57   590.54   275.80     0.50  2060.25     1.17
HUB    331.91   532.55    99.44     0.45  2929.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.10     1.03    19.22   600.28     1.01   576.68     0.92     0.79
MEAN    22.25     1.04    19.28   601.72     1.01   577.49     0.92     0.79
HUB     22.63     1.06    19.26   605.39     1.02   578.04     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     10.38    35.79    31.50     4.29     0.93     0.09     2.90
MEAN    14.27    27.84    23.50     4.34     0.88     0.12     3.34     0.79
HUB     23.96    10.76     6.50     4.26     0.88     0.16     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.868

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      544.539     135.201     527.488    1178.909       0.462      -0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.266      19.234      577.716       46.000      14.376      33.000      18.624

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      578.794     135.201     594.375    1175.627       0.492      -0.213

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       21.950       18.596     574.504     440.827       0.123       0.100

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      535.517       0.000     535.517    1179.738       0.454      -0.059

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950       19.051      578.529       0.000       0.060       0.124      -0.065

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4       Texit         Del T       Ns         Ns nondim
      0.482       21.947        1.027     602.463       9.464     448.997       3.481

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  58983.656       0.264     515.996 1512388.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    496129.47   4340.2026     151.2282      1.4527      0.7418       3.9538       1.1524
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 80% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.453   EfDer =  0.995

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     152.345    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   69.24777

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     148.826    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  117196.414  119540.086       1.919     831.557     433.413     619.754       1.430

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   355.89    -0.12   355.89     0.32   541.71
  MEAN    17.06     0.00    -0.02   355.89    -0.12   355.89     0.32
  HUB     12.51     0.00    -0.02   355.89    -0.12   355.89     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.81    50.47     6.34   543.87   650.07    14.07   512.23     0.59
  MEAN    51.65    47.20     4.45   449.76   573.63    14.07   512.23     0.52
  HUB     42.83    38.62     4.21   329.80   485.29    14.07   512.23     0.44

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   560.22   282.21   483.94  1120.05     0.50
  MEAN    18.04   588.60   326.63   489.66  1117.45     0.53
  HUB     15.00   672.40   445.61   503.54  1111.60     0.60

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   550.15   261.66     0.49  5824.51
  MEAN   475.49   511.78   148.86     0.46  5893.23     1.24
  HUB    395.45   506.03    50.16     0.46  6685.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.49     1.16    14.74   547.48     1.05   521.27     0.92     0.91
  MEAN    17.52     1.16    14.50   547.77     1.05   518.83     0.92     0.91
  HUB     17.87     1.18    13.95   551.12     1.05   513.37     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     30.25    28.40    24.20     4.20     0.93     0.23     2.90
  MEAN    33.71    16.91    12.70     4.21     0.92     0.19     3.51     0.91
  HUB     41.51    -5.69    -9.30     3.61     0.92     0.06     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     599.082     325.997     502.618    1117.367       0.536      -0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.595      14.465     518.813      24.000      32.967      35.400       2.433

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	537.261	325.997	628.430	1123.668	0.478	0.190

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.556	15.010	524.681	528.796	0.022	0.357

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	493.978	0.000	493.978	1127.653	0.438	0.270

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.339	528.409	0.000	0.060	0.039	0.291

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.868	17.503	1.159	548.790	25.980	229.393	1.778

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
161745.156	0.547	1392.490	1496496.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 4.453 EfDer = 0.986

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
152.345	3021.000	17.503	548.790	1.000	1.000	0.980

W Kg/sec = 69.24777

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
131.607	2937.013	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
117196.414	119540.086	1.541	590.487	383.275	474.134	1.237

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	469.86	-0.16	469.86	0.42	526.69
MEAN	18.08	0.00	-0.02	469.86	-0.16	469.86	0.42	
HUB	15.21	0.00	-0.02	469.86	-0.16	469.86	0.42	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.07	46.36	2.71	541.76	717.25	15.54	530.35	0.63
MEAN	45.42	42.30	3.12	476.60	669.38	15.54	530.35	0.59
HUB	40.49	37.84	2.65	400.98	617.81	15.54	530.35	0.55

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	527.09	190.76	491.35	1142.16	0.46
MEAN	18.01	540.06	219.35	493.50	1141.19	0.47
HUB	15.22	585.54	310.02	496.74	1140.13	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	601.86	347.57	0.53	3898.73	
MEAN	474.80	555.70	255.45	0.49	3953.48	1.29
HUB	401.33	505.06	91.31	0.44	4721.85	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.22	1.10	16.60	565.30	1.03	542.10	0.92	0.90
MEAN	19.24	1.10	16.50	565.53	1.03	541.17	0.92	0.90
HUB	19.59	1.12	16.36	568.78	1.04	540.15	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	21.22	35.27	31.50	3.77	0.93	0.21	2.90	
MEAN	23.96	27.37	23.50	3.87	0.91	0.22	3.30	0.90
HUB	31.97	10.42	6.50	3.92	0.91	0.25	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986
    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     548.697     219.970     502.674    1141.384       0.481      -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.322      16.493     541.392      46.000      23.634      30.600       6.966

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     516.443     219.970     561.337    1144.404       0.451       0.093

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.273      16.757     544.261     511.151       0.027       0.205

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     510.077       0.000     510.077    1144.978       0.445       0.091

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.752     544.807       0.000       0.060       0.053       0.091

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.832      19.200       1.097     566.534      17.744     295.551       2.291

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 110511.594       0.381     951.412 1383248.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.453   EfDer =  0.963

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    152.345    3021.000      19.200     566.534       1.000       1.000       0.980
W Kg/sec =   69.24777

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    121.898    2890.653       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117196.414  119540.086       1.537     545.479     355.008     429.765       1.211

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   478.93    -0.16   478.93     0.42   506.26
 MEAN    17.74     0.00    -0.02   478.93    -0.16   478.93     0.42
 HUB     15.05     0.00    -0.02   478.93    -0.16   478.93     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.86    46.36     1.50   529.11   713.80    17.03   547.38     0.62
 MEAN    44.33    43.40     0.93   467.64   669.49    17.03   547.38     0.58
 HUB     39.65    38.84     0.81   396.77   622.04    17.03   547.38     0.54

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   530.53   163.19   504.81  1157.44     0.46
 MEAN    17.51   542.79   197.93   505.41  1157.32     0.47
 HUB     14.85   587.58   296.33   507.38  1157.05     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   619.49   359.07     0.54  3236.07
 MEAN   461.53   570.02   263.59     0.49  3468.08     1.26
 HUB    391.49   516.23    95.16     0.45  4403.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.67     1.08    17.89   580.23     1.02   556.73     0.92     0.88
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 MEAN    20.77     1.08    17.86   581.21     1.03   556.61     0.92     0.88
 HUB     21.21     1.10    17.79   585.17     1.03   556.35     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.91    35.42    31.50     3.92     0.93     0.17     2.90
 MEAN    21.39    27.54    23.50     4.04     0.91     0.19     3.28     0.88
 HUB     30.29    10.62     6.50     4.12     0.91     0.23     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.963

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     549.248     199.233     511.839    1157.695       0.474       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.854      17.872     557.016      46.000      21.268      31.500      10.232

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     535.746     199.233     571.593    1158.966       0.462       0.032

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.777      17.943     558.239     471.992       0.035       0.175

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     520.096       0.000     520.096    1160.397       0.448       0.044

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.007     559.619       0.000       0.060       0.070       0.053

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.774      20.672       1.077     582.204      15.670     314.755       2.440

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  97619.383       0.358     840.421 1375559.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 4.453   EfDer =  0.931

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    152.345    3021.000       20.672     582.204       1.000       1.000       0.980
W Kg/sec =   69.24777

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
    114.772    2851.487        1.402       0.249      53.349      56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 117196.414  119540.086        1.536     513.330     334.264     401.059       1.200

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   485.81    -0.17   485.81     0.42   479.25
 MEAN    16.97      0.00    -0.02   485.81    -0.17   485.81     0.42
 HUB     14.32      0.00    -0.02   485.81    -0.17   485.81     0.42

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     46.27     46.36    -0.09   507.76   702.85     18.33    562.50     0.60
 MEAN    42.65     43.80    -1.15   447.40   660.55     18.33    562.50     0.57
 HUB     37.86     37.84     0.02   377.52   615.36     18.33    562.50     0.53

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   530.04   130.99   513.60  1170.31      0.45
 MEAN    16.57   540.08   168.27   513.20  1170.76      0.46
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 HUB     13.89   580.62   269.23   514.42  1171.01     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   631.10   366.74     0.54  2476.39
 MEAN   436.94   579.27   268.67     0.49  2791.73     1.22
 HUB    366.18   523.48    96.96     0.45  3741.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.80     1.05    18.93   592.68     1.02   569.23     0.92     0.85
 MEAN    21.95     1.06    18.96   594.02     1.02   569.67     0.92     0.85
 HUB     22.39     1.08    18.93   598.04     1.03   569.90     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     14.31    35.53    31.50     4.03     0.93     0.13     2.90
 MEAN    18.15    27.63    23.50     4.13     0.90     0.16     3.29     0.85
 HUB     27.63    10.67     6.50     4.17     0.90     0.20     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.931

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     529.654     169.216     501.896    1172.595       0.452       0.055

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.014      19.136     571.494      46.000      18.632      32.400      13.768

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     535.451     169.216     561.554    1172.067       0.457       0.013

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.907      18.982     570.978     456.573       0.045       0.147

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     508.946       0.000     508.946    1174.436       0.433      -0.005

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.122     573.289       0.000       0.060       0.092       0.058

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.677      21.759       1.053     594.912      12.708     359.779       2.789

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79188.195       0.320     681.744 1409752.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 4.453   EfDer =  0.891

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    152.345    3021.000      21.759     594.912       1.000       1.000       0.980
W Kg/sec =   69.24777

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    110.225    2820.866       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117196.414  119540.086       1.588     509.668     321.030     390.276       1.216

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   471.86    -0.16   471.86     0.40   450.96
 MEAN    15.91     0.00    -0.02   471.86    -0.16   471.86     0.40
 HUB     13.07     0.00    -0.02   471.86    -0.16   471.86     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.68    47.36    -1.68   482.97   675.33    19.48   576.33     0.57
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 MEAN    41.65    44.80    -3.15   419.52   631.49    19.48   576.33     0.54
 HUB     36.15    38.84    -2.69   344.57   584.37    19.48   576.33     0.50
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   513.50   111.86   501.17  1182.70     0.43
 MEAN    15.50   521.41   144.17   501.08  1182.98     0.44
 HUB     12.59   555.47   236.66   502.53  1183.08     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   617.71   361.10     0.52  2009.71
 MEAN   408.57   566.56   264.40     0.48  2236.82     1.19
 HUB    331.91   511.48    95.26     0.43  2981.63

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.66     1.04    19.90   603.41     1.01   581.41     0.92     0.82
 MEAN    22.76     1.05    19.91   604.37     1.02   581.69     0.92     0.82
 HUB     23.10     1.06    19.86   607.53     1.02   581.78     0.92     0.82

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     12.58    35.77    31.50     4.27     0.93     0.11     2.90
 MEAN    16.05    27.82    23.50     4.32     0.89     0.14     3.34     0.82
 HUB     25.22    10.73     6.50     4.23     0.89     0.17     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.891

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219      526.814     146.810     505.944    1183.214       0.445       -0.012

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      22.780      19.878      581.942       46.000      16.181      33.000      16.819

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
      15.219      551.046     146.810     570.267    1180.996       0.467       -0.167

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       22.522       19.398     579.762     440.827       0.107       0.124

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      511.263       0.000     511.263    1184.582       0.432       -0.027

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       19.799      583.289       0.000       0.060       0.113       -0.031

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4       Texit         Del T       Ns         Ns nondim
      0.568       22.507        1.034     605.104       10.192     416.799       3.231

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  63527.168       0.284     546.916 1475118.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    512591.47   4412.9824     148.8259      1.4898       0.7693       4.4533       1.1574
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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 80% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.043   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     149.467    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   67.93939

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     146.014    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  114982.070  117281.461       1.956     831.557     425.224     619.754       1.457

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   348.42    -0.12   348.42     0.31   541.71
  MEAN    17.06     0.00    -0.02   348.42    -0.12   348.42     0.31
  HUB     12.51     0.00    -0.02   348.42    -0.12   348.42     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.36    50.47     6.89   543.87   646.01    14.11   512.67     0.58
  MEAN    52.24    47.20     5.04   449.76   569.03    14.11   512.67     0.51
  HUB     43.44    38.62     4.82   329.80   479.84    14.11   512.67     0.43

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   553.35   288.68   472.08  1121.34     0.49
  MEAN    18.04   580.98   330.24   477.99  1118.54     0.52
  HUB     15.00   662.61   444.47   491.43  1112.68     0.60

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   536.64   255.19     0.48  5957.91
  MEAN   475.49   499.57   145.25     0.45  5958.26     1.27
  HUB    395.45   493.87    49.02     0.44  6668.57

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.56     1.16    14.86   548.04     1.05   522.47     0.92     0.91
  MEAN    17.56     1.16    14.60   548.04     1.05   519.85     0.92     0.91
  HUB     17.87     1.18    14.05   551.05     1.05   514.39     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     31.45    28.39    24.20     4.19     0.93     0.25     2.90
  MEAN    34.64    16.90    12.70     4.20     0.92     0.21     3.51     0.91
  HUB     42.13    -5.70    -9.30     3.60     0.92     0.08     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     590.941     329.598     490.486    1118.514       0.528      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.629      14.573     519.878      24.000      33.900      35.400       1.500

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	523.091	329.598	618.271	1125.285	0.465	0.210

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.593	15.169	526.191	528.796	0.021	0.371

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	481.445	0.000	481.445	1129.015	0.426	0.287

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.478	529.686	0.000	0.060	0.037	0.308

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.873	17.542	1.161	549.045	26.235	225.311	1.747

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
163338.484	0.552	1379.638	1465094.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 5.043 EfDer = 0.991

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
149.467	3021.000	17.542	549.045	1.000	1.000	0.980

W Kg/sec = 67.93939

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
128.861	2936.329	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
114982.070	117281.461	1.573	590.487	375.277	474.134	1.263

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	458.20	-0.16	458.20	0.41	526.56
MEAN	18.08	0.00	-0.02	458.20	-0.16	458.20	0.41	
HUB	15.21	0.00	-0.02	458.20	-0.16	458.20	0.41	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.78	46.36	3.42	541.76	709.67	15.66	531.51	0.63
MEAN	46.14	42.30	3.84	476.60	661.25	15.66	531.51	0.58
HUB	41.20	37.84	3.36	400.98	608.99	15.66	531.51	0.54

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	518.05	200.65	477.62	1144.15	0.45
MEAN	18.01	530.94	226.39	480.25	1142.88	0.46
HUB	15.22	576.03	312.58	483.84	1141.54	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	584.94	337.69	0.51	4100.47	
MEAN	474.80	540.69	248.41	0.47	4080.20	1.32
HUB	401.33	491.91	88.75	0.43	4760.82	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.36	1.10	16.82	566.40	1.03	543.99	0.92	0.91
MEAN	19.35	1.10	16.69	566.32	1.03	542.78	0.92	0.91
HUB	19.67	1.12	16.52	569.20	1.04	541.49	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	22.79	35.26	31.50	3.76	0.93	0.22	2.90	
MEAN	25.24	27.35	23.50	3.85	0.92	0.23	3.30	0.91
HUB	32.86	10.39	6.50	3.89	0.92	0.26	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991
    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     539.180     227.030     489.052    1143.110       0.472      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.432      16.682     543.031      46.000      24.902      30.600       5.698

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     501.218     227.030     550.238    1146.577       0.437       0.118

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.393      17.004     546.329     511.151       0.024       0.223

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     494.876       0.000     494.876    1147.130       0.431       0.116

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.004     546.857       0.000       0.060       0.048       0.118

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.847      19.327       1.102     567.308      18.263     285.623       2.214

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 113741.383       0.392     960.716 1350857.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.043   EfDer =  0.974

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    149.467    3021.000      19.327     567.308       1.000       1.000       0.980
W Kg/sec =   67.93939

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    118.890    2888.679       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 114982.070  117281.461       1.575     545.479     346.246     429.765       1.241

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   465.06    -0.16   465.06     0.40   505.92
 MEAN    17.74     0.00    -0.02   465.06    -0.16   465.06     0.40
 HUB     15.05     0.00    -0.02   465.06    -0.16   465.06     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.69    46.36     2.33   529.11   704.56    17.26   549.25     0.61
 MEAN    45.17    43.40     1.77   467.64   659.64    17.26   549.25     0.57
 HUB     40.48    38.84     1.64   396.77   611.42    17.26   549.25     0.53

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   518.63   175.25   488.13  1160.36     0.45
 MEAN    17.51   531.18   206.54   489.38  1159.86     0.46
 HUB     14.85   575.80   299.50   491.77  1159.24     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   598.90   347.01     0.52  3474.87
 MEAN   461.53   551.82   254.98     0.48  3618.73     1.28
 HUB    391.49   500.30    91.99     0.43  4450.02

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.93     1.08    18.24   582.02     1.03   559.56     0.92     0.89
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 MEAN    21.00     1.09    18.18   582.62     1.03   559.07     0.92     0.89
 HUB     21.40     1.11    18.07   586.14     1.03   558.46     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.75    35.41    31.50     3.91     0.93     0.19     2.90
 MEAN    22.88    27.52    23.50     4.02     0.91     0.21     3.28     0.89
 HUB     31.34    10.60     6.50     4.10     0.91     0.24     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     537.329     207.900     495.480    1160.261       0.463       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.078      18.194     559.487      46.000      22.763      31.500       8.737

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     516.862     207.900     557.108    1162.127       0.445       0.061

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.018      18.346     561.288     471.992       0.030       0.196

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     501.618       0.000     501.618    1163.469       0.431       0.075

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.415     562.585       0.000       0.060       0.061       0.084

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.803      20.927       1.083     583.594      16.285     301.327       2.336

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 101455.422       0.372     856.943 1341373.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.043   EfDer =  0.948

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    149.467    3021.000       20.927     583.594       1.000       1.000       0.980
W Kg/sec =   67.93939

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
    111.364    2848.089        1.402       0.249      53.349      56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 114982.070  117281.461        1.583     513.330     324.338     401.059       1.237

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   469.09    -0.16   469.09      0.40   478.68
 MEAN    16.97      0.00    -0.02   469.09    -0.16   469.09      0.40
 HUB     14.32      0.00    -0.02   469.09    -0.16   469.09      0.40

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     47.28    46.36      0.92   507.76   691.39     18.72   565.23      0.59
 MEAN    43.66    43.80     -0.14   447.40   648.35     18.72   565.23      0.56
 HUB     38.84    37.84      1.00   377.52   602.23     18.72   565.23      0.52

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   514.45   145.68   493.39  1174.32      0.44
 MEAN    16.57   525.14   178.69   493.80  1174.29      0.45
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 HUB     13.89   565.76   273.07   495.50  1174.11     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   606.12   352.06     0.52  2753.47
 MEAN   436.94   557.25   258.25     0.47  2964.37     1.24
 HUB    366.18   504.17    93.12     0.43  3795.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.22     1.06    19.47   595.24     1.02   573.15     0.92     0.87
 MEAN    22.32     1.07    19.45   596.14     1.02   573.12     0.92     0.87
 HUB     22.72     1.09    19.38   599.65     1.03   572.93     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.45    35.51    31.50     4.01     0.93     0.16     2.90
 MEAN    19.89    27.61    23.50     4.11     0.90     0.18     3.29     0.87
 HUB     28.86    10.64     6.50     4.14     0.90     0.22     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.948

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     515.405     179.697     483.065    1176.019       0.438       0.056

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.390      19.620     574.836      46.000      20.405      32.400      11.995

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     513.173     179.697     543.726    1176.215       0.436       0.045

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.307      19.570     575.027     456.573       0.038       0.171

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     487.683       0.000     487.683    1178.391       0.414       0.030

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.710     577.157       0.000       0.060       0.081       0.092

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.730      22.179       1.060     597.011      13.417     339.417       2.631

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  83608.750       0.337     706.201 1372288.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.043   EfDer =  0.915

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    149.467    3021.000      22.179     597.011       1.000       1.000       0.980
W Kg/sec =   67.93939

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.278    2815.904       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 114982.070  117281.461       1.647     509.668     309.534     390.276       1.261

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   452.75    -0.16   452.75     0.38   450.17
 MEAN    15.91     0.00    -0.02   452.75    -0.16   452.75     0.38
 HUB     13.07     0.00    -0.02   452.75    -0.16   452.75     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.86    47.36    -0.50   482.97   662.12    20.04   579.90     0.56
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 MEAN    42.83    44.80    -1.97   419.52   617.34    20.04   579.90     0.52
 HUB     37.29    38.84    -1.55   344.57   569.05    20.04   579.90     0.48
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   495.27   128.62   478.28  1187.67     0.42
 MEAN    15.50   503.78   156.15   478.96  1187.43     0.42
 HUB     12.59   537.89   241.07   480.85  1187.07     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   589.34   344.33     0.50  2310.35
 MEAN   408.57   541.41   252.42     0.46  2422.45     1.23
 HUB    331.91   489.35    90.84     0.41  3037.17

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.26     1.05    20.63   606.78     1.02   586.31     0.92     0.84
 MEAN    23.31     1.05    20.60   607.26     1.02   586.08     0.92     0.84
 HUB     23.61     1.06    20.50   609.86     1.02   585.71     0.92     0.84

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.05    35.75    31.50     4.25     0.93     0.14     2.90
 MEAN    18.06    27.79    23.50     4.29     0.89     0.16     3.34     0.84
 HUB     26.63    10.70     6.50     4.20     0.89     0.19     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.915

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      508.902     159.015     483.421    1187.689       0.428       -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.336      20.566      586.352       46.000      18.208      33.000      14.792

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      522.839     159.015     546.485    1186.474       0.441       -0.118

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.136       20.244     585.152     440.827       0.091       0.150

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     486.223       0.000     486.223    1189.596       0.409       0.012

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      20.599      588.236       0.000       0.060       0.099       0.008

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.647      23.113       1.042     607.967      10.956     386.730       2.998

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  68289.500       0.305     576.807 1433933.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    530433.56   4480.3052     146.0140      1.5299      0.7961      5.0429      1.1629
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 80% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.504   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     147.236    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   66.92538

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     143.835    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  113265.953  115531.023       1.985     831.557     418.878     619.754       1.480

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   342.67    -0.12   342.67     0.31   541.71
  MEAN    17.06     0.00    -0.02   342.67    -0.12   342.67     0.31
  HUB     12.51     0.00    -0.02   342.67    -0.12   342.67     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.79    50.47     7.32   543.87   642.92    14.14   513.00     0.58
  MEAN    52.70    47.20     5.50   449.76   565.52    14.14   513.00     0.51
  HUB     43.91    38.62     5.29   329.80   475.68    14.14   513.00     0.43

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   548.32   293.59   463.10  1122.29     0.49
  MEAN    18.04   575.30   333.00   469.13  1119.35     0.51
  HUB     15.00   655.23   443.59   482.24  1113.48     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   526.40   250.29     0.47  6059.10
  MEAN   475.49   490.29   142.49     0.44  6007.94     1.28
  HUB    395.45   484.63    48.14     0.44  6655.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.60     1.17    14.95   548.47     1.05   523.36     0.92     0.91
  MEAN    17.58     1.16    14.68   548.25     1.05   520.61     0.92     0.91
  HUB     17.86     1.18    14.13   551.00     1.05   515.14     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     32.37    28.39    24.20     4.19     0.93     0.26     2.90
  MEAN    35.37    16.90    12.70     4.20     0.92     0.22     3.51     0.91
  HUB     42.61    -5.70    -9.30     3.60     0.92     0.09     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     584.885     332.349     481.285    1119.362       0.523      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.653      14.652     520.667      24.000      34.627      35.400       0.773

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     512.442     332.349     610.781    1126.477       0.455       0.226
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.620      15.285     527.307     528.796       0.021       0.383

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     472.008       0.000     472.008    1130.022       0.418       0.299

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.580     530.632       0.000       0.060       0.037       0.321

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.875      17.570       1.163     549.240      26.430     222.210       1.723

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 164548.391       0.556    1369.114 1440904.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.504   EfDer =  0.994

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   147.236    3021.000      17.570     549.240       1.000       1.000       0.980
W Kg/sec =   66.92538

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
   126.763    2935.809       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113265.953  115531.023       1.600     590.487     369.167     474.134       1.284

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   449.41    -0.15   449.41     0.40   526.47
 MEAN    18.08     0.00    -0.02   449.41    -0.15   449.41     0.40
 HUB     15.21     0.00    -0.02   449.41    -0.15   449.41     0.40

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.33    46.36     3.97   541.76   704.02    15.76   532.37     0.62
 MEAN    46.69    42.30     4.39   476.60   655.18    15.76   532.37     0.58
 HUB     41.75    37.84     3.91   400.98   602.39    15.76   532.37     0.53

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   511.60   208.01   467.40  1145.60     0.45
 MEAN    18.01   524.32   231.68   470.36  1144.12     0.46
 HUB     15.22   569.00   314.50   474.19  1142.57     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   572.35   330.33     0.50  4250.67
 MEAN   474.80   529.47   243.12     0.46  4175.30     1.33
 HUB    401.33   482.07    86.83     0.42  4789.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.47     1.11    16.97   567.24     1.03   545.38     0.92     0.91
 MEAN    19.43     1.11    16.82   566.92     1.03   543.96     0.92     0.91
 HUB     19.72     1.12    16.64   569.52     1.04   542.48     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.99    35.25    31.50     3.75     0.93     0.24     2.90
 MEAN    26.22    27.33    23.50     3.83     0.92     0.25     3.30     0.91
 HUB     33.55    10.38     6.50     3.88     0.92     0.27     3.92


  blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     532.277     232.328     478.897    1144.372       0.465      -0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.510      16.819     544.230      46.000      25.879      30.600       4.721

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     489.966     232.328     542.257    1148.163       0.427       0.136

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.477      17.182     547.842     511.151       0.022       0.237

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     483.672       0.000     483.672    1148.699       0.421       0.134

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.185     548.354       0.000       0.060       0.044       0.137

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.856      19.417       1.105     567.890      18.650     278.452       2.159

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 116152.578       0.401     966.440 1326164.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.504   EfDer =  0.980

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    147.236    3021.000      19.417     567.890       1.000       1.000       0.980
W Kg/sec =   66.92538

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    116.633    2887.200       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 113265.953  115531.023       1.606     545.479     339.675     429.765       1.265

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   454.81    -0.16   454.81     0.40   505.66
 MEAN    17.74     0.00    -0.02   454.81    -0.16   454.81     0.40
 HUB     15.05     0.00    -0.02   454.81    -0.16   454.81     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.33    46.36     2.97   529.11   697.84    17.43   550.62     0.61
 MEAN    45.81    43.40     2.41   467.64   652.45    17.43   550.62     0.57
 HUB     41.11    38.84     2.27   396.77   603.66    17.43   550.62     0.52

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   510.33   184.06   475.98  1162.46      0.44
 MEAN    17.51   522.93   212.84   477.66  1161.69      0.45
 HUB     14.85   567.29   301.82   480.34  1160.83      0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   583.89   338.20     0.50  3649.33
 MEAN   461.53   538.52   248.69     0.46  3728.94      1.30
 HUB    391.49   488.64    89.68     0.42  4484.36

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.12     1.09    18.50   583.33     1.03   561.59     0.92     0.90
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 MEAN    21.16     1.09    18.41   583.67     1.03   560.84     0.92     0.90
 HUB     21.52     1.11    18.28   586.87     1.03   560.00     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.14    35.40    31.50     3.90     0.93     0.21     2.90
 MEAN    24.02    27.50    23.50     4.00     0.91     0.22     3.28     0.90
 HUB     32.14    10.57     6.50     4.07     0.91     0.25     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     528.877     214.240     483.541    1162.109       0.455       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.239      18.423     561.271      46.000      23.896      31.500       7.604

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     503.243     214.240     546.949    1164.393       0.432       0.083

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.190      18.634     563.480     471.992       0.027       0.213

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     488.315       0.000     488.315    1165.670       0.419       0.098

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.705     564.716       0.000       0.060       0.056       0.108

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.822      21.108       1.087     584.625      16.735     291.956       2.263

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 104259.094       0.382     867.481 1315542.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.504   EfDer =  0.959

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.236    3021.000      21.108     584.625       1.000       1.000       0.980
W Kg/sec =   66.92538

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.860    2845.576       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113265.953  115531.023       1.619     513.330     317.044     401.059       1.265

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   457.00    -0.16   457.00     0.39   478.26
 MEAN    16.97     0.00    -0.02   457.00    -0.16   457.00     0.39
 HUB     14.32     0.00    -0.02   457.00    -0.16   457.00     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.02    46.36     1.66   507.76   683.24    18.99   567.19     0.58
 MEAN    44.40    43.80     0.60   447.40   639.65    18.99   567.19     0.55
 HUB     39.57    37.84     1.73   377.52   592.86    18.99   567.19     0.51

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   503.82   156.12   479.02  1177.15     0.43
 MEAN    16.57   514.78   186.16   479.94  1176.79     0.44
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HUB     13.89   555.30   275.82   481.95  1176.33     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    497.74   588.36   341.62     0.50  2950.51
MEAN   436.94   541.51   250.78     0.46  3088.02     1.27
HUB    366.18   490.35    90.37     0.42  3833.38

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.52     1.07    19.85   597.11     1.02   575.92     0.92     0.88
MEAN    22.59     1.07    19.80   597.69     1.02   575.57     0.92     0.88
HUB     22.96     1.09    19.70   600.84     1.03   575.10     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     18.05    35.50    31.50     4.00     0.93     0.18     2.90
MEAN    21.20    27.59    23.50     4.09     0.90     0.20     3.29     0.88
HUB     29.78    10.62     6.50     4.12     0.90     0.23     3.90

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.959

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     505.545     187.204     469.607    1178.448       0.429       0.055

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.659      19.963     577.213      46.000      21.734      32.400      10.666

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     497.469     187.204     531.526    1179.139       0.422       0.069

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.591      19.985     577.889     456.573       0.033       0.190

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     472.697       0.000     472.697    1181.184       0.400       0.056

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      20.127     579.895       0.000       0.060       0.072       0.117

   STAGE EXIT CONDITIONS, STAGE             4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.764      22.478       1.065     598.548      13.923     325.839       2.526

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  86762.523       0.350     721.902 1344311.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.504   EfDer =  0.931

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.236    3021.000      22.478     598.548       1.000       1.000       0.980
W Kg/sec =   66.92538

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.435    2812.286       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113265.953  115531.023       1.692     509.668     301.255     390.276       1.296

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   439.23    -0.15   439.23     0.37   449.59
 MEAN    15.91     0.00    -0.02   439.23    -0.15   439.23     0.37
 HUB     13.07     0.00    -0.02   439.23    -0.15   439.23     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.72    47.36     0.36   482.97   652.94    20.44   582.45     0.55
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MEAN    43.70    44.80    -1.10   419.52   607.49    20.44   582.45     0.51
HUB     38.13    38.84    -0.71   344.57   558.35    20.44   582.45     0.47
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   483.13   140.38   462.29  1191.12     0.41
MEAN    15.50   491.81   164.57   463.46  1190.54     0.41
HUB     12.59   525.77   244.19   465.62  1189.87     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    472.96   569.49   332.58     0.48  2521.20
MEAN   408.57   523.76   244.00     0.44  2552.87     1.25
HUB    331.91   473.81    87.72     0.40  3076.39

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.69     1.05    21.15   609.21     1.02   589.73     0.92     0.85
MEAN    23.71     1.05    21.08   609.35     1.02   589.16     0.92     0.85
HUB     23.97     1.07    20.96   611.56     1.02   588.49     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     16.89    35.73    31.50     4.23     0.93     0.16     2.90
MEAN    19.55    27.77    23.50     4.27     0.90     0.18     3.34     0.85
HUB     27.67    10.67     6.50     4.17     0.90     0.20     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.931

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     496.782     167.589     467.661    1190.815       0.417       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.734      21.052     589.442      46.000      19.715      33.000      13.285

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     503.548     167.589     530.704    1190.244       0.423       -0.082

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      23.571      20.838     588.877     440.827       0.080       0.170

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     468.908       0.000     468.908    1193.082       0.393       0.041

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950      21.164     591.689       0.000       0.060       0.089       0.038

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.697      23.545       1.047     610.039      11.492     367.496       2.849

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  71633.211       0.320     596.019 1403505.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    543355.81   4520.9546    143.8347      1.5585      0.8132      5.5035      1.1668
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 80% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.961   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     145.038    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   65.92652

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     141.688    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  111575.445  113806.719       2.015     831.557     412.626     619.754       1.502

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   337.03    -0.12   337.03     0.30   541.71
  MEAN    17.06     0.00    -0.02   337.03    -0.12   337.03     0.30
  HUB     12.51     0.00    -0.02   337.03    -0.12   337.03     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.22    50.47     7.75   543.87   639.93    14.17   513.32     0.58
  MEAN    53.16    47.20     5.96   449.76   562.12    14.17   513.32     0.51
  HUB     44.39    38.62     5.77   329.80   471.63    14.17   513.32     0.42

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   543.58   298.32   454.40  1123.19     0.48
  MEAN    18.04   569.88   335.66   460.54  1120.12     0.51
  HUB     15.00   648.13   442.75   473.34  1114.25     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   516.51   245.56     0.46  6156.67
  MEAN   475.49   481.30   139.83     0.43  6055.97     1.30
  HUB    395.45   475.69    47.31     0.43  6642.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.65     1.17    15.03   548.88     1.05   524.21     0.92     0.91
  MEAN    17.61     1.17    14.75   548.46     1.05   521.33     0.92     0.91
  HUB     17.86     1.18    14.20   550.94     1.05   515.86     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     33.28    28.39    24.20     4.19     0.93     0.27     2.90
  MEAN    36.09    16.89    12.70     4.19     0.92     0.23     3.51     0.91
  HUB     43.09    -5.71    -9.30     3.59     0.92     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     579.115     335.009     472.380    1120.167       0.517      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.675      14.726     521.416      24.000      35.344      35.400       0.056

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     502.214     335.009     603.697    1127.603       0.445       0.241
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      17.643      15.395     528.361     528.796       0.020       0.394

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     462.928       0.000     462.928    1130.977       0.409       0.311

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      15.674     531.528       0.000       0.060       0.037       0.333

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.877      17.594       1.165     549.428      26.618     219.207       1.699

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 165717.266       0.560    1358.260 1417198.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.961   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.038    3021.000      17.594     549.428       1.000       1.000       0.980
W Kg/sec =   65.92652

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    124.721    2935.308       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111575.445  113806.719       1.626     590.487     363.218     474.134       1.305

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   440.93    -0.15   440.93     0.39   526.38
 MEAN    18.08     0.00    -0.02   440.93    -0.15   440.93     0.39
 HUB     15.21     0.00    -0.02   440.93    -0.15   440.93     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.87    46.36     4.51   541.76   698.63    15.85   533.19     0.62
 MEAN    47.24    42.30     4.94   476.60   649.39    15.85   533.19     0.57
 HUB     42.29    37.84     4.45   400.98   596.09    15.85   533.19     0.53

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   505.67   215.02   457.67  1146.96     0.44
 MEAN    18.01   518.13   236.69   460.90  1145.28     0.45
 HUB     15.22   562.36   316.34   464.95  1143.55     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   560.36   323.32     0.49  4393.75
 MEAN   474.80   518.77   238.10     0.45  4265.61     1.35
 HUB    401.33   472.65    84.99     0.41  4817.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.56     1.11    17.12   568.03     1.03   546.68     0.92     0.91
 MEAN    19.50     1.11    16.95   567.49     1.03   545.07     0.92     0.91
 HUB     19.76     1.12    16.75   569.82     1.04   543.42     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.16    35.24    31.50     3.74     0.93     0.25     2.90
 MEAN    27.18    27.32    23.50     3.82     0.92     0.26     3.30     0.91
 HUB     34.23    10.36     6.50     3.86     0.92     0.27     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     525.826     237.359     469.205    1145.556       0.459       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.582      16.945     545.357      46.000      26.834      30.600       3.766

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     479.303     237.359     534.856    1149.650       0.417       0.154

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.554      17.347     549.262     511.151       0.020       0.251

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     473.080       0.000     473.080    1150.168       0.411       0.152

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.352     549.756       0.000       0.060       0.041       0.156

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864      19.498       1.108     568.446      19.019     271.791       2.107

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 118450.117       0.409     970.847 1302166.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.961   EfDer =  0.986

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    145.038    3021.000      19.498     568.446       1.000       1.000       0.980
W Kg/sec =   65.92652

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    114.471    2885.786       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 111575.445  113806.719       1.636     545.479     333.378     429.765       1.289

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   445.10    -0.15   445.10     0.39   505.41
 MEAN    17.74     0.00    -0.02   445.10    -0.15   445.10     0.39
 HUB     15.05     0.00    -0.02   445.10    -0.15   445.10     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.94    46.36     3.58   529.11   691.54    17.59   551.91     0.60
 MEAN    46.42    43.40     3.02   467.64   645.71    17.59   551.91     0.56
 HUB     41.73    38.84     2.89   396.77   596.37    17.59   551.91     0.52

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   502.83   192.27   464.62  1164.40     0.43
 MEAN    17.51   515.38   218.74   466.66  1163.39     0.44
 HUB     14.85   559.41   304.00   469.60  1162.31     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   569.88   329.98     0.49  3812.02
 MEAN   461.53   526.04   242.79     0.45  3832.07     1.32
 HUB    391.49   477.68    87.49     0.41  4516.76

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     21.30     1.09    18.73   584.58     1.03   563.47     0.92     0.90
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 MEAN    21.31     1.09    18.62   584.66     1.03   562.49     0.92     0.90
 HUB     21.64     1.11    18.46   587.56     1.03   561.43     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.48    35.38    31.50     3.88     0.93     0.22     2.90
 MEAN    25.11    27.49    23.50     3.99     0.91     0.24     3.28     0.90
 HUB     32.92    10.55     6.50     4.05     0.91     0.26     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     521.145     220.173     472.352    1163.820       0.448       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.386      18.633     562.926      46.000      24.991      31.500       6.509

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     490.595     220.173     537.735    1166.485       0.421       0.104

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.345      18.897     565.506     471.992       0.024       0.228

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     475.982       0.000     475.982    1167.701       0.408       0.119

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.969     566.686       0.000       0.060       0.051       0.130

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4         PR4        Texit        Del T       Ns        Ns nondim
      0.837      21.271       1.091     585.602      17.156     283.493       2.198

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 106879.836       0.392     876.014 1290609.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.961   EfDer =  0.968

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    145.038    3021.000      21.271     585.602       1.000       1.000       0.980
W Kg/sec =   65.92652

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    106.501    2843.201       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 111575.445  113806.719       1.655     513.330     310.175     401.059       1.293

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   445.75    -0.15   445.75     0.38   477.86
 MEAN    16.97     0.00    -0.02   445.75    -0.15   445.75     0.38
 HUB     14.32     0.00    -0.02   445.75    -0.15   445.75     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.73    46.36     2.37   507.76   675.77    19.24   569.02     0.58
 MEAN    45.12    43.80     1.32   447.40   631.67    19.24   569.02     0.54
 HUB     40.27    37.84     2.43   377.52   584.24    19.24   569.02     0.50

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   494.43   165.73   465.82  1179.72      0.42
 MEAN    16.57   505.48   193.05   467.17  1179.09      0.43
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 HUB     13.89   545.78   278.37   469.46  1178.36     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   572.03   332.01     0.48  3131.86
 MEAN   436.94   527.00   243.89     0.45  3202.21     1.29
 HUB    366.18   477.60    87.82     0.41  3868.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.80     1.07    20.20   598.85     1.02   578.45     0.92     0.89
 MEAN    22.83     1.07    20.12   599.15     1.02   577.82     0.92     0.89
 HUB     23.17     1.09    20.00   601.97     1.03   577.11     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.58    35.48    31.50     3.98     0.93     0.20     2.90
 MEAN    22.45    27.57    23.50     4.07     0.91     0.21     3.29     0.89
 HUB     30.67    10.60     6.50     4.10     0.91     0.24     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.968

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     496.716     194.137     457.207    1180.673       0.421       0.055

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.903      20.275     579.395      46.000      23.007      32.400       9.393

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     483.147     194.137     520.692    1181.804       0.409       0.091

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.849      20.362     580.505     456.573       0.029       0.207

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     459.042       0.000     459.042    1183.732       0.388       0.081

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.504     582.401       0.000       0.060       0.065       0.141

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.790      22.748       1.069     599.991      14.389     313.946       2.434

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  89670.961       0.362     734.965 1317540.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.961   EfDer =  0.945

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.038    3021.000      22.748     599.991       1.000       1.000       0.980
W Kg/sec =   65.92652

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.803    2808.901       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111575.445  113806.719       1.736     509.668     293.587     390.276       1.329

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   426.87    -0.15   426.87     0.36   449.05
 MEAN    15.91     0.00    -0.02   426.87    -0.15   426.87     0.36
 HUB     13.07     0.00    -0.02   426.87    -0.15   426.87     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.54    47.36     1.18   482.97   644.69    20.80   584.78     0.54
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 MEAN    44.51    44.80    -0.29   419.52   598.61    20.80   584.78     0.50
 HUB     38.92    38.84     0.08   344.57   548.67    20.80   584.78     0.46
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   472.61   151.00   447.84  1194.23     0.40
 MEAN    15.50   481.26   172.20   449.40  1193.36     0.40
 HUB     12.59   514.90   246.99   451.80  1192.43     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   551.56   321.95     0.46  2711.66
 MEAN   408.57   507.77   236.37     0.43  2670.99     1.27
 HUB    331.91   459.71    84.92     0.39  3111.50

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.09     1.06    21.62   611.46     1.02   592.82     0.92     0.87
 MEAN    24.07     1.06    21.51   611.29     1.02   591.96     0.92     0.87
 HUB     24.29     1.07    21.37   613.15     1.02   591.03     0.92     0.87

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.63    35.71    31.50     4.21     0.93     0.18     2.90
 MEAN    20.97    27.74    23.50     4.24     0.90     0.19     3.34     0.87
 HUB     28.66    10.65     6.50     4.15     0.90     0.22     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.945

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      486.123     175.355     453.394    1193.641       0.407       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.096      21.492      592.244      46.000      21.145      33.000      11.855

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      486.380     175.355     517.025    1193.620       0.407       -0.048

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.964      21.372     592.223     440.827       0.070       0.189

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     453.389       0.000     453.389    1196.225       0.379       0.069

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.676     594.811       0.000       0.060       0.080       0.066

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.737      23.937       1.052     611.967      11.976     351.236       2.723

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  74653.930       0.334     611.882 1374609.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    555372.12   4551.9678    141.6879      1.5845      0.8273      5.9606      1.1705
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 80% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     140.038    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   63.65342

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     136.803    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  107728.406  109882.742       2.087     831.557     398.399     619.754       1.556

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   324.31    -0.11   324.31     0.29   541.71
  MEAN    17.06     0.00    -0.02   324.31    -0.11   324.31     0.29
  HUB     12.51     0.00    -0.02   324.31    -0.11   324.31     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.20    50.47     8.73   543.87   633.32    14.24   514.03     0.57
  MEAN    54.21    47.20     7.01   449.76   554.58    14.24   514.03     0.50
  HUB     45.49    38.62     6.87   329.80   462.62    14.24   514.03     0.42

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   533.61   308.81   435.18  1125.12     0.47
  MEAN    18.04   558.19   341.58   441.48  1121.77     0.50
  HUB     15.00   632.55   440.86   453.60  1115.90     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   494.61   235.06     0.44  6373.05
  MEAN   475.49   461.34   133.91     0.41  6162.62     1.35
  HUB    395.45   455.87    45.42     0.41  6614.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.74     1.17    15.21   549.80     1.05   526.02     0.92     0.91
  MEAN    17.65     1.17    14.90   548.91     1.05   522.89     0.92     0.91
  HUB     17.85     1.18    14.35   550.82     1.05   517.41     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     35.36    28.38    24.20     4.18     0.93     0.30     2.90
  MEAN    37.73    16.87    12.70     4.17     0.93     0.26     3.51     0.91
  HUB     44.18    -5.72    -9.30     3.58     0.93     0.12     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     566.673     340.915     452.653    1121.891       0.505      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.720      14.884     523.023      24.000      36.985      35.400      -1.585

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     479.794     340.915     588.579    1130.006       0.425       0.275
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      17.690      15.625     530.616     528.796       0.020       0.419

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     442.983       0.000     442.983    1133.023       0.391       0.338

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      15.873     533.453       0.000       0.060       0.037       0.359

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.879      17.640       1.168     549.844      27.034     212.543       1.648

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 168306.938       0.569    1331.922 1363684.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  1.000

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   140.038    3021.000      17.640     549.844       1.000       1.000       0.980
W Kg/sec =   63.65342

  W cor      RPM cor        GAMMA       Cp          R           Blades       THK
   120.153    2934.197       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107728.406  109882.742       1.688     590.487     349.918     474.134       1.355

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   422.26    -0.15   422.26     0.37   526.18
 MEAN    18.08     0.00    -0.02   422.26    -0.15   422.26     0.37
 HUB     15.21     0.00    -0.02   422.26    -0.15   422.26     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.07    46.36     5.71   541.76   687.00    16.03   534.95     0.61
 MEAN    48.47    42.30     6.17   476.60   636.86    16.03   534.95     0.56
 HUB     43.53    37.84     5.69   400.98   582.42    16.03   534.95     0.51

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   493.58   230.16   436.64  1149.82     0.43
 MEAN    18.01   505.21   247.62   440.36  1147.74     0.44
 HUB     15.22   548.13   320.31   444.80  1145.63     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   534.43   308.17     0.46  4702.95
 MEAN   474.80   495.51   227.18     0.43  4462.24     1.39
 HUB    401.33   452.12    81.02     0.39  4878.25

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.76     1.12    17.41   569.75     1.04   549.41     0.92     0.91
 MEAN    19.65     1.11    17.20   568.73     1.03   547.42     0.92     0.91
 HUB     19.85     1.13    16.96   570.50     1.04   545.41     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.80    35.21    31.50     3.71     0.93     0.28     2.90
 MEAN    29.35    27.29    23.50     3.79     0.93     0.28     3.30     0.91
 HUB     35.76    10.32     6.50     3.82     0.93     0.29     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     512.371     248.314     448.178    1148.053       0.446       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.727      17.203     547.738      46.000      28.989      30.600       1.611

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     456.397     248.314     519.576    1152.789       0.396       0.193

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.707      17.686     552.266     511.151       0.018       0.283

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     450.410       0.000     450.410    1153.263       0.391       0.191

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.692     552.720       0.000       0.060       0.037       0.196

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.875      19.656       1.114     569.661      19.818     257.893       1.999

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 123426.102       0.426     976.751 1248642.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  0.995

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    140.038    3021.000      19.656     569.661       1.000       1.000       0.980
W Kg/sec =   63.65342

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
    109.751    2882.708       1.402       0.249      53.349      56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 107728.406  109882.742       1.707     545.479     319.631     429.765       1.345

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   424.23    -0.15   424.23     0.37   504.87
 MEAN    17.74      0.00    -0.02   424.23    -0.15   424.23     0.37
 HUB     15.05      0.00    -0.02   424.23    -0.15   424.23     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.29     46.36     4.93   529.11   678.30    17.91   554.63     0.59
 MEAN    47.80     43.40     4.40   467.64   631.51    17.91   554.63     0.55
 HUB     43.09     38.84     4.25   396.77   580.96    17.91   554.63     0.50

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   488.01    209.63    440.69  1168.41       0.42
 MEAN    17.51   500.05    231.23    443.37  1166.93       0.43
 HUB     14.85   543.01    308.61    446.79  1165.41       0.47

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26    540.31    312.62     0.46  4155.78
 MEAN   461.53    499.62    230.30     0.43  4050.66      1.36
 HUB    391.49    454.41     82.89     0.39  4585.02

         Pt2       PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     21.65      1.10     19.20   587.25      1.03    567.36      0.92      0.91
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 MEAN    21.60     1.10    19.03   586.80     1.03   565.93     0.92     0.91
 HUB     21.87     1.11    18.84   589.07     1.03   564.45     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.44    35.35    31.50     3.85     0.93     0.26     2.90
 MEAN    27.54    27.45    23.50     3.95     0.92     0.26     3.28     0.91
 HUB     34.63    10.51     6.50     4.01     0.92     0.29     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     505.472     232.749     448.698    1167.377       0.433       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.678      19.055     566.373      46.000      27.417      31.500       4.083

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     464.187     232.749     519.270    1170.817       0.396       0.150

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.653      19.427     569.716     471.992       0.020       0.264

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     450.311       0.000     450.311    1171.905       0.384       0.165

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      19.498     570.775       0.000       0.060       0.042       0.177

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.861      21.592       1.098     587.706      18.045     266.471       2.066

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 112422.359       0.412     889.671 1235502.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  0.984

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    140.038    3021.000       21.592     587.706       1.000        1.000        0.980
W Kg/sec =   63.65342

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    101.483    2838.107        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 107728.406  109882.742        1.737     513.330     295.560     401.059       1.357

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   422.26    -0.15   422.26      0.36   477.00
 MEAN    16.97      0.00    -0.02   422.26    -0.15   422.26      0.36
 HUB     14.32      0.00    -0.02   422.26    -0.15   422.26      0.36

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     50.26    46.36     3.90   507.76   660.51     19.74   572.82      0.56
 MEAN    46.67    43.80     2.87   447.40   615.31     19.74   572.82      0.52
 HUB     41.81    37.84     3.97   377.52   566.51     19.74   572.82      0.48

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2      Ao2          Mach2
 TIP     18.88   476.34   185.43   438.77  1184.95      0.40
 MEAN    16.57   487.14   207.23   440.86  1183.78      0.41
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 HUB     13.89   526.57   283.62   443.66  1182.56     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   538.57   312.31     0.45  3503.67
 MEAN   436.94   497.11   229.71     0.42  3437.09     1.33
 HUB    366.18   451.27    82.56     0.38  3941.58

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.35     1.08    20.89   602.53     1.03   583.59     0.92     0.90
 MEAN    23.32     1.08    20.75   602.25     1.02   582.44     0.92     0.90
 HUB     23.58     1.09    20.58   604.38     1.03   581.24     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.91    35.44    31.50     3.94     0.93     0.23     2.90
 MEAN    25.18    27.52    23.50     4.02     0.91     0.24     3.29     0.90
 HUB     32.59    10.54     6.50     4.04     0.91     0.27     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     479.323     208.397     431.650    1185.225       0.404       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.390      20.895     583.874      46.000      25.771      32.400       6.629

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     454.046     208.397     499.586    1187.223       0.382       0.140

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.357      21.113     585.843     456.573       0.022       0.246

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     431.354       0.000     431.354    1188.921       0.363       0.134

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.253     587.521       0.000       0.060       0.051       0.192

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.835      23.280       1.078     603.053      15.347     291.136       2.257

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  95643.555       0.386     756.889 1259035.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.038    3021.000      23.280     603.053       1.000       1.000       0.980
W Kg/sec =   63.65342

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.347    2801.762       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107728.406  109882.742       1.835     509.668     277.699     390.276       1.405

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   401.69    -0.14   401.69     0.34   447.91
 MEAN    15.91     0.00    -0.02   401.69    -0.14   401.69     0.34
 HUB     13.07     0.00    -0.02   401.69    -0.14   401.69     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.26    47.36     2.90   482.97   628.29    21.51   589.59     0.53
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 MEAN    46.25    44.80     1.45   419.52   580.92    21.51   589.59     0.49
 HUB     40.63    38.84     1.79   344.57   529.32    21.51   589.59     0.44
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   452.95   172.30   418.90  1200.45     0.38
 MEAN    15.50   461.02   187.57   421.14  1199.05     0.38
 HUB     12.59   493.56   252.69   423.97  1197.61     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   515.63   300.66     0.43  3093.57
 MEAN   408.57   475.60   220.99     0.40  2909.14     1.33
 HUB    331.91   431.31    79.22     0.36  3183.16

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.88     1.07    22.55   616.14     1.02   599.01     0.92     0.89
 MEAN    24.78     1.06    22.38   615.36     1.02   597.62     0.92     0.89
 HUB     24.93     1.07    22.18   616.52     1.02   596.19     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.36    35.67    31.50     4.17     0.93     0.23     2.90
 MEAN    24.01    27.69    23.50     4.19     0.91     0.23     3.34     0.89
 HUB     30.80    10.58     6.50     4.08     0.91     0.24     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     465.731     191.013     424.759    1199.324       0.388       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.815      22.362     597.900      46.000      24.213      33.000       8.787

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     452.678     191.013     491.328    1200.327       0.377       0.021

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.737      22.422     598.901     440.827       0.051       0.231

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     422.685       0.000     422.685    1202.521       0.351       0.130

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.686     601.092       0.000       0.060       0.062       0.127

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.803      24.711       1.062     616.003      12.950     321.291       2.491

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  80733.531       0.361     638.897 1312063.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    580532.50   4594.1294    136.8026      1.6357      0.8501      7.0126      1.1783
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 80% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     135.209    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   61.45868

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     132.086    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  104013.984  106094.039       2.162     831.557     384.662     619.754       1.611

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   312.15    -0.11   312.15     0.28   541.71
  MEAN    17.06     0.00    -0.02   312.15    -0.11   312.15     0.28
  HUB     12.51     0.00    -0.02   312.15    -0.11   312.15     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.15    50.47     9.68   543.87   627.18    14.30   514.67     0.56
  MEAN    55.24    47.20     8.04   449.76   547.56    14.30   514.67     0.49
  HUB     46.58    38.62     7.96   329.80   454.18    14.30   514.67     0.41

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   524.98   318.57   417.27  1126.84     0.47
  MEAN    18.04   547.66   347.08   423.65  1123.26     0.49
  HUB     15.00   618.19   439.09   435.16  1117.38     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   474.21   225.31     0.42  6574.24
  MEAN   475.49   442.68   128.41     0.39  6261.69     1.39
  HUB    395.45   437.34    43.64     0.39  6587.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.83     1.18    15.36   550.65     1.05   527.63     0.92     0.91
  MEAN    17.69     1.17    15.03   549.33     1.05   524.28     0.92     0.91
  HUB     17.83     1.18    14.48   550.71     1.05   518.79     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     37.36    28.37    24.20     4.17     0.93     0.33     2.90
  MEAN    39.33    16.86    12.70     4.16     0.93     0.28     3.51     0.91
  HUB     45.26    -5.73    -9.30     3.57     0.93     0.15     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     555.477     346.401     434.237    1123.430       0.494      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.757      15.021     524.458      24.000      38.580      35.400      -3.180

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     459.132     346.401     575.148    1132.141       0.406       0.306
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.725      15.824     532.623     528.796       0.021       0.444

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     424.556       0.000     424.556    1134.850       0.374       0.361

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.042     535.175       0.000       0.060       0.040       0.383

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.877      17.672       1.170     550.230      27.420     206.314       1.599

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 170711.172       0.577    1304.368 1312555.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.209    3021.000      17.672     550.230       1.000       1.000       0.980
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    115.839    2933.167       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       1.750     590.487     337.352     474.134       1.405

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   404.97    -0.14   404.97     0.36   526.00
 MEAN    18.08     0.00    -0.02   404.97    -0.14   404.97     0.36
 HUB     15.21     0.00    -0.02   404.97    -0.14   404.97     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.23    46.36     6.87   541.76   676.51    16.18   536.53     0.60
 MEAN    49.65    42.30     7.35   476.60   625.53    16.18   536.53     0.55
 HUB     44.73    37.84     6.89   400.98   570.00    16.18   536.53     0.50

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   483.57   243.88   417.57  1152.31     0.42
 MEAN    18.01   494.06   257.54   421.63  1149.90     0.43
 HUB     15.22   535.44   323.92   426.35  1147.48     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   510.95   294.45     0.44  4982.95
 MEAN   474.80   474.31   217.26     0.41  4640.83     1.43
 HUB    401.33   433.32    77.41     0.38  4933.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.93     1.13    17.65   571.32     1.04   551.80     0.92     0.91
 MEAN    19.77     1.12    17.41   569.88     1.04   549.49     0.92     0.91
 HUB     19.91     1.13    17.14   571.11     1.04   547.17     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.29    35.19    31.50     3.69     0.93     0.31     2.90
 MEAN    31.42    27.26    23.50     3.76     0.93     0.30     3.30     0.91
 HUB     37.23    10.29     6.50     3.79     0.93     0.31     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     500.775     258.264     429.040    1150.243       0.435       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.843      17.417     549.830      46.000      31.046      30.600      -0.446

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     435.793     258.264     506.573    1155.547       0.377       0.230

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.825      17.969     554.912     511.151       0.017       0.314

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     430.115       0.000     430.115    1155.974       0.372       0.225

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.972     555.323       0.000       0.060       0.037       0.231

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      19.777       1.119     570.772      20.542     245.847       1.906

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 127938.578       0.441     977.552 1198238.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    135.209    3021.000      19.777     570.772       1.000       1.000       0.980
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    105.423    2879.902       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 104013.984  106094.039       1.777     545.479     307.026     429.765       1.400

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   405.48    -0.14   405.48     0.35   504.38
 MEAN    17.74     0.00    -0.02   405.48    -0.14   405.48     0.35
 HUB     15.05     0.00    -0.02   405.48    -0.14   405.48     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.54    46.36     6.18   529.11   666.72    18.17   557.04     0.58
 MEAN    49.08    43.40     5.68   467.64   619.06    18.17   557.04     0.53
 HUB     44.39    38.84     5.55   396.77   567.41    18.17   557.04     0.49

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   476.13    224.85    419.69  1171.84      0.41
 MEAN    17.51   487.29    242.23    422.82  1169.99      0.42
 HUB     14.85   528.89    312.66    426.57  1168.11      0.45

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26    514.39    297.41     0.44  4457.06
 MEAN   461.53    476.31    219.30     0.41  4243.11     1.40
 HUB    391.49    433.79     78.83     0.37  4645.17

         Pt2       PR       Ps2      Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     21.94     1.11     19.58    589.63     1.03    570.71     0.92      0.91
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 MEAN    21.83     1.10    19.37   588.73     1.03   568.90     0.92     0.91
 HUB     22.04     1.11    19.14   590.43     1.03   567.08     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.18    35.32    31.50     3.82     0.93     0.29     2.90
 MEAN    29.81    27.41    23.50     3.91     0.92     0.29     3.28     0.91
 HUB     36.24    10.47     6.50     3.97     0.92     0.31     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     492.448     243.820     427.851    1170.439       0.421       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.911      19.396     569.350      46.000      29.678      31.500       1.822

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     441.246     243.820     504.129    1174.534       0.376       0.192

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.893      19.858     573.342     471.992       0.017       0.297

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     428.105       0.000     428.105    1175.511       0.364       0.206

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      19.925     574.296       0.000       0.060       0.038       0.218

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      21.839       1.104     589.598      18.826     252.364       1.956

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 117290.453       0.430     896.192 1184124.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.994

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    135.209    3021.000       21.839     589.598       1.000       1.000       0.980
W Kg/sec =   61.45868

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     97.030    2833.551        1.402       0.249      53.349      56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 104013.984  106094.039        1.817     513.330     282.592     401.059       1.419

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   401.85    -0.14   401.85      0.34   476.24
 MEAN    16.97      0.00    -0.02   401.85    -0.14   401.85      0.34
 HUB     14.32      0.00    -0.02   401.85    -0.14   401.85      0.34

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     51.65    46.36     5.29   507.76   647.64     20.15   576.12     0.55
 MEAN    48.08    43.80     4.28   447.40   601.48     20.15   576.12     0.51
 HUB     43.22    37.84     5.38   377.52   551.46     20.15   576.12     0.47

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   462.36    202.16   415.83  1189.32      0.39
 MEAN    16.57   472.40    219.31   418.41  1187.75      0.40
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 HUB     13.89   510.60   288.09   421.57  1186.14     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   510.18   295.58     0.43  3819.35
 MEAN   436.94   471.63   217.63     0.40  3637.12     1.38
 HUB    366.18   428.74    78.09     0.36  4003.56

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.80     1.09    21.44   605.76     1.03   587.91     0.92     0.91
 MEAN    23.70     1.09    21.25   604.98     1.03   586.36     0.92     0.91
 HUB     23.90     1.09    21.04   606.53     1.03   584.77     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.93    35.41    31.50     3.91     0.93     0.27     2.90
 MEAN    27.66    27.48    23.50     3.98     0.92     0.27     3.29     0.91
 HUB     34.35    10.49     6.50     3.99     0.92     0.29     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     465.398     220.541     409.826    1189.076       0.391       0.053

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.773      21.388     587.678      46.000      28.286      32.400       4.114

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     429.588     220.541     482.892    1191.779       0.360       0.183

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.753      21.711     590.353     456.573       0.018       0.282

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     408.169       0.000     408.169    1193.290       0.342       0.179

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.846     591.851       0.000       0.060       0.042       0.236

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.861      23.690       1.085     605.758      16.161     273.205       2.118

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 100720.828       0.407     769.587 1205131.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.209    3021.000      23.690     605.758       1.000       1.000       0.980
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     90.665    2795.498       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       1.930     509.668     264.064     390.276       1.478

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   380.51    -0.13   380.51     0.32   446.91
 MEAN    15.91     0.00    -0.02   380.51    -0.13   380.51     0.32
 HUB     13.07     0.00    -0.02   380.51    -0.13   380.51     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.77    47.36     4.41   482.97   614.96    22.08   593.67     0.51
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 MEAN    47.80    44.80     3.00   419.52   566.47    22.08   593.67     0.47
 HUB     42.17    38.84     3.33   344.57   513.43    22.08   593.67     0.43
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   438.34   189.85   395.09  1205.56     0.36
 MEAN    15.50   445.34   200.30   397.75  1203.77     0.37
 HUB     12.59   476.38   257.38   400.87  1201.96     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   486.05   283.11     0.40  3408.28
 MEAN   408.57   448.97   208.26     0.37  3106.33     1.37
 HUB    331.91   407.74    74.54     0.34  3242.09

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.51     1.08    23.28   620.17     1.02   604.14     0.92     0.90
 MEAN    25.35     1.07    23.06   618.90     1.02   602.34     0.92     0.90
 HUB     25.42     1.07    22.81   619.47     1.02   600.53     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.67    35.62    31.50     4.12     0.93     0.26     2.90
 MEAN    26.73    27.64    23.50     4.14     0.91     0.26     3.34     0.90
 HUB     32.70    10.53     6.50     4.03     0.91     0.27     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     449.992     203.978     401.106    1204.035       0.374      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.380      23.044     602.613      46.000      26.955      33.000       6.045

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     425.519     203.978     471.883    1205.820       0.353       0.080

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.334      23.242     604.401     440.827       0.039       0.269

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     397.770       0.000     397.770    1207.720       0.329       0.182

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.478     606.308       0.000       0.060       0.049       0.180

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.843      25.311       1.068     619.512      13.754     298.881       2.317

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  85750.484       0.383     655.201 1254982.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    602411.50   4602.8994    132.0858      1.6754      0.8622      8.0445      1.1850
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 80% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     131.020    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   59.55438

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     127.993    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  100791.102  102806.711       2.231     831.557     372.744     619.754       1.663

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   301.69    -0.10   301.69     0.27   541.71
  MEAN    17.06     0.00    -0.02   301.69    -0.10   301.69     0.27
  HUB     12.51     0.00    -0.02   301.69    -0.10   301.69     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.99    50.47    10.52   543.87   622.04    14.35   515.21     0.56
  MEAN    56.15    47.20     8.95   449.76   541.66    14.35   515.21     0.49
  HUB     47.56    38.62     8.94   329.80   447.05    14.35   515.21     0.40

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   518.19   326.74   402.19  1128.23     0.46
  MEAN    18.04   539.10   351.70   408.57  1124.46     0.48
  HUB     15.00   606.22   437.56   419.58  1118.58     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   457.06   217.13     0.41  6742.85
  MEAN   475.49   426.92   123.79     0.38  6344.99     1.43
  HUB    395.45   421.69    42.11     0.38  6564.67

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.90     1.18    15.48   551.37     1.05   528.94     0.92     0.91
  MEAN    17.72     1.17    15.14   549.68     1.05   525.41     0.92     0.91
  HUB     17.82     1.18    14.59   550.61     1.05   519.92     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     39.09    28.36    24.20     4.16     0.93     0.36     2.90
  MEAN    40.72    16.86    12.70     4.16     0.93     0.31     3.51     0.91
  HUB     46.20    -5.73    -9.30     3.57     0.93     0.17     4.78

    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.996

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     546.368     351.014     418.697    1124.673       0.486      -0.003

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      17.784      15.130     525.620      24.000      39.975      35.400      -4.575

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     441.869     351.014     564.322    1133.864       0.390       0.333

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.749      15.982     534.245     528.796       0.023       0.466

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     409.131       0.000     409.131    1136.330       0.360       0.381

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.173     536.572       0.000       0.060       0.044       0.403

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      17.691       1.171     550.553      27.743     201.055       1.559

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 172722.875       0.584    1278.847 1268596.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.020    3021.000      17.691     550.553       1.000       1.000       0.980
W Kg/sec =   59.55438

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    112.159    2932.307       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100791.102  102806.711       1.808     590.487     326.637     474.134       1.452

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   390.46    -0.13   390.46     0.34   525.84
 MEAN    18.08     0.00    -0.02   390.46    -0.13   390.46     0.34
 HUB     15.21     0.00    -0.02   390.46    -0.13   390.46     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.23    46.36     7.87   541.76   667.92    16.30   537.82     0.59
 MEAN    50.68    42.30     8.38   476.60   616.23    16.30   537.82     0.54
 HUB     45.77    37.84     7.93   400.98   559.78    16.30   537.82     0.49

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   476.01   255.14   401.86  1154.29     0.41
 MEAN    18.01   485.33   265.73   406.12  1151.63     0.42
 HUB     15.22   525.16   326.90   411.00  1148.97     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   491.62   283.20     0.43  5212.74
 MEAN   474.80   456.77   209.07     0.40  4788.16     1.47
 HUB    401.33   417.69    74.42     0.36  4978.48

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.05     1.13    17.84   572.62     1.04   553.70     0.92     0.91
 MEAN    19.85     1.12    17.57   570.82     1.04   551.15     0.92     0.91
 HUB     19.94     1.13    17.28   571.63     1.04   548.60     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.41    35.17    31.50     3.67     0.93     0.33     2.90
 MEAN    33.20    27.24    23.50     3.74     0.93     0.32     3.30     0.91
 HUB     38.50    10.26     6.50     3.76     0.93     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     491.679     266.473     413.207    1151.990       0.427       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.926      17.577     551.503      46.000      32.818      30.600      -2.218

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     418.901     266.473     496.474    1157.756       0.362       0.261

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.908      18.184     557.037     511.151       0.018       0.340

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     413.541       0.000     413.541    1158.143       0.357       0.253

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.181     557.410       0.000       0.060       0.038       0.260

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      19.858       1.122     571.691      21.138     236.278       1.832

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 131651.844       0.454     974.755 1155394.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    131.020    3021.000      19.858     571.691       1.000       1.000       0.980
W Kg/sec =   59.55438

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    101.820    2877.585       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 100791.102  102806.711       1.840     545.479     296.535     429.765       1.449

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   390.13    -0.13   390.13     0.34   503.98
 MEAN    17.74     0.00    -0.02   390.13    -0.13   390.13     0.34
 HUB     15.05     0.00    -0.02   390.13    -0.13   390.13     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.60    46.36     7.24   529.11   657.49    18.36   558.98     0.57
 MEAN    50.17    43.40     6.77   467.64   609.11    18.36   558.98     0.53
 HUB     45.49    38.84     6.65   396.77   556.53    18.36   558.98     0.48

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   467.40   237.05   402.83  1174.53      0.40
 MEAN    17.51   477.57   251.11   406.23  1172.41      0.41
 HUB     14.85   517.77   315.95   410.19  1170.26      0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   493.58   285.21     0.42  4698.60
 MEAN   461.53   457.49   210.42     0.39  4398.37     1.44
 HUB    391.49   417.09    75.54     0.36  4693.90

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     22.15     1.12    19.86   591.58     1.03   573.34     0.92     0.91
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 MEAN    22.00     1.11    19.62   590.30     1.03   571.26     0.92     0.91
 HUB     22.15     1.12    19.36   591.56     1.03   569.17     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.47    35.30    31.50     3.80     0.93     0.31     2.90
 MEAN    31.72    27.38    23.50     3.88     0.93     0.31     3.28     0.91
 HUB     37.61    10.43     6.50     3.93     0.93     0.32     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     482.531     252.753     411.038    1172.854       0.411       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.075      19.644     571.705      46.000      31.588      31.500      -0.088

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     422.942     252.753     492.710    1177.466       0.359       0.226

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.060      20.176     576.210     471.992       0.016       0.325

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     410.452       0.000     410.452    1178.353       0.348       0.238

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.235     577.079       0.000       0.060       0.037       0.250

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.879      22.009       1.108     591.145      19.454     241.516       1.872

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 121205.898       0.444     897.413 1140754.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.998

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    131.020    3021.000       22.009     591.145       1.000       1.000       0.980
W Kg/sec =   59.55438

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     93.420    2829.840        1.402       0.249      53.349      56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 100791.102  102806.711        1.887     513.330     272.080     401.059       1.474

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   385.57    -0.13   385.57     0.33   475.61
 MEAN    16.97      0.00    -0.02   385.57    -0.13   385.57     0.33
 HUB     14.32      0.00    -0.02   385.57    -0.13   385.57     0.33

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     52.80    46.36     6.44   507.76   637.66     20.44   578.74     0.54
 MEAN    49.25    43.80     5.45   447.40   590.72     20.44   578.74     0.50
 HUB     44.41    37.84     6.57   377.52   539.71     20.44   578.74     0.46

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   452.35   215.20   397.88  1192.70      0.38
 MEAN    16.57   461.48   228.81   400.76  1190.84      0.39
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 HUB     13.89   498.35   291.59   404.15  1188.95     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   487.99   282.53     0.41  4065.61
 MEAN   436.94   451.59   208.13     0.38  3794.45     1.42
 HUB    366.18   410.97    74.60     0.35  4052.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.12     1.10    21.84   608.34     1.03   591.26     0.92     0.91
 MEAN    23.97     1.09    21.61   607.20     1.03   589.42     0.92     0.91
 HUB     24.11     1.10    21.36   608.29     1.03   587.56     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.41    35.38    31.50     3.88     0.93     0.29     2.90
 MEAN    29.72    27.44    23.50     3.94     0.92     0.29     3.29     0.91
 HUB     35.81    10.46     6.50     3.96     0.92     0.31     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     455.111     230.093     392.662    1192.077       0.382       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.043      21.740     590.653      46.000      30.370      32.400       2.030

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     410.574     230.093     470.652    1195.320       0.343       0.219

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.030      22.144     593.872     456.573       0.016       0.313

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     390.205       0.000     390.205    1196.690       0.326       0.215

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.270     595.233       0.000       0.060       0.038       0.270

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      23.974       1.089     607.943      16.798     259.960       2.015

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 104693.891       0.423     775.158 1159984.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.020    3021.000      23.974     607.943       1.000       1.000       0.980
W Kg/sec =   59.55438

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.972    2790.471       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100791.102  102806.711       2.012     509.668     253.309     390.276       1.541

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   364.04    -0.13   364.04     0.30   446.11
 MEAN    15.91     0.00    -0.02   364.04    -0.13   364.04     0.30
 HUB     13.07     0.00    -0.02   364.04    -0.13   364.04     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.00    47.36     5.64   482.97   604.91    22.49   596.88     0.50
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 MEAN    49.06    44.80     4.26   419.52   555.54    22.49   596.88     0.46
 HUB     43.44    38.84     4.60   344.57   501.34    22.49   596.88     0.42
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   428.21   203.24   376.91  1209.47     0.35
 MEAN    15.50   434.02   210.03   379.82  1207.41     0.36
 HUB     12.59   463.56   260.99   383.11  1205.33     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   463.47   269.72     0.38  3648.43
 MEAN   408.57   428.58   198.54     0.35  3256.89     1.42
 HUB    331.91   389.62    70.92     0.32  3287.51

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.96     1.08    23.80   623.37     1.03   608.07     0.92     0.91
 MEAN    25.74     1.07    23.54   621.72     1.02   606.00     0.92     0.91
 HUB     25.76     1.07    23.26   621.85     1.02   603.91     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.33    35.59    31.50     4.09     0.93     0.29     2.90
 MEAN    28.94    27.60    23.50     4.10     0.92     0.28     3.34     0.91
 HUB     34.26    10.49     6.50     3.99     0.92     0.29     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     438.660     213.877     382.987    1207.658       0.363      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.776      23.528     606.253      46.000      29.181      33.000       3.819

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     405.075     213.877     458.071    1210.011       0.335       0.126

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.748      23.824     608.617     440.827       0.032       0.301

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     378.948       0.000     378.948    1211.709       0.313       0.223

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      24.038     610.327       0.000       0.060       0.042       0.220

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.864      25.726       1.073     622.311      14.368     282.910       2.193

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  89583.523       0.400     663.280 1207453.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    619858.00   4589.4526    127.9930      1.7029      0.8665      8.9529      1.1903
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 80% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  0.991

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     126.046    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   57.29363

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     123.134    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       2.319     831.557     358.594     619.754       1.728

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   289.39    -0.10   289.39     0.26   541.71
  MEAN    17.06     0.00    -0.02   289.39    -0.10   289.39     0.26
  HUB     12.51     0.00    -0.02   289.39    -0.10   289.39     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.99    50.47    11.52   543.87   616.16    14.41   515.82     0.55
  MEAN    57.25    47.20    10.05   449.76   534.90    14.41   515.82     0.48
  HUB     48.74    38.62    10.12   329.80   438.84    14.41   515.82     0.39

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   510.93   336.16   384.78  1129.77     0.45
  MEAN    18.04   529.54   357.00   391.11  1125.80     0.47
  HUB     15.00   592.54   435.76   401.52  1119.93     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   437.26   207.72     0.39  6936.94
  MEAN   475.49   408.66   118.49     0.36  6440.60     1.48
  HUB    395.45   403.53    40.32     0.36  6537.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.97     1.19    15.61   552.19     1.06   530.38     0.92     0.91
  MEAN    17.75     1.17    15.25   550.09     1.05   526.67     0.92     0.91
  HUB     17.79     1.18    14.70   550.50     1.05   521.17     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     41.14    28.36    24.20     4.16     0.93     0.38     2.90
  MEAN    42.39    16.85    12.70     4.15     0.94     0.33     3.51     0.91
  HUB     47.34    -5.73    -9.30     3.57     0.94     0.19     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     536.210     356.309     400.705    1126.052       0.476      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.810      15.246     526.909      24.000      41.644      35.400      -6.244

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     422.054     356.309     552.345    1135.773       0.372       0.364
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      17.769      16.151     536.046     528.796       0.025       0.492

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     391.390       0.000     391.390    1137.978       0.344       0.402

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      16.312     538.129       0.000       0.060       0.050       0.424

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.866      17.705       1.172     550.924      28.114     194.961       1.511

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 175032.500       0.592    1246.752 1216867.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  0.993

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   126.046    3021.000      17.705     550.924       1.000       1.000       0.980
W Kg/sec =   57.29363

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
   107.855    2931.319       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 96964.961   98904.055       1.880     590.487     314.102     474.134       1.509

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   373.74    -0.13   373.74     0.33   525.67
 MEAN    18.08     0.00    -0.02   373.74    -0.13   373.74     0.33
 HUB     15.21     0.00    -0.02   373.74    -0.13   373.74     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.41    46.36     9.05   541.76   658.28    16.43   539.26     0.58
 MEAN    51.90    42.30     9.60   476.60   605.77    16.43   539.26     0.53
 HUB     47.02    37.84     9.18   400.98   548.25    16.43   539.26     0.48

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   468.24   267.88   384.04  1156.46     0.40
 MEAN    18.01   475.94   275.01   388.44  1153.54     0.41
 HUB     15.22   513.67   330.24   393.45  1150.62     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   469.72   270.46     0.41  5472.74
 MEAN   474.80   436.81   199.79     0.38  4955.27     1.51
 HUB    401.33   399.82    71.08     0.35  5029.25

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.18     1.14    18.02   574.09     1.04   555.78     0.92     0.91
 MEAN    19.94     1.13    17.73   571.90     1.04   552.99     0.92     0.91
 HUB     19.97     1.13    17.41   572.21     1.04   550.18     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.90    35.15    31.50     3.65     0.93     0.36     2.90
 MEAN    35.30    27.22    23.50     3.72     0.94     0.35     3.30     0.91
 HUB     40.01    10.24     6.50     3.74     0.94     0.35     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     481.898     275.784     395.182    1153.909       0.418       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.005      17.740     553.344      46.000      34.910      30.600      -4.310

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     399.818     275.784     485.707    1160.193       0.345       0.297

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.984      18.406     559.387     511.151       0.019       0.372

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     394.880       0.000     394.880    1160.533       0.340       0.283

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.393     559.715       0.000       0.060       0.043       0.291

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      19.930       1.126     572.736      21.812     225.783       1.750

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 135851.672       0.469     967.668 1105473.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  0.998

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    126.046    3021.000      19.930     572.736       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     97.694    2874.958       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       1.917     545.479     284.520     429.765       1.510

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   372.79    -0.13   372.79     0.32   503.52
 MEAN    17.74     0.00    -0.02   372.79    -0.13   372.79     0.32
 HUB     15.05     0.00    -0.02   372.79    -0.13   372.79     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.84    46.36     8.48   529.11   647.35    18.56   561.13     0.56
 MEAN    51.45    43.40     8.05   467.64   598.15    18.56   561.13     0.51
 HUB     46.79    38.84     7.95   396.77   544.51    18.56   561.13     0.47

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   458.61   250.55   384.12  1177.45     0.39
 MEAN    17.51   467.35   260.93   387.73  1175.04     0.40
 HUB     14.85   505.65   319.56   391.87  1172.63     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   470.50   271.71     0.40  4965.96
 MEAN   461.53   436.55   200.60     0.37  4570.22     1.49
 HUB    391.49   398.41    71.93     0.34  4747.39

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.36     1.12    20.14   593.75     1.04   576.19     0.92     0.91
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 MEAN    22.16     1.11    19.87   592.08     1.03   573.84     0.92     0.91
 HUB     22.25     1.12    19.58   592.83     1.04   571.48     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.12    35.27    31.50     3.77     0.93     0.34     2.90
 MEAN    33.94    27.36    23.50     3.86     0.93     0.34     3.28     0.91
 HUB     39.20    10.40     6.50     3.90     0.93     0.34     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     472.107     262.640     392.308    1175.484       0.402       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.231      19.890     574.276      46.000      33.801      31.500      -2.301

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     402.735     262.640     480.807    1180.658       0.341       0.265

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.215      20.495     579.343     471.992       0.017       0.359

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     391.027       0.000     391.027    1181.449       0.331       0.272

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.542     580.119       0.000       0.060       0.038       0.285

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      22.163       1.112     592.885      20.149     229.954       1.783

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 125536.398       0.460     894.192 1090492.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    126.046    3021.000      22.163     592.885       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     89.382    2825.684       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       1.972     513.330     260.319     401.059       1.541

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   367.60    -0.13   367.60     0.31   474.91
 MEAN    16.97     0.00    -0.02   367.60    -0.13   367.60     0.31
 HUB     14.32     0.00    -0.02   367.60    -0.13   367.60     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.10    46.36     7.74   507.76   626.96    20.73   581.61     0.53
 MEAN    50.60    43.80     6.80   447.40   579.15    20.73   581.61     0.49
 HUB     45.77    37.84     7.93   377.52   527.02    20.73   581.61     0.45

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   442.49   229.34   378.42  1196.32     0.37
 MEAN    16.57   450.26   239.09   381.54  1194.17     0.38
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 HUB     13.89   485.35   295.39   385.11  1192.01     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   463.93   268.39     0.39  4332.43
 MEAN   436.94   429.79   197.85     0.36  3964.73     1.46
 HUB    366.18   391.56    70.79     0.33  4104.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.43     1.10    22.22   611.21     1.03   594.87     0.92     0.91
 MEAN    24.23     1.09    21.96   609.66     1.03   592.73     0.92     0.91
 HUB     24.31     1.10    21.68   610.25     1.03   590.59     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.22    35.35    31.50     3.85     0.93     0.32     2.90
 MEAN    32.07    27.41    23.50     3.91     0.93     0.32     3.29     0.91
 HUB     37.49    10.42     6.50     3.92     0.93     0.33     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     444.572     240.430     373.949    1195.317       0.372       0.050

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.297      22.082     593.875      46.000      32.739      32.400      -0.339

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     390.044     240.430     458.193    1199.134       0.325       0.259

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.286      22.568     597.674     456.573       0.015       0.348

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     370.870       0.000     370.870    1200.355       0.309       0.253

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.680     598.892       0.000       0.060       0.037       0.306

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      24.234       1.093     610.373      17.488     246.273       1.909

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 108999.406       0.440     776.400 1107969.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3021.000      24.234     610.373       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     82.938    2784.910       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       2.110     509.668     241.561     390.276       1.616

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   346.27    -0.12   346.27     0.29   445.22
 MEAN    15.91     0.00    -0.02   346.27    -0.12   346.27     0.29
 HUB     13.07     0.00    -0.02   346.27    -0.12   346.27     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.37    47.36     7.01   482.97   594.38    22.88   600.37     0.49
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 MEAN    50.47    44.80     5.67   419.52   544.06    22.88   600.37     0.45
 HUB     44.87    38.84     6.03   344.57   488.58    22.88   600.37     0.41
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   418.50   217.40   357.60  1213.62     0.34
 MEAN    15.50   422.68   220.37   360.69  1211.29     0.35
 HUB     12.59   450.22   264.80   364.12  1208.95     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   439.53   255.55     0.36  3902.40
 MEAN   408.57   406.84   188.20     0.34  3417.09     1.47
 HUB    331.91   370.25    67.11     0.31  3335.43

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.39     1.09    24.30   626.87     1.03   612.26     0.92     0.91
 MEAN    26.11     1.08    24.00   624.82     1.02   609.91     0.92     0.91
 HUB     26.07     1.08    23.69   624.48     1.02   607.56     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.30    35.55    31.50     4.05     0.93     0.32     2.90
 MEAN    31.42    27.55    23.50     4.05     0.92     0.31     3.34     0.91
 HUB     36.03    10.44     6.50     3.94     0.92     0.31     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     427.347     224.410     363.683    1211.525       0.353       -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.147      23.989     610.152      46.000      31.677      33.000       1.323

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     383.590     224.410     444.411    1214.461       0.316       0.175

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.129      24.382     613.113     440.827       0.028       0.337

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     359.129       0.000     359.129    1215.962       0.295       0.267

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.574     614.629       0.000       0.060       0.037       0.263

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      26.109       1.077     625.392      15.019     266.893       2.069

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93644.711       0.419     667.029 1152909.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    639064.69   4552.0405    123.1343      1.7283      0.8656     10.0471      1.1962
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 80% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  0.986

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     121.700    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   55.31819

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     118.889    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   93621.680   95493.914       2.402     831.557     346.230     619.754       1.790

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   278.73    -0.10   278.73     0.25   541.71
  MEAN    17.06     0.00    -0.02   278.73    -0.10   278.73     0.25
  HUB     12.51     0.00    -0.02   278.73    -0.10   278.73     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.87    50.47    12.40   543.87   611.22    14.46   516.32     0.55
  MEAN    58.22    47.20    11.02   449.76   529.21    14.46   516.32     0.47
  HUB     49.81    38.62    11.19   329.80   431.89    14.46   516.32     0.39

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   505.24   344.12   369.93  1131.02     0.45
  MEAN    18.04   521.71   361.50   376.17  1126.90     0.46
  HUB     15.00   581.00   434.18   386.07  1121.03     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   420.42   199.75     0.37  7101.16
  MEAN   475.49   393.06   113.99     0.35  6521.64     1.53
  HUB    395.45   388.01    38.73     0.35  6513.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.02     1.19    15.71   552.88     1.06   531.56     0.92     0.90
  MEAN    17.77     1.18    15.34   550.43     1.05   527.70     0.92     0.90
  HUB     17.77     1.18    14.79   550.40     1.05   522.20     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     42.93    28.37    24.20     4.17     0.93     0.41     2.90
  MEAN    43.86    16.86    12.70     4.16     0.94     0.36     3.51     0.90
  HUB     48.36    -5.73    -9.30     3.57     0.94     0.22     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     527.884     360.797     385.341    1127.176       0.468      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.828      15.338     527.962      24.000      43.116      35.400      -7.716

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     405.255     360.797     542.592    1137.333       0.356       0.390
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.781      16.285     537.519     528.796       0.028       0.515

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     376.320       0.000     376.320    1139.329       0.330       0.420

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.419     539.408       0.000       0.060       0.056       0.442

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.858      17.709       1.172     551.236      28.426     189.757       1.471

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 176978.844       0.598    1217.150 1172050.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    3021.000      17.709     551.236       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.140    2930.488       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       1.947     590.487     303.283     474.134       1.563

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   359.51    -0.12   359.51     0.32   525.52
 MEAN    18.08     0.00    -0.02   359.51    -0.12   359.51     0.32
 HUB     15.21     0.00    -0.02   359.51    -0.12   359.51     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.44    46.36    10.08   541.76   650.30    16.53   540.44     0.57
 MEAN    52.98    42.30    10.68   476.60   597.09    16.53   540.44     0.52
 HUB     48.13    37.84    10.29   400.98   538.64    16.53   540.44     0.47

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   462.38   278.51   369.09  1158.21     0.40
 MEAN    18.01   468.51   282.80   373.53  1155.09     0.41
 HUB     15.22   504.23   333.05   378.59  1151.97     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   451.37   259.83     0.39  5689.68
 MEAN   474.80   419.99   192.00     0.36  5095.42     1.55
 HUB    401.33   384.70    68.28     0.33  5071.92

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.27     1.14    18.16   575.32     1.04   557.47     0.92     0.90
 MEAN    19.99     1.13    17.85   572.81     1.04   554.48     0.92     0.90
 HUB     19.98     1.13    17.51   572.71     1.04   551.48     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.04    35.14    31.50     3.64     0.93     0.38     2.90
 MEAN    37.13    27.20    23.50     3.70     0.94     0.37     3.30     0.90
 HUB     41.34    10.22     6.50     3.72     0.94     0.36     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     474.156     283.592     380.000    1155.465       0.410       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.060      17.861     554.838      46.000      36.734      30.600      -6.134

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     383.850     283.592     477.247    1162.183       0.330       0.327

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.034      18.574     561.309     511.151       0.022       0.400

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     379.307       0.000     379.307    1162.483       0.326       0.308

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.550     561.598       0.000       0.060       0.049       0.316

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864      19.972       1.128     573.613      22.376     217.243       1.684

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 139365.188       0.481     958.467 1062600.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  0.995

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    121.700    3021.000      19.972     573.613       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     94.198    2872.760       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       1.988     545.479     274.337     429.765       1.567

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   358.29    -0.12   358.29     0.31   503.13
 MEAN    17.74     0.00    -0.02   358.29    -0.12   358.29     0.31
 HUB     15.05     0.00    -0.02   358.29    -0.12   358.29     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.90    46.36     9.54   529.11   639.11    18.70   562.90     0.55
 MEAN    52.55    43.40     9.15   467.64   589.22    18.70   562.90     0.51
 HUB     47.93    38.84     9.09   396.77   534.69    18.70   562.90     0.46

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   452.09   261.62   368.70  1179.79     0.38
 MEAN    17.51   459.42   269.02   372.42  1177.18     0.39
 HUB     14.85   495.86   322.52   376.65  1174.55     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   451.52   260.63     0.38  5185.25
 MEAN   461.53   419.23   192.51     0.36  4711.80     1.53
 HUB    391.49   382.91    68.98     0.33  4791.21

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.51     1.13    20.34   595.56     1.04   578.49     0.92     0.91
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 MEAN    22.27     1.11    20.04   593.55     1.03   575.93     0.92     0.91
 HUB     22.31     1.12    19.73   593.89     1.04   573.36     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.36    35.26    31.50     3.76     0.93     0.36     2.90
 MEAN    35.84    27.34    23.50     3.84     0.93     0.36     3.28     0.91
 HUB     40.57    10.38     6.50     3.88     0.93     0.36     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     464.023     270.785     376.820    1177.606       0.394       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.336      20.066     576.356      46.000      35.701      31.500      -4.201

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     386.153     270.785     471.634    1183.239       0.326       0.298

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.317      20.728     581.883     471.992       0.018       0.387

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     375.129       0.000     375.129    1183.951       0.317       0.300

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.762     582.584       0.000       0.060       0.043       0.313

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      22.260       1.115     594.332      20.720     220.762       1.711

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 129093.383       0.473     887.824 1047505.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    121.700    3021.000      22.260     594.332       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     86.028    2822.241       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       2.049     513.330     250.553     401.059       1.601

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   352.86    -0.12   352.86     0.30   474.33
 MEAN    16.97     0.00    -0.02   352.86    -0.12   352.86     0.30
 HUB     14.32     0.00    -0.02   352.86    -0.12   352.86     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.21    46.36     8.85   507.76   618.43    20.93   583.94     0.52
 MEAN    51.75    43.80     7.95   447.40   569.90    20.93   583.94     0.48
 HUB     46.94    37.84     9.10   377.52   516.84    20.93   583.94     0.44

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   435.30   240.72   362.69  1199.21     0.36
 MEAN    16.57   441.72   247.40   365.93  1196.85     0.37
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 HUB     13.89   475.05   298.44   369.61  1194.47     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   444.52   257.02     0.37  4547.13
 MEAN   436.94   412.11   189.54     0.34  4102.40     1.51
 HUB    366.18   375.76    67.75     0.31  4147.01

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.64     1.11    22.50   613.57     1.03   597.75     0.92     0.91
 MEAN    24.40     1.10    22.21   611.69     1.03   595.40     0.92     0.91
 HUB     24.43     1.10    21.90   611.88     1.03   593.04     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.57    35.32    31.50     3.82     0.93     0.35     2.90
 MEAN    34.06    27.38    23.50     3.88     0.93     0.34     3.29     0.91
 HUB     38.92    10.39     6.50     3.89     0.93     0.35     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     436.581     248.789     358.758    1197.915       0.364       0.049

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.468      22.320     596.467      46.000      34.740      32.400      -2.340

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     373.511     248.789     448.783    1202.189       0.311       0.292

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.456      22.871     600.732     456.573       0.015       0.378

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     355.341       0.000     355.341    1203.295       0.295       0.283

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.968     601.837       0.000       0.060       0.038       0.335

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      24.402       1.096     612.376      18.044     235.684       1.827

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 112467.008       0.454     773.478 1063678.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    3021.000      24.402     612.376       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     79.658    2780.351       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       2.197     509.668     232.008     390.276       1.682

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   331.96    -0.11   331.96     0.28   444.49
 MEAN    15.91     0.00    -0.02   331.96    -0.11   331.96     0.28
 HUB     13.07     0.00    -0.02   331.96    -0.11   331.96     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.50    47.36     8.14   482.97   586.15    23.15   603.18     0.49
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 MEAN    51.65    44.80     6.85   419.52   535.06    23.15   603.18     0.44
 HUB     46.08    38.84     7.24   344.57   478.54    23.15   603.18     0.40
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   411.62   228.63   342.28  1216.90     0.34
 MEAN    15.50   414.22   228.56   345.45  1214.38     0.34
 HUB     12.59   439.86   267.81   348.94  1211.86     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   420.54   244.33     0.35  4103.71
 MEAN   408.57   389.54   180.00     0.32  3544.02     1.51
 HUB    331.91   354.78    64.11     0.29  3373.18

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.68     1.09    24.65   629.73     1.03   615.59     0.92     0.91
 MEAN    26.36     1.08    24.32   627.36     1.02   613.04     0.92     0.91
 HUB     26.27     1.08    23.98   626.64     1.02   610.49     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.74    35.52    31.50     4.02     0.93     0.35     2.90
 MEAN    33.49    27.52    23.50     4.02     0.93     0.34     3.34     0.91
 HUB     37.51    10.41     6.50     3.91     0.93     0.33     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     418.925     232.756     348.315    1214.602       0.345       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.395      24.308     613.266      46.000      33.752      33.000      -0.752

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     366.677     232.756     434.312    1217.989       0.301       0.214

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.380      24.771     616.691     440.827       0.027       0.368

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     343.507       0.000     343.507    1219.344       0.282       0.300

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.944     618.064       0.000       0.060       0.037       0.296

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      26.359       1.080     627.910      15.534     254.784       1.975

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96861.383       0.433     666.152 1106589.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    654765.81   4503.0718    118.8887      1.7448      0.8608     11.0174      1.2010
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 80% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  0.981

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     117.504    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   53.41085

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     114.790    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   90393.664   92201.352       2.488     831.557     334.292     619.754       1.854

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   268.52    -0.09   268.52     0.24   541.71
  MEAN    17.06     0.00    -0.02   268.52    -0.09   268.52     0.24
  HUB     12.51     0.00    -0.02   268.52    -0.09   268.52     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.73    50.47    13.26   543.87   606.63    14.51   516.79     0.54
  MEAN    59.17    47.20    11.97   449.76   523.90    14.51   516.79     0.47
  HUB     50.86    38.62    12.24   329.80   425.36    14.51   516.79     0.38

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   500.29   351.61   355.90  1132.16     0.44
  MEAN    18.04   514.58   365.72   362.00  1127.90     0.46
  HUB     15.00   570.20   432.64   371.42  1122.03     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   404.51   192.26     0.36  7255.70
  MEAN   475.49   378.28   109.77     0.34  6597.71     1.57
  HUB    395.45   373.27    37.19     0.33  6490.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.07     1.20    15.80   553.54     1.06   532.63     0.92     0.90
  MEAN    17.79     1.18    15.42   550.75     1.05   528.63     0.92     0.90
  HUB     17.74     1.17    14.87   550.30     1.05   523.14     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     44.65    28.38    24.20     4.18     0.93     0.43     2.90
  MEAN    45.29    16.87    12.70     4.17     0.94     0.38     3.51     0.90
  HUB     49.35    -5.72    -9.30     3.58     0.94     0.24     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     520.297     365.009     370.780    1128.197       0.461       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.842      15.419     528.919      24.000      44.551      35.400      -9.151

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	389.426	365.009	533.746	1138.753	0.342	0.415

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.788	16.404	538.863	528.796	0.031	0.538

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	362.091	0.000	362.091	1140.565	0.317	0.437

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.512	540.578	0.000	0.060	0.064	0.459

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.848	17.708	1.172	551.529	28.719	184.822	1.433

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
178801.688	0.604	1187.288	1129097.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =11.967 EfDer = 0.982

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
117.504	3021.000	17.708	551.529	1.000	1.000	0.980

W Kg/sec = 53.41085

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
100.584	2929.710	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
90393.664	92201.352	2.016	590.487	292.928	474.134	1.619

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	346.06	-0.12	346.06	0.30	525.38
MEAN	18.08	0.00	-0.02	346.06	-0.12	346.06	0.30	
HUB	15.21	0.00	-0.02	346.06	-0.12	346.06	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.44	46.36	11.08	541.76	642.96	16.61	541.53	0.56
MEAN	54.02	42.30	11.72	476.60	589.08	16.61	541.53	0.52
HUB	49.21	37.84	11.37	400.98	529.75	16.61	541.53	0.46

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	457.46	288.40	355.10	1159.79	0.39
MEAN	18.01	461.93	290.02	359.54	1156.50	0.40
HUB	15.22	495.55	335.62	364.59	1153.20	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	434.23	249.93	0.37	5891.65	
MEAN	474.80	404.25	184.78	0.35	5225.37	1.60
HUB	401.33	370.47	65.71	0.32	5110.94	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.35	1.15	18.28	576.47	1.05	559.00	0.92	0.90
MEAN	20.04	1.13	17.95	573.65	1.04	555.83	0.92	0.90
HUB	19.98	1.13	17.60	573.17	1.04	552.66	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.08	35.14	31.50	3.64	0.93	0.40	2.90	
MEAN	38.89	27.20	23.50	3.70	0.94	0.39	3.30	0.90
HUB	42.63	10.22	6.50	3.72	0.94	0.38	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.982
    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     467.289     290.832     365.754    1156.874       0.404       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.100      17.961     556.195      46.000      38.490      30.600      -7.890

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     368.946     290.832     469.792    1163.995       0.317       0.356

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.068      18.717     563.062     511.151       0.025       0.428

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     364.796       0.000     364.796    1164.257       0.313       0.330

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.680     563.316       0.000       0.060       0.057       0.339

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.854      19.997       1.129     574.429      22.900     209.474       1.624

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 142625.078       0.492     947.066 1021800.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  0.990

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    117.504     3021.000      19.997     574.429       1.000       1.000       0.980
W Kg/sec =   53.41085

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     90.898     2870.719       1.402       0.249      53.349      56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  90393.664   92201.352       2.061     545.479     264.728     429.765       1.623

     ROTOR LEADING EDGE CONDITIONS, STAGE             3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   344.75    -0.12   344.75     0.30   502.77
 MEAN    17.74      0.00    -0.02   344.75    -0.12   344.75     0.30
 HUB     15.05      0.00    -0.02   344.75    -0.12   344.75     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.92     46.36    10.56   529.11   631.61    18.82   564.51     0.54
 MEAN    53.61     43.40    10.21   467.64   581.08    18.82   564.51     0.50
 HUB     49.02     38.84    10.18   396.77   525.71    18.82   564.51     0.45

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   446.69    271.80    354.48  1181.90      0.38
 MEAN    17.51   452.52    276.48    358.24  1179.10      0.38
 HUB     14.85   487.01    325.21    362.51  1176.29      0.41

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26    434.03    250.45     0.37  5386.75
 MEAN   461.53    403.21    185.05     0.34  4842.29     1.57
 HUB    391.49    368.52     66.28     0.31  4831.17

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     22.62     1.13     20.50   597.22     1.04   580.57     0.92     0.91
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 MEAN    22.35     1.12    20.18   594.92     1.04   577.82     0.92     0.91
 HUB     22.34     1.12    19.85   594.87     1.04   575.07     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.48    35.24    31.50     3.74     0.93     0.39     2.90
 MEAN    37.66    27.32    23.50     3.82     0.94     0.38     3.28     0.91
 HUB     41.90    10.36     6.50     3.86     0.94     0.38     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     456.992     278.292     362.485    1179.522       0.387       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.413      20.206     578.237      46.000      37.515      31.500      -6.015

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     370.896     278.292     463.692    1185.576       0.313       0.329

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.390      20.919     584.188     471.992       0.020       0.416

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     360.529       0.000     360.529    1186.218       0.304       0.324

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.938     584.821       0.000       0.060       0.049       0.337

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.867      22.325       1.116     595.673      21.244     212.527       1.647

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 132362.312       0.485     878.919 1006720.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  0.995

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    117.504    3021.000       22.325     595.673       1.000       1.000       0.980
W Kg/sec =   53.41085

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     82.912    2819.064        1.402       0.249      53.349      56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  90393.664   92201.352        2.126     513.330     241.479     401.059       1.661

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   339.30    -0.12   339.30      0.29   473.80
 MEAN    16.97      0.00    -0.02   339.30    -0.12   339.30      0.29
 HUB     14.32      0.00    -0.02   339.30    -0.12   339.30      0.29

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     56.25    46.36      9.89   507.76   610.78     21.09   586.06      0.51
 MEAN    52.83    43.80      9.03   447.40   561.60     21.09   586.06      0.47
 HUB     48.06    37.84     10.22   377.52   507.67     21.09   586.06      0.43

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   429.40    251.02    348.39   1201.79      0.36
 MEAN    16.57   434.38    254.93    351.70   1199.25      0.36
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 HUB     13.89   465.88   301.20   355.42  1196.70     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   426.90   246.72     0.36  4741.54
 MEAN   436.94   396.01   182.01     0.33  4227.22     1.55
 HUB    366.18   361.32    64.99     0.30  4185.32

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.81     1.11    22.71   615.73     1.03   600.34     0.92     0.91
 MEAN    24.53     1.10    22.40   613.55     1.03   597.81     0.92     0.91
 HUB     24.51     1.10    22.07   613.38     1.03   595.26     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.77    35.30    31.50     3.80     0.93     0.37     2.90
 MEAN    35.94    27.36    23.50     3.86     0.93     0.36     3.29     0.91
 HUB     40.28    10.36     6.50     3.86     0.93     0.36     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     429.736     256.367     344.889    1200.254       0.358       0.047

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.592      22.505     598.807      46.000      36.625      32.400      -4.225

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     358.510     256.367     440.742    1204.941       0.298       0.323

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.578      23.112     603.493     456.573       0.016       0.407

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     341.278       0.000     341.278    1205.945       0.283       0.309

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.192     604.499       0.000       0.060       0.043       0.359

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      24.520       1.098     614.221      18.548     226.382       1.755

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 115609.469       0.467     767.676 1021777.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    117.504    3021.000      24.520     614.221       1.000       1.000       0.980
W Kg/sec =   53.41085

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     76.658    2776.174       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  90393.664   92201.352       2.283     509.668     223.273     390.276       1.748

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   318.98    -0.11   318.98     0.26   443.82
 MEAN    15.91     0.00    -0.02   318.98    -0.11   318.98     0.26
 HUB     13.07     0.00    -0.02   318.98    -0.11   318.98     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.56    47.36     9.20   482.97   578.89    23.36   605.73     0.48
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 MEAN    52.76    44.80     7.96   419.52   527.10    23.36   605.73     0.44
 HUB     47.22    38.84     8.38   344.57   469.63    23.36   605.73     0.39
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   406.07   238.65   328.54  1219.84     0.33
 MEAN    15.50   407.07   235.90   331.74  1217.16     0.33
 HUB     12.59   430.76   270.48   335.25  1214.47     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   403.53   234.30     0.33  4283.44
 MEAN   408.57   373.99   172.66     0.31  3657.69     1.55
 HUB    331.91   340.83    61.43     0.28  3406.81

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.90     1.10    24.92   632.33     1.03   618.57     0.92     0.91
 MEAN    26.55     1.08    24.57   629.69     1.03   615.86     0.92     0.91
 HUB     26.40     1.08    24.20   628.63     1.02   613.14     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.00    35.50    31.50     4.00     0.93     0.37     2.90
 MEAN    35.42    27.50    23.50     4.00     0.93     0.36     3.34     0.91
 HUB     38.90    10.38     6.50     3.88     0.93     0.34     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      411.819     240.229     334.492    1217.358       0.338       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.577      24.551      616.064       46.000      35.686      33.000      -2.686

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      351.588     240.229     425.822    1221.143       0.288       0.249

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       26.560       25.073     619.900     440.827       0.028       0.397

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      329.561       0.000     329.561    1222.375       0.270       0.330

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       25.229      621.152       0.000       0.060       0.039       0.325

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.880       26.537        1.082      630.215       15.994     244.335       1.894

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  99735.195       0.446     662.267 1062840.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    669133.69   4443.2158     114.7895      1.7566       0.8534      11.9669       1.2054
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 80% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.026   EfDer =  0.973

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     112.885    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   51.31144

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     110.278    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  86840.570   88577.203       2.589     831.557     321.152     619.754       1.930

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   257.36    -0.09   257.36     0.23   541.71
  MEAN    17.06     0.00    -0.02   257.36    -0.09   257.36     0.23
  HUB     12.51     0.00    -0.02   257.36    -0.09   257.36     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.68    50.47    14.21   543.87   601.77    14.56   517.28     0.54
  MEAN    60.23    47.20    13.03   449.76   518.26    14.56   517.28     0.46
  HUB     52.04    38.62    13.42   329.80   418.40    14.56   517.28     0.38

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   495.40   359.62   340.73  1133.33     0.44
  MEAN    18.04   507.19   370.23   346.66  1128.94     0.45
  HUB     15.00   558.68   430.94   355.55  1123.08     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   387.36   184.25     0.34  7420.78
  MEAN   475.49   362.29   105.26     0.32  6678.98     1.63
  HUB    395.45   357.31    35.49     0.32  6465.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.12     1.20    15.89   554.24     1.06   533.74     0.92     0.89
  MEAN    17.80     1.18    15.50   551.10     1.05   529.61     0.92     0.89
  HUB     17.71     1.17    14.95   550.19     1.05   524.12     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     46.54    28.40    24.20     4.20     0.93     0.46     2.90
  MEAN    46.88    16.89    12.70     4.19     0.94     0.41     3.51     0.89
  HUB     50.48    -5.70    -9.30     3.60     0.94     0.26     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     512.427     369.510     355.026    1129.253       0.454       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.853      15.499     529.909      24.000      46.145      35.400     -10.745

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     372.387     369.510     524.604    1140.227       0.327       0.443
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.792      16.523     540.258     528.796       0.035       0.564

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     346.738       0.000     346.738    1141.852       0.304       0.454

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.602     541.799       0.000       0.060       0.073       0.476

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.837      17.701       1.172     551.841      29.031     179.480       1.391

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 180741.953       0.611    1152.997 1082160.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.026   EfDer =  0.974

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    112.885    3021.000      17.701     551.841       1.000       1.000       0.980
W Kg/sec =   51.31144

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     96.698    2928.882       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  86840.570   88577.203       2.097     590.487     281.611     474.134       1.684

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   331.52    -0.11   331.52     0.29   525.23
 MEAN    18.08     0.00    -0.02   331.52    -0.11   331.52     0.29
 HUB     15.21     0.00    -0.02   331.52    -0.11   331.52     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.54    46.36    12.18   541.76   635.25    16.69   542.66     0.56
 MEAN    55.18    42.30    12.88   476.60   580.66    16.69   542.66     0.51
 HUB     50.43    37.84    12.59   400.98   520.37    16.69   542.66     0.46

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   452.80   298.91   340.12  1161.42     0.39
 MEAN    18.01   455.35   297.74   344.52  1157.96     0.39
 HUB     15.22   486.45   338.33   349.52  1154.48     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   415.94   239.43     0.36  6106.06
 MEAN   474.80   387.36   177.06     0.33  5364.33     1.65
 HUB    401.33   355.15    63.00     0.31  5152.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.42     1.15    18.38   577.69     1.05   560.57     0.92     0.89
 MEAN    20.07     1.13    18.04   574.55     1.04   557.24     0.92     0.89
 HUB     19.97     1.13    17.67   573.65     1.04   553.89     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.31    35.14    31.50     3.64     0.93     0.43     2.90
 MEAN    40.83    27.20    23.50     3.70     0.94     0.41     3.30     0.89
 HUB     44.07    10.22     6.50     3.72     0.94     0.40     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     460.404     298.575     350.464    1158.329       0.397       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.133      18.053     557.597      46.000      40.429      30.600      -9.829

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     353.018     298.575     462.352    1165.881       0.303       0.387

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.093      18.853     564.891     511.151       0.029       0.458

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     349.306       0.000     349.306    1166.106       0.300       0.353

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.801     565.109       0.000       0.060       0.067       0.363

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.842      20.011       1.131     575.297      23.457     201.366       1.561

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 146092.844       0.504     931.962  977503.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.026   EfDer =  0.984

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    112.885    3021.000      20.011     575.297       1.000       1.000       0.980
W Kg/sec =   51.31144

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     87.334    2868.551       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  86840.570   88577.203       2.145     545.479     254.348     429.765       1.690

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   330.27    -0.11   330.27     0.28   502.39
 MEAN    17.74     0.00    -0.02   330.27    -0.11   330.27     0.28
 HUB     15.05     0.00    -0.02   330.27    -0.11   330.27     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.03    46.36    11.67   529.11   623.82    18.93   566.19     0.53
 MEAN    54.78    43.40    11.38   467.64   572.60    18.93   566.19     0.49
 HUB     50.23    38.84    11.39   396.77   516.33    18.93   566.19     0.44

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   441.60   282.49   339.42  1184.07     0.37
 MEAN    17.51   445.66   284.31   343.19  1181.10     0.38
 HUB     14.85   477.84   328.03   347.46  1178.11     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   415.56   239.76     0.35  5598.50
 MEAN   461.53   386.25   177.22     0.33  4979.35     1.62
 HUB    391.49   353.21    63.46     0.30  4872.95

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     22.72     1.14    20.64   598.99     1.04   582.71     0.92     0.90
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 MEAN    22.41     1.12    20.31   596.37     1.04   579.79     0.92     0.90
 HUB     22.36     1.12    19.96   595.92     1.04   576.86     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.77    35.24    31.50     3.74     0.93     0.41     2.90
 MEAN    39.64    27.31    23.50     3.81     0.94     0.40     3.28     0.90
 HUB     43.35    10.35     6.50     3.85     0.94     0.40     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     449.990     286.178     347.265    1181.503       0.381       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.474      20.331     580.187      46.000      39.492      31.500      -7.992

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     354.782     286.178     455.816    1187.998       0.299       0.362

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.444      21.096     586.584     471.992       0.023       0.447

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     345.127       0.000     345.127    1188.569       0.290       0.349

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.096     587.148       0.000       0.060       0.058       0.362

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      22.370       1.118     597.092      21.795     204.061       1.582

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 135794.781       0.498     866.268  962543.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =13.026   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    112.885    3021.000      22.370     597.092       1.000       1.000       0.980
W Kg/sec =   51.31144

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     79.590    2815.711       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  86840.570   88577.203       2.214     513.330     231.805     401.059       1.730

     ROTOR LEADING EDGE CONDITIONS, STAGE           4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   324.96    -0.11   324.96     0.27   473.24
 MEAN    16.97     0.00    -0.02   324.96    -0.11   324.96     0.27
 HUB     14.32     0.00    -0.02   324.96    -0.11   324.96     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.39    46.36    11.03   507.76   602.94    21.24   588.28     0.51
 MEAN    54.01    43.80    10.21   447.40   553.06    21.24   588.28     0.46
 HUB     49.29    37.84    11.45   377.52   498.21    21.24   588.28     0.42

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   423.90   261.75   333.43  1204.45     0.35
 MEAN    16.57   427.16   262.78   336.77  1201.74     0.36
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 HUB     13.89   456.49   304.04   340.50  1199.01     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   408.49   235.99     0.34  4944.01
 MEAN   436.94   379.14   174.16     0.32  4357.17     1.60
 HUB    366.18   346.13    62.14     0.29  4224.78

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.95     1.12    22.90   618.01     1.04   603.01     0.92     0.91
 MEAN    24.63     1.10    22.57   615.52     1.03   600.29     0.92     0.91
 HUB     24.56     1.10    22.22   614.96     1.03   597.57     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.13    35.29    31.50     3.79     0.93     0.40     2.90
 MEAN    37.96    27.35    23.50     3.85     0.94     0.39     3.29     0.91
 HUB     41.76    10.34     6.50     3.84     0.94     0.38     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     423.025     264.257     330.331    1202.669       0.352       0.045

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.691      22.664     601.228      46.000      38.659      32.400      -6.259

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     342.848     264.257     432.870    1207.783       0.284       0.356

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.672      23.328     606.353     456.573       0.019       0.438

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     326.614       0.000     326.614    1208.687       0.270       0.336

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.387     607.260       0.000       0.060       0.050       0.384

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      24.606       1.100     616.164      19.072     216.965       1.682

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 118877.922       0.480     758.351  976497.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.026   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    112.885    3021.000      24.606     616.164       1.000       1.000       0.980
W Kg/sec =   51.31144

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     73.504    2771.793       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  86840.570   88577.203       2.381     509.668     214.087     390.276       1.823

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   305.42    -0.11   305.42     0.25   443.12
 MEAN    15.91     0.00    -0.02   305.42    -0.11   305.42     0.25
 HUB     13.07     0.00    -0.02   305.42    -0.11   305.42     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.70    47.36    10.34   482.97   571.53    23.54   608.38     0.47
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 MEAN    53.95    44.80     9.15   419.52   519.00    23.54   608.38     0.43
 HUB     48.46    38.84     9.62   344.57   460.52    23.54   608.38     0.38
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   400.97   248.95   314.32  1222.84     0.33
 MEAN    15.50   400.12   243.46   317.53  1220.01     0.33
 HUB     12.59   421.57   273.25   321.02  1217.17     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   385.98   224.00     0.32  4468.11
 MEAN   408.57   357.89   165.10     0.29  3774.75     1.60
 HUB    331.91   326.33    58.66     0.27  3441.63

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.09     1.10    25.14   635.06     1.03   621.64     0.92     0.91
 MEAN    26.69     1.08    24.77   632.12     1.03   618.77     0.92     0.91
 HUB     26.50     1.08    24.39   630.72     1.02   615.89     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.38    35.48    31.50     3.98     0.93     0.40     2.90
 MEAN    37.48    27.47    23.50     3.97     0.93     0.38     3.34     0.91
 HUB     40.40    10.36     6.50     3.86     0.93     0.36     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     404.931     247.926     320.159    1220.194       0.332      -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.721      24.757     618.951      46.000      37.754      33.000      -4.754

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     336.051     247.926     417.609    1224.384       0.274       0.284

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.698      25.335     623.209     440.827       0.031       0.428

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     315.193       0.000     315.193    1225.497       0.257       0.359

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.472     624.343       0.000       0.060       0.044       0.353

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      26.673       1.084     632.632      16.468     233.901       1.813

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102693.273       0.459     655.105 1015613.688

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    684200.75   4364.6831    110.2775      1.7656      0.8428     13.0264      1.2101
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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 80% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.967

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     108.898    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   49.49893

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     106.382    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   83773.047   85448.320       2.684     831.557     309.808     619.754       2.000

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   247.78    -0.09   247.78     0.22   541.71
  MEAN    17.06     0.00    -0.02   247.78    -0.09   247.78     0.22
  HUB     12.51     0.00    -0.02   247.78    -0.09   247.78     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     65.51    50.47    15.04   543.87   597.73    14.60   517.68     0.54
  MEAN    61.15    47.20    13.95   449.76   513.57    14.60   517.68     0.46
  HUB     53.09    38.62    14.47   329.80   412.58    14.60   517.68     0.37

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   491.65   366.37   327.86  1134.28     0.43
  MEAN    18.04   501.18   374.01   333.61  1129.78     0.44
  HUB     15.00   548.99   429.42   342.04  1123.93     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   372.83   177.50     0.33  7559.97
  MEAN   475.49   348.70   101.48     0.31  6747.13     1.68
  HUB    395.45   343.72    33.97     0.31  6442.40

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.16     1.20    15.96   554.83     1.06   534.64     0.92     0.88
  MEAN    17.81     1.18    15.56   551.38     1.05   530.40     0.92     0.88
  HUB     17.68     1.17    15.02   550.09     1.05   524.92     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     48.17    28.43    24.20     4.23     0.93     0.48     2.90
  MEAN    48.27    16.92    12.70     4.22     0.95     0.43     3.51     0.88
  HUB     51.46    -5.67    -9.30     3.63     0.95     0.29     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.967

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     506.016     373.285     341.630    1130.111       0.448       0.002

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      17.860      15.561     530.715      24.000      47.535      35.400     -12.135

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     357.958     373.285     517.180    1141.430       0.314       0.466
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.791      16.617     541.399     528.796       0.039       0.587

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     333.704       0.000     333.704    1142.906       0.292       0.468

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.672     542.800       0.000       0.060       0.082       0.490

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.826      17.690       1.171     552.101      29.291     174.934       1.356

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 182364.531       0.617    1122.254 1041909.562


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.967

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.898    3021.000      17.690     552.101       1.000       1.000       0.980
W Kg/sec =   49.49893

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.360    2928.191       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83773.047   85448.320       2.172     590.487     271.889     474.134       1.744

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   319.16    -0.11   319.16     0.28   525.10
 MEAN    18.08     0.00    -0.02   319.16    -0.11   319.16     0.28
 HUB     15.21     0.00    -0.02   319.16    -0.11   319.16     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.50    46.36    13.14   541.76   628.88    16.76   543.60     0.55
 MEAN    56.20    42.30    13.90   476.60   573.69    16.76   543.60     0.50
 HUB     51.49    37.84    13.65   400.98   512.58    16.76   543.60     0.45

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   449.36   307.69   327.49  1162.74     0.39
 MEAN    18.01   450.14   304.18   331.81  1159.14     0.39
 HUB     15.22   478.94   340.58   336.73  1155.53     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   400.56   230.64     0.34  6285.38
 MEAN   474.80   373.11   170.62     0.32  5480.19     1.69
 HUB    401.33   342.17    60.75     0.30  5186.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.46     1.16    18.46   578.71     1.05   561.85     0.92     0.88
 MEAN    20.09     1.14    18.11   575.30     1.04   558.38     0.92     0.88
 HUB     19.96     1.13    17.73   574.06     1.04   554.90     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.22    35.16    31.50     3.66     0.93     0.45     2.90
 MEAN    42.51    27.21    23.50     3.71     0.95     0.43     3.30     0.88
 HUB     45.33    10.23     6.50     3.73     0.95     0.42     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     454.944     305.030     337.535    1159.513       0.392       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.151      18.120     558.739      46.000      42.104      30.600     -11.504

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     339.603     305.030     456.480    1167.427       0.291       0.414

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.104      18.956     566.392     511.151       0.033       0.485

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     336.261       0.000     336.261    1167.621       0.288       0.372

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.890     566.581       0.000       0.060       0.078       0.382

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.830      20.011       1.131     576.023      23.921     194.691       1.509

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 148987.281       0.514     916.854  939730.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.978

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    108.898    3021.000      20.011     576.023       1.000       1.000       0.980
W Kg/sec =   49.49893

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     84.300    2866.745       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  83773.047   85448.320       2.222     545.479     245.514     429.765       1.750

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   318.06    -0.11   318.06     0.27   502.08
 MEAN    17.74     0.00    -0.02   318.06    -0.11   318.06     0.27
 HUB     15.05     0.00    -0.02   318.06    -0.11   318.06     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.99    46.36    12.63   529.11   617.44    19.01   567.58     0.53
 MEAN    55.79    43.40    12.39   467.64   565.65    19.01   567.58     0.48
 HUB     51.29    38.84    12.45   396.77   508.60    19.01   567.58     0.44

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2      Ao2          Mach2
 TIP     19.81   437.86   291.38   326.83  1185.83      0.37
 MEAN    17.51   440.30   290.84   330.57  1182.73      0.37
 HUB     14.85   470.34   330.35   334.80  1179.60      0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   400.16   230.88     0.34  5774.38
 MEAN   461.53   372.04   170.69     0.31  5093.46     1.66
 HUB    391.49   340.33    61.14     0.29  4907.35

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     22.79     1.14    20.74   600.46     1.04   584.45     0.92     0.89
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 MEAN    22.45     1.12    20.40   597.58     1.04   581.39     0.92     0.89
 HUB     22.36     1.12    20.03   596.79     1.04   578.32     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.72    35.24    31.50     3.74     0.93     0.43     2.90
 MEAN    41.34    27.31    23.50     3.81     0.94     0.42     3.28     0.89
 HUB     44.62    10.35     6.50     3.85     0.94     0.41     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     444.512     292.744     334.503    1183.118       0.376       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.509      20.417     581.779      46.000      41.191      31.500      -9.691

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     341.328     292.744     449.670    1189.981       0.287       0.390

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.473      21.224     588.549     471.992       0.027       0.474

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     332.273       0.000     332.273    1190.496       0.279       0.369

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.207     589.058       0.000       0.060       0.067       0.382

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.846      22.388       1.119     598.275      22.252     197.156       1.528

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 138646.266       0.508     853.216  924943.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.985

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    108.898    3021.000      22.388     598.275       1.000       1.000       0.980
W Kg/sec =   49.49893

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     76.792    2812.927       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83773.047   85448.320       2.295     513.330     223.657     401.059       1.793

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   312.98    -0.11   312.98     0.26   472.77
 MEAN    16.97     0.00    -0.02   312.98    -0.11   312.98     0.26
 HUB     14.32     0.00    -0.02   312.98    -0.11   312.98     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.36    46.36    12.00   507.76   596.56    21.34   590.10     0.50
 MEAN    55.03    43.80    11.23   447.40   546.10    21.34   590.10     0.46
 HUB     50.35    37.84    12.51   377.52   490.47    21.34   590.10     0.41

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   419.85   270.57   321.04  1206.61     0.35
 MEAN    16.57   421.56   269.26   324.36  1203.76     0.35
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 HUB     13.89   448.87   306.35   328.07  1200.90     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   393.28   227.17     0.33  5110.42
 MEAN   436.94   365.14   167.68     0.30  4464.56     1.64
 HUB    366.18   333.48    59.83     0.28  4256.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.04     1.12    23.02   619.89     1.04   605.18     0.92     0.90
 MEAN    24.69     1.10    22.68   617.16     1.03   602.33     0.92     0.90
 HUB     24.58     1.10    22.32   616.28     1.03   599.47     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.12    35.28    31.50     3.78     0.93     0.42     2.90
 MEAN    39.70    27.34    23.50     3.84     0.94     0.41     3.29     0.90
 HUB     43.04    10.34     6.50     3.84     0.94     0.40     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     417.838     270.777     318.227    1204.637       0.347       0.043

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.748      22.770     603.207      46.000      40.394      32.400      -7.994

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     329.884     270.777     426.783    1210.105       0.273       0.384

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.724      23.479     608.695     456.573       0.021       0.465

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     314.485       0.000     314.485    1210.928       0.260       0.357

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.518     609.523       0.000       0.060       0.058       0.403

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      24.649       1.101     617.778      19.503     209.387       1.623

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 121565.734       0.491     748.104  938024.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.898    3021.000      24.649     617.778       1.000       1.000       0.980
W Kg/sec =   49.49893

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     70.876    2768.170       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83773.047   85448.320       2.469     509.668     206.435     390.276       1.891

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   294.18    -0.10   294.18     0.24   442.54
 MEAN    15.91     0.00    -0.02   294.18    -0.10   294.18     0.24
 HUB     13.07     0.00    -0.02   294.18    -0.10   294.18     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.66    47.36    11.30   482.97   565.60    23.66   610.56     0.47
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 MEAN    54.97    44.80    10.17   419.52   512.47    23.66   610.56     0.42
 HUB     49.52    38.84    10.68   344.57   453.15    23.66   610.56     0.37
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   397.29   257.38   302.64  1225.29     0.32
 MEAN    15.50   394.77   249.64   305.81  1222.34     0.32
 HUB     12.59   414.17   275.48   309.26  1219.38     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   371.57   215.58     0.30  4619.23
 MEAN   408.57   344.64   158.93     0.28  3870.45     1.65
 HUB    331.91   314.37    56.43     0.26  3469.64

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.20     1.10    25.29   637.31     1.03   624.14     0.92     0.91
 MEAN    26.78     1.09    24.91   634.14     1.03   621.14     0.92     0.91
 HUB     26.55     1.08    24.51   632.45     1.02   618.14     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.38    35.46    31.50     3.96     0.93     0.42     2.90
 MEAN    39.23    27.46    23.50     3.96     0.94     0.40     3.34     0.91
 HUB     41.69    10.34     6.50     3.84     0.94     0.38     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      399.638     254.218     308.356    1222.502       0.327       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.806      24.891      621.307      46.000      39.503      33.000      -6.503

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      323.325     254.218     411.298    1227.022       0.264       0.314

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.775      25.512     625.911     440.827       0.036       0.456

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     303.419       0.000     303.419    1228.042       0.247       0.382

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.633     626.951       0.000       0.060       0.051       0.375

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.867      26.746       1.085     634.633      16.855     225.592       1.749

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 105108.750       0.470     646.829  975515.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    696672.56   4287.2563    106.3821      1.7704      0.8320     13.9532      1.2139
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 80% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  0.959

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     104.649    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   47.56755

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     102.231    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   80504.336   82114.242       2.793     831.557     297.720     619.754       2.082

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   237.65    -0.08   237.65     0.21   541.71
  MEAN    17.06     0.00    -0.02   237.65    -0.08   237.65     0.21
  HUB     12.51     0.00    -0.02   237.65    -0.08   237.65     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     66.40    50.47    15.93   543.87   593.60    14.64   518.09     0.53
  MEAN    62.15    47.20    14.95   449.76   508.76    14.64   518.09     0.46
  HUB     54.23    38.62    15.61   329.80   406.57    14.64   518.09     0.36

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   488.08   373.37   314.35  1135.24     0.43
  MEAN    18.04   495.12   377.91   319.88  1130.64     0.44
  HUB     15.00   538.95   427.78   327.83  1124.79     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   357.61   170.50     0.32  7704.38
  MEAN   475.49   334.44    97.57     0.30  6817.45     1.74
  HUB    395.45   329.42    32.34     0.29  6417.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.19     1.20    16.02   555.44     1.06   535.54     0.92     0.88
  MEAN    17.82     1.18    15.62   551.68     1.06   531.21     0.92     0.88
  HUB     17.65     1.17    15.08   549.99     1.05   525.73     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     49.91    28.47    24.20     4.27     0.93     0.51     2.90
  MEAN    49.75    16.96    12.70     4.26     0.95     0.45     3.51     0.88
  HUB     52.54    -5.63    -9.30     3.67     0.95     0.31     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.959

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     499.549     377.179     327.545    1130.975       0.442       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.863      15.621     531.527      24.000      49.029      35.400     -13.629

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	342.838	377.179	509.708	1142.646	0.300	0.491

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.786	16.708	542.553	528.796	0.043	0.611

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	320.008	0.000	320.008	1143.976	0.280	0.483

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.739	543.817	0.000	0.060	0.091	0.504

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.814	17.675	1.170	552.370	29.560	170.151	1.319

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
184035.375	0.622	1088.346	999280.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =14.953 EfDer = 0.958

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
104.649	3021.000	17.675	552.370	1.000	1.000	0.980

W Kg/sec = 47.56755

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
89.815	2927.479	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
80504.336	82114.242	2.258	590.487	261.566	474.134	1.813

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	306.16	-0.11	306.16	0.27	524.98
MEAN	18.08	0.00	-0.02	306.16	-0.11	306.16	0.27	
HUB	15.21	0.00	-0.02	306.16	-0.11	306.16	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.53	46.36	14.17	541.76	622.38	16.82	544.54	0.54
MEAN	57.29	42.30	14.99	476.60	566.55	16.82	544.54	0.49
HUB	52.64	37.84	14.80	400.98	504.58	16.82	544.54	0.44

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	446.25	316.79	314.29	1164.07	0.38
MEAN	18.01	445.06	310.85	318.51	1160.34	0.38
HUB	15.22	471.25	342.86	323.30	1156.59	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	384.53	221.54	0.33	6471.08	
MEAN	474.80	358.23	163.95	0.31	5600.34	1.74
HUB	401.33	328.55	58.47	0.28	5220.94	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.51	1.16	18.53	579.76	1.05	563.14	0.92	0.88
MEAN	20.11	1.14	18.16	576.08	1.04	559.54	0.92	0.88
HUB	19.93	1.13	17.78	574.47	1.04	555.93	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.23	35.18	31.50	3.68	0.93	0.47	2.90	
MEAN	44.30	27.24	23.50	3.74	0.95	0.45	3.30	0.88
HUB	46.68	10.25	6.50	3.75	0.95	0.44	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.958
    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     449.608     311.724     323.998    1160.706       0.387       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.162      18.177     559.892      46.000      43.894      30.600     -13.294

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     325.597     311.724     450.761    1168.997       0.279       0.442

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.107      19.051     567.919     511.151       0.037       0.515

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     322.634       0.000     322.634    1169.162       0.276       0.391

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.970     568.080       0.000       0.060       0.089       0.402

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.817      20.002       1.132     576.772      24.402     187.861       1.456

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 151980.125       0.524     898.778  899923.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  0.970

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    104.649    3021.000      20.002     576.772       1.000       1.000       0.980
W Kg/sec =   47.56755

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     81.102    2864.883       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  80504.336   82114.242       2.309     545.479     236.200     429.765       1.819

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   305.29    -0.11   305.29     0.26   501.75
 MEAN    17.74     0.00    -0.02   305.29    -0.11   305.29     0.26
 HUB     15.05     0.00    -0.02   305.29    -0.11   305.29     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.02    46.36    13.66   529.11   610.96    19.08   568.99     0.52
 MEAN    56.87    43.40    13.47   467.64   558.56    19.08   568.99     0.48
 HUB     52.43    38.84    13.59   396.77   500.71    19.08   568.99     0.43

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   434.46   300.52   313.75  1187.62     0.37
 MEAN    17.51   435.08   297.55   317.42  1184.37     0.37
 HUB     14.85   462.72   332.72   321.58  1181.11     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   384.19   221.73     0.32  5955.47
 MEAN   461.53   357.27   163.98     0.30  5210.98     1.72
 HUB    391.49   326.91    58.78     0.28  4942.43

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.84     1.14    20.82   601.97     1.04   586.22     0.92     0.89
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 MEAN    22.47     1.12    20.47   598.82     1.04   583.02     0.92     0.89
 HUB     22.34     1.12    20.09   597.69     1.04   579.81     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.77    35.25    31.50     3.75     0.93     0.46     2.90
 MEAN    43.15    27.32    23.50     3.82     0.94     0.44     3.28     0.89
 HUB     45.98    10.36     6.50     3.86     0.94     0.43     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     439.182     299.505     321.213    1184.751       0.371       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.531      20.489     583.393      46.000      42.997      31.500     -11.497

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     327.366     299.505     443.702    1191.994       0.275       0.419

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.487      21.338     590.548     471.992       0.031       0.503

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     318.932       0.000     318.932    1192.453       0.267       0.389

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.302     591.003       0.000       0.060       0.078       0.402

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4         PR4        Texit        Del T       Ns        Ns nondim
      0.834      22.390       1.119     599.495      22.723     190.149       1.474

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 141578.703       0.519     837.266  885376.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  0.978

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    104.649    3021.000      22.390     599.495       1.000       1.000       0.980
W Kg/sec =   47.56755

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     73.865    2810.064       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
  80504.336   82114.242       2.386     513.330     215.133     401.059       1.864

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   300.53    -0.10   300.53     0.25   472.29
 MEAN    16.97     0.00    -0.02   300.53    -0.10   300.53     0.25
 HUB     14.32     0.00    -0.02   300.53    -0.10   300.53     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.38    46.36    13.02   507.76   590.12    21.42   591.96     0.49
 MEAN    56.12    43.80    12.32   447.40   539.06    21.42   591.96     0.45
 HUB     51.49    37.84    13.65   377.52   482.62    21.42   591.96     0.40

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   416.17   279.61   308.25  1208.79     0.34
 MEAN    16.57   416.13   275.90   311.52  1205.81     0.35
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 HUB     13.89   441.19   308.71   315.18  1202.82     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   377.62   218.12     0.31  5281.08
 MEAN   436.94   350.68   161.04     0.29  4574.48     1.69
 HUB    366.18   320.38    57.47     0.27  4289.52

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.11     1.12    23.13   621.83     1.04   607.38     0.92     0.90
 MEAN    24.73     1.10    22.77   618.84     1.03   604.39     0.92     0.90
 HUB     24.58     1.10    22.40   617.64     1.03   601.39     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.21    35.28    31.50     3.78     0.93     0.44     2.90
 MEAN    41.53    27.34    23.50     3.84     0.94     0.43     3.29     0.90
 HUB     44.41    10.33     6.50     3.83     0.94     0.42     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     412.831     277.451     305.696    1206.631       0.342       0.040

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.785      22.854     605.215      46.000      42.227      32.400      -9.827

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     316.513     277.451     420.903    1212.461       0.261       0.413

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.755      23.608     611.078     456.573       0.025       0.495

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     301.975       0.000     301.975    1213.205       0.249       0.378

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.626     611.828       0.000       0.060       0.067       0.422

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.846      24.668       1.102     619.438      19.944     201.762       1.564

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 124319.008       0.502     735.196  897590.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    104.649    3021.000      24.668     619.438       1.000       1.000       0.980
W Kg/sec =   47.56755

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     68.150    2764.457       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  80504.336   82114.242       2.568     509.668     198.497     390.276       1.966

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   282.58    -0.10   282.58     0.23   441.95
 MEAN    15.91     0.00    -0.02   282.58    -0.10   282.58     0.23
 HUB     13.07     0.00    -0.02   282.58    -0.10   282.58     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.67    47.36    12.31   482.97   559.65    23.75   612.78     0.46
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MEAN    56.04    44.80    11.24   419.52   505.90    23.75   612.78     0.42
HUB     50.65    38.84    11.81   344.57   445.70    23.75   612.78     0.37
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   393.98   265.96   290.66  1227.75     0.32
MEAN    15.50   389.62   255.93   293.77  1224.69     0.32
HUB     12.59   406.73   277.72   297.16  1221.62     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    472.96   356.84   207.00     0.29  4773.03
MEAN   408.57   331.06   152.64     0.27  3967.85     1.70
HUB    331.91   302.06    54.19     0.25  3497.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     27.29     1.11    25.41   639.62     1.03   626.67     0.92     0.90
MEAN    26.83     1.09    25.02   636.21     1.03   623.55     0.92     0.90
HUB     26.57     1.08    24.61   634.23     1.02   620.43     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.46    35.46    31.50     3.96     0.93     0.44     2.90
MEAN    41.06    27.46    23.50     3.96     0.94     0.42     3.34     0.90
HUB     43.06    10.34     6.50     3.84     0.94     0.40     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.985

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      394.553     260.623     296.223    1224.839       0.322       -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.861      24.996      623.699       46.000      41.342      33.000      -8.342

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      310.301     260.623     405.229    1229.694       0.252       0.343

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       26.821      25.658     628.654     440.827       0.041       0.485

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      291.362       0.000     291.362    1230.623       0.237       0.405

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950       25.760      629.604       0.000       0.060       0.059       0.397

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4       Texit         Del T       Ns         Ns nondim
      0.858       26.786       1.086     636.687       17.248     217.304       1.685

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 107563.508       0.481     636.108  933388.812

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc   TR
    709476.69   4195.6948     102.2312      1.7731       0.8194      14.9531      1.2178
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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 80% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =16.040   EfDer =  0.949

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     100.090    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   45.49547

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
      97.778    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   76997.508   78537.289       2.920     831.557     284.751     619.754       2.176

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   226.84    -0.08   226.84     0.20   541.71
  MEAN    17.06     0.00    -0.02   226.84    -0.08   226.84     0.20
  HUB     12.51     0.00    -0.02   226.84    -0.08   226.84     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     67.36    50.47    16.89   543.87   589.35    14.68   518.51     0.53
  MEAN    63.24    47.20    16.04   449.76   503.79    14.68   518.51     0.45
  HUB     55.49    38.62    16.87   329.80   400.35    14.68   518.51     0.36

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   484.75   380.70   300.07  1136.21     0.43
  MEAN    18.04   489.04   381.99   305.35  1131.50     0.43
  HUB     15.00   528.47   425.97   312.77  1125.67     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   341.56   163.17     0.30  7855.53
  MEAN   475.49   319.34    93.49     0.28  6890.99     1.81
  HUB    395.45   314.26    30.53     0.28  6390.59

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.23     1.21    16.08   556.08     1.06   536.45     0.92     0.87
  MEAN    17.82     1.18    15.67   551.99     1.06   532.02     0.92     0.87
  HUB     17.61     1.17    15.14   549.87     1.05   526.55     0.92     0.87

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     51.75    28.54    24.20     4.34     0.93     0.53     2.90
  MEAN    51.36    17.02    12.70     4.32     0.95     0.48     3.51     0.87
  HUB     53.71    -5.57    -9.30     3.73     0.95     0.34     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.949

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     493.048     381.252     312.639    1131.845       0.436       0.003

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      17.863      15.677     532.344      24.000      50.647      35.400     -15.247

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     326.881     381.252     502.200    1143.878       0.286       0.517
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      17.778      16.797     543.724     528.796       0.048       0.638

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     305.505       0.000     305.505    1145.065       0.267       0.499

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      16.802     544.853       0.000       0.060       0.102       0.519

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.801      17.655       1.169     552.649      29.839     165.070       1.280

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 185771.203       0.628    1050.755  953829.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =16.040   EfDer =  0.948

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    100.090    3021.000      17.655     552.649       1.000       1.000       0.980
W Kg/sec =   45.49547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.022    2926.741       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76997.508   78537.289       2.357     590.487     250.520     474.134       1.893

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   292.38    -0.10   292.38     0.26   524.84
 MEAN    18.08     0.00    -0.02   292.38    -0.10   292.38     0.26
 HUB     15.21     0.00    -0.02   292.38    -0.10   292.38     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.65    46.36    15.29   541.76   615.71    16.87   545.51     0.54
 MEAN    58.48    42.30    16.18   476.60   559.22    16.87   545.51     0.49
 HUB     53.91    37.84    16.07   400.98   496.34    16.87   545.51     0.43

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   443.51   326.28   300.40  1165.41     0.38
 MEAN    18.01   440.12   317.81   304.46  1161.55     0.38
 HUB     15.22   463.37   345.21   309.10  1157.68     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   367.71   212.05     0.32  6664.79
 MEAN   474.80   342.55   156.99     0.29  5725.62     1.80
 HUB    401.33   314.15    56.12     0.27  5256.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.54     1.16    18.58   580.86     1.05   564.44     0.92     0.87
 MEAN    20.11     1.14    18.21   576.89     1.04   560.71     0.92     0.87
 HUB     19.90     1.13    17.82   574.90     1.04   556.97     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.36    35.22    31.50     3.72     0.93     0.49     2.90
 MEAN    46.23    27.28    23.50     3.78     0.95     0.47     3.30     0.87
 HUB     48.16    10.29     6.50     3.79     0.95     0.46     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.948

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     444.407     318.705     309.717    1161.913       0.382       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.163      18.225     561.060      46.000      45.819      30.600     -15.219

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     310.858     318.705     445.203    1170.602       0.266       0.472

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.100      19.138     569.482     511.151       0.042       0.546

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     308.275       0.000     308.275    1170.739       0.263       0.412

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.040     569.616       0.000       0.060       0.102       0.422

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.802      19.981       1.132     577.551      24.902     180.809       1.402

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 155097.922       0.535     877.262  857684.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =16.040   EfDer =  0.961

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    100.090    3021.000      19.981     577.551       1.000       1.000       0.980
W Kg/sec =   45.49547

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     77.701    2862.949       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  76997.508   78537.289       2.410     545.479     226.295     429.765       1.899

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   291.81    -0.10   291.81     0.25   501.41
 MEAN    17.74     0.00    -0.02   291.81    -0.10   291.81     0.25
 HUB     15.05     0.00    -0.02   291.81    -0.10   291.81     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.13    46.36    14.77   529.11   604.33    19.14   570.44     0.52
 MEAN    58.04    43.40    14.64   467.64   551.31    19.14   570.44     0.47
 HUB     53.67    38.84    14.83   396.77   492.60    19.14   570.44     0.42

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   431.44   310.03   300.04  1189.42     0.36
 MEAN    17.51   430.01   304.52   303.60  1186.05     0.36
 HUB     14.85   454.94   335.14   307.65  1182.66     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   367.51   212.23     0.31  6143.63
 MEAN   461.53   341.80   157.00     0.29  5332.94     1.77
 HUB    391.49   312.77    56.36     0.26  4978.29

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     22.88     1.15    20.89   603.55     1.05   588.01     0.92     0.88
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 MEAN    22.48     1.13    20.53   600.12     1.04   584.68     0.92     0.88
 HUB     22.31     1.12    20.14   598.62     1.04   581.34     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.94    35.27    31.50     3.77     0.93     0.48     2.90
 MEAN    45.09    27.35    23.50     3.85     0.95     0.46     3.28     0.88
 HUB     47.45    10.38     6.50     3.88     0.95     0.45     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.961

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     434.001     306.522     307.247    1186.414       0.366       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.537      20.545     585.038      46.000      44.932      31.500     -13.432

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     312.741     306.522     437.908    1194.054       0.262       0.450

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.485      21.437     592.597     471.992       0.035       0.534

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     304.945       0.000     304.945    1194.459       0.255       0.410

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.381     592.999       0.000       0.060       0.090       0.423

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.820      22.374       1.120     600.762      23.211     182.965       1.418

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 144619.469       0.530     817.994  843447.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =16.040   EfDer =  0.970

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    100.090    3021.000      22.374     600.762       1.000       1.000       0.980
W Kg/sec =   45.49547

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     70.773    2807.099       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  76997.508   78537.289       2.490     513.330     206.128     401.059       1.946

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   287.46    -0.10   287.46     0.24   471.79
 MEAN    16.97     0.00    -0.02   287.46    -0.10   287.46     0.24
 HUB     14.32     0.00    -0.02   287.46    -0.10   287.46     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.49    46.36    14.13   507.76   583.57    21.49   593.87     0.49
 MEAN    57.28    43.80    13.48   447.40   531.87    21.49   593.87     0.44
 HUB     52.72    37.84    14.88   377.52   474.58    21.49   593.87     0.40

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   412.88   288.97   294.90  1211.00     0.34
 MEAN    16.57   410.87   282.76   298.09  1207.90     0.34
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 HUB     13.89   433.36   311.11   301.67  1204.78     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   361.32   208.77     0.30  5457.60
 MEAN   436.94   335.60   154.18     0.28  4688.15     1.74
 HUB    366.18   306.66    55.07     0.25  4322.78

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.15     1.12    23.21   623.85     1.04   609.62     0.92     0.89
 MEAN    24.75     1.11    22.84   620.59     1.03   606.50     0.92     0.89
 HUB     24.56     1.10    22.45   619.05     1.03   603.37     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.42    35.30    31.50     3.80     0.93     0.47     2.90
 MEAN    43.49    27.35    23.50     3.85     0.94     0.45     3.29     0.89
 HUB     45.88    10.35     6.50     3.85     0.94     0.44     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     407.998     284.352     292.586    1208.667       0.338       0.038

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.799      22.916     607.270      46.000      44.182      32.400     -11.782

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     302.570     284.352     415.217    1214.872       0.249       0.444

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.761      23.715     613.522     456.573       0.029       0.526

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     288.922       0.000     288.922    1215.539       0.238       0.400

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.709     614.195       0.000       0.060       0.079       0.441

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.833      24.661       1.102     621.161      20.400     194.007       1.504

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 127161.680       0.513     719.249  854788.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =16.040   EfDer =  0.978

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    100.090    3021.000      24.661     621.161       1.000       1.000       0.980
W Kg/sec =   45.49547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     65.290    2760.620       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76997.508   78537.289       2.680     509.668     190.167     390.276       2.052

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   270.47    -0.09   270.47     0.22   441.33
 MEAN    15.91     0.00    -0.02   270.47    -0.09   270.47     0.22
 HUB     13.07     0.00    -0.02   270.47    -0.09   270.47     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.76    47.36    13.40   482.97   553.63    23.83   615.06     0.46
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MEAN    57.20    44.80    12.40   419.52   499.22    23.83   615.06     0.41
HUB     51.88    38.84    13.04   344.57   438.11    23.83   615.06     0.36
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   391.03   274.77   278.22  1230.27     0.32
MEAN    15.50   384.67   262.44   281.24  1227.10     0.31
HUB     12.59   399.19   279.99   284.53  1223.92     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    472.96   341.59   198.18     0.28  4931.13
MEAN   408.57   316.94   146.13     0.26  4068.64     1.75
HUB    331.91   289.23    51.92     0.24  3526.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     27.34     1.11    25.49   642.01     1.03   629.25     0.92     0.89
MEAN    26.86     1.09    25.09   638.36     1.03   626.02     0.92     0.89
HUB     26.56     1.08    24.67   636.07     1.02   622.78     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.64    35.46    31.50     3.96     0.93     0.47     2.90
MEAN    43.02    27.46    23.50     3.96     0.94     0.44     3.34     0.89
HUB     44.54    10.34     6.50     3.84     0.94     0.42     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.978

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      389.680     267.250     283.599    1227.224       0.318       -0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.885      25.069      626.147      46.000      43.300      33.000     -10.300

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      296.797     267.250     399.389    1232.426       0.241       0.374

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.834      25.772     631.466     440.827       0.048       0.516

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701      278.852       0.000     278.852    1233.266       0.226       0.428

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      25.855      632.328       0.000       0.060       0.070       0.419

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.846      26.793       1.086     638.814      17.653     208.923       1.620

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 110090.648       0.492     622.692  888806.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    722740.88   4087.9521     97.7779      1.7735      0.8047     16.0399      1.2219
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 80% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =16.989   EfDer =  0.940

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      96.156    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   43.70718

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      93.935    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73970.969   75450.234       3.040     831.557     273.558     619.754       2.266

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   217.56    -0.07   217.56     0.19   541.71
  MEAN    17.06     0.00    -0.02   217.56    -0.07   217.56     0.19
  HUB     12.51     0.00    -0.02   217.56    -0.07   217.56     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.20    50.47    17.73   543.87   585.84    14.71   518.86     0.52
  MEAN    64.19    47.20    16.99   449.76   499.68    14.71   518.86     0.45
  HUB     56.59    38.62    17.97   329.80   395.16    14.71   518.86     0.35

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   482.24   386.86   287.92  1136.99     0.42
  MEAN    18.04   484.08   385.38   292.96  1132.20     0.43
  HUB     15.00   519.66   424.37   299.94  1126.38     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   327.95   157.02     0.29  7982.40
  MEAN   475.49   306.50    90.11     0.27  6951.93     1.88
  HUB    395.45   301.33    28.92     0.27  6366.47

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.25     1.21    16.12   556.62     1.06   537.19     0.92     0.86
  MEAN    17.82     1.18    15.71   552.25     1.06   532.68     0.92     0.86
  HUB     17.58     1.16    15.19   549.77     1.05   527.22     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     53.34    28.61    24.20     4.41     0.93     0.55     2.90
  MEAN    52.76    17.10    12.70     4.40     0.95     0.50     3.51     0.86
  HUB     54.75    -5.51    -9.30     3.79     0.95     0.36     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.940

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     487.750     384.627     299.936    1132.552       0.431       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.858      15.718     533.009      24.000      52.053      35.400     -16.653

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     313.317     384.627     496.090    1144.884       0.274       0.540
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.767      16.865     544.680     528.796       0.051       0.662

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     293.134       0.000     293.134    1145.958       0.256       0.512

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.849     545.703       0.000       0.060       0.112       0.533

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.788      17.634       1.167     552.880      30.070     160.727       1.246

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 187209.484       0.633    1017.269  914825.688


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =16.989   EfDer =  0.938

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    96.156    3021.000      17.634     552.880       1.000       1.000       0.980
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    82.756    2926.130       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73970.969   75450.234       2.450     590.487     241.008     474.134       1.967

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   280.61    -0.10   280.61     0.24   524.73
 MEAN    18.08     0.00    -0.02   280.61    -0.10   280.61     0.24
 HUB     15.21     0.00    -0.02   280.61    -0.10   280.61     0.24

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.62    46.36    16.26   541.76   610.21    16.91   546.30     0.53
 MEAN    59.52    42.30    17.22   476.60   553.16    16.91   546.30     0.48
 HUB     55.02    37.84    17.18   400.98   489.50    16.91   546.30     0.43

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   441.60   334.22   288.63  1166.50     0.38
 MEAN    18.01   436.25   323.63   292.53  1162.54     0.38
 HUB     15.22   456.85   347.13   297.00  1158.56     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   353.51   204.11     0.30  6826.85
 MEAN   474.80   329.28   151.17     0.28  5830.34     1.86
 HUB    401.33   301.91    54.19     0.26  5285.90

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.55     1.17    18.61   581.78     1.05   565.50     0.92     0.86
 MEAN    20.11     1.14    18.24   577.56     1.04   561.67     0.92     0.86
 HUB     19.87     1.13    17.84   575.26     1.04   557.83     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.19    35.27    31.50     3.77     0.93     0.51     2.90
 MEAN    47.89    27.33    23.50     3.83     0.95     0.49     3.30     0.86
 HUB     49.45    10.34     6.50     3.84     0.95     0.47     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.938

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     440.320     324.540     297.583    1162.895       0.379       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.155      18.254     562.010      46.000      47.481      30.600     -16.881

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     298.362     324.540     440.847    1171.919       0.255       0.498

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.085      19.199     570.766     511.151       0.046       0.574

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     296.075       0.000     296.075    1172.035       0.253       0.429

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.087     570.880       0.000       0.060       0.113       0.440

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.788      19.955       1.132     578.200      25.320     174.937       1.356

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 157699.125       0.544     856.914  821594.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =16.989   EfDer =  0.953

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     96.156    3021.000      19.955     578.200       1.000       1.000       0.980
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     74.787    2861.343       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  73970.969   75450.234       2.504     545.479     217.811     429.765       1.973

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   280.35    -0.10   280.35     0.24   501.13
 MEAN    17.74     0.00    -0.02   280.35    -0.10   280.35     0.24
 HUB     15.05     0.00    -0.02   280.35    -0.10   280.35     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.09    46.36    15.73   529.11   598.88    19.18   571.64     0.51
 MEAN    59.06    43.40    15.66   467.64   545.32    19.18   571.64     0.46
 HUB     54.76    38.84    15.92   396.77   485.90    19.18   571.64     0.41

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   429.31   317.98   288.43  1190.90     0.36
 MEAN    17.51   426.06   310.36   291.89  1187.43     0.36
 HUB     14.85   448.52   337.12   295.83  1183.93     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   353.45   204.28     0.30  6301.10
 MEAN   461.53   328.71   151.16     0.28  5435.12     1.83
 HUB    391.49   300.78    54.37     0.25  5007.75

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.90     1.15    20.93   604.86     1.05   589.48     0.92     0.87
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 MEAN    22.48     1.13    20.56   601.20     1.04   586.05     0.92     0.87
 HUB     22.27     1.12    20.17   599.39     1.04   582.60     0.92     0.87
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.79    35.31    31.50     3.81     0.93     0.50     2.90
 MEAN    46.76    27.38    23.50     3.88     0.95     0.48     3.28     0.87
 HUB     48.73    10.41     6.50     3.91     0.95     0.47     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.953

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     429.956     312.401     295.412    1187.775       0.362       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.527      20.575     586.386      46.000      46.601      31.500     -15.101

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     300.379     312.401     433.384    1195.749       0.251       0.477

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.469      21.503     594.286     471.992       0.039       0.562

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     293.102       0.000     293.102    1196.111       0.245       0.428

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.430     594.647       0.000       0.060       0.101       0.440

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.807      22.345       1.120     601.818      23.618     177.008       1.372

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 147160.344       0.540     799.648  807664.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =16.989   EfDer =  0.962

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     96.156     3021.000       22.345     601.818       1.000        1.000        0.980
W Kg/sec =   43.70718

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     68.137     2804.634        1.401       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  73970.969   75450.234        2.587     513.330     198.452     401.059       2.021

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   276.38    -0.10   276.38     0.23   471.38
 MEAN    16.97      0.00    -0.02   276.38    -0.10   276.38     0.23
 HUB     14.32      0.00    -0.02   276.38    -0.10   276.38     0.23

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     61.44    46.36    15.08   507.76   578.18     21.53   595.44     0.48
 MEAN    58.30    43.80    14.50   447.40   525.97     21.53   595.44     0.44
 HUB     53.80    37.84    15.96   377.52   467.95     21.53   595.44     0.39

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   410.53   296.78   283.64  1212.82      0.34
 MEAN    16.57   406.76   288.50   286.75  1209.62      0.34
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 HUB     13.89   426.93   313.10   290.23  1206.41     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   347.61   200.95     0.29  5605.09
 MEAN   436.94   322.89   148.44     0.27  4783.10     1.80
 HUB    366.18   295.05    53.09     0.24  4350.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.17     1.13    23.25   625.53     1.04   611.46     0.92     0.88
 MEAN    24.74     1.11    22.88   622.05     1.03   608.24     0.92     0.88
 HUB     24.52     1.10    22.48   620.22     1.03   605.01     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.30    35.32    31.50     3.82     0.93     0.49     2.90
 MEAN    45.17    27.37    23.50     3.87     0.95     0.47     3.29     0.88
 HUB     47.17    10.37     6.50     3.87     0.95     0.45     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.962

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     404.242     290.118     281.502    1210.339       0.334       0.036

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.790      22.946     608.962      46.000      45.864      32.400     -13.464

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     290.816     290.118     410.782    1216.860       0.239       0.470

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.747      23.781     615.541     456.573       0.032       0.554

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     277.905       0.000     277.905    1217.465       0.228       0.417

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.755     616.154       0.000       0.060       0.090       0.457

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.820      24.634       1.102     622.598      20.780     187.612       1.454

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 129534.492       0.523     703.871  818292.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =16.989   EfDer =  0.971

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     96.156    3021.000      24.634     622.598       1.000       1.000       0.980
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     62.864    2757.432       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73970.969   75450.234       2.783     509.668     183.103     390.276       2.131

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   260.23    -0.09   260.23     0.21   440.82
 MEAN    15.91     0.00    -0.02   260.23    -0.09   260.23     0.21
 HUB     13.07     0.00    -0.02   260.23    -0.09   260.23     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.69    47.36    14.33   482.97   548.70    23.86   616.95     0.45
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 MEAN    58.19    44.80    13.39   419.52   493.75    23.86   616.95     0.41
 HUB     52.95    38.84    14.11   344.57   431.86    23.86   616.95     0.35
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   388.96   282.14   267.75  1232.33     0.32
 MEAN    15.50   380.79   267.83   270.68  1229.08     0.31
 HUB     12.59   393.03   281.89   273.88  1225.81     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   328.79   190.82     0.27  5063.24
 MEAN   408.57   305.08   140.74     0.25  4152.17     1.80
 HUB    331.91   278.41    50.03     0.23  3550.13

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.36     1.11    25.54   644.00     1.03   631.38     0.92     0.89
 MEAN    26.86     1.09    25.13   640.15     1.03   628.06     0.92     0.89
 HUB     26.53     1.08    24.70   637.61     1.02   624.72     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.50    35.48    31.50     3.98     0.93     0.49     2.90
 MEAN    44.70    27.47    23.50     3.97     0.94     0.46     3.34     0.89
 HUB     45.83    10.35     6.50     3.85     0.94     0.43     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     385.871     272.742     272.962    1229.189       0.314      -0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.879      25.103     628.168      46.000      44.977      33.000     -11.977

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     285.453     272.742     394.806    1234.679       0.231       0.399

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.818      25.837     633.791     440.827       0.054       0.543

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     268.334       0.000     268.334    1235.449       0.217       0.447

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.904     634.582       0.000       0.060       0.081       0.437

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.834      26.771       1.087     640.588      17.990     202.041       1.566

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 112194.812       0.502     609.650  850798.812

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    733798.25   3987.3511      93.9346      1.7721      0.7913     16.9895      1.2253
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 80% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =18.025   EfDer =  0.929

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      91.914    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   41.77924

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      89.791    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   70708.070   72122.078       3.180     831.557     261.491     619.754       2.370

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   207.61    -0.07   207.61     0.19   541.71
  MEAN    17.06     0.00    -0.02   207.61    -0.07   207.61     0.19
  HUB     12.51     0.00    -0.02   207.61    -0.07   207.61     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     69.11    50.47    18.64   543.87   582.22    14.75   519.21     0.52
  MEAN    65.23    47.20    18.03   449.76   495.43    14.75   519.21     0.44
  HUB     57.82    38.62    19.20   329.80   389.77    14.75   519.21     0.35

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   479.91   393.30   275.00  1137.78     0.42
  MEAN    18.04   479.08   388.91   279.76  1132.92     0.42
  HUB     15.00   510.44   422.62   286.26  1127.11     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   313.53   150.57     0.28  8115.24
  MEAN   475.49   292.85    86.58     0.26  7015.61     1.95
  HUB    395.45   287.54    27.17     0.26  6340.15

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.26     1.21    16.16   557.18     1.07   537.94     0.92     0.85
  MEAN    17.81     1.18    15.75   552.52     1.06   533.35     0.92     0.85
  HUB     17.54     1.16    15.23   549.66     1.05   527.90     0.92     0.85

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     55.04    28.70    24.20     4.50     0.93     0.58     2.90
  MEAN    54.27    17.20    12.70     4.50     0.95     0.52     3.51     0.85
  HUB     55.89    -5.42    -9.30     3.88     0.95     0.39     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.929

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     482.386     388.155     286.412    1133.269       0.426       0.004

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      17.847      15.754     533.684      24.000      53.577      35.400     -18.177

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     298.900     388.155     489.904    1145.911       0.261       0.564
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.750      16.929     545.658     528.796       0.055       0.688

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     279.937       0.000     279.937    1146.873       0.244       0.527

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.892     546.575       0.000       0.060       0.121       0.547

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.774      17.608       1.166     553.120      30.310     156.075       1.210

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188705.531       0.638     980.167  872992.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =18.025   EfDer =  0.925

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    91.914    3021.000      17.608     553.120       1.000       1.000       0.980
W Kg/sec =   41.77924

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    79.241    2925.494       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  70708.070   72122.078       2.559     590.487     230.775     474.134       2.055

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   268.05    -0.09   268.05     0.23   524.62
 MEAN    18.08     0.00    -0.02   268.05    -0.09   268.05     0.23
 HUB     15.21     0.00    -0.02   268.05    -0.09   268.05     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.68    46.36    17.32   541.76   604.53    16.95   547.12     0.53
 MEAN    60.65    42.30    18.35   476.60   546.89    16.95   547.12     0.48
 HUB     56.24    37.84    18.40   400.98   482.40    16.95   547.12     0.42

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   439.99   342.54   276.15  1167.60     0.38
 MEAN    18.01   432.48   329.73   279.86  1163.55     0.37
 HUB     15.22   450.11   349.10   284.13  1159.47     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   338.52   195.79     0.29  6996.61
 MEAN   474.80   315.23   145.07     0.27  5940.05     1.92
 HUB    401.33   288.89    52.23     0.25  5315.69

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.55     1.17    18.63   582.74     1.05   566.57     0.92     0.85
 MEAN    20.09     1.14    18.26   578.27     1.05   562.65     0.92     0.85
 HUB     19.82     1.13    17.86   575.62     1.04   558.71     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     51.13    35.34    31.50     3.84     0.93     0.54     2.90
 MEAN    49.68    27.40    23.50     3.90     0.95     0.51     3.30     0.85
 HUB     50.86    10.42     6.50     3.92     0.95     0.49     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.925

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     436.334     330.653     284.703    1163.894       0.375       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.133      18.269     562.979      46.000      49.271      30.600     -18.671

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     285.117     330.653     436.604    1173.272       0.243       0.525

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.057      19.249     572.089     511.151       0.050       0.605

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     283.112       0.000     283.112    1173.370       0.241       0.449

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.124     572.184       0.000       0.060       0.124       0.460

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.772      19.916       1.131     578.877      25.757     168.799       1.309

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 160417.266       0.554     833.233  783037.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =18.025   EfDer =  0.942

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     91.914    3021.000      19.916     578.877       1.000       1.000       0.980
W Kg/sec =   41.77924

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     71.669    2859.670       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  70708.070   72122.078       2.613     545.479     208.730     429.765       2.059

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   268.16    -0.09   268.16     0.23   500.84
 MEAN    17.74     0.00    -0.02   268.16    -0.09   268.16     0.23
 HUB     15.05     0.00    -0.02   268.16    -0.09   268.16     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.13    46.36    16.77   529.11   593.26    19.20   572.87     0.51
 MEAN    60.17    43.40    16.77   467.64   539.15    19.20   572.87     0.46
 HUB     55.95    38.84    17.11   396.77   478.96    19.20   572.87     0.41

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   427.49    326.32    276.16  1192.42       0.36
 MEAN    17.51   422.22    316.48    279.48  1188.84       0.36
 HUB     14.85   441.89    339.16    283.27  1185.24       0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   338.61   195.94     0.28  6466.24
 MEAN   461.53   314.88   145.05     0.26  5542.10      1.89
 HUB    391.49   288.06    52.34     0.24  5037.88

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     22.90     1.15    20.95   606.24     1.05   590.98     0.92     0.86
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 MEAN    22.45     1.13    20.57   602.33     1.04   587.45     0.92     0.86
 HUB     22.21     1.12    20.18   600.20     1.04   583.90     0.92     0.86
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.76    35.36    31.50     3.86     0.93     0.52     2.90
 MEAN    48.55    27.43    23.50     3.93     0.95     0.50     3.28     0.86
 HUB     50.13    10.47     6.50     3.97     0.95     0.49     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.942

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     426.019     318.556     282.868    1189.170       0.358       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.500      20.588     587.771      46.000      48.396      31.500     -16.896

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     287.302     318.556     428.976    1197.496       0.240       0.505

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.435      21.553     596.031     471.992       0.043       0.592

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     280.549       0.000     280.549    1197.817       0.234       0.447

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.462     596.351       0.000       0.060       0.113       0.459

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.792      22.299       1.120     602.921      24.045     170.809       1.324

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 149816.719       0.549     778.172  769475.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =18.025   EfDer =  0.953

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     91.914    3021.000      22.299     602.921       1.000       1.000       0.980
W Kg/sec =   41.77924

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     65.326    2802.067       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  70708.070   72122.078       2.698     513.330     190.267     401.059       2.108

     ROTOR LEADING EDGE CONDITIONS, STAGE           4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   264.62    -0.09   264.62     0.22   470.94
 MEAN    16.97     0.00    -0.02   264.62    -0.09   264.62     0.22
 HUB     14.32     0.00    -0.02   264.62    -0.09   264.62     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.48    46.36    16.12   507.76   572.65    21.55   597.08     0.48
 MEAN    59.40    43.80    15.60   447.40   519.88    21.55   597.08     0.43
 HUB     54.98    37.84    17.14   377.52   461.10    21.55   597.08     0.38

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   408.45   304.94   271.75  1214.69     0.34
 MEAN    16.57   402.74   294.48   274.74  1211.40     0.33
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 HUB     13.89   420.30   315.13   278.11  1208.08     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   333.19   192.80     0.27  5759.00
 MEAN   436.94   309.48   142.47     0.26  4882.14     1.86
 HUB    366.18   282.76    51.06     0.23  4378.45

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.16     1.13    23.27   627.28     1.04   613.36     0.92     0.87
 MEAN    24.71     1.11    22.89   623.57     1.03   610.04     0.92     0.87
 HUB     24.46     1.10    22.49   621.44     1.03   606.70     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.29    35.35    31.50     3.85     0.93     0.51     2.90
 MEAN    46.99    27.41    23.50     3.91     0.95     0.49     3.29     0.87
 HUB     48.57    10.40     6.50     3.90     0.95     0.47     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.953

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     400.586     296.131     269.769    1212.062       0.330       0.033

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.759      22.953     610.707      46.000      47.667      32.400     -15.267

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     278.403     296.131     406.450    1218.912       0.228       0.498

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.709      23.826     617.630     456.573       0.036       0.584

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     266.250       0.000     266.250    1219.457       0.218       0.436

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.780     618.182       0.000       0.060       0.102       0.473

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.807      24.583       1.102     624.097      21.176     180.995       1.403

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 132005.094       0.533     685.656  779371.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =18.025   EfDer =  0.963

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     91.914    3021.000      24.583     624.097       1.000       1.000       0.980
W Kg/sec =   41.77924

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     60.287    2754.119       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  70708.070   72122.078       2.902     509.668     175.600     390.276       2.223

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   249.38    -0.09   249.38     0.20   440.29
 MEAN    15.91     0.00    -0.02   249.38    -0.09   249.38     0.20
 HUB     13.07     0.00    -0.02   249.38    -0.09   249.38     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.69    47.36    15.33   482.97   543.64    23.88   618.91     0.45
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 MEAN    59.28    44.80    14.48   419.52   488.12    23.88   618.91     0.40
 HUB     54.11    38.84    15.27   344.57   425.42    23.88   618.91     0.35
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   387.18   289.84   256.71  1234.46     0.31
 MEAN    15.50   377.03   273.49   259.53  1231.13     0.31
 HUB     12.59   386.69   283.84   262.61  1227.77     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   315.33   183.12     0.26  5201.27
 MEAN   408.57   292.57   135.07     0.24  4239.87     1.86
 HUB    331.91   266.97    48.07     0.22  3574.67

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.35     1.11    25.55   646.09     1.04   633.58     0.92     0.88
 MEAN    26.82     1.09    25.13   642.02     1.03   630.16     0.92     0.88
 HUB     26.46     1.08    24.70   639.21     1.02   626.74     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.47    35.50    31.50     4.00     0.93     0.51     2.90
 MEAN    46.50    27.49    23.50     3.99     0.95     0.48     3.34     0.88
 HUB     47.22    10.37     6.50     3.87     0.95     0.45     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.963

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     382.189     278.509     261.727    1231.215       0.310       -0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.845      25.109     630.256      46.000      46.779      33.000     -13.779

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     273.495     278.509     390.342    1237.008       0.221       0.426

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.773      25.876     636.201     440.827       0.061       0.573

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     257.234       0.000     257.234    1237.708       0.208       0.466

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.925     636.920       0.000       0.060       0.092       0.455

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.821      26.718       1.087     642.440      18.342     194.928       1.511

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 114394.172       0.511     594.182  810268.938

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    745338.81   3871.4099     89.7911      1.7686      0.7762     18.0251      1.2288
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 80% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =18.474   EfDer =  0.924

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      90.090    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   40.94990

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      88.009    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  69304.477   70690.422       3.244     831.557     256.300     619.754       2.418

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   203.35    -0.07   203.35     0.18   541.71
  MEAN    17.06     0.00    -0.02   203.35    -0.07   203.35     0.18
  HUB     12.51     0.00    -0.02   203.35    -0.07   203.35     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     69.50    50.47    19.03   543.87   580.71    14.76   519.36     0.52
  MEAN    65.67    47.20    18.47   449.76   493.66    14.76   519.36     0.44
  HUB     58.35    38.62    19.73   329.80   387.51    14.76   519.36     0.35

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   479.03   396.02   269.50  1138.11     0.42
  MEAN    18.04   477.03   390.40   274.13  1133.21     0.42
  HUB     15.00   506.55   421.85   280.43  1127.41     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   307.40   147.85     0.27  8171.40
  MEAN   475.49   287.04    85.09     0.25  7042.45     1.99
  HUB    395.45   281.67    26.40     0.25  6328.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.27     1.21    16.17   557.42     1.07   538.25     0.92     0.85
  MEAN    17.80     1.18    15.76   552.63     1.06   533.63     0.92     0.85
  HUB     17.52     1.16    15.25   549.61     1.05   528.18     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     55.76    28.75    24.20     4.55     0.93     0.59     2.90
  MEAN    54.92    17.24    12.70     4.54     0.95     0.53     3.51     0.85
  HUB     56.39    -5.38    -9.30     3.92     0.95     0.40     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.924

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     480.193     389.641     280.650    1133.563       0.424       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.840      15.767     533.962      24.000      54.236      35.400     -18.836

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     292.765     389.641     487.372    1146.335       0.255       0.575
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.741      16.953     546.062     528.796       0.057       0.700

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     274.304       0.000     274.304    1147.252       0.239       0.534

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.907     546.936       0.000       0.060       0.125       0.553

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.768      17.595       1.165     553.221      30.411     154.079       1.194

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 189334.047       0.640     963.910  855063.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =18.474   EfDer =  0.919

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     90.090    3021.000      17.595     553.221       1.000       1.000       0.980
W Kg/sec =   40.94990

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.732    2925.227       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  69304.477   70690.422       2.608     590.487     226.380     474.134       2.094

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   262.68    -0.09   262.68     0.23   524.57
 MEAN    18.08     0.00    -0.02   262.68    -0.09   262.68     0.23
 HUB     15.21     0.00    -0.02   262.68    -0.09   262.68     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     64.14    46.36    17.78   541.76   602.17    16.96   547.46     0.52
 MEAN    61.14    42.30    18.84   476.60   544.27    16.96   547.46     0.47
 HUB     56.78    37.84    18.94   400.98   479.44    16.96   547.46     0.42

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   439.43   346.02   270.86  1168.06     0.38
 MEAN    18.01   431.00   332.30   274.48  1163.97     0.37
 HUB     15.22   447.31   349.92   278.65  1159.85     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   332.19   192.31     0.28  7067.67
 MEAN   474.80   309.26   142.50     0.27  5986.34     1.95
 HUB    401.33   283.35    51.41     0.24  5328.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.55     1.17    18.63   583.14     1.05   567.02     0.92     0.84
 MEAN    20.08     1.14    18.26   578.56     1.05   563.05     0.92     0.84
 HUB     19.79     1.12    17.86   575.78     1.04   559.07     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     51.95    35.38    31.50     3.88     0.93     0.55     2.90
 MEAN    50.44    27.44    23.50     3.94     0.95     0.52     3.30     0.84
 HUB     51.47    10.45     6.50     3.95     0.95     0.50     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.919

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     434.757     333.233     279.231    1164.305       0.373       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.119      18.271     563.378      46.000      50.039      30.600     -19.439

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     279.495     333.233     434.927    1173.834       0.238       0.537

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.041      19.265     572.638     511.151       0.051       0.618

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     277.597       0.000     277.597    1173.925       0.236       0.458

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.135     572.726       0.000       0.060       0.128       0.469

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.765      19.896       1.131     579.161      25.940     166.214       1.288

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 161559.078       0.557     822.506  766557.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =18.474   EfDer =  0.938

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     90.090    3021.000      19.896     579.161       1.000       1.000       0.980
W Kg/sec =   40.94990

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     70.335    2858.968       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  69304.477   70690.422       2.663     545.479     204.847     429.765       2.098

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   262.96    -0.09   262.96     0.22   500.72
 MEAN    17.74     0.00    -0.02   262.96    -0.09   262.96     0.22
 HUB     15.05     0.00    -0.02   262.96    -0.09   262.96     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.58    46.36    17.22   529.11   590.93    19.21   573.39     0.50
 MEAN    60.65    43.40    17.25   467.64   536.59    19.21   573.39     0.46
 HUB     56.47    38.84    17.63   396.77   476.07    19.21   573.39     0.41

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   426.85    329.82    270.96  1193.04      0.36
 MEAN    17.51   420.69    319.04    274.21  1189.43      0.35
 HUB     14.85   439.14    340.00    277.93  1185.79      0.37

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26    332.34    192.44     0.28  6535.54
 MEAN   461.53    309.02    142.49     0.26  5586.91      1.92
 HUB    391.49    282.66     51.50     0.24  5050.30

         Pt2       PR       Ps2      Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     22.89     1.15     20.95    606.82      1.05    591.61     0.92      0.86
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 MEAN    22.44     1.13    20.57   602.80     1.04   588.03     0.92     0.86
 HUB     22.18     1.11    20.18   600.53     1.04   584.43     0.92     0.86
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     50.60    35.38    31.50     3.88     0.93     0.53     2.90
 MEAN    49.32    27.46    23.50     3.96     0.95     0.51     3.28     0.86
 HUB     50.74    10.50     6.50     4.00     0.95     0.50     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.938

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     424.449     321.134     277.543    1189.748       0.357       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.482      20.587     588.346      46.000      49.164      31.500     -17.664

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     281.759     321.134     427.218    1198.222       0.235       0.517

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.414      21.567     596.757     471.992       0.045       0.606

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     275.218       0.000     275.218    1198.527       0.230       0.456

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.469     597.061       0.000       0.060       0.118       0.467

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.786      22.273       1.120     603.384      24.223     168.212       1.304

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 150928.797       0.553     768.387  753164.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =18.474   EfDer =  0.949

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     90.090    3021.000      22.273     603.384       1.000       1.000       0.980
W Kg/sec =   40.94990

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     64.128    2800.992       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  69304.477   70690.422       2.748     513.330     186.777     401.059       2.147

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   259.63    -0.09   259.63     0.22   470.76
 MEAN    16.97     0.00    -0.02   259.63    -0.09   259.63     0.22
 HUB     14.32     0.00    -0.02   259.63    -0.09   259.63     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.92    46.36    16.56   507.76   570.36    21.56   597.76     0.48
 MEAN    59.88    43.80    16.08   447.40   517.35    21.56   597.76     0.43
 HUB     55.49    37.84    17.65   377.52   458.25    21.56   597.76     0.38

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   407.72   308.39   266.71  1215.47     0.34
 MEAN    16.57   401.15   296.99   269.65  1212.13     0.33
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 HUB     13.89   417.56   315.98   272.96  1208.78     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   327.09   189.35     0.27  5824.10
 MEAN   436.94   303.81   139.95     0.25  4923.85     1.88
 HUB    366.18   277.54    50.20     0.23  4390.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.15     1.13    23.27   628.02     1.04   614.15     0.92     0.87
 MEAN    24.69     1.11    22.89   624.21     1.03   610.78     0.92     0.87
 HUB     24.42     1.10    22.48   621.95     1.03   607.41     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.15    35.37    31.50     3.87     0.93     0.52     2.90
 MEAN    47.76    27.43    23.50     3.93     0.95     0.50     3.29     0.87
 HUB     49.18    10.42     6.50     3.92     0.95     0.48     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.949

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     399.142     298.664     264.791    1212.778       0.329       0.032

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.737      22.948     611.434      46.000      48.440      32.400     -16.040

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     273.143     298.664     404.731    1219.767       0.224       0.510

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.685      23.837     618.502     456.573       0.038       0.597

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     261.305       0.000     261.305    1220.288       0.214       0.444

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.781     619.030       0.000       0.060       0.108       0.481

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.801      24.554       1.102     624.727      21.343     178.223       1.382

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 133048.078       0.537     677.355  762757.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =18.474   EfDer =  0.959

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     90.090    3021.000      24.554     624.727       1.000       1.000       0.980
W Kg/sec =   40.94990

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     59.191    2752.730       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  69304.477   70690.422       2.956     509.668     172.407     390.276       2.264

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   244.78    -0.08   244.78     0.20   440.07
 MEAN    15.91     0.00    -0.02   244.78    -0.08   244.78     0.20
 HUB     13.07     0.00    -0.02   244.78    -0.08   244.78     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.13    47.36    15.77   482.97   541.54    23.87   619.73     0.44
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MEAN    59.74    44.80    14.94   419.52   485.78    23.88   619.73     0.40
HUB     54.62    38.84    15.78   344.57   422.73    23.87   619.73     0.35

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   386.55   293.09   252.03  1235.35     0.31
MEAN    15.50   375.53   275.87   254.80  1231.98     0.30
HUB     12.59   384.06   284.66   257.83  1228.59     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    472.96   309.63   179.87     0.25  5259.49
MEAN   408.57   287.28   132.70     0.23  4276.60     1.89
HUB    331.91   262.12    47.26     0.21  3584.92

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     27.34     1.11    25.54   646.96     1.04   634.50     0.92     0.88
MEAN    26.80     1.09    25.13   642.81     1.03   631.04     0.92     0.88
HUB     26.43     1.08    24.70   639.88     1.02   627.58     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     49.31    35.51    31.50     4.01     0.93     0.52     2.90
MEAN    47.27    27.51    23.50     4.01     0.95     0.49     3.34     0.88
HUB     47.83    10.39     6.50     3.89     0.95     0.46     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.959

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     380.721     280.924     256.963    1232.059       0.309       -0.015

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.821      25.101     631.128      46.000      47.551      33.000     -14.551

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219     268.432     280.924     388.554    1237.980       0.217       0.438

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.744      25.881     637.208     440.827       0.065       0.586

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     252.530       0.000     252.530    1238.651       0.204       0.474

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      25.924     637.899       0.000       0.060       0.098       0.463

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.815      26.687       1.087     643.218      18.490     191.958       1.488

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 115318.531       0.516     587.093  792968.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    750188.50   3819.2510     88.0087      1.7665      0.7695     18.4744      1.2303
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 70% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.467   EfDer =  0.989

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     139.337    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   63.33516

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     136.119    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  107189.766  109333.328       2.098     831.557     396.407     619.754       1.563

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   322.54    -0.11   322.54     0.29   473.93
  MEAN    17.06     0.00    -0.02   322.54    -0.11   322.54     0.29
  HUB     12.51     0.00    -0.02   322.54    -0.11   322.54     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.87    50.47     5.40   475.82   574.93    14.25   514.12     0.52
  MEAN    50.67    47.20     3.47   393.48   508.87    14.25   514.12     0.46
  HUB     41.83    38.62     3.21   288.54   432.84    14.25   514.12     0.39

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   503.23   235.59   444.68  1118.32     0.45
  MEAN    18.04   528.19   279.83   447.98  1116.75     0.47
  HUB     15.00   601.86   391.34   457.27  1112.55     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   505.42   240.23     0.45  4862.46
  MEAN   415.99   468.21   136.17     0.42  5048.84     1.20
  HUB    345.97   459.51    45.38     0.41  5871.54

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.81     1.11    14.63   540.83     1.03   519.68     0.92     0.90
  MEAN    16.88     1.12    14.48   541.52     1.04   518.22     0.92     0.90
  HUB     17.19     1.14    14.08   544.56     1.04   514.31     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     27.91    28.38    24.20     4.18     0.93     0.19     2.90
  MEAN    31.99    16.91    12.70     4.21     0.92     0.16     3.51     0.90
  HUB     40.56    -5.67    -9.30     3.63     0.92     0.04     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     537.890     279.282     459.703    1116.639       0.482      -0.014

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.935      14.446     518.137      24.000      31.280      35.400       4.120

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     496.547     279.282     569.699    1120.482       0.443       0.145
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.905      14.770     521.709     528.796       0.022       0.322

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     457.947       0.000     457.947    1123.781       0.408       0.227

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.029     524.786       0.000       0.060       0.042       0.246

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.854      16.852       1.116     542.302      19.492     236.991       1.837

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 121356.844       0.536     955.573 1356237.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.467   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    139.337    2643.000      16.852     542.302       1.000       1.000       0.980
W Kg/sec =   63.33516

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    124.275    2584.845       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107189.766  109333.328       1.632     590.487     361.920     474.134       1.310

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   436.22    -0.15   436.22     0.39   463.53
 MEAN    18.08     0.00    -0.02   436.22    -0.15   436.22     0.39
 HUB     15.21     0.00    -0.02   436.22    -0.15   436.22     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.38    46.36     1.02   473.98   644.27    15.19   526.41     0.57
 MEAN    43.72    42.30     1.42   416.97   603.55    15.19   526.41     0.54
 HUB     38.82    37.84     0.98   350.81   559.88    15.19   526.41     0.50

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   486.55   141.89   465.40  1132.83     0.43
 MEAN    18.01   497.21   174.33   465.65  1132.85     0.44
 HUB     15.22   536.97   265.12   466.96  1132.74     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   570.00   329.09     0.50  2900.52
 MEAN   415.39   524.35   241.06     0.46  3142.35     1.23
 HUB    351.11   474.81    85.99     0.42  4038.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.91     1.06    15.77   553.05     1.02   533.28     0.92     0.89
 MEAN    18.00     1.07    15.77   553.94     1.02   533.30     0.92     0.89
 HUB     18.34     1.09    15.72   557.26     1.03   533.18     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.96    35.26    31.50     3.76     0.93     0.15     2.90
 MEAN    20.52    27.37    23.50     3.87     0.91     0.17     3.30     0.89
 HUB     29.59    10.43     6.50     3.93     0.91     0.21     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     505.592     174.817     474.408    1132.940       0.446      -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.057      15.747     533.402      46.000      20.229      30.600      10.371

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     491.401     174.817     521.571    1134.194       0.433       0.030

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.002      15.821     534.584     511.151       0.034       0.154

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     486.041       0.000     486.041    1134.658       0.428       0.018

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.790     535.021       0.000       0.060       0.071       0.017

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.771      17.916       1.063     554.750      12.447     325.058       2.520

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  77515.211       0.349     610.361 1262376.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.467   EfDer =  0.923

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    139.337    2643.000      17.916     554.750       1.000       1.000       0.980
W Kg/sec =   63.33516

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    118.231    2555.681       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 107189.766  109333.328       1.584     545.479     344.322     429.765       1.248

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   456.84    -0.16   456.84     0.40   447.60
 MEAN    17.74     0.00    -0.02   456.84    -0.16   456.84     0.40
 HUB     15.05     0.00    -0.02   456.84    -0.16   456.84     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.39    46.36    -0.97   462.91   650.49    16.03   537.32     0.57
 MEAN    41.86    43.40    -1.54   409.13   613.37    16.03   537.32     0.54
 HUB     37.24    38.84    -1.60   347.12   573.85    16.03   537.32     0.50

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   503.17   107.02   491.66  1141.48     0.44
 MEAN    17.51   512.05   147.79   490.26  1142.51     0.45
 HUB     14.85   550.56   250.12   490.47  1143.32     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   603.45   349.89     0.53  2123.16
 MEAN   403.78   553.07   255.99     0.48  2590.03     1.18
 HUB    342.51   499.10    92.39     0.44  3716.67

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     18.68     1.04    16.34   562.61     1.01   541.47     0.92     0.84
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 MEAN    18.85     1.05    16.42   564.34     1.02   542.45     0.92     0.84
 HUB     19.26     1.08    16.43   568.51     1.02   543.21     0.92     0.84
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     12.28    35.44    31.50     3.94     0.93     0.10     2.90
 MEAN    16.78    27.57    23.50     4.07     0.89     0.13     3.28     0.84
 HUB     27.02    10.67     6.50     4.17     0.89     0.19     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.923

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     518.560     148.757     496.766    1142.745       0.454      -0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.902      16.409     542.703      46.000      16.670      31.500      14.830

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     524.891     148.757     545.563    1142.165       0.460      -0.051

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.805      16.267     542.151     471.992       0.048       0.111

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     510.796       0.000     510.796    1143.448       0.447      -0.050

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.282     543.370       0.000       0.060       0.099      -0.045

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.638      18.676       1.042     565.157      10.407     365.630       2.834

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  64818.633       0.310     510.387 1270049.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.467   EfDer =  0.863

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    139.337    2643.000      18.676     565.157       1.000       1.000       0.980
W Kg/sec =   63.33516

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    114.481    2532.042       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107189.766  109333.328       1.540     513.330     333.408     401.059       1.203

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   477.17    -0.16   477.17     0.42   425.56
 MEAN    16.97     0.00    -0.02   477.17    -0.16   477.17     0.42
 HUB     14.32     0.00    -0.02   477.17    -0.16   477.17     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.96    46.36    -3.40   444.22   652.05    16.57   546.15     0.57
 MEAN    39.37    43.80    -4.43   391.42   617.28    16.57   546.15     0.54
 HUB     34.70    37.84    -3.14   330.28   580.42    16.57   546.15     0.51

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   519.59    67.11   515.23  1147.61     0.45
 MEAN    16.57   524.91   113.35   512.52  1149.49     0.46
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HUB     13.89   558.56   223.26   512.00  1151.05     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   633.36   368.34     0.55  1270.28
MEAN   382.27   578.79   268.92     0.50  1881.40     1.13
HUB    320.37   521.12    97.10     0.45  3103.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.11     1.02    16.60   569.86     1.01   547.32     0.92     0.79
MEAN    19.32     1.03    16.74   572.12     1.01   549.12     0.92     0.79
HUB     19.74     1.06    16.80   576.65     1.02   550.60     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP      7.42    35.56    31.50     4.06     0.93     0.05     2.90
MEAN    12.47    27.69    23.50     4.19     0.88     0.09     3.29     0.79
HUB     23.56    10.74     6.50     4.24     0.88     0.15     3.90

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.863

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     514.298     113.985     501.508    1151.198       0.447       0.052

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.363      16.881     550.794      46.000      12.805      32.400      19.595

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     540.730     113.985     552.613    1148.763       0.471      -0.075

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.224      16.514     548.466     456.573       0.062       0.073

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     515.267       0.000     515.267    1151.111       0.448      -0.107

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.594     550.711       0.000       0.060       0.129      -0.045

   STAGE EXIT CONDITIONS, STAGE             4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.410      19.044       1.020     572.878       7.721     453.414       3.515

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  48096.719       0.254     378.717 1317426.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.467   EfDer =  0.803

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    139.337    2643.000      19.044     572.878       1.000       1.000       0.980
W Kg/sec =   63.33516

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    113.034    2514.921       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107189.766  109333.328       1.548     509.668     329.201     390.276       1.186

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   477.21    -0.16   477.21     0.41   402.05
 MEAN    15.91     0.00    -0.02   477.21    -0.16   477.21     0.41
 HUB     13.07     0.00    -0.02   477.21    -0.16   477.21     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     41.53    47.36    -5.83   422.54   637.50    16.93   553.87     0.55
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 MEAN    37.58    44.80    -7.22   367.03   602.13    16.93   553.87     0.52
 HUB     32.29    38.84    -6.55   301.45   564.54    16.93   553.87     0.49
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   518.92    40.35   517.35  1153.60     0.45
 MEAN    15.50   521.59    85.09   514.60  1155.66     0.45
 HUB     12.59   548.86   192.12   514.13  1157.36     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   638.05   373.43     0.55   726.81
 MEAN   357.44   582.23   272.36     0.50  1321.26     1.10
 HUB    290.38   523.44    98.26     0.45  2420.97

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.27     1.01    16.77   575.57     1.00   553.09     0.92     0.73
 MEAN    19.46     1.02    16.92   577.77     1.01   555.06     0.92     0.73
 HUB     19.82     1.04    16.99   581.84     1.02   556.70     0.92     0.73

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP      4.46    35.82    31.50     4.32     0.93     0.01     2.90
 MEAN     9.39    27.89    23.50     4.39     0.87     0.05     3.34     0.73
 HUB     20.49    10.82     6.50     4.32     0.87     0.11     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.803

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     527.223      86.647     520.054    1155.746       0.456       -0.018

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.466      16.875     555.190      46.000       9.459      33.000      23.541

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     575.403      86.647     581.890    1151.121       0.500       -0.287

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.148      16.140     550.755     440.827       0.141       0.046

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     532.200       0.000     532.200    1155.288       0.461       -0.126

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      16.545     554.750       0.000       0.060       0.145       -0.133

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.149      19.139       1.005     578.393       5.516     581.399       4.507

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  34363.062       0.201     270.577 1394444.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    346150.47   2725.6160     136.1186      1.2669       0.6602       3.4667       1.1063
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    P&W Fan Hub + 4 Stage LPC 70% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     137.138    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   62.33530

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     133.970    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  105497.594  107607.312       2.131     831.557     390.149     619.754       1.589

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   316.99    -0.11   316.99     0.28   473.93
  MEAN    17.06     0.00    -0.02   316.99    -0.11   316.99     0.28
  HUB     12.51     0.00    -0.02   316.99    -0.11   316.99     0.28

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.33    50.47     5.86   475.82   571.83    14.28   514.42     0.51
  MEAN    51.15    47.20     3.95   393.48   505.37    14.28   514.42     0.45
  HUB     42.32    38.62     3.70   288.54   428.72    14.28   514.42     0.39

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   497.79   240.40   435.90  1119.20     0.44
  MEAN    18.04   522.35   282.54   439.34  1117.49     0.47
  HUB     15.00   594.62   390.53   448.40  1113.28     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   495.41   235.42     0.44  4961.64
  MEAN   415.99   459.16   133.46     0.41  5097.71     1.22
  HUB    345.97   450.60    44.56     0.40  5859.26

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.86     1.12    14.71   541.19     1.04   520.50     0.92     0.91
  MEAN    16.91     1.12    14.55   541.70     1.04   518.91     0.92     0.91
  HUB     17.19     1.14    14.15   544.52     1.04   514.99     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     28.88    28.37    24.20     4.17     0.93     0.21     2.90
  MEAN    32.74    16.90    12.70     4.20     0.92     0.17     3.51     0.91
  HUB     41.05    -5.67    -9.30     3.63     0.92     0.05     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.992

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     531.691     281.989     450.753    1117.416       0.476      -0.013

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      16.959      14.521     518.858      24.000      32.030      35.400       3.370

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     486.074     281.989     561.948    1121.584       0.433       0.162
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.932      14.879     522.736     528.796       0.021       0.333

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     448.539       0.000     448.539    1124.723       0.399       0.242

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.127     525.666       0.000       0.060       0.040       0.261

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.861      16.882       1.118     542.470      19.660     233.440       1.810

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 122400.695       0.541     948.578 1332915.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.976

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.138    2643.000      16.882     542.470       1.000       1.000       0.980
W Kg/sec =   62.33530

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    122.118    2584.446       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 105497.594  107607.312       1.660     590.487     355.636     474.134       1.333

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   427.42    -0.15   427.42     0.38   463.46
 MEAN    18.08     0.00    -0.02   427.42    -0.15   427.42     0.38
 HUB     15.21     0.00    -0.02   427.42    -0.15   427.42     0.38

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.97    46.36     1.61   473.98   638.34    15.28   527.21     0.57
 MEAN    44.30    42.30     2.00   416.97   597.22    15.28   527.21     0.53
 HUB     39.39    37.84     1.55   350.81   553.04    15.28   527.21     0.49

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   478.77   149.51   454.82  1134.28     0.42
 MEAN    18.01   489.63   179.76   455.44  1134.07     0.43
 HUB     15.22   529.34   267.10   457.01  1133.75     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   556.96   321.47     0.49  3055.98
 MEAN   415.39   512.79   235.64     0.45  3240.04     1.25
 HUB    351.11   464.66    84.01     0.41  4068.36

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.01     1.07    15.93   553.79     1.02   534.65     0.92     0.89
 MEAN    18.07     1.07    15.90   554.47     1.02   534.45     0.92     0.89
 HUB     18.39     1.09    15.83   557.54     1.03   534.14     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.20    35.25    31.50     3.75     0.93     0.17     2.90
 MEAN    21.54    27.36    23.50     3.86     0.91     0.19     3.30     0.89
 HUB     30.30    10.42     6.50     3.92     0.91     0.22     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.976

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     497.708     180.260     463.918    1134.191       0.439      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.134      15.884     534.580      46.000      21.234      30.600       9.366

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     479.648     180.260     512.402    1135.753       0.422       0.048

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.087      15.996     536.054     511.151       0.030       0.168

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     474.210       0.000     474.210    1136.212       0.417       0.039

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.972     536.487       0.000       0.060       0.065       0.038

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.793      18.009       1.067     555.267      12.797     315.144       2.443

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79693.430       0.359     617.606 1238415.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.936

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    137.138    2643.000      18.009     555.267       1.000       1.000       0.980
W Kg/sec =   62.33530

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    115.818    2554.490       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 105497.594  107607.312       1.617     545.479     337.295     429.765       1.274

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   446.01    -0.15   446.01     0.39   447.39
 MEAN    17.74      0.00    -0.02   446.01    -0.15   446.01     0.39
 HUB     15.05      0.00    -0.02   446.01    -0.15   446.01     0.39

       BetaFlo   BetaBlade Incid   U1        W1       Ps1      Ts1     Rel Mach
 TIP     46.07     46.36    -0.29   462.91   642.92     16.20   538.66     0.56
 MEAN    42.54     43.40    -0.86   409.13   605.34     16.20   538.66     0.53
 HUB     37.91     38.84    -0.93   347.12   565.26     16.20   538.66     0.50

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   492.35    116.64    478.34   1143.71      0.43
 MEAN    17.51   501.88    154.62    477.47   1144.42      0.44
 HUB     14.85   540.65    252.65    477.98   1144.95      0.47

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91    587.01    340.27     0.51   2313.74
 MEAN   403.78    538.57    249.16     0.47   2709.61     1.20
 HUB    342.51    486.36     89.86     0.42   3754.21

         Pt2       PR       Ps2      Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     18.85      1.05     16.60    563.84      1.02    543.60      0.92      0.86
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 MEAN    19.00     1.06    16.65   565.30     1.02   544.27     0.92     0.86
 HUB     19.39     1.08    16.64   569.17     1.03   544.76     0.92     0.86
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     13.70    35.43    31.50     3.93     0.93     0.12     2.90
 MEAN    17.94    27.56    23.50     4.06     0.90     0.15     3.28     0.86
 HUB     27.86    10.65     6.50     4.15     0.90     0.20     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.936

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     508.112     155.636     483.689    1144.684       0.444      -0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.057      16.643     544.545      46.000      17.837      31.500      13.663

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     509.676     155.636     532.909    1144.545       0.445      -0.029

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.975      16.557     544.412     471.992       0.044       0.127

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     495.789       0.000     495.789    1145.769       0.433      -0.027

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.578     545.578       0.000       0.060       0.092      -0.021

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4         PR4        Texit        Del T       Ns        Ns nondim
      0.680      18.857       1.047     566.103      10.836     350.480       2.717

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  67492.336       0.323     523.050 1244331.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.881

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.138    2643.000      18.857     566.103       1.000       1.000       0.980
W Kg/sec =   62.33530

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.684    2529.924       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 105497.594  107607.312       1.578     513.330     325.264     401.059       1.233

     ROTOR LEADING EDGE CONDITIONS, STAGE           4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   463.59    -0.16   463.59     0.40   425.20
 MEAN    16.97     0.00    -0.02   463.59    -0.16   463.59     0.40
 HUB     14.32     0.00    -0.02   463.59    -0.16   463.59     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.79    46.36    -2.57   444.22   642.17    16.85   548.16     0.56
 MEAN    40.19    43.80    -3.61   391.42   606.83    16.85   548.16     0.53
 HUB     35.48    37.84    -2.36   330.28   569.30    16.85   548.16     0.50

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   504.74    79.23   498.48  1150.81     0.44
 MEAN    16.57   511.24   121.93   496.49  1152.26     0.44
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 HUB     13.89   545.53   226.39   496.33  1153.45     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   612.69   356.23     0.53  1498.90
 MEAN   382.27   560.61   260.34     0.49  2023.50     1.15
 HUB    320.37   505.15    93.98     0.44  3146.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.38     1.03    16.98   571.65     1.01   550.38     0.92     0.81
 MEAN    19.57     1.04    17.09   573.60     1.01   551.78     0.92     0.81
 HUB     19.97     1.06    17.13   577.76     1.02   552.91     0.92     0.81

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     9.03    35.55    31.50     4.05     0.93     0.07     2.90
 MEAN   13.80    27.67    23.50     4.17     0.88     0.11     3.29     0.81
 HUB    24.52    10.72     6.50     4.22     0.88     0.16     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.881

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     501.149     122.612     485.919    1153.885       0.434       0.053

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.615      17.228     553.367      46.000      14.162      32.400      18.238

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     522.056     122.612     536.262    1152.021       0.453      -0.053

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.495      16.930     551.581     456.573       0.057       0.090

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     497.430       0.000     497.430    1154.208       0.431      -0.085

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.009     553.677       0.000       0.060       0.121      -0.023

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.488      19.328       1.025     574.335       8.232     425.935       3.302

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  51280.691       0.270     397.414 1288563.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.822

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.138    2643.000      19.328     574.335       1.000       1.000       0.980
W Kg/sec =   62.33530

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    109.753    2511.728       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*      AthrRotor  ChokeMargin
 105497.594  107607.312       1.594     509.668     319.645     390.276       1.221

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   461.26    -0.16   461.26     0.40   401.54
 MEAN    15.91     0.00    -0.02   461.26    -0.16   461.26     0.40
 HUB     13.07     0.00    -0.02   461.26    -0.16   461.26     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.50    47.36    -4.86   422.54   625.65    17.32   556.57     0.54
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 MEAN    38.52    44.80    -6.28   367.03   589.56    17.32   556.57     0.51
 HUB     33.18    38.84    -5.66   301.45   551.12    17.32   556.57     0.48
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   500.87    54.53   497.89  1157.69     0.43
 MEAN    15.50   504.98    95.13   495.94  1159.24     0.44
 HUB     12.59   533.15   195.80   495.90  1160.51     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   613.96   359.24     0.53   981.26
 MEAN   357.44   561.04   262.32     0.48  1476.81     1.12
 HUB    290.38   504.84    94.58     0.44  2467.17

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.65     1.02    17.28   577.97     1.01   557.03     0.92     0.75
 MEAN    19.82     1.03    17.39   579.80     1.01   558.52     0.92     0.75
 HUB     20.15     1.04    17.43   583.47     1.02   559.74     0.92     0.75

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP      6.25    35.81    31.50     4.31     0.93     0.03     2.90
 MEAN    10.86    27.88    23.50     4.38     0.87     0.07     3.34     0.75
 HUB     21.55    10.80     6.50     4.30     0.87     0.13     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.822

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     510.248      96.874     500.968    1159.375       0.440       -0.016

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.821      17.349     558.680      46.000      10.944      33.000      22.056

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     550.946      96.874     559.398    1155.628       0.477       -0.257

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.539      16.721     555.075     440.827       0.132       0.063

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     510.972       0.000     510.972    1159.311       0.441       -0.108

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      17.079     558.619       0.000       0.060       0.140       -0.114

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.267      19.519       1.010     580.414       6.079     531.409       4.119

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  37871.137       0.221     293.493 1361900.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    358738.28   2780.1406     133.9698      1.2921      0.6919       3.9529       1.1102
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 70% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.534   EfDer =  0.995

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     134.533    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   61.15139

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     131.425    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  103493.922  105563.570       2.173     831.557     382.739     619.754       1.619

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   310.45    -0.11   310.45     0.28   473.93
  MEAN    17.06     0.00    -0.02   310.45    -0.11   310.45     0.28
  HUB     12.51     0.00    -0.02   310.45    -0.11   310.45     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.88    50.47     6.41   475.82   568.23    14.31   514.76     0.51
  MEAN    51.73    47.20     4.53   393.48   501.29    14.31   514.76     0.45
  HUB     42.92    38.62     4.30   288.54   423.91    14.31   514.76     0.38

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   491.65   245.99   425.68  1120.20     0.44
  MEAN    18.04   515.65   285.67   429.28  1118.34     0.46
  HUB     15.00   586.24   389.57   438.07  1114.11     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   483.76   229.83     0.43  5077.07
  MEAN   415.99   448.63   130.32     0.40  5154.25     1.24
  HUB    345.97   440.24    43.60     0.40  5844.92

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.90     1.12    14.81   541.62     1.04   521.43     0.92     0.91
  MEAN    16.93     1.12    14.63   541.91     1.04   519.70     0.92     0.91
  HUB     17.19     1.14    14.23   544.47     1.04   515.76     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     30.02    28.36    24.20     4.16     0.93     0.22     2.90
  MEAN    33.64    16.89    12.70     4.19     0.92     0.19     3.51     0.91
  HUB     41.65    -5.68    -9.30     3.62     0.92     0.07     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.995

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     524.584     285.119     440.336    1118.301       0.469      -0.012

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      16.984      14.605     519.680      24.000      32.923      35.400       2.477

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     473.983     285.119     553.130    1122.832       0.422       0.182
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.961      15.002     523.900     528.796       0.019       0.347

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     437.664       0.000     437.664    1125.792       0.389       0.258

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.238     526.666       0.000       0.060       0.039       0.278

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.867      16.914       1.120     542.665      19.855     229.320       1.778

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 123612.883       0.546     939.778 1305437.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.534   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    134.533    2643.000      16.914     542.665       1.000       1.000       0.980
W Kg/sec =   61.15139

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    119.593    2583.982       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 103493.922  105563.570       1.695     590.487     348.284     474.134       1.361

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   417.23    -0.14   417.23     0.37   463.38
 MEAN    18.08     0.00    -0.02   417.23    -0.14   417.23     0.37
 HUB     15.21     0.00    -0.02   417.23    -0.14   417.23     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.65    46.36     2.29   473.98   631.56    15.39   528.13     0.56
 MEAN    44.99    42.30     2.69   416.97   589.97    15.39   528.13     0.52
 HUB     40.07    37.84     2.23   350.81   545.21    15.39   528.13     0.48

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   470.15   158.24   442.72  1135.91     0.41
 MEAN    18.01   481.14   186.00   443.73  1135.45     0.42
 HUB     15.22   520.68   269.39   445.57  1134.89     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   542.04   312.74     0.48  3234.16
 MEAN   415.39   499.51   229.39     0.44  3352.52     1.27
 HUB    351.11   453.00    81.72     0.40  4103.10

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.11     1.07    16.10   554.64     1.02   536.19     0.92     0.90
 MEAN    18.16     1.07    16.05   555.08     1.02   535.75     0.92     0.90
 HUB     18.45     1.09    15.97   557.86     1.03   535.22     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.67    35.24    31.50     3.74     0.93     0.18     2.90
 MEAN    22.74    27.34    23.50     3.84     0.91     0.20     3.30     0.90
 HUB     31.16    10.39     6.50     3.89     0.91     0.23     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.983

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     488.878     186.526     451.896    1135.594       0.431      -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.218      16.037     535.904      46.000      22.429      30.600       8.171

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     466.276     186.526     502.201    1137.503       0.410       0.071

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.181      16.192     537.707     511.151       0.027       0.185

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     460.782       0.000     460.782    1137.953       0.405       0.063

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.175     538.132       0.000       0.060       0.058       0.063

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.814      18.112       1.071     555.864      13.199     304.231       2.358

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  82195.148       0.371     624.896 1210431.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.534   EfDer =  0.949

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    134.533    2643.000      18.112     555.864       1.000       1.000       0.980
W Kg/sec =   61.15139

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    113.035    2553.120       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 103493.922  105563.570       1.657     545.479     329.192     429.765       1.306

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   433.68    -0.15   433.68     0.38   447.15
 MEAN    17.74     0.00    -0.02   433.68    -0.15   433.68     0.38
 HUB     15.05     0.00    -0.02   433.68    -0.15   433.68     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.88    46.36     0.52   462.91   634.42    16.39   540.16     0.56
 MEAN    43.34    43.40    -0.06   409.13   596.31    16.39   540.16     0.52
 HUB     38.69    38.84    -0.15   347.12   555.58    16.39   540.16     0.49

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   480.57   127.50   463.35  1146.17     0.42
 MEAN    17.51   490.69   162.38   463.04  1146.55     0.43
 HUB     14.85   529.59   255.50   463.88  1146.77     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   568.51   329.41     0.50  2528.79
 MEAN   403.78   522.19   241.40     0.46  2845.35     1.22
 HUB    342.51   471.97    87.01     0.41  3796.45

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.05     1.05    16.88   565.23     1.02   545.94     0.92     0.87
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 MEAN    19.17     1.06    16.90   566.40     1.02   546.30     0.92     0.87
 HUB     19.54     1.08    16.88   569.92     1.03   546.50     0.92     0.87
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.39    35.41    31.50     3.91     0.93     0.14     2.90
 MEAN    19.32    27.53    23.50     4.03     0.90     0.17     3.28     0.87
 HUB     28.85    10.62     6.50     4.12     0.90     0.21     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.949

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     496.629     163.445     468.963    1146.832       0.433       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.231      16.903     546.589      46.000      19.215      31.500      12.285

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     492.718     163.445     519.120    1147.171       0.430      -0.003

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.164      16.879     546.913     471.992       0.038       0.146

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     479.074       0.000     479.074    1148.332       0.417       0.001

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      16.905     548.020       0.000       0.060       0.083       0.008

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.723      19.059       1.052     567.185      11.321     334.432       2.592

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  70514.414       0.338     536.092 1214540.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 4.534   EfDer =  0.901

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    134.533    2643.000       19.059     567.185       1.000        1.000        0.980
W Kg/sec =   61.15139

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    108.504    2527.511        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 103493.922  105563.570        1.624     513.330     316.003     401.059       1.269

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   448.39    -0.15   448.39      0.39   424.80
 MEAN    16.97      0.00    -0.02   448.39    -0.15   448.39      0.39
 HUB     14.32      0.00    -0.02   448.39    -0.15   448.39      0.39

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     44.74    46.36    -1.62   444.22   631.29     17.16   550.40      0.55
 MEAN    41.13    43.80    -2.67   391.42   595.30     17.16   550.40      0.52
 HUB     36.39    37.84    -1.45   330.28   557.00     17.16   550.40      0.48

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2      Ao2          Mach2
 TIP     18.88   488.84    92.65   479.98  1154.28      0.42
 MEAN    16.57   496.43   131.49   478.70  1155.29      0.43
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 HUB     13.89   531.25   229.90   478.93  1156.09     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   589.83   342.81     0.51  1752.21
 MEAN   382.27   540.41   250.78     0.47  2181.84     1.17
 HUB    320.37   487.40    90.47     0.42  3195.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.69     1.03    17.41   573.67     1.01   553.72     0.92     0.82
 MEAN    19.85     1.04    17.48   575.26     1.01   554.69     0.92     0.82
 HUB     20.23     1.06    17.50   579.02     1.02   555.46     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     10.93    35.54    31.50     4.04     0.93     0.09     2.90
 MEAN    15.36    27.65    23.50     4.15     0.89     0.13     3.29     0.82
 HUB     25.64    10.70     6.50     4.20     0.89     0.18     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.901

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     486.914     132.225     468.617    1156.826       0.421       0.053

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.899      17.614     556.190      46.000      15.757      32.400      16.643

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     501.584     132.225     518.719    1155.567       0.434      -0.028

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.800      17.393     554.979     456.573       0.050       0.110

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     477.813       0.000     477.813    1157.589       0.413      -0.057

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.473     556.923       0.000       0.060       0.111       0.004

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.566      19.650       1.031     575.985       8.800     398.442       3.089

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  54820.480       0.289     416.777 1255509.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 4.534   EfDer =  0.846

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    134.533    2643.000      19.650     575.985       1.000       1.000       0.980
W Kg/sec =   61.15139

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.057    2508.129       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 103493.922  105563.570       1.650     509.668     308.881     390.276       1.264

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   443.62    -0.15   443.62     0.38   400.97
 MEAN    15.91     0.00    -0.02   443.62    -0.15   443.62     0.38
 HUB     13.07     0.00    -0.02   443.62    -0.15   443.62     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.62    47.36    -3.74   422.54   612.76    17.76   559.56     0.53
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 MEAN    39.61    44.80    -5.19   367.03   575.87    17.76   559.56     0.50
 HUB     34.21    38.84    -4.63   301.45   536.44    17.76   559.56     0.46
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   481.75    70.07   476.62  1162.09     0.41
 MEAN    15.50   487.15   106.21   475.43  1163.12     0.42
 HUB     12.59   516.06   199.84   475.79  1163.95     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   587.63   343.71     0.51  1259.79
 MEAN   357.44   537.73   251.24     0.46  1648.42     1.14
 HUB    290.38   484.33    90.54     0.42  2518.02

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.08     1.02    17.84   580.65     1.01   561.28     0.92     0.77
 MEAN    20.22     1.03    17.92   582.09     1.01   562.28     0.92     0.77
 HUB     20.52     1.04    17.93   585.31     1.02   563.08     0.92     0.77

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP      8.36    35.80    31.50     4.30     0.93     0.06     2.90
 MEAN    12.59    27.85    23.50     4.35     0.88     0.09     3.34     0.77
 HUB     22.78    10.77     6.50     4.27     0.88     0.14     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.846

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     492.081     108.157     480.047    1163.300       0.423       -0.015

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.227      17.882     562.468      46.000      12.697      33.000      20.303

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     524.631     108.157     535.664    1160.440       0.452       -0.221

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.988      17.370     559.705     440.827       0.120       0.083

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     487.775       0.000     487.775    1163.664       0.419       -0.084

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      17.683     562.820       0.000       0.060       0.133       -0.089

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.385      19.958       1.016     582.681       6.697     484.633       3.757

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  41723.086       0.244     317.203 1325000.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    372866.00   2834.7456     131.4253      1.3211       0.7258       4.5345       1.1145
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 70% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.987   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     132.525    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   60.23870

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     129.464    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  101949.258  103988.031       2.206     831.557     377.027     619.754       1.644

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   305.44    -0.11   305.44     0.27   473.93
  MEAN    17.06     0.00    -0.02   305.44    -0.11   305.44     0.27
  HUB     12.51     0.00    -0.02   305.44    -0.11   305.44     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.31    50.47     6.84   475.82   565.51    14.34   515.02     0.51
  MEAN    52.19    47.20     4.99   393.48   498.20    14.34   515.02     0.45
  HUB     43.38    38.62     4.76   288.54   420.25    14.34   515.02     0.38

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   487.13   250.24   417.94  1120.94     0.43
  MEAN    18.04   510.65   288.07   421.64  1118.97     0.46
  HUB     15.00   579.92   388.85   430.24  1114.73     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   474.93   225.58     0.42  5164.63
  MEAN   415.99   440.62   127.93     0.39  5197.38     1.26
  HUB    345.97   432.37    42.88     0.39  5834.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.94     1.12    14.88   541.95     1.04   522.13     0.92     0.91
  MEAN    16.95     1.12    14.69   542.07     1.04   520.29     0.92     0.91
  HUB     17.19     1.14    14.29   544.43     1.04   516.34     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     30.91    28.36    24.20     4.16     0.93     0.24     2.90
  MEAN    34.34    16.88    12.70     4.18     0.92     0.20     3.51     0.91
  HUB     42.11    -5.69    -9.30     3.61     0.92     0.08     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     519.288     287.507     432.435    1118.957       0.464      -0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.003      14.667     520.290      24.000      33.618      35.400       1.782

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     464.872     287.507     546.596    1123.756       0.414       0.197
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.982      15.093     524.763     528.796       0.019       0.358

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     429.463       0.000     429.463    1126.585       0.381       0.271

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.318     527.408       0.000       0.060       0.038       0.290

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.871      16.936       1.121     542.813      20.003     226.198       1.753

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 124533.992       0.550     932.650 1284351.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.987   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    132.525    2643.000      16.936     542.813       1.000       1.000       0.980
W Kg/sec =   60.23870

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    117.668    2583.630       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 101949.258  103988.031       1.723     590.487     342.678     474.134       1.384

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   409.54    -0.14   409.54     0.36   463.32
 MEAN    18.08     0.00    -0.02   409.54    -0.14   409.54     0.36
 HUB     15.21     0.00    -0.02   409.54    -0.14   409.54     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.18    46.36     2.82   473.98   626.50    15.46   528.81     0.56
 MEAN    45.52    42.30     3.22   416.97   584.55    15.46   528.81     0.52
 HUB     40.59    37.84     2.75   350.81   539.34    15.46   528.81     0.48

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   463.92   164.76   433.67  1137.10     0.41
 MEAN    18.01   474.92   190.68   434.96  1136.46     0.42
 HUB     15.22   514.25   271.09   436.99  1135.74     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   530.89   306.22     0.47  3367.31
 MEAN   415.39   489.57   224.71     0.43  3436.76     1.28
 HUB    351.11   444.26    80.02     0.39  4128.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.19     1.07    16.22   555.29     1.02   537.31     0.92     0.90
 MEAN    18.22     1.08    16.16   555.54     1.02   536.71     0.92     0.90
 HUB     18.49     1.09    16.06   558.11     1.03   536.02     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.80    35.23    31.50     3.73     0.93     0.20     2.90
 MEAN    23.67    27.32    23.50     3.82     0.92     0.21     3.30     0.90
 HUB     31.81    10.38     6.50     3.88     0.92     0.24     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     482.416     191.219     442.900    1136.624       0.424      -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.280      16.147     536.876      46.000      23.352      30.600       7.248

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     456.339     191.219     494.783    1138.786       0.401       0.088

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.249      16.335     538.921     511.151       0.025       0.198

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     450.826       0.000     450.826    1139.228       0.396       0.081

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.322     539.338       0.000       0.060       0.054       0.082

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.828      18.185       1.074     556.312      13.499     296.369       2.297

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  84065.461       0.379     629.576 1189124.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.987   EfDer =  0.958

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    132.525    2643.000      18.185     556.312       1.000       1.000       0.980
W Kg/sec =   60.23870

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    110.943    2552.091       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 101949.258  103988.031       1.688     545.479     323.099     429.765       1.330

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   424.51    -0.15   424.51     0.37   446.97
 MEAN    17.74     0.00    -0.02   424.51    -0.15   424.51     0.37
 HUB     15.05     0.00    -0.02   424.51    -0.15   424.51     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.49    46.36     1.13   462.91   628.19    16.53   541.26     0.55
 MEAN    43.95    43.40     0.55   409.13   589.67    16.53   541.26     0.52
 HUB     39.28    38.84     0.44   347.12   548.46    16.53   541.26     0.48

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   472.19   135.48   452.34  1147.95      0.41
 MEAN    17.51   482.62   168.08   452.41  1148.09      0.42
 HUB     14.85   521.54   257.60   453.48  1148.10      0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   554.92   321.43     0.48  2686.73
 MEAN   403.78   510.12   235.70     0.44  2945.07     1.23
 HUB    342.51   461.36    84.91     0.40  3827.59

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     19.20     1.06    17.09   566.26     1.02   547.64     0.92     0.88
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 MEAN    19.30     1.06    17.09   567.22     1.02   547.77     0.92     0.88
 HUB     19.64     1.08    17.05   570.49     1.03   547.77     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.67    35.40    31.50     3.90     0.93     0.15     2.90
 MEAN    20.38    27.52    23.50     4.02     0.90     0.18     3.28     0.88
 HUB     29.60    10.60     6.50     4.10     0.90     0.22     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.958

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     488.367     169.181     458.126    1148.388       0.425       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.357      17.091     548.074      46.000      20.269      31.500      11.231

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     480.356     169.181     509.278    1149.067       0.418       0.016

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.300      17.111     548.722     471.992       0.035       0.160

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     466.903       0.000     466.903    1150.181       0.406       0.022

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.142     549.786       0.000       0.060       0.076       0.030

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.751      19.205       1.056     567.989      11.677     323.274       2.506

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  72734.914       0.348     544.720 1192019.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 4.987   EfDer =  0.915

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    132.525    2643.000       19.205     567.989       1.000        1.000        0.980
W Kg/sec =   60.23870

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    106.147    2525.720        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 101949.258  103988.031        1.661     513.330     309.138     401.059       1.297

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   437.29    -0.15   437.29      0.38   424.50
 MEAN    16.97      0.00    -0.02   437.29    -0.15   437.29      0.38
 HUB     14.32      0.00    -0.02   437.29    -0.15   437.29      0.38

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     45.46     46.36    -0.90   444.22   623.45     17.39   552.02      0.54
 MEAN    41.84     43.80    -1.96   391.42   586.99     17.39   552.02      0.51
 HUB     37.08     37.84    -0.76   330.28   548.10     17.39   552.02      0.48

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2      Ao2          Mach2
 TIP     18.88   477.70    102.35   466.61  1156.76      0.41
 MEAN    16.57   485.94    138.44   465.80  1157.46      0.42
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 HUB     13.89   521.02   232.45   466.29  1157.99     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   573.31   333.11     0.50  1935.32
 MEAN   382.27   525.76   243.83     0.45  2297.01     1.19
 HUB    320.37   474.51    87.92     0.41  3230.85

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.92     1.04    17.71   575.16     1.01   556.10     0.92     0.84
 MEAN    20.06     1.04    17.77   576.49     1.01   556.78     0.92     0.84
 HUB     20.41     1.06    17.76   579.95     1.02   557.29     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     12.37    35.52    31.50     4.02     0.93     0.11     2.90
 MEAN    16.55    27.63    23.50     4.13     0.89     0.14     3.29     0.84
 HUB     26.50    10.68     6.50     4.18     0.89     0.19     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.915

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     476.845     139.216     456.070    1158.933       0.411       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.108      17.893     558.216      46.000      16.975      32.400      15.425

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     486.897     139.216     506.408    1158.093       0.420      -0.008

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.023      17.728     557.408     456.573       0.046       0.126

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     463.716       0.000     463.716    1160.002       0.400      -0.035

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.809     559.247       0.000       0.060       0.103       0.026

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.618      19.885       1.035     577.201       9.211     380.214       2.947

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  57385.492       0.303     429.767 1230768.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 4.987   EfDer =  0.864

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    132.525    2643.000      19.885     577.201       1.000       1.000       0.980
W Kg/sec =   60.23870

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.347    2505.485       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 101949.258  103988.031       1.693     509.668     300.988     390.276       1.297

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   430.90    -0.15   430.90     0.37   400.55
 MEAN    15.91     0.00    -0.02   430.90    -0.15   430.90     0.37
 HUB     13.07     0.00    -0.02   430.90    -0.15   430.90     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.45    47.36    -2.91   422.54   603.61    18.08   561.70     0.52
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 MEAN    40.43    44.80    -4.37   367.03   566.12    18.08   561.70     0.49
 HUB     34.99    38.84    -3.85   301.45   525.96    18.08   561.70     0.45
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   468.51    81.20   461.42  1165.19     0.40
 MEAN    15.50   474.65   114.16   460.72  1165.88     0.41
 HUB     12.59   503.92   202.75   461.33  1166.41     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   568.79   332.58     0.49  1459.41
 MEAN   357.44   521.01   243.28     0.45  1771.57     1.16
 HUB    290.38   469.58    87.63     0.40  2554.54

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.40     1.03    18.25   582.60     1.01   564.28     0.92     0.79
 MEAN    20.52     1.03    18.30   583.76     1.01   564.95     0.92     0.79
 HUB     20.80     1.05    18.29   586.66     1.02   565.46     0.92     0.79

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP      9.98    35.78    31.50     4.28     0.93     0.08     2.90
 MEAN    13.92    27.84    23.50     4.34     0.88     0.11     3.34     0.79
 HUB     23.72    10.76     6.50     4.26     0.88     0.15     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.864

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     479.374     116.254     465.064    1166.080       0.411       -0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.527      18.270     565.157      46.000      14.035      33.000      18.965

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     506.099     116.254     519.279    1163.810       0.435       -0.192

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.319      17.840     562.959     440.827       0.111       0.099

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     471.242       0.000     471.242    1166.745       0.404       -0.063

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      18.126     565.803       0.000       0.060       0.126       -0.068

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.462      20.284       1.020     584.341       7.140     455.205       3.529

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  44486.082       0.260     333.161 1297621.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    383205.97   2869.8738     129.4638      1.3427      0.7491       4.9872       1.1177
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 70% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     130.475    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   59.30701

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     127.461    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  100372.453  102379.688       2.240     831.557     371.195     619.754       1.670

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   300.34    -0.10   300.34     0.27   473.93
  MEAN    17.06     0.00    -0.02   300.34    -0.10   300.34     0.27
  HUB     12.51     0.00    -0.02   300.34    -0.10   300.34     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.75    50.47     7.28   475.82   562.77    14.36   515.28     0.51
  MEAN    52.65    47.20     5.45   393.48   495.09    14.36   515.28     0.44
  HUB     43.86    38.62     5.24   288.54   416.56    14.36   515.28     0.37

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   482.69   254.51   410.14  1121.68     0.43
  MEAN    18.04   505.70   290.48   413.95  1119.59     0.45
  HUB     15.00   573.61   388.12   422.36  1115.34     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   466.04   221.31     0.42  5252.68
  MEAN   415.99   432.56   125.51     0.39  5240.83     1.28
  HUB    345.97   424.45    42.16     0.38  5823.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.98     1.12    14.94   542.27     1.04   522.81     0.92     0.91
  MEAN    16.97     1.12    14.75   542.23     1.04   520.87     0.92     0.91
  HUB     17.19     1.14    14.35   544.39     1.04   516.91     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     31.82    28.35    24.20     4.15     0.93     0.25     2.90
  MEAN    35.06    16.87    12.70     4.17     0.92     0.21     3.51     0.91
  HUB     42.58    -5.70    -9.30     3.60     0.92     0.09     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     514.034     289.914     424.477    1119.604       0.459      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.021      14.728     520.892      24.000      34.333      35.400       1.067

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     455.749     289.914     540.145    1124.667       0.405       0.212
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.002      15.181     525.613     528.796       0.018       0.369

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     421.245       0.000     421.245    1127.367       0.374       0.283

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.397     528.141       0.000       0.060       0.037       0.303

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      16.957       1.122     542.962      20.152     223.057       1.729

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 125461.570       0.554     925.064 1262912.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    130.475    2643.000      16.957     542.962       1.000       1.000       0.980
W Kg/sec =   59.30701

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    115.721    2583.275       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100372.453  102379.688       1.752     590.487     337.007     474.134       1.407

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   401.82    -0.14   401.82     0.36   463.25
 MEAN    18.08     0.00    -0.02   401.82    -0.14   401.82     0.36
 HUB     15.21     0.00    -0.02   401.82    -0.14   401.82     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.72    46.36     3.36   473.98   621.48    15.53   529.48     0.55
 MEAN    46.07    42.30     3.77   416.97   579.17    15.53   529.48     0.51
 HUB     41.13    37.84     3.29   350.81   533.50    15.53   529.48     0.47

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   457.91   171.24   424.69  1138.26     0.40
 MEAN    18.01   468.85   195.34   426.21  1137.45     0.41
 HUB     15.22   507.91   272.80   428.44  1136.57     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   519.81   299.74     0.46  3499.50
 MEAN   415.39   479.67   220.05     0.42  3520.62     1.30
 HUB    351.11   435.54    78.31     0.38  4154.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.27     1.08    16.34   555.92     1.02   538.41     0.92     0.91
 MEAN    18.28     1.08    16.26   556.00     1.02   537.65     0.92     0.91
 HUB     18.53     1.09    16.15   558.35     1.03   536.81     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.96    35.21    31.50     3.71     0.93     0.21     2.90
 MEAN    24.62    27.31    23.50     3.81     0.92     0.22     3.30     0.91
 HUB     32.49    10.36     6.50     3.86     0.92     0.25     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     476.112     195.891     433.946    1137.632       0.419      -0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.339      16.255     537.829      46.000      24.295      30.600       6.305

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     446.500     195.891     487.582    1140.043       0.392       0.105

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.313      16.473     540.110     511.151       0.022       0.211

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     440.990       0.000     440.990    1140.474       0.387       0.099

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.464     540.519       0.000       0.060       0.050       0.101

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.841      18.255       1.077     556.760      13.798     288.781       2.239

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  85926.641       0.387     633.562 1167598.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.967

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    130.475    2643.000      18.255     556.760       1.000       1.000       0.980
W Kg/sec =   59.30701

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    108.853    2551.064       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 100372.453  102379.688       1.721     545.479     317.011     429.765       1.356

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   415.44    -0.14   415.44     0.36   446.79
 MEAN    17.74     0.00    -0.02   415.44    -0.14   415.44     0.36
 HUB     15.05     0.00    -0.02   415.44    -0.14   415.44     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.10    46.36     1.74   462.91   622.10    16.66   542.35     0.54
 MEAN    44.57    43.40     1.17   409.13   583.18    16.66   542.35     0.51
 HUB     39.89    38.84     1.05   347.12   541.46    16.66   542.35     0.47

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   464.23   143.30   441.56  1149.67      0.40
 MEAN    17.51   474.86   173.68   441.96  1149.58      0.41
 HUB     14.85   513.72   259.67   443.26  1149.39      0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   541.59   313.61     0.47  2841.60
 MEAN   403.78   498.27   230.10     0.43  3043.12      1.25
 HUB    342.51   450.93    82.84     0.39  3858.22

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     19.34     1.06    17.28   567.28     1.02   549.29     0.92     0.88
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 MEAN    19.42     1.06    17.27   568.03     1.02   549.20     0.92     0.88
 HUB     19.74     1.08    17.21   571.05     1.03   549.01     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.98    35.38    31.50     3.88     0.93     0.17     2.90
 MEAN    21.45    27.50    23.50     4.00     0.91     0.19     3.28     0.88
 HUB     30.36    10.59     6.50     4.09     0.91     0.23     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     480.427     174.822     447.490    1149.896       0.418       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.479      17.272     549.514      46.000      21.339      31.500      10.161

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     468.313     174.822     499.880    1150.900       0.407       0.036

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.432      17.335     550.473     471.992       0.031       0.175

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     455.061       0.000     455.061    1151.968       0.395       0.044

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.370     551.495       0.000       0.060       0.069       0.052

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.776      19.345       1.060     568.787      12.027     312.797       2.425

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  74914.758       0.359     552.368 1169396.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.929

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    130.475    2643.000      19.345     568.787       1.000       1.000       0.980
W Kg/sec =   59.30701

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    103.821    2523.948       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100372.453  102379.688       1.698     513.330     302.363     401.059       1.326

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   426.47    -0.15   426.47     0.37   424.20
 MEAN    16.97     0.00    -0.02   426.47    -0.15   426.47     0.37
 HUB     14.32     0.00    -0.02   426.47    -0.15   426.47     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.18    46.36    -0.18   444.22   615.90    17.60   553.60     0.53
 MEAN    42.56    43.80    -1.24   391.42   578.96    17.60   553.60     0.50
 HUB     37.77    37.84    -0.07   330.28   539.50    17.60   553.60     0.47

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   467.25   111.75   453.69  1159.12     0.40
 MEAN    16.57   475.98   145.16   453.31  1159.54     0.41
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 HUB     13.89   511.23   234.96   454.04  1159.83     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   557.33   323.71     0.48  2112.66
 MEAN   382.27   511.57   237.11     0.44  2408.40     1.21
 HUB    320.37   462.00    85.41     0.40  3265.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.15     1.04    18.01   576.61     1.01   558.38     0.92     0.85
 MEAN    20.26     1.05    18.04   577.70     1.02   558.79     0.92     0.85
 HUB     20.59     1.06    18.02   580.88     1.02   559.06     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     13.84    35.51    31.50     4.01     0.93     0.13     2.90
 MEAN    17.76    27.61    23.50     4.11     0.90     0.15     3.29     0.85
 HUB     27.36    10.65     6.50     4.15     0.90     0.20     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.929

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     467.294     145.979     443.907    1160.955       0.403       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.310      18.162     560.166      46.000      18.203      32.400      14.197

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     472.784     145.979     494.807    1160.509       0.407       0.012

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.238      18.050     559.735     456.573       0.041       0.142

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     450.165       0.000     450.165    1162.314       0.387      -0.012

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.134     561.478       0.000       0.060       0.095       0.048

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.664      20.113       1.040     578.398       9.611     363.714       2.819

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  59873.379       0.316     441.463 1206103.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.882

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    130.475    2643.000      20.113     578.398       1.000       1.000       0.980
W Kg/sec =   59.30701

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.700    2502.892       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100372.453  102379.688       1.738     509.668     293.280     390.276       1.331

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   418.62    -0.14   418.62     0.36   400.13
 MEAN    15.91     0.00    -0.02   418.62    -0.14   418.62     0.36
 HUB     13.07     0.00    -0.02   418.62    -0.14   418.62     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.28    47.36    -2.08   422.54   594.90    18.39   563.77     0.51
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 MEAN    41.25    44.80    -3.55   367.03   556.83    18.39   563.77     0.48
 HUB     35.77    38.84    -3.07   301.45   515.95    18.39   563.77     0.44
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   456.23    91.88   446.88  1168.13     0.39
 MEAN    15.50   462.92   121.83   446.60  1168.51     0.40
 HUB     12.59   492.41   205.60   447.44  1168.76     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   550.74   321.90     0.47  1650.95
 MEAN   357.44   504.94   235.61     0.43  1890.38     1.18
 HUB    290.38   455.40    84.79     0.39  2590.34

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.72     1.03    18.65   584.51     1.01   567.13     0.92     0.81
 MEAN    20.81     1.03    18.67   585.40     1.01   567.51     0.92     0.81
 HUB     21.07     1.05    18.64   587.99     1.02   567.75     0.92     0.81

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     11.62    35.77    31.50     4.27     0.93     0.10     2.90
 MEAN    15.26    27.82    23.50     4.32     0.89     0.13     3.34     0.81
 HUB     24.68    10.73     6.50     4.23     0.89     0.17     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.882

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     467.468     124.065     450.704    1168.724       0.400       -0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.820      18.644     567.722      46.000      15.391      33.000      17.609

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     488.576     124.065     504.082    1166.989       0.419       -0.163

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.641      18.294     566.037     440.827       0.101       0.115

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     455.476       0.000     455.476    1169.674       0.389       -0.040

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      18.556     568.646       0.000       0.060       0.118       -0.044

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.531      20.604       1.024     585.964       7.567     429.542       3.330

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  47147.660       0.275     347.633 1270507.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    393324.00   2900.0898     127.4614      1.3639       0.7704       5.4532       1.1208
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 70% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.032   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     127.956    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   58.16170

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     125.000    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   98434.109  100402.578       2.284     831.557     364.027     619.754       1.702

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   294.10    -0.10   294.10     0.26   473.93
  MEAN    17.06     0.00    -0.02   294.10    -0.10   294.10     0.26
  HUB     12.51     0.00    -0.02   294.10    -0.10   294.10     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.29    50.47     7.82   475.82   559.46    14.39   515.59     0.50
  MEAN    53.23    47.20     6.03   393.48   491.33    14.39   515.59     0.44
  HUB     44.46    38.62     5.84   288.54   412.08    14.39   515.59     0.37

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   477.50   259.69   400.71  1122.55     0.43
  MEAN    18.04   499.78   293.38   404.61  1120.33     0.45
  HUB     15.00   565.99   387.22   412.80  1116.06     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   455.28   216.13     0.41  5359.44
  MEAN   415.99   422.78   122.62     0.38  5293.07     1.30
  HUB    345.97   414.85    41.25     0.37  5809.61

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.02     1.13    15.02   542.67     1.04   523.62     0.92     0.91
  MEAN    16.99     1.12    14.82   542.42     1.04   521.56     0.92     0.91
  HUB     17.19     1.14    14.42   544.34     1.04   517.58     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     32.95    28.34    24.20     4.14     0.93     0.27     2.90
  MEAN    35.95    16.86    12.70     4.16     0.93     0.23     3.51     0.91
  HUB     43.17    -5.71    -9.30     3.59     0.93     0.10     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.999

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     507.765     292.806     414.837    1120.372       0.453      -0.009

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      17.042      14.799     521.607      24.000      35.216      35.400       0.184

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     444.762     292.806     532.493    1125.742       0.395       0.230
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.024      15.285     526.619     528.796       0.018       0.382

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     411.343       0.000     411.343    1128.293       0.365       0.298

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.489     529.009       0.000       0.060       0.037       0.318

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.877      16.980       1.124     543.141      20.331     219.263       1.700

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 126579.898       0.559     915.286 1236673.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.032   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    127.956    2643.000      16.980     543.141       1.000       1.000       0.980
W Kg/sec =   58.16170

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    113.351    2582.848       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  98434.109  100402.578       1.789     590.487     330.107     474.134       1.436

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   392.51    -0.14   392.51     0.35   463.18
 MEAN    18.08     0.00    -0.02   392.51    -0.14   392.51     0.35
 HUB     15.21     0.00    -0.02   392.51    -0.14   392.51     0.35

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.38    46.36     4.02   473.98   615.50    15.62   530.27     0.54
 MEAN    46.74    42.30     4.44   416.97   572.74    15.62   530.28     0.51
 HUB     41.80    37.84     3.96   350.81   526.52    15.62   530.27     0.47

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   450.98   178.97   413.95  1139.62     0.40
 MEAN    18.01   461.75   200.92   415.75  1138.61     0.41
 HUB     15.22   500.40   274.83   418.18  1137.55     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   506.58   292.01     0.44  3657.28
 MEAN   415.39   467.81   214.47     0.41  3620.97     1.32
 HUB    351.11   425.08    76.29     0.37  4185.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.36     1.08    16.48   556.69     1.02   539.70     0.92     0.91
 MEAN    18.35     1.08    16.38   556.55     1.02   538.75     0.92     0.91
 HUB     18.57     1.09    16.26   558.65     1.03   537.73     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.38    35.20    31.50     3.70     0.93     0.23     2.90
 MEAN    25.79    27.29    23.50     3.79     0.92     0.24     3.30     0.91
 HUB     33.31    10.34     6.50     3.84     0.92     0.26     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     468.746     201.482     423.235    1138.814       0.412      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.407      16.378     538.946      46.000      25.457      30.600       5.143

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     434.800     201.482     479.214    1141.517       0.381       0.126

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.386      16.632     541.508     511.151       0.020       0.228

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     429.322       0.000     429.322    1141.933       0.376       0.121

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.627     541.903       0.000       0.060       0.046       0.124

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.853      18.334       1.080     557.296      14.155     280.004       2.171

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  88148.195       0.397     637.390 1141429.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.032   EfDer =  0.975

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    127.956    2643.000      18.334     557.296       1.000       1.000       0.980
W Kg/sec =   58.16170

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    106.343    2549.836       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  98434.109  100402.578       1.761     545.479     309.701     429.765       1.388

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   404.66    -0.14   404.66     0.35   446.57
 MEAN    17.74     0.00    -0.02   404.66    -0.14   404.66     0.35
 HUB     15.05     0.00    -0.02   404.66    -0.14   404.66     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.85     46.36     2.49   462.91   614.95    16.81   543.62     0.54
 MEAN    45.32     43.40     1.92   409.13   575.54    16.81   543.62     0.50
 HUB     40.63     38.84     1.79   347.12   533.24    16.81   543.62     0.47

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   455.17   152.49   428.87  1151.66      0.40
 MEAN    17.51   465.94   180.31   429.64  1151.32      0.40
 HUB     14.85   504.61   262.12   431.19  1150.90      0.44

       U2        W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   525.93   304.42     0.46  3023.54
 MEAN   403.78   484.28   223.47     0.42  3159.10      1.27
 HUB    342.51   438.62    80.38     0.38  3894.65

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     19.51     1.06    17.51   568.49     1.02   551.19     0.92     0.89
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 MEAN    19.56     1.07    17.47   569.00     1.02   550.87     0.92     0.89
 HUB     19.85     1.08    17.40   571.72     1.03   550.46     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.57    35.37    31.50     3.87     0.93     0.19     2.90
 MEAN    22.77    27.48    23.50     3.98     0.91     0.21     3.28     0.89
 HUB     31.30    10.56     6.50     4.06     0.91     0.24     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.975

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     471.310     181.494     434.963    1151.646       0.409       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.618      17.479     551.187      46.000      22.649      31.500       8.851

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     454.235     181.494     489.152    1153.024       0.394       0.061

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.581      17.592     552.507     471.992       0.027       0.193

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     441.242       0.000     441.242    1154.037       0.382       0.070

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.631     553.478       0.000       0.060       0.062       0.079

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.802      19.505       1.064     569.736      12.440     300.997       2.333

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  77485.945       0.371     560.293 1142051.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.032   EfDer =  0.944

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    127.956    2643.000      19.505     569.736       1.000       1.000       0.980
W Kg/sec =   58.16170

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    101.067    2521.846       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  98434.109  100402.578       1.744     513.330     294.341     401.059       1.363

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   413.80    -0.14   413.80     0.36   423.85
 MEAN    16.97     0.00    -0.02   413.80    -0.14   413.80     0.36
 HUB     14.32     0.00    -0.02   413.80    -0.14   413.80     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.04    46.36     0.68   444.22   607.20    17.85   555.44     0.53
 MEAN    43.42    43.80    -0.38   391.42   569.69    17.85   555.44     0.49
 HUB     38.61    37.84     0.77   330.28   529.54    17.85   555.44     0.46

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   455.54   122.64   438.72  1161.82     0.39
 MEAN    16.57   464.70   152.97   438.80  1161.94     0.40
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 HUB     13.89   500.00   237.86   439.80  1161.94     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   538.82   312.81     0.46  2318.27
 MEAN   382.27   495.09   229.29     0.43  2537.80     1.23
 HUB    320.37   447.47    82.51     0.39  3305.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.40     1.05    18.35   578.32     1.02   560.99     0.92     0.86
 MEAN    20.49     1.05    18.35   579.13     1.02   561.10     0.92     0.86
 HUB     20.80     1.07    18.31   581.98     1.02   561.10     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.62    35.49    31.50     3.99     0.93     0.15     2.90
 MEAN    19.22    27.59    23.50     4.09     0.90     0.17     3.29     0.86
 HUB     28.41    10.63     6.50     4.13     0.90     0.21     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.944

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     456.481     153.835     429.779    1163.281       0.392       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.542      18.471     562.412      46.000      19.694      32.400      12.706

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     456.535     153.835     481.757    1163.276       0.392       0.037

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.485      18.419     562.408     456.573       0.036       0.161

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     434.565       0.000     434.565    1164.966       0.373       0.016

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.506     564.042       0.000       0.060       0.085       0.076

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.711      20.375       1.045     579.809      10.073     345.848       2.681

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  62758.152       0.331     453.798 1176515.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.032   EfDer =  0.903

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    127.956    2643.000      20.375     579.809       1.000       1.000       0.980
W Kg/sec =   58.16170

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      97.605    2499.843       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  98434.109  100402.578       1.793     509.668     284.266     390.276       1.373

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   404.45    -0.14   404.45     0.35   399.64
 MEAN    15.91     0.00    -0.02   404.45    -0.14   404.45     0.35
 HUB     13.07     0.00    -0.02   404.45    -0.14   404.45     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.26    47.36    -1.10   422.54   585.01    18.75   566.15     0.50
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 MEAN    42.23    44.80    -2.57   367.03   546.25    18.75   566.15     0.47
 HUB     36.71    38.84    -2.13   301.45   504.52    18.75   566.15     0.43
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   442.64   104.12   430.22  1171.46     0.38
 MEAN    15.50   449.78   130.65   430.39  1171.51     0.38
 HUB     12.59   479.35   208.84   431.47  1171.46     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   530.07   309.66     0.45  1870.50
 MEAN   357.44   486.49   226.80     0.42  2026.93     1.21
 HUB    290.38   439.11    81.54     0.37  2631.09

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.08     1.03    19.10   586.73     1.01   570.38     0.92     0.83
 MEAN    21.14     1.04    19.10   587.31     1.01   570.43     0.92     0.83
 HUB     21.38     1.05    19.05   589.55     1.02   570.37     0.92     0.83

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     13.61    35.74    31.50     4.24     0.93     0.12     2.90
 MEAN    16.89    27.79    23.50     4.29     0.89     0.14     3.34     0.83
 HUB     25.83    10.70     6.50     4.20     0.89     0.18     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.903

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     454.164     133.042     434.240    1171.731       0.388       -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.160      19.075     570.647      46.000      17.034      33.000      15.966

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     468.767     133.042     487.281    1170.576       0.400       -0.127

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.014      18.814     569.522     440.827       0.089       0.136

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     437.518       0.000     437.518    1173.003       0.373       -0.011

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      19.053     571.886       0.000       0.060       0.107       -0.014

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.603      20.976       1.030     587.866       8.056     402.812       3.123

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  50198.727       0.293     362.982 1238204.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    405170.91   2929.7485     125.0000      1.3885       0.7930       6.0315       1.1244
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 70% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     123.994    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   56.36100

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     121.130    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95386.555   97294.086       2.357     831.557     352.757     619.754       1.757

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   284.35    -0.10   284.35     0.26   473.93
  MEAN    17.06     0.00    -0.02   284.35    -0.10   284.35     0.26
  HUB     12.51     0.00    -0.02   284.35    -0.10   284.35     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.14    50.47     8.67   475.82   554.39    14.44   516.06     0.50
  MEAN    54.15    47.20     6.95   393.48   485.55    14.44   516.06     0.44
  HUB     45.43    38.62     6.81   288.54   405.17    14.44   516.06     0.36

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   469.86   267.63   386.19  1123.84     0.42
  MEAN    18.04   490.89   297.85   390.21  1121.44     0.44
  HUB     15.00   554.36   385.84   398.05  1117.14     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   438.73   208.19     0.39  5523.20
  MEAN   415.99   407.70   118.14     0.36  5373.71     1.33
  HUB    345.97   400.05    39.87     0.36  5788.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.08     1.13    15.14   543.27     1.04   524.83     0.92     0.91
  MEAN    17.02     1.13    14.92   542.72     1.04   522.59     0.92     0.91
  HUB     17.18     1.14    14.51   544.26     1.04   518.59     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     34.72    28.33    24.20     4.13     0.93     0.29     2.90
  MEAN    37.35    16.84    12.70     4.14     0.93     0.25     3.51     0.91
  HUB     44.11    -5.72    -9.30     3.58     0.93     0.12     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     498.350     297.272     399.978    1121.518       0.444      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.071      14.904     522.674      24.000      36.621      35.400      -1.221

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     427.953     297.272     521.071    1127.346       0.380       0.259
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      17.054      15.438     528.121     528.796       0.018       0.404

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     396.182       0.000     396.182    1129.678       0.351       0.321

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      15.622     530.308       0.000       0.060       0.037       0.341

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.878      17.011       1.126     543.417      20.607     213.427       1.654

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 128299.383       0.567     898.997 1195665.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    123.994    2643.000      17.011     543.417       1.000       1.000       0.980
W Kg/sec =   56.36100

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    109.675    2582.192       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95386.555   97294.086       1.849     590.487     319.400     474.134       1.484

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   378.23    -0.13   378.23     0.33   463.06
 MEAN    18.08     0.00    -0.02   378.23    -0.13   378.23     0.33
 HUB     15.21     0.00    -0.02   378.23    -0.13   378.23     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.42    46.36     5.06   473.98   606.49    15.74   531.47     0.54
 MEAN    47.80    42.30     5.50   416.97   563.05    15.74   531.47     0.50
 HUB     42.86    37.84     5.02   350.81   515.96    15.74   531.47     0.46

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   441.06   190.67   397.72  1141.62     0.39
 MEAN    18.01   451.35   209.35   399.86  1140.33     0.40
 HUB     15.22   489.17   277.90   402.56  1139.00     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   486.57   280.30     0.43  3896.23
 MEAN   415.39   449.83   206.04     0.39  3772.74     1.35
 HUB    351.11   409.17    73.21     0.36  4232.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.49     1.09    16.68   557.85     1.03   541.60     0.92     0.91
 MEAN    18.45     1.08    16.56   557.39     1.03   540.38     0.92     0.91
 HUB     18.63     1.09    16.41   559.09     1.03   539.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.61    35.18    31.50     3.68     0.93     0.25     2.90
 MEAN    27.63    27.26    23.50     3.76     0.92     0.26     3.30     0.91
 HUB     34.62    10.31     6.50     3.81     0.92     0.28     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     457.949     209.938     406.993    1140.557       0.402       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.502      16.555     540.598      46.000      27.286      30.600       3.314

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     417.188     209.938     467.033    1143.695       0.365       0.159

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.488      16.862     543.577     511.151       0.017       0.254

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     411.819       0.000     411.819    1144.086       0.360       0.155

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.861     543.949       0.000       0.060       0.040       0.159

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      18.442       1.084     558.112      14.695     267.252       2.072

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91511.305       0.413     641.222 1100887.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.986

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    123.994    2643.000      18.442     558.112       1.000       1.000       0.980
W Kg/sec =   56.36100

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    102.519    2547.972       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  95386.555   97294.086       1.827     545.479     298.565     429.765       1.439

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   388.45    -0.13   388.45     0.34   446.25
 MEAN    17.74     0.00    -0.02   388.45    -0.13   388.45     0.34
 HUB     15.05     0.00    -0.02   388.45    -0.13   388.45     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.01    46.36     3.65   462.91   604.40    17.03   545.51     0.53
 MEAN    46.49    43.40     3.09   409.13   564.26    17.03   545.51     0.49
 HUB     41.80    38.84     2.96   347.12   521.04    17.03   545.51     0.45

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   442.45   166.15   410.07  1154.55     0.38
 MEAN    17.51   453.15   190.15   411.33  1153.86     0.39
 HUB     14.85   491.31   265.79   413.21  1153.11     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   502.69   290.75     0.44  3294.21
 MEAN   403.78   463.50   213.63     0.40  3331.18     1.31
 HUB    342.51   420.27    76.71     0.36  3949.05

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     19.74     1.07    17.84   570.31     1.02   553.96     0.92     0.90
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 MEAN    19.76     1.07    17.76   570.45     1.02   553.30     0.92     0.90
 HUB     20.01     1.08    17.66   572.74     1.03   552.58     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.06    35.34    31.50     3.84     0.93     0.22     2.90
 MEAN    24.81    27.45    23.50     3.95     0.91     0.23     3.28     0.90
 HUB     32.75    10.52     6.50     4.02     0.91     0.26     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     458.238     191.394     416.354    1154.196       0.397       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.816      17.774     553.631      46.000      24.688      31.500       6.812

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     433.523     191.394     473.893    1156.113       0.375       0.098

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.790      17.958     555.472     471.992       0.022       0.222

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     420.967       0.000     420.967    1157.045       0.364       0.110

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.002     556.368       0.000       0.060       0.052       0.119

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4         PR4        Texit        Del T       Ns        Ns nondim
      0.834      19.728       1.070     571.166      13.053     284.446       2.205

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  81308.367       0.389     569.730 1099984.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.963

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    123.994    2643.000      19.728     571.166       1.000       1.000       0.980
W Kg/sec =   56.36100

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     96.952    2518.688       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 95386.555   97294.086       1.818     513.330     282.356     401.059       1.420

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   395.16    -0.14   395.16     0.34   423.32
 MEAN    16.97     0.00    -0.02   395.16    -0.14   395.16     0.34
 HUB     14.32     0.00    -0.02   395.16    -0.14   395.16     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.35    46.36     1.99   444.22   594.65    18.20   558.13     0.51
 MEAN    44.74    43.80     0.94   391.42   556.30    18.20   558.13     0.48
 HUB     39.90    37.84     2.06   330.28   515.10    18.20   558.13     0.44

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   439.39   138.50   417.00  1165.69     0.38
 MEAN    16.57   448.84   164.38   417.66  1165.38     0.39
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 HUB     13.89   483.92   242.06   419.03  1165.00     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   511.93   296.96     0.44  2617.41
 MEAN   382.27   471.08   217.89     0.40  2726.72     1.27
 HUB    320.37   426.28    78.30     0.37  3364.20

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.78     1.05    18.83   580.86     1.02   564.74     0.92     0.88
 MEAN    20.82     1.06    18.79   581.26     1.02   564.44     0.92     0.88
 HUB     21.08     1.07    18.72   583.62     1.02   564.07     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.37    35.46    31.50     3.96     0.93     0.18     2.90
 MEAN    21.48    27.55    23.50     4.05     0.91     0.20     3.29     0.88
 HUB     30.01    10.58     6.50     4.08     0.91     0.23     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.963

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     441.324     165.304     409.196    1166.626       0.378       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.873      18.908     565.652      46.000      21.997      32.400      10.403

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     433.122     165.304     463.595    1167.243       0.371       0.075

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.833      18.942     566.251     456.573       0.029       0.192

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     412.114       0.000     412.114    1168.770       0.353       0.060

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.034     567.733       0.000       0.060       0.071       0.119

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.771      20.745       1.052     581.913      10.748     321.934       2.496

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  66959.781       0.353     469.189 1131409.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.932

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    123.994    2643.000      20.745     581.913       1.000       1.000       0.980
W Kg/sec =   56.36100

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.065    2495.320       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95386.555   97294.086       1.880     509.668     271.042     390.276       1.440

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   383.98    -0.13   383.98     0.33   398.92
 MEAN    15.91     0.00    -0.02   383.98    -0.13   383.98     0.33
 HUB     13.07     0.00    -0.02   383.98    -0.13   383.98     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.75    47.36     0.39   422.54   571.05    19.25   569.60     0.49
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 MEAN    43.72    44.80    -1.08   367.03   531.27    19.25   569.60     0.45
 HUB     38.15    38.84    -0.69   301.45   488.26    19.25   569.60     0.42
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   424.24   121.64   406.43  1176.17     0.36
 MEAN    15.50   431.64   143.29   407.16  1175.78     0.37
 HUB     12.59   461.01   213.54   408.58  1175.31     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   500.53   292.13     0.43  2184.72
 MEAN   357.44   460.05   214.16     0.39  2222.73     1.24
 HUB    290.38   415.74    76.85     0.35  2690.14

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.61     1.04    19.75   590.00     1.01   574.98     0.92     0.85
 MEAN    21.63     1.04    19.71   590.14     1.01   574.59     0.92     0.85
 HUB     21.82     1.05    19.62   591.87     1.02   574.13     0.92     0.85

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.66    35.71    31.50     4.21     0.93     0.16     2.90
 MEAN    19.39    27.74    23.50     4.24     0.90     0.17     3.34     0.85
 HUB     27.59    10.65     6.50     4.15     0.90     0.20     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.932

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     435.843     145.916     410.692    1176.002       0.371       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.649      19.687      574.814      46.000      19.560      33.000      13.440

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     440.933     145.916     464.450    1175.620       0.375       -0.072

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.546      19.550     574.441     440.827       0.072       0.168

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     412.080       0.000     412.080    1177.721       0.350       0.037

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      19.761     576.496       0.000       0.060       0.090       0.033

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.692      21.509       1.037     590.671       8.758     368.638       2.858

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  54574.816       0.319     382.407 1189351.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    422653.66   2961.5449     121.1299      1.4237      0.8213       6.9532       1.1298
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 70% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     119.767    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   54.43945

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     117.000    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   92134.484   93976.977       2.441     831.557     340.730     619.754       1.819

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   274.02    -0.09   274.02     0.25   473.93
  MEAN    17.06     0.00    -0.02   274.02    -0.09   274.02     0.25
  HUB     12.51     0.00    -0.02   274.02    -0.09   274.02     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.07    50.47     9.60   475.82   549.16    14.48   516.54     0.49
  MEAN    55.15    47.20     7.95   393.48   479.57    14.48   516.54     0.43
  HUB     46.49    38.62     7.87   288.54   397.99    14.48   516.54     0.36

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   462.38   275.86   371.08  1125.13     0.41
  MEAN    18.04   481.94   302.52   375.17  1122.55     0.43
  HUB     15.00   542.39   384.39   382.67  1118.23     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   421.52   199.96     0.37  5692.94
  MEAN   415.99   391.95   113.47     0.35  5457.87     1.38
  HUB    345.97   384.59    38.42     0.34  5767.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.14     1.13    15.26   543.90     1.04   526.05     0.92     0.91
  MEAN    17.05     1.13    15.02   543.03     1.04   523.63     0.92     0.91
  HUB     17.17     1.14    14.61   544.18     1.04   519.61     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     36.63    28.32    24.20     4.12     0.93     0.32     2.90
  MEAN    38.88    16.83    12.70     4.13     0.93     0.28     3.51     0.91
  HUB     45.13    -5.73    -9.30     3.57     0.93     0.14     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     488.867     301.932     384.484    1122.664       0.435      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.098      15.007     523.743      24.000      38.142      35.400      -2.742

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     410.573     301.932     509.641    1128.950       0.364       0.289
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.080      15.587     529.625     528.796       0.018       0.428

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     380.494       0.000     380.494    1131.066       0.336       0.344

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.750     531.612       0.000       0.060       0.039       0.365

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      17.035       1.128     543.704      20.894     207.354       1.607

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 130084.227       0.575     880.427 1152223.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.767    2643.000      17.035     543.704       1.000       1.000       0.980
W Kg/sec =   54.43945

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    105.811    2581.511       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92134.484   93976.977       1.916     590.487     308.146     474.134       1.539

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   363.43    -0.13   363.43     0.32   462.94
 MEAN    18.08     0.00    -0.02   363.43    -0.13   363.43     0.32
 HUB     15.21     0.00    -0.02   363.43    -0.13   363.43     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.53    46.36     6.17   473.98   597.37    15.86   532.67     0.53
 MEAN    48.93    42.30     6.63   416.97   553.21    15.86   532.67     0.49
 HUB     44.00    37.84     6.16   350.81   505.21    15.86   532.67     0.45

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   431.65   202.58   381.16  1143.59     0.38
 MEAN    18.01   441.20   217.97   383.59  1142.04     0.39
 HUB     15.22   477.91   281.06   386.53  1140.44     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   466.17   268.39     0.41  4139.32
 MEAN   415.39   431.41   197.42     0.38  3927.97     1.39
 HUB    351.11   392.82    70.05     0.34  4280.53

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.62     1.09    16.87   559.04     1.03   543.48     0.92     0.91
 MEAN    18.53     1.09    16.72   558.25     1.03   542.00     0.92     0.91
 HUB     18.67     1.10    16.55   559.56     1.03   540.49     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.99    35.15    31.50     3.65     0.93     0.28     2.90
 MEAN    29.61    27.23    23.50     3.73     0.93     0.28     3.30     0.91
 HUB     36.02    10.27     6.50     3.77     0.93     0.29     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     447.407     218.586     390.376    1142.280       0.392       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.590      16.722     542.233      46.000      29.246      30.600       1.354

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     399.318     218.586     455.231    1145.856       0.348       0.194

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.579      17.080     545.633     511.151       0.016       0.283

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     394.133       0.000     394.133    1146.217       0.344       0.189

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.080     545.977       0.000       0.060       0.037       0.194

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      18.538       1.088     558.950      15.246     254.834       1.975

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94944.328       0.428     642.596 1058360.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  0.994

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    119.767    2643.000      18.538     558.950       1.000       1.000       0.980
W Kg/sec =   54.43945

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     98.586    2546.061       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  92134.484   93976.977       1.900     545.479     287.111     429.765       1.497

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   372.03    -0.13   372.03     0.32   445.91
 MEAN    17.74      0.00    -0.02   372.03    -0.13   372.03     0.32
 HUB     15.05      0.00    -0.02   372.03    -0.13   372.03     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.22     46.36     4.86   462.91   593.97    17.24   547.39     0.52
 MEAN    47.73     43.40     4.33   409.13   553.08    17.24   547.39     0.48
 HUB     43.03     38.84     4.19   347.12   508.91    17.24   547.39     0.44

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   430.66    179.74    391.36  1157.35      0.37
 MEAN    17.51   440.96    199.97    393.02  1156.34      0.38
 HUB     14.85   478.29    269.41    395.20  1155.28      0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   479.57   277.17     0.41  3563.19
 MEAN   403.78   442.72   203.81     0.38  3503.08     1.35
 HUB    342.51   401.90    73.10     0.35  4002.67

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     19.96     1.08    18.14   572.15     1.02   556.66     0.92     0.91
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 MEAN    19.94     1.08    18.03   571.92     1.02   555.69     0.92     0.91
 HUB     20.15     1.09    17.90   573.77     1.03   554.67     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.67    35.31    31.50     3.81     0.93     0.24     2.90
 MEAN    26.97    27.41    23.50     3.91     0.92     0.25     3.28     0.91
 HUB     34.28    10.48     6.50     3.98     0.92     0.28     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     445.802     201.284     397.775    1156.681       0.385       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.997      18.047     556.018      46.000      26.841      31.500       4.659

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     413.065     201.284     459.497    1159.120       0.356       0.137

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.980      18.299     558.366     471.992       0.018       0.252

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     401.015       0.000     401.015    1159.970       0.346       0.150

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.346     559.185       0.000       0.060       0.044       0.161

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.857      19.929       1.075     572.614      13.664     268.987       2.085

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  85111.047       0.408     576.043 1056183.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  0.979

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    119.767    2643.000       19.929     572.614       1.000        1.000        0.980
W Kg/sec =   54.43945

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     92.820    2515.500        1.402       0.249      53.349       56.000        0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 92134.484   93976.977        1.899     513.330     270.323     401.059       1.484

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   376.75    -0.13   376.75      0.32   422.78
 MEAN    16.97      0.00    -0.02   376.75    -0.13   376.75      0.32
 HUB     14.32      0.00    -0.02   376.75    -0.13   376.75      0.32

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     49.71    46.36      3.35   444.22   582.57     18.53   560.76      0.50
 MEAN    46.10    43.80      2.30   391.42   543.37     18.53   560.76      0.47
 HUB     41.25    37.84      3.41   330.28   501.11     18.53   560.76      0.43

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   424.76    153.87    395.91  1169.37      0.36
 MEAN    16.57   434.11    175.50    397.05  1168.70      0.37
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 HUB     13.89   468.64   246.21   398.75  1167.96     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   485.83   281.59     0.42  2907.56
 MEAN   382.27   447.67   206.77     0.38  2910.89     1.31
 HUB    320.37   405.59    74.15     0.35  3421.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.13     1.06    19.28   583.38     1.02   568.32     0.92     0.90
 MEAN    21.13     1.06    19.20   583.39     1.02   567.66     0.92     0.90
 HUB     21.34     1.07    19.10   585.28     1.02   566.95     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.24    35.42    31.50     3.92     0.93     0.21     2.90
 MEAN    23.85    27.51    23.50     4.01     0.91     0.22     3.29     0.90
 HUB     31.69    10.53     6.50     4.03     0.91     0.25     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     427.274     176.485     389.122    1169.841       0.365       0.053

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.178      19.311     568.775      46.000      24.397      32.400       8.003

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     410.567     176.485     446.892    1171.042       0.351       0.116

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.153      19.427     569.944     456.573       0.023       0.225

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     390.542       0.000     390.542    1172.417       0.333       0.105

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.522     571.283       0.000       0.060       0.058       0.163

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.816      21.082       1.058     584.017      11.404     300.675       2.331

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  71049.367       0.375     480.871 1084887.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  0.956

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.767    2643.000      21.082     584.017       1.000       1.000       0.980
W Kg/sec =   54.43945

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.611    2490.820       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92134.484   93976.977       1.975     509.668     258.071     390.276       1.512

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   364.24    -0.13   364.24     0.31   398.20
 MEAN    15.91     0.00    -0.02   364.24    -0.13   364.24     0.31
 HUB     13.07     0.00    -0.02   364.24    -0.13   364.24     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.25    47.36     1.89   422.54   557.96    19.72   572.94     0.48
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 MEAN    45.23    44.80     0.43   367.03   517.17    19.72   572.94     0.44
 HUB     39.62    38.84     0.78   301.45   472.88    19.72   572.94     0.40
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   407.97   138.31   383.81  1180.60     0.35
 MEAN    15.50   415.17   155.35   385.01  1179.82     0.35
 HUB     12.59   443.92   217.99   386.71  1178.99     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   472.43   275.46     0.40  2483.64
 MEAN   357.44   434.82   202.09     0.37  2409.61     1.29
 HUB    290.38   393.42    72.39     0.33  2746.19

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.11     1.05    20.36   593.21     1.02   579.32     0.92     0.88
 MEAN    22.08     1.05    20.27   592.94     1.02   578.55     0.92     0.88
 HUB     22.22     1.05    20.15   594.18     1.02   577.73     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.82    35.67    31.50     4.17     0.93     0.20     2.90
 MEAN    21.97    27.70    23.50     4.20     0.90     0.20     3.34     0.88
 HUB     29.41    10.60     6.50     4.10     0.90     0.22     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.956

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      419.254     158.202     388.260    1180.041       0.355       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.102      20.253      578.770       46.000      22.169      33.000      10.831

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      414.929     158.202     444.065    1180.348       0.352       -0.016

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       22.035       20.228     579.071     440.827       0.056       0.202

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      388.150       0.000     388.150    1182.176       0.328       0.087

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       20.417     580.867       0.000       0.060       0.073       0.084

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.763       22.002       1.044      593.444       9.426     339.760       2.634

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  58741.254       0.343     397.568 1139375.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc   TR
    439930.25   2977.5049     117.0002      1.4564       0.8425       7.9535      1.1351
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 70% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     115.614    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   52.55191

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     112.943    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   88939.984   90718.586       2.528     831.557     328.916     619.754       1.884

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   263.94    -0.09   263.94     0.24   473.93
  MEAN    17.06     0.00    -0.02   263.94    -0.09   263.94     0.24
  HUB     12.51     0.00    -0.02   263.94    -0.09   263.94     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.99    50.47    10.52   475.82   544.20    14.53   516.99     0.49
  MEAN    56.15    47.20     8.95   393.48   473.88    14.53   516.99     0.42
  HUB     47.56    38.62     8.94   288.54   391.12    14.53   516.99     0.35

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   455.69   283.74   356.57  1126.33     0.40
  MEAN    18.04   473.63   306.96   360.70  1123.58     0.42
  HUB     15.00   531.01   382.95   367.86  1119.24     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   405.02   192.08     0.36  5855.37
  MEAN   415.99   376.81   109.03     0.34  5537.91     1.42
  HUB    345.97   369.71    36.98     0.33  5745.39

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.19     1.14    15.36   544.50     1.04   527.16     0.92     0.91
  MEAN    17.08     1.13    15.11   543.33     1.04   524.59     0.92     0.91
  HUB     17.15     1.14    14.70   544.10     1.04   520.55     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     38.51    28.31    24.20     4.11     0.93     0.35     2.90
  MEAN    40.40    16.82    12.70     4.12     0.93     0.30     3.51     0.91
  HUB     46.15    -5.74    -9.30     3.56     0.93     0.17     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.996

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     480.056     306.365     369.587    1123.720       0.427      -0.005

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      17.120      15.099     524.729      24.000      39.657      35.400      -4.257

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     393.992     306.365     499.089    1130.427       0.349       0.319
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.100      15.721     531.012     528.796       0.020       0.452

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     365.514       0.000     365.514    1132.348       0.323       0.366

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.863     532.818       0.000       0.060       0.043       0.387

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.873      17.052       1.129     543.977      21.167     201.536       1.562

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 131782.047       0.582     860.993 1109851.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.614    2643.000      17.052     543.977       1.000       1.000       0.980
W Kg/sec =   52.55191

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.067    2580.864       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88939.984   90718.586       1.987     590.487     297.243     474.134       1.595

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   349.27    -0.12   349.27     0.31   462.82
 MEAN    18.08     0.00    -0.02   349.27    -0.12   349.27     0.31
 HUB     15.21     0.00    -0.02   349.27    -0.12   349.27     0.31

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.62    46.36     7.26   473.98   588.86    15.96   533.79     0.52
 MEAN    50.06    42.30     7.76   416.97   544.01    15.96   533.79     0.48
 HUB     45.14    37.84     7.30   350.81   495.12    15.96   533.79     0.44

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   423.48   213.78   365.56  1145.38     0.37
 MEAN    18.01   432.10   226.12   368.20  1143.59     0.38
 HUB     15.22   467.49   284.03   371.31  1141.77     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   446.97   257.20     0.39  4367.89
 MEAN   415.39   414.00   189.27     0.36  4074.67     1.43
 HUB    351.11   377.33    67.08     0.33  4325.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.72     1.10    17.04   560.16     1.03   545.18     0.92     0.91
 MEAN    18.61     1.09    16.86   559.07     1.03   543.48     0.92     0.91
 HUB     18.71     1.10    16.67   560.00     1.03   541.75     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.32    35.13    31.50     3.63     0.93     0.30     2.90
 MEAN    31.56    27.20    23.50     3.70     0.93     0.30     3.30     0.91
 HUB     37.41    10.24     6.50     3.74     0.93     0.31     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     437.952     226.759     374.675    1143.849       0.383       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.662      16.864     543.724      46.000      31.183      30.600      -0.583

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     382.556     226.759     444.712    1147.834       0.333       0.228

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.653      17.270     547.520     511.151       0.015       0.311

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     377.609       0.000     377.609    1148.163       0.329       0.221

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.268     547.834       0.000       0.060       0.037       0.227

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      18.613       1.092     559.742      15.765     243.627       1.889

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98176.602       0.443     641.433 1017252.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.998

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    115.614    2643.000      18.613     559.742       1.000       1.000       0.980
W Kg/sec =   52.55191

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     94.852    2544.260       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  88939.984   90718.586       1.975     545.479     276.237     429.765       1.556

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   356.65    -0.12   356.65     0.31   445.60
 MEAN    17.74      0.00    -0.02   356.65    -0.12   356.65     0.31
 HUB     15.05      0.00    -0.02   356.65    -0.12   356.65     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.39     46.36     6.03   462.91   584.46    17.41   549.12     0.51
 MEAN    48.93     43.40     5.53   409.13   542.85    17.41   549.12     0.47
 HUB     44.23     38.84     5.39   347.12   497.77    17.41   549.12     0.43

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   420.62    192.22    374.12  1159.86      0.36
 MEAN    17.51   430.28    209.04    376.08  1158.58      0.37
 HUB     14.85   466.54    272.76    378.50  1157.26      0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   458.29   264.68     0.40  3810.43
 MEAN   403.78   423.51   194.74     0.37  3661.75     1.38
 HUB    342.51   384.87    69.75     0.33  4052.31

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     20.15     1.08    18.40   573.85     1.03   559.08     0.92     0.91
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 MEAN    20.09     1.08    18.26   573.30     1.02   557.84     0.92     0.91
 HUB     20.25     1.09    18.10   574.75     1.03   556.57     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.19    35.28    31.50     3.78     0.93     0.27     2.90
 MEAN    29.07    27.38    23.50     3.88     0.92     0.28     3.28     0.91
 HUB     35.78    10.44     6.50     3.94     0.92     0.30     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     434.900     210.411     380.612    1158.919       0.375       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.146      18.277     558.174      46.000      28.935      31.500       2.565

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     394.341     210.411     446.965    1161.831       0.339       0.175

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.135      18.590     560.983     471.992       0.016       0.282

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     382.823       0.000     382.823    1162.604       0.329       0.188

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.636     561.730       0.000       0.060       0.039       0.199

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      20.091       1.079     573.968      14.226     255.521       1.981

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  88613.664       0.424     578.954 1014103.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.990

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    115.614    2643.000      20.091     573.968       1.000       1.000       0.980
W Kg/sec =   52.55191

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     88.985    2512.532       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  88939.984   90718.586       1.981     513.330     259.157     401.059       1.548

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   359.91    -0.12   359.91     0.31   422.28
 MEAN    16.97     0.00    -0.02   359.91    -0.12   359.91     0.31
 HUB     14.32     0.00    -0.02   359.91    -0.12   359.91     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.99    46.36     4.63   444.22   571.82    18.80   563.15     0.49
 MEAN    47.41    43.80     3.61   391.42   531.83    18.80   563.15     0.46
 HUB     42.55    37.84     4.71   330.28   488.58    18.80   563.15     0.42

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   412.57   167.71   376.94  1172.63     0.35
 MEAN    16.57   421.48   185.54   378.45  1171.64     0.36
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 HUB     13.89   455.16   249.91   380.41  1170.62     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   462.36   267.75     0.39  3168.72
 MEAN   382.27   426.53   196.73     0.36  3077.16     1.34
 HUB    320.37   386.88    70.45     0.33  3473.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.42     1.07    19.66   585.70     1.02   571.49     0.92     0.91
 MEAN    21.38     1.06    19.55   585.36     1.02   570.53     0.92     0.91
 HUB     21.55     1.07    19.41   586.83     1.02   569.53     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.99    35.39    31.50     3.89     0.93     0.24     2.90
 MEAN    26.12    27.47    23.50     3.97     0.92     0.25     3.29     0.91
 HUB     33.30    10.49     6.50     3.99     0.92     0.27     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     415.268     186.580     370.992    1172.703       0.354       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.430      19.649     571.564      46.000      26.699      32.400       5.701

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     390.408     186.580     432.702    1174.417       0.332       0.155

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.415      19.836     573.236     456.573       0.018       0.257

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     371.324       0.000     371.324    1175.660       0.316       0.147

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.930     574.450       0.000       0.060       0.048       0.204

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.847      21.359       1.063     585.962      11.994     282.955       2.193

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  74730.836       0.394     488.251 1040532.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.975

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.614    2643.000      21.359     585.962       1.000       1.000       0.980
W Kg/sec =   52.55191

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      84.573    2486.684       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88939.984   90718.586       2.069     509.668     246.313     390.276       1.584

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   346.59    -0.12   346.59     0.29   397.54
 MEAN    15.91     0.00    -0.02   346.59    -0.12   346.59     0.29
 HUB     13.07     0.00    -0.02   346.59    -0.12   346.59     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.65    47.36     3.29   422.54   546.60    20.11   575.93     0.46
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MEAN    46.65    44.80     1.85   367.03   504.90    20.11   575.93     0.43
HUB     41.03    38.84     2.19   301.45   459.42    20.11   575.93     0.39
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   394.75   153.01   363.89  1184.47     0.33
MEAN    15.50   401.36   166.00   365.42  1183.37     0.34
HUB     12.59   429.19   221.94   367.35  1182.24     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.78   447.67   260.76     0.38  2747.26
MEAN   357.44   412.54   191.45     0.35  2574.46     1.33
HUB    290.38   373.67    68.44     0.32  2795.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.53     1.06    20.86   596.13     1.02   583.12     0.92     0.89
MEAN    22.46     1.05    20.74   595.49     1.02   582.04     0.92     0.89
HUB     22.56     1.06    20.59   596.31     1.02   580.93     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     22.81    35.63    31.50     4.13     0.93     0.23     2.90
MEAN    24.43    27.65    23.50     4.15     0.91     0.23     3.34     0.89
HUB     31.14    10.55     6.50     4.05     0.91     0.24     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.975

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     405.384     169.041     368.458    1183.589       0.343       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.481      20.726     582.259      46.000      24.645      33.000       8.355

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     392.354     169.041     427.220    1184.470       0.331       0.036

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.438      20.795     583.127     440.827       0.044       0.235

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     367.286       0.000     367.286    1186.084       0.310       0.135

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      20.967     584.716       0.000       0.060       0.059       0.132

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.811      22.410       1.049     595.977      10.016     316.680       2.455

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  62416.633       0.365     407.797 1092024.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    455719.78   2977.4287    112.9435      1.4834      0.8554      8.9532      1.1400
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 70% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.991

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     111.200    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   50.54562

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     108.632    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   85544.477   87255.180       2.629     831.557     316.359     619.754       1.959

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   253.30    -0.09   253.30     0.23   473.93
  MEAN    17.06     0.00    -0.02   253.30    -0.09   253.30     0.23
  HUB     12.51     0.00    -0.02   253.30    -0.09   253.30     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.98    50.47    11.51   475.82   539.12    14.57   517.45     0.48
  MEAN    57.23    47.20    10.03   393.48   468.04    14.57   517.45     0.42
  HUB     48.73    38.62    10.11   288.54   384.01    14.57   517.45     0.34

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   449.23   291.89   341.48  1127.51     0.40
  MEAN    18.04   465.30   311.56   345.60  1124.60     0.41
  HUB     15.00   519.31   381.42   352.41  1120.25     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   387.87   183.93     0.34  6023.48
  MEAN   415.99   361.03   104.44     0.32  5620.72     1.47
  HUB    345.97   354.19    35.46     0.32  5722.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.25     1.14    15.46   545.13     1.04   528.27     0.92     0.91
  MEAN    17.10     1.13    15.19   543.64     1.04   525.55     0.92     0.91
  HUB     17.14     1.13    14.79   544.01     1.04   521.49     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     40.52    28.31    24.20     4.11     0.93     0.37     2.90
  MEAN    42.03    16.81    12.70     4.11     0.94     0.33     3.51     0.91
  HUB     47.26    -5.75    -9.30     3.55     0.94     0.19     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     471.222     310.951     354.061    1124.772       0.419      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.140      15.188     525.712      24.000      41.291      35.400      -5.891

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     376.829     310.951     488.560    1131.902       0.333       0.350
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.116      15.850     532.398     528.796       0.022       0.477

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     349.994       0.000     349.994    1133.632       0.309       0.388

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.970     534.027       0.000       0.060       0.048       0.409

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      17.063       1.129     544.258      21.448     195.486       1.515

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 133535.359       0.590     839.141 1065123.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      17.063     544.258       1.000       1.000       0.980
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     98.134    2580.196       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85544.477   87255.180       2.066     590.487     285.789     474.134       1.659

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   334.58    -0.12   334.58     0.29   462.70
 MEAN    18.08     0.00    -0.02   334.58    -0.12   334.58     0.29
 HUB     15.21     0.00    -0.02   334.58    -0.12   334.58     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.79    46.36     8.43   473.98   580.27    16.06   534.91     0.51
 MEAN    51.26    42.30     8.96   416.97   534.70    16.06   534.91     0.47
 HUB     46.37    37.84     8.53   350.81   484.87    16.06   534.91     0.43

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
    0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   415.86   225.21   349.60  1147.14     0.36
 MEAN    18.01   423.25   234.43   352.40  1145.13     0.37
 HUB     15.22   457.01   287.03   355.64  1143.10     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   427.34   245.76     0.37  4601.21
 MEAN   415.39   396.14   180.96     0.35  4224.12     1.47
 HUB    351.11   361.36    64.09     0.32  4371.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.82     1.10    17.19   561.30     1.03   546.86     0.92     0.91
 MEAN    18.67     1.09    16.99   559.90     1.03   544.94     0.92     0.91
 HUB     18.73     1.10    16.78   560.45     1.03   543.01     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.79    35.11    31.50     3.61     0.93     0.33     2.90
 MEAN    33.63    27.18    23.50     3.68     0.93     0.33     3.30     0.91
 HUB     38.91    10.22     6.50     3.72     0.93     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     428.753     235.086     358.558    1145.399       0.374       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.724      16.996     545.200      46.000      33.251      30.600      -2.651

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     365.464     235.086     434.545    1149.800       0.318       0.264

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.714      17.447     549.398     511.151       0.016       0.342

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     360.819       0.000     360.819    1150.095       0.314       0.253

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.440     549.680       0.000       0.060       0.039       0.260

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      18.673       1.094     560.552      16.294     232.621       1.803

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 101469.648       0.457     637.639  974203.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    111.200    2643.000      18.673     560.552       1.000       1.000       0.980
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     91.002    2542.420       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  85544.477   87255.180       2.058     545.479     265.025     429.765       1.622

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   340.98    -0.12   340.98     0.30   445.28
 MEAN    17.74      0.00    -0.02   340.98    -0.12   340.98     0.30
 HUB     15.05      0.00    -0.02   340.98    -0.12   340.98     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.63     46.36     7.27   462.91   575.03    17.57   550.84     0.50
 MEAN    50.20     43.40     6.80   409.13   532.69    17.57   550.84     0.46
 HUB     45.52     38.84     6.68   347.12   486.67    17.57   550.84     0.42

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   411.40    204.71    356.85  1162.31       0.35
 MEAN    17.51   420.11    218.13    359.05  1160.77       0.36
 HUB     14.85   455.01    276.11    361.65  1159.21       0.39

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91    436.97    252.19     0.38  4057.75
 MEAN   403.78    404.20    185.65     0.35  3820.80      1.43
 HUB    342.51    367.70     66.40     0.32  4102.02

         Pt2       PR       Ps2      Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     20.32      1.09     18.63   575.58      1.03   561.45      0.92      0.91
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 MEAN    20.22     1.08    18.47   574.70     1.03   559.96     0.92     0.91
 HUB     20.34     1.09    18.29   575.74     1.03   558.46     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.84    35.25    31.50     3.75     0.93     0.30     2.90
 MEAN    31.28    27.34    23.50     3.84     0.93     0.30     3.28     0.91
 HUB     37.36    10.40     6.50     3.90     0.93     0.32     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     424.538     219.562     363.352    1161.111       0.366       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.275      18.484     560.291      46.000      31.143      31.500       0.357

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     375.664     219.562     435.122    1164.490       0.323       0.215

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.267      18.856     563.557     471.992       0.014       0.314

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     364.745       0.000     364.745    1165.188       0.313       0.225

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.896     564.232       0.000       0.060       0.037       0.237

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4         PR4        Texit        Del T       Ns        Ns nondim
      0.878      20.226       1.083     575.341      14.789     242.680       1.881

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  92120.430       0.441     578.888  970262.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.997

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    111.200    2643.000      20.226     575.341       1.000       1.000       0.980
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     85.116    2509.532       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 85544.477   87255.180       2.071     513.330     247.888     401.059       1.618

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   343.14    -0.12   343.14     0.29   421.78
 MEAN    16.97     0.00    -0.02   343.14    -0.12   343.14     0.29
 HUB     14.32     0.00    -0.02   343.14    -0.12   343.14     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.32    46.36     5.96   444.22   561.42    19.05   565.51     0.48
 MEAN    48.77    43.80     4.97   391.42   520.63    19.05   565.51     0.45
 HUB     43.92    37.84     6.08   330.28   476.35    19.05   565.51     0.41

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   401.58   181.26   358.34  1175.77     0.34
 MEAN    16.57   409.73   195.39   360.14  1174.50     0.35
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HUB     13.89   442.24   253.58   362.31  1173.21     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   439.35   254.20     0.37  3424.48
MEAN   382.27   405.74   186.88     0.35  3240.43     1.39
HUB    320.37   368.42    66.78     0.31  3523.97

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.68     1.07    20.00   588.02     1.02   574.56     0.92     0.91
MEAN    21.60     1.07    19.85   587.34     1.02   573.32     0.92     0.91
HUB     21.72     1.07    19.69   588.39     1.02   572.06     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     26.83    35.35    31.50     3.85     0.93     0.27     2.90
MEAN    28.48    27.42    23.50     3.92     0.92     0.28     3.29     0.91
HUB     34.99    10.44     6.50     3.94     0.92     0.29     3.90

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     404.122     196.492     353.136    1175.481       0.344       0.051

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.650      19.948     574.280      46.000      29.092      32.400       3.308

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     370.734     196.492     419.587    1177.690       0.315       0.195

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.641      20.203     576.440     456.573       0.015       0.291

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     352.633       0.000     352.633    1178.806       0.299       0.190

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      20.293     577.533       0.000       0.060       0.040       0.245

   STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      21.595       1.068     587.914      12.574     266.672       2.067

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  78343.891       0.413     492.316  994599.562


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      21.595     587.914       1.000       1.000       0.980
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.588    2482.551       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85544.477   87255.180       2.172     509.668     234.706     390.276       1.663

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   329.38    -0.11   329.38     0.28   396.88
 MEAN    15.91     0.00    -0.02   329.38    -0.11   329.38     0.28
 HUB     13.07     0.00    -0.02   329.38    -0.11   329.38     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.07    47.36     4.71   422.54   535.84    20.46   578.86     0.45
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MEAN    48.10    44.80     3.30   367.03   493.24    20.46   578.86     0.42
HUB     42.48    38.84     3.64   301.45   446.58    20.46   578.86     0.38
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   383.12   167.15   344.74  1188.16     0.32
MEAN    15.50   388.80   176.29   346.53  1186.79     0.33
HUB     12.59   415.36   225.77   348.65  1185.39     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.78   423.87   246.63     0.36  3000.69
MEAN   357.44   391.03   181.16     0.33  2733.82     1.37
HUB    290.38   354.59    64.62     0.30  2843.87

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.91     1.06    21.32   599.02     1.02   586.77     0.92     0.90
MEAN    22.79     1.06    21.16   598.03     1.02   585.41     0.92     0.90
HUB     22.84     1.06    20.98   598.44     1.02   584.04     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.87    35.58    31.50     4.08     0.93     0.26     2.90
MEAN    26.96    27.60    23.50     4.10     0.92     0.26     3.34     0.90
HUB     32.92    10.50     6.50     4.00     0.92     0.27     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.988

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      392.801     179.519     349.379    1186.993       0.331      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.812      21.145      585.619      46.000      27.195      33.000       5.805

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      370.903     179.519     412.063    1188.407       0.312       0.088

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.789      21.299     587.015     440.827       0.034       0.270

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     347.410       0.000     347.410    1189.832       0.292       0.183

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      21.455     588.423       0.000       0.060       0.048       0.180

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.846      22.765       1.054     598.498      10.584     296.192       2.296

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  65960.508       0.385     414.498 1043222.438

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    471429.81   2962.4805    108.6316      1.5069      0.8618     10.0345      1.1448
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 70% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.986

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     107.366    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   48.80284

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     104.886    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   82594.961   84246.680       2.722     831.557     305.451     619.754       2.029

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   244.12    -0.08   244.12     0.22   473.93
  MEAN    17.06     0.00    -0.02   244.12    -0.08   244.12     0.22
  HUB     12.51     0.00    -0.02   244.12    -0.08   244.12     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.84    50.47    12.37   475.82   534.87    14.61   517.83     0.48
  MEAN    58.19    47.20    10.99   393.48   463.13    14.61   517.83     0.41
  HUB     49.77    38.62    11.15   288.54   378.02    14.61   517.83     0.34

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   444.15   298.79   328.62  1128.48     0.39
  MEAN    18.04   458.46   315.43   332.70  1125.45     0.41
  HUB     15.00   509.42   380.07   339.20  1121.08     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   373.27   177.03     0.33  6165.71
  MEAN   415.99   347.56   100.56     0.31  5690.62     1.51
  HUB    345.97   340.91    34.10     0.30  5702.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.29     1.14    15.54   545.65     1.04   529.18     0.92     0.90
  MEAN    17.11     1.13    15.26   543.89     1.04   526.34     0.92     0.90
  HUB     17.12     1.13    14.85   543.94     1.04   522.26     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     42.28    28.31    24.20     4.11     0.93     0.40     2.90
  MEAN    43.47    16.82    12.70     4.12     0.94     0.35     3.51     0.90
  HUB     48.25    -5.74    -9.30     3.56     0.94     0.21     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     463.961     314.822     340.803    1125.632       0.412      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.153      15.258     526.516      24.000      42.731      35.400      -7.331

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     362.256     314.822     479.940    1133.109       0.320       0.376
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.126      15.953     533.535     528.796       0.024       0.500

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     336.802       0.000     336.802    1134.687       0.297       0.407

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.053     535.021       0.000       0.060       0.054       0.427

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      17.067       1.130     544.495      21.685     190.336       1.475

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 135009.734       0.596     819.153 1026515.062


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.366    2643.000      17.067     544.495       1.000       1.000       0.980
W Kg/sec =   48.80284

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.749    2579.635       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82594.961   84246.680       2.140     590.487     275.933     474.134       1.718

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   322.08    -0.11   322.08     0.28   462.60
 MEAN    18.08     0.00    -0.02   322.08    -0.11   322.08     0.28
 HUB     15.21     0.00    -0.02   322.08    -0.11   322.08     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.81    46.36     9.45   473.98   573.14    16.14   535.83     0.50
 MEAN    52.32    42.30    10.02   416.97   526.96    16.14   535.83     0.46
 HUB     47.45    37.84     9.61   350.81   476.32    16.14   535.83     0.42

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   410.03   234.77   336.17  1148.57     0.36
 MEAN    18.01   416.21   241.39   339.05  1146.39     0.36
 HUB     15.22   448.37   289.52   342.36  1144.18     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   410.86   236.21     0.36  4796.18
 MEAN   415.39   381.09   174.00     0.33  4349.49     1.51
 HUB    351.11   347.86    61.59     0.30  4409.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.89     1.11    17.30   562.26     1.03   548.22     0.92     0.91
 MEAN    18.72     1.10    17.09   560.61     1.03   546.14     0.92     0.91
 HUB     18.74     1.10    16.86   560.83     1.03   544.04     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.93    35.09    31.50     3.59     0.93     0.35     2.90
 MEAN    35.45    27.17    23.50     3.67     0.94     0.35     3.30     0.91
 HUB     40.22    10.20     6.50     3.70     0.94     0.35     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     421.425     242.071     344.965    1146.657       0.368       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.768      17.094     546.400      46.000      35.058      30.600      -4.458

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     351.126     242.071     426.483    1151.406       0.305       0.294

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.756      17.583     550.935     511.151       0.017       0.369

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     346.776       0.000     346.776    1151.671       0.301       0.279

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.569     551.189       0.000       0.060       0.043       0.286

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      18.711       1.096     561.231      16.736     223.694       1.734

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 104224.773       0.470     632.370  937301.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    107.366    2643.000      18.711     561.231       1.000       1.000       0.980
W Kg/sec =   48.80284

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     87.741    2540.881       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  82594.961   84246.680       2.135     545.479     255.528     429.765       1.682

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   327.86    -0.11   327.86     0.28   445.01
 MEAN    17.74     0.00    -0.02   327.86    -0.11   327.86     0.28
 HUB     15.05     0.00    -0.02   327.86    -0.11   327.86     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.70    46.36     8.34   462.91   567.34    17.69   552.26     0.49
 MEAN    51.30    43.40     7.90   409.13   524.38    17.69   552.26     0.45
 HUB     46.64    38.84     7.80   347.12   477.56    17.69   552.26     0.41

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   404.45   215.00   342.57  1164.28     0.35
 MEAN    17.51   412.15   225.62   344.91  1162.55     0.35
 HUB     14.85   445.67   278.86   347.64  1160.80     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   419.38   241.91     0.36  4261.38
 MEAN   403.78   388.21   178.16     0.33  3951.83     1.47
 HUB    342.51   353.42    63.64     0.30  4142.84

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.44     1.09    18.80   577.01     1.03   563.35     0.92     0.91
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 MEAN    20.31     1.09    18.62   575.87     1.03   561.68     0.92     0.91
 HUB     20.39     1.09    18.42   576.57     1.03   559.99     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.11    35.23    31.50     3.73     0.93     0.33     2.90
 MEAN    33.19    27.32    23.50     3.82     0.93     0.32     3.28     0.91
 HUB     38.74    10.37     6.50     3.87     0.93     0.33     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     416.419     227.101     349.042    1162.882       0.358       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.365      18.636     562.004      46.000      33.050      31.500      -1.550

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     360.285     227.101     425.887    1166.643       0.309       0.248

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.357      19.053     565.645     471.992       0.014       0.343

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     349.904       0.000     349.904    1167.277       0.300       0.255

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.087     566.260       0.000       0.060       0.037       0.267

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      20.316       1.086     576.483      15.252     232.519       1.802

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  95008.031       0.455     576.448  932830.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    107.366    2643.000      20.316     576.483       1.000       1.000       0.980
W Kg/sec =   48.80284

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     81.898    2507.044       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  82594.961   84246.680       2.152     513.330     238.517     401.059       1.681

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   329.35    -0.11   329.35     0.28   421.36
 MEAN    16.97     0.00    -0.02   329.35    -0.11   329.35     0.28
 HUB     14.32     0.00    -0.02   329.35    -0.11   329.35     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.45    46.36     7.09   444.22   553.09    19.22   567.43     0.47
 MEAN    49.93    43.80     6.13   391.42   511.64    19.22   567.43     0.44
 HUB     45.09    37.84     7.25   330.28   466.51    19.22   567.43     0.40

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   393.42   192.24   343.25  1178.27     0.33
 MEAN    16.57   400.68   203.36   345.23  1176.79     0.34
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 HUB     13.89   431.97   256.53   347.55  1175.30     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   420.69   243.22     0.36  3631.65
 MEAN   382.27   388.83   178.90     0.33  3372.45     1.43
 HUB    320.37   353.36    63.84     0.30  3564.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.87     1.08    20.24   589.93     1.02   577.01     0.92     0.91
 MEAN    21.76     1.07    20.08   588.97     1.02   575.57     0.92     0.91
 HUB     21.84     1.07    19.89   589.68     1.02   574.10     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.25    35.32    31.50     3.82     0.93     0.30     2.90
 MEAN    30.50    27.39    23.50     3.89     0.93     0.30     3.29     0.91
 HUB     36.43    10.41     6.50     3.91     0.93     0.31     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     395.563     204.507     338.595    1177.709       0.336       0.050

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.804      20.164     576.463      46.000      31.131      32.400       1.269

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     354.834     204.507     409.549    1180.313       0.301       0.229

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.798      20.472     579.014     456.573       0.013       0.321

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     337.575       0.000     337.575    1181.329       0.286       0.224

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.556     580.012       0.000       0.060       0.037       0.277

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      21.756       1.071     589.526      13.043     254.178       1.970

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  81266.383       0.429     493.073  955558.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.995

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.366    2643.000      21.756     589.526       1.000       1.000       0.980
W Kg/sec =   48.80284

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.338    2479.156       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82594.961   84246.680       2.263     509.668     225.242     390.276       1.733

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   315.48    -0.11   315.48     0.27   396.34
 MEAN    15.91     0.00    -0.02   315.48    -0.11   315.48     0.27
 HUB     13.07     0.00    -0.02   315.48    -0.11   315.48     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.26    47.36     5.90   422.54   527.41    20.70   581.22     0.45
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 MEAN    49.33    44.80     4.53   367.03   484.06    20.70   581.22     0.41
 HUB     43.71    38.84     4.87   301.45   436.43    20.70   581.22     0.37
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   374.66   178.37   329.48  1191.08     0.31
 MEAN    15.50   379.31   184.46   331.44  1189.50     0.32
 HUB     12.59   404.58   228.81   333.67  1187.91     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   404.94   235.41     0.34  3201.87
 MEAN   357.44   373.86   172.99     0.31  2860.39     1.42
 HUB    290.38   339.30    61.58     0.29  2882.09

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.18     1.07    21.64   601.38     1.02   589.66     0.92     0.91
 MEAN    23.02     1.06    21.45   600.11     1.02   588.10     0.92     0.91
 HUB     23.03     1.06    21.25   600.19     1.02   586.53     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.43    35.55    31.50     4.05     0.93     0.29     2.90
 MEAN    29.10    27.56    23.50     4.06     0.92     0.28     3.34     0.91
 HUB     34.44    10.46     6.50     3.96     0.92     0.29     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     383.318     187.840     334.139    1189.698       0.322       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.045      21.444     588.296      46.000      29.343      33.000       3.657

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     353.961     187.840     400.715    1191.523       0.297       0.130

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.032      21.662     590.103     440.827       0.028       0.300

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     331.694       0.000     331.694    1192.809       0.278       0.222

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.806     591.377       0.000       0.060       0.041       0.219

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.865      23.011       1.058     600.561      11.035     280.934       2.178

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  68774.781       0.402     417.282 1001884.188

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    484283.69   2938.3252    104.8861      1.5232      0.8623     10.9895      1.1487
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 70% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.981

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     103.556    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   47.07069

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     101.163    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   79663.445   81256.547       2.823     831.557     294.610     619.754       2.104

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   235.05    -0.08   235.05     0.21   473.93
  MEAN    17.06     0.00    -0.02   235.05    -0.08   235.05     0.21
  HUB     12.51     0.00    -0.02   235.05    -0.08   235.05     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.72    50.47    13.25   475.82   530.78    14.65   518.20     0.48
  MEAN    59.15    47.20    11.95   393.48   458.41    14.65   518.20     0.41
  HUB     50.84    38.62    12.22   288.54   372.22    14.65   518.20     0.33

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   439.55   305.49   316.04  1129.38     0.39
  MEAN    18.04   452.02   319.21   320.05  1126.24     0.40
  HUB     15.00   499.87   378.72   326.25  1121.86     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   359.02   170.33     0.32  6303.87
  MEAN   415.99   334.36    96.78     0.30  5758.65     1.56
  HUB    345.97   327.89    32.75     0.29  5681.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.33     1.15    15.61   546.17     1.04   530.03     0.92     0.90
  MEAN    17.13     1.13    15.32   544.15     1.04   527.08     0.92     0.90
  HUB     17.10     1.13    14.92   543.86     1.04   522.99     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     44.03    28.32    24.20     4.12     0.93     0.42     2.90
  MEAN    44.92    16.83    12.70     4.13     0.94     0.37     3.51     0.90
  HUB     49.26    -5.73    -9.30     3.57     0.94     0.24     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     457.122     318.590     327.812    1126.439       0.406      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.164      15.321     527.272      24.000      44.183      35.400      -8.783

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     348.042     318.590     471.839    1134.248       0.307       0.403
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      17.132      16.048      534.607     528.796       0.027       0.524

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     323.919       0.000     323.919    1135.683       0.285       0.424

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      16.128     535.961       0.000       0.060       0.062       0.445

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.849      17.066       1.130     544.725      21.915     185.296       1.436

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 136438.906       0.603     798.443  988356.188


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.986

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   103.556    2643.000      17.066     544.725       1.000       1.000       0.980
W Kg/sec =   47.07069

  W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    91.409    2579.091       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 79663.445   81256.547       2.218     590.487     266.205     474.134       1.781

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   309.86    -0.11   309.86     0.27   462.50
 MEAN    18.08     0.00    -0.02   309.86    -0.11   309.86     0.27
 HUB     15.21     0.00    -0.02   309.86    -0.11   309.86     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.83    46.36    10.47   473.98   566.36    16.21   536.71     0.50
 MEAN    53.39    42.30    11.09   416.97   519.58    16.21   536.71     0.46
 HUB     48.56    37.84    10.72   350.81   468.14    16.21   536.71     0.41

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   404.92   243.96   323.17  1149.90     0.35
 MEAN    18.01   409.76   248.13   326.09  1147.56     0.36
 HUB     15.22   440.16   291.91   329.44  1145.20     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   394.94   227.02     0.34  4983.81
 MEAN   415.39   366.49   167.26     0.32  4470.74     1.55
 HUB    351.11   334.71    59.20     0.29  4445.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.96     1.11    17.40   563.19     1.03   549.49     0.92     0.90
 MEAN    18.75     1.10    17.17   561.28     1.03   547.26     0.92     0.90
 HUB     18.74     1.10    16.93   561.19     1.03   545.01     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.05    35.09    31.50     3.59     0.93     0.38     2.90
 MEAN    37.27    27.15    23.50     3.65     0.94     0.37     3.30     0.90
 HUB     41.54    10.19     6.50     3.69     0.94     0.36     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     414.710     248.826     331.768    1147.835       0.361       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.802      17.178     547.524      46.000      36.870      30.600      -6.270

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     337.268     248.826     419.123    1152.922       0.293       0.325

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.787      17.702     552.388     511.151       0.019       0.397

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     333.232       0.000     333.232    1153.157       0.289       0.303

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.680     552.614       0.000       0.060       0.050       0.311

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.861      18.736       1.098     561.887      17.162     215.309       1.669

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 106878.734       0.482     625.456  901036.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.996

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    103.556    2643.000      18.736     561.887       1.000       1.000       0.980
W Kg/sec =   47.07069

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     84.561    2539.398       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  79663.445   81256.547       2.215     545.479     246.269     429.765       1.745

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   315.18    -0.11   315.18     0.27   444.75
 MEAN    17.74     0.00    -0.02   315.18    -0.11   315.18     0.27
 HUB     15.05     0.00    -0.02   315.18    -0.11   315.18     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.76    46.36     9.40   462.91   560.11    17.79   553.59     0.49
 MEAN    52.40    43.40     9.00   409.13   516.54    17.79   553.59     0.45
 HUB     47.77    38.84     8.93   347.12   468.94    17.79   553.59     0.41

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   398.41   224.80   328.93  1166.11     0.34
 MEAN    17.51   404.96   232.78   331.37  1164.21     0.35
 HUB     14.85   436.94   281.50   334.17  1162.29     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   402.58   232.10     0.35  4455.54
 MEAN   403.78   372.89   171.00     0.32  4077.07     1.51
 HUB    342.51   339.70    61.01     0.29  4181.88

        Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     20.54     1.10    18.95   578.39     1.03   565.13     0.92     0.91
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 MEAN    20.39     1.09    18.75   576.98     1.03   563.29     0.92     0.91
 HUB     20.43     1.09    18.53   577.37     1.03   561.43     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.35    35.21    31.50     3.71     0.93     0.35     2.90
 MEAN    35.09    27.30    23.50     3.80     0.93     0.35     3.28     0.91
 HUB     40.11    10.35     6.50     3.85     0.93     0.35     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     409.083     234.306     335.335    1164.537       0.351       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.436      18.762     563.608      46.000      34.943      31.500      -3.443

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     345.631     234.306     417.565    1168.661       0.296       0.281

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.427      19.222     567.607     471.992       0.015       0.371

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     335.800       0.000     335.800    1169.236       0.287       0.283

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.247     568.166       0.000       0.060       0.041       0.296

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      20.383       1.088     577.581      15.694     223.143       1.730

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  97763.602       0.468     572.114  896153.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    103.556    2643.000      20.383     577.581       1.000       1.000       0.980
W Kg/sec =   47.07069

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     78.807    2504.660       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79663.445   81256.547       2.237     513.330     229.516     401.059       1.747

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   316.22    -0.11   316.22     0.27   420.96
 MEAN    16.97     0.00    -0.02   316.22    -0.11   316.22     0.27
 HUB     14.32     0.00    -0.02   316.22    -0.11   316.22     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.56    46.36     8.20   444.22   545.37    19.37   569.23     0.47
 MEAN    51.07    43.80     7.27   391.42   503.28    19.37   569.23     0.43
 HUB     46.26    37.84     8.42   330.28   457.33    19.37   569.23     0.39

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   386.39   202.53   329.06  1180.58     0.33
 MEAN    16.57   392.61   210.89   331.16  1178.93     0.33
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 HUB     13.89   422.50   259.29   333.58  1177.25     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   403.16   232.93     0.34  3825.85
 MEAN   382.27   372.88   171.38     0.32  3497.07     1.47
 HUB    320.37   339.13    61.07     0.29  3603.13

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.02     1.08    20.45   591.74     1.02   579.28     0.92     0.91
 MEAN    21.88     1.07    20.26   590.53     1.02   577.66     0.92     0.91
 HUB     21.93     1.08    20.06   590.92     1.02   576.02     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.61    35.29    31.50     3.79     0.93     0.32     2.90
 MEAN    32.49    27.36    23.50     3.86     0.93     0.32     3.29     0.91
 HUB     37.86    10.38     6.50     3.88     0.93     0.33     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     387.961     212.073     324.867    1179.782       0.329       0.049

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.926      20.342     578.499      46.000      33.137      32.400      -0.737

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     339.909     212.073     400.641    1182.756       0.287       0.263

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.921      20.698     581.419     456.573       0.013       0.350

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     323.479       0.000     323.479    1183.681       0.273       0.255

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.773     582.329       0.000       0.060       0.037       0.307

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      21.880       1.073     591.064      13.483     242.928       1.883

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  84012.305       0.443     491.641  917428.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.556    2643.000      21.880     591.064       1.000       1.000       0.980
W Kg/sec =   47.07069

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     74.267    2475.927       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79663.445   81256.547       2.356     509.668     216.298     390.276       1.804

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   302.45    -0.10   302.45     0.26   395.82
 MEAN    15.91     0.00    -0.02   302.45    -0.10   302.45     0.26
 HUB     13.07     0.00    -0.02   302.45    -0.10   302.45     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.41    47.36     7.05   422.54   519.72    20.91   583.43     0.44
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 MEAN    50.52    44.80     5.72   367.03   475.67    20.91   583.43     0.40
 HUB     44.92    38.84     6.08   301.45   427.10    20.91   583.43     0.36
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   367.50   188.75   315.32  1193.76     0.31
 MEAN    15.50   370.97   192.04   317.40  1192.02     0.31
 HUB     12.59   394.78   231.60   319.71  1190.25     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   387.38   225.03     0.32  3388.08
 MEAN   357.44   357.91   165.41     0.30  2977.76     1.46
 HUB    290.38   325.07    58.79     0.27  2917.16

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.40     1.07    21.91   603.60     1.02   592.33     0.92     0.91
 MEAN    23.21     1.06    21.70   602.09     1.02   590.60     0.92     0.91
 HUB     23.18     1.06    21.48   601.86     1.02   588.85     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.90    35.51    31.50     4.01     0.93     0.32     2.90
 MEAN    31.18    27.53    23.50     4.03     0.92     0.31     3.34     0.91
 HUB     35.92    10.42     6.50     3.92     0.92     0.30     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      375.002     195.558     319.974    1192.199       0.315       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.232      21.690      590.779       46.000      31.432      33.000       1.568

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      338.350     195.558     390.799    1194.399       0.283        0.171

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       23.223       21.963     592.961     440.827       0.025        0.330

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      317.204       0.000     317.204    1195.563       0.265        0.258

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       22.095      594.118       0.000       0.060       0.037        0.255

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.876       23.204        1.061      602.517       11.452     267.511        2.074

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  71378.227       0.417     417.707  961605.438

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    496471.78   2905.3611     101.1634       1.5360       0.8589      11.9532       1.1525
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 70% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  0.974

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      99.590    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   45.26799

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
      97.289    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.935     831.557     283.327     619.754       2.187

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   225.65    -0.08   225.65     0.20   473.93
  MEAN    17.06     0.00    -0.02   225.65    -0.08   225.65     0.20
  HUB     12.51     0.00    -0.02   225.65    -0.08   225.65     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.63    50.47    14.16   475.82   526.69    14.68   518.56     0.47
  MEAN    60.17    47.20    12.97   393.48   453.66    14.68   518.56     0.41
  HUB     51.98    38.62    13.36   288.54   366.36    14.68   518.56     0.33

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   435.23   312.31   303.13  1130.27     0.39
  MEAN    18.04   445.67   323.03   307.05  1127.02     0.40
  HUB     15.00   490.16   377.28   312.92  1122.64     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   344.42   163.51     0.30  6444.60
  MEAN   415.99   320.81    92.97     0.28  5827.45     1.61
  HUB    345.97   314.49    31.31     0.28  5660.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.36     1.15    15.67   546.69     1.05   530.87     0.92     0.89
  MEAN    17.14     1.13    15.38   544.40     1.04   527.81     0.92     0.89
  HUB     17.08     1.13    14.98   543.78     1.04   523.71     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     45.85    28.34    24.20     4.14     0.93     0.45     2.90
  MEAN    46.45    16.84    12.70     4.14     0.94     0.40     3.51     0.89
  HUB     50.33    -5.71    -9.30     3.59     0.94     0.26     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     450.367     322.399     314.466    1127.234       0.400      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.173      15.382     528.016      24.000      45.714      35.400     -10.314

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     333.499     322.399     463.856    1135.372       0.294       0.430
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.136      16.138     535.667     528.796       0.030       0.549

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     310.718       0.000     310.718    1136.670       0.273       0.441

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.197     536.893       0.000       0.060       0.070       0.462

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.838      17.061       1.129     544.957      22.147     180.126       1.396

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 137884.031       0.609     775.997  948857.062


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  0.979

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    99.590    2643.000      17.061     544.957       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    87.951    2578.542       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.305     590.487     256.136     474.134       1.851

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   297.32    -0.10   297.32     0.26   462.40
 MEAN    18.08     0.00    -0.02   297.32    -0.10   297.32     0.26
 HUB     15.21     0.00    -0.02   297.32    -0.10   297.32     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.91    46.36    11.55   473.98   559.60    16.27   537.57     0.49
 MEAN    54.52    42.30    12.22   416.97   512.20    16.27   537.57     0.45
 HUB     49.73    37.84    11.89   350.81   459.93    16.27   537.57     0.40

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   400.27   253.27   309.95  1151.20     0.35
 MEAN    18.01   403.58   254.92   312.88  1148.72     0.35
 HUB     15.22   431.99   294.32   316.22  1146.21     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   378.77   217.71     0.33  5173.78
 MEAN   415.39   351.63   160.47     0.31  4592.94     1.60
 HUB    351.11   321.28    56.80     0.28  4481.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.01     1.11    17.48   564.12     1.04   550.74     0.92     0.90
 MEAN    18.78     1.10    17.25   561.97     1.03   548.37     0.92     0.90
 HUB     18.74     1.10    16.99   561.56     1.03   545.97     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.25    35.08    31.50     3.58     0.93     0.40     2.90
 MEAN    39.17    27.15    23.50     3.65     0.94     0.39     3.30     0.90
 HUB     42.95    10.18     6.50     3.68     0.94     0.38     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     408.255     255.635     318.312    1148.993       0.355       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.829      17.254     548.631      46.000      38.768      30.600      -8.168

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     323.195     255.635     412.073    1154.421       0.280       0.356

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.810      17.812     553.827     511.151       0.022       0.427

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     319.497       0.000     319.497    1154.627       0.277       0.327

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.779     554.025       0.000       0.060       0.058       0.336

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.850      18.751       1.099     562.550      17.593     207.024       1.605

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 109560.031       0.494     616.593  863694.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  0.991

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     99.590    2643.000      18.751     562.550       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     81.305    2537.902       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  76612.523   78144.609       2.304     545.479     236.787     429.765       1.815

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   302.31    -0.10   302.31     0.26   444.48
 MEAN    17.74      0.00    -0.02   302.31    -0.10   302.31     0.26
 HUB     15.05      0.00    -0.02   302.31    -0.10   302.31     0.26

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     56.86     46.36     10.50   462.91   552.96     17.88   554.92      0.48
 MEAN    53.55     43.40     10.15   409.13   508.79     17.88   554.92      0.44
 HUB     48.96     38.84     10.12   347.12   460.39     17.88   554.92      0.40

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   392.93    234.59    315.22  1167.90      0.34
 MEAN    17.51   398.14    239.95    317.71  1165.84      0.34
 HUB     14.85   428.33    284.08    320.57  1163.76      0.37

       U2        W2        Wu2      MachRel2  DelRCu     Ws1/W2
 TIP    456.91    385.73    222.32      0.33  4649.25
 MEAN   403.78    357.47    163.83      0.31  4202.53      1.55
 HUB    342.51    325.85     58.43      0.28  4220.15

         Pt2       PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     20.63      1.10     19.07   579.77      1.03   566.87      0.92      0.91
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 MEAN    20.44     1.09    18.86   578.11     1.03   564.88     0.92     0.91
 HUB     20.45     1.09    18.62   578.18     1.03   562.86     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.66    35.20    31.50     3.70     0.93     0.38     2.90
 MEAN    37.06    27.28    23.50     3.78     0.94     0.37     3.28     0.91
 HUB     41.55    10.33     6.50     3.83     0.94     0.37     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     402.130     241.524     321.520    1166.159       0.345       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.492      18.872     565.183      46.000      36.914      31.500      -5.414

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     330.933     241.524     409.696    1170.646       0.283       0.315

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.480      19.373     569.541     471.992       0.017       0.402

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     321.679       0.000     321.679    1171.164       0.275       0.311

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      19.387     570.045       0.000       0.060       0.046       0.323

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.868      20.431       1.090     578.685      16.135     214.041       1.659

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 100511.906       0.481     565.671  858481.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  0.997

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     99.590    2643.000      20.431     578.685       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     75.683    2502.270       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.329     513.330     220.418     401.059       1.820

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   303.05    -0.10   303.05     0.26   420.56
 MEAN    16.97     0.00    -0.02   303.05    -0.10   303.05     0.26
 HUB     14.32     0.00    -0.02   303.05    -0.10   303.05     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.70    46.36     9.34   444.22   537.83    19.50   571.02     0.46
 MEAN    52.26    43.80     8.46   391.42   495.11    19.50   571.02     0.42
 HUB     47.47    37.84     9.63   330.28   448.32    19.50   571.02     0.38

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   380.06   212.68   314.98  1182.83     0.32
 MEAN    16.57   385.04   218.31   317.17  1181.01     0.33
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 HUB     13.89   413.30   262.00   319.65  1179.17     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   385.80   222.77     0.33  4017.50
 MEAN   382.27   357.04   163.95     0.30  3620.08     1.51
 HUB    320.37   324.94    58.37     0.28  3640.61

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.15     1.08    20.62   593.56     1.03   581.50     0.92     0.91
 MEAN    21.98     1.08    20.42   592.09     1.02   579.71     0.92     0.91
 HUB     21.99     1.08    20.19   592.16     1.02   577.90     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.03    35.27    31.50     3.77     0.93     0.35     2.90
 MEAN    34.54    27.34    23.50     3.84     0.93     0.35     3.29     0.91
 HUB     39.34    10.35     6.50     3.85     0.93     0.35     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     380.848     219.542     311.202    1181.808       0.322       0.047

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.023      20.492     580.494      46.000      35.202      32.400      -2.802

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     325.132     219.542     392.313    1185.146       0.274       0.297

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.017      20.894     583.777     456.573       0.014       0.381

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     309.553       0.000     309.553    1185.984       0.261       0.286

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.957     584.603       0.000       0.060       0.039       0.336

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      21.975       1.076     592.602      13.917     232.226       1.800

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  86719.797       0.457     488.050  878372.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2643.000      21.975     592.602       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     71.207    2472.712       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.458     509.668     207.388     390.276       1.882

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   289.56    -0.10   289.56     0.24   395.31
 MEAN    15.91     0.00    -0.02   289.56    -0.10   289.56     0.24
 HUB     13.07     0.00    -0.02   289.56    -0.10   289.56     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.58    47.36     8.22   422.54   512.32    21.08   585.60     0.43
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 MEAN    51.74    44.80     6.94   367.03   467.57    21.08   585.60     0.39
 HUB     46.16    38.84     7.32   301.45   418.06    21.08   585.60     0.35
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   361.16   198.89   301.47  1196.37     0.30
 MEAN    15.50   363.26   199.45   303.61  1194.46     0.30
 HUB     12.59   385.38   234.29   305.98  1192.54     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   370.22   214.89     0.31  3569.83
 MEAN   357.44   342.26   158.00     0.29  3092.55     1.50
 HUB    290.38   311.07    56.09     0.26  2951.05

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.58     1.07    22.13   605.81     1.02   594.93     0.92     0.91
 MEAN    23.36     1.06    21.91   604.05     1.02   593.03     0.92     0.91
 HUB     23.30     1.06    21.67   603.52     1.02   591.13     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.41    35.48    31.50     3.98     0.93     0.34     2.90
 MEAN    33.30    27.49    23.50     3.99     0.93     0.33     3.34     0.91
 HUB     37.44    10.39     6.50     3.89     0.93     0.32     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      367.332     203.105     306.074    1194.631       0.307       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.381      21.896      593.200       46.000      33.568      33.000      -0.568

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      323.144     203.105     381.672    1197.193       0.270       0.210

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       23.375      22.220     595.746     440.827       0.024       0.362

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      303.088       0.000     303.088    1198.245       0.253       0.293

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       22.339     596.795       0.000       0.060       0.037       0.289

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.880       23.356       1.063     604.462      11.860     254.969       1.977

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  73919.266       0.432     416.010  920421.438

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc   TR
    508595.00   2862.3210      97.2890       1.5460       0.8520      12.9716      1.1562
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 70% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.992   EfDer =  0.966

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      95.675    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   43.48865

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      93.465    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   73601.117   75072.977       3.055     831.557     272.190     619.754       2.277

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   216.43    -0.07   216.43     0.19   473.93
  MEAN    17.06     0.00    -0.02   216.43    -0.07   216.43     0.19
  HUB     12.51     0.00    -0.02   216.43    -0.07   216.43     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     65.54    50.47    15.07   475.82   522.80    14.72   518.90     0.47
  MEAN    61.19    47.20    13.99   393.48   449.14    14.72   518.90     0.40
  HUB     53.13    38.62    14.51   288.54   360.75    14.72   518.90     0.32

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   431.41   318.88   290.57  1131.10     0.38
  MEAN    18.04   439.74   326.68   294.36  1127.75     0.39
  HUB     15.00   480.83   375.82   299.92  1123.36     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   330.24   156.94     0.29  6580.11
  MEAN   415.99   307.61    89.31     0.27  5893.31     1.67
  HUB    345.97   301.40    29.85     0.27  5638.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.39     1.15    15.73   547.19     1.05   531.65     0.92     0.88
  MEAN    17.14     1.13    15.44   544.65     1.04   528.49     0.92     0.88
  HUB     17.05     1.13    15.03   543.70     1.04   524.39     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     47.66    28.37    24.20     4.17     0.93     0.47     2.90
  MEAN    47.98    16.88    12.70     4.18     0.95     0.42     3.51     0.88
  HUB     51.41    -5.68    -9.30     3.62     0.95     0.28     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     444.048     326.047     301.449    1127.974       0.394       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.178      15.435     528.709      24.000      47.245      35.400     -11.845

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     319.366     326.047     456.401    1136.423       0.281       0.457
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      17.136      16.220      536.660     528.796       0.034       0.574

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     297.866       0.000     297.866    1137.596       0.262       0.458

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      16.258      537.768       0.000       0.060       0.080       0.478

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.826      17.053       1.129     545.179      22.369     175.094       1.357

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 139263.422       0.615     752.953  910072.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.992   EfDer =  0.971

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    95.675    2643.000      17.053     545.179       1.000       1.000       0.980
W Kg/sec =   43.48865

  W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    84.553    2578.018       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 73601.117   75072.977       2.398     590.487     246.239     474.134       1.926

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   285.10    -0.10   285.10     0.25   462.31
MEAN    18.08     0.00    -0.02   285.10    -0.10   285.10     0.25
HUB     15.21     0.00    -0.02   285.10    -0.10   285.10     0.25

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.98    46.36    12.62   473.98   553.20    16.32   538.39     0.49
MEAN    55.64    42.30    13.34   416.97   505.20    16.32   538.39     0.44
HUB     50.91    37.84    13.07   350.81   452.13    16.32   538.39     0.40

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   396.28   262.17   297.16  1152.41     0.34
MEAN    18.01   397.98   261.44   300.06  1149.80     0.35
HUB     15.22   424.26   296.58   303.37  1147.15     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    470.98   363.19   208.80     0.32  5355.61
MEAN   415.39   337.25   153.95     0.29  4710.38     1.65
HUB    351.11   308.23    54.53     0.27  4516.33

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.06     1.12    17.56   565.02     1.04   551.90     0.92     0.89
MEAN    18.81     1.10    17.31   562.63     1.03   549.40     0.92     0.89
HUB     18.73     1.10    17.04   561.91     1.03   546.88     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.42    35.09    31.50     3.59     0.93     0.42     2.90
MEAN    41.07    27.16    23.50     3.66     0.94     0.41     3.30     0.89
HUB     44.35    10.19     6.50     3.69     0.94     0.40     3.92


  blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     402.401     262.178     305.269    1150.069       0.350       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.848      17.316     549.661      46.000      40.657      30.600     -10.057

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     309.599     262.178     405.695    1155.827       0.268       0.387

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.823      17.907     555.179     511.151       0.026       0.457

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     306.239       0.000     306.239    1156.007       0.265       0.350

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.862     555.351       0.000       0.060       0.069       0.359

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.838      18.756       1.100     563.183      18.005     199.237       1.544

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 112125.727       0.505     606.228  827207.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
  RESET =  0.000BLEED =  0.000 DPInc =13.992   EfDer =  0.985

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     95.675    2643.000      18.756     563.183       1.000       1.000       0.980
W Kg/sec =   43.48865

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     78.133    2536.474       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  73601.117   75072.977       2.397     545.479     227.549     429.765       1.889

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   289.87    -0.10   289.87     0.25   444.23
 MEAN    17.74     0.00    -0.02   289.87    -0.10   289.87     0.25
 HUB     15.05     0.00    -0.02   289.87    -0.10   289.87     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.95    46.36    11.59   462.91   546.26    17.95   556.17     0.47
 MEAN    54.69    43.40    11.29   409.13   501.49    17.95   556.17     0.43
 HUB     50.14    38.84    11.30   347.12   452.31    17.95   556.17     0.39

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   388.25   243.91   302.08  1169.57      0.33
 MEAN    17.51   392.00   246.75   304.59  1167.37      0.34
 HUB     14.85   420.27   286.53   307.46  1165.14      0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   369.62   213.00     0.32  4833.77
 MEAN   403.78   342.69   157.03     0.29  4321.57     1.60
 HUB    342.51   312.51    55.98     0.27  4256.46

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     20.70     1.10    19.18   581.08     1.03   568.50     0.92     0.90
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 MEAN    20.49     1.09    18.95   579.19     1.03   566.36     0.92     0.90
 HUB     20.46     1.09    18.70   578.95     1.03   564.20     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.92    35.19    31.50     3.69     0.93     0.40     2.90
 MEAN    39.01    27.27    23.50     3.77     0.94     0.39     3.28     0.90
 HUB     42.98    10.32     6.50     3.82     0.94     0.39     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     395.861     248.372     308.249    1167.672       0.339       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.531      18.960     566.654      46.000      38.860      31.500      -7.360

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     316.875     248.372     402.615    1172.505       0.270       0.348

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.516      19.499     571.354     471.992       0.020       0.432

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     308.193       0.000     308.193    1172.969       0.263       0.336

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.500     571.807       0.000       0.060       0.055       0.348

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.858      20.460       1.091     579.738      16.555     205.594       1.594

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 103125.555       0.494     557.567  821751.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =13.992   EfDer =  0.993

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     95.675     2643.000       20.460     579.738       1.000        1.000        0.980
W Kg/sec =   43.48865

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     72.673     2499.996        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  73601.117   75072.977        2.425     513.330     211.653     401.059       1.895

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   290.45    -0.10   290.45      0.25   420.18
 MEAN    16.97      0.00    -0.02   290.45    -0.10   290.45      0.25
 HUB     14.32      0.00    -0.02   290.45    -0.10   290.45      0.25

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     56.83     46.36    10.47   444.22   530.84     19.61   572.70      0.45
 MEAN    53.43     43.80     9.63   391.42   487.50     19.61   572.70      0.42
 HUB     48.68     37.84    10.84   330.28   439.91     19.61   572.70      0.37

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2      Ao2          Mach2
 TIP     18.88   374.68   222.26   301.63  1184.92      0.32
 MEAN    16.57   378.29   225.32   303.87  1182.95      0.32
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 HUB     13.89   404.80   264.55   306.39  1180.96     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   369.37   213.19     0.31  4198.28
 MEAN   382.27   342.01   156.95     0.29  3736.09     1.56
 HUB    320.37   311.43    55.82     0.26  3676.03

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.25     1.09    20.76   595.28     1.03   583.56     0.92     0.91
 MEAN    22.05     1.08    20.54   593.57     1.02   581.62     0.92     0.91
 HUB     22.02     1.08    20.30   593.35     1.02   579.67     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.39    35.25    31.50     3.75     0.93     0.38     2.90
 MEAN    36.56    27.32    23.50     3.82     0.94     0.37     3.29     0.91
 HUB     40.81    10.32     6.50     3.82     0.94     0.37     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     374.529     226.585     298.214    1183.695       0.316       0.045

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.093      20.610     582.355      46.000      37.228      32.400      -4.828

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     311.152     226.585     384.911    1187.376       0.262       0.330

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.085      21.054     585.983     456.573       0.015       0.412

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     296.401       0.000     296.401    1188.134       0.249       0.313

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.103     586.731       0.000       0.060       0.045       0.362

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      22.038       1.077     594.065      14.327     222.453       1.724

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  89273.914       0.471     482.676  840376.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.992   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     95.675    2643.000      22.038     594.065       1.000       1.000       0.980
W Kg/sec =   43.48865

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     68.296    2469.666       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73601.117   75072.977       2.562     509.668     198.911     390.276       1.962

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   277.36    -0.10   277.36     0.23   394.82
 MEAN    15.91     0.00    -0.02   277.36    -0.10   277.36     0.23
 HUB     13.07     0.00    -0.02   277.36    -0.10   277.36     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.72    47.36     9.36   422.54   505.52    21.22   587.64     0.43
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 MEAN    52.93    44.80     8.13   367.03   460.12    21.22   587.64     0.39
 HUB     47.39    38.84     8.55   301.45   409.71    21.22   587.64     0.34
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   355.85   208.34   288.48  1198.78     0.30
 MEAN    15.50   356.48   206.38   290.66  1196.74     0.30
 HUB     12.59   376.79   236.84   293.05  1194.68     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   354.16   205.44     0.30  3739.29
 MEAN   357.44   327.57   151.07     0.27  3199.86     1.55
 HUB    290.38   297.90    53.54     0.25  2983.05

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.72     1.08    22.31   607.90     1.02   597.34     0.92     0.91
 MEAN    23.47     1.06    22.07   605.91     1.02   595.30     0.92     0.91
 HUB     23.37     1.06    21.81   605.11     1.02   593.26     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.84    35.46    31.50     3.96     0.93     0.37     2.90
 MEAN    35.38    27.46    23.50     3.96     0.93     0.35     3.34     0.91
 HUB     38.94    10.35     6.50     3.85     0.93     0.34     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      360.594     210.161     293.019    1196.889       0.301       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.491      22.056      595.453       46.000      35.649      33.000      -2.649

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      308.953     210.161     373.657    1199.786       0.258       0.248

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.484       22.424     598.339     440.827       0.025       0.393

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     289.914       0.000     289.914    1200.739       0.241       0.325

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.529     599.290       0.000       0.060       0.039       0.320

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.879      23.463       1.065     606.306      12.241     243.695       1.889

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  76293.539       0.446     412.495  880407.312

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    520082.16   2811.9192     93.4649      1.5531      0.8425     13.9922      1.1597
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 70% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =14.987   EfDer =  0.959

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      91.914    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   41.77924

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      89.791    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   70708.070   72122.078       3.180     831.557     261.491     619.754       2.370

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   207.61    -0.07   207.61     0.19   473.93
  MEAN    17.06     0.00    -0.02   207.61    -0.07   207.61     0.19
  HUB     12.51     0.00    -0.02   207.61    -0.07   207.61     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     66.43    50.47    15.96   475.82   519.21    14.75   519.21     0.46
  MEAN    62.19    47.20    14.99   393.48   444.96    14.75   519.21     0.40
  HUB     54.27    38.62    15.65   288.54   355.52    14.75   519.21     0.32

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   428.13   325.05   278.64  1131.85     0.38
  MEAN    18.04   434.36   330.12   282.30  1128.41     0.38
  HUB     15.00   472.08   374.39   287.55  1124.02     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   316.81   150.77     0.28  6707.27
  MEAN   415.99   295.07    85.87     0.26  5955.26     1.73
  HUB    345.97   288.95    28.43     0.26  5616.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.42     1.15    15.78   547.66     1.05   532.35     0.92     0.88
  MEAN    17.15     1.14    15.48   544.87     1.04   529.12     0.92     0.88
  HUB     17.03     1.13    15.08   543.62     1.04   525.01     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     49.40    28.42    24.20     4.22     0.93     0.50     2.90
  MEAN    49.46    16.92    12.70     4.22     0.95     0.45     3.51     0.88
  HUB     52.47    -5.65    -9.30     3.65     0.95     0.31     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.959

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     438.318     329.478     289.080    1128.645       0.388       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.181      15.482     529.339      24.000      48.737      35.400     -13.337

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     305.976     329.478     449.641    1137.382       0.269       0.482
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.133      16.292     537.566     528.796       0.037       0.599

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     285.663       0.000     285.663    1138.444       0.251       0.473

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.311     538.570       0.000       0.060       0.089       0.493

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.814      17.042       1.128     545.386      22.576     170.309       1.320

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 140552.750       0.621     730.054  872992.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =14.987   EfDer =  0.963

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     91.914    2643.000      17.042     545.386       1.000       1.000       0.980
W Kg/sec =   41.77924

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.298    2577.529       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  70708.070   72122.078       2.494     590.487     236.759     474.134       2.003

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   273.49    -0.09   273.49     0.24   462.22
 MEAN    18.08     0.00    -0.02   273.49    -0.09   273.49     0.24
 HUB     15.21     0.00    -0.02   273.49    -0.09   273.49     0.24

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.02    46.36    13.66   473.98   547.30    16.37   539.14     0.48
 MEAN    56.75    42.30    14.45   416.97   498.73    16.37   539.14     0.44
 HUB     52.07    37.84    14.23   350.81   444.89    16.37   539.14     0.39

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   393.01   270.53   285.08  1153.51     0.34
 MEAN    18.01   393.05   267.55   287.93  1150.78     0.34
 HUB     15.22   417.14   298.70   291.18  1148.02     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   348.50   200.45     0.30  5526.09
 MEAN   415.39   323.67   147.84     0.28  4820.35     1.70
 HUB    351.11   295.86    52.41     0.26  4548.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.09     1.12    17.61   565.85     1.04   552.96     0.92     0.88
 MEAN    18.82     1.10    17.36   563.24     1.03   550.34     0.92     0.88
 HUB     18.72     1.10    17.08   562.23     1.03   547.70     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.50    35.11    31.50     3.61     0.93     0.45     2.90
 MEAN    42.90    27.18    23.50     3.68     0.95     0.43     3.30     0.88
 HUB     45.73    10.20     6.50     3.70     0.95     0.42     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.963

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     397.232     268.305     292.926    1151.048       0.345       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.859      17.366     550.599      46.000      42.488      30.600     -11.888

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     296.770     268.305     400.076    1157.118       0.256       0.417

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.830      17.987     556.421     511.151       0.030       0.487

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     293.731       0.000     293.731    1157.274       0.254       0.370

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.930     556.571       0.000       0.060       0.080       0.380

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.825      18.753       1.100     563.776      18.391     192.057       1.489

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 114529.867       0.516     594.887  792474.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =14.987   EfDer =  0.978

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     91.914    2643.000      18.753     563.776       1.000       1.000       0.980
W Kg/sec =   41.77924

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     75.116    2535.140       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  70708.070   72122.078       2.493     545.479     218.762     429.765       1.965

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   278.12    -0.10   278.12     0.24   444.00
 MEAN    17.74     0.00    -0.02   278.12    -0.10   278.12     0.24
 HUB     15.05     0.00    -0.02   278.12    -0.10   278.12     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.01    46.36    12.65   462.91   540.11    18.01   557.32     0.47
 MEAN    55.80    43.40    12.40   409.13   494.79    18.01   557.32     0.43
 HUB     51.31    38.84    12.47   347.12   444.87    18.01   557.32     0.38

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   384.39   252.57   289.76  1171.08      0.33
 MEAN    17.51   386.63   253.11   292.26  1168.76      0.33
 HUB     14.85   412.89   288.77   295.11  1166.40      0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   354.56   204.33     0.30  5005.42
 MEAN   403.78   328.81   150.67     0.28  4432.77     1.65
 HUB    342.51   299.96    53.74     0.26  4289.67

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.75     1.11    19.26   582.31     1.03   569.98     0.92     0.89
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 MEAN    20.51     1.09    19.01   580.19     1.03   567.71     0.92     0.89
 HUB     20.45     1.09    18.75   579.66     1.03   565.43     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.08    35.19    31.50     3.69     0.93     0.42     2.90
 MEAN    40.89    27.27    23.50     3.77     0.94     0.41     3.28     0.89
 HUB     44.38    10.32     6.50     3.82     0.94     0.41     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     390.375     254.770     295.778    1169.051       0.334       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.556      19.027     567.997      46.000      40.740      31.500      -9.240

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     303.711     254.770     396.419    1174.208       0.259       0.379

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.536      19.601     573.020     471.992       0.023       0.462

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     295.573       0.000     295.573    1174.625       0.252       0.359

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      19.588     573.427       0.000       0.060       0.064       0.371

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.847      20.472       1.092     580.721      16.945     197.896       1.534

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 105555.828       0.506     548.274  786848.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =14.987   EfDer =  0.988

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     91.914     2643.000       20.472     580.721       1.000        1.000        0.980
W Kg/sec =   41.77924

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     69.835     2497.879        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  70708.070   72122.078        2.524     513.330     203.388     401.059       1.972

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   278.66    -0.10   278.66      0.24   419.82
 MEAN    16.97      0.00    -0.02   278.66    -0.10   278.66      0.24
 HUB     14.32      0.00    -0.02   278.66    -0.10   278.66      0.24

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     57.91     46.36    11.55   444.22   524.47     19.69    574.24      0.45
 MEAN    54.56     43.80    10.76   391.42   480.56     19.69    574.24      0.41
 HUB     49.85     37.84    12.01   330.28   432.20     19.69    574.24      0.37

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2      Cm2      Ao2          Mach2
 TIP     18.88   370.22    231.10   289.23  1186.82      0.31
 MEAN    16.57   372.41    231.79   291.48  1184.72      0.31
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 HUB     13.89   397.06   266.87   294.00  1182.60     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   354.14   204.36     0.30  4364.97
 MEAN   382.27   328.03   150.48     0.28  3843.30     1.60
 HUB    320.37   298.83    53.49     0.25  3708.25

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.32     1.09    20.87   596.88     1.03   585.44     0.92     0.90
 MEAN    22.10     1.08    20.63   594.95     1.02   583.37     0.92     0.90
 HUB     22.04     1.08    20.38   594.45     1.02   581.29     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.63    35.24    31.50     3.74     0.93     0.40     2.90
 MEAN    38.49    27.31    23.50     3.81     0.94     0.39     3.29     0.90
 HUB     42.23    10.31     6.50     3.81     0.94     0.39     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     369.039     233.094     286.106    1185.417       0.311       0.043

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.138      20.698     584.057      46.000      39.170      32.400      -6.770

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     298.171     233.094     378.469    1189.416       0.251       0.362

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.127      21.180     588.004     456.573       0.017       0.442

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     284.204       0.000     284.204    1190.102       0.239       0.338

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.214     588.683       0.000       0.060       0.052       0.385

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      22.074       1.078     595.426      14.705     213.676       1.656

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91628.227       0.483     475.932  804331.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =14.987   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     91.914    2643.000      22.074     595.426       1.000       1.000       0.980
W Kg/sec =   41.77924

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     65.579    2466.842       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  70708.070   72122.078       2.668     509.668     190.998     390.276       2.043

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   266.04    -0.09   266.04     0.22   394.37
 MEAN    15.91     0.00    -0.02   266.04    -0.09   266.04     0.22
 HUB     13.07     0.00    -0.02   266.04    -0.09   266.04     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.81    47.36    10.45   422.54   499.40    21.32   589.52     0.42
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 MEAN    54.07    44.80     9.27   367.03   453.38    21.32   589.52     0.38
 HUB     48.58    38.84     9.74   301.45   402.13    21.32   589.52     0.34
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   351.51   217.01   276.52  1200.97     0.29
 MEAN    15.50   350.60   212.72   278.70  1198.81     0.29
 HUB     12.59   369.03   239.12   281.08  1196.63     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   339.39   196.77     0.28  3894.83
 MEAN   357.44   314.04   144.73     0.26  3298.05     1.60
 HUB    290.38   285.72    51.27     0.24  3011.68

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.82     1.08    22.44   609.84     1.02   599.53     0.92     0.91
 MEAN    23.55     1.07    22.19   607.63     1.02   597.37     0.92     0.91
 HUB     23.41     1.06    21.92   606.57     1.02   595.21     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.12    35.43    31.50     3.93     0.93     0.39     2.90
 MEAN    37.35    27.44    23.50     3.94     0.93     0.38     3.34     0.91
 HUB     40.39    10.34     6.50     3.84     0.93     0.36     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     354.776     216.617     280.968    1198.945       0.296       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.565      22.174     597.510      46.000      37.631      33.000      -4.631

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     295.922     216.617     366.732    1202.147       0.246       0.282

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.554      22.580     600.706     440.827       0.028       0.423

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     277.816       0.000     277.816    1203.014       0.231       0.353

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.672     601.573       0.000       0.060       0.044       0.347

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      23.531       1.066     608.015      12.589     233.699       1.812

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  78464.547       0.458     407.558  842485.188

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    530731.19   2756.7039     89.7911      1.5576      0.8314     14.9870      1.1630
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 70% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =15.956   EfDer =  0.950

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      88.301    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   40.13702

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      86.262    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  67928.758   69287.188       3.310     831.557     251.213     619.754       2.467

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   199.18    -0.07   199.18     0.18   473.93
  MEAN    17.06     0.00    -0.02   199.18    -0.07   199.18     0.18
  HUB     12.51     0.00    -0.02   199.18    -0.07   199.18     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     67.29    50.47    16.82   475.82   515.89    14.78   519.50     0.46
  MEAN    63.16    47.20    15.96   393.48   441.08    14.78   519.50     0.39
  HUB     55.39    38.62    16.77   288.54   350.66    14.78   519.50     0.31

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   425.35   330.87   267.30  1132.54     0.38
  MEAN    18.04   429.46   333.31   270.82  1129.01     0.38
  HUB     15.00   463.86   372.98   275.78  1124.62     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   304.08   144.95     0.27  6827.19
  MEAN   415.99   283.16    82.69     0.25  6012.67     1.79
  HUB    345.97   277.10    27.01     0.25  5595.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.44     1.15    15.82   548.11     1.05   532.99     0.92     0.87
  MEAN    17.15     1.14    15.52   545.09     1.04   529.68     0.92     0.87
  HUB     17.00     1.13    15.12   543.54     1.04   525.57     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     51.07    28.47    24.20     4.27     0.93     0.52     2.90
  MEAN    50.90    16.98    12.70     4.28     0.95     0.47     3.51     0.87
  HUB     53.52    -5.59    -9.30     3.71     0.95     0.33     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.950

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     433.085     332.658     277.311    1129.257       0.384       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.181      15.521     529.912      24.000      50.185      35.400     -14.785

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     293.269     332.658     443.473    1138.259       0.258       0.507
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.129      16.355     538.395     528.796       0.041       0.624

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     274.055       0.000     274.055    1139.221       0.241       0.488

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.355     539.305       0.000       0.060       0.099       0.507

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.802      17.029       1.127     545.578      22.768     165.754       1.285

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 141752.406       0.626     707.344  837527.938


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =15.956   EfDer =  0.954

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    88.301    2643.000      17.029     545.578       1.000       1.000       0.980
W Kg/sec =   40.13702

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    78.177    2577.073       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 67928.758   69287.188       2.594     590.487     227.671     474.134       2.083

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   262.43    -0.09   262.43     0.23   462.14
 MEAN    18.08     0.00    -0.02   262.43    -0.09   262.43     0.23
 HUB     15.21     0.00    -0.02   262.43    -0.09   262.43     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.03    46.36    14.67   473.98   541.86    16.41   539.83     0.48
 MEAN    57.82    42.30    15.52   416.97   492.76    16.41   539.83     0.43
 HUB     53.21    37.84    15.37   350.81   438.18    16.41   539.83     0.38

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   390.35   278.37   273.65  1154.51     0.34
 MEAN    18.01   388.70   273.27   276.43  1151.67     0.34
 HUB     15.22   410.55   300.63   279.60  1148.81     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   334.64   192.61     0.29  5686.09
 MEAN   415.39   310.82   142.12     0.27  4923.23     1.75
 HUB    351.11   284.12    50.48     0.25  4577.89

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.12     1.12    17.66   566.64     1.04   553.92     0.92     0.87
 MEAN    18.83     1.11    17.40   563.81     1.03   551.20     0.92     0.87
 HUB     18.70     1.10    17.11   562.54     1.03   548.46     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.49    35.14    31.50     3.64     0.93     0.47     2.90
 MEAN    44.67    27.21    23.50     3.71     0.95     0.45     3.30     0.87
 HUB     47.08    10.23     6.50     3.73     0.95     0.44     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.954

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     392.661     274.038     281.222    1151.940       0.341       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.864      17.405     551.454      46.000      44.259      30.600     -13.659

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     284.635     274.038     395.113    1158.304       0.246       0.446

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.829      18.053     557.564     511.151       0.033       0.516

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     281.893       0.000     281.893    1158.439       0.243       0.390

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.985     557.694       0.000       0.060       0.092       0.400

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.811      18.742       1.101     564.330      18.752     185.413       1.437

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 116776.953       0.526     582.716  759383.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =15.956   EfDer =  0.970

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     88.301    2643.000      18.742     564.330       1.000       1.000       0.980
W Kg/sec =   40.13702

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     72.238    2533.896       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  67928.758   69287.188       2.593     545.479     210.383     429.765       2.043

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   266.99    -0.09   266.99     0.23   443.78
 MEAN    17.74      0.00    -0.02   266.99    -0.09   266.99     0.23
 HUB     15.05      0.00    -0.02   266.99    -0.09   266.99     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.03     46.36    13.67   462.91   534.46    18.06   558.38     0.46
 MEAN    56.88     43.40    13.48   409.13   488.61    18.06   558.38     0.42
 HUB     52.44     38.84    13.60   347.12   437.99    18.06   558.38     0.38

     ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   381.21   260.68    278.15  1172.47       0.33
 MEAN    17.51   381.91   259.04    280.62  1170.03       0.33
 HUB     14.85   406.12   290.86    283.43  1167.57       0.35

       U2        W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   340.40   196.23     0.29   5165.89
 MEAN   403.78   315.75   144.74     0.27   4536.58      1.70
 HUB    342.51   288.10    51.65     0.25   4320.62

         Pt2       PR       Ps2     Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     20.78     1.11     19.32   583.46      1.03    571.33     0.92      0.89
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 MEAN    20.53     1.10    19.07   581.13     1.03   568.95     0.92     0.89
 HUB     20.44     1.09    18.80   580.33     1.03   566.56     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.14    35.20    31.50     3.70     0.93     0.45     2.90
 MEAN    42.71    27.28    23.50     3.78     0.94     0.43     3.28     0.89
 HUB     45.74    10.33     6.50     3.83     0.94     0.43     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     385.548     260.742     284.009    1170.312       0.329       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.569      19.078     569.228      46.000      42.554      31.500     -11.054

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     291.324     260.742     390.969    1175.774       0.248       0.410

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.544      19.684     574.553     471.992       0.026       0.491

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     283.699       0.000     283.699    1176.148       0.241       0.380

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.657     574.919       0.000       0.060       0.075       0.392

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.835      20.470       1.092     581.639      17.309     190.825       1.479

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 107825.977       0.516     538.051  753644.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =15.956   EfDer =  0.981

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     88.301    2643.000      20.470     581.639       1.000       1.000       0.980
W Kg/sec =   40.13702

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     67.147    2495.907       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  67928.758   69287.188       2.625     513.330     195.560     401.059       2.051

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   267.54    -0.09   267.54     0.23   419.49
 MEAN    16.97     0.00    -0.02   267.54    -0.09   267.54     0.23
 HUB     14.32     0.00    -0.02   267.54    -0.09   267.54     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.95    46.36    12.59   444.22   518.65    19.75   575.66     0.44
 MEAN    55.65    43.80    11.85   391.42   474.20    19.75   575.66     0.40
 HUB     51.00    37.84    13.16   330.28   425.12    19.75   575.66     0.36

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   366.53   239.31   277.62  1188.55     0.31
 MEAN    16.57   367.26   237.82   279.86  1186.34     0.31
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 HUB     13.89   389.99   269.00   282.37  1184.11     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   339.92   196.15     0.29  4519.99
 MEAN   382.27   314.94   144.45     0.27  3943.21     1.65
 HUB    320.37   287.00    51.37     0.24  3737.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.38     1.09    20.95   598.37     1.03   587.16     0.92     0.90
 MEAN    22.13     1.08    20.70   596.24     1.03   584.98     0.92     0.90
 HUB     22.04     1.08    20.44   595.48     1.02   582.78     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.76    35.24    31.50     3.74     0.93     0.42     2.90
 MEAN    40.36    27.30    23.50     3.80     0.94     0.41     3.29     0.90
 HUB     43.61    10.31     6.50     3.81     0.94     0.40     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     364.259     239.160     274.749    1186.994       0.307       0.041

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.165      20.762     585.619      46.000      41.039      32.400      -8.639

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     286.033     239.160     372.844    1191.289       0.240       0.392

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.150      21.278     589.865     456.573       0.020       0.472

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     272.804       0.000     272.804    1191.913       0.229       0.361

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.297     590.482       0.000       0.060       0.061       0.405

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.852      22.089       1.079     596.695      15.056     205.701       1.595

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93814.727       0.495     468.135  770088.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =15.956   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     88.301    2643.000      22.089     596.695       1.000       1.000       0.980
W Kg/sec =   40.13702

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     63.026    2464.218       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  67928.758   69287.188       2.777     509.668     183.565     390.276       2.126

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   255.45    -0.09   255.45     0.21   393.95
 MEAN    15.91     0.00    -0.02   255.45    -0.09   255.45     0.21
 HUB     13.07     0.00    -0.02   255.45    -0.09   255.45     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.85    47.36    11.49   422.54   493.83    21.39   591.25     0.41
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 MEAN    55.17    44.80    10.37   367.03   447.24    21.39   591.25     0.38
 HUB     49.73    38.84    10.89   301.45   395.20    21.39   591.25     0.33
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   347.94   224.99   265.41  1202.97     0.29
 MEAN    15.50   345.49   218.57   267.57  1200.70     0.29
 HUB     12.59   362.01   241.24   269.92  1198.43     0.30

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   325.70   188.79     0.27  4037.86
 MEAN   357.44   301.46   138.88     0.25  3388.64     1.64
 HUB    290.38   274.36    49.15     0.23  3038.31

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.89     1.08    22.54   611.64     1.03   601.53     0.92     0.91
 MEAN    23.59     1.07    22.27   609.24     1.02   599.27     0.92     0.91
 HUB     23.43     1.06    21.99   607.94     1.02   597.00     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.29    35.43    31.50     3.93     0.93     0.42     2.90
 MEAN    39.24    27.43    23.50     3.93     0.94     0.40     3.34     0.91
 HUB     41.79    10.32     6.50     3.82     0.94     0.38     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     349.718     222.573     269.748    1200.827       0.291      -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.610      22.259     599.397      46.000      39.527      33.000      -6.527

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     283.838     222.573     360.698    1204.312       0.236       0.314

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.594      22.698     602.881     440.827       0.032       0.453

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     266.597       0.000     266.597    1205.102       0.221       0.379

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.777     603.672       0.000       0.060       0.051       0.372

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.866      23.568       1.067     609.604      12.909     224.714       1.742

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  80465.742       0.470     401.524  806483.188

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    540635.81   2697.7700     86.2617      1.5601      0.8192     15.9559      1.1660
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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 70% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =17.015   EfDer =  0.940

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      84.406    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   38.36656

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      82.457    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  64932.395   66230.898       3.463     831.557     240.132     619.754       2.581

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   190.12    -0.07   190.12     0.17   473.93
  MEAN    17.06     0.00    -0.02   190.12    -0.07   190.12     0.17
  HUB     12.51     0.00    -0.02   190.12    -0.07   190.12     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.22    50.47    17.75   475.82   512.46    14.80   519.79     0.46
  MEAN    64.21    47.20    17.01   393.48   437.07    14.80   519.79     0.39
  HUB     56.62    38.62    18.00   288.54   345.60    14.80   519.79     0.31

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   422.71   336.97   255.22  1133.23     0.37
  MEAN    18.04   424.50   336.67   258.57  1129.63     0.38
  HUB     15.00   455.23   371.43   263.20  1125.24     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   290.54   138.85     0.26  6953.10
  MEAN   415.99   270.46    79.32     0.24  6073.28     1.86
  HUB    345.97   264.43    25.47     0.23  5572.32

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.46     1.16    15.86   548.57     1.05   533.65     0.92     0.86
  MEAN    17.15     1.14    15.55   545.31     1.04   530.26     0.92     0.86
  HUB     16.97     1.12    15.16   543.46     1.04   526.15     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     52.86    28.55    24.20     4.35     0.93     0.55     2.90
  MEAN    52.48    17.06    12.70     4.36     0.95     0.49     3.51     0.86
  HUB     54.68    -5.53    -9.30     3.77     0.95     0.36     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.940

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     427.782     336.014     264.749    1129.878       0.379       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.178      15.558     530.495      24.000      51.765      35.400     -16.365

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     279.734     336.014     437.215    1139.156       0.246       0.534
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.120      16.416     539.244     528.796       0.044       0.650

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     261.657       0.000     261.657    1140.019       0.230       0.503

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.398     540.062       0.000       0.060       0.110       0.523

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.788      17.011       1.126     545.780      22.970     160.875       1.247

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 143008.281       0.632     682.133  799456.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =17.015   EfDer =  0.943

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     84.406    2643.000      17.011     545.780       1.000       1.000       0.980
W Kg/sec =   38.36656

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     74.818    2576.597       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  64932.395   66230.898       2.710     590.487     217.890     474.134       2.176

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   250.62    -0.09   250.62     0.22   462.05
 MEAN    18.08     0.00    -0.02   250.62    -0.09   250.62     0.22
 HUB     15.21     0.00    -0.02   250.62    -0.09   250.62     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.14    46.36    15.78   473.98   536.23    16.45   540.54     0.47
 MEAN    59.00    42.30    16.70   416.97   486.56    16.45   540.54     0.43
 HUB     54.46    37.84    16.62   350.81   431.21    16.45   540.54     0.38

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   387.96   286.58   261.50  1155.53     0.34
 MEAN    18.01   384.43   279.28   264.18  1152.59     0.33
 HUB     15.22   403.72   302.62   267.24  1149.62     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   319.98   184.40     0.28  5853.71
 MEAN   415.39   297.18   136.11     0.26  5031.46     1.81
 HUB    351.11   271.60    48.50     0.24  4608.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.13     1.12    17.70   567.46     1.04   554.89     0.92     0.86
 MEAN    18.83     1.11    17.43   564.42     1.03   552.08     0.92     0.86
 HUB     18.67     1.10    17.14   562.85     1.03   549.24     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.62    35.19    31.50     3.69     0.93     0.50     2.90
 MEAN    46.59    27.26    23.50     3.76     0.95     0.48     3.30     0.86
 HUB     48.55    10.29     6.50     3.79     0.95     0.46     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.943

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     388.164     280.068     268.763    1152.849       0.337       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.861      17.436     552.327      46.000      46.180      30.600     -15.580

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     271.743     280.068     390.234    1159.525       0.234       0.476

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.821      18.114     558.743     511.151       0.038       0.548

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     269.301       0.000     269.301    1159.640       0.232       0.410

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.033     558.853       0.000       0.060       0.104       0.420

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.795      18.724       1.101     564.909      19.129     178.501       1.384

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 119129.695       0.537     568.235  723990.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =17.015   EfDer =  0.961

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     84.406    2643.000      18.724     564.909       1.000       1.000       0.980
W Kg/sec =   38.36656

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     69.157    2532.596       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  64932.395   66230.898       2.708     545.479     201.408     429.765       2.134

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   255.13    -0.09   255.13     0.22   443.56
 MEAN    17.74      0.00    -0.02   255.13    -0.09   255.13     0.22
 HUB     15.05      0.00    -0.02   255.13    -0.09   255.13     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.14     46.36    14.78   462.91   528.63    18.10   559.47     0.46
 MEAN    58.06     43.40    14.66   409.13   482.24    18.10   559.47     0.42
 HUB     53.69     38.84    14.85   347.12   430.87    18.10   559.47     0.37

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   378.34    269.18    265.86  1173.88       0.32
 MEAN    17.51   377.27    265.26    268.28  1171.33       0.32
 HUB     14.85   399.13    293.01    271.02  1168.76       0.34

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91    325.46    187.73     0.28  5334.26
 MEAN   403.78    301.93    138.52     0.26  4645.37      1.76
 HUB    342.51    275.50     49.50     0.24  4352.51

         Pt2       PR       Ps2     Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     20.81     1.11     19.36   584.66      1.03   572.71     0.92     0.88
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 MEAN    20.53     1.10    19.11   582.11     1.03   570.23     0.92     0.88
 HUB     20.41     1.09    18.83   581.03     1.03   567.73     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.36    35.23    31.50     3.73     0.93     0.47     2.90
 MEAN    44.68    27.31    23.50     3.81     0.95     0.46     3.28     0.88
 HUB     47.23    10.35     6.50     3.85     0.95     0.45     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.961

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     380.807     267.002     271.522    1171.607       0.325       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.571      19.118     570.493      46.000      44.519      31.500     -13.019

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     278.218     267.002     385.610    1177.389       0.236       0.442

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.541      19.757     576.138     471.992       0.030       0.523

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     271.128       0.000     271.128    1177.721       0.230       0.401

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.714     576.463       0.000       0.060       0.087       0.413

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.820      20.456       1.093     582.600      17.691     183.516       1.423

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 110202.164       0.528     525.652  718180.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =17.015   EfDer =  0.973

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
     84.406     2643.000      20.456     582.600       1.000       1.000       0.980
W Kg/sec =   38.36656

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     64.283     2493.848       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  64932.395   66230.898       2.742     513.330     187.221     401.059       2.142

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   255.76    -0.09   255.76     0.22   419.14
 MEAN    16.97      0.00    -0.02   255.76    -0.09   255.76     0.22
 HUB     14.32      0.00    -0.02   255.76    -0.09   255.76     0.22

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     60.07    46.36    13.71   444.22   512.67     19.79   577.14     0.44
 MEAN    56.84    43.80    13.04   391.42   467.65     19.79   577.14     0.40
 HUB     52.25    37.84    14.41   330.28   417.80     19.79   577.14     0.35

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   363.16   247.90   265.39  1190.33      0.31
 MEAN    16.57   362.19   244.09   267.59  1188.01      0.30
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 HUB     13.89   382.74   271.22   270.05  1185.67     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   324.98   187.56     0.27  4682.10
 MEAN   382.27   301.16   138.18     0.25  4046.98     1.71
 HUB    320.37   274.49    49.15     0.23  3768.48

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.41     1.10    21.01   599.93     1.03   588.92     0.92     0.89
 MEAN    22.14     1.08    20.75   597.58     1.03   586.63     0.92     0.89
 HUB     22.02     1.08    20.48   596.55     1.02   584.32     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.05    35.25    31.50     3.75     0.93     0.45     2.90
 MEAN    42.37    27.31    23.50     3.81     0.94     0.43     3.29     0.89
 HUB     45.12    10.31     6.50     3.81     0.94     0.42     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     359.566     245.461     262.748    1188.617       0.303       0.038

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.175      20.810     587.230      46.000      43.052      32.400     -10.652

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     273.248     245.461     367.309    1193.223       0.229       0.424

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.156      21.360     591.789     456.573       0.023       0.504

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     260.796       0.000     260.796    1193.782       0.218       0.384

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.362     592.344       0.000       0.060       0.072       0.426

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.839      22.085       1.080     598.022      15.422     197.530       1.531

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96095.906       0.507     458.366  733558.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =17.015   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     84.406    2643.000      22.085     598.022       1.000       1.000       0.980
W Kg/sec =   38.36656

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     60.324    2461.483       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  64932.395   66230.898       2.901     509.668     175.696     390.276       2.221

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   244.27    -0.08   244.27     0.20   393.51
 MEAN    15.91     0.00    -0.02   244.27    -0.08   244.27     0.20
 HUB     13.07     0.00    -0.02   244.27    -0.08   244.27     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.97    47.36    12.61   422.54   488.14    21.45   593.04     0.41
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 MEAN    56.36    44.80    11.56   367.03   440.95    21.45   593.04     0.37
 HUB     50.99    38.84    12.15   301.45   388.07    21.45   593.04     0.32
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   344.70   233.30   253.75  1205.02     0.29
 MEAN    15.50   340.51   224.68   255.87  1202.66     0.28
 HUB     12.59   354.82   243.40   258.18  1200.28     0.30

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   311.39   180.48     0.26  4186.92
 MEAN   357.44   288.27   132.77     0.24  3483.28     1.70
 HUB    290.38   262.42    46.99     0.22  3065.46

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.93     1.08    22.61   613.52     1.03   603.60     0.92     0.90
 MEAN    23.62     1.07    22.34   610.91     1.02   601.24     0.92     0.90
 HUB     23.43     1.06    22.05   609.37     1.02   598.86     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.60    35.42    31.50     3.92     0.93     0.44     2.90
 MEAN    41.29    27.42    23.50     3.92     0.94     0.42     3.34     0.90
 HUB     43.31    10.31     6.50     3.81     0.94     0.40     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.983

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      344.808     228.796     257.963    1202.764       0.287       -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.633      22.321      601.343      46.000      41.571      33.000      -8.571

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      271.192     228.796     354.814    1206.543       0.225       0.347

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.610      22.793     605.127     440.827       0.037       0.485

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     254.852       0.000     254.852    1207.258       0.211       0.404

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.858     605.845       0.000       0.060       0.061       0.396

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.855      23.580       1.068     611.265      13.243     215.574       1.671

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  82548.359       0.482     393.746  768097.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    550984.38   2628.1321     82.4566      1.5608      0.8048     17.0148      1.1692
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 70% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =18.041   EfDer =  0.929

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      80.683    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   36.67420

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
      78.819    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  62068.199   63309.430       3.623     831.557     229.539     619.754       2.700

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   181.51    -0.06   181.51     0.16   473.93
  MEAN    17.06     0.00    -0.02   181.51    -0.06   181.51     0.16
  HUB     12.51     0.00    -0.02   181.51    -0.06   181.51     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     69.12    50.47    18.65   475.82   509.32    14.83   520.06     0.46
  MEAN    65.24    47.20    18.04   393.48   433.39    14.83   520.06     0.39
  HUB     57.83    38.62    19.21   288.54   340.93    14.83   520.06     0.30

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   420.53   342.65   243.79  1133.85     0.37
  MEAN    18.04   420.04   339.76   246.97  1130.18     0.37
  HUB     15.00   447.18   369.89   251.29  1125.80     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   277.79   133.17     0.24  7070.25
  MEAN   415.99   258.46    76.23     0.23  6129.04     1.94
  HUB    345.97   252.43    23.92     0.22  5549.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.47     1.16    15.89   549.01     1.05   534.24     0.92     0.85
  MEAN    17.14     1.13    15.58   545.52     1.04   530.78     0.92     0.85
  HUB     16.94     1.12    15.19   543.37     1.04   526.67     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     54.57    28.64    24.20     4.44     0.93     0.57     2.90
  MEAN    53.99    17.15    12.70     4.45     0.95     0.52     3.51     0.85
  HUB     55.81    -5.44    -9.30     3.86     0.95     0.38     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.929

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     423.002     339.103     252.863    1130.436       0.374       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.170      15.586     531.020      24.000      53.289      35.400     -17.889

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     266.951     339.103     431.571    1139.968       0.234       0.559
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      17.108      16.466      540.013     528.796       0.048       0.677

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     249.912       0.000     249.912    1140.744       0.219       0.519

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      16.432      540.748       0.000       0.060       0.119       0.538

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.774      16.991       1.125     545.965      23.155     156.243       1.211

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 144160.062       0.637     657.295  763214.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =18.041   EfDer =  0.931

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    80.683    2643.000      16.991     545.965       1.000       1.000       0.980
W Kg/sec =   36.67420

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    71.614    2576.160       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 62068.199   63309.430       2.831     590.487     208.558     474.134       2.273

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   239.42    -0.08   239.42     0.21   461.98
 MEAN    18.08     0.00    -0.02   239.42    -0.08   239.42     0.21
 HUB     15.21     0.00    -0.02   239.42    -0.08   239.42     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.20    46.36    16.84   473.98   531.09    16.48   541.18     0.47
 MEAN    60.14    42.30    17.84   416.97   480.88    16.48   541.18     0.42
 HUB     55.69    37.84    17.85   350.81   424.79    16.48   541.18     0.37

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   386.14   294.24   250.06  1156.44     0.33
 MEAN    18.01   380.75   284.89   252.62  1153.41     0.33
 HUB     15.22   397.47   304.43   255.55  1150.36     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   306.21   176.74     0.26  6010.06
 MEAN   415.39   284.33   130.51     0.25  5132.26     1.87
 HUB    351.11   259.78    46.68     0.23  4635.58

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.14     1.13    17.72   568.23     1.04   555.78     0.92     0.85
 MEAN    18.82     1.11    17.45   564.98     1.03   552.87     0.92     0.85
 HUB     18.63     1.10    17.15   563.14     1.03   549.94     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.64    35.25    31.50     3.75     0.93     0.52     2.90
 MEAN    48.44    27.32    23.50     3.82     0.95     0.50     3.30     0.85
 HUB     49.99    10.35     6.50     3.85     0.95     0.48     3.92


  blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.931

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     384.276     285.685     257.006    1153.668       0.333       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.849      17.454     553.115      46.000      48.025      30.600     -17.425

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     259.599     285.685     386.015    1160.639       0.224       0.506

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.804      18.160     559.818     511.151       0.042       0.579

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     257.417       0.000     257.417    1160.736       0.222       0.431

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.067     559.912       0.000       0.060       0.116       0.441

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.779      18.698       1.100     565.446      19.481     172.100       1.334

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 121318.938       0.547     553.152  690418.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =18.041   EfDer =  0.952

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     80.683    2643.000      18.698     565.446       1.000       1.000       0.980
W Kg/sec =   36.67420

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     66.229    2531.394       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  62068.199   63309.430       2.828     545.479     192.882     429.765       2.228

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   243.94    -0.08   243.94     0.21   443.34
 MEAN    17.74      0.00    -0.02   243.94    -0.08   243.94     0.21
 HUB     15.05      0.00    -0.02   243.94    -0.08   243.94     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.22     46.36    15.86   462.91   523.32    18.13   560.48     0.45
 MEAN    59.20     43.40    15.80   409.13   476.40    18.13   560.48     0.41
 HUB     54.91     38.84    16.07   347.12   424.33    18.13   560.48     0.37

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   376.10    277.09    254.31  1175.17       0.32
 MEAN    17.51   373.28    271.05    256.65  1172.52       0.32
 HUB     14.85   392.73    294.95    259.31  1169.86       0.34

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91    311.47    179.82     0.27  5490.78
 MEAN   403.78    288.94    132.73     0.25  4746.71      1.82
 HUB    342.51    263.64     47.56     0.23  4381.26

         Pt2       PR       Ps2     Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     20.82      1.11    19.39   585.78      1.04   573.97      0.92      0.87
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 MEAN    20.52     1.10    19.13   583.02     1.03   571.39     0.92     0.87
 HUB     20.38     1.09    18.85   581.67     1.03   568.79     0.92     0.87
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.45    35.26    31.50     3.76     0.93     0.50     2.90
 MEAN    46.56    27.35    23.50     3.85     0.95     0.48     3.28     0.87
 HUB     48.68    10.39     6.50     3.89     0.95     0.47     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.952

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     376.718     272.833     259.766    1172.781       0.321       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.560      19.140     571.642      46.000      46.405      31.500     -14.905

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     265.907     272.833     380.978    1178.864       0.226       0.473

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.525      19.809     577.587     471.992       0.034       0.555

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     259.306       0.000     259.306    1179.160       0.220       0.422

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.752     577.877       0.000       0.060       0.100       0.433

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.806      20.430       1.093     583.490      18.045     176.799       1.371

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 112405.992       0.538     512.513  684583.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =18.041   EfDer =  0.965

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     80.683    2643.000      20.430     583.490       1.000       1.000       0.980
W Kg/sec =   36.67420

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     61.575    2491.945       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  62068.199   63309.430       2.862     513.330     179.333     401.059       2.236

     ROTOR LEADING EDGE CONDITIONS, STAGE           4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   244.68    -0.08   244.68     0.21   418.82
 MEAN    16.97     0.00    -0.02   244.68    -0.08   244.68     0.21
 HUB     14.32     0.00    -0.02   244.68    -0.08   244.68     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.16    46.36    14.80   444.22   507.22    19.83   578.49     0.43
 MEAN    58.00    43.80    14.20   391.42   461.67    19.83   578.49     0.39
 HUB     53.48    37.84    15.64   330.28   411.11    19.83   578.49     0.35

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   360.49   255.88   253.93  1191.95     0.30
 MEAN    16.57   357.83   249.94   256.07  1189.53     0.30
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 HUB     13.89   376.11   273.22   258.48  1187.10     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   311.01   179.58     0.26  4832.63
 MEAN   382.27   288.24   132.32     0.24  4143.97     1.77
 HUB    320.37   262.74    47.15     0.22  3796.22

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.43     1.10    21.04   601.38     1.03   590.53     0.92     0.88
 MEAN    22.13     1.08    20.78   598.83     1.03   588.14     0.92     0.88
 HUB     21.99     1.08    20.51   597.54     1.02   585.74     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.22    35.27    31.50     3.77     0.93     0.47     2.90
 MEAN    44.31    27.33    23.50     3.83     0.95     0.46     3.29     0.88
 HUB     46.59    10.34     6.50     3.84     0.95     0.44     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.965

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     355.557     251.350     251.484    1190.096       0.299       0.036

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.167      20.835     588.699      46.000      44.985      32.400     -12.585

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     261.277     251.350     362.550    1194.992       0.219       0.455

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.143      21.417     593.553     456.573       0.027       0.536

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     249.545       0.000     249.545    1195.496       0.209       0.405

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.402     594.054       0.000       0.060       0.085       0.444

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.825      22.063       1.080     599.252      15.761     190.071       1.473

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98212.281       0.518     447.797  698989.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =18.041   EfDer =  0.976

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     80.683    2643.000      22.063     599.252       1.000       1.000       0.980
W Kg/sec =   36.67420

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     57.781    2458.956       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  62068.199   63309.430       3.029     509.668     168.290     390.276       2.319

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   233.80    -0.08   233.80     0.20   393.11
 MEAN    15.91     0.00    -0.02   233.80    -0.08   233.80     0.20
 HUB     13.07     0.00    -0.02   233.80    -0.08   233.80     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.05    47.36    13.69   422.54   482.98    21.48   594.69     0.40
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MEAN    57.51    44.80    12.71   367.03   435.23    21.48   594.69     0.36
HUB     52.21    38.84    13.37   301.45   381.56    21.48   594.69     0.32
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   342.15   240.99   242.87  1206.89     0.28
MEAN    15.50   336.20   230.30   244.94  1204.44     0.28
HUB     12.59   348.30   245.39   247.18  1201.97     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.78   298.06   172.78     0.25  4324.90
MEAN   357.44   275.97   127.15     0.23  3570.33     1.76
HUB    290.38   251.25    45.00     0.21  3090.45

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.95     1.09    22.65   615.26     1.03   605.49     0.92     0.89
MEAN    23.62     1.07    22.37   612.46     1.02   603.03     0.92     0.89
HUB     23.40     1.06    22.08   610.69     1.02   600.56     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.78    35.43    31.50     3.93     0.93     0.47     2.90
MEAN    43.24    27.43    23.50     3.93     0.94     0.44     3.34     0.89
HUB     44.79    10.32     6.50     3.82     0.94     0.42     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.976

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      340.561     234.519     246.946    1204.534       0.283       -0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.632      22.354      603.124       46.000      43.522      33.000     -10.522

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      259.405     234.519     349.700    1208.584       0.215       0.379

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       23.602       22.855     607.188     440.827       0.043       0.516

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      243.900       0.000     243.900    1209.232       0.202       0.427

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950       22.906      607.839       0.000       0.060       0.072       0.418

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.843       23.565       1.068      612.803       13.552     207.290       1.607

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  84470.695       0.493     385.143  731786.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    560568.00   2555.8999      78.8194       1.5599       0.7899      18.0407       1.1721
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 70% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =19.034   EfDer =  0.917

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      77.124    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   35.05649

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      75.343    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  59330.348   60516.828       3.790     831.557     219.414     619.754       2.825

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   173.30    -0.06   173.30     0.15   473.93
  MEAN    17.06     0.00    -0.02   173.30    -0.06   173.30     0.15
  HUB     12.51     0.00    -0.02   173.30    -0.06   173.30     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     69.99    50.47    19.52   475.82   506.45    14.86   520.30     0.45
  MEAN    66.23    47.20    19.03   393.48   430.01    14.86   520.30     0.38
  HUB     59.02    38.62    20.40   288.54   336.63    14.86   520.30     0.30

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   418.77   347.96   233.00  1134.41     0.37
  MEAN    18.04   416.02   342.62   235.99  1130.68     0.37
  HUB     15.00   439.65   368.36   240.01  1126.30     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   265.78   127.86     0.23  7179.67
  MEAN   415.99   247.13    73.38     0.22  6180.45     2.02
  HUB    345.97   241.05    22.39     0.21  5526.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.48     1.16    15.91   549.41     1.05   534.76     0.92     0.84
  MEAN    17.13     1.13    15.60   545.71     1.04   531.25     0.92     0.84
  HUB     16.91     1.12    15.22   543.28     1.04   527.14     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     56.19    28.76    24.20     4.56     0.93     0.59     2.90
  MEAN    55.44    17.27    12.70     4.57     0.95     0.54     3.51     0.84
  HUB     56.91    -5.33    -9.30     3.97     0.95     0.41     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.917

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     418.698     341.951     241.615    1130.939       0.370       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.157      15.606     531.493      24.000      54.756      35.400     -19.356

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     254.874     341.951     426.487    1140.703       0.223       0.583
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.092      16.507     540.709     528.796       0.051       0.702

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     238.781       0.000     238.781    1141.403       0.209       0.534

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.458     541.373       0.000       0.060       0.128       0.552

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.760      16.969       1.123     546.135      23.325     151.834       1.177

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 145218.734       0.641     632.916  728700.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =19.034   EfDer =  0.918

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     77.124    2643.000      16.969     546.135       1.000       1.000       0.980
W Kg/sec =   35.05649

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     68.557    2575.759       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  59330.348   60516.828       2.958     590.487     199.656     474.134       2.375

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   228.79    -0.08   228.79     0.20   461.90
 MEAN    18.08     0.00    -0.02   228.79    -0.08   228.79     0.20
 HUB     15.21     0.00    -0.02   228.79    -0.08   228.79     0.20

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     64.24    46.36    17.88   473.98   526.38    16.50   541.76     0.46
 MEAN    61.25    42.30    18.95   416.97   475.68    16.50   541.76     0.42
 HUB     56.89    37.84    19.05   350.81   418.89    16.50   541.76     0.37

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   384.80   301.35   239.28  1157.26     0.33
 MEAN    18.01   377.57   290.06   241.71  1154.16     0.33
 HUB     15.22   391.75   306.07   244.51  1151.02     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   293.31   169.63     0.25  6155.16
 MEAN   415.39   272.27   125.33     0.24  5225.45     1.94
 HUB    351.11   248.62    45.04     0.22  4660.54

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.14     1.13    17.72   568.93     1.04   556.57     0.92     0.84
 MEAN    18.80     1.11    17.45   565.49     1.04   553.59     0.92     0.84
 HUB     18.59     1.10    17.16   563.40     1.03   550.58     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     51.55    35.33    31.50     3.83     0.93     0.54     2.90
 MEAN    50.20    27.41    23.50     3.91     0.95     0.52     3.30     0.84
 HUB     51.38    10.44     6.50     3.94     0.95     0.50     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.918

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     380.900     290.877     245.916    1154.407       0.330       0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.828      17.459     553.826      46.000      49.788      30.600     -19.188

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     248.162     290.877     382.353    1161.652       0.214       0.534

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.779      18.190     560.798     511.151       0.045       0.609

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     246.197       0.000     246.197    1161.736       0.212       0.451

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.089     560.879       0.000       0.060       0.127       0.461

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.763      18.664       1.100     565.941      19.806     166.164       1.288

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 123342.766       0.556     537.573  658549.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =19.034   EfDer =  0.941

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     77.124    2643.000      18.664     565.941       1.000       1.000       0.980
W Kg/sec =   35.05649

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     63.449    2530.287       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  59330.348   60516.828       2.952     545.479     184.786     429.765       2.326

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   233.36    -0.08   233.36     0.20   443.15
 MEAN    17.74     0.00    -0.02   233.36    -0.08   233.36     0.20
 HUB     15.05     0.00    -0.02   233.36    -0.08   233.36     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.25    46.36    16.89   462.91   518.47    18.15   561.39     0.45
 MEAN    60.31    43.40    16.91   409.13   471.07    18.15   561.39     0.41
 HUB     56.09    38.84    17.25   347.12   418.34    18.15   561.39     0.36

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   374.39   284.43   243.45  1176.33     0.32
 MEAN    17.51   369.84   276.43   245.70  1173.60     0.32
 HUB     14.85   386.88   296.72   248.26  1170.85     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   298.36   172.48     0.25  5636.19
 MEAN   403.78   276.74   127.35     0.24  4840.76     1.88
 HUB    342.51   252.45    45.79     0.22  4407.47

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.82     1.12    19.40   586.81     1.04   575.11     0.92     0.86
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 MEAN    20.50     1.10    19.14   583.87     1.03   572.45     0.92     0.86
 HUB     20.33     1.09    18.85   582.26     1.03   569.77     0.92     0.86
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.44    35.32    31.50     3.82     0.93     0.52     2.90
 MEAN    48.37    27.40    23.50     3.90     0.95     0.50     3.28     0.86
 HUB     50.08    10.45     6.50     3.95     0.95     0.49     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.941

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     373.188     278.244     248.696    1173.847       0.318       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.536      19.145     572.686      46.000      48.209      31.500     -16.709

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     254.335     278.244     376.969    1180.211       0.215       0.502

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.496      19.842     578.913     471.992       0.038       0.585

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     248.174       0.000     248.174    1180.475       0.210       0.441

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.772     579.171       0.000       0.060       0.112       0.452

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.791      20.391       1.093     584.313      18.372     170.602       1.322

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 114448.938       0.548     498.810  652728.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =19.034   EfDer =  0.956

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     77.124    2643.000      20.391     584.313       1.000       1.000       0.980
W Kg/sec =   35.05649

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     59.011    2490.189       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  59330.348   60516.828       2.987     513.330     171.868     401.059       2.334

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   234.23    -0.08   234.23     0.20   418.53
 MEAN    16.97     0.00    -0.02   234.23    -0.08   234.23     0.20
 HUB     14.32     0.00    -0.02   234.23    -0.08   234.23     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.20    46.36    15.84   444.22   502.26    19.84   579.73     0.43
 MEAN    59.11    43.80    15.31   391.42   456.22    19.84   579.73     0.39
 HUB     54.66    37.84    16.82   330.28   404.97    19.84   579.73     0.34

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   358.39   263.27   243.18  1193.42     0.30
 MEAN    16.57   354.04   255.34   245.25  1190.92     0.30
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 HUB     13.89   370.09   275.08   247.58  1188.40     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   297.97   172.19     0.25  4972.09
 MEAN   382.27   276.15   126.93     0.23  4233.29     1.82
 HUB    320.37   251.69    45.28     0.21  3822.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.42     1.10    21.06   602.72     1.03   592.00     0.92     0.87
 MEAN    22.11     1.08    20.79   599.98     1.03   589.52     0.92     0.87
 HUB     21.94     1.08    20.51   598.46     1.02   587.03     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.27    35.30    31.50     3.80     0.93     0.50     2.90
 MEAN    46.15    27.36    23.50     3.86     0.95     0.48     3.29     0.87
 HUB     48.01    10.36     6.50     3.86     0.95     0.46     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.956

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     352.081     256.773     240.892    1191.444       0.296       0.033

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.142      20.839     590.042      46.000      46.828      32.400     -14.428

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     250.046     256.773     358.406    1196.611       0.209       0.485

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.114      21.450     595.170     456.573       0.031       0.567

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     238.977       0.000     238.977    1197.065       0.200       0.424

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.419     595.622       0.000       0.060       0.097       0.462

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.811      22.023       1.080     600.389      16.075     183.236       1.420

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 100169.938       0.528     436.577  666243.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =19.034   EfDer =  0.968

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     77.124    2643.000      22.023     600.389       1.000       1.000       0.980
W Kg/sec =   35.05649

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     55.384    2456.626       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  59330.348   60516.828       3.160     509.668     161.308     390.276       2.419

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   223.95    -0.08   223.95     0.19   392.73
 MEAN    15.91     0.00    -0.02   223.95    -0.08   223.95     0.19
 HUB     13.07     0.00    -0.02   223.95    -0.08   223.95     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.08    47.36    14.72   422.54   478.29    21.49   596.20     0.40
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MEAN    58.61    44.80    13.81   367.03   430.02    21.49   596.20     0.36
HUB     53.40    38.84    14.56   301.45   375.60    21.49   596.20     0.31
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   340.17   248.15   232.69  1208.60     0.28
MEAN    15.50   332.49   235.53   234.68  1206.07     0.28
HUB     12.59   342.34   247.18   236.86  1203.53     0.28

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.78   285.62   165.63     0.24  4453.15
MEAN   357.44   264.46   121.92     0.22  3651.33     1.81
HUB    290.38   240.77    43.20     0.20  3113.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.95     1.09    22.67   616.87     1.03   607.21     0.92     0.89
MEAN    23.59     1.07    22.38   613.90     1.02   604.68     0.92     0.89
HUB     23.36     1.06    22.08   611.91     1.02   602.13     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.84    35.44    31.50     3.94     0.93     0.49     2.90
MEAN    45.10    27.45    23.50     3.95     0.94     0.47     3.34     0.89
HUB     46.22    10.34     6.50     3.84     0.94     0.44     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.968

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      336.916     239.846     236.615    1206.149       0.279       -0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.608      22.362      604.754       46.000      45.388      33.000     -12.388

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      248.377     239.846     345.278    1210.453       0.205       0.408

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       23.571      22.888     609.078     440.827       0.050       0.547

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      233.646       0.000     233.646    1211.042       0.193       0.448

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950       22.925      609.671       0.000       0.060       0.083       0.437

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4       Texit         Del T       Ns         Ns nondim
      0.830       23.529        1.068     614.226       13.837     199.725       1.548

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  86252.859       0.504     375.921  697403.938

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    569433.25   2481.7969      75.3427      1.5575       0.7747      19.0337       1.1749
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 70% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =19.994   EfDer =  0.903

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      73.722    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   33.51014

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      72.019    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  56713.266   57847.410       3.965     831.557     209.736     619.754       2.955

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   165.48    -0.06   165.48     0.15   473.93
  MEAN    17.06     0.00    -0.02   165.48    -0.06   165.48     0.15
  HUB     12.51     0.00    -0.02   165.48    -0.06   165.48     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     70.83    50.47    20.36   475.82   503.83    14.88   520.52     0.45
  MEAN    67.19    47.20    19.99   393.48   426.92    14.88   520.52     0.38
  HUB     60.17    38.62    21.55   288.54   332.67    14.88   520.52     0.30

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   417.34   352.88   222.81  1134.92     0.37
  MEAN    18.04   412.45   345.28   225.60  1131.14     0.36
  HUB     15.00   432.67   366.89   229.33  1126.76     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   254.48   122.94     0.22  7281.14
  MEAN   415.99   236.42    70.71     0.21  6228.49     2.10
  HUB    345.97   230.29    20.92     0.20  5504.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.47     1.16    15.91   549.79     1.05   535.24     0.92     0.83
  MEAN    17.12     1.13    15.61   545.89     1.04   531.68     0.92     0.83
  HUB     16.87     1.12    15.24   543.20     1.04   527.57     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     57.73    28.89    24.20     4.69     0.93     0.62     2.90
  MEAN    56.84    17.40    12.70     4.70     0.95     0.56     3.51     0.83
  HUB     57.99    -5.21    -9.30     4.09     0.95     0.43     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.903

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     414.859     344.611     230.979    1131.391       0.367       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.139      15.617     531.918      24.000      56.168      35.400     -20.768

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     243.464     344.611     421.938    1141.370       0.213       0.606
   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.071      16.538      541.342     528.796       0.053       0.727

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     228.230       0.000     228.230    1142.002       0.200       0.549

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.477     541.942       0.000       0.060       0.135       0.567

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.744      16.943       1.122     546.293      23.483     147.622       1.144

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 146199.875       0.646     609.085  695821.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =19.994   EfDer =  0.902

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     73.722    2643.000      16.943     546.293       1.000       1.000       0.980
W Kg/sec =   33.51014

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     65.642    2575.387       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  56713.266   57847.410       3.089     590.487     191.169     474.134       2.480

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   218.72    -0.08   218.72     0.19   461.84
 MEAN    18.08     0.00    -0.02   218.72    -0.08   218.72     0.19
 HUB     15.21     0.00    -0.02   218.72    -0.08   218.72     0.19

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     65.23    46.36    18.87   473.98   522.08    16.51   542.30     0.46
 MEAN    62.32    42.30    20.02   416.97   470.92    16.51   542.30     0.41
 HUB     58.06    37.84    20.22   350.81   413.47    16.51   542.30     0.36

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   383.86   307.95   229.16  1158.01     0.33
 MEAN    18.01   374.85   294.88   231.43  1154.83     0.32
 HUB     15.22   386.52   307.57   234.08  1151.63     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   281.23   163.03     0.24  6289.90
 MEAN   415.39   260.93   120.51     0.23  5312.13     2.01
 HUB    351.11   238.10    43.54     0.21  4683.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.12     1.13    17.71   569.59     1.04   557.29     0.92     0.83
 MEAN    18.77     1.11    17.44   565.97     1.04   554.24     0.92     0.83
 HUB     18.54     1.09    17.15   563.64     1.03   551.16     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     53.35    35.43    31.50     3.93     0.93     0.56     2.90
 MEAN    51.87    27.51    23.50     4.01     0.95     0.54     3.30     0.83
 HUB     52.73    10.54     6.50     4.04     0.95     0.52     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.902

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     378.007     295.707     235.470    1155.075       0.327       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.795      17.449     554.468      46.000      51.470      30.600     -20.870

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     237.399     295.707     379.211    1162.577       0.204       0.561

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.743      18.205     561.694     511.151       0.048       0.639

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     235.611       0.000     235.611    1162.650       0.203       0.471

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.096     561.765       0.000       0.060       0.136       0.481

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.746      18.622       1.099     566.400      20.108     160.634       1.245

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 125220.984       0.565     521.685  628276.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =19.994   EfDer =  0.930

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     73.722    2643.000       18.622     566.400       1.000        1.000        0.980
W Kg/sec =   33.51014

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     60.812    2529.260        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  56713.266   57847.410        3.080     545.479     177.106     429.765       2.427

     ROTOR LEADING EDGE CONDITIONS, STAGE             3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   223.37    -0.08   223.37     0.19   442.97
 MEAN    17.74      0.00    -0.02   223.37    -0.08   223.37     0.19
 HUB     15.05      0.00    -0.02   223.37    -0.08   223.37     0.19

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     64.24     46.36    17.88   462.91   514.05     18.15   562.23      0.44
 MEAN    61.37     43.40    17.97   409.13   466.20     18.15   562.23      0.40
 HUB     57.25     38.84    18.41   347.12   412.84     18.15   562.23      0.35

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   373.14    291.25    233.25  1177.38      0.32
 MEAN    17.51   366.89    281.41    235.40  1174.58      0.31
 HUB     14.85   381.54    298.33    237.86  1171.76      0.33

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91    286.10    165.66     0.24  5771.13
 MEAN   403.78    265.30    122.37     0.23  4927.92      1.94
 HUB    342.51    241.92     44.18     0.21  4431.35

         Pt2       PR       Ps2     Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     20.79      1.12    19.39   587.77      1.04   576.15      0.92     0.85
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 MEAN    20.46     1.10    19.12   584.65     1.03   573.41     0.92     0.85
 HUB     20.27     1.09    18.84   582.81     1.03   570.66     0.92     0.85
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     51.31    35.38    31.50     3.88     0.93     0.54     2.90
 MEAN    50.09    27.47    23.50     3.97     0.95     0.52     3.28     0.85
 HUB     51.43    10.52     6.50     4.02     0.95     0.51     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.930

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     370.153     283.259     238.281    1174.817       0.315       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.497      19.132     573.638      46.000      49.929      31.500     -18.429

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     243.465     283.259     373.511    1181.444       0.206       0.530

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.453      19.856     580.128     471.992       0.041       0.615

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     237.695       0.000     237.695    1181.680       0.201       0.461

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.773     580.359       0.000       0.060       0.123       0.471

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.777      20.340       1.092     585.076      18.676     164.872       1.278

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 116340.016       0.557     484.686  622501.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =19.994   EfDer =  0.946

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     73.722    2643.000      20.340     585.076       1.000       1.000       0.980
W Kg/sec =   33.51014

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     56.587    2488.565       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  56713.266   57847.410       3.115     513.330     164.809     401.059       2.433

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   224.39    -0.08   224.39     0.19   418.25
 MEAN    16.97     0.00    -0.02   224.39    -0.08   224.39     0.19
 HUB     14.32     0.00    -0.02   224.39    -0.08   224.39     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.20    46.36    16.84   444.22   497.75    19.83   580.87     0.42
 MEAN    60.18    43.80    16.38   391.42   451.24    19.83   580.87     0.38
 HUB     55.82    37.84    17.98   330.28   399.36    19.83   580.87     0.34

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   356.79   270.13   233.09  1194.76     0.30
 MEAN    16.57   350.79   260.37   235.08  1192.19     0.29
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 HUB     13.89   364.58   276.75   237.33  1189.59     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   285.76   165.32     0.24  5101.63
 MEAN   382.27   264.81   121.90     0.22  4316.62     1.89
 HUB    320.37   241.30    43.61     0.20  3845.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.39     1.10    21.05   603.96     1.03   593.34     0.92     0.87
 MEAN    22.07     1.08    20.78   601.06     1.03   590.78     0.92     0.87
 HUB     21.87     1.08    20.49   599.31     1.02   588.22     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.21    35.35    31.50     3.85     0.93     0.52     2.90
 MEAN    47.92    27.41    23.50     3.91     0.95     0.50     3.29     0.87
 HUB     49.39    10.41     6.50     3.91     0.95     0.48     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.946

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     349.124     261.832     230.935    1192.675       0.293       0.031

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.099      20.822     591.269      46.000      48.588      32.400     -16.188

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     239.507     261.832     354.852    1198.094       0.200       0.512

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.067      21.460     596.655     456.573       0.034       0.596

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     229.044       0.000     229.044    1198.505       0.191       0.443

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.414     597.064       0.000       0.060       0.108       0.478

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.797      21.967       1.080     601.443      16.366     176.945       1.372

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 101984.820       0.538     424.880  635198.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =19.994   EfDer =  0.959

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     73.722    2643.000      21.967     601.443       1.000       1.000       0.980
W Kg/sec =   33.51014

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     53.123    2454.473       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  56713.266   57847.410       3.294     509.668     154.725     390.276       2.522

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   214.69    -0.07   214.69     0.18   392.39
 MEAN    15.91     0.00    -0.02   214.69    -0.07   214.69     0.18
 HUB     13.07     0.00    -0.02   214.69    -0.07   214.69     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.07    47.36    15.71   422.54   474.02    21.48   597.60     0.40
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 MEAN    59.68    44.80    14.88   367.03   425.27    21.48   597.60     0.35
 HUB     54.55    38.84    15.71   301.45   370.15    21.48   597.60     0.31
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   338.66   254.75   223.14  1210.16     0.28
 MEAN    15.50   329.28   240.37   225.06  1207.56     0.27
 HUB     12.59   336.92   248.83   227.15  1204.95     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   274.01   159.03     0.23  4571.59
 MEAN   357.44   253.69   117.08     0.21  3726.34     1.87
 HUB    290.38   230.92    41.55     0.19  3133.76

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.92     1.09    22.65   618.36     1.03   608.79     0.92     0.88
 MEAN    23.55     1.07    22.36   615.23     1.02   606.18     0.92     0.88
 HUB     23.29     1.06    22.06   613.04     1.02   603.57     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.79    35.48    31.50     3.98     0.93     0.51     2.90
 MEAN    46.88    27.48    23.50     3.98     0.95     0.49     3.34     0.88
 HUB     47.61    10.37     6.50     3.87     0.95     0.46     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.959

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     333.779     244.778     226.920    1207.627       0.276       -0.015

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.563      22.344     606.248      46.000      47.168      33.000     -14.168

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     238.045     244.778     341.441    1212.168       0.196       0.435

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.518      22.893     610.816     440.827       0.056       0.576

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     224.030       0.000     224.030    1212.704       0.185       0.467

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.918     611.356       0.000       0.060       0.095       0.455

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.817      23.470       1.068     615.544      14.102     192.796       1.495

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  87900.203       0.513     366.202  664815.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    577645.88   2406.5386     72.0193      1.5536      0.7591     19.9940      1.1774
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 60% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.544   EfDer =  0.990

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     120.486    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   54.76639

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     117.703    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92687.805   94541.367       2.426     831.557     342.776     619.754       1.808

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   275.77    -0.09   275.77     0.25   406.33
  MEAN    17.06     0.00    -0.02   275.77    -0.09   275.77     0.25
  HUB     12.51     0.00    -0.02   275.77    -0.09   275.77     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.95    50.47     5.48   407.95   492.49    14.48   516.46     0.44
  MEAN    50.74    47.20     3.54   337.36   435.80    14.48   516.46     0.39
  HUB     41.90    38.62     3.28   247.38   370.53    14.48   516.46     0.33

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   432.02   201.76   382.01  1119.13     0.39
  MEAN    18.04   452.83   240.03   383.98  1118.05     0.41
  HUB     15.00   513.88   335.18   389.52  1115.13     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   434.10   206.19     0.39  4164.28
  MEAN   356.65   401.30   116.62     0.36  4330.82     1.20
  HUB    296.62   391.42    38.56     0.35  5028.92

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.35     1.08    14.75   536.04     1.03   520.45     0.92     0.91
  MEAN    16.40     1.09    14.65   536.57     1.03   519.44     0.92     0.91
  HUB     16.62     1.10    14.36   538.78     1.03   516.73     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     27.84    28.36    24.20     4.16     0.93     0.19     2.90
  MEAN    32.01    16.89    12.70     4.19     0.92     0.16     3.51     0.91
  HUB     40.71    -5.65    -9.30     3.65     0.92     0.05     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     460.907     239.565     393.756    1117.985       0.412      -0.014

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.436      14.619     519.387      24.000      31.317      35.400       4.083

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     427.154     239.565     489.747    1120.677       0.381       0.142
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.420      14.852     521.890     528.796       0.019       0.315

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     395.468       0.000     395.468    1123.011       0.352       0.219

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.028     524.068       0.000       0.060       0.042       0.237

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854      16.376       1.084     537.130      14.320     236.764       1.835

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  89155.555       0.536     607.040 1159592.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.544   EfDer =  0.966

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    120.486    2266.000      16.376     537.130       1.000       1.000       0.980
W Kg/sec =   54.76639

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    110.061    2226.785       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92687.805   94541.367       1.842     590.487     320.524     474.134       1.479

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   377.53    -0.13   377.53     0.34   399.32
 MEAN    18.08     0.00    -0.02   377.53    -0.13   377.53     0.34
 HUB     15.21     0.00    -0.02   377.53    -0.13   377.53     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.12    46.36     0.76   406.37   554.77    15.14   525.23     0.49
 MEAN    43.45    42.30     1.15   357.49   520.02    15.14   525.23     0.46
 HUB     38.56    37.84     0.72   300.77   482.77    15.14   525.23     0.43

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   422.77   116.69   406.35  1129.10     0.37
 MEAN    18.01   431.74   145.99   406.31  1129.25     0.38
 HUB     15.22   465.62   226.19   406.99  1129.30     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   497.55   287.11     0.44  2385.43
 MEAN   356.14   457.44   210.15     0.41  2631.60     1.22
 HUB    301.03   413.81    74.83     0.37  3445.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.10     1.04    15.52   544.71     1.01   529.78     0.92     0.88
 MEAN    17.18     1.05    15.53   545.49     1.02   529.92     0.92     0.88
 HUB     17.43     1.06    15.50   548.07     1.02   529.97     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.02    35.24    31.50     3.74     0.93     0.14     2.90
 MEAN    19.76    27.35    23.50     3.85     0.91     0.16     3.30     0.88
 HUB     29.06    10.42     6.50     3.92     0.91     0.20     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     438.947     146.399     413.813    1129.328       0.389      -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.217      15.511     529.998      46.000      19.483      30.600      11.117

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     429.167     146.399     453.450    1130.083       0.380       0.021

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.180      15.551     530.707     511.151       0.031       0.144

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     424.530       0.000     424.530    1130.435       0.376       0.003

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.516     531.037       0.000       0.060       0.075       0.000

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.753      17.105       1.045     546.089       8.959     331.807       2.572

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  55787.246       0.342     379.843 1079521.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.544   EfDer =  0.911

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    120.486    2266.000      17.105     546.089       1.000       1.000       0.980
W Kg/sec =   54.76639

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    106.246    2208.443       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  92687.805   94541.367       1.763     545.479     309.415     429.765       1.389

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   400.15    -0.14   400.15     0.35   386.78
 MEAN    17.74     0.00    -0.02   400.15    -0.14   400.15     0.35
 HUB     15.05     0.00    -0.02   400.15    -0.14   400.15     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.77    46.36    -1.59   396.88   563.69    15.69   532.72     0.50
 MEAN    41.25    43.40    -2.15   350.77   532.22    15.69   532.72     0.47
 HUB     36.65    38.84    -2.19   297.61   498.77    15.69   532.72     0.44

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   441.26    83.38   433.31  1134.72      0.39
 MEAN    17.51   448.64   120.55   432.14  1135.69      0.40
 HUB     14.85   481.41   212.27   432.08  1136.50      0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   531.83   308.35     0.47  1654.53
 MEAN   346.18   487.50   225.64     0.43  2112.80      1.16
 HUB    293.65   439.68    81.39     0.39  3154.25

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     17.59     1.03    15.84   551.34     1.01   535.08     0.92     0.83
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 MEAN    17.72     1.04    15.91   552.80     1.01   535.99     0.92     0.83
 HUB     18.04     1.05    15.94   556.11     1.02   536.75     0.92     0.83
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     10.89    35.44    31.50     3.94     0.93     0.08     2.90
 MEAN    15.59    27.57    23.50     4.07     0.89     0.12     3.28     0.83
 HUB     26.16    10.67     6.50     4.17     0.89     0.17     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.911

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     454.286     121.338     437.782    1135.877       0.400      -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.764      15.908     536.182      46.000      15.491      31.500      16.009

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     462.061     121.338     477.727    1135.247       0.407      -0.060

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.696      15.786     535.587     471.992       0.046       0.099

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     450.106       0.000     450.106    1136.211       0.396      -0.070

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.776     536.498       0.000       0.060       0.107      -0.065

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.588      17.580       1.028     553.416       7.327     381.746       2.959

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  45629.477       0.297     310.681 1091590.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.544   EfDer =  0.844

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    120.486    2266.000       17.580     553.416       1.000       1.000       0.980
W Kg/sec =   54.76639

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
    104.062    2193.775        1.402       0.249      53.349      56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*     AthrRotor  ChokeMargin
 92687.805   94541.367        1.694     513.330     303.061     401.059       1.323

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   421.80    -0.15   421.80     0.37   368.71
 MEAN    16.97      0.00    -0.02   421.80    -0.15   421.80     0.37
 HUB     14.32      0.00    -0.02   421.80    -0.15   421.80     0.37

       BetaFlo   BetaBlade Incid   U1        W1       Ps1      Ts1     Rel Mach
 TIP     42.09     46.36    -4.27   380.86   568.40     15.99   538.56     0.50
 MEAN    38.52     43.80    -5.28   335.59   539.10     15.99   538.56     0.47
 HUB     33.89     37.84    -3.95   283.17   508.11     15.99   538.56     0.45

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   459.27    46.51   456.91  1138.43      0.40
 MEAN    16.57   463.45    88.97   454.83  1140.09      0.41
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 HUB     13.89   491.80   188.38   454.29  1141.53     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   561.77   326.83     0.49   880.98
 MEAN   327.74   513.70   238.77     0.45  1477.05     1.11
 HUB    274.67   462.41    86.29     0.41  2618.63

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.82     1.01    15.93   556.21     1.01   538.60     0.92     0.77
 MEAN    17.98     1.02    16.05   558.11     1.01   540.17     0.92     0.77
 HUB     18.30     1.04    16.11   561.73     1.02   541.54     0.92     0.77

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     5.81    35.58    31.50     4.08     0.93     0.03     2.90
 MEAN   11.07    27.70    23.50     4.20     0.88     0.07     3.29     0.77
 HUB    22.52    10.76     6.50     4.26     0.88     0.14     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.844

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     454.507      89.471     445.614    1141.403       0.398       0.050

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.016      16.149     541.435      46.000      11.353      32.400      21.047

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     478.706      89.471     486.995    1139.414       0.420      -0.080

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.919      15.868     539.549     456.573       0.058       0.061

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     456.947       0.000     456.947    1141.207       0.400      -0.123

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.902     541.249       0.000       0.060       0.136      -0.063

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.310      17.762       1.010     558.684       5.268     486.933       3.775

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  32808.262       0.235     223.384 1137064.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.544   EfDer =  0.786

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    120.486    2266.000      17.762     558.684       1.000       1.000       0.980
W Kg/sec =   54.76639

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.486    2183.409       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92687.805   94541.367       1.691     509.668     301.387     390.276       1.295

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   424.59    -0.15   424.59     0.37   349.06
 MEAN    15.91     0.00    -0.02   424.59    -0.15   424.59     0.37
 HUB     13.07     0.00    -0.02   424.59    -0.15   424.59     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     40.48    47.36    -6.88   362.27   558.23    16.15   543.63     0.49
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 MEAN    36.56    44.80    -8.24   314.67   528.57    16.15   543.63     0.46
 HUB     31.34    38.84    -7.50   258.45   497.14    16.15   543.63     0.43
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   461.39    21.87   460.87  1142.16     0.40
 MEAN    15.50   463.07    63.50   458.69  1144.00     0.40
 HUB     12.59   485.66   161.24   458.12  1145.61     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   568.52   332.89     0.50   394.96
 MEAN   306.46   519.06   242.95     0.45   986.50     1.08
 HUB    248.96   466.44    87.72     0.41  2031.89

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.86     1.01    15.96   559.94     1.00   542.17     0.92     0.72
 MEAN    18.01     1.01    16.09   561.82     1.01   543.91     0.92     0.72
 HUB     18.28     1.03    16.15   565.14     1.01   545.44     0.92     0.72

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP      2.72    35.84    31.50     4.34     0.93    -0.01     2.90
 MEAN     7.88    27.91    23.50     4.41     0.86     0.04     3.34     0.72
 HUB     19.39    10.84     6.50     4.34     0.86     0.10     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.786

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     467.713      64.669     463.221    1144.112       0.409       -0.018

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.013      16.053     544.033      46.000       7.948      33.000      25.052

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     507.653      64.669     511.756    1140.687       0.445       -0.270

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.798      15.533     540.780     440.827       0.128       0.036

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     472.543       0.000     472.543    1143.713       0.413       -0.132

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      15.791     543.653       0.000       0.060       0.146       -0.140

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
     -0.001      17.762       1.000     562.297       3.613     645.908       5.007

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  22501.922       0.179     153.211 1208893.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    245882.47   1674.1588     117.7028      1.1757      0.6291       3.5438       1.0755
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 60% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.992   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     118.688    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   53.94899

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     115.946    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  91304.422   93130.320       2.463     831.557     337.660     619.754       1.835

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   271.39    -0.09   271.39     0.24   406.33
  MEAN    17.06     0.00    -0.02   271.39    -0.09   271.39     0.24
  HUB     12.51     0.00    -0.02   271.39    -0.09   271.39     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.37    50.47     5.90   407.95   490.05    14.50   516.66     0.44
  MEAN    51.19    47.20     3.99   337.36   433.04    14.50   516.66     0.39
  HUB     42.36    38.62     3.74   247.38   367.28    14.50   516.66     0.33

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   427.87   205.46   375.31  1119.71     0.38
  MEAN    18.04   448.36   242.13   377.36  1118.54     0.40
  HUB     15.00   508.41   334.59   382.79  1115.60     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   426.45   202.49     0.38  4240.52
  MEAN   356.65   394.36   114.53     0.35  4368.62     1.22
  HUB    296.62   384.67    37.97     0.34  5020.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.38     1.08    14.80   536.28     1.03   520.99     0.92     0.91
  MEAN    16.42     1.09    14.69   536.69     1.03   519.90     0.92     0.91
  HUB     16.62     1.10    14.41   538.76     1.03   517.17     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     28.70    28.35    24.20     4.15     0.93     0.20     2.90
  MEAN    32.69    16.88    12.70     4.18     0.92     0.17     3.51     0.91
  HUB     41.16    -5.67    -9.30     3.63     0.92     0.06     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     456.192     241.658     386.928    1118.494       0.408      -0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.451      14.668     519.859      24.000      31.987      35.400       3.413

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     419.313     241.658     483.965    1121.391       0.374       0.157
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      16.437      14.923     522.556     528.796       0.018       0.326

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     388.319       0.000     388.319    1123.632       0.346       0.232

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      15.093     524.647       0.000       0.060       0.041       0.250

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.860      16.395       1.085     537.242      14.432     233.517       1.810

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  89848.672       0.540     602.629 1141185.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.992   EfDer =  0.972

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    118.688    2266.000      16.395     537.242       1.000       1.000       0.980
W Kg/sec =   53.94899

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    108.302    2226.554       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  91304.422   93130.320       1.872     590.487     315.401     474.134       1.503

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   370.79    -0.13   370.79     0.33   399.28
 MEAN    18.08     0.00    -0.02   370.79    -0.13   370.79     0.33
 HUB     15.21     0.00    -0.02   370.79    -0.13   370.79     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.63    46.36     1.27   406.37   550.20    15.21   525.76     0.49
 MEAN    43.96    42.30     1.66   357.49   515.14    15.21   525.76     0.46
 HUB     39.06    37.84     1.22   300.77   477.52    15.21   525.76     0.42

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   416.80   122.44   398.41  1130.06     0.37
 MEAN    18.01   425.91   150.12   398.58  1130.07     0.38
 HUB     15.22   459.75   227.71   399.40  1129.98     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   487.74   281.36     0.43  2502.81
 MEAN   356.14   448.68   206.02     0.40  2705.92     1.23
 HUB    301.03   406.07    73.32     0.36  3468.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.16     1.05    15.62   545.19     1.01   530.68     0.92     0.89
 MEAN    17.22     1.05    15.61   545.84     1.02   530.69     0.92     0.89
 HUB     17.46     1.07    15.58   548.26     1.02   530.60     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.08    35.23    31.50     3.73     0.93     0.15     2.90
 MEAN    20.64    27.33    23.50     3.83     0.91     0.17     3.30     0.89
 HUB     29.69    10.40     6.50     3.90     0.91     0.21     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.972

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     432.905     150.539     405.888    1130.157       0.383      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.265      15.601     530.776      46.000      20.349      30.600      10.251

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     420.470     150.539     446.606    1131.100       0.372       0.036

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.234      15.663     531.662     511.151       0.029       0.156

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     415.778       0.000     415.778    1131.448       0.367       0.020

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.634     531.990       0.000       0.060       0.070       0.018

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.774      17.165       1.047     546.428       9.186     322.712       2.502

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  57202.375       0.351     383.665 1061114.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.992   EfDer =  0.923

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    118.688    2266.000      17.165     546.428       1.000       1.000       0.980
W Kg/sec =   53.94899

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    104.327    2207.759       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  91304.422   93130.320       1.795     545.479     303.827     429.765       1.415

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   392.05    -0.14   392.05     0.35   386.66
 MEAN    17.74     0.00    -0.02   392.05    -0.14   392.05     0.35
 HUB     15.05     0.00    -0.02   392.05    -0.14   392.05     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.36    46.36    -1.00   396.88   557.96    15.80   533.59     0.49
 MEAN    41.83    43.40    -1.57   350.77   526.15    15.80   533.59     0.46
 HUB     37.21    38.84    -1.63   297.61   492.29    15.80   533.59     0.43

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   433.15     90.42   423.60  1136.18      0.38
 MEAN    17.51   440.99    125.62   422.72  1136.94      0.39
 HUB     14.85   473.97    214.16   422.82  1137.57      0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   519.84   301.31     0.46  1793.98
 MEAN   346.18   476.80   220.56     0.42  2201.63      1.17
 HUB    293.65   430.23    79.49     0.38  3182.31

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     17.70     1.03     16.01   552.12     1.01   536.46     0.92     0.84
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 MEAN    17.82     1.04    16.06   553.42     1.01   537.18     0.92     0.84
 HUB     18.12     1.06    16.08   556.53     1.02   537.77     0.92     0.84
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     12.05    35.42    31.50     3.92     0.93     0.10     2.90
 MEAN    16.55    27.55    23.50     4.05     0.89     0.13     3.28     0.84
 HUB     26.86    10.65     6.50     4.15     0.89     0.18     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.923

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     446.460     126.448     428.179    1137.146       0.393      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.860      16.057     537.380      46.000      16.453      31.500      15.047

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     451.200     126.448     468.583    1136.770       0.397      -0.044

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.801      15.967     537.025     471.992       0.042       0.111

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     439.365       0.000     439.365    1137.702       0.386      -0.052

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.962     537.905       0.000       0.060       0.101      -0.047

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.629      17.694       1.031     554.026       7.598     367.695       2.850

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  47319.418       0.308     317.379 1072077.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.992   EfDer =  0.859

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    118.688    2266.000      17.694     554.026       1.000       1.000       0.980
W Kg/sec =   53.94899

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.908    2192.568       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 91304.422   93130.320       1.730     513.330     296.786     401.059       1.351

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   411.95    -0.14   411.95     0.36   368.51
 MEAN    16.97     0.00    -0.02   411.95    -0.14   411.95     0.36
 HUB     14.32     0.00    -0.02   411.95    -0.14   411.95     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.76    46.36    -3.60   380.86   561.13    16.16   539.86     0.49
 MEAN    39.18    43.80    -4.62   335.59   531.43    16.16   539.86     0.47
 HUB     34.52    37.84    -3.32   283.17   499.97    16.16   539.86     0.44

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   448.53    55.06   445.14  1140.47     0.39
 MEAN    16.57   453.52    95.11   443.43  1141.87     0.40
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 HUB     13.89   482.37   190.67   443.09  1143.08     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   547.22   318.29     0.48  1042.24
 MEAN   327.74   500.75   232.63     0.44  1578.81     1.12
 HUB    274.67   450.98    84.00     0.39  2650.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.99     1.02    16.16   557.34     1.01   540.54     0.92     0.79
 MEAN    18.14     1.03    16.27   559.04     1.01   541.87     0.92     0.79
 HUB     18.44     1.04    16.31   562.44     1.02   543.01     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     7.05    35.57    31.50     4.07     0.93     0.04     2.90
 MEAN   12.11    27.68    23.50     4.18     0.88     0.08     3.29     0.79
 HUB    23.28    10.73     6.50     4.23     0.88     0.15     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.859

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     444.907      95.649     434.504    1143.134       0.389       0.051

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.168      16.364     543.077      46.000      12.415      32.400      19.985

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     465.853      95.649     475.571    1141.457       0.408      -0.066

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.082      16.120     541.484     456.573       0.055       0.073

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     444.620       0.000     444.620    1143.157       0.389      -0.108

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.154     543.099       0.000       0.060       0.131      -0.048

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.383      17.933       1.014     559.606       5.580     460.891       3.573

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  34751.672       0.249     233.085 1115560.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.992   EfDer =  0.798

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    118.688    2266.000      17.933     559.606       1.000       1.000       0.980
W Kg/sec =   53.94899

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.054    2181.609       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  91304.422   93130.320       1.732     509.668     294.303     390.276       1.326

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   413.43    -0.14   413.43     0.36   348.77
 MEAN    15.91     0.00    -0.02   413.43    -0.14   413.43     0.36
 HUB     13.07     0.00    -0.02   413.43    -0.14   413.43     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     41.24    47.36    -6.12   362.27   549.79    16.39   545.34     0.48
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MEAN    37.29    44.80    -7.51   314.67   519.64    16.39   545.34     0.45
HUB     32.03    38.84    -6.81   258.45   487.64    16.39   545.34     0.43
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   448.74    31.52   447.63  1144.72     0.39
MEAN    15.50   451.41    70.42   445.88  1146.26     0.39
HUB     12.59   474.70   163.77   445.55  1147.61     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    354.76   552.13   323.23     0.48   568.10
MEAN   306.46   504.50   236.04     0.44  1093.61     1.09
HUB    248.96   453.63    85.20     0.40  2063.67

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.08     1.01    16.26   561.41     1.00   544.60     0.92     0.73
MEAN    18.22     1.02    16.37   563.08     1.01   546.07     0.92     0.73
HUB     18.47     1.03    16.42   566.16     1.01   547.34     0.92     0.73

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP      4.03    35.83    31.50     4.33     0.93     0.01     2.90
MEAN     8.97    27.90    23.50     4.40     0.86     0.05     3.34     0.73
HUB     20.18    10.83     6.50     4.33     0.86     0.11     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.798

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     455.851      71.711     450.175    1146.390       0.398       -0.017

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.219      16.336     546.199      46.000       9.051      33.000      23.949

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     491.901      71.711     497.101    1143.392       0.430       -0.253

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.021      15.866     543.347     440.827       0.124       0.047

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     458.489       0.000     458.489    1146.178       0.400       -0.123

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950      16.101     545.998       0.000       0.060       0.145       -0.130

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.107      17.980       1.003     563.549       3.943     596.885       4.627

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  24559.137       0.195     164.722 1185022.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    253681.28   1701.4795     115.9461      1.1902      0.6569       3.9922       1.0779
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 60% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.453   EfDer =  0.995

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     116.858    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   53.11724

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     114.158    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   89896.742   91694.484       2.501     831.557     332.454     619.754       1.864

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   266.95    -0.09   266.95     0.24   406.33
  MEAN    17.06     0.00    -0.02   266.95    -0.09   266.95     0.24
  HUB     12.51     0.00    -0.02   266.95    -0.09   266.95     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.81    50.47     6.34   407.95   487.61    14.52   516.86     0.44
  MEAN    51.65    47.20     4.45   337.36   430.27    14.52   516.86     0.39
  HUB     42.83    38.62     4.21   247.38   364.01    14.52   516.86     0.33

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   423.78   209.17   368.56  1120.29     0.38
  MEAN    18.04   443.92   244.23   370.70  1119.02     0.40
  HUB     15.00   502.92   333.99   376.01  1116.07     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   418.75   198.78     0.37  4317.05
  MEAN   356.65   387.37   112.42     0.35  4406.58     1.24
  HUB    296.62   377.86    37.37     0.34  5010.94

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.40     1.09    14.86   536.52     1.03   521.52     0.92     0.91
  MEAN    16.43     1.09    14.74   536.81     1.03   520.35     0.92     0.91
  HUB     16.62     1.10    14.45   538.73     1.03   517.60     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     29.58    28.34    24.20     4.14     0.93     0.22     2.90
  MEAN    33.38    16.87    12.70     4.17     0.92     0.18     3.51     0.91
  HUB     41.61    -5.68    -9.30     3.62     0.92     0.07     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.995

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     451.506     243.760     380.052    1118.996       0.403      -0.013

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      16.466      14.717     520.326      24.000      32.676      35.400       2.724

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     411.450     243.760     478.236    1122.096       0.367       0.171
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.453      14.992     523.213     528.796       0.017       0.336

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     381.150       0.000     381.150    1124.245       0.339       0.244

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.157     525.219       0.000       0.060       0.039       0.263

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.865      16.413       1.086     537.353      14.543     230.265       1.785

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  90543.305       0.544     597.925 1122511.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.453   EfDer =  0.978

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    116.858    2266.000      16.413     537.353       1.000       1.000       0.980
W Kg/sec =   53.11724

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.525    2226.323       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  89896.742   91694.484       1.903     590.487     310.226     474.134       1.528

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   364.02    -0.13   364.02     0.32   399.24
 MEAN    18.08     0.00    -0.02   364.02    -0.13   364.02     0.32
 HUB     15.21     0.00    -0.02   364.02    -0.13   364.02     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.15    46.36     1.79   406.37   545.66    15.26   526.29     0.48
 MEAN    44.49    42.30     2.19   357.49   510.30    15.26   526.29     0.45
 HUB     39.58    37.84     1.74   300.77   472.28    15.26   526.29     0.42

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   410.98   128.15   390.49  1131.00     0.36
 MEAN    18.01   420.18   154.22   390.85  1130.87     0.37
 HUB     15.22   453.94   229.23   391.81  1130.65     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   477.97   275.64     0.42  2619.47
 MEAN   356.14   439.93   201.92     0.39  2779.78     1.24
 HUB    301.03   398.33    71.80     0.35  3491.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.22     1.05    15.72   545.67     1.02   531.57     0.92     0.90
 MEAN    17.27     1.05    15.70   546.18     1.02   531.44     0.92     0.90
 HUB     17.50     1.07    15.65   548.44     1.02   531.23     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.17    35.22    31.50     3.72     0.93     0.16     2.90
 MEAN    21.53    27.32    23.50     3.82     0.91     0.18     3.30     0.90
 HUB     30.33    10.38     6.50     3.88     0.91     0.22     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     426.971     154.654     397.977    1130.970       0.378      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.312      15.688     531.540      46.000      21.236      30.600       9.364

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     411.825     154.654     439.907    1132.098       0.364       0.051

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.286      15.774     532.601     511.151       0.026       0.168

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     407.093       0.000     407.093    1132.442       0.359       0.037

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.749     532.925       0.000       0.060       0.065       0.036

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.793      17.222       1.049     546.765       9.412     313.974       2.434

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  58610.648       0.359     387.050 1042532.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.453   EfDer =  0.934

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    116.858    2266.000      17.222     546.765       1.000       1.000       0.980
W Kg/sec =   53.11724

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.406    2207.077       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  89896.742   91694.484       1.829     545.479     298.231     429.765       1.441

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   384.00    -0.13   384.00     0.34   386.54
 MEAN    17.74     0.00    -0.02   384.00    -0.13   384.00     0.34
 HUB     15.05     0.00    -0.02   384.00    -0.13   384.00     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.95    46.36    -0.41   396.88   552.33    15.91   534.45     0.49
 MEAN    42.42    43.40    -0.98   350.77   520.18    15.91   534.45     0.46
 HUB     37.79    38.84    -1.05   297.61   485.91    15.91   534.45     0.43

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   425.32    97.39   414.02  1137.59     0.37
 MEAN    17.51   433.55   130.61   413.40  1138.17     0.38
 HUB     14.85   466.66   216.00   413.66  1138.63     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   507.98   294.34     0.45  1932.03
 MEAN   346.18   466.24   215.57     0.41  2288.90     1.19
 HUB    293.65   420.89    77.65     0.37  3209.65

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.81     1.03    16.17   552.90     1.01   537.79     0.92     0.85
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 MEAN    17.91     1.04    16.21   554.03     1.01   538.34     0.92     0.85
 HUB     18.20     1.06    16.21   556.96     1.02   538.77     0.92     0.85
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     13.24    35.41    31.50     3.91     0.93     0.11     2.90
 MEAN    17.53    27.54    23.50     4.04     0.90     0.14     3.28     0.85
 HUB     27.57    10.63     6.50     4.13     0.90     0.19     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.934

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     438.845     131.469     418.690    1138.382       0.385      -0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.955      16.203     538.548      46.000      17.432      31.500      14.068

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     440.525     131.469     459.724    1138.252       0.387      -0.028

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.903      16.144     538.425     471.992       0.039       0.123

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     428.816       0.000     428.816    1139.150       0.376      -0.034

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.144     539.275       0.000       0.060       0.094      -0.028

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.666      17.805       1.034     554.631       7.866     354.580       2.749

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  48985.055       0.319     323.485 1052463.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 4.453   EfDer =  0.873

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    116.858    2266.000       17.805     554.631       1.000       1.000       0.980
W Kg/sec =   53.11724

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     99.766    2191.371        1.402       0.249      53.349      56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  89896.742   91694.484        1.767     513.330     290.549     401.059       1.380

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   402.27    -0.14   402.27     0.35   368.30
 MEAN    16.97      0.00    -0.02   402.27    -0.14   402.27     0.35
 HUB     14.32      0.00    -0.02   402.27    -0.14   402.27     0.35

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     43.44    46.36    -2.92   380.86   554.06     16.34   541.12     0.49
 MEAN    39.85    43.80    -3.95   335.59   523.96     16.34   541.12     0.46
 HUB     35.16    37.84    -2.68   283.17   492.02     16.34   541.12     0.43

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   438.24    63.44   433.62  1142.44      0.38
 MEAN    16.57   443.93   101.11   432.26  1143.60      0.39
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 HUB     13.89   473.18   192.86   432.09  1144.59     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   532.98   309.91     0.47  1200.36
 MEAN   327.74   488.07   226.63     0.43  1678.13     1.14
 HUB    274.67   439.77    81.81     0.38  2680.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.15     1.02    16.39   558.44     1.01   542.41     0.92     0.80
 MEAN    18.29     1.03    16.48   559.96     1.01   543.50     0.92     0.80
 HUB     18.58     1.04    16.51   563.14     1.02   544.45     0.92     0.80

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     8.32    35.55    31.50     4.05     0.93     0.06     2.90
 MEAN   13.17    27.67    23.50     4.17     0.88     0.10     3.29     0.80
 HUB    24.05    10.72     6.50     4.22     0.88     0.16     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.873

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     435.639     101.678     423.607    1144.809       0.381       0.051

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.319      16.575     544.668      46.000      13.497      32.400      18.903

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     453.319     101.678     464.582    1143.429       0.396      -0.051

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.242      16.367     543.356     456.573       0.051       0.086

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     432.573       0.000     432.573    1145.042       0.378      -0.092

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.402     544.891       0.000       0.060       0.125      -0.032

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.449      18.102       1.017     560.515       5.884     437.642       3.393

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  36648.742       0.263     242.019 1094071.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 4.453   EfDer =  0.812

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    116.858    2266.000      18.102     560.515       1.000       1.000       0.980
W Kg/sec =   53.11724

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     98.645    2179.838       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  89896.742   91694.484       1.774     509.668     287.288     390.276       1.358

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   402.49    -0.14   402.49     0.35   348.49
 MEAN    15.91     0.00    -0.02   402.49    -0.14   402.49     0.35
 HUB     13.07     0.00    -0.02   402.49    -0.14   402.49     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.00    47.36    -5.36   362.27   541.61    16.62   546.99     0.47
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 MEAN    38.03    44.80    -6.77   314.67   510.98    16.62   546.99     0.45
 HUB     32.72    38.84    -6.12   258.45   478.40    16.62   546.99     0.42
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   436.66    40.95   434.74  1147.17     0.38
 MEAN    15.50   440.18    77.17   433.36  1148.44     0.38
 HUB     12.59   464.05   166.25   433.25  1149.53     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   536.16   313.81     0.47   737.18
 MEAN   306.46   490.28   229.29     0.43  1198.21     1.11
 HUB    248.96   441.07    82.71     0.38  2094.96

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.30     1.01    16.56   562.86     1.00   546.94     0.92     0.74
 MEAN    18.42     1.02    16.65   564.32     1.01   548.14     0.92     0.74
 HUB     18.67     1.03    16.68   567.17     1.01   549.19     0.92     0.74

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP      5.38    35.82    31.50     4.32     0.93     0.02     2.90
 MEAN    10.10    27.88    23.50     4.38     0.87     0.06     3.34     0.74
 HUB     20.99    10.81     6.50     4.31     0.87     0.12     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.812

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     444.446      78.588     437.443    1148.582       0.387       -0.016

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.426      16.616     548.289      46.000      10.185      33.000      22.815

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     476.623      78.588     483.058    1145.987       0.416       -0.236

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.245      16.195     545.814     440.827       0.118       0.059

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     444.754       0.000     444.754    1148.558       0.387       -0.112

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      16.410     548.266       0.000       0.060       0.143       -0.118

    STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.204      18.200       1.005     564.781       4.266     555.186       4.304

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  26569.672       0.211     175.459 1161275.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    261357.42   1725.9384     114.1585      1.2048       0.6834       4.4529       1.0803
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 60% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.029   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     114.596    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   52.08887

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     111.948    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   88156.312   89919.258       2.551     831.557     326.018     619.754       1.901

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   261.48    -0.09   261.48     0.23   406.33
  MEAN    17.06     0.00    -0.02   261.48    -0.09   261.48     0.23
  HUB     12.51     0.00    -0.02   261.48    -0.09   261.48     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.35    50.47     6.88   407.95   484.63    14.54   517.10     0.43
  MEAN    52.23    47.20     5.03   337.36   426.90    14.54   517.10     0.38
  HUB     43.42    38.62     4.80   247.38   360.02    14.54   517.10     0.32

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   418.93   213.70   360.32  1120.97     0.37
  MEAN    18.04   438.56   246.78   362.54  1119.60     0.39
  HUB     15.00   496.26   333.25   367.73  1116.63     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   409.35   194.25     0.37  4410.54
  MEAN   356.65   378.83   109.87     0.34  4452.49     1.26
  HUB    296.62   369.55    36.63     0.33  4999.85

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.43     1.09    14.92   536.82     1.03   522.16     0.92     0.91
  MEAN    16.45     1.09    14.79   536.95     1.03   520.89     0.92     0.91
  HUB     16.62     1.10    14.51   538.69     1.03   518.12     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     30.67    28.33    24.20     4.13     0.93     0.23     2.90
  MEAN    34.24    16.86    12.70     4.16     0.92     0.20     3.51     0.91
  HUB     42.18    -5.69    -9.30     3.61     0.92     0.08     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     445.851     246.302     371.643    1119.597       0.398      -0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.483      14.774     520.886      24.000      33.534      35.400       1.866

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     401.880     246.302     471.351    1122.938       0.358       0.189
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.472      15.075     523.999     528.796       0.016       0.349

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     372.423       0.000     372.423    1124.978       0.331       0.260

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.231     525.904       0.000       0.060       0.038       0.278

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.870      16.434       1.088     537.489      14.679     226.309       1.754

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91389.172       0.549     591.827 1099500.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.029   EfDer =  0.984

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    114.596    2266.000      16.434     537.489       1.000       1.000       0.980
W Kg/sec =   52.08887

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.346    2226.041       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88156.312   89919.258       1.943     590.487     303.878     474.134       1.560

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   355.78    -0.12   355.78     0.32   399.19
 MEAN    18.08     0.00    -0.02   355.78    -0.12   355.78     0.32
 HUB     15.21     0.00    -0.02   355.78    -0.12   355.78     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.81    46.36     2.45   406.37   540.20    15.33   526.92     0.48
 MEAN    45.15    42.30     2.85   357.49   504.45    15.33   526.92     0.45
 HUB     40.22    37.84     2.38   300.77   465.96    15.33   526.92     0.41

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   404.15   135.09   380.90  1132.12     0.36
 MEAN    18.01   413.39   159.22   381.49  1131.82     0.37
 HUB     15.22   446.97   231.08   382.61  1131.45     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   466.14   268.70     0.41  2761.15
 MEAN   356.14   429.32   196.92     0.38  2869.80     1.26
 HUB    301.03   388.95    69.95     0.34  3519.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.29     1.05    15.83   546.26     1.02   532.62     0.92     0.90
 MEAN    17.33     1.05    15.80   546.60     1.02   532.33     0.92     0.90
 HUB     17.53     1.07    15.74   548.67     1.02   531.98     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.53    35.20    31.50     3.70     0.93     0.18     2.90
 MEAN    22.65    27.30    23.50     3.80     0.91     0.20     3.30     0.90
 HUB     31.13    10.36     6.50     3.86     0.91     0.23     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     419.940     159.669     388.401    1131.936       0.371      -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.367      15.791     532.448      46.000      22.347      30.600       8.253

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     401.401     159.669     431.992    1133.287       0.354       0.071

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.346      15.903     533.720     511.151       0.023       0.183

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     396.642       0.000     396.642    1133.624       0.350       0.059

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.884     534.037       0.000       0.060       0.059       0.059

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.813      17.290       1.052     547.176       9.687     303.765       2.355

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  60323.766       0.370     390.650 1019753.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.029   EfDer =  0.946

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    114.596    2266.000      17.290     547.176       1.000       1.000       0.980
W Kg/sec =   52.08887

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    100.070    2206.248       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88156.312   89919.258       1.872     545.479     291.431     429.765       1.475

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   374.30    -0.13   374.30     0.33   386.40
 MEAN    17.74     0.00    -0.02   374.30    -0.13   374.30     0.33
 HUB     15.05     0.00    -0.02   374.30    -0.13   374.30     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.69    46.36     0.33   396.88   545.63    16.03   535.48     0.48
 MEAN    43.15    43.40    -0.25   350.77   513.06    16.03   535.48     0.45
 HUB     38.50    38.84    -0.34   297.61   478.27    16.03   535.48     0.42

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   416.20   105.73   402.55  1139.26      0.37
 MEAN    17.51   424.81   136.64   402.23  1139.62      0.37
 HUB     14.85   458.01   218.22   402.68  1139.88      0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   493.80   286.00     0.43  2097.17
 MEAN   346.18   453.54   209.54     0.40  2394.46      1.21
 HUB    293.65   409.68    75.43     0.36  3242.56

         Pt2       PR       Ps2     Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     17.93     1.04    16.35   553.84     1.01   539.37     0.92     0.87
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 MEAN    18.03     1.04    16.37   554.78     1.01   539.71     0.92     0.87
 HUB     18.29     1.06    16.36   557.47     1.02   539.96     0.92     0.87
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     14.72    35.39    31.50     3.89     0.93     0.13     2.90
 MEAN    18.76    27.52    23.50     4.02     0.90     0.16     3.28     0.87
 HUB     28.45    10.61     6.50     4.11     0.90     0.20     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.946

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     429.919     137.541     407.324    1139.840       0.377       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.067      16.375     539.928      46.000      18.658      31.500      12.842

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     427.807     137.541     449.373    1140.000       0.375      -0.007

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.024      16.352     540.080     471.992       0.035       0.139

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     416.257       0.000     416.257    1140.859       0.365      -0.010

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      16.358     540.894       0.000       0.060       0.086      -0.003

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.706      17.936       1.037     555.363       8.187     339.713       2.633

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  50986.793       0.332     330.185 1028524.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.029   EfDer =  0.891

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    114.596    2266.000       17.936     555.363       1.000        1.000        0.980
W Kg/sec =   52.08887

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     97.185    2189.926        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 88156.312   89919.258         1.814     513.330     283.033     401.059       1.417

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   390.71    -0.13   390.71      0.34   368.06
 MEAN    16.97      0.00    -0.02   390.71    -0.13   390.71      0.34
 HUB     14.32      0.00    -0.02   390.71    -0.13   390.71      0.34

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     44.28    46.36    -2.08   380.86   545.72     16.54    542.62      0.48
 MEAN    40.67    43.80    -3.13   335.59   515.14     16.54    542.62      0.45
 HUB     35.95    37.84    -1.89   283.17   482.62     16.54    542.62      0.42

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2      Ao2          Mach2
 TIP     18.88   426.34    73.40   419.97  1144.74      0.37
 MEAN    16.57   432.75   108.28   418.99  1145.62      0.38
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 HUB     13.89   462.39   195.51   419.02  1146.36     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   516.08   299.95     0.45  1388.33
 MEAN   327.74   472.98   219.46     0.41  1796.90     1.16
 HUB    274.67   426.43    79.16     0.37  2717.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.34     1.02    16.67   559.77     1.01   544.59     0.92     0.82
 MEAN    18.47     1.03    16.73   561.07     1.01   545.43     0.92     0.82
 HUB     18.74     1.04    16.75   563.99     1.02   546.14     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     9.91    35.53    31.50     4.03     0.93     0.08     2.90
 MEAN   14.49    27.65    23.50     4.15     0.89     0.11     3.29     0.82
 HUB    25.01    10.70     6.50     4.20     0.89     0.17     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.891

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     424.851     108.888     410.660    1146.775       0.370       0.051

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.499      16.824     546.539      46.000      14.851      32.400      17.549

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     438.510     108.888     451.827    1145.741       0.383      -0.032

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.433      16.659     545.555     456.573       0.047       0.102

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     418.318       0.000     418.318    1147.257       0.365      -0.070

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.697     546.999       0.000       0.060       0.117      -0.011

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.522      18.306       1.021     561.611       6.248     412.344       3.196

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  38913.598       0.279     252.000 1067993.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.029   EfDer =  0.831

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    114.596    2266.000      18.306     561.611       1.000       1.000       0.980
W Kg/sec =   52.08887

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.755    2177.711       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88156.312   89919.258       1.828     509.668     278.871     390.276       1.399

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   389.51    -0.13   389.51     0.34   348.15
 MEAN    15.91     0.00    -0.02   389.51    -0.13   389.51     0.34
 HUB     13.07     0.00    -0.02   389.51    -0.13   389.51     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.94    47.36    -4.42   362.27   532.03    16.91   548.94     0.46
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 MEAN    38.95    44.80    -5.85   314.67   500.82    16.91   548.94     0.44
 HUB     33.58    38.84    -5.26   258.45   467.53    16.91   548.94     0.41
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   422.76    52.07   419.54  1150.03     0.37
 MEAN    15.50   427.14    85.19   418.56  1150.99     0.37
 HUB     12.59   451.55   169.18   418.66  1151.80     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   517.33   302.68     0.45   936.63
 MEAN   306.46   473.45   221.27     0.41  1322.42     1.13
 HUB    248.96   426.19    79.78     0.37  2131.69

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.56     1.01    16.91   564.58     1.01   549.66     0.92     0.76
 MEAN    18.67     1.02    16.98   565.81     1.01   550.58     0.92     0.76
 HUB     18.90     1.03    17.00   568.38     1.01   551.36     0.92     0.76

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP      7.08    35.81    31.50     4.31     0.93     0.04     2.90
 MEAN    11.50    27.86    23.50     4.36     0.87     0.08     3.34     0.76
 HUB     22.00    10.79     6.50     4.29     0.87     0.13     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.831

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     431.216      86.755     422.399    1151.141       0.375       -0.015

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.676      16.950     550.733      46.000      11.606      33.000      21.394

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     458.703      86.755     466.835    1149.005       0.399       -0.212

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.517      16.589     548.690     440.827       0.111       0.074

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     428.527       0.000     428.527    1151.343       0.372       -0.095

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      16.783     550.926       0.000       0.060       0.138       -0.101

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.309      18.470       1.009     566.258       4.647     512.186       3.970

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  28945.410       0.230     187.447 1132584.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    270558.75   1752.1105     111.9483      1.2226      0.7137      5.0288      1.0831
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 60% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.469   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     112.885    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   51.31144

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     110.278    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   86840.570   88577.203       2.589     831.557     321.152     619.754       1.930

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   257.36    -0.09   257.36     0.23   406.33
  MEAN    17.06     0.00    -0.02   257.36    -0.09   257.36     0.23
  HUB     12.51     0.00    -0.02   257.36    -0.09   257.36     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.76    50.47     7.29   407.95   482.42    14.56   517.28     0.43
  MEAN    52.67    47.20     5.47   337.36   424.38    14.56   517.28     0.38
  HUB     43.88    38.62     5.26   247.38   357.03    14.56   517.28     0.32

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   415.41   217.11   354.16  1121.47     0.37
  MEAN    18.04   434.63   248.71   356.44  1120.03     0.39
  HUB     15.00   491.29   332.66   361.53  1117.04     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   402.30   190.84     0.36  4480.87
  MEAN   356.65   372.43   107.95     0.33  4487.21     1.27
  HUB    296.62   363.32    36.04     0.33  4991.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.46     1.09    14.97   537.04     1.03   522.63     0.92     0.91
  MEAN    16.46     1.09    14.83   537.06     1.03   521.29     0.92     0.91
  HUB     16.62     1.10    14.55   538.66     1.03   518.51     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     31.51    28.32    24.20     4.12     0.93     0.24     2.90
  MEAN    34.91    16.85    12.70     4.15     0.92     0.21     3.51     0.91
  HUB     42.62    -5.69    -9.30     3.61     0.92     0.09     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     441.701     248.224     365.355    1120.037       0.394      -0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.495      14.816     521.295      24.000      34.192      35.400       1.208

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	394.748	248.224	466.306	1123.556	0.351	0.203

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.485	15.134	524.576	528.796	0.016	0.359

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	365.921	0.000	365.921	1125.516	0.325	0.272

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.285	526.407	0.000	0.060	0.037	0.290

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.873	16.448	1.089	537.591	14.781	223.355	1.731

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
92023.766	0.553	587.042	1082160.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 5.469 EfDer = 0.988

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
112.885	2266.000	16.448	537.591	1.000	1.000	0.980

W Kg/sec = 51.31144

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
102.710	2225.831	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
86840.570	88577.203	1.974	590.487	299.113	474.134	1.585

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	349.63	-0.12	349.63	0.31	399.15
MEAN	18.08	0.00	-0.02	349.63	-0.12	349.63	0.31	
HUB	15.21	0.00	-0.02	349.63	-0.12	349.63	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.30	46.36	2.94	406.37	536.17	15.38	527.38	0.48
MEAN	45.65	42.30	3.35	357.49	500.13	15.38	527.38	0.44
HUB	40.71	37.84	2.87	300.77	461.28	15.38	527.38	0.41

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	399.24	140.21	373.81	1132.93	0.35
MEAN	18.01	408.46	162.93	374.55	1132.51	0.36
HUB	15.22	441.85	232.43	375.78	1132.03	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	457.39	263.58	0.40	2865.66	
MEAN	356.14	421.45	193.21	0.37	2936.55	1.28
HUB	301.03	381.99	68.60	0.34	3540.10	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.34	1.05	15.91	546.69	1.02	533.38	0.92	0.90
MEAN	17.37	1.06	15.87	546.92	1.02	532.98	0.92	0.90
HUB	17.56	1.07	15.81	548.83	1.02	532.53	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.56	35.19	31.50	3.69	0.93	0.19	2.90	
MEAN	23.51	27.29	23.50	3.79	0.92	0.21	3.30	0.90
HUB	31.74	10.35	6.50	3.85	0.92	0.24	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.988
    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     414.834     163.388     381.303    1132.638       0.366      -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.407      15.864     533.109      46.000      23.195      30.600       7.405

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     393.705     163.388     426.262    1134.153       0.347       0.085

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.389      15.996     534.536     511.151       0.021       0.194

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     388.941       0.000     388.941    1134.483       0.343       0.075

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.981     534.847       0.000       0.060       0.055       0.076

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.827      17.337       1.054     547.481       9.890     296.482       2.298

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  61587.977       0.378     392.885 1002667.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.469   EfDer =  0.955

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    112.885    2266.000      17.337     547.481       1.000       1.000       0.980
W Kg/sec =   51.31144

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     98.335    2205.634       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  86840.570   88577.203       1.905     545.479     286.375     429.765       1.501

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   367.14    -0.13   367.14     0.32   386.29
 MEAN    17.74     0.00    -0.02   367.14    -0.13   367.14     0.32
 HUB     15.05     0.00    -0.02   367.14    -0.13   367.14     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.24    46.36     0.88   396.88   540.74    16.13   536.22     0.48
 MEAN    43.70    43.40     0.30   350.77   507.86    16.13   536.22     0.45
 HUB     39.04    38.84     0.20   297.61   472.69    16.13   536.22     0.42

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   409.70    111.84    394.14  1140.46      0.36
 MEAN    17.51   418.52    141.06    394.04  1140.66      0.37
 HUB     14.85   451.73    219.88    394.61  1140.78      0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   483.42   279.90     0.42  2218.02
 MEAN   346.18   444.23   205.13     0.39  2471.66      1.22
 HUB    293.65   401.45    73.78     0.35  3267.05

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     18.03     1.04    16.49   554.52     1.01   540.51     0.92     0.87
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 MEAN    18.11     1.04    16.50   555.33     1.01   540.70     0.92     0.87
 HUB     18.36     1.06    16.48   557.86     1.02   540.82     0.92     0.87
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.84    35.38    31.50     3.88     0.93     0.14     2.90
 MEAN    19.70    27.50    23.50     4.00     0.90     0.17     3.28     0.87
 HUB     29.13    10.59     6.50     4.09     0.90     0.21     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.955

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     423.499     141.983     398.989    1140.893       0.371       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.147      16.498     540.926      46.000      19.588      31.500      11.912

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     418.528     141.983     441.956    1141.262       0.367       0.009

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.110      16.502     541.276     471.992       0.032       0.151

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     407.106       0.000     407.106    1142.092       0.356       0.008

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.511     542.063       0.000       0.060       0.080       0.015

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.734      18.029       1.040     555.904       8.422     329.366       2.553

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  52453.988       0.342     334.617 1010641.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.469   EfDer =  0.904

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    112.885    2266.000      18.029     555.904       1.000       1.000       0.980
W Kg/sec =   51.31144

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.284    2188.861       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 86840.570   88577.203       1.850     513.330     277.495     401.059       1.445

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   382.28    -0.13   382.28     0.33   367.88
 MEAN    16.97     0.00    -0.02   382.28    -0.13   382.28     0.33
 HUB     14.32     0.00    -0.02   382.28    -0.13   382.28     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.90    46.36    -1.46   380.86   539.71    16.69   543.70     0.47
 MEAN    41.29    43.80    -2.51   335.59   508.77    16.69   543.70     0.44
 HUB     36.54    37.84    -1.30   283.17   475.81    16.69   543.70     0.42

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   417.91    80.61   410.07  1146.38     0.36
 MEAN    16.57   424.78   113.47   409.34  1147.07     0.37
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 HUB     13.89   454.64   197.48   409.51  1147.64     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   503.83   292.73     0.44  1524.44
 MEAN   327.74   462.03   214.27     0.40  1882.88     1.17
 HUB    274.67   416.72    77.19     0.36  2744.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.49     1.03    16.86   560.74     1.01   546.16     0.92     0.83
 MEAN    18.60     1.03    16.91   561.88     1.01   546.82     0.92     0.83
 HUB     18.86     1.05    16.92   564.62     1.02   547.36     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     11.12    35.52    31.50     4.02     0.93     0.09     2.90
 MEAN    15.49    27.63    23.50     4.13     0.89     0.13     3.29     0.83
 HUB     25.74    10.68     6.50     4.18     0.89     0.18     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.904

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     417.156     114.109     401.246    1148.186       0.363       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.629      17.003     547.885      46.000      15.875      32.400      16.525

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     427.804     114.109     442.760    1147.398       0.373      -0.017

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.571      16.870     547.133     456.573       0.043       0.114

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     408.005       0.000     408.005    1148.846       0.355      -0.053

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.910     548.515       0.000       0.060       0.111       0.006

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.571      18.453       1.024     562.415       6.512     395.406       3.065

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  40557.512       0.291     258.726 1048615.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.469   EfDer =  0.846

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    112.885    2266.000      18.453     562.415       1.000       1.000       0.980
W Kg/sec =   51.31144

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.638    2176.153       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  86840.570   88577.203       1.869     509.668     272.706     390.276       1.431

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   380.10    -0.13   380.10     0.33   347.90
 MEAN    15.91     0.00    -0.02   380.10    -0.13   380.10     0.33
 HUB     13.07     0.00    -0.02   380.10    -0.13   380.10     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.63    47.36    -3.73   362.27   525.18    17.11   550.35     0.46
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 MEAN    39.63    44.80    -5.17   314.67   493.54    17.11   550.35     0.43
 HUB     34.23    38.84    -4.61   258.45   459.72    17.11   550.35     0.40
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   412.97    60.13   408.57  1152.06     0.36
 MEAN    15.50   417.88    90.98   407.86  1152.80     0.36
 HUB     12.59   442.61   171.35   408.09  1153.43     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   503.72   294.63     0.44  1081.07
 MEAN   306.46   461.28   215.48     0.40  1412.05     1.14
 HUB    248.96   415.41    77.61     0.36  2159.05

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.76     1.02    17.16   565.85     1.01   551.61     0.92     0.77
 MEAN    18.85     1.02    17.22   566.90     1.01   552.32     0.92     0.77
 HUB     19.07     1.03    17.22   569.27     1.01   552.91     0.92     0.77

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP      8.37    35.80    31.50     4.30     0.93     0.06     2.90
 MEAN    12.57    27.85    23.50     4.35     0.88     0.09     3.34     0.77
 HUB     22.78    10.77     6.50     4.27     0.88     0.14     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.846

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     421.830      92.648     411.530    1152.969       0.366       -0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.860      17.192     552.482      46.000      12.687      33.000      20.312

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     445.854      92.648     455.378    1151.152       0.387       -0.192

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.717      16.875     550.742     440.827       0.104       0.086

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     416.819       0.000     416.819    1153.335       0.361       -0.081

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      17.056     552.833       0.000       0.060       0.133       -0.086

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.381      18.669       1.012     567.339       4.924     484.481       3.756

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  30669.016       0.244     195.645 1111358.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    277292.25   1768.9148     110.2775      1.2358       0.7347       5.4688       1.0852
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 60% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     111.020    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   50.46355

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     108.455    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   85405.578   87113.516       2.633     831.557     315.845     619.754       1.962

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   252.87    -0.09   252.87     0.23   406.33
  MEAN    17.06     0.00    -0.02   252.87    -0.09   252.87     0.23
  HUB     12.51     0.00    -0.02   252.87    -0.09   252.87     0.23

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.21    50.47     7.74   407.95   480.04    14.58   517.47     0.43
  MEAN    53.15    47.20     5.95   337.36   421.68    14.58   517.47     0.38
  HUB     44.38    38.62     5.76   247.38   353.81    14.58   517.47     0.32

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   411.69   220.75   347.51  1122.00     0.37
  MEAN    18.04   430.43   250.77   349.84  1120.48     0.38
  HUB     15.00   485.97   332.06   354.83  1117.48     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   394.72   187.20     0.35  4555.88
  MEAN   356.65   365.52   105.89     0.33  4524.33     1.29
  HUB    296.62   356.59    35.44     0.32  4982.04

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.48     1.09    15.02   537.28     1.03   523.13     0.92     0.91
  MEAN    16.47     1.09    14.88   537.18     1.03   521.71     0.92     0.91
  HUB     16.62     1.10    14.59   538.64     1.03   518.91     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     32.43    28.31    24.20     4.11     0.93     0.26     2.90
  MEAN    35.63    16.84    12.70     4.14     0.92     0.22     3.51     0.91
  HUB     43.10    -5.70    -9.30     3.60     0.92     0.10     4.78

    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.999

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     437.269     250.280     358.559    1120.504       0.390      -0.010

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      16.507      14.859     521.730      24.000      34.916      35.400       0.484

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     387.069     250.280     460.937    1124.210       0.344       0.218

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.498      15.197     525.186     528.796       0.015       0.370

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     358.919       0.000     358.919    1126.085       0.319       0.284

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.341     526.940       0.000       0.060       0.037       0.303

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      16.462       1.090     537.700      14.890     220.181       1.707

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  92703.586       0.557     581.607 1063300.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.020    2266.000      16.462     537.700       1.000       1.000       0.980
W Kg/sec =   50.46355

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    100.937    2225.604       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85405.578   87113.516       2.009     590.487     293.951     474.134       1.613

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   343.01    -0.12   343.01     0.30   399.11
 MEAN    18.08     0.00    -0.02   343.01    -0.12   343.01     0.30
 HUB     15.21     0.00    -0.02   343.01    -0.12   343.01     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.84    46.36     3.48   406.37   531.87    15.44   527.87     0.47
 MEAN    46.19    42.30     3.89   357.49   495.52    15.44   527.87     0.44
 HUB     41.26    37.84     3.42   300.77   456.28    15.44   527.87     0.40

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   394.14   145.72   366.21  1133.78     0.35
 MEAN    18.01   403.27   166.92   367.11  1133.24     0.36
 HUB     15.22   436.41   233.88   368.45  1132.64     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   448.02   258.08     0.40  2977.93
 MEAN   356.14   413.01   189.22     0.36  3008.30     1.29
 HUB    301.03   374.52    67.15     0.33  3562.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.40     1.06    16.00   547.16     1.02   534.18     0.92     0.91
 MEAN    17.41     1.06    15.95   547.25     1.02   533.67     0.92     0.91
 HUB     17.58     1.07    15.87   549.01     1.02   533.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.70    35.17    31.50     3.67     0.93     0.20     2.90
 MEAN    24.45    27.27    23.50     3.77     0.92     0.22     3.30     0.91
 HUB     32.41    10.33     6.50     3.83     0.92     0.24     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     409.470     167.385     373.695    1133.378       0.361      -0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.447      15.941     533.806      46.000      24.129      30.600       6.471

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     385.482     167.385     420.255    1135.068       0.340       0.102

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.433      16.094     535.398     511.151       0.020       0.207

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     380.727       0.000     380.727    1135.390       0.335       0.093

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.082     535.703       0.000       0.060       0.051       0.094

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.839      17.385       1.056     547.809      10.109     288.894       2.239

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  62946.453       0.386     394.915  984160.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.963

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    111.020    2266.000      17.385     547.809       1.000       1.000       0.980
W Kg/sec =   50.46355

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     96.469    2204.975       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  85405.578   87113.516       1.942     545.479     280.942     429.765       1.530

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   359.50    -0.12   359.50     0.32   386.18
 MEAN    17.74      0.00    -0.02   359.50    -0.12   359.50     0.32
 HUB     15.05      0.00    -0.02   359.50    -0.12   359.50     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.84     46.36     1.48   396.88   535.58    16.22   537.02     0.47
 MEAN    44.31     43.40     0.91   350.77   502.36    16.22   537.02     0.44
 HUB     39.63     38.84     0.79   297.61   466.78    16.22   537.02     0.41

     ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   402.99    118.34    385.22  1141.71       0.35
 MEAN    17.51   411.97    145.75    385.33  1141.76       0.36
 HUB     14.85   445.13    221.63    386.04  1141.73       0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   472.38   273.40     0.41  2346.71
 MEAN   346.18   434.34   200.44     0.38  2553.75      1.24
 HUB    293.65   392.70    72.02     0.34  3293.08

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     18.12      1.04    16.63   555.26     1.01   541.70     0.92     0.88
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 MEAN    18.19     1.05    16.62   555.92     1.01   541.75     0.92     0.88
 HUB     18.43     1.06    16.59   558.27     1.02   541.72     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.08    35.36    31.50     3.86     0.93     0.16     2.90
 MEAN    20.72    27.48    23.50     3.98     0.91     0.18     3.28     0.88
 HUB     29.86    10.57     6.50     4.07     0.91     0.22     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.963

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     416.808     146.705     390.137    1141.998       0.365       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.230      16.626     541.974      46.000      20.608      31.500      10.892

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     408.716     146.705     434.247    1142.585       0.358       0.027

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.200      16.657     542.532     471.992       0.029       0.165

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     397.441       0.000     397.441    1143.384       0.348       0.028

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      16.671     543.291       0.000       0.060       0.074       0.035

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.760      18.126       1.043     556.482       8.673     318.831       2.472

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  54014.734       0.352     338.879  991335.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.918

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    111.020    2266.000       18.126     556.482       1.000        1.000        0.980
W Kg/sec =   50.46355

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     93.257    2187.724        1.402       0.249      53.349       56.000        0.050

   CFM        SCFM             A1/A*       Area1        A*      AthrRotor  ChokeMargin
  85405.578   87113.516        1.890     513.330     271.591     401.059       1.477

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   373.36    -0.13   373.36      0.33   367.69
 MEAN    16.97      0.00    -0.02   373.36    -0.13   373.36      0.33
 HUB     14.32      0.00    -0.02   373.36    -0.13   373.36      0.33

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     45.58    46.36    -0.78   380.86   533.43     16.84   544.84      0.47
 MEAN    41.96    43.80    -1.84   335.59   502.10     16.84   544.84      0.44
 HUB     37.19    37.84    -0.65   283.17   468.67     16.84   544.84      0.41

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   409.27    88.20   399.65  1148.09      0.36
 MEAN    16.57   416.52   118.96   399.18  1148.59      0.36
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 HUB     13.89   446.54   199.51   399.49  1148.98     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   490.94   285.14     0.43  1667.77
 MEAN   327.74   450.48   208.78     0.39  1973.83     1.19
 HUB    274.67   406.50    75.16     0.35  2773.04

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.64     1.03    17.07   561.78     1.01   547.79     0.92     0.84
 MEAN    18.73     1.03    17.10   562.75     1.01   548.26     0.92     0.84
 HUB     18.98     1.05    17.10   565.29     1.02   548.64     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     12.45    35.51    31.50     4.01     0.93     0.11     2.90
 MEAN    16.59    27.61    23.50     4.11     0.89     0.14     3.29     0.84
 HUB     26.54    10.65     6.50     4.15     0.89     0.19     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.918

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     409.203     119.630     391.326    1149.657       0.356       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.766      17.190     549.289      46.000      16.999      32.400      15.401

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     416.575     119.630     433.412    1149.125       0.363       0.000

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.716      17.089     548.781     456.573       0.039       0.128

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     397.186       0.000     397.186    1150.503       0.345      -0.034

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.133     550.098       0.000       0.060       0.103       0.026

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.618      18.608       1.027     563.271       6.789     378.710       2.936

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  42287.801       0.303     265.306 1027784.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.863

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    111.020    2266.000      18.608     563.271       1.000       1.000       0.980
W Kg/sec =   50.46355

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.395    2174.500       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85405.578   87113.516       1.915     509.668     266.174     390.276       1.466

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   370.21    -0.13   370.21     0.32   347.63
 MEAN    15.91     0.00    -0.02   370.21    -0.13   370.21     0.32
 HUB     13.07     0.00    -0.02   370.21    -0.13   370.21     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.39    47.36    -2.97   362.27   518.06    17.32   551.83     0.45
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 MEAN    40.38    44.80    -4.42   314.67   485.96    17.32   551.83     0.42
 HUB     34.93    38.84    -3.91   258.45   451.58    17.32   551.83     0.39
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   402.97    68.58   397.09  1154.17     0.35
 MEAN    15.50   408.34    97.07   396.64  1154.69     0.35
 HUB     12.59   433.29   173.58   397.01  1155.12     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   489.47   286.18     0.42  1232.66
 MEAN   306.46   448.51   209.38     0.39  1506.45     1.16
 HUB    248.96   404.10    75.38     0.35  2187.05

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.97     1.02    17.43   567.18     1.01   553.63     0.92     0.79
 MEAN    19.05     1.02    17.47   568.05     1.01   554.13     0.92     0.79
 HUB     19.25     1.03    17.46   570.21     1.01   554.54     0.92     0.79

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP      9.80    35.78    31.50     4.28     0.93     0.08     2.90
 MEAN    13.75    27.83    23.50     4.33     0.88     0.11     3.34     0.79
 HUB     23.62    10.75     6.50     4.25     0.88     0.15     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.863

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     412.176      98.855     400.146    1154.865       0.357       -0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.054      17.446     554.300      46.000      13.877      33.000      19.123

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     432.483      98.855     443.637    1153.373       0.375       -0.170

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.929      17.176     552.868     440.827       0.097       0.099

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     404.579       0.000     404.579    1155.405       0.350       -0.063

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      17.343     554.818       0.000       0.060       0.127       -0.068

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.451      18.880       1.015     568.484       5.213     458.050       3.551

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  32475.229       0.258     203.744 1088621.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc   TR
    284427.78   1784.4515     108.4552      1.2497      0.7556       5.9532      1.0874
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 60% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     107.227    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   48.73943

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     104.750    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   82487.648   84137.219       2.726     831.557     305.054     619.754       2.032

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   243.79    -0.08   243.79     0.22   406.33
  MEAN    17.06     0.00    -0.02   243.79    -0.08   243.79     0.22
  HUB     12.51     0.00    -0.02   243.79    -0.08   243.79     0.22

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.14    50.47     8.67   407.95   475.32    14.61   517.85     0.43
  MEAN    54.15    47.20     6.95   337.36   416.29    14.61   517.85     0.37
  HUB     45.43    38.62     6.81   247.38   347.38    14.61   517.85     0.31

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   404.59   228.08   334.17  1123.04     0.36
  MEAN    18.04   422.23   254.90   336.60  1121.36     0.38
  HUB     15.00   475.37   330.81   341.38  1118.33     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   379.51   179.87     0.34  4706.94
  MEAN   356.65   351.64   101.75     0.31  4598.84     1.33
  HUB    296.62   343.09    34.19     0.31  4963.23

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.53     1.09    15.11   537.76     1.03   524.09     0.92     0.91
  MEAN    16.50     1.09    14.96   537.42     1.03   522.53     0.92     0.91
  HUB     16.61     1.10    14.67   538.58     1.03   519.70     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     34.31    28.29    24.20     4.09     0.93     0.28     2.90
  MEAN    37.14    16.82    12.70     4.12     0.93     0.25     3.51     0.91
  HUB     44.10    -5.72    -9.30     3.58     0.93     0.12     4.78

    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       1.000

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     428.601     254.406     344.929    1121.412       0.382      -0.009

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      16.530      14.943     522.576      24.000      36.411      35.400      -1.011

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     371.745     254.406     450.463    1125.483       0.330       0.248

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.522      15.318     526.377     528.796       0.015       0.393

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     344.946       0.000     344.946    1127.197       0.306       0.309

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.448     527.981       0.000       0.060       0.037       0.328

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      16.486       1.091     537.919      15.109     213.838       1.658

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94066.633       0.565     569.995 1025114.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.227    2266.000      16.486     537.919       1.000       1.000       0.980
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     97.366    2225.151       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82487.648   84137.219       2.082     590.487     283.552     474.134       1.672

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   329.78    -0.11   329.78     0.29   399.03
 MEAN    18.08     0.00    -0.02   329.78    -0.11   329.78     0.29
 HUB     15.21     0.00    -0.02   329.78    -0.11   329.78     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.95    46.36     4.59   406.37   523.43    15.54   528.84     0.46
 MEAN    47.32    42.30     5.02   357.49   486.45    15.54   528.84     0.43
 HUB     42.38    37.84     4.54   300.77   446.42    15.54   528.84     0.40

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   384.50   156.56   351.18  1135.42     0.34
 MEAN    18.01   393.30   174.75   352.35  1134.65     0.35
 HUB     15.22   425.79   236.76   353.90  1133.83     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   429.48   247.23     0.38  3199.37
 MEAN   356.14   396.30   181.39     0.35  3149.31     1.32
 HUB    301.03   359.68    64.27     0.32  3605.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.50     1.06    16.16   548.08     1.02   535.73     0.92     0.91
 MEAN    17.48     1.06    16.09   547.92     1.02   535.00     0.92     0.91
 HUB     17.63     1.07    15.99   549.37     1.02   534.23     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.03    35.15    31.50     3.65     0.93     0.23     2.90
 MEAN    26.38    27.24    23.50     3.74     0.92     0.24     3.30     0.91
 HUB     33.78    10.29     6.50     3.79     0.92     0.26     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     399.145     175.241     358.618    1134.806       0.352      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.522      16.084     535.152      46.000      26.043      30.600       4.557

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     369.269     175.241     408.741    1136.837       0.325       0.135

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.513      16.277     537.069     511.151       0.016       0.234

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     364.581       0.000     364.581    1137.141       0.321       0.128

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.270     537.357       0.000       0.060       0.044       0.131

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      17.473       1.060     548.458      10.539     274.553       2.128

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  65624.633       0.402     397.651  946910.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.978

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    107.227    2266.000      17.473     548.458       1.000       1.000       0.980
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     92.760    2203.670       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  82487.648   84137.219       2.019     545.479     270.142     429.765       1.591

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   344.45    -0.12   344.45     0.30   385.95
 MEAN    17.74     0.00    -0.02   344.45    -0.12   344.45     0.30
 HUB     15.05     0.00    -0.02   344.45    -0.12   344.45     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.05    46.36     2.69   396.88   525.60    16.40   538.55     0.46
 MEAN    45.53    43.40     2.13   350.77   491.70    16.40   538.55     0.43
 HUB     40.84    38.84     2.00   297.61   455.29    16.40   538.55     0.40

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   390.46   130.99   367.83  1144.11      0.34
 MEAN    17.51   399.56   154.91   368.31  1143.86      0.35
 HUB     14.85   432.44   225.05   369.27  1143.57      0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   450.88   260.75     0.39  2597.24
 MEAN   346.18   415.02   191.27     0.36  2714.04     1.27
 HUB    293.65   375.59    68.60     0.33  3343.84

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     18.31     1.05    16.89   556.71     1.02   543.97     0.92     0.89
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 MEAN    18.34     1.05    16.86   557.08     1.02   543.74     0.92     0.89
 HUB     18.55     1.06    16.81   559.08     1.02   543.46     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.60    35.33    31.50     3.83     0.93     0.18     2.90
 MEAN    22.81    27.44    23.50     3.94     0.91     0.20     3.28     0.89
 HUB     31.36    10.52     6.50     4.02     0.91     0.24     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     404.145     155.926     372.854    1144.109       0.353       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.386      16.864     543.979      46.000      22.695      31.500       8.805

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     389.679     155.926     419.718    1145.117       0.340       0.063

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.365      16.949     544.938     471.992       0.023       0.192

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     378.733       0.000     378.733    1145.854       0.331       0.068

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.970     545.641       0.000       0.060       0.062       0.077

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4         PR4        Texit        Del T       Ns        Ns nondim
      0.804      18.305       1.048     557.619       9.162     299.518       2.322

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  57057.895       0.372     345.741  952661.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.942

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    107.227    2266.000      18.305     557.619       1.000       1.000       0.980
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     89.280    2185.492       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  82487.648   84137.219       1.974     513.330     260.009     401.059       1.542

     ROTOR LEADING EDGE CONDITIONS, STAGE           4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   356.05    -0.12   356.05     0.31   367.32
 MEAN    16.97     0.00    -0.02   356.05    -0.12   356.05     0.31
 HUB     14.32     0.00    -0.02   356.05    -0.12   356.05     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.94    46.36     0.58   380.86   521.46    17.12   547.03     0.45
 MEAN    43.32    43.80    -0.48   335.59   489.36    17.12   547.03     0.43
 HUB     38.51    37.84     0.67   283.17   455.00    17.12   547.03     0.40

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   393.29   102.85   379.61  1151.32     0.34
 MEAN    16.57   401.08   129.54   379.58  1151.46     0.35
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 HUB     13.89   431.17   203.44   380.16  1151.53     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   466.12   270.49     0.40  1944.18
 MEAN   327.74   428.22   198.21     0.37  2148.98     1.22
 HUB    274.67   386.78    71.23     0.34  2827.53

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.92     1.03    17.45   563.79     1.01   550.88     0.92     0.86
 MEAN    18.99     1.04    17.46   564.44     1.01   551.01     0.92     0.86
 HUB     19.21     1.05    17.43   566.60     1.02   551.07     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.16    35.47    31.50     3.97     0.93     0.14     2.90
 MEAN    18.84    27.57    23.50     4.07     0.90     0.16     3.29     0.86
 HUB     28.15    10.61     6.50     4.11     0.90     0.21     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.942

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     394.337     130.263     372.200    1152.449       0.342       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.023      17.541     551.959      46.000      19.289      32.400      13.111

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     395.078     130.263     415.999    1152.398       0.343       0.035

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.988      17.503     551.910     456.573       0.032       0.156

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     376.486       0.000     376.486    1153.648       0.326       0.008

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.553     553.108       0.000       0.060       0.088       0.066

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.700      18.899       1.032     564.944       7.325     349.356       2.708

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  45623.734       0.327     276.456  986310.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.895

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.227    2266.000      18.899     564.944       1.000       1.000       0.980
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.042    2171.278       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82487.648   84137.219       2.011     509.668     253.494     390.276       1.540

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   351.24    -0.12   351.24     0.30   347.12
 MEAN    15.91     0.00    -0.02   351.24    -0.12   351.24     0.30
 HUB     13.07     0.00    -0.02   351.24    -0.12   351.24     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.90    47.36    -1.46   362.27   504.67    17.72   554.64     0.44
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MEAN    41.87    44.80    -2.93   314.67   471.66    17.72   554.64     0.41
HUB     36.36    38.84    -2.48   258.45   436.15    17.72   554.64     0.38
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   384.67    84.73   375.22  1158.12     0.33
MEAN    15.50   390.65   108.76   375.21  1158.26     0.34
HUB     12.59   415.80   177.92   375.82  1158.33     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    354.76   462.28   270.03     0.40  1522.26
MEAN   306.46   424.10   197.69     0.37  1687.52     1.19
HUB    248.96   382.47    71.04     0.33  2241.58

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.37     1.02    17.94   569.78     1.01   557.42     0.92     0.82
MEAN    19.42     1.03    17.94   570.30     1.01   557.56     0.92     0.82
HUB     19.59     1.04    17.92   572.06     1.01   557.62     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     12.72    35.74    31.50     4.24     0.93     0.11     2.90
MEAN    16.17    27.78    23.50     4.28     0.89     0.13     3.34     0.82
HUB     25.33    10.70     6.50     4.20     0.89     0.17     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.895

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      394.301     110.759     378.426    1158.437       0.340       -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.426      17.928      557.732       46.000      16.314      33.000      16.686

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      407.234     110.759     422.027    1157.537       0.352       -0.124

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       19.332       17.745     556.866     440.827       0.082       0.128

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      381.326       0.000     381.326    1159.309       0.329       -0.023

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       17.892      558.572       0.000       0.060       0.112       -0.027

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.571       19.286        1.020      570.713       5.769      413.514       3.206

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  35937.613       0.286     217.763 1043580.938

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    298310.50   1807.6064     104.7498      1.2766       0.7917       6.9532       1.0916
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 60% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     103.509    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   47.04952

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     101.118    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   79627.609   81219.992       2.824     831.557     294.477     619.754       2.105

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   234.94    -0.08   234.94     0.21   406.33
  MEAN    17.06     0.00    -0.02   234.94    -0.08   234.94     0.21
  HUB     12.51     0.00    -0.02   234.94    -0.08   234.94     0.21

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.07    50.47     9.60   407.95   470.83    14.65   518.20     0.42
  MEAN    55.15    47.20     7.95   337.36   411.17    14.65   518.20     0.37
  HUB     46.49    38.62     7.87   247.38   341.22    14.65   518.20     0.31

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   398.16   235.09   321.34  1123.99     0.35
  MEAN    18.04   414.58   258.86   323.83  1122.18     0.37
  HUB     15.00   465.31   329.62   328.42  1119.12     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   364.89   172.86     0.32  4851.52
  MEAN   356.65   338.28    97.79     0.30  4670.22     1.37
  HUB    296.62   330.08    33.01     0.29  4945.38

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.57     1.10    15.20   538.22     1.03   524.98     0.92     0.91
  MEAN    16.52     1.09    15.03   537.65     1.03   523.29     0.92     0.91
  HUB     16.60     1.10    14.74   538.52     1.03   520.44     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     36.19    28.28    24.20     4.08     0.93     0.31     2.90
  MEAN    38.64    16.80    12.70     4.10     0.93     0.27     3.51     0.91
  HUB     45.10    -5.74    -9.30     3.56     0.93     0.14     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.998

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     420.522     258.359     331.797    1122.252       0.375      -0.007

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      16.549      15.018     523.359      24.000      37.907      35.400      -2.507

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     357.069     258.359     440.735    1126.662       0.317       0.278
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.540      15.427     527.480     528.796       0.016       0.417

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     331.565       0.000     331.565    1128.227       0.294       0.332

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.542     528.947       0.000       0.060       0.039       0.352

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.877      16.504       1.092     538.129      15.319     207.759       1.611

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  95373.062       0.573     557.874  987890.812


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.509    2266.000      16.504     538.129       1.000       1.000       0.980
W Kg/sec =   47.04952

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.906    2224.718       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79627.609   81219.992       2.159     590.487     273.476     474.134       1.734

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   317.10    -0.11   317.10     0.28   398.95
 MEAN    18.08     0.00    -0.02   317.10    -0.11   317.10     0.28
 HUB     15.21     0.00    -0.02   317.10    -0.11   317.10     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.04    46.36     5.68   406.37   515.53    15.62   529.73     0.46
 MEAN    48.44    42.30     6.14   357.49   477.94    15.62   529.73     0.42
 HUB     43.50    37.84     5.66   300.77   437.13    15.62   529.73     0.39

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   375.98   166.81   336.95  1136.92     0.33
 MEAN    18.01   384.27   182.20   338.32  1135.94     0.34
 HUB     15.22   415.92   239.50   340.04  1134.93     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   411.94   236.98     0.36  3408.56
 MEAN   356.14   380.42   173.94     0.33  3283.40     1.36
 HUB    301.03   345.56    61.53     0.30  3647.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.59     1.07    16.30   548.95     1.02   537.15     0.92     0.91
 MEAN    17.55     1.06    16.21   548.56     1.02   536.22     0.92     0.91
 HUB     17.67     1.07    16.10   549.71     1.02   535.27     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.34    35.12    31.50     3.62     0.93     0.26     2.90
 MEAN    28.30    27.21    23.50     3.71     0.93     0.26     3.30     0.91
 HUB     35.16    10.26     6.50     3.76     0.93     0.28     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     389.785     182.712     344.309    1136.113       0.343       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.586      16.209     536.386      46.000      27.953      30.600       2.647

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     353.971     182.712     398.346    1138.467       0.311       0.168

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.580      16.439     538.611     511.151       0.014       0.261

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     349.403       0.000     349.403    1138.751       0.307       0.162

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.435     538.879       0.000       0.060       0.039       0.166

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      17.545       1.063     549.075      10.946     261.668       2.028

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  68162.164       0.418     398.707  910860.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.988

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    103.509    2266.000      17.545     549.075       1.000       1.000       0.980
W Kg/sec =   47.04952

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     89.226    2202.431       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  79627.609   81219.992       2.099     545.479     259.849     429.765       1.654

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   330.28    -0.11   330.28     0.29   385.73
 MEAN    17.74     0.00    -0.02   330.28    -0.11   330.28     0.29
 HUB     15.05     0.00    -0.02   330.28    -0.11   330.28     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.24    46.36     3.88   396.88   516.41    16.55   539.97     0.45
 MEAN    46.73    43.40     3.33   350.77   481.87    16.55   539.97     0.42
 HUB     42.03    38.84     3.19   297.61   444.66    16.55   539.97     0.39

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   379.53   142.75   351.67  1146.27     0.33
 MEAN    17.51   388.50   163.45   352.44  1145.78     0.34
 HUB     14.85   420.86   228.22   353.61  1145.24     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   430.89   248.99     0.38  2830.07
 MEAN   346.18   397.00   182.74     0.35  2863.39     1.30
 HUB    293.65   359.62    65.44     0.31  3390.71

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     18.47     1.05    17.12   558.06     1.02   546.03     0.92     0.90
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 MEAN    18.48     1.05    17.06   558.17     1.02   545.56     0.92     0.90
 HUB     18.65     1.06    16.99   559.84     1.02   545.05     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.09    35.30    31.50     3.80     0.93     0.21     2.90
 MEAN    24.88    27.41    23.50     3.91     0.92     0.23     3.28     0.90
 HUB     32.84    10.48     6.50     3.98     0.92     0.26     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     392.860     164.519     356.753    1146.023       0.343       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.519      17.071     545.802      46.000      24.757      31.500       6.743

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     372.081     164.519     406.830    1147.416       0.324       0.099

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.506      17.204     547.129     471.992       0.019       0.220

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     361.494       0.000     361.494    1148.096       0.315       0.108

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.230     547.778       0.000       0.060       0.052       0.117

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.836      18.457       1.052     558.690       9.616     282.841       2.193

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  59885.891       0.390     350.296  915437.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.962

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    103.509    2266.000      18.457     558.690       1.000       1.000       0.980
W Kg/sec =   47.04952

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     85.557    2183.396       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  79627.609   81219.992       2.060     513.330     249.167     401.059       1.610

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   340.06    -0.12   340.06     0.30   366.96
 MEAN    16.97     0.00    -0.02   340.06    -0.12   340.06     0.30
 HUB     14.32     0.00    -0.02   340.06    -0.12   340.06     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.25    46.36     1.89   380.86   510.67    17.37   549.03     0.44
 MEAN    44.63    43.80     0.83   335.59   477.85    17.37   549.03     0.42
 HUB     39.80    37.84     1.96   283.17   442.60    17.37   549.03     0.39

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   379.54   116.24   361.30  1154.20     0.33
 MEAN    16.57   387.52   139.23   361.65  1154.04     0.34
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 HUB     13.89   417.43   207.05   362.46  1153.83     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   443.44   257.10     0.38  2196.91
 MEAN   327.74   407.83   188.51     0.35  2309.62     1.26
 HUB    274.67   368.71    67.62     0.32  2877.53

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.17     1.04    17.79   565.67     1.01   553.64     0.92     0.88
 MEAN    19.21     1.04    17.77   566.02     1.01   553.48     0.92     0.88
 HUB     19.40     1.05    17.72   567.83     1.02   553.28     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.83    35.44    31.50     3.94     0.93     0.17     2.90
 MEAN    21.06    27.53    23.50     4.03     0.91     0.19     3.29     0.88
 HUB     29.74    10.57     6.50     4.07     0.91     0.23     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.962

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     381.321     140.016     354.684    1154.956       0.330       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.247      17.846     554.364      46.000      21.542      32.400      10.858

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     375.558     140.016     400.810    1155.335       0.325       0.070

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.223      17.865     554.728     456.573       0.026       0.185

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     357.721       0.000     357.721    1156.472       0.309       0.050

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.921     555.820       0.000       0.060       0.074       0.108

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.761      19.152       1.038     566.505       7.815     325.224       2.521

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  48678.355       0.349     284.738  946668.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.924

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.509    2266.000      19.152     566.505       1.000       1.000       0.980
W Kg/sec =   47.04952

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.028    2168.283       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79627.609   81219.992       2.108     509.668     241.806     390.276       1.614

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   333.99    -0.12   333.99     0.29   346.64
 MEAN    15.91     0.00    -0.02   333.99    -0.12   333.99     0.29
 HUB     13.07     0.00    -0.02   333.99    -0.12   333.99     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.34    47.36    -0.02   362.27   492.82    18.08   557.19     0.43
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 MEAN    43.30    44.80    -1.50   314.67   458.95    18.08   557.19     0.40
 HUB     37.75    38.84    -1.09   258.45   422.38    18.08   557.19     0.36
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   369.11    99.28   355.51  1161.61     0.32
 MEAN    15.50   375.32   119.31   355.85  1161.43     0.32
 HUB     12.59   400.36   181.86   356.67  1161.20     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   437.78   255.48     0.38  1783.18
 MEAN   306.46   402.06   187.15     0.35  1850.78     1.23
 HUB    248.96   362.92    67.10     0.31  2291.17

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.72     1.03    18.39   572.17     1.01   560.79     0.92     0.85
 MEAN    19.74     1.03    18.36   572.38     1.01   560.62     0.92     0.85
 HUB     19.89     1.04    18.32   573.78     1.01   560.40     0.92     0.85

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.60    35.70    31.50     4.20     0.93     0.15     2.90
 MEAN    18.53    27.74    23.50     4.24     0.90     0.16     3.34     0.85
 HUB     27.02    10.65     6.50     4.15     0.90     0.19     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.924

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      378.840     121.493     358.830    1161.612       0.326       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.756      18.351      560.792       46.000      18.705      33.000      14.295

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      384.751     121.493     403.477    1161.221       0.331       -0.077

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       19.689       18.246     560.416     440.827       0.067       0.157

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      360.501       0.000     360.501    1162.783       0.310       0.020

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       18.379      561.924       0.000       0.060       0.096       0.016

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4       Texit         Del T       Ns         Ns nondim
      0.664       19.648        1.026     572.775       6.270     378.802       2.936

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  39060.570       0.310     228.480 1000779.562

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    311160.03   1820.0946     101.1179      1.3006       0.8189       7.9529       1.0956
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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 60% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.995

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      99.590    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   45.26799

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      97.289    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.935     831.557     283.327     619.754       2.187

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   225.65    -0.08   225.65     0.20   406.33
  MEAN    17.06     0.00    -0.02   225.65    -0.08   225.65     0.20
  HUB     12.51     0.00    -0.02   225.65    -0.08   225.65     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.06    50.47    10.59   407.95   466.27    14.68   518.56     0.42
  MEAN    56.23    47.20     9.03   337.36   405.93    14.68   518.56     0.36
  HUB     47.64    38.62     9.02   247.38   334.90    14.68   518.56     0.30

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   391.93   242.30   308.05  1124.94     0.35
  MEAN    18.04   406.94   262.95   310.57  1122.99     0.36
  HUB     15.00   454.96   328.31   314.96  1119.90     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   349.77   165.65     0.31  5000.22
  MEAN   356.65   324.40    93.71     0.29  4743.87     1.41
  HUB    296.62   316.55    31.69     0.28  4925.55

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.62     1.10    15.28   538.69     1.03   525.86     0.92     0.91
  MEAN    16.54     1.09    15.10   537.88     1.03   524.05     0.92     0.91
  HUB     16.59     1.10    14.81   538.46     1.03   521.17     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     38.19    28.27    24.20     4.07     0.93     0.34     2.90
  MEAN    40.25    16.79    12.70     4.09     0.93     0.30     3.51     0.91
  HUB     46.19    -5.74    -9.30     3.56     0.93     0.17     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     412.441     262.437     318.173    1123.084       0.367      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.566      15.091     524.135      24.000      39.517      35.400      -4.117

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     341.927     262.437     431.031    1127.834       0.303       0.310
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.556      15.532     528.578     528.796       0.017       0.442

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     317.759       0.000     317.759    1129.254       0.281       0.356

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.632     529.910       0.000       0.060       0.042       0.376

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.872      16.517       1.093     538.343      15.533     201.502       1.562

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96707.609       0.581     544.261  948857.062


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.999

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    99.590    2266.000      16.517     538.343       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    90.297    2224.275       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.246     590.487     262.964     474.134       1.803

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   303.99    -0.10   303.99     0.27   398.87
 MEAN    18.08     0.00    -0.02   303.99    -0.10   303.99     0.27
 HUB     15.21     0.00    -0.02   303.99    -0.10   303.99     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.21    46.36     6.85   406.37   507.57    15.71   530.63     0.45
 MEAN    49.63    42.30     7.33   357.49   469.35    15.71   530.63     0.42
 HUB     44.70    37.84     6.86   300.77   427.71    15.71   530.63     0.38

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   367.93   177.26   322.42  1138.39     0.32
 MEAN    18.01   375.47   189.80   323.97  1137.22     0.33
 HUB     15.22   406.03   242.27   325.83  1136.02     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   394.05   226.54     0.35  3621.79
 MEAN   356.14   364.17   166.34     0.32  3420.18     1.40
 HUB    301.03   331.08    58.76     0.29  3689.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.67     1.07    16.44   549.85     1.02   538.54     0.92     0.91
 MEAN    17.60     1.07    16.32   549.21     1.02   537.43     0.92     0.91
 HUB     17.69     1.07    16.20   550.06     1.02   536.29     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.80    35.09    31.50     3.59     0.93     0.28     2.90
 MEAN    30.36    27.18    23.50     3.68     0.93     0.29     3.30     0.91
 HUB     36.63    10.22     6.50     3.72     0.93     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     380.666     190.332     329.667    1137.400       0.335       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.642      16.324     537.602      46.000      30.000      30.600       0.600

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     338.402     190.332     388.255    1140.082       0.297       0.204

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.638      16.591     540.141     511.151       0.013       0.290

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     334.012       0.000     334.012    1140.342       0.293       0.197

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.588     540.387       0.000       0.060       0.037       0.202

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      17.607       1.066     549.704      11.361     249.151       1.931

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  70747.172       0.434     398.158  873308.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.995

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     99.590    2266.000      17.607     549.704       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     85.597    2201.169       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  76612.523   78144.609       2.188     545.479     249.281     429.765       1.724

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   315.88    -0.11   315.88     0.28   385.51
 MEAN    17.74      0.00    -0.02   315.88    -0.11   315.88     0.28
 HUB     15.05      0.00    -0.02   315.88    -0.11   315.88     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.49     46.36     5.13   396.88   507.32    16.69   541.37     0.44
 MEAN    48.00     43.40     4.60   350.77   472.12    16.69   541.37     0.41
 HUB     43.30     38.84     4.46   297.61   434.07    16.69   541.37     0.38

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   369.33   154.53   335.45  1148.37      0.32
 MEAN    17.51   377.89   172.00   336.48  1147.64      0.33
 HUB     14.85   409.49   231.40   337.85  1146.88      0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   410.84   237.20     0.36  3063.41
 MEAN   346.18   378.89   174.18     0.33  3013.07     1.34
 HUB    293.65   343.53    62.25     0.30  3437.91

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     18.62      1.06    17.33   559.43     1.02   548.04     0.92     0.91
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 MEAN    18.60     1.06    17.25   559.27     1.02   547.35     0.92     0.91
 HUB     18.74     1.06    17.16   560.62     1.02   546.62     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.73    35.27    31.50     3.77     0.93     0.24     2.90
 MEAN    27.08    27.37    23.50     3.87     0.92     0.25     3.28     0.91
 HUB     34.41    10.44     6.50     3.94     0.92     0.28     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     382.051     173.130     340.571    1147.894       0.333       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.639      17.261     547.586      46.000      26.947      31.500       4.553

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     354.516     173.130     394.532    1149.668       0.308       0.138

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.631      17.441     549.280     471.992       0.016       0.251

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     344.348       0.000     344.348    1150.288       0.299       0.148

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.470     549.873       0.000       0.060       0.044       0.158

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      18.592       1.056     559.775      10.071     267.171       2.071

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  62722.617       0.409     352.997  876843.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.978

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     99.590    2266.000      18.592     559.775       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     81.801    2181.279       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  76612.523   78144.609       2.155     513.330     238.230     401.059       1.683

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   324.12    -0.11   324.12     0.28   366.61
 MEAN    16.97     0.00    -0.02   324.12    -0.11   324.12     0.28
 HUB     14.32     0.00    -0.02   324.12    -0.11   324.12     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.61    46.36     3.25   380.86   500.20    17.59   551.00     0.43
 MEAN    46.01    43.80     2.21   335.59   466.64    17.59   551.00     0.41
 HUB     41.15    37.84     3.31   283.17   430.47    17.59   551.00     0.37

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   366.87   129.43   343.28  1156.97     0.32
 MEAN    16.57   374.75   148.81   343.93  1156.54     0.32
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 HUB     13.89   404.18   210.64   344.96  1156.07     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   421.11   243.91     0.36  2445.84
 MEAN   327.74   387.69   178.93     0.34  2468.32     1.29
 HUB    274.67   350.85    64.03     0.30  2927.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.41     1.04    18.10   567.54     1.01   556.30     0.92     0.90
 MEAN    19.42     1.04    18.05   567.61     1.01   555.89     0.92     0.90
 HUB     19.57     1.05    17.99   569.07     1.02   555.43     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.66    35.40    31.50     3.90     0.93     0.20     2.90
 MEAN    23.40    27.49    23.50     3.99     0.91     0.22     3.29     0.90
 HUB     31.41    10.51     6.50     4.01     0.91     0.25     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     369.080     149.651     337.380    1157.386       0.319       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.453      18.127     556.700      46.000      23.921      32.400       8.479

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     356.423     149.651     386.565    1158.182       0.308       0.108

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.438      18.201     557.466     456.573       0.021       0.217

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     339.375       0.000     339.375    1159.211       0.293       0.094

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.261     558.457       0.000       0.060       0.060       0.151

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.809      19.382       1.042     568.074       8.299     303.513       2.353

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  51694.625       0.371     290.932  905809.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.950

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2266.000      19.382     568.074       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     79.047    2165.287       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.214     509.668     230.212     390.276       1.695

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   317.08    -0.11   317.08     0.27   346.16
 MEAN    15.91     0.00    -0.02   317.08    -0.11   317.08     0.27
 HUB     13.07     0.00    -0.02   317.08    -0.11   317.08     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.81    47.36     1.45   362.27   481.51    18.40   559.68     0.41
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 MEAN    44.79    44.80    -0.01   314.67   446.79    18.40   559.68     0.39
 HUB     39.20    38.84     0.36   258.45   409.14    18.40   559.68     0.35
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   354.98   113.43   336.37  1164.95     0.30
 MEAN    15.50   361.08   129.61   337.01  1164.49     0.31
 HUB     12.59   385.66   185.68   338.02  1163.98     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   413.98   241.33     0.36  2036.92
 MEAN   306.46   380.59   176.85     0.33  2010.38     1.27
 HUB    248.96   343.89    63.28     0.30  2339.12

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.06     1.03    18.81   574.54     1.01   564.02     0.92     0.87
 MEAN    20.05     1.03    18.76   574.46     1.01   563.57     0.92     0.87
 HUB     20.16     1.04    18.68   575.50     1.01   563.08     0.92     0.87

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.64    35.66    31.50     4.16     0.93     0.18     2.90
 MEAN    21.04    27.69    23.50     4.19     0.90     0.19     3.34     0.87
 HUB     28.78    10.60     6.50     4.10     0.90     0.21     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.950

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      364.517     131.987     339.783    1164.658       0.313       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.063      18.744      563.738      46.000      21.228      33.000      11.772

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      363.155     131.987     386.397    1164.743       0.312       -0.027

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.018      18.712     563.821     440.827       0.053       0.188

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     340.423       0.000     340.423    1166.122       0.292       0.067

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.834     565.156       0.000       0.060       0.079       0.064

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.740      19.983       1.031     574.832       6.758     348.907       2.705

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  42101.520       0.335     236.943  956876.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    323973.56   1823.2903     97.2890      1.3228      0.8393      9.0280      1.0995
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 60% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      96.156    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   43.70718

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      93.935    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73970.969   75450.234       3.040     831.557     273.558     619.754       2.266

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   217.56    -0.07   217.56     0.19   406.33
  MEAN    17.06     0.00    -0.02   217.56    -0.07   217.56     0.19
  HUB     12.51     0.00    -0.02   217.56    -0.07   217.56     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.93    50.47    11.46   407.95   462.40    14.71   518.86     0.41
  MEAN    57.19    47.20     9.99   337.36   401.49    14.71   518.86     0.36
  HUB     48.68    38.62    10.06   247.38   329.49    14.71   518.86     0.29

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   386.93   248.50   296.59  1125.72     0.34
  MEAN    18.04   400.57   266.43   299.11  1123.67     0.36
  HUB     15.00   446.15   327.18   303.32  1120.56     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   336.73   159.45     0.30  5128.11
  MEAN   356.65   312.42    90.22     0.28  4806.68     1.45
  HUB    296.62   304.86    30.56     0.27  4908.61

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.65     1.10    15.34   539.10     1.03   526.60     0.92     0.91
  MEAN    16.55     1.10    15.16   538.08     1.03   524.68     0.92     0.91
  HUB     16.58     1.10    14.86   538.40     1.03   521.78     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     39.96    28.26    24.20     4.06     0.93     0.36     2.90
  MEAN    41.69    16.78    12.70     4.08     0.94     0.32     3.51     0.91
  HUB     47.17    -5.75    -9.30     3.55     0.94     0.19     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     405.700     265.916     306.400    1123.775       0.361      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.579      15.149     524.780      24.000      40.954      35.400      -5.554

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     328.906     265.916     422.954    1128.808       0.291       0.338
   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.567      15.617     529.492     528.796       0.018       0.465

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     305.882       0.000     305.882    1130.109       0.271       0.376

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.703     530.712       0.000       0.060       0.047       0.396

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.866      16.524       1.094     538.527      15.717     196.116       1.520

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  97853.297       0.588     531.720  914825.688


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.997

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    96.156    2266.000      16.524     538.527       1.000       1.000       0.980
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    87.161    2223.895       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73970.969   75450.234       2.326     590.487     253.831     474.134       1.868

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   292.71    -0.10   292.71     0.26   398.80
 MEAN    18.08     0.00    -0.02   292.71    -0.10   292.71     0.26
 HUB     15.21     0.00    -0.02   292.71    -0.10   292.71     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.24    46.36     7.88   406.37   500.89    15.77   531.37     0.44
 MEAN    50.70    42.30     8.40   357.49   462.11    15.77   531.37     0.41
 HUB     45.79    37.84     7.95   300.77   419.77    15.77   531.37     0.37

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   361.61   186.12   310.04  1139.60     0.32
 MEAN    18.01   368.34   196.25   311.70  1138.27     0.32
 HUB     15.22   397.75   244.59   313.65  1136.92     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   378.83   217.68     0.33  3802.57
 MEAN   356.14   350.31   159.88     0.31  3536.35     1.43
 HUB    301.03   318.69    56.44     0.28  3724.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.73     1.07    16.54   550.60     1.02   539.68     0.92     0.91
 MEAN    17.65     1.07    16.41   549.76     1.02   538.43     0.92     0.91
 HUB     17.71     1.07    16.27   550.36     1.02   537.15     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.98    35.07    31.50     3.57     0.93     0.31     2.90
 MEAN    32.20    27.16    23.50     3.66     0.93     0.31     3.30     0.91
 HUB     37.95    10.20     6.50     3.70     0.93     0.32     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     373.263     196.805     317.164    1138.459       0.328       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.684      16.413     538.604      46.000      31.820      30.600      -1.220

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     325.169     196.805     380.089    1141.420       0.285       0.235

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.680      16.710     541.410     511.151       0.013       0.317

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     320.972       0.000     320.972    1141.658       0.281       0.226

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.705     541.636       0.000       0.060       0.037       0.232

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      17.649       1.068     550.240      11.713     238.957       1.852

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  72937.234       0.447     396.330  840755.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     96.156    2266.000      17.649     550.240       1.000       1.000       0.980
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     82.489    2200.097       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  73970.969   75450.234       2.271     545.479     240.229     429.765       1.789

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   303.66    -0.10   303.66     0.27   385.32
 MEAN    17.74      0.00    -0.02   303.66    -0.10   303.66     0.27
 HUB     15.05      0.00    -0.02   303.66    -0.10   303.66     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.59     46.36     6.23   396.88   499.81    16.80   542.54     0.44
 MEAN    49.13     43.40     5.73   350.77   464.03    16.80   542.54     0.41
 HUB     44.43     38.84     5.59   297.61   425.26    16.80   542.54     0.37

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   361.41   164.41   321.85  1150.09      0.31
 MEAN    17.51   369.43   179.19   323.06  1149.18      0.32
 HUB     14.85   400.15   234.05   324.56  1148.23      0.35

       U2        W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   394.04   227.33     0.34  3259.01
 MEAN   346.18   363.67   166.99     0.32  3138.94      1.38
 HUB    293.65   329.99    59.60     0.29  3477.24

         Pt2       PR       Ps2     Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     18.73      1.06    17.49   560.59      1.02   549.68      0.92     0.91
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 MEAN    18.69     1.06    17.40   560.21     1.02   548.81     0.92     0.91
 HUB     18.80     1.07    17.29   561.28     1.02   547.91     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.06    35.23    31.50     3.73     0.93     0.27     2.90
 MEAN    29.02    27.33    23.50     3.83     0.92     0.27     3.28     0.91
 HUB     35.80    10.41     6.50     3.91     0.92     0.29     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     373.423     180.370     326.973    1149.423       0.325       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.728      17.406     549.048      46.000      28.883      31.500       2.617

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     339.841     180.370     384.741    1151.515       0.295       0.172

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.723      17.623     551.048     471.992       0.014       0.278

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     330.072       0.000     330.072    1152.086       0.286       0.182

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.652     551.595       0.000       0.060       0.039       0.193

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.871      18.688       1.059     560.693      10.453     254.744       1.975

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  65100.805       0.424     353.748  843517.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.989

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     96.156     2266.000       18.688     560.693       1.000        1.000        0.980
W Kg/sec =   43.70718

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     78.636     2179.493        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  73970.969   75450.234        2.241     513.330     229.013     401.059       1.751

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   310.83    -0.11   310.83      0.27   366.31
 MEAN    16.97      0.00    -0.02   310.83    -0.11   310.83      0.27
 HUB     14.32      0.00    -0.02   310.83    -0.11   310.83      0.27

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     50.79    46.36     4.43   380.86   491.68     17.77   552.63      0.43
 MEAN    47.20    43.80     3.40   335.59   457.50     17.77   552.63      0.40
 HUB     42.34    37.84     4.50   283.17   420.55     17.77   552.63      0.36

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2      Ao2          Mach2
 TIP     18.88   357.12   140.28   328.41  1159.21      0.31
 MEAN    16.57   364.67   156.71   329.29  1158.57      0.31
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 HUB     13.89   393.48   213.57   330.47  1157.89     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   402.70   233.06     0.35  2650.62
 MEAN   327.74   371.05   171.03     0.32  2599.14     1.33
 HUB    274.67   336.07    61.09     0.29  2968.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.59     1.05    18.34   569.11     1.02   558.46     0.92     0.90
 MEAN    19.57     1.05    18.27   568.94     1.01   557.84     0.92     0.90
 HUB     19.70     1.05    18.18   570.12     1.02   557.19     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.13    35.36    31.50     3.86     0.93     0.23     2.90
 MEAN    25.45    27.45    23.50     3.95     0.92     0.24     3.29     0.90
 HUB     32.87    10.47     6.50     3.97     0.92     0.27     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     359.456     157.593     323.068    1159.359       0.310       0.051

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.606      18.340     558.601      46.000      26.003      32.400       6.397

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     340.704     157.593     375.386    1160.496       0.294       0.142

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.597      18.457     559.697     456.573       0.017       0.245

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     324.347       0.000     324.347    1161.437       0.279       0.132

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.519     560.605       0.000       0.060       0.050       0.188

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.839      19.551       1.046     569.390       8.697     286.958       2.224

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  54175.062       0.389     294.379  870688.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.968

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     96.156    2266.000      19.551     569.390       1.000       1.000       0.980
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     75.747    2162.784       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73970.969   75450.234       2.310     509.668     220.601     390.276       1.769

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   303.20    -0.10   303.20     0.26   345.76
 MEAN    15.91     0.00    -0.02   303.20    -0.10   303.20     0.26
 HUB     13.07     0.00    -0.02   303.20    -0.10   303.20     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.08    47.36     2.72   362.27   472.49    18.65   561.71     0.41
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MEAN    46.07    44.80     1.27   314.67   437.05    18.65   561.71     0.38
HUB     40.46    38.84     1.62   258.45   398.47    18.65   561.71     0.34
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   344.28   124.94   320.81  1167.62     0.29
MEAN    15.50   350.01   137.97   321.67  1166.94     0.30
HUB     12.59   373.97   188.80   322.81  1166.23     0.32

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    354.76   394.63   229.82     0.34  2243.35
MEAN   306.46   363.12   168.49     0.31  2139.79     1.31
HUB    248.96   328.37    60.16     0.28  2378.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.32     1.04    19.13   576.51     1.01   566.62     0.92     0.89
MEAN    20.28     1.04    19.05   576.18     1.01   565.95     0.92     0.89
HUB     20.36     1.04    18.96   576.94     1.01   565.26     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     21.28    35.62    31.50     4.12     0.93     0.21     2.90
MEAN    23.21    27.65    23.50     4.15     0.91     0.22     3.34     0.89
HUB     30.32    10.56     6.50     4.06     0.91     0.23     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.968

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     353.405     140.495     324.277    1167.110       0.303       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.295      19.043     566.117      46.000      23.425      33.000       9.575

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     345.759     140.495     373.213    1167.570       0.296       0.017

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.266      19.068     566.563     440.827       0.043       0.217

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     324.214       0.000     324.214    1168.812       0.277       0.109

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      19.182     567.768       0.000       0.060       0.066       0.106

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.790      20.237       1.035     576.545       7.155     326.886       2.534

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  44574.617       0.354     242.212  919284.938

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    334641.03   1818.3898     93.9346      1.3396      0.8507      9.9879      1.1028
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 60% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.987

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      92.762    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   42.16433

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      90.619    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  71359.812   72786.852       3.151     831.557     263.901     619.754       2.348

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   209.60    -0.07   209.60     0.19   406.33
  MEAN    17.06     0.00    -0.02   209.60    -0.07   209.60     0.19
  HUB     12.51     0.00    -0.02   209.60    -0.07   209.60     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.81    50.47    12.34   407.95   458.71    14.74   519.14     0.41
  MEAN    58.15    47.20    10.95   337.36   397.23    14.74   519.14     0.36
  HUB     49.73    38.62    11.11   247.38   324.29    14.74   519.14     0.29

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   382.39   254.50   285.40  1126.45     0.34
  MEAN    18.04   394.57   269.81   287.91  1124.30     0.35
  HUB     15.00   437.62   326.01   291.94  1121.17     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   324.04   153.45     0.29  5251.84
  MEAN   356.65   300.72    86.85     0.27  4867.47     1.50
  HUB    296.62   293.42    29.39     0.26  4890.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.68     1.10    15.40   539.49     1.03   527.28     0.92     0.90
  MEAN    16.56     1.10    15.21   538.27     1.03   525.27     0.92     0.90
  HUB     16.57     1.10    14.91   538.35     1.03   522.35     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     41.72    28.27    24.20     4.07     0.93     0.39     2.90
  MEAN    43.14    16.79    12.70     4.09     0.94     0.34     3.51     0.90
  HUB     48.16    -5.75    -9.30     3.55     0.94     0.21     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     399.348     269.283     294.899    1124.421       0.355      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.589      15.202     525.384      24.000      42.400      35.400      -7.000

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     316.235     269.283     415.352    1129.724       0.280       0.365
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.574      15.695     530.351     528.796       0.020       0.488

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     294.320       0.000     294.320    1130.914       0.260       0.395

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.766     531.469       0.000       0.060       0.053       0.415

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      16.527       1.094     538.704      15.894     190.885       1.480

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98953.383       0.595     518.717  881331.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     92.762    2266.000      16.527     538.704       1.000       1.000       0.980
W Kg/sec =   42.16433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     84.081    2223.530       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  71359.812   72786.852       2.411     590.487     244.863     474.134       1.936

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   281.72    -0.10   281.72     0.25   398.74
 MEAN    18.08     0.00    -0.02   281.72    -0.10   281.72     0.25
 HUB     15.21     0.00    -0.02   281.72    -0.10   281.72     0.25

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.27    46.36     8.91   406.37   494.55    15.83   532.08     0.44
 MEAN    51.77    42.30     9.47   357.49   455.23    15.83   532.08     0.40
 HUB     46.88    37.84     9.04   300.77   412.17    15.83   532.08     0.36

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   356.00   194.64   298.08  1140.72     0.31
 MEAN    18.01   361.79   202.49   299.82  1139.26     0.32
 HUB     15.22   389.93   246.85   301.84  1137.76     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   364.14   209.16     0.32  3976.52
 MEAN   356.14   336.90   153.65     0.30  3648.55     1.47
 HUB    301.03   306.67    54.18     0.27  3759.20

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.79     1.08    16.63   551.33     1.02   540.75     0.92     0.91
 MEAN    17.68     1.07    16.49   550.29     1.02   539.36     0.92     0.91
 HUB     17.72     1.07    16.33   550.64     1.02   537.95     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.14    35.06    31.50     3.56     0.93     0.33     2.90
 MEAN    34.03    27.13    23.50     3.63     0.94     0.33     3.30     0.91
 HUB     39.28    10.18     6.50     3.68     0.94     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     366.464     203.056     305.064    1139.447       0.322       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.718      16.491     539.540      46.000      33.648      30.600      -3.048

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     312.411     203.056     372.603    1142.678       0.273       0.267

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.713      16.815     542.605     511.151       0.014       0.344

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     308.432       0.000     308.432    1142.895       0.270       0.253

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.807     542.811       0.000       0.060       0.040       0.260

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      17.680       1.070     550.756      12.052     229.460       1.779

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  75049.359       0.460     393.412  808871.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     92.762    2266.000      17.680     550.756       1.000       1.000       0.980
W Kg/sec =   42.16433

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     79.472    2199.067       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  71359.812   72786.852       2.357     545.479     231.443     429.765       1.857

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   291.90    -0.10   291.90     0.26   385.14
 MEAN    17.74      0.00    -0.02   291.90    -0.10   291.90     0.26
 HUB     15.05      0.00    -0.02   291.90    -0.10   291.90     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.67     46.36      7.31   396.88   492.74     16.90   543.64     0.43
 MEAN    50.24     43.40      6.84   350.77   456.42     16.90   543.64     0.40
 HUB     45.56     38.84      6.72   297.61   416.94     16.90   543.64     0.36

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   354.41    173.75    308.89  1151.68      0.31
 MEAN    17.51   361.72    186.00    310.24  1150.60      0.31
 HUB     14.85   391.44    236.59    311.85  1149.50      0.34

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73    378.06    217.98     0.33  3444.07
 MEAN   346.18    349.15    160.18     0.30  3258.07     1.42
 HUB    293.65    317.03     57.07     0.28  3514.80

         Pt2       PR       Ps2      Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     18.83      1.06     17.63   561.69      1.02   551.20      0.92      0.91
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 MEAN    18.76     1.06    17.52   561.10     1.02   550.18     0.92     0.91
 HUB     18.85     1.07    17.40   561.92     1.02   549.12     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.36    35.21    31.50     3.71     0.93     0.29     2.90
 MEAN    30.94    27.31    23.50     3.81     0.93     0.30     3.28     0.91
 HUB     37.19    10.37     6.50     3.87     0.93     0.31     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     365.569     187.224     313.987    1150.847       0.318       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.800      17.529     550.410      46.000      30.807      31.500       0.693

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     325.898     187.224     375.849    1153.239       0.283       0.206

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.797      17.782     552.701     471.992       0.013       0.306

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     316.546       0.000     316.546    1153.762       0.274       0.215

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.808     553.203       0.000       0.060       0.037       0.226

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.877      18.766       1.061     561.570      10.814     243.469       1.887

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  67353.883       0.439     353.072  810973.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.995

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     92.762     2266.000       18.766     561.570       1.000        1.000        0.980
W Kg/sec =   42.16433

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     75.608     2177.790        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  71359.812   72786.852        2.331     513.330     220.194     401.059       1.821

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   298.22    -0.10   298.22      0.26   366.02
 MEAN    16.97      0.00    -0.02   298.22    -0.10   298.22      0.26
 HUB     14.32      0.00    -0.02   298.22    -0.10   298.22      0.26

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     51.95     46.36      5.59   380.86   483.80     17.91   554.14      0.42
 MEAN    48.38     43.80      4.58   335.59   449.02     17.91   554.14      0.39
 HUB     43.53     37.84      5.69   283.17   411.31     17.91   554.14      0.36

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   348.60   150.47   314.45  1161.27      0.30
 MEAN    16.57   355.65   164.15   315.50  1160.45      0.31
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HUB     13.89   383.62   216.33   316.81  1159.59     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    373.34   385.42   222.87     0.33  2842.94
MEAN   327.74   355.39   163.59     0.31  2722.40     1.37
HUB    274.67   322.14    58.34     0.28  3006.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.74     1.05    18.54   570.60     1.02   560.45     0.92     0.91
MEAN    19.70     1.05    18.46   570.21     1.02   559.65     0.92     0.91
HUB     19.80     1.06    18.35   571.11     1.02   558.83     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.57    35.33    31.50     3.83     0.93     0.26     2.90
MEAN    27.49    27.41    23.50     3.91     0.92     0.26     3.29     0.91
HUB     34.33    10.43     6.50     3.93     0.92     0.28     3.90

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     350.853     165.076     309.593    1161.183       0.302       0.051

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.733      18.521     560.363      46.000      28.067      32.400       4.333

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     325.984     165.076     365.398    1162.639       0.280       0.176

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.728      18.679     561.768     456.573       0.014       0.274

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     310.315       0.000     310.315    1163.500       0.267       0.169

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.740     562.601       0.000       0.060       0.043       0.223

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.860      19.691       1.049     570.642       9.071     272.330       2.111

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  56506.805       0.405     296.211  836516.812


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    92.762    2266.000      19.691     570.642       1.000       1.000       0.980
W Kg/sec =   42.16433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    72.635    2160.411       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 71359.812   72786.852       2.409     509.668     211.538     390.276       1.845

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   290.21    -0.10   290.21     0.25   345.38
MEAN    15.91     0.00    -0.02   290.21    -0.10   290.21     0.25
HUB     13.07     0.00    -0.02   290.21    -0.10   290.21     0.25

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.31    47.36     3.95   362.27   464.26    18.86   563.61     0.40
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 MEAN    47.32    44.80     2.52   314.67   428.14    18.86   563.61     0.37
 HUB     41.70    38.84     2.86   258.45   388.68    18.86   563.61     0.33
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   335.05   135.59   306.38  1170.07     0.29
 MEAN    15.50   340.21   145.74   307.41  1169.20     0.29
 HUB     12.59   363.36   191.70   308.68  1168.31     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   376.70   219.16     0.32  2434.35
 MEAN   306.46   346.89   160.72     0.30  2260.21     1.34
 HUB    248.96   313.94    57.26     0.27  2414.83

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.54     1.04    19.40   578.37     1.01   569.00     0.92     0.90
 MEAN    20.48     1.04    19.31   577.82     1.01   568.15     0.92     0.90
 HUB     20.53     1.04    19.20   578.31     1.01   567.28     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.87    35.58    31.50     4.08     0.93     0.24     2.90
 MEAN    25.36    27.60    23.50     4.10     0.91     0.24     3.34     0.90
 HUB     31.84    10.51     6.50     4.01     0.91     0.25     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      343.593     148.412     309.887    1169.364       0.294       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.492      19.299      568.308       46.000      25.591      33.000       7.409

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      329.748     148.412     361.607    1170.164       0.282        0.059

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       20.474      19.374     569.086     440.827       0.034        0.246

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      309.282       0.000     309.282    1171.286       0.264        0.150

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       19.481     570.178       0.000       0.060       0.055        0.147

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit         Del T        Ns         Ns nondim
      0.827       20.450       1.039      578.164       7.523      308.001        2.388

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  46867.840       0.372     245.683  882811.188

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    344731.28   1807.0945      90.6187      1.3536       0.8567      10.9534       1.1059
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 60% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.980

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      89.191    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   40.54142

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      87.131    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  68613.172   69985.281       3.277     831.557     253.744     619.754       2.442

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   201.25    -0.07   201.25     0.18   406.33
  MEAN    17.06     0.00    -0.02   201.25    -0.07   201.25     0.18
  HUB     12.51     0.00    -0.02   201.25    -0.07   201.25     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.75    50.47    13.28   407.95   454.95    14.77   519.43     0.41
  MEAN    59.19    47.20    11.99   337.36   392.89    14.77   519.43     0.35
  HUB     50.88    38.62    12.26   247.38   318.96    14.77   519.43     0.29

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   378.04   260.69   273.77  1127.18     0.34
  MEAN    18.04   388.58   273.28   276.25  1124.93     0.35
  HUB     15.00   428.89   324.80   280.09  1121.79     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   310.86   147.26     0.28  5379.48
  MEAN   356.65   288.56    83.37     0.26  4930.11     1.55
  HUB    296.62   281.50    28.18     0.25  4872.87

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.71     1.11    15.46   539.90     1.03   527.96     0.92     0.90
  MEAN    16.57     1.10    15.26   538.47     1.03   525.86     0.92     0.90
  HUB     16.55     1.10    14.96   538.29     1.03   522.93     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     43.60    28.28    24.20     4.08     0.93     0.42     2.90
  MEAN    44.69    16.79    12.70     4.09     0.94     0.37     3.51     0.90
  HUB     49.23    -5.75    -9.30     3.55     0.94     0.23     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     392.992     272.751     282.930    1125.066       0.349      -0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.597      15.252     525.987      24.000      43.951      35.400      -8.551

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     303.095     272.751     407.750    1130.642       0.268       0.394
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.580      15.771     531.213     528.796       0.023       0.513

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     282.322       0.000     282.322    1131.722       0.249       0.414

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.826     532.229       0.000       0.060       0.060       0.434

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.849      16.527       1.094     538.886      16.076     185.454       1.438

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 100088.438       0.601     504.473  846247.312


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    89.191    2266.000      16.527     538.886       1.000       1.000       0.980
W Kg/sec =   40.54142

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    80.859    2223.154       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  68613.172   69985.281       2.508     590.487     235.480     474.134       2.013

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   270.30    -0.09   270.30     0.24   398.67
 MEAN    18.08     0.00    -0.02   270.30    -0.09   270.30     0.24
 HUB     15.21     0.00    -0.02   270.30    -0.09   270.30     0.24

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.38    46.36    10.02   406.37   488.13    15.88   532.78     0.43
 MEAN    52.91    42.30    10.61   357.49   448.25    15.88   532.78     0.40
 HUB     48.06    37.84    10.22   300.77   404.45    15.88   532.78     0.36

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   350.74   203.37   285.76  1141.84     0.31
 MEAN    18.01   355.39   208.84   287.55  1140.24     0.31
 HUB     15.22   382.02   249.12   289.62  1138.61     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   349.05   200.43     0.31  4154.65
 MEAN   356.14   323.08   147.29     0.28  3762.95     1.52
 HUB    301.03   294.24    51.91     0.26  3793.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.84     1.08    16.71   552.08     1.02   541.81     0.92     0.90
 MEAN    17.71     1.07    16.56   550.84     1.02   540.29     0.92     0.90
 HUB     17.72     1.07    16.39   550.93     1.02   538.75     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.44    35.05    31.50     3.55     0.93     0.36     2.90
 MEAN    35.99    27.12    23.50     3.62     0.94     0.35     3.30     0.90
 HUB     40.70    10.16     6.50     3.66     0.94     0.35     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     359.806     209.430     292.573    1140.430       0.316       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.746      16.561     540.473      46.000      35.596      30.600      -4.996

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     299.290     209.430     365.288    1143.939       0.262       0.300

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.740      16.914     543.804     511.151       0.015       0.373

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     295.563       0.000     295.563    1144.133       0.258       0.281

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.900     543.989       0.000       0.060       0.045       0.288

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      17.704       1.071     551.284      12.398     220.039       1.706

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  77205.188       0.474     389.135  775624.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.998

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     89.191    2266.000      17.704     551.284       1.000       1.000       0.980
W Kg/sec =   40.54142

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     76.349    2198.012       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  68613.172   69985.281       2.453     545.479     222.348     429.765       1.933

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   279.82    -0.10   279.82     0.24   384.96
 MEAN    17.74     0.00    -0.02   279.82    -0.10   279.82     0.24
 HUB     15.05     0.00    -0.02   279.82    -0.10   279.82     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.82    46.36     8.46   396.88   485.68    16.98   544.75     0.42
 MEAN    51.43    43.40     8.03   350.77   448.78    16.98   544.75     0.39
 HUB     46.77    38.84     7.93   297.61   408.57    16.98   544.75     0.36

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   347.89   183.25   295.71  1153.25     0.30
 MEAN    17.51   354.30   192.94   297.16  1152.02     0.31
 HUB     14.85   382.75   239.13   298.86  1150.76     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   361.81   208.48     0.31  3632.20
 MEAN   346.18   334.35   153.25     0.29  3379.37     1.46
 HUB    293.65   303.79    54.52     0.26  3552.53

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.91     1.07    17.75   562.82     1.02   552.71     0.92     0.91
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 MEAN    18.83     1.06    17.63   562.02     1.02   551.53     0.92     0.91
 HUB     18.89     1.07    17.49   562.57     1.02   550.33     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.79    35.18    31.50     3.68     0.93     0.32     2.90
 MEAN    32.99    27.28    23.50     3.78     0.93     0.32     3.28     0.91
 HUB     38.66    10.34     6.50     3.84     0.93     0.33     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     357.998     194.203     300.746    1152.259       0.311       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.862      17.640     551.764      46.000      32.852      31.500      -1.352

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     311.742     194.203     367.284    1154.957       0.270       0.242

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.859      17.927     554.351     471.992       0.012       0.336

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     302.851       0.000     302.851    1155.432       0.262       0.247

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.949     554.807       0.000       0.060       0.037       0.259

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      18.828       1.064     562.466      11.182     232.477       1.802

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  69642.281       0.454     351.016  777127.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     89.191    2266.000      18.828     562.466       1.000       1.000       0.980
W Kg/sec =   40.54142

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     72.514    2176.055       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  68613.172   69985.281       2.431     513.330     211.183     401.059       1.899

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   285.43    -0.10   285.43     0.25   365.73
 MEAN    16.97     0.00    -0.02   285.43    -0.10   285.43     0.25
 HUB     14.32     0.00    -0.02   285.43    -0.10   285.43     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.16    46.36     6.80   380.86   476.02    18.05   555.66     0.41
 MEAN    49.63    43.80     5.83   335.59   440.63    18.05   555.66     0.38
 HUB     44.78    37.84     6.94   283.17   402.13    18.05   555.66     0.35

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   340.70   160.69   300.43  1163.30     0.29
 MEAN    16.57   347.01   171.58   301.62  1162.30     0.30
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 HUB     13.89   373.94   219.06   303.05  1161.28     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   368.08   212.66     0.32  3035.66
 MEAN   327.74   339.65   156.16     0.29  2845.43     1.41
 HUB    274.67   308.11    55.60     0.27  3044.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.88     1.06    18.73   572.10     1.02   562.41     0.92     0.91
 MEAN    19.81     1.05    18.62   571.50     1.02   561.45     0.92     0.91
 HUB     19.88     1.06    18.50   572.13     1.02   560.46     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.14    35.29    31.50     3.79     0.93     0.28     2.90
 MEAN    29.63    27.37    23.50     3.87     0.92     0.29     3.29     0.91
 HUB     35.86    10.40     6.50     3.90     0.92     0.30     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     342.646     172.546     296.030    1162.987       0.295       0.049

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.844      18.682     562.108      46.000      30.236      32.400       2.164

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     311.245     172.546     355.873    1164.759       0.267       0.212

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.841      18.879     563.823     456.573       0.012       0.305

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     296.303       0.000     296.303    1165.542       0.254       0.206

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.937     564.581       0.000       0.060       0.038       0.259

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      19.809       1.052     571.912       9.445     258.467       2.004

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  58838.895       0.422     296.564  801085.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     89.191    2266.000      19.809     571.912       1.000       1.000       0.980
W Kg/sec =   40.54142

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     69.501    2158.010       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  68613.172   69985.281       2.518     509.668     202.411     390.276       1.928

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   277.23    -0.10   277.23     0.24   345.00
 MEAN    15.91     0.00    -0.02   277.23    -0.10   277.23     0.24
 HUB     13.07     0.00    -0.02   277.23    -0.10   277.23     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.58    47.36     5.22   362.27   456.25    19.04   565.50     0.39
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 MEAN    48.63    44.80     3.83   314.67   419.45    19.04   565.50     0.36
 HUB     43.00    38.84     4.16   258.45   379.08    19.04   565.50     0.32
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   326.61   146.13   292.09  1172.47     0.28
 MEAN    15.50   330.97   153.42   293.26  1171.43     0.28
 HUB     12.59   353.06   194.54   294.63  1170.36     0.30

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   358.95   208.62     0.31  2623.35
 MEAN   306.46   330.79   153.04     0.28  2379.14     1.38
 HUB    248.96   299.61    54.42     0.26  2450.49

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.74     1.05    19.65   580.24     1.01   571.33     0.92     0.91
 MEAN    20.65     1.04    19.53   579.46     1.01   570.32     0.92     0.91
 HUB     20.67     1.04    19.41   579.69     1.01   569.28     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.58    35.54    31.50     4.04     0.93     0.27     2.90
 MEAN    27.62    27.56    23.50     4.06     0.92     0.27     3.34     0.91
 HUB     33.44    10.47     6.50     3.97     0.92     0.27     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     334.352     156.232     295.606    1171.577       0.285       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.664      19.526     570.464      46.000      27.857      33.000       5.143

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     313.980     156.232     350.702    1172.708       0.268       0.103

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.654      19.649     571.567     440.827       0.028       0.277

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     294.572       0.000     294.572    1173.720       0.251       0.192

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.748     572.553       0.000       0.060       0.046       0.189

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854      20.634       1.042     579.798       7.886     290.564       2.252

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  49132.555       0.390     247.641  845082.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    354907.38   1788.8293     87.1308      1.3658      0.8579     11.9868      1.1090
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    P&W Fan Hub + 4 Stage LPC 60% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.974

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      85.685    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   38.94787

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      83.706    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  65916.203   67234.383       3.411     831.557     243.770     619.754       2.542

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   193.09    -0.07   193.09     0.17   406.33
  MEAN    17.06     0.00    -0.02   193.09    -0.07   193.09     0.17
  HUB     12.51     0.00    -0.02   193.09    -0.07   193.09     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.67    50.47    14.20   407.95   451.40    14.80   519.70     0.40
  MEAN    60.22    47.20    13.02   337.36   388.77    14.80   519.70     0.35
  HUB     52.03    38.62    13.41   247.38   313.87    14.80   519.70     0.28

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   374.15   266.63   262.48  1127.85     0.33
  MEAN    18.04   382.99   276.60   264.91  1125.52     0.34
  HUB     15.00   420.46   323.53   268.55  1122.36     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   298.11   141.32     0.26  5502.01
  MEAN   356.65   276.74    80.05     0.25  4989.90     1.60
  HUB    296.62   269.90    26.91     0.24  4853.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.73     1.11    15.51   540.29     1.03   528.60     0.92     0.89
  MEAN    16.58     1.10    15.30   538.66     1.03   526.41     0.92     0.89
  HUB     16.54     1.09    15.01   538.23     1.03   523.46     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     45.45    28.30    24.20     4.10     0.93     0.44     2.90
  MEAN    46.24    16.81    12.70     4.11     0.94     0.39     3.51     0.89
  HUB     50.30    -5.72    -9.30     3.58     0.94     0.26     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     387.055     276.063     271.295    1125.664       0.344      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.603      15.297     526.546      24.000      45.499      35.400     -10.099

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     290.363     276.063     400.651    1131.497       0.257       0.422
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.582      15.839     532.017     528.796       0.025       0.539

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     270.685       0.000     270.685    1132.477       0.239       0.432

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.879     532.939       0.000       0.060       0.069       0.452

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.838      16.524       1.094     539.059      16.249     180.205       1.397

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 101164.203       0.608     489.853  811938.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    85.685    2266.000      16.524     539.059       1.000       1.000       0.980
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    77.709    2222.797       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 65916.203   67234.383       2.609     590.487     226.308     474.134       2.095

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP    20.55     0.00    -0.02   259.21    -0.09   259.21     0.23   398.61
 MEAN   18.08     0.00    -0.02   259.21    -0.09   259.21     0.23
 HUB    15.21     0.00    -0.02   259.21    -0.09   259.21     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP    57.47    46.36    11.11   406.37   482.08    15.93   533.45     0.43
 MEAN   54.06    42.30    11.76   357.49   441.65    15.93   533.45     0.39
 HUB    49.25    37.84    11.41   300.77   397.13    15.93   533.45     0.35

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP    20.42   346.19   211.73   273.89  1142.87     0.30
 MEAN   18.01   349.60   214.95   275.71  1141.15     0.31
 HUB    15.22   374.58   251.27   277.79  1139.40     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP   403.80   334.52   192.06     0.29  4325.42
 MEAN  356.14   309.75   141.19     0.27  3872.92     1.56
 HUB   301.03   282.21    49.75     0.25  3826.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    17.88     1.08    16.78   552.80     1.03   542.79     0.92     0.90
 MEAN   17.74     1.07    16.62   551.36     1.02   541.15     0.92     0.90
 HUB    17.72     1.07    16.44   551.21     1.02   539.49     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    37.71    35.04    31.50     3.54     0.93     0.38     2.90
 MEAN   37.94    27.12    23.50     3.62     0.94     0.37     3.30     0.90
 HUB    42.13    10.15     6.50     3.65     0.94     0.37     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     353.769     215.557     280.513    1141.340       0.310       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.768      16.621     541.337      46.000      37.540      30.600      -6.940

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     286.660     215.557     358.663    1145.118       0.250       0.333

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.759      17.000     544.927     511.151       0.017       0.403

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     283.198       0.000     283.198    1145.291       0.247       0.306

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.979     545.091       0.000       0.060       0.053       0.315

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.856      17.718       1.072     551.789      12.730     211.252       1.638

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79272.414       0.486     383.849  743251.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.995

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     85.685    2266.000      17.718     551.789       1.000       1.000       0.980
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     73.323    2197.007       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  65916.203   67234.383       2.554     545.479     213.537     429.765       2.013

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   268.19    -0.09   268.19     0.23   384.78
 MEAN    17.74     0.00    -0.02   268.19    -0.09   268.19     0.23
 HUB     15.05     0.00    -0.02   268.19    -0.09   268.19     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.96    46.36     9.60   396.88   479.07    17.05   545.78     0.42
 MEAN    52.61    43.40     9.21   350.77   441.63    17.05   545.78     0.39
 HUB     47.98    38.84     9.14   297.61   400.69    17.05   545.78     0.35

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   342.25   192.28   283.14  1154.70     0.30
 MEAN    17.51   347.63   199.55   284.66  1153.33     0.30
 HUB     14.85   374.65   241.51   286.42  1151.94     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   346.34   199.46     0.30  3810.84
 MEAN   346.18   320.21   146.63     0.28  3495.07     1.50
 HUB    293.65   291.13    52.15     0.25  3587.74

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     18.98     1.07    17.86   563.89     1.02   554.11     0.92     0.91
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 MEAN    18.88     1.07    17.72   562.89     1.02   552.80     0.92     0.91
 HUB     18.91     1.07    17.57   563.18     1.02   551.46     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.18    35.16    31.50     3.66     0.93     0.35     2.90
 MEAN    35.03    27.25    23.50     3.75     0.93     0.34     3.28     0.91
 HUB     40.14    10.32     6.50     3.82     0.93     0.35     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     351.203     200.860     288.095    1153.567       0.304       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.910      17.731     553.020      46.000      34.884      31.500      -3.384

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     298.272     200.860     359.598    1156.557       0.258       0.277

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.906      18.050     555.891     471.992       0.013       0.367

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     289.850       0.000     289.850    1156.987       0.251       0.278

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.065     556.304       0.000       0.060       0.041       0.290

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      18.873       1.065     563.320      11.531     222.412       1.724

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  71815.062       0.468     347.740  744246.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     85.685    2266.000      18.873     563.320       1.000       1.000       0.980
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     69.552    2174.405       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 65916.203   67234.383       2.534     513.330     202.557     401.059       1.980

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   273.27    -0.09   273.27     0.24   365.45
 MEAN    16.97     0.00    -0.02   273.27    -0.09   273.27     0.24
 HUB     14.32     0.00    -0.02   273.27    -0.09   273.27     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.35    46.36     7.99   380.86   468.83    18.15   557.08     0.40
 MEAN    50.85    43.80     7.05   335.59   432.85    18.15   557.08     0.37
 HUB     46.03    37.84     8.19   283.17   393.59    18.15   557.08     0.34

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   333.89   170.24   287.23  1165.17     0.29
 MEAN    16.57   339.32   178.57   288.53  1164.02     0.29
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HUB     13.89   365.04   221.65   290.04  1162.84     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    373.34   351.79   203.10     0.30  3215.96
MEAN   327.74   324.81   149.17     0.28  2961.15     1.45
HUB    274.67   294.85    53.02     0.25  3080.10

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.99     1.06    18.88   573.53     1.02   564.22     0.92     0.91
MEAN    19.90     1.05    18.76   572.72     1.02   563.11     0.92     0.91
HUB     19.94     1.06    18.62   573.10     1.02   561.97     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.65    35.26    31.50     3.76     0.93     0.31     2.90
MEAN    31.75    27.34    23.50     3.84     0.93     0.31     3.29     0.91
HUB     37.39    10.36     6.50     3.86     0.93     0.32     3.90

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     335.356     179.572     283.227    1164.655       0.288       0.048

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.929      18.813     563.726      46.000      32.376      32.400       0.024

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     297.393     179.572     347.402    1166.725       0.255       0.248

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.928      19.046     565.732     456.573       0.011       0.336

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    16.096     283.169       0.000     283.169    1167.436       0.243       0.240

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      19.098     566.421       0.000       0.060       0.037       0.291

   STAGE EXIT CONDITIONS, STAGE             4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.878      19.898       1.054     573.117       9.797     246.070       1.908

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  61027.215       0.438     295.503  766750.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    85.685    2266.000      19.898     573.117       1.000       1.000       0.980
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    66.541    2155.741       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 65916.203   67234.383       2.630     509.668     193.790     390.276       2.014

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   265.04    -0.09   265.04     0.23   344.63
MEAN    15.91     0.00    -0.02   265.04    -0.09   265.04     0.23
HUB     13.07     0.00    -0.02   265.04    -0.09   265.04     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.82    47.36     6.46   362.27   448.95    19.20   567.25     0.38
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 MEAN    49.90    44.80     5.10   314.67   411.49    19.20   567.25     0.35
 HUB     44.29    38.84     5.45   258.45   370.26    19.20   567.25     0.32
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   319.44   155.92   278.80  1174.67     0.27
 MEAN    15.50   322.82   160.55   280.07  1173.47     0.28
 HUB     12.59   343.69   197.17   281.51  1172.26     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   342.44   198.84     0.29  2798.87
 MEAN   306.46   315.80   145.91     0.27  2489.57     1.43
 HUB    248.96   286.24    51.80     0.24  2483.51

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.90     1.05    19.85   582.00     1.02   573.48     0.92     0.91
 MEAN    20.78     1.04    19.72   581.02     1.01   572.32     0.92     0.91
 HUB     20.78     1.04    19.58   581.00     1.01   571.14     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.22    35.50    31.50     4.00     0.93     0.30     2.90
 MEAN    29.82    27.52    23.50     4.02     0.92     0.29     3.34     0.91
 HUB     35.01    10.43     6.50     3.93     0.92     0.29     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     326.226     163.492     282.300    1173.614       0.278       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.799      19.711     572.455      46.000      30.077      33.000       2.923

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     299.388     163.492     341.120    1175.050       0.255       0.146

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.795      19.876     573.857     440.827       0.024       0.308

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     280.961       0.000     280.961    1175.964       0.239       0.232

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.967     574.749       0.000       0.060       0.040       0.228

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.870      20.778       1.044     581.340       8.224     275.312       2.134

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  51235.980       0.407     248.093  808590.062

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    364514.88   1765.0374     83.7060      1.3754      0.8548     13.0194      1.1120
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 60% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  0.966

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      82.317    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   37.41694

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      80.416    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63325.230   64591.602       3.551     831.557     234.188     619.754       2.646

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   185.28    -0.06   185.28     0.17   406.33
  MEAN    17.06     0.00    -0.02   185.28    -0.06   185.28     0.17
  HUB     12.51     0.00    -0.02   185.28    -0.06   185.28     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     65.58    50.47    15.11   407.95   448.11    14.82   519.94     0.40
  MEAN    61.23    47.20    14.03   337.36   384.95    14.82   519.94     0.34
  HUB     53.17    38.62    14.55   247.38   309.13    14.82   519.94     0.28

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   370.79   272.24   251.74  1128.47     0.33
  MEAN    18.04   377.90   279.72   254.10  1126.05     0.34
  HUB     15.00   412.59   322.33   257.56  1122.89     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   285.99   135.71     0.25  5617.60
  MEAN   356.65   265.49    76.94     0.24  5046.04     1.66
  HUB    296.62   258.84    25.71     0.23  4835.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.76     1.11    15.55   540.65     1.03   529.17     0.92     0.88
  MEAN    16.58     1.10    15.34   538.84     1.03   526.91     0.92     0.88
  HUB     16.52     1.09    15.05   538.17     1.03   523.95     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     47.24    28.33    24.20     4.13     0.93     0.47     2.90
  MEAN    47.75    16.85    12.70     4.15     0.95     0.42     3.51     0.88
  HUB     51.37    -5.70    -9.30     3.60     0.95     0.28     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     381.639     279.172     260.213    1126.210       0.339      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.607      15.337     527.057      24.000      47.013      35.400     -11.613

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     278.271     279.172     394.172    1132.281       0.246       0.450
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.583      15.900     532.754     528.796       0.028       0.564

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     259.620       0.000     259.620    1133.171       0.229       0.449

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.924     533.592       0.000       0.060       0.078       0.468

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.826      16.518       1.093     539.222      16.412     175.209       1.358

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102177.656       0.614     475.312  779103.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  0.974

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    82.317    2266.000      16.518     539.222       1.000       1.000       0.980
W Kg/sec =   37.41694

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    74.693    2222.462       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63325.230   64591.602       2.715     590.487     217.522     474.134       2.180

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   248.67    -0.09   248.67     0.22   398.55
 MEAN    18.08     0.00    -0.02   248.67    -0.09   248.67     0.22
 HUB     15.21     0.00    -0.02   248.67    -0.09   248.67     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.54    46.36    12.18   406.37   476.49    15.97   534.06     0.42
 MEAN    55.18    42.30    12.88   357.49   435.54    15.97   534.06     0.38
 HUB     50.43    37.84    12.59   300.77   390.32    15.97   534.06     0.34

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   342.35   219.57   262.67  1143.81     0.30
 MEAN    18.01   344.46   220.69   264.48  1141.98     0.30
 HUB     15.22   367.71   253.29   266.56  1140.12     0.32

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   320.83   184.22     0.28  4485.43
 MEAN   356.14   297.15   135.45     0.26  3976.14     1.61
 HUB    301.03   270.80    47.74     0.24  3857.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.92     1.08    16.83   553.47     1.03   543.68     0.92     0.89
 MEAN    17.75     1.07    16.67   551.85     1.02   541.94     0.92     0.89
 HUB     17.71     1.07    16.48   551.47     1.02   540.18     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.89    35.04    31.50     3.54     0.93     0.41     2.90
 MEAN    39.84    27.12    23.50     3.62     0.94     0.39     3.30     0.89
 HUB     43.54    10.15     6.50     3.65     0.94     0.39     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     348.403     221.308     269.087    1142.170       0.305       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.783      16.670     542.126      46.000      39.435      30.600      -8.835

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     274.728     221.308     352.778    1146.202       0.240       0.365

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.771      17.074     545.960     511.151       0.020       0.433

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     271.529       0.000     271.529    1146.355       0.237       0.330

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.044     546.106       0.000       0.060       0.062       0.339

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.844      17.724       1.073     552.263      13.041     203.197       1.575

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  81209.250       0.498     377.771  712383.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  0.990

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     82.317    2266.000      17.724     552.263       1.000       1.000       0.980
W Kg/sec =   37.41694

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     70.447    2196.064       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  63325.230   64591.602       2.659     545.479     205.161     429.765       2.095

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   257.21    -0.09   257.21     0.22   384.62
 MEAN    17.74     0.00    -0.02   257.21    -0.09   257.21     0.22
 HUB     15.05     0.00    -0.02   257.21    -0.09   257.21     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.06    46.36    10.70   396.88   473.01    17.11   546.74     0.41
 MEAN    53.76    43.40    10.36   350.77   435.04    17.11   546.74     0.38
 HUB     49.17    38.84    10.33   297.61   393.42    17.11   546.74     0.34

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   337.48    200.65    271.35  1156.02      0.29
 MEAN    17.51   341.74    205.68    272.91  1154.53      0.30
 HUB     14.85   367.25    243.73    274.71  1153.02      0.32

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73    331.88    191.08     0.29  3976.73
 MEAN   346.18    306.96    140.50     0.27  3602.32      1.55
 HUB    293.65    279.21     49.92     0.24  3620.76

         Pt2       PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     19.04     1.07     17.94    564.89      1.02    555.38      0.92      0.91
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 MEAN    18.91     1.07    17.79   563.70     1.02   553.95     0.92     0.91
 HUB     18.92     1.07    17.63   563.76     1.02   552.50     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.48    35.15    31.50     3.65     0.93     0.37     2.90
 MEAN    37.00    27.24    23.50     3.74     0.94     0.37     3.28     0.91
 HUB     41.58    10.30     6.50     3.80     0.94     0.37     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     345.187     207.030     276.212    1154.760       0.299       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.944      17.803     554.168      46.000      36.853      31.500      -5.353

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     285.664     207.030     352.796    1158.023       0.247       0.311

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.938      18.152     557.303     471.992       0.015       0.397

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     277.702       0.000     277.702    1158.412       0.240       0.305

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.159     557.678       0.000       0.060       0.046       0.317

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      18.901       1.066     564.118      11.855     213.331       1.654

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  73833.086       0.481     343.458  712954.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  0.998

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     82.317    2266.000      18.901     564.118       1.000       1.000       0.980
W Kg/sec =   37.41694

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     66.764    2172.867       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63325.230   64591.602       2.640     513.330     194.438     401.059       2.063

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   261.90    -0.09   261.90     0.23   365.19
 MEAN    16.97     0.00    -0.02   261.90    -0.09   261.90     0.23
 HUB     14.32     0.00    -0.02   261.90    -0.09   261.90     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.49    46.36     9.13   380.86   462.29    18.24   558.39     0.40
 MEAN    52.04    43.80     8.24   335.59   425.76    18.24   558.39     0.37
 HUB     47.24    37.84     9.40   283.17   385.78    18.24   558.39     0.33

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   328.17   179.09   274.99  1166.86     0.28
 MEAN    16.57   332.58   185.03   276.36  1165.58     0.29
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 HUB     13.89   356.96   224.01   277.92  1164.27     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   336.69   194.26     0.29  3382.93
 MEAN   327.74   311.03   142.71     0.27  3068.18     1.49
 HUB    274.67   282.50    50.66     0.24  3112.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.07     1.06    19.00   574.86     1.02   565.87     0.92     0.91
 MEAN    19.96     1.06    18.86   573.86     1.02   564.62     0.92     0.91
 HUB     19.98     1.06    18.71   574.00     1.02   563.36     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.07    35.24    31.50     3.74     0.93     0.34     2.90
 MEAN    33.80    27.31    23.50     3.81     0.93     0.33     3.29     0.91
 HUB     38.87    10.33     6.50     3.83     0.93     0.34     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     328.994     186.070     271.321    1166.174       0.282       0.046

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.992      18.916     565.201      46.000      34.442      32.400      -2.042

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     284.563     186.070     339.997    1168.520       0.244       0.282

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.991      19.181     567.478     456.573       0.011       0.367

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     271.032       0.000     271.032    1169.166       0.232       0.271

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.226     568.105       0.000       0.060       0.038       0.321

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      19.960       1.056     574.239      10.121     235.079       1.822

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  63048.555       0.452     293.291  734145.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     82.317    2266.000      19.960     574.239       1.000       1.000       0.980
W Kg/sec =   37.41694

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     63.787    2153.634       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63325.230   64591.602       2.744     509.668     185.770     390.276       2.101

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   253.76    -0.09   253.76     0.22   344.30
 MEAN    15.91     0.00    -0.02   253.76    -0.09   253.76     0.22
 HUB     13.07     0.00    -0.02   253.76    -0.09   253.76     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.00    47.36     7.64   362.27   442.38    19.32   568.86     0.38
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 MEAN    51.12    44.80     6.32   314.67   404.31    19.32   568.86     0.35
 HUB     45.53    38.84     6.69   258.45   362.27    19.32   568.86     0.31
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   313.45   164.83   266.61  1176.65     0.27
 MEAN    15.50   315.77   167.09   267.94  1175.33     0.27
 HUB     12.59   335.30   199.58   269.43  1174.00     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   327.34   189.92     0.28  2958.68
 MEAN   306.46   302.02   139.37     0.26  2590.82     1.47
 HUB    248.96   273.92    49.38     0.23  2513.83

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.02     1.05    20.01   583.63     1.02   575.43     0.92     0.91
 MEAN    20.89     1.05    19.86   582.46     1.01   574.14     0.92     0.91
 HUB     20.86     1.05    19.71   582.22     1.01   572.83     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.73    35.47    31.50     3.97     0.93     0.32     2.90
 MEAN    31.95    27.48    23.50     3.98     0.93     0.31     3.34     0.91
 HUB     36.53    10.39     6.50     3.89     0.93     0.31     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      319.202     170.150     270.072    1175.462       0.272       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.902      19.856      574.264       46.000      32.212      33.000       0.788

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      286.054     170.150     332.833    1177.175       0.243       0.185

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       20.900      20.058     575.939     440.827       0.021       0.339

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      268.527       0.000     268.527    1178.004       0.228       0.268

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       20.141      576.750       0.000       0.060       0.037       0.264

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.878       20.884       1.046     582.770       8.532     262.059       2.031

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  53156.406       0.422     247.274  773985.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    373424.97   1737.1069      80.4157      1.3824       0.8483      14.0280       1.1147
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    P&W Fan Hub + 4 Stage LPC 60% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.958

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      79.082    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   35.94620

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      77.255    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  60836.117   62052.707       3.696     831.557     224.983     619.754       2.755

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   177.81    -0.06   177.81     0.16   406.33
  MEAN    17.06     0.00    -0.02   177.81    -0.06   177.81     0.16
  HUB     12.51     0.00    -0.02   177.81    -0.06   177.81     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     66.45    50.47    15.98   407.95   445.07    14.84   520.17     0.40
  MEAN    62.21    47.20    15.01   337.36   381.40    14.84   520.17     0.34
  HUB     54.30    38.62    15.68   247.38   304.70    14.84   520.17     0.27

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   367.91   277.54   241.51  1129.03     0.33
  MEAN    18.04   373.26   282.64   243.80  1126.54     0.33
  HUB     15.00   405.14   321.08   247.07  1123.37     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   274.47   130.41     0.24  5726.97
  MEAN   356.65   254.78    74.01     0.23  5098.82     1.72
  HUB    296.62   248.28    24.46     0.22  4816.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.78     1.11    15.59   541.00     1.03   529.70     0.92     0.88
  MEAN    16.59     1.10    15.37   539.01     1.03   527.37     0.92     0.88
  HUB     16.50     1.09    15.08   538.11     1.03   524.40     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     48.97    28.37    24.20     4.17     0.93     0.49     2.90
  MEAN    49.22    16.89    12.70     4.19     0.95     0.44     3.51     0.88
  HUB     52.42    -5.65    -9.30     3.65     0.95     0.31     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.958

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     376.701     282.095     249.651    1126.706       0.334       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.609      15.371     527.521      24.000      48.492      35.400     -13.092

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     266.773     282.095     388.260    1132.998       0.235       0.476
   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.582      15.953     533.430     528.796       0.031       0.589

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     249.082       0.000     249.082    1133.807       0.220       0.464

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.963     534.192       0.000       0.060       0.088       0.484

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.814      16.510       1.093     539.374      16.564     170.456       1.321

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 103123.086       0.620     460.855  747667.688


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.966

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     79.082    2266.000      16.510     539.374       1.000       1.000       0.980
W Kg/sec =   35.94620

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     71.801    2222.149       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  60836.117   62052.707       2.824     590.487     209.101     474.134       2.267

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   238.62    -0.08   238.62     0.21   398.49
 MEAN    18.08     0.00    -0.02   238.62    -0.08   238.62     0.21
 HUB     15.21     0.00    -0.02   238.62    -0.08   238.62     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.58    46.36    13.22   406.37   471.32    16.01   534.62     0.42
 MEAN    56.28    42.30    13.98   357.49   429.88    16.01   534.62     0.38
 HUB     51.58    37.84    13.74   300.77   383.99    16.01   534.62     0.34

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   339.15   226.95   252.02  1144.66     0.30
 MEAN    18.01   339.90   226.07   253.82  1142.73     0.30
 HUB     15.22   361.35   255.15   255.88  1140.78     0.32

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   307.88   176.84     0.27  4636.07
 MEAN   356.14   285.21   130.07     0.25  4072.95     1.66
 HUB    301.03   259.96    45.88     0.23  3885.39

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.94     1.09    16.88   554.10     1.03   544.49     0.92     0.88
 MEAN    17.76     1.08    16.70   552.31     1.02   542.66     0.92     0.88
 HUB     17.70     1.07    16.51   551.71     1.02   540.81     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.00    35.06    31.50     3.56     0.93     0.43     2.90
 MEAN    41.69    27.13    23.50     3.63     0.95     0.42     3.30     0.88
 HUB     44.92    10.17     6.50     3.67     0.95     0.41     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     343.628     226.702     258.238    1142.927       0.301       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.793      16.710     542.846      46.000      41.279      30.600     -10.679

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     263.426     226.702     347.544    1147.199       0.230       0.395

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.778      17.136     546.912     511.151       0.023       0.463

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     260.481       0.000     260.481    1147.334       0.227       0.352

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.098     547.040       0.000       0.060       0.072       0.361

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.831      17.724       1.074     552.707      13.333     195.771       1.518

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  83027.117       0.509     371.046  682932.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.984

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     79.082    2266.000      17.724     552.707       1.000       1.000       0.980
W Kg/sec =   35.94620

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     67.706    2195.183       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  60836.117   62052.707       2.766     545.479     197.179     429.765       2.180

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   246.81    -0.08   246.81     0.22   384.46
 MEAN    17.74     0.00    -0.02   246.81    -0.08   246.81     0.22
 HUB     15.05     0.00    -0.02   246.81    -0.08   246.81     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.13    46.36    11.77   396.88   467.43    17.16   547.62     0.41
 MEAN    54.88    43.40    11.48   350.77   428.97    17.16   547.62     0.37
 HUB     50.34    38.84    11.50   297.61   386.70    17.16   547.62     0.34

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   333.48   208.52   260.26  1157.23     0.29
 MEAN    17.51   336.53   211.41   261.83  1155.63     0.29
 HUB     14.85   360.44   245.78   263.64  1154.01     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   318.28   183.22     0.28  4132.42
 MEAN   346.18   294.49   134.78     0.25  3702.49     1.59
 HUB    293.65   267.95    47.87     0.23  3651.13

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     19.08     1.08    18.01   565.83     1.02   556.54     0.92     0.90
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 MEAN    18.94     1.07    17.85   564.46     1.02   555.01     0.92     0.90
 HUB     18.92     1.07    17.68   564.30     1.02   553.45     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.70    35.15    31.50     3.65     0.93     0.40     2.90
 MEAN    38.92    27.24    23.50     3.74     0.94     0.39     3.28     0.90
 HUB     42.99    10.29     6.50     3.79     0.94     0.39     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     339.863     212.793     265.002    1155.852       0.294       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.967      17.861     555.219      46.000      38.764      31.500      -7.264

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     273.807     212.793     346.772    1159.370       0.236       0.344

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.959      18.236     558.604     471.992       0.017       0.427

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     266.292       0.000     266.292    1159.722       0.230       0.330

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.234     558.943       0.000       0.060       0.054       0.342

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      18.917       1.067     564.864      12.158     205.053       1.590

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  75720.281       0.493     338.392  683147.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.994

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     79.082    2266.000      18.917     564.864       1.000       1.000       0.980
W Kg/sec =   35.94620

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     64.129    2171.431       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 60836.117   62052.707       2.749     513.330     186.764     401.059       2.147

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   251.20    -0.09   251.20     0.22   364.95
 MEAN    16.97     0.00    -0.02   251.20    -0.09   251.20     0.22
 HUB     14.32     0.00    -0.02   251.20    -0.09   251.20     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.60    46.36    10.24   380.86   456.31    18.31   559.60     0.39
 MEAN    53.19    43.80     9.39   335.59   419.26    18.31   559.60     0.36
 HUB     48.43    37.84    10.59   283.17   378.60    18.31   559.60     0.33

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   323.32   187.26   263.57  1168.40     0.28
 MEAN    16.57   326.65   191.02   264.98  1167.01     0.28
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 HUB     13.89   349.61   226.20   266.57  1165.59     0.30

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   322.64   186.08     0.28  3537.20
 MEAN   327.74   298.17   136.72     0.26  3167.46     1.54
 HUB    274.67   270.94    48.47     0.23  3143.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.14     1.06    19.09   576.09     1.02   567.37     0.92     0.91
 MEAN    20.01     1.06    18.95   574.92     1.02   566.01     0.92     0.91
 HUB     20.00     1.06    18.79   574.84     1.02   564.64     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.39    35.22    31.50     3.72     0.93     0.36     2.90
 MEAN    35.79    27.29    23.50     3.79     0.94     0.36     3.29     0.91
 HUB     40.32    10.30     6.50     3.80     0.94     0.36     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     323.415     192.097     260.184    1167.563       0.277       0.044

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.037      18.996     566.553      46.000      36.439      32.400      -4.039

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     272.601     192.097     333.486    1170.166       0.233       0.315

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.034      19.290     569.081     456.573       0.013       0.397

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     259.734       0.000     259.734    1170.753       0.222       0.299

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.326     569.653       0.000       0.060       0.042       0.347

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      20.001       1.057     575.286      10.422     225.233       1.746

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  64920.777       0.466     290.129  703139.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     79.082    2266.000      20.001     575.286       1.000       1.000       0.980
W Kg/sec =   35.94620

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     61.209    2151.672       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  60836.117   62052.707       2.859     509.668     178.264     390.276       2.189

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   243.26    -0.08   243.26     0.21   343.98
 MEAN    15.91     0.00    -0.02   243.26    -0.08   243.26     0.21
 HUB     13.07     0.00    -0.02   243.26    -0.08   243.26     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.13    47.36     8.77   362.27   436.43    19.41   570.35     0.37
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MEAN    52.30    44.80     7.50   314.67   397.80    19.41   570.35     0.34
HUB     46.74    38.84     7.90   258.45   354.99    19.41   570.35     0.30
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   308.46   173.08   255.33  1178.46     0.26
MEAN    15.50   309.62   173.11   256.70  1177.03     0.26
HUB     12.59   327.71   201.78   258.22  1175.58     0.28

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    354.76   313.37   181.68     0.27  3106.58
MEAN   306.46   289.27   133.35     0.25  2684.10     1.51
HUB    248.96   262.50    47.19     0.22  2541.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.12     1.06    20.13   585.15     1.02   577.20     0.92     0.91
MEAN    20.96     1.05    19.98   583.81     1.01   575.80     0.92     0.91
HUB     20.91     1.05    19.81   583.35     1.01   574.39     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.13    35.43    31.50     3.93     0.93     0.35     2.90
MEAN    33.99    27.45    23.50     3.95     0.93     0.34     3.34     0.91
HUB     38.00    10.36     6.50     3.86     0.93     0.33     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      313.087     176.282     258.743    1177.148       0.266       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.976      19.968      575.918       46.000      34.267      33.000      -1.267

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      273.759     176.282     325.606    1179.115       0.232       0.223

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       20.975       20.201     577.845     440.827       0.021       0.369

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      257.067       0.000     257.067    1179.870       0.218       0.301

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950       20.276      578.585       0.000       0.060       0.037       0.296

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.880       20.959       1.048     584.102       8.816     250.343       1.941

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  54928.438       0.436     245.474  741115.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    381719.69   1705.8960      77.2548      1.3873       0.8395      15.0123       1.1172
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 60% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.950

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      75.973    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   34.53327

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      74.218    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   58444.840   59613.613       3.847     831.557     216.140     619.754       2.867

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   170.65    -0.06   170.65     0.15   406.33
  MEAN    17.06     0.00    -0.02   170.65    -0.06   170.65     0.15
  HUB     12.51     0.00    -0.02   170.65    -0.06   170.65     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     67.30    50.47    16.83   407.95   442.26    14.86   520.38     0.40
  MEAN    63.17    47.20    15.97   337.36   378.11    14.86   520.38     0.34
  HUB     55.41    38.62    16.79   247.38   300.58    14.86   520.38     0.27

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   365.41   282.51   231.77  1129.54     0.32
  MEAN    18.04   369.02   285.36   233.97  1126.99     0.33
  HUB     15.00   398.17   319.90   237.07  1123.81     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   263.54   125.44     0.23  5829.34
  MEAN   356.65   244.59    71.29     0.22  5147.82     1.78
  HUB    296.62   238.21    23.28     0.21  4799.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.79     1.11    15.62   541.33     1.04   530.17     0.92     0.87
  MEAN    16.59     1.10    15.40   539.16     1.03   527.79     0.92     0.87
  HUB     16.49     1.09    15.11   538.06     1.03   524.81     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     50.63    28.42    24.20     4.22     0.93     0.51     2.90
  MEAN    50.65    16.95    12.70     4.25     0.95     0.46     3.51     0.87
  HUB     53.46    -5.61    -9.30     3.69     0.95     0.33     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.950

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     372.173     284.809     239.576    1127.159       0.330       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.610      15.400     527.946      24.000      49.930      35.400     -14.530

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     255.829     284.809     382.837    1133.655       0.226       0.501
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      16.579      16.001     534.049     528.796       0.034       0.613

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     239.034       0.000     239.034    1134.392       0.211       0.479

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      15.997     534.743       0.000       0.060       0.097       0.498

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.802      16.501       1.092     539.515      16.705     165.927       1.286

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 104003.922       0.625     446.521  717563.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.958

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    75.973    2266.000      16.501     539.515       1.000       1.000       0.980
W Kg/sec =   34.53327

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    69.027    2221.858       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 58444.840   59613.613       2.937     590.487     201.025     474.134       2.359

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   229.03    -0.08   229.03     0.20   398.44
 MEAN    18.08     0.00    -0.02   229.03    -0.08   229.03     0.20
 HUB     15.21     0.00    -0.02   229.03    -0.08   229.03     0.20

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.60    46.36    14.24   406.37   466.53    16.04   535.13     0.41
 MEAN    57.36    42.30    15.06   357.49   424.63    16.04   535.13     0.37
 HUB     52.72    37.84    14.88   300.77   378.11    16.04   535.13     0.33

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   336.50   233.89   241.92  1145.44     0.29
 MEAN    18.01   335.86   231.14   243.68  1143.42     0.29
 HUB     15.22   355.43   256.84   245.70  1141.39     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   295.62   169.91     0.26  4777.69
 MEAN   356.14   273.87   125.00     0.24  4164.18     1.71
 HUB    301.03   249.64    44.19     0.22  3911.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.96     1.09    16.92   554.69     1.03   545.23     0.92     0.88
 MEAN    17.77     1.08    16.74   552.74     1.02   543.32     0.92     0.88
 HUB     17.69     1.07    16.54   551.94     1.02   541.39     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.03    35.08    31.50     3.58     0.93     0.45     2.90
 MEAN    43.49    27.16    23.50     3.66     0.95     0.44     3.30     0.88
 HUB     46.27    10.20     6.50     3.70     0.95     0.43     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.958

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     339.395     231.785     247.921    1143.616       0.297       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.798      16.741     543.502      46.000      43.073      30.600     -12.473

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     252.699     231.785     342.901    1148.118       0.220       0.425

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.780      17.189     547.789     511.151       0.027       0.492

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     249.995       0.000     249.995    1148.237       0.218       0.372

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.142     547.903       0.000       0.060       0.084       0.381

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.818      17.718       1.074     553.122      13.607     188.898       1.464

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  84730.938       0.520     363.776  654816.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.977

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     75.973    2266.000      17.718     553.122       1.000       1.000       0.980
W Kg/sec =   34.53327

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     65.089    2194.359       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  58444.840   59613.613       2.878     545.479     189.559     429.765       2.267

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   236.92    -0.08   236.92     0.21   384.32
 MEAN    17.74     0.00    -0.02   236.92    -0.08   236.92     0.21
 HUB     15.05     0.00    -0.02   236.92    -0.08   236.92     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.17    46.36    12.81   396.88   462.29    17.20   548.43     0.40
 MEAN    55.97    43.40    12.57   350.77   423.36    17.20   548.43     0.37
 HUB     51.48    38.84    12.64   297.61   380.46    17.20   548.43     0.33

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   330.13   215.87   249.77  1158.33     0.29
 MEAN    17.51   331.93   216.79   251.35  1156.64     0.29
 HUB     14.85   354.16   247.68   253.15  1154.93     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   305.48   175.87     0.26  4277.93
 MEAN   346.18   282.70   129.39     0.24  3796.72     1.64
 HUB    293.65   257.29    45.97     0.22  3679.34

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     19.11     1.08    18.06   566.71     1.02   557.61     0.92     0.89
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 MEAN    18.95     1.07    17.90   565.18     1.02   555.98     0.92     0.89
 HUB     18.91     1.07    17.72   564.81     1.02   554.33     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.84    35.15    31.50     3.65     0.93     0.42     2.90
 MEAN    40.78    27.24    23.50     3.74     0.94     0.41     3.28     0.89
 HUB     44.37    10.29     6.50     3.79     0.94     0.41     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     335.163     218.214     254.395    1156.852       0.290       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.981      17.905     556.183      46.000      40.622      31.500      -9.122

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     262.616     218.214     341.445    1160.612       0.226       0.375

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.970      18.305     559.804     471.992       0.020       0.456

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     255.529       0.000     255.529    1160.930       0.220       0.353

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.293     560.111       0.000       0.060       0.063       0.365

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.846      18.922       1.068     565.563      12.441     197.461       1.531

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  77486.562       0.505     332.674  654731.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.989

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     75.973    2266.000      18.922     565.563       1.000       1.000       0.980
W Kg/sec =   34.53327

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     61.629    2170.089       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 58444.840   59613.613       2.860     513.330     179.485     401.059       2.234

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   241.11    -0.08   241.11     0.21   364.73
 MEAN    16.97     0.00    -0.02   241.11    -0.08   241.11     0.21
 HUB     14.32     0.00    -0.02   241.11    -0.08   241.11     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.67    46.36    11.31   380.86   450.83    18.36   560.71     0.39
 MEAN    54.31    43.80    10.51   335.59   413.29    18.36   560.71     0.36
 HUB     49.60    37.84    11.76   283.17   371.98    18.36   560.71     0.32

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   319.25   194.91   252.85  1169.81     0.27
 MEAN    16.57   321.44   196.64   254.28  1168.32     0.28
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 HUB     13.89   342.86   228.21   255.89  1166.80     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   309.48   178.44     0.26  3681.43
 MEAN   327.74   286.08   131.10     0.24  3260.55     1.58
 HUB    274.67   260.07    46.46     0.22  3170.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.19     1.07    19.17   577.25     1.02   568.74     0.92     0.90
 MEAN    20.04     1.06    19.01   575.91     1.02   567.29     0.92     0.90
 HUB     20.01     1.06    18.84   575.63     1.02   565.82     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.63    35.21    31.50     3.71     0.93     0.39     2.90
 MEAN    37.72    27.27    23.50     3.77     0.94     0.38     3.29     0.90
 HUB     41.73    10.29     6.50     3.79     0.94     0.38     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     318.529     197.749     249.712    1168.837       0.273       0.042

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.066      19.056     567.794      46.000      38.376      32.400      -5.976

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     261.387     197.749     327.762    1171.681       0.223       0.347

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.062      19.378     570.561     456.573       0.014       0.427

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     249.156       0.000     249.156    1172.216       0.213       0.325

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.404     571.082       0.000       0.060       0.049       0.371

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      20.025       1.058     576.265      10.702     216.309       1.677

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  66668.617       0.478     286.229  673621.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     75.973    2266.000      20.025     576.265       1.000       1.000       0.980
W Kg/sec =   34.53327

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     58.784    2149.844       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  58444.840   59613.613       2.977     509.668     171.201     390.276       2.280

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   233.41    -0.08   233.41     0.20   343.69
 MEAN    15.91     0.00    -0.02   233.41    -0.08   233.41     0.20
 HUB     13.07     0.00    -0.02   233.41    -0.08   233.41     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.21    47.36     9.85   362.27   431.02    19.48   571.72     0.37
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 MEAN    53.44    44.80     8.64   314.67   391.85    19.48   571.72     0.33
 HUB     47.92    38.84     9.08   258.45   348.31    19.48   571.72     0.30
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   304.27   180.67   244.83  1180.11     0.26
 MEAN    15.50   304.23   178.69   246.22  1178.59     0.26
 HUB     12.59   320.82   203.82   247.75  1177.04     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   300.41   174.08     0.25  3242.76
 MEAN   306.46   277.40   127.77     0.24  2770.56     1.56
 HUB    248.96   251.83    45.14     0.21  2567.17

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.19     1.06    20.23   586.56     1.02   578.83     0.92     0.91
 MEAN    21.01     1.05    20.06   585.06     1.02   577.33     0.92     0.91
 HUB     20.94     1.05    19.89   584.41     1.01   575.82     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.43    35.41    31.50     3.91     0.93     0.37     2.90
 MEAN    35.97    27.43    23.50     3.93     0.93     0.36     3.34     0.91
 HUB     39.44    10.33     6.50     3.83     0.93     0.35     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     307.740     181.967     248.177    1178.693       0.261       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.027      20.053     577.438      46.000      36.249      33.000      -3.249

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     262.338     181.967     319.270    1180.897       0.222       0.258

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.025      20.314     579.598     440.827       0.023       0.399

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     246.425       0.000     246.425    1181.585       0.209       0.330

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.379     580.274       0.000       0.060       0.040       0.324

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.877      21.007       1.049     585.344       9.079     239.880       1.860

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  56565.789       0.449     242.855  709849.812

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    389455.84   1672.0562     74.2182      1.3906      0.8290     15.9719      1.1196
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 60% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =17.022   EfDer =  0.940

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      72.622    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   33.00999

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      70.944    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  55866.812   56984.027       4.025     831.557     206.605     619.754       3.000

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   162.95    -0.06   162.95     0.15   406.33
  MEAN    17.06     0.00    -0.02   162.95    -0.06   162.95     0.15
  HUB     12.51     0.00    -0.02   162.95    -0.06   162.95     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.23    50.47    17.76   407.95   439.34    14.88   520.59     0.39
  MEAN    64.22    47.20    17.02   337.36   374.70    14.88   520.59     0.33
  HUB     56.63    38.62    18.01   247.38   296.27    14.88   520.59     0.26

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   363.05   287.76   221.35  1130.06     0.32
  MEAN    18.04   364.70   288.23   223.45  1127.45     0.32
  HUB     15.00   390.78   318.56   226.35  1124.26     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   251.87   120.19     0.22  5937.73
  MEAN   356.65   233.69    68.42     0.21  5199.54     1.85
  HUB    296.62   227.41    21.94     0.20  4779.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.81     1.11    15.64   541.67     1.04   530.66     0.92     0.86
  MEAN    16.59     1.10    15.43   539.33     1.03   528.22     0.92     0.86
  HUB     16.46     1.09    15.14   537.99     1.03   525.24     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     52.43    28.50    24.20     4.30     0.93     0.54     2.90
  MEAN    52.22    17.03    12.70     4.33     0.95     0.49     3.51     0.86
  HUB     54.60    -5.54    -9.30     3.76     0.95     0.36     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.940

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     367.563     287.674     228.793    1127.622       0.326       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.607      15.427     528.379      24.000      51.504      35.400     -16.104

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     244.135     287.674     377.304    1134.331       0.215       0.528
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      16.573      16.046     534.685     528.796       0.038       0.640

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     228.278       0.000     228.278    1134.994       0.201       0.495

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      16.029     535.311       0.000       0.060       0.108       0.514

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.788      16.488       1.091     539.663      16.853     161.073       1.249

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 104926.555       0.630     430.612  685209.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =17.022   EfDer =  0.948

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    72.622    2266.000      16.488     539.663       1.000       1.000       0.980
W Kg/sec =   33.00999

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    66.041    2221.552       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 55866.812   56984.027       3.070     590.487     192.329     474.134       2.465

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   218.76    -0.08   218.76     0.19   398.38
 MEAN    18.08     0.00    -0.02   218.76    -0.08   218.76     0.19
 HUB     15.21     0.00    -0.02   218.76    -0.08   218.76     0.19

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.71    46.36    15.35   406.37   461.58    16.07   535.67     0.41
 MEAN    58.54    42.30    16.24   357.49   419.18    16.07   535.67     0.37
 HUB     53.98    37.84    16.14   300.77   371.97    16.07   535.67     0.33

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   334.07   241.21   231.14  1146.23     0.29
 MEAN    18.01   331.88   236.48   232.85  1144.13     0.29
 HUB     15.22   349.32   258.62   234.81  1142.01     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   282.60   162.59     0.25  4926.97
 MEAN   356.14   261.80   119.66     0.23  4260.42     1.77
 HUB    301.03   238.61    42.40     0.21  3938.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.98     1.09    16.95   555.31     1.03   545.99     0.92     0.87
 MEAN    17.77     1.08    16.76   553.19     1.03   544.00     0.92     0.87
 HUB     17.67     1.07    16.56   552.17     1.02   541.98     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.22    35.12    31.50     3.62     0.93     0.48     2.90
 MEAN    45.44    27.20    23.50     3.70     0.95     0.46     3.30     0.87
 HUB     47.76    10.24     6.50     3.74     0.95     0.45     3.92


  blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.948

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     335.206     237.147     236.905    1144.323       0.293       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.798      16.768     544.175      46.000      45.029      30.600     -14.429

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     241.266     237.147     338.302    1149.068       0.210       0.457

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.777      17.238     548.698     511.151       0.030       0.524

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     238.812       0.000     238.812    1149.171       0.208       0.393

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.181     548.796       0.000       0.060       0.097       0.403

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.802      17.707       1.074     553.559      13.896     181.731       1.409

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  86528.609       0.531     355.108  624685.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =17.022   EfDer =  0.968

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     72.622    2266.000      17.707     553.559       1.000       1.000       0.980
W Kg/sec =   33.00999

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     62.283    2193.492       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  55866.812   56984.027       3.007     545.479     181.386     429.765       2.369

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   226.38    -0.08   226.38     0.20   384.17
 MEAN    17.74      0.00    -0.02   226.38    -0.08   226.38     0.20
 HUB     15.05      0.00    -0.02   226.38    -0.08   226.38     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.30     46.36    13.94   396.88   456.97     17.23   549.28     0.40
 MEAN    57.17     43.40    13.77   350.77   417.54     17.23   549.28     0.36
 HUB     52.75     38.84    13.91   297.61   373.98     17.23   549.28     0.33

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   327.03    223.61    238.64  1159.46      0.28
 MEAN    17.51   327.39    222.47    240.19  1157.68      0.28
 HUB     14.85   347.68    249.66    241.97  1155.87      0.30

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73    291.91    168.12     0.25  4431.28
 MEAN   346.18    270.18    123.71     0.23  3896.12      1.70
 HUB    293.65    245.94     43.99     0.21  3708.65

         Pt2       PR       Ps2      Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     19.14      1.08     18.11   567.63      1.03    558.70      0.92      0.89
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 MEAN    18.96     1.07    17.93   565.93     1.02   556.98     0.92     0.89
 HUB     18.90     1.07    17.75   565.34     1.02   555.24     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.14    35.17    31.50     3.67     0.93     0.45     2.90
 MEAN    42.81    27.25    23.50     3.75     0.94     0.43     3.28     0.89
 HUB     45.90    10.30     6.50     3.80     0.94     0.43     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.968

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     330.528     223.933     243.111    1157.881       0.285       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.988      17.942     557.176      46.000      42.649      31.500     -11.149

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     250.737     223.933     336.177    1161.898       0.216       0.410

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.974      18.367     561.049     471.992       0.023       0.489

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     244.107       0.000     244.107    1162.182       0.210       0.376

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.344     561.323       0.000       0.060       0.075       0.388

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.832      18.918       1.068     566.299      12.740     189.612       1.470

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79346.320       0.517     325.632  624318.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =17.022   EfDer =  0.982

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     72.622    2266.000      18.918     566.299       1.000       1.000       0.980
W Kg/sec =   33.00999

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     58.963    2168.679       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 55866.812   56984.027       2.989     513.330     171.719     401.059       2.336

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   230.39    -0.08   230.39     0.20   364.49
 MEAN    16.97     0.00    -0.02   230.39    -0.08   230.39     0.20
 HUB     14.32     0.00    -0.02   230.39    -0.08   230.39     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.83    46.36    12.47   380.86   445.19    18.41   561.87     0.38
 MEAN    55.54    43.80    11.74   335.59   407.13    18.41   561.87     0.35
 HUB     50.88    37.84    13.04   283.17   365.12    18.41   561.87     0.31

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   315.47   202.94   241.53  1171.26     0.27
 MEAN    16.57   316.27   202.48   242.95  1169.67     0.27
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 HUB     13.89   335.91   230.28   244.56  1168.05     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   295.59   170.41     0.25  3832.96
 MEAN   327.74   273.34   125.26     0.23  3357.27     1.63
 HUB    274.67   248.55    44.39     0.21  3199.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.22     1.07    19.23   578.47     1.02   570.16     0.92     0.90
 MEAN    20.06     1.06    19.06   576.96     1.02   568.61     0.92     0.90
 HUB     20.00     1.06    18.89   576.46     1.02   567.04     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.04    35.20    31.50     3.70     0.93     0.41     2.90
 MEAN    39.81    27.27    23.50     3.77     0.94     0.40     3.29     0.90
 HUB     43.28    10.29     6.50     3.79     0.94     0.40     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     313.694     203.621     238.626    1170.152       0.268       0.040

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.084      19.105     569.078      46.000      40.474      32.400      -8.074

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     249.548     203.621     322.080    1173.249       0.213       0.381

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.078      19.454     572.094     456.573       0.017       0.460

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     237.995       0.000     237.995    1173.731       0.203       0.351

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.468     572.565       0.000       0.060       0.058       0.395

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854      20.035       1.059     577.294      10.995     207.204       1.606

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  68494.391       0.491     281.096  642068.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =17.022   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     72.622    2266.000      20.035     577.294       1.000       1.000       0.980
W Kg/sec =   33.00999

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     56.214    2147.927       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  55866.812   56984.027       3.113     509.668     163.717     390.276       2.384

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   223.01    -0.08   223.01     0.19   343.38
 MEAN    15.91     0.00    -0.02   223.01    -0.08   223.01     0.19
 HUB     13.07     0.00    -0.02   223.01    -0.08   223.01     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.39    47.36    11.03   362.27   425.48    19.54   573.14     0.36
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MEAN    54.68    44.80     9.88   314.67   385.75    19.54   573.14     0.33
HUB     49.22    38.84    10.38   258.45   341.43    19.54   573.14     0.29

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   300.41   188.63   233.80  1181.81     0.25
MEAN    15.50   298.92   184.49   235.20  1180.19     0.25
HUB     12.59   313.74   205.91   236.72  1178.55     0.27

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    354.76   286.81   166.13     0.24  3385.39
MEAN   306.46   264.94   121.97     0.22  2860.33     1.61
HUB    248.96   240.60    43.05     0.20  2593.45

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.24     1.06    20.31   588.04     1.02   580.51     0.92     0.91
MEAN    21.05     1.05    20.13   586.37     1.02   578.91     0.92     0.91
HUB     20.95     1.05    19.95   585.53     1.01   577.31     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.90    35.40    31.50     3.90     0.93     0.40     2.90
MEAN    38.11    27.41    23.50     3.91     0.94     0.38     3.34     0.91
HUB     41.02    10.31     6.50     3.81     0.94     0.37     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     302.483     187.870     237.068    1180.288       0.256       -0.010

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.063      20.121     579.008      46.000      38.396      33.000      -5.396

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     250.372     187.870     313.019    1182.737       0.212       0.295

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.058      20.409     581.413     440.827       0.025       0.432

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     235.279       0.000     235.279    1183.359       0.199       0.360

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      20.465     582.025       0.000       0.060       0.046       0.353

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.870      21.038       1.050     586.646       9.352     229.312       1.778

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  58270.824       0.463     239.140  676453.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    397566.69   1631.5875     70.9444      1.3926      0.8157     17.0217      1.1221
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 60% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =18.040   EfDer =  0.929

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      69.419    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   31.55391

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      67.815    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   53402.504   54470.438       4.211     831.557     197.492     619.754       3.138

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   155.62    -0.05   155.62     0.14   406.33
  MEAN    17.06     0.00    -0.02   155.62    -0.05   155.62     0.14
  HUB     12.51     0.00    -0.02   155.62    -0.05   155.62     0.14

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     69.12    50.47    18.65   407.95   436.67    14.90   520.79     0.39
  MEAN    65.24    47.20    18.04   337.36   371.57    14.90   520.79     0.33
  HUB     57.83    38.62    19.21   247.38   292.30    14.90   520.79     0.26

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   361.09   292.69   211.47  1130.53     0.32
  MEAN    18.04   360.83   290.92   213.46  1127.86     0.32
  HUB     15.00   383.89   317.23   216.17  1124.67     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   240.84   115.26     0.21  6039.33
  MEAN   356.65   223.35    65.73     0.20  5248.00     1.92
  HUB    296.62   217.15    20.62     0.19  4759.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.82     1.11    15.67   541.99     1.04   531.10     0.92     0.85
  MEAN    16.58     1.10    15.45   539.48     1.03   528.61     0.92     0.85
  HUB     16.44     1.09    15.17   537.93     1.03   525.62     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     54.15    28.59    24.20     4.39     0.93     0.56     2.90
  MEAN    53.73    17.12    12.70     4.42     0.95     0.51     3.51     0.85
  HUB     55.73    -5.45    -9.30     3.85     0.95     0.38     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.929

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     363.425     290.358     218.564    1128.038       0.322       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.602      15.448     528.770      24.000      53.030      35.400     -17.630

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     233.059     290.358     372.322    1134.945       0.205       0.555
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.565      16.085     535.265     528.796       0.041       0.667

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     218.066       0.000     218.066    1135.544       0.192       0.511

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.055     535.829       0.000       0.060       0.118       0.529

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.774      16.474       1.090     539.801      16.991     156.448       1.213

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 105784.961       0.636     414.985  654374.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =18.040   EfDer =  0.936

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     69.419    2266.000      16.474     539.801       1.000       1.000       0.980
W Kg/sec =   31.55391

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     63.191    2221.269       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  53402.504   54470.438       3.209     590.487     184.027     474.134       2.576

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   209.01    -0.07   209.01     0.18   398.33
 MEAN    18.08     0.00    -0.02   209.01    -0.07   209.01     0.18
 HUB     15.21     0.00    -0.02   209.01    -0.07   209.01     0.18

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.79    46.36    16.43   406.37   457.03    16.09   536.15     0.40
 MEAN    59.69    42.30    17.39   357.49   414.17    16.09   536.15     0.36
 HUB     55.21    37.84    17.37   300.77   366.32    16.09   536.15     0.32

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   332.19   248.05   220.95  1146.95     0.29
 MEAN    18.01   328.41   241.46   222.60  1144.78     0.29
 HUB     15.22   343.68   260.23   224.49  1142.58     0.30

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   270.33   155.74     0.24  5066.73
 MEAN   356.14   250.40   114.68     0.22  4349.93     1.83
 HUB    301.03   228.17    40.80     0.20  3962.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.99     1.09    16.97   555.89     1.03   546.68     0.92     0.86
 MEAN    17.77     1.08    16.78   553.62     1.03   544.61     0.92     0.86
 HUB     17.65     1.07    16.58   552.39     1.02   542.52     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.31    35.18    31.50     3.68     0.93     0.50     2.90
 MEAN    47.33    27.26    23.50     3.76     0.95     0.48     3.30     0.86
 HUB     49.22    10.30     6.50     3.80     0.95     0.47     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.936

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     331.543     242.135     226.477    1144.963       0.290       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.792      16.785     544.786      46.000      46.914      30.600     -16.314

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     230.460     242.135     334.277    1149.937       0.200       0.488

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.768      17.276     549.530     511.151       0.034       0.556

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     228.229       0.000     228.229    1150.027       0.198       0.414

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.210     549.615       0.000       0.060       0.109       0.424

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.786      17.690       1.074     553.965      14.164     175.100       1.357

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  88201.211       0.541     346.005  596049.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =18.040   EfDer =  0.959

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     69.419    2266.000      17.690     553.965       1.000       1.000       0.980
W Kg/sec =   31.55391

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     59.614    2192.688       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  53402.504   54470.438       3.142     545.479     173.612     429.765       2.475

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   216.39    -0.07   216.39     0.19   384.02
 MEAN    17.74      0.00    -0.02   216.39    -0.07   216.39     0.19
 HUB     15.05      0.00    -0.02   216.39    -0.07   216.39     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.40     46.36    15.04   396.88   452.10    17.26   550.06     0.39
 MEAN    58.34     43.40    14.94   350.77   412.21    17.26   550.06     0.36
 HUB     53.99     38.84    15.15   297.61   368.02    17.26   550.06     0.32

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   324.55    230.84    228.14  1160.49      0.28
 MEAN    17.51   323.43    227.74    229.66  1158.62      0.28
 HUB     14.85   341.72    251.46    231.40  1156.73      0.30

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73    279.17    160.90     0.24  4574.41
 MEAN   346.18    258.40    118.45     0.22  3988.25      1.76
 HUB    293.65    235.21     42.20     0.20  3735.26

         Pt2       PR       Ps2      Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     19.15      1.08     18.14   568.49      1.03   559.70      0.92      0.88
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 MEAN    18.96     1.07    17.96   566.63     1.02   557.89     0.92     0.88
 HUB     18.88     1.07    17.77   565.83     1.02   556.08     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.34    35.19    31.50     3.69     0.93     0.47     2.90
 MEAN    44.76    27.28    23.50     3.78     0.95     0.46     3.28     0.88
 HUB     47.38    10.33     6.50     3.83     0.95     0.45     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.959

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     326.471     229.234     232.455    1158.819       0.282       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.985      17.966     558.082      46.000      44.600      31.500     -13.100

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     239.546     229.234     331.557    1163.077       0.206       0.442

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.968      18.415     562.191     471.992       0.027       0.521

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     233.341       0.000     233.341    1163.330       0.201       0.398

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.381     562.436       0.000       0.060       0.088       0.409

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.817      18.904       1.069     566.982      13.017     182.414       1.414

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  81072.602       0.528     318.040  595451.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =18.040   EfDer =  0.974

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     69.419    2266.000      18.904     566.982       1.000       1.000       0.980
W Kg/sec =   31.55391

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     56.437    2167.371       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  53402.504   54470.438       3.123     513.330     164.364     401.059       2.440

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   220.28    -0.08   220.28     0.19   364.27
 MEAN    16.97     0.00    -0.02   220.28    -0.08   220.28     0.19
 HUB     14.32     0.00    -0.02   220.28    -0.08   220.28     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.96    46.36    13.60   380.86   440.04    18.44   562.93     0.38
 MEAN    56.73    43.80    12.93   335.59   401.49    18.44   562.93     0.34
 HUB     52.13    37.84    14.29   283.17   358.82    18.44   562.93     0.31

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   312.37   210.38   230.90  1172.58     0.27
 MEAN    16.57   311.78   207.95   232.31  1170.90     0.27
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 HUB     13.89   329.58   232.21   233.89  1169.20     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   282.61   162.96     0.24  3973.53
 MEAN   327.74   261.38   119.79     0.22  3447.79     1.69
 HUB    274.67   237.71    42.46     0.20  3226.49

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.24     1.07    19.27   579.60     1.02   571.45     0.92     0.89
 MEAN    20.06     1.06    19.10   577.93     1.02   569.81     0.92     0.89
 HUB     19.99     1.06    18.91   577.23     1.02   568.16     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.34    35.21    31.50     3.71     0.93     0.44     2.90
 MEAN    41.83    27.28    23.50     3.78     0.94     0.43     3.29     0.89
 HUB     44.79    10.29     6.50     3.79     0.94     0.42     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     309.524     209.117     228.199    1171.353       0.264       0.038

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.089      19.136     570.251      46.000      42.502      32.400     -10.102

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     238.438     209.117     317.148    1174.688       0.203       0.414

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.079      19.510     573.504     456.573       0.020       0.492

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     227.525       0.000     227.525    1175.123       0.194       0.374

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.512     573.928       0.000       0.060       0.069       0.416

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.841      20.029       1.060     578.250      11.268     198.914       1.542

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  70194.234       0.504     275.366  612153.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =18.040   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     69.419    2266.000      20.029     578.250       1.000       1.000       0.980
W Kg/sec =   31.55391

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     53.793    2146.150       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  53402.504   54470.438       3.253     509.668     156.667     390.276       2.491

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   213.25    -0.07   213.25     0.18   343.10
 MEAN    15.91     0.00    -0.02   213.25    -0.07   213.25     0.18
 HUB     13.07     0.00    -0.02   213.25    -0.07   213.25     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.52    47.36    12.16   362.27   420.44    19.57   574.45     0.36
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MEAN    55.88    44.80    11.08   314.67   380.18    19.57   574.45     0.32
HUB     50.48    38.84    11.64   258.45   335.13    19.57   574.45     0.29
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   297.27   196.00   223.50  1183.37     0.25
MEAN    15.50   294.34   189.91   224.88  1181.66     0.25
HUB     12.59   307.33   207.85   226.38  1179.94     0.26

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    354.76   274.15   158.76     0.23  3517.60
MEAN   306.46   253.29   116.55     0.21  2944.34     1.67
HUB    248.96   230.08    41.11     0.19  2617.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.27     1.06    20.36   589.42     1.02   582.04     0.92     0.90
MEAN    21.07     1.05    20.18   587.60     1.02   580.36     0.92     0.90
HUB     20.95     1.05    19.98   586.56     1.01   578.67     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.25    35.39    31.50     3.89     0.93     0.43     2.90
MEAN    40.18    27.40    23.50     3.90     0.94     0.41     3.34     0.90
HUB     42.56    10.29     6.50     3.79     0.94     0.39     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.986

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      297.965     193.394     226.676    1181.745       0.252       -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.078      20.165      580.445       46.000      40.470      33.000      -7.470

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      239.210     193.394     307.608    1184.424       0.202       0.330

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       21.069       20.478     583.080     440.827       0.030       0.464

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      224.882       0.000     224.882    1184.988       0.190       0.387

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950       20.523      583.635       0.000       0.060       0.055       0.379

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.860       21.046       1.051      587.857       9.607     219.766       1.704

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  59856.750       0.476     234.812  644809.312

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    405109.75   1589.2081      67.8150       1.3931       0.8016      18.0398       1.1244
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 60% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =19.026   EfDer =  0.917

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      66.357    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   30.16205

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      64.824    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  51046.902   52067.727       4.405     831.557     188.781     619.754       3.283

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   148.63    -0.05   148.63     0.13   406.33
  MEAN    17.06     0.00    -0.02   148.63    -0.05   148.63     0.13
  HUB     12.51     0.00    -0.02   148.63    -0.05   148.63     0.13

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     69.98    50.47    19.51   407.95   434.23    14.92   520.96     0.39
  MEAN    66.23    47.20    19.03   337.36   368.69    14.92   520.96     0.33
  HUB     59.01    38.62    20.39   247.38   288.64    14.92   520.96     0.26

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   359.47   297.28   202.11  1130.95     0.32
  MEAN    18.04   357.34   293.39   203.99  1128.24     0.32
  HUB     15.00   377.44   315.93   206.51  1125.05     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   230.43   110.67     0.20  6133.84
  MEAN   356.65   213.57    63.26     0.19  5292.50     2.00
  HUB    296.62   207.41    19.31     0.18  4739.64

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.82     1.11    15.68   542.29     1.04   531.50     0.92     0.84
  MEAN    16.58     1.10    15.46   539.62     1.03   528.96     0.92     0.84
  HUB     16.42     1.09    15.19   537.87     1.03   525.97     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     55.79    28.70    24.20     4.50     0.93     0.59     2.90
  MEAN    55.19    17.23    12.70     4.53     0.95     0.54     3.51     0.84
  HUB     56.83    -5.34    -9.30     3.96     0.95     0.41     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.917

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     359.675     292.822     208.858    1128.415       0.319       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.593      15.463     529.123      24.000      54.501      35.400     -19.101

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     222.565     292.822     367.804    1135.502       0.196       0.580
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.554      16.116     535.790     528.796       0.043       0.692

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     208.367       0.000     208.367    1136.044       0.183       0.527

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.075     536.301       0.000       0.060       0.127       0.544

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.759      16.458       1.089     539.928      17.118     152.046       1.179

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 106572.320       0.640     399.632  624979.062


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =19.026   EfDer =  0.923

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    66.357    2266.000      16.458     539.928       1.000       1.000       0.980
W Kg/sec =   30.16205

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    60.470    2221.009       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  51046.902   52067.727       3.353     590.487     176.104     474.134       2.692

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   199.74    -0.07   199.74     0.18   398.29
 MEAN    18.08     0.00    -0.02   199.74    -0.07   199.74     0.18
 HUB     15.21     0.00    -0.02   199.74    -0.07   199.74     0.18

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.83    46.36    17.47   406.37   452.86    16.11   536.60     0.40
 MEAN    60.81    42.30    18.51   357.49   409.56    16.11   536.60     0.36
 HUB     56.42    37.84    18.58   300.77   361.11    16.11   536.60     0.32

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   330.74   254.42   211.33  1147.60     0.29
 MEAN    18.01   325.41   246.11   212.90  1145.36     0.28
 HUB     15.22   338.53   261.73   214.71  1143.10     0.30

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   258.79   149.38     0.23  5196.66
 MEAN   356.14   239.65   110.03     0.21  4433.64     1.90
 HUB    301.03   218.27    39.30     0.19  3985.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.99     1.09    16.98   556.43     1.03   547.30     0.92     0.84
 MEAN    17.76     1.08    16.79   554.01     1.03   545.17     0.92     0.84
 HUB     17.62     1.07    16.58   552.59     1.02   543.01     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     50.29    35.25    31.50     3.75     0.93     0.53     2.90
 MEAN    49.14    27.33    23.50     3.83     0.95     0.51     3.30     0.84
 HUB     50.64    10.37     6.50     3.87     0.95     0.49     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.923

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     328.372     246.799     216.607    1145.541       0.287       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.780      16.792     545.337      46.000      48.728      30.600     -18.128

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     220.247     246.799     330.785    1150.732       0.191       0.518

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.752      17.304     550.291     511.151       0.037       0.587

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     218.211       0.000     218.211    1150.810       0.190       0.435

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.230     550.366       0.000       0.060       0.121       0.444

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.770      17.668       1.074     554.342      14.414     168.939       1.310

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  89759.766       0.550     336.587  568820.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =19.026   EfDer =  0.949

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     66.357    2266.000       17.668     554.342       1.000        1.000        0.980
W Kg/sec =   30.16205

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     57.074    2191.942        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  51046.902   52067.727        3.282     545.479     166.218     429.765       2.586

     ROTOR LEADING EDGE CONDITIONS, STAGE             3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   206.93    -0.07   206.93     0.18   383.89
 MEAN    17.74      0.00    -0.02   206.93    -0.07   206.93     0.18
 HUB     15.05      0.00    -0.02   206.93    -0.07   206.93     0.18

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     62.47     46.36    16.11   396.88   447.64     17.27   550.77      0.39
 MEAN    59.47     43.40    16.07   350.77   407.32     17.27   550.77      0.35
 HUB     55.20     38.84    16.36   297.61   362.53     17.27   550.77      0.31

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   322.60   237.59    218.23   1161.43      0.28
 MEAN    17.51   320.00   232.66    219.71   1159.49      0.28
 HUB     14.85   336.27   253.11    221.39   1157.52      0.29

       U2        W2        Wu2      MachRel2  DelRCu     Ws1/W2
 TIP    391.73    267.18    154.15      0.23   4708.02
 MEAN   346.18    247.30    113.53      0.21   4074.31      1.82
 HUB    293.65    225.07     40.54      0.19   3759.75

         Pt2        PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     19.15      1.08     18.15    569.29      1.03    560.60      0.92      0.87
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 MEAN    18.95     1.07    17.97   567.28     1.02   558.73     0.92     0.87
 HUB     18.85     1.07    17.77   566.28     1.02   556.84     0.92     0.87
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.43    35.24    31.50     3.74     0.93     0.49     2.90
 MEAN    46.64    27.33    23.50     3.83     0.95     0.48     3.28     0.87
 HUB     48.82    10.38     6.50     3.88     0.95     0.47     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.949

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     322.953     234.185     222.388    1159.673       0.278       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.974      17.977     558.909      46.000      46.480      31.500     -14.980

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     228.990     234.185     327.535    1164.157       0.197       0.474

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.953      18.448     563.239     471.992       0.030       0.552

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     223.177       0.000     223.177    1164.384       0.192       0.419

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.403     563.458       0.000       0.060       0.100       0.429

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.803      18.882       1.069     567.617      13.275     175.770       1.363

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  82682.133       0.539     310.047  568032.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =19.026   EfDer =  0.966

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     66.357    2266.000      18.882     567.617       1.000       1.000       0.980
W Kg/sec =   30.16205

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     54.042    2166.158       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  51046.902   52067.727       3.262     513.330     157.390     401.059       2.548

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   210.72    -0.07   210.72     0.18   364.07
 MEAN    16.97     0.00    -0.02   210.72    -0.07   210.72     0.18
 HUB     14.32     0.00    -0.02   210.72    -0.07   210.72     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.05    46.36    14.69   380.86   435.33    18.45   563.91     0.37
 MEAN    57.88    43.80    14.08   335.59   396.32    18.45   563.91     0.34
 HUB     53.35    37.84    15.51   283.17   353.03    18.45   563.91     0.30

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   309.90   217.35   220.90  1173.79     0.26
 MEAN    16.57   307.87   213.02   222.27  1172.03     0.26
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 HUB     13.89   323.77   233.94   223.82  1170.25     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   270.43   156.00     0.23  4104.94
 MEAN   327.74   250.13   114.72     0.21  3531.82     1.75
 HUB    274.67   227.50    40.73     0.19  3250.45

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.25     1.07    19.29   580.65     1.02   572.63     0.92     0.88
 MEAN    20.06     1.06    19.12   578.83     1.02   570.92     0.92     0.88
 HUB     19.96     1.06    18.93   577.94     1.02   569.19     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.54    35.23    31.50     3.73     0.93     0.46     2.90
 MEAN    43.78    27.30    23.50     3.80     0.95     0.45     3.29     0.88
 HUB     46.27    10.31     6.50     3.81     0.95     0.44     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     305.901     214.219     218.371    1172.451       0.261       0.036

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.080      19.151     571.326      46.000      44.450      32.400     -12.050

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     227.988     214.219     312.839    1176.009       0.194       0.446

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.068      19.548     574.799     456.573       0.023       0.524

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     217.673       0.000     217.673    1176.401       0.185       0.396

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.538     575.183       0.000       0.060       0.081       0.436

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.827      20.011       1.060     579.139      11.521     191.335       1.483

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  71772.727       0.515     269.138  583767.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =19.026   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     66.357    2266.000      20.011     579.139       1.000       1.000       0.980
W Kg/sec =   30.16205

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     51.507    2144.504       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  51046.902   52067.727       3.398     509.668     150.010     390.276       2.602

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   204.06    -0.07   204.06     0.17   342.84
 MEAN    15.91     0.00    -0.02   204.06    -0.07   204.06     0.17
 HUB     13.07     0.00    -0.02   204.06    -0.07   204.06     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.61    47.36    13.25   362.27   415.85    19.59   575.66     0.35
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MEAN    57.04    44.80    12.24   314.67   375.10    19.59   575.66     0.32
HUB     51.72    38.84    12.88   258.45   329.35    19.59   575.66     0.28
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   294.74   202.84   213.85  1184.78     0.25
MEAN    15.50   290.33   194.89   215.19  1183.01     0.25
HUB     12.59   301.45   209.59   216.66  1181.21     0.26

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    354.76   262.32   151.92     0.22  3640.23
MEAN   306.46   242.40   111.57     0.20  3021.47     1.72
HUB    248.96   220.21    39.38     0.19  2639.62

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.29     1.06    20.39   590.69     1.02   583.44     0.92     0.90
MEAN    21.07     1.05    20.20   588.73     1.02   581.69     0.92     0.90
HUB     20.93     1.05    20.00   587.52     1.01   579.93     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.49    35.39    31.50     3.89     0.93     0.45     2.90
MEAN    42.17    27.40    23.50     3.90     0.94     0.43     3.34     0.90
HUB     44.05    10.30     6.50     3.80     0.94     0.41     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.979

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      294.009     198.465     216.917    1183.079       0.249       -0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.076      20.189      581.764       46.000      42.456      33.000      -9.456

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      228.757     198.465     302.850    1185.971       0.193       0.363

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       21.063      20.523     584.612     440.827       0.035       0.496

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      215.144       0.000     215.144    1186.483       0.181       0.411

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950       20.558      585.116       0.000       0.060       0.065       0.402

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.848       21.036       1.051     588.980       9.841     211.123       1.637

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  61317.859       0.487     229.934  614798.812

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    412104.81   1545.3381      64.8237      1.3924       0.7867      19.0262       1.1266
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 60% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =19.981   EfDer =  0.903

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      63.430    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   28.83159

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      61.964    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  48795.203   49771.000       4.608     831.557     180.453     619.754       3.434

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   141.96    -0.05   141.96     0.13   406.33
  MEAN    17.06     0.00    -0.02   141.96    -0.05   141.96     0.13
  HUB     12.51     0.00    -0.02   141.96    -0.05   141.96     0.13

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     70.81    50.47    20.34   407.95   431.99    14.94   521.13     0.39
  MEAN    67.18    47.20    19.98   337.36   366.06    14.94   521.13     0.33
  HUB     60.15    38.62    21.53   247.38   285.26    14.94   521.13     0.25

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   358.15   301.55   193.24  1131.33     0.32
  MEAN    18.04   354.19   295.68   195.00  1128.58     0.31
  HUB     15.00   371.44   314.68   197.34  1125.38     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   220.60   106.40     0.19  6221.96
  MEAN   356.65   204.31    60.97     0.18  5333.79     2.08
  HUB    296.62   198.17    18.06     0.18  4720.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.82     1.11    15.69   542.57     1.04   531.86     0.92     0.83
  MEAN    16.56     1.10    15.47   539.75     1.03   529.28     0.92     0.83
  HUB     16.39     1.09    15.20   537.81     1.03   526.28     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     57.35    28.84    24.20     4.64     0.93     0.61     2.90
  MEAN    56.60    17.36    12.70     4.66     0.95     0.56     3.51     0.83
  HUB     57.91    -5.23    -9.30     4.07     0.95     0.43     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.903

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     356.301     295.109     199.652    1128.755       0.316       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.580      15.472     529.441      24.000      55.920      35.400     -20.520

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     212.622     295.109     363.727    1136.009       0.187       0.604
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.540      16.140     536.269     528.796       0.045       0.717

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     199.155       0.000     199.155    1136.500       0.175       0.542

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.090     536.732       0.000       0.060       0.134       0.560

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.744      16.439       1.088     540.045      17.235     147.839       1.146

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 107301.148       0.645     384.617  596949.812


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =19.981   EfDer =  0.909

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    63.430    2266.000      16.439     540.045       1.000       1.000       0.980
W Kg/sec =   28.83159

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    57.875    2220.768       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 48795.203   49771.000       3.503     590.487     168.546     474.134       2.813

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP    20.55     0.00    -0.02   190.93    -0.07   190.93     0.17   398.24
 MEAN   18.08     0.00    -0.02   190.93    -0.07   190.93     0.17
 HUB    15.21     0.00    -0.02   190.93    -0.07   190.93     0.17

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP    64.84    46.36    18.48   406.37   449.05    16.12   537.00     0.40
 MEAN   61.90    42.30    19.60   357.49   405.34    16.12   537.00     0.36
 HUB    57.60    37.84    19.76   300.77   356.31    16.12   537.00     0.31

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP    20.42   329.69   260.38   202.23  1148.18     0.29
 MEAN   18.01   322.80   250.40   203.72  1145.89     0.28
 HUB    15.22   333.78   263.06   205.44  1143.57     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP   403.80   247.92   143.41     0.22  5318.39
 MEAN  356.14   229.52   105.74     0.20  4510.92     1.96
 HUB   301.03   208.92    37.97     0.18  4005.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    17.98     1.09    16.98   556.94     1.03   547.86     0.92     0.83
 MEAN   17.74     1.08    16.79   554.37     1.03   545.67     0.92     0.83
 HUB    17.59     1.07    16.58   552.77     1.02   543.46     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    52.16    35.34    31.50     3.84     0.93     0.55     2.90
 MEAN   50.87    27.43    23.50     3.93     0.95     0.53     3.30     0.83
 HUB    52.01    10.47     6.50     3.97     0.95     0.51     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.909

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     325.601     251.105     207.273    1146.065       0.284       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.759      16.790     545.838      46.000      50.462      30.600     -19.862

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     210.599     251.105     327.728    1151.458       0.183       0.546

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.730      17.320     550.987     511.151       0.040       0.617

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     208.727       0.000     208.727    1151.526       0.181       0.455

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.240     551.053       0.000       0.060       0.131       0.464

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.753      17.640       1.073     554.691      14.647     163.206       1.265

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91205.031       0.559     326.921  542917.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =19.981   EfDer =  0.939

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     63.430    2266.000      17.640     554.691       1.000       1.000       0.980
W Kg/sec =   28.83159

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     54.661    2191.252       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  48795.203   49771.000       3.427     545.479     159.189     429.765       2.700

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   197.97    -0.07   197.97     0.17   383.77
 MEAN    17.74     0.00    -0.02   197.97    -0.07   197.97     0.17
 HUB     15.05     0.00    -0.02   197.97    -0.07   197.97     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.49    46.36    17.13   396.88   443.57    17.28   551.42     0.39
 MEAN    60.57    43.40    17.17   350.77   402.84    17.28   551.42     0.35
 HUB     56.37    38.84    17.53   297.61   357.49    17.28   551.42     0.31

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   321.12   243.90   208.88  1162.28     0.28
 MEAN    17.51   317.04   237.24   210.30  1160.27     0.27
 HUB     14.85   331.26   254.59   211.93  1158.25     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   255.91   147.84     0.22  4832.99
 MEAN   346.18   236.85   108.94     0.20  4154.51     1.88
 HUB    293.65   215.50    39.06     0.19  3781.69

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     19.15     1.09    18.16   570.04     1.03   561.43     0.92     0.86
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 MEAN    18.93     1.07    17.97   567.88     1.02   559.49     0.92     0.86
 HUB     18.81     1.07    17.77   566.70     1.02   557.54     0.92     0.86
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.42    35.29    31.50     3.79     0.93     0.52     2.90
 MEAN    48.44    27.39    23.50     3.89     0.95     0.50     3.28     0.86
 HUB     50.22    10.44     6.50     3.94     0.95     0.49     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.939

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     319.910     238.799     212.879    1160.451       0.276       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.952      17.976     559.662      46.000      48.284      31.500     -16.784

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     219.035     238.799     324.039    1165.147       0.188       0.503

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.929      18.467     564.201     471.992       0.033       0.583

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     213.578       0.000     213.578    1165.351       0.183       0.439

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.413     564.398       0.000       0.060       0.112       0.449

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.788      18.850       1.069     568.207      13.516     169.624       1.315

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  84179.453       0.549     301.738  541976.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =19.981   EfDer =  0.957

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     63.430    2266.000      18.850     568.207       1.000       1.000       0.980
W Kg/sec =   28.83159

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     51.771    2165.034       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 48795.203   49771.000       3.405     513.330     150.778     401.059       2.660

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   201.70    -0.07   201.70     0.17   363.88
 MEAN    16.97     0.00    -0.02   201.70    -0.07   201.70     0.17
 HUB     14.32     0.00    -0.02   201.70    -0.07   201.70     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.10    46.36    15.74   380.86   431.03    18.46   564.81     0.37
 MEAN    59.00    43.80    15.20   335.59   391.60    18.46   564.81     0.34
 HUB     54.55    37.84    16.71   283.17   347.72    18.46   564.81     0.30

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   307.92   223.81   211.48  1174.89     0.26
 MEAN    16.57   304.47   217.75   212.81  1173.06     0.26
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 HUB     13.89   318.47   235.56   214.32  1171.22     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   259.00   149.53     0.22  4226.86
 MEAN   327.74   239.56   109.99     0.20  3610.13     1.80
 HUB    274.67   217.86    39.10     0.19  3272.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.25     1.07    19.30   581.63     1.02   573.71     0.92     0.88
 MEAN    20.04     1.06    19.12   579.67     1.02   571.93     0.92     0.88
 HUB     19.92     1.06    18.93   578.60     1.02   570.13     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.62    35.26    31.50     3.76     0.93     0.49     2.90
 MEAN    45.66    27.33    23.50     3.83     0.95     0.47     3.29     0.88
 HUB     47.70    10.34     6.50     3.84     0.95     0.46     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.957

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     302.774     218.974     209.100    1173.455       0.258       0.033

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.059      19.151     572.311      46.000      46.321      32.400     -13.921

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     218.149     218.974     309.093    1177.222       0.185       0.476

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.044      19.569     575.991     456.573       0.026       0.555

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     208.389       0.000     208.389    1177.577       0.177       0.416

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.547     576.339       0.000       0.060       0.093       0.453

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.813      19.980       1.060     579.964      11.757     184.370       1.429

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  73240.875       0.525     262.529  556816.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =19.981   EfDer =  0.971

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     63.430    2266.000      19.980     579.964       1.000       1.000       0.980
W Kg/sec =   28.83159

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     49.347    2142.977       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  48795.203   49771.000       3.546     509.668     143.719     390.276       2.716

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   195.39    -0.07   195.39     0.17   342.59
 MEAN    15.91     0.00    -0.02   195.39    -0.07   195.39     0.17
 HUB     13.07     0.00    -0.02   195.39    -0.07   195.39     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.66    47.36    14.30   362.27   411.66    19.60   576.78     0.35
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 MEAN    58.17    44.80    13.37   314.67   370.46    19.60   576.78     0.31
 HUB     52.92    38.84    14.08   258.45   324.05    19.60   576.78     0.28
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   292.75   209.21   204.77  1186.08     0.25
 MEAN    15.50   286.86   199.55   206.08  1184.24     0.24
 HUB     12.59   296.08   211.19   207.51  1182.39     0.25

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   251.22   145.54     0.21  3754.54
 MEAN   306.46   232.16   106.91     0.20  3093.59     1.78
 HUB    248.96   210.92    37.77     0.18  2659.80

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.28     1.07    20.40   591.88     1.02   584.73     0.92     0.89
 MEAN    21.05     1.05    20.21   589.78     1.02   582.91     0.92     0.89
 HUB     20.90     1.05    20.00   588.41     1.01   581.09     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.61    35.40    31.50     3.90     0.93     0.48     2.90
 MEAN    44.08    27.42    23.50     3.92     0.94     0.45     3.34     0.89
 HUB     45.50    10.32     6.50     3.82     0.94     0.43     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     290.599     203.208     207.737    1184.302       0.245       -0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.058      20.193     582.974      46.000      44.369      33.000     -11.369

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     218.941     203.208     298.712    1187.394       0.184       0.394

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.040      20.547     586.022     440.827       0.040       0.527

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     205.996       0.000     205.996    1187.859       0.173       0.433

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.572     586.481       0.000       0.060       0.077       0.423

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.835      21.009       1.051     590.023      10.060     203.214       1.575

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  62680.016       0.498     224.674  586316.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    418606.50   1500.4779     61.9643      1.3906      0.7714     19.9809      1.1286
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 60% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =21.005   EfDer =  0.885

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      60.328    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   27.42202

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      58.935    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  46409.617   47337.707       4.845     831.557     171.631     619.754       3.611

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   134.92    -0.05   134.92     0.12   406.33
  MEAN    17.06     0.00    -0.02   134.92    -0.05   134.92     0.12
  HUB     12.51     0.00    -0.02   134.92    -0.05   134.92     0.12

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     71.70    50.47    21.23   407.95   429.73    14.95   521.29     0.38
  MEAN    68.20    47.20    21.00   337.36   363.38    14.95   521.29     0.32
  HUB     61.40    38.62    22.78   247.38   281.82    14.95   521.29     0.25

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   357.02   306.00   183.94  1131.71     0.32
  MEAN    18.04   351.06   298.02   185.55  1128.92     0.31
  HUB     15.00   365.20   313.28   187.70  1125.72     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   210.30   101.95     0.19  6313.65
  MEAN   356.65   194.60    58.64     0.17  5375.81     2.17
  HUB    296.62   188.44    16.66     0.17  4699.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.81     1.11    15.69   542.87     1.04   532.22     0.92     0.81
  MEAN    16.55     1.10    15.47   539.89     1.03   529.59     0.92     0.81
  HUB     16.36     1.08    15.21   537.74     1.03   526.60     0.92     0.81

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     58.99    29.00    24.20     4.80     0.93     0.63     2.90
  MEAN    58.09    17.54    12.70     4.84     0.95     0.58     3.51     0.81
  HUB     59.07    -5.07    -9.30     4.23     0.95     0.46     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.885

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     352.933     297.437     189.981    1129.094       0.313       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.560      15.474     529.760      24.000      57.433      35.400     -22.033

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     202.189     297.437     359.652    1136.518       0.178       0.629
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      16.519      16.158     536.750     528.796       0.047       0.744

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     189.462       0.000     189.462    1136.959       0.167       0.560

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      16.099     537.166       0.000       0.060       0.140       0.577

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
    0.726      16.415       1.087     540.164      17.354     143.381       1.111

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 108043.664       0.649     368.344  567323.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =21.005   EfDer =  0.889

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    60.328    2266.000      16.415     540.164       1.000       1.000       0.980
W Kg/sec =   27.42202

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    55.133    2220.522       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 46409.617   47337.707       3.678     590.487     160.560     474.134       2.953

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   181.66    -0.06   181.66     0.16   398.20
MEAN    18.08     0.00    -0.02   181.66    -0.06   181.66     0.16
HUB     15.21     0.00    -0.02   181.66    -0.06   181.66     0.16

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     65.92    46.36    19.56   406.37   445.18    16.12   537.41     0.39
MEAN    63.07    42.30    20.77   357.49   401.05    16.12   537.41     0.35
HUB     58.87    37.84    21.03   300.77   351.43    16.12   537.41     0.31

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   328.88   266.48   192.74  1148.77     0.29
MEAN    18.01   320.36   254.85   194.11  1146.42     0.28
HUB     15.22   328.95   264.39   195.72  1144.04     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   236.65   137.31     0.21  5442.89
MEAN   356.14   218.95   101.29     0.19  4590.99     2.04
HUB    301.03   199.12    36.64     0.17  4025.78

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.95     1.09    16.96   557.45     1.03   548.42     0.92     0.81
MEAN    17.71     1.08    16.77   554.74     1.03   546.17     0.92     0.81
HUB     17.54     1.07    16.56   552.95     1.02   543.91     0.92     0.81

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     54.12    35.47    31.50     3.97     0.93     0.57     2.90
MEAN    52.70    27.56    23.50     4.06     0.95     0.55     3.30     0.81
HUB     53.49    10.60     6.50     4.10     0.95     0.53     3.92


  blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.889

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     322.992     255.567     197.508    1146.586       0.282       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.726      16.774     546.336      46.000      52.302      30.600     -21.702

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     200.516     255.567     324.840    1152.191       0.174       0.576

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.695      17.324     551.691     511.151       0.042       0.649

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     198.792       0.000     198.792    1152.251       0.173       0.478

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.238     551.748       0.000       0.060       0.139       0.487

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.733      17.600       1.072     555.049      14.885     157.282       1.219

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  92686.719       0.568     315.989  515598.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =21.005   EfDer =  0.925

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     60.328    2266.000      17.600     555.049       1.000       1.000       0.980
W Kg/sec =   27.42202

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     52.122    2190.547       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  46409.617   47337.707       3.593     545.479     151.797     429.765       2.831

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   188.57    -0.06   188.57     0.16   383.65
 MEAN    17.74     0.00    -0.02   188.57    -0.06   188.57     0.16
 HUB     15.05     0.00    -0.02   188.57    -0.06   188.57     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     64.59    46.36    18.23   396.88   439.46    17.27   552.08     0.38
 MEAN    61.74    43.40    18.34   350.77   398.30    17.27   552.08     0.35
 HUB     57.65    38.84    18.81   297.61   352.38    17.27   552.08     0.31

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   319.91   250.38   199.13  1163.13     0.28
 MEAN    17.51   314.24   241.97   200.48  1161.07     0.27
 HUB     14.85   326.20   256.11   202.03  1158.98     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   244.20   141.35     0.21  4961.36
 MEAN   346.18   225.95   104.21     0.19  4237.29     1.95
 HUB    293.65   205.49    37.55     0.18  3804.16

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     19.12     1.09    18.14   570.80     1.03   562.26     0.92     0.85
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 MEAN    18.89     1.07    17.95   568.50     1.02   560.26     0.92     0.85
 HUB     18.76     1.07    17.75   567.13     1.02   558.24     0.92     0.85
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     51.50    35.37    31.50     3.87     0.93     0.54     2.90
 MEAN    50.36    27.47    23.50     3.97     0.95     0.52     3.28     0.85
 HUB     51.73    10.53     6.50     4.03     0.95     0.51     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.925

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     317.031     243.562     202.944    1161.232       0.273       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.914      17.959     560.419      46.000      50.198      31.500     -18.698

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     208.646     243.562     320.711    1166.150       0.179       0.535

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.889      18.471     565.177     471.992       0.036       0.616

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     203.543       0.000     203.543    1166.331       0.175       0.460

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.407     565.352       0.000       0.060       0.124       0.470

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.771      18.803       1.068     568.811      13.763     163.315       1.266

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  85719.250       0.559     292.235  514525.031


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =21.005   EfDer =  0.946

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     60.328    2266.000      18.803     568.811       1.000       1.000       0.980
W Kg/sec =   27.42202

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     49.390    2163.883       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  46409.617   47337.707       3.569     513.330     143.841     401.059       2.788

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   192.25    -0.07   192.25     0.16   363.68
 MEAN    16.97     0.00    -0.02   192.25    -0.07   192.25     0.16
 HUB     14.32     0.00    -0.02   192.25    -0.07   192.25     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.22    46.36    16.86   380.86   426.69    18.45   565.73     0.37
 MEAN    60.20    43.80    16.40   335.59   386.81    18.45   565.73     0.33
 HUB     55.83    37.84    17.99   283.17   342.32    18.45   565.73     0.29

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   306.25   230.48   201.65  1176.00     0.26
 MEAN    16.57   301.24   222.63   202.94  1174.11     0.26
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 HUB     13.89   313.11   237.19   204.39  1172.20     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   247.13   142.86     0.21  4352.81
 MEAN   327.74   228.55   105.11     0.19  3690.93     1.87
 HUB    274.67   207.80    37.48     0.18  3295.56

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.22     1.08    19.29   582.63     1.02   574.80     0.92     0.87
 MEAN    20.00     1.06    19.10   580.53     1.02   572.95     0.92     0.87
 HUB     19.87     1.06    18.91   579.27     1.02   571.09     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.82    35.32    31.50     3.82     0.93     0.51     2.90
 MEAN    47.65    27.38    23.50     3.88     0.95     0.50     3.29     0.87
 HUB     49.25    10.39     6.50     3.89     0.95     0.48     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.946

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     299.819     223.880     199.422    1174.469       0.255       0.030

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.020      19.132     573.307      46.000      48.307      32.400     -15.907

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     207.892     223.880     305.518    1178.453       0.176       0.508

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.002      19.572     577.203     456.573       0.029       0.589

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     198.700       0.000     198.700    1178.772       0.169       0.437

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.538     577.515       0.000       0.060       0.107       0.472

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.797      19.930       1.060     580.811      12.000     177.265       1.374

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  74752.648       0.536     254.848  528446.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =21.005   EfDer =  0.962

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     60.328    2266.000      19.930     580.811       1.000       1.000       0.980
W Kg/sec =   27.42202

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     47.086    2141.414       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  46409.617   47337.707       3.717     509.668     137.135     390.276       2.846

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   186.34    -0.06   186.34     0.16   342.34
 MEAN    15.91     0.00    -0.02   186.34    -0.06   186.34     0.16
 HUB     13.07     0.00    -0.02   186.34    -0.06   186.34     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.78    47.36    15.42   362.27   407.44    19.59   577.91     0.35
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MEAN    59.37    44.80    14.57   314.67   365.76    19.59   577.91     0.31
HUB     54.22    38.84    15.38   258.45   318.67    19.59   577.91     0.27
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   291.04   215.77   195.32  1187.39     0.25
MEAN    15.50   283.57   204.37   196.58  1185.49     0.24
HUB     12.59   290.66   212.82   197.96  1183.57     0.25

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    354.76   239.73   138.99     0.20  3872.05
MEAN   306.46   221.51   102.09     0.19  3168.29     1.85
HUB    248.96   201.23    36.14     0.17  2680.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.26     1.07    20.38   593.10     1.02   586.03     0.92     0.88
MEAN    21.01     1.05    20.19   590.87     1.02   584.16     0.92     0.88
HUB     20.84     1.05    19.98   589.32     1.01   582.27     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     47.85    35.43    31.50     3.93     0.93     0.50     2.90
MEAN    46.11    27.44    23.50     3.94     0.95     0.48     3.34     0.88
HUB     47.07    10.35     6.50     3.85     0.95     0.45     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.962

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      287.375     208.119     198.169    1185.540       0.242       -0.016

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.019      20.176      584.202       46.000      46.403      33.000     -13.403

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      208.727     208.119     294.755    1188.840       0.176       0.427

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       20.996      20.549     587.459     440.827       0.047       0.561

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      196.471       0.000     196.471    1189.260       0.165       0.456

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       20.563      587.874       0.000       0.060       0.090       0.444

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.821       20.959       1.052     591.096      10.285     195.187       1.513

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  64081.648       0.509     218.468  556347.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency      Rotor1Inc    TR
    425283.94   1449.8845      58.9348      1.3874      0.7536      21.0048      1.1306
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 60% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =21.502   EfDer =  0.875

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      58.835    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   26.74329

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      57.476    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  45260.922   46166.043       4.968     831.557     167.383     619.754       3.703

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   131.53    -0.05   131.53     0.12   406.33
  MEAN    17.06     0.00    -0.02   131.53    -0.05   131.53     0.12
  HUB     12.51     0.00    -0.02   131.53    -0.05   131.53     0.12

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     72.13    50.47    21.66   407.95   428.67    14.96   521.36     0.38
  MEAN    68.70    47.20    21.50   337.36   362.13    14.96   521.36     0.32
  HUB     62.00    38.62    23.38   247.38   280.21    14.96   521.36     0.25

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   356.55   308.08   179.49  1131.89     0.32
  MEAN    18.04   349.62   299.09   181.04  1129.07     0.31
  HUB     15.00   362.25   312.57   183.09  1125.88     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   205.41    99.87     0.18  6356.53
  MEAN   356.65   189.97    57.56     0.17  5395.26     2.22
  HUB    296.62   183.78    15.95     0.16  4689.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.80     1.11    15.68   543.00     1.04   532.38     0.92     0.80
  MEAN    16.53     1.09    15.47   539.95     1.03   529.74     0.92     0.80
  HUB     16.34     1.08    15.21   537.71     1.03   526.75     0.92     0.80

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     59.77    29.09    24.20     4.89     0.93     0.64     2.90
  MEAN    58.81    17.64    12.70     4.94     0.95     0.60     3.51     0.80
  HUB     59.64    -4.98    -9.30     4.32     0.95     0.47     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.875

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     351.380     298.514     185.358    1129.250       0.311       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.548      15.472     529.906      24.000      58.162      35.400     -22.762

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     197.205     298.514     357.772    1136.752       0.173       0.642
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.506      16.163     536.971     528.796       0.048       0.757

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     184.822       0.000     184.822    1137.170       0.163       0.569

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.101     537.366       0.000       0.060       0.143       0.586

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.716      16.401       1.086     540.219      17.409     141.235       1.095

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 108384.898       0.651     360.362  553082.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =21.502   EfDer =  0.878

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    58.835    2266.000      16.401     540.219       1.000       1.000       0.980
W Kg/sec =   26.74329

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    53.816    2220.410       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 45260.922   46166.043       3.768     590.487     156.726     474.134       3.025

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   177.22    -0.06   177.22     0.16   398.18
MEAN    18.08     0.00    -0.02   177.22    -0.06   177.22     0.16
HUB     15.21     0.00    -0.02   177.22    -0.06   177.22     0.16

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     66.44    46.36    20.08   406.37   443.39    16.12   537.60     0.39
MEAN    63.63    42.30    21.33   357.49   399.06    16.12   537.60     0.35
HUB     59.50    37.84    21.66   300.77   349.15    16.12   537.60     0.31

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   328.62   269.37   188.22  1149.04     0.29
MEAN    18.01   319.28   256.94   189.54  1146.66     0.28
HUB     15.22   326.71   265.00   191.09  1144.26     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   231.30   134.43     0.20  5501.77
MEAN   356.14   213.93    99.20     0.19  4628.50     2.08
HUB    301.03   194.46    36.03     0.17  4035.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.94     1.09    16.94   557.69     1.03   548.67     0.92     0.80
MEAN    17.69     1.08    16.76   554.92     1.03   546.41     0.92     0.80
HUB     17.52     1.07    16.55   553.03     1.02   544.12     0.92     0.80

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     55.06    35.53    31.50     4.03     0.93     0.58     2.90
MEAN    53.58    27.63    23.50     4.13     0.95     0.56     3.30     0.80
HUB     54.20    10.68     6.50     4.18     0.95     0.54     3.92


  blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.878

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     321.841     257.657     192.859    1146.825       0.281       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.704      16.760     546.565      46.000      53.185      30.600     -22.585

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     195.718     257.657     323.562    1152.530       0.170       0.591

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.672      17.320     552.016     511.151       0.043       0.665

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     194.055       0.000     194.055    1152.586       0.168       0.490

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.232     552.070       0.000       0.060       0.142       0.499

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.722      17.577       1.072     555.215      14.996     154.479       1.198

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93382.875       0.573     310.482  502489.094


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =21.502   EfDer =  0.918

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     58.835    2266.000      17.577     555.215       1.000       1.000       0.980
W Kg/sec =   26.74329

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     50.908    2190.218       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  45260.922   46166.043       3.679     545.479     148.262     429.765       2.899

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   184.09    -0.06   184.09     0.16   383.59
 MEAN    17.74     0.00    -0.02   184.09    -0.06   184.09     0.16
 HUB     15.05     0.00    -0.02   184.09    -0.06   184.09     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     65.12    46.36    18.76   396.88   437.55    17.27   552.39     0.38
 MEAN    62.31    43.40    18.91   350.77   396.20    17.27   552.39     0.34
 HUB     58.27    38.84    19.43   297.61   350.00    17.27   552.39     0.30

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   319.45   253.42   194.50  1163.53     0.27
 MEAN    17.51   313.01   244.20   195.81  1161.43     0.27
 HUB     14.85   323.86   256.81   197.32  1159.31     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   238.67   138.32     0.21  5021.44
 MEAN   346.18   220.77   101.98     0.19  4276.30     1.99
 HUB    293.65   200.73    36.84     0.17  3814.57

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     19.10     1.09    18.13   571.16     1.03   562.64     0.92     0.84
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 MEAN    18.87     1.07    17.94   568.79     1.02   560.61     0.92     0.84
 HUB     18.73     1.07    17.74   567.33     1.02   558.57     0.92     0.84
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     52.49    35.42    31.50     3.92     0.93     0.55     2.90
 MEAN    51.28    27.51    23.50     4.01     0.95     0.54     3.28     0.84
 HUB     52.46    10.58     6.50     4.08     0.95     0.52     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.918

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     315.772     245.807     198.219    1161.591       0.272       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.889      17.943     560.769      46.000      51.117      31.500     -19.617

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     203.710     245.807     319.247    1166.615       0.175       0.550

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.863      18.465     565.629     471.992       0.038       0.632

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     198.767       0.000     198.767    1166.786       0.170       0.471

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.397     565.795       0.000       0.060       0.129       0.480

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.763      18.774       1.068     569.094      13.879     160.352       1.243

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  86441.414       0.563     287.403  501361.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =21.502   EfDer =  0.940

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     58.835    2266.000      18.774     569.094       1.000       1.000       0.980
W Kg/sec =   26.74329

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     48.253    2163.346       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  45260.922   46166.043       3.653     513.330     140.532     401.059       2.854

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   187.76    -0.06   187.76     0.16   363.59
 MEAN    16.97     0.00    -0.02   187.76    -0.06   187.76     0.16
 HUB     14.32     0.00    -0.02   187.76    -0.06   187.76     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.76    46.36    17.40   380.86   424.68    18.44   566.15     0.36
 MEAN    60.78    43.80    16.98   335.59   384.60    18.44   566.15     0.33
 HUB     56.46    37.84    18.62   283.17   339.82    18.44   566.15     0.29

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   305.60   233.63   196.99  1176.51     0.26
 MEAN    16.57   299.81   224.91   198.25  1174.59     0.26
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 HUB     13.89   310.59   237.91   199.66  1172.65     0.26

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   241.50   139.71     0.21  4412.27
 MEAN   327.74   223.33   102.84     0.19  3728.65     1.91
 HUB    274.67   203.02    36.76     0.17  3305.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.20     1.08    19.27   583.10     1.02   575.31     0.92     0.86
 MEAN    19.97     1.06    19.09   580.93     1.02   573.43     0.92     0.86
 HUB     19.83     1.06    18.89   579.59     1.02   571.53     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.86    35.34    31.50     3.84     0.93     0.53     2.90
 MEAN    48.60    27.42    23.50     3.92     0.95     0.51     3.29     0.86
 HUB     49.99    10.43     6.50     3.93     0.95     0.49     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.940

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     298.510     226.170     194.821    1174.938       0.254       0.029

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.993      19.114     573.768      46.000      49.259      32.400     -16.859

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     203.023     226.170     303.926    1179.025       0.172       0.524

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.974      19.564     577.766     456.573       0.031       0.605

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     194.094       0.000     194.094    1179.327       0.165       0.447

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.525     578.062       0.000       0.060       0.113       0.481

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.790      19.898       1.060     581.207      12.113     173.949       1.348

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  75458.711       0.541     250.888  514851.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =21.502   EfDer =  0.957

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     58.835    2266.000      19.898     581.207       1.000       1.000       0.980
W Kg/sec =   26.74329

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     46.009    2140.684       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  45260.922   46166.043       3.804     509.668     133.999     390.276       2.913

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   182.03    -0.06   182.03     0.15   342.23
 MEAN    15.91     0.00    -0.02   182.03    -0.06   182.03     0.15
 HUB     13.07     0.00    -0.02   182.03    -0.06   182.03     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.33    47.36    15.97   362.27   405.49    19.57   578.44     0.34
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MEAN    59.96    44.80    15.16   314.67   363.59    19.57   578.44     0.31
HUB     54.85    38.84    16.01   258.45   316.18    19.57   578.44     0.27
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   290.39   218.87   190.84  1188.00     0.24
MEAN    15.50   282.10   206.61   192.07  1186.07     0.24
HUB     12.59   288.17   213.61   193.42  1184.13     0.24

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    354.76   234.27   135.88     0.20  3927.70
MEAN   306.46   216.47    99.85     0.18  3202.95     1.88
HUB    248.96   196.62    35.35     0.17  2690.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.23     1.07    20.37   593.67     1.02   586.64     0.92     0.88
MEAN    20.98     1.05    20.17   591.37     1.02   584.73     0.92     0.88
HUB     20.81     1.05    19.97   589.75     1.01   582.81     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     48.91    35.45    31.50     3.95     0.93     0.51     2.90
MEAN    47.09    27.47    23.50     3.97     0.95     0.49     3.34     0.88
HUB     47.84    10.36     6.50     3.86     0.95     0.46     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.957

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      285.932     210.398     193.624    1186.115       0.241      -0.016

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.991      20.158      584.773      46.000      47.377      33.000     -14.377

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      203.881     210.398     292.975    1189.513       0.171       0.443

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       20.966      20.540     588.128     440.827       0.050       0.577

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      191.949       0.000     191.949    1189.911       0.161       0.467

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       20.549      588.522       0.000       0.060       0.096       0.454

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.813      20.927       1.052     591.598      10.391     191.440       1.484

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  64742.680       0.514     215.259  541990.188

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    428410.59   1424.3938      57.4761      1.3852      0.7444     21.5023      1.1316
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.464   EfDer =  0.989

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     101.607    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   46.18479

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      99.259    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   78164.125   79727.242       2.877     831.557     289.065     619.754       2.144

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   230.42    -0.08   230.42     0.21   338.55
  MEAN    17.06     0.00    -0.02   230.42    -0.08   230.42     0.21
  HUB     12.51     0.00    -0.02   230.42    -0.08   230.42     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.87    50.47     5.40   339.90   410.71    14.66   518.38     0.37
  MEAN    50.66    47.20     3.46   281.08   363.52    14.66   518.38     0.33
  HUB     41.82    38.62     3.20   206.11   309.21    14.66   518.38     0.28

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   361.39   167.02   320.48  1119.75     0.32
  MEAN    18.04   378.44   199.54   321.56  1119.05     0.34
  HUB     15.00   428.19   279.21   324.64  1117.12     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   364.14   172.88     0.33  3447.22
  MEAN   297.16   336.05    97.62     0.30  3600.18     1.20
  HUB    247.14   326.22    32.07     0.29  4189.13

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.96     1.06    14.84   531.93     1.02   521.03     0.92     0.90
  MEAN    15.99     1.06    14.78   532.34     1.02   520.38     0.92     0.90
  HUB     16.14     1.07    14.58   533.90     1.02   518.58     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     27.53    28.34    24.20     4.14     0.93     0.18     2.90
  MEAN    31.82    16.89    12.70     4.19     0.92     0.16     3.51     0.90
  HUB     40.70    -5.64    -9.30     3.66     0.92     0.05     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.989

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     385.071     199.148     329.575    1119.009       0.344      -0.015

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      16.018      14.756     520.338      24.000      31.143      35.400       4.257

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	358.842	199.148	410.399	1120.760	0.320	0.136

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.010	14.911	521.968	528.796	0.016	0.307

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	333.150	0.000	333.150	1122.353	0.297	0.209

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.026	523.453	0.000	0.060	0.043	0.225

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.852	15.975	1.057	532.723	9.913	237.600	1.842

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
61719.043	0.534	354.383	968918.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 3.464 EfDer = 0.961

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
101.607	1888.000	15.975	532.723	1.000	1.000	0.980

W Kg/sec = 46.18479

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
94.751	1862.985	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
78164.125	79727.242	2.140	590.487	275.936	474.134	1.718

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	318.59	-0.11	318.59	0.28	334.08
MEAN	18.08	0.00	-0.02	318.59	-0.11	318.59	0.28	
HUB	15.21	0.00	-0.02	318.59	-0.11	318.59	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.75	46.36	0.39	338.58	464.98	15.11	524.25	0.41
MEAN	43.08	42.30	0.78	297.86	436.21	15.11	524.25	0.39
HUB	38.20	37.84	0.36	250.60	405.40	15.11	524.25	0.36

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	357.34	92.69	345.11	1126.22	0.32
MEAN	18.01	364.72	118.36	344.98	1126.42	0.32
HUB	15.22	392.85	187.39	345.28	1126.55	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	336.44	422.51	243.74	0.38	1895.09	
MEAN	296.73	388.36	178.37	0.34	2133.59	1.20
HUB	250.81	351.05	63.42	0.31	2854.30	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.44	1.03	15.33	537.74	1.01	527.07	0.92	0.88
MEAN	16.50	1.03	15.34	538.37	1.01	527.26	0.92	0.88
HUB	16.68	1.04	15.33	540.28	1.01	527.39	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	15.03	35.23	31.50	3.73	0.93	0.13	2.90	
MEAN	18.94	27.34	23.50	3.84	0.91	0.15	3.30	0.88
HUB	28.49	10.41	6.50	3.91	0.91	0.19	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.961
    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     370.754     118.689     351.243    1126.472       0.329      -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.529      15.333     527.315      46.000      18.671      30.600      11.929

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     364.542     118.689     383.377    1126.879       0.323       0.012

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.507      15.351     527.696     511.151       0.028       0.135

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     360.534       0.000     360.534    1127.138       0.320      -0.013

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.317     527.939       0.000       0.060       0.080      -0.016

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.731      16.444       1.029     538.795       6.072     340.016       2.636

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  37805.809       0.334     217.076  901563.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.464   EfDer =  0.899

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    101.607    1888.000       16.444     538.795       1.000        1.000        0.980
W Kg/sec =   46.18479

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     92.571    1852.458        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  78164.125   79727.242        2.023     545.479     269.589     429.765       1.594

     ROTOR LEADING EDGE CONDITIONS, STAGE             3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   340.64    -0.12   340.64     0.30   324.44
 MEAN    17.74      0.00    -0.02   340.64    -0.12   340.64     0.30
 HUB     15.05      0.00    -0.02   340.64    -0.12   340.64     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.16     46.36    -2.20   330.67   474.82    15.44   529.10     0.42
 MEAN    40.64     43.40    -2.76   292.26   448.91    15.44   529.10     0.40
 HUB     36.07     38.84    -2.77   247.96   421.40    15.44   529.10     0.37

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   375.49     62.88   370.19  1129.67      0.33
 MEAN    17.51   381.52     95.53   369.37  1130.46      0.34
 HUB     14.85   408.64    175.07   369.24  1131.17      0.36

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39    454.40    263.51     0.40  1247.96
 MEAN   288.44    416.71    192.91     0.37  1674.42      1.14
 HUB    244.67    375.74     69.60     0.33  2601.54

         Pt2       PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     16.74      1.02     15.50   542.10      1.01   530.32      0.92      0.82
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 MEAN    16.84     1.02    15.56   543.23     1.01   531.07     0.92     0.82
 HUB     17.06     1.04    15.58   545.68     1.01   531.73     0.92     0.82
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP      9.64    35.44    31.50     3.94     0.93     0.07     2.90
 MEAN    14.50    27.58    23.50     4.08     0.89     0.10     3.28     0.82
 HUB     25.37    10.67     6.50     4.17     0.89     0.16     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.899

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     386.279      96.153     374.120    1130.608       0.342      -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.862      15.552     531.206      46.000      14.414      31.500      17.086

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     394.219      96.153     405.776    1130.057       0.349      -0.065

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.820      15.460     530.689     471.992       0.042       0.089

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     384.155       0.000     384.155    1130.753       0.340      -0.086

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.438     531.343       0.000       0.060       0.114      -0.082

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.535      16.724       1.017     543.667       4.872     398.528       3.089

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  30341.252       0.285     174.216  914551.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.464   EfDer =  0.828

   W act       RPM act        Pt          Tt           POTS        POTH       AeroBl
    101.607    1888.000      16.724     543.667       1.000       1.000       0.980
W Kg/sec =   46.18479

   W cor       RPM cor        GAMMA       Cp          R           Blades       THK
     91.436    1844.138       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  78164.125   79727.242       1.928     513.330     266.287     401.059       1.506

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   361.00    -0.12   361.00     0.32   309.94
 MEAN    16.97      0.00    -0.02   361.00    -0.12   361.00     0.32
 HUB     14.32      0.00    -0.02   361.00    -0.12   361.00     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     41.33     46.36    -5.03   317.33   480.73    15.58   532.78     0.42
 MEAN    37.77     43.80    -6.03   279.61   456.70    15.58   532.78     0.40
 HUB     33.18     37.84    -4.66   235.93   431.33    15.58   532.78     0.38

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   392.54    30.99   391.32  1131.82      0.35
 MEAN    16.57   395.88    68.25   389.96  1133.12      0.35
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HUB     13.89   419.17   154.76   389.55  1134.30     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    311.07   481.22   280.07     0.43   587.57
MEAN   273.07   440.48   204.82     0.39  1133.20     1.09
HUB    228.85   396.54    74.09     0.35  2151.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.85     1.01    15.50   545.22     1.00   532.35     0.92     0.76
MEAN    16.97     1.01    15.59   546.67     1.01   533.58     0.92     0.76
HUB     17.19     1.03    15.64   549.36     1.01   534.69     0.92     0.76

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP      4.53    35.59    31.50     4.09     0.93     0.01     2.90
MEAN     9.93    27.71    23.50     4.21     0.87     0.06     3.29     0.76
HUB     21.67    10.77     6.50     4.27     0.87     0.13     3.90

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.828

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     388.607      68.629     382.499    1134.061       0.343       0.048

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    16.989      15.662     534.472      46.000      10.172      32.400      22.228

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     409.196      68.629     414.911    1132.605       0.361      -0.079

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.929      15.467     533.100     456.573       0.052       0.053

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     390.939       0.000     390.939    1133.900       0.345      -0.132

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.474     534.320       0.000       0.060       0.141      -0.074

   STAGE EXIT CONDITIONS, STAGE             4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.215      16.802       1.005     547.083       3.415     519.518       4.027

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  21268.533       0.220     122.121  954876.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.464   EfDer =  0.775

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    101.607    1888.000      16.802     547.083       1.000       1.000       0.980
W Kg/sec =   46.18479

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.293    1838.373       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  78164.125   79727.242       1.917     509.668     265.872     390.276       1.468

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   364.40    -0.13   364.40     0.32   293.90
 MEAN    15.91     0.00    -0.02   364.40    -0.13   364.40     0.32
 HUB     13.07     0.00    -0.02   364.40    -0.13   364.40     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     39.65    47.36    -7.71   301.84   473.25    15.64   535.99     0.42
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MEAN    35.75    44.80    -9.05   262.18   448.99    15.64   535.99     0.40
HUB     30.60    38.84    -8.24   215.34   423.33    15.64   535.99     0.37
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   395.22     9.96   395.09  1134.10     0.35
MEAN    15.50   396.40    46.68   393.65  1135.54     0.35
HUB     12.59   414.74   132.00   393.18  1136.86     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    295.58   487.52   285.62     0.43   180.96
MEAN   255.34   445.52   208.65     0.39   725.50     1.06
HUB    207.43   400.35    75.43     0.35  1663.56

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.84     1.00    15.48   547.56     1.00   534.52     0.92     0.71
MEAN    16.95     1.01    15.58   549.00     1.00   535.88     0.92     0.71
HUB     17.14     1.02    15.63   551.48     1.01   537.12     0.92     0.71

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP      1.44    35.86    31.50     4.36     0.93    -0.03     2.90
MEAN     6.76    27.93    23.50     4.43     0.85     0.02     3.34     0.71
HUB     18.56    10.86     6.50     4.36     0.85     0.09     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.775

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     400.089      47.541     397.254    1135.646       0.352      -0.018

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.947      15.552     535.983      46.000       6.824      33.000      26.176

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     431.328      47.541     433.940    1133.346       0.381      -0.244

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.820      15.218     533.815     440.827       0.110       0.031

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     403.576       0.000     403.576    1135.398       0.355      -0.132

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      15.365     535.749       0.000       0.060       0.146      -0.140

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     -0.135      16.770       0.998     549.350       2.267     707.290       5.483

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  14116.009       0.162      81.052 1017998.688

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    165250.66    948.8489      99.2594      1.1100      0.5986       3.4637      1.0508
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      99.920    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   45.41820

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      97.612    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76866.727   78403.898       2.925     831.557     284.267     619.754       2.180

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   226.43    -0.08   226.43     0.20   338.55
  MEAN    17.06     0.00    -0.02   226.43    -0.08   226.43     0.20
  HUB     12.51     0.00    -0.02   226.43    -0.08   226.43     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.34    50.47     5.87   339.90   408.48    14.68   518.53     0.37
  MEAN    51.15    47.20     3.95   281.08   361.00    14.68   518.53     0.32
  HUB     42.32    38.62     3.70   206.11   306.25    14.68   518.53     0.27

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   357.69   170.30   314.54  1120.18     0.32
  MEAN    18.04   374.44   201.40   315.67  1119.42     0.33
  HUB     15.00   423.38   278.73   318.69  1117.47     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   357.35   169.59     0.32  3515.00
  MEAN   297.16   329.87    95.76     0.29  3633.81     1.22
  HUB    247.14   320.25    31.59     0.29  4181.87

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.98     1.06    14.88   532.11     1.02   521.43     0.92     0.91
  MEAN    16.01     1.06    14.81   532.43     1.02   520.72     0.92     0.91
  HUB     16.14     1.07    14.62   533.88     1.02   518.91     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     28.43    28.33    24.20     4.13     0.93     0.20     2.90
  MEAN    32.54    16.88    12.70     4.18     0.92     0.17     3.51     0.91
  HUB     41.17    -5.66    -9.30     3.64     0.92     0.06     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     380.874     201.010     323.511    1119.387       0.340      -0.014

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.029      14.793     520.690      24.000      31.854      35.400       3.546

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     351.981     201.010     405.334    1121.286       0.314       0.151
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.023      14.963     522.459     528.796       0.015       0.318

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     326.833       0.000     326.833    1122.815       0.291       0.222

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.075     523.884       0.000       0.060       0.041       0.239

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.858      15.990       1.058     532.806       9.996     234.065       1.814

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  62235.840       0.539     351.419  952140.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.968

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    99.920    1888.000      15.990     532.806       1.000       1.000       0.980
W Kg/sec =   45.41820

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    93.102    1862.839       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76866.727   78403.898       2.178     590.487     271.133     474.134       1.749

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   312.60    -0.11   312.60     0.28   334.06
 MEAN    18.08     0.00    -0.02   312.60    -0.11   312.60     0.28
 HUB     15.21     0.00    -0.02   312.60    -0.11   312.60     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.29    46.36     0.93   338.58   460.90    15.15   524.65     0.41
 MEAN    43.63    42.30     1.33   297.86   431.85    15.15   524.65     0.38
 HUB     38.73    37.84     0.89   250.60   400.71    15.15   524.65     0.36

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   352.03    97.73   338.19  1126.93     0.31
 MEAN    18.01   359.52   122.01   338.18  1127.03     0.32
 HUB     15.22   387.61   188.71   338.57  1127.06     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    336.44   413.95   238.71     0.37  1997.84
 MEAN   296.73   380.65   174.72     0.34  2199.30     1.21
 HUB    250.81   344.21    62.10     0.31  2874.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.49     1.03    15.41   538.09     1.01   527.74     0.92     0.89
 MEAN    16.54     1.03    15.41   538.63     1.01   527.83     0.92     0.89
 HUB     16.71     1.04    15.39   540.41     1.01   527.87     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.12    35.22    31.50     3.72     0.93     0.14     2.90
 MEAN    19.84    27.32    23.50     3.82     0.91     0.16     3.30     0.89
 HUB     29.14    10.39     6.50     3.89     0.91     0.20     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.968

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     365.389     122.350     344.296    1127.091       0.324      -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.564      15.400     527.894      46.000      19.563      30.600      11.037

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     357.055     122.350     377.436    1127.627       0.317       0.027

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.545      15.433     528.397     511.151       0.026       0.146

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     353.016       0.000     353.016    1127.883       0.313       0.004

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.404     528.636       0.000       0.060       0.075       0.002

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.755      16.488       1.031     539.044       6.238     330.043       2.558

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  38841.867       0.343     219.323  885163.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.911

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     99.920    1888.000      16.488     539.044       1.000       1.000       0.980
W Kg/sec =   45.41820

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     90.813    1852.029       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  76866.727   78403.898       2.063     545.479     264.470     429.765       1.625

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   333.62    -0.11   333.62     0.30   324.36
 MEAN    17.74      0.00    -0.02   333.62    -0.11   333.62     0.30
 HUB     15.05      0.00    -0.02   333.62    -0.11   333.62     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.76     46.36    -1.60   330.67   469.81    15.52   529.75     0.42
 MEAN    41.23     43.40    -2.17   292.26   443.60    15.52   529.75     0.39
 HUB     36.63     38.84    -2.21   247.96   415.74    15.52   529.75     0.37

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   368.50     68.85    362.01  1130.73      0.33
 MEAN    17.51   374.89     99.86    361.35  1131.39      0.33
 HUB     14.85   402.20    176.70    361.31  1131.97      0.36

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39    444.26    257.53     0.39  1366.32
 MEAN   288.44    407.59    188.58     0.36  1750.24      1.16
 HUB    244.67    367.65     67.97     0.32  2625.68

         Pt2       PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     16.81      1.02     15.62    542.66      1.01    531.32      0.92      0.83
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 MEAN    16.90     1.03    15.66   543.68     1.01   531.94     0.92     0.83
 HUB     17.11     1.04    15.68   545.99     1.01   532.48     0.92     0.83
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     10.77    35.43    31.50     3.93     0.93     0.08     2.90
 MEAN    15.45    27.56    23.50     4.06     0.89     0.12     3.28     0.83
 HUB     26.06    10.65     6.50     4.15     0.89     0.17     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.911

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     379.514     100.515     365.961    1131.538       0.335      -0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.931      15.661     532.081      46.000      15.358      31.500      16.142

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     385.224     100.515     398.122    1131.151       0.341      -0.051

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.893      15.589     531.716     471.992       0.039       0.100

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     375.265       0.000     375.265    1131.823       0.332      -0.070

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.571     532.349       0.000       0.060       0.108      -0.065

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.581      16.804       1.019     544.109       5.065     383.103       2.970

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  31540.160       0.296     178.094  897374.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.841

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.920    1888.000      16.804     544.109       1.000       1.000       0.980
W Kg/sec =   45.41820

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.524    1843.389       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76866.727   78403.898       1.969     513.330     260.718     401.059       1.538

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   352.77    -0.12   352.77     0.31   309.82
 MEAN    16.97     0.00    -0.02   352.77    -0.12   352.77     0.31
 HUB     14.32     0.00    -0.02   352.77    -0.12   352.77     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     41.98    46.36    -4.38   317.33   474.58    15.71   533.72     0.42
 MEAN    38.41    43.80    -5.39   279.61   450.22    15.71   533.72     0.40
 HUB     33.79    37.84    -4.05   235.93   424.47    15.71   533.72     0.37

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   383.65    37.93   381.77  1133.27     0.34
 MEAN    16.57   387.60    73.26   380.62  1134.39     0.34
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 HUB     13.89   411.32   156.65   380.32  1135.41     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    311.07   469.41   273.13     0.41   718.52
 MEAN   273.07   429.88   199.81     0.38  1216.18     1.11
 HUB    228.85   387.12    72.20     0.34  2177.67

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.96     1.01    15.67   546.01     1.00   533.72     0.92     0.77
 MEAN    17.07     1.02    15.75   547.33     1.01   534.78     0.92     0.77
 HUB     17.29     1.03    15.79   549.87     1.01   535.74     0.92     0.77

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     5.67    35.58    31.50     4.08     0.93     0.02     2.90
 MEAN   10.89    27.70    23.50     4.20     0.88     0.07     3.29     0.77
 HUB    22.39    10.75     6.50     4.25     0.88     0.13     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.841

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     380.569      73.667     373.371    1135.303       0.335       0.049

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.094      15.813     535.642      46.000      11.161      32.400      21.239

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     398.964      73.667     405.708    1134.033       0.352      -0.068

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.040      15.640     534.444     456.573       0.049       0.064

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     381.109       0.000     381.109    1135.266       0.336      -0.120

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.648     535.607       0.000       0.060       0.137      -0.062

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.293      16.919       1.007     547.737       3.627     490.900       3.805

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  22587.670       0.233     127.543  936275.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.784

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.920    1888.000      16.919     547.737       1.000       1.000       0.980
W Kg/sec =   45.41820

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.213    1837.276       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76866.727   78403.898       1.962     509.668     259.815     390.276       1.502

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   355.39    -0.12   355.39     0.31   293.72
 MEAN    15.91     0.00    -0.02   355.39    -0.12   355.39     0.31
 HUB     13.07     0.00    -0.02   355.39    -0.12   355.39     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     40.35    47.36    -7.01   301.84   466.35    15.81   537.19     0.41
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MEAN    36.43    44.80    -8.37   262.18   441.71    15.81   537.19     0.39
HUB     31.23    38.84    -7.61   215.34   415.61    15.81   537.19     0.37
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   385.11    17.56   384.71  1135.87     0.34
MEAN    15.50   387.04    52.16   383.51  1137.12     0.34
HUB     12.59   405.96   134.03   383.20  1138.26     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    295.58   474.66   278.02     0.42   317.22
MEAN   255.34   434.00   203.17     0.38   810.35     1.08
HUB    207.43   390.16    73.40     0.34  1689.10

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.98     1.00    15.68   548.58     1.00   536.19     0.92     0.72
MEAN    17.09     1.01    15.77   549.88     1.00   537.37     0.92     0.72
HUB     17.27     1.02    15.81   552.21     1.01   538.44     0.92     0.72

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP      2.61    35.85    31.50     4.35     0.93    -0.01     2.90
MEAN     7.75    27.91    23.50     4.41     0.86     0.03     3.34     0.72
HUB     19.28    10.84     6.50     4.34     0.86     0.10     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.784

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      390.599      53.120     386.970    1137.233       0.343       -0.017

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.085      15.744      537.481      46.000       7.816      33.000      25.184

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      419.511      53.120     422.861    1135.162       0.370       -0.234

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       16.965      15.437     535.525     440.827       0.108       0.040

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      392.790       0.000     392.790    1137.082       0.345       -0.127

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950       15.571      537.338       0.000       0.060       0.146       -0.135

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
     -0.022       16.913       1.000      550.221       2.484     652.097       5.055

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  15470.908       0.177      87.358  997645.438

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    170676.44    963.7369      97.6119      1.1195       0.6276       3.9534       1.0524
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.487   EfDer =  0.995

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      98.103    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   44.59237

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      95.837    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   75469.062   76978.289       2.979     831.557     279.098     619.754       2.221

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   222.15    -0.08   222.15     0.20   338.55
  MEAN    17.06     0.00    -0.02   222.15    -0.08   222.15     0.20
  HUB     12.51     0.00    -0.02   222.15    -0.08   222.15     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.84    50.47     6.37   339.90   406.12    14.70   518.69     0.36
  MEAN    51.69    47.20     4.49   281.08   358.33    14.70   518.69     0.32
  HUB     42.87    38.62     4.25   206.11   303.09    14.70   518.69     0.27

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   353.83   173.84   308.19  1120.63     0.32
  MEAN    18.04   370.26   203.43   309.37  1119.80     0.33
  HUB     15.00   418.23   278.15   312.32  1117.83     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   350.08   166.06     0.31  3587.82
  MEAN   297.16   323.26    93.73     0.29  3670.31     1.23
  HUB    247.14   313.86    31.01     0.28  4173.20

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.00     1.06    14.93   532.31     1.02   521.85     0.92     0.91
  MEAN    16.02     1.06    14.85   532.52     1.02   521.07     0.92     0.91
  HUB     16.14     1.07    14.66   533.86     1.02   519.25     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     29.43    28.32    24.20     4.12     0.93     0.21     2.90
  MEAN    33.33    16.86    12.70     4.16     0.92     0.18     3.51     0.91
  HUB     41.69    -5.67    -9.30     3.63     0.92     0.07     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.995

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     376.471     203.031     317.031    1119.782       0.336      -0.013

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      16.040      14.832     521.057      24.000      32.636      35.400       2.764

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     344.667     203.031     400.021    1121.838       0.307       0.167
   BlockageThr  PtTh        PsTh       TsTh        AreaTh       w 2-Th  DiffFact4
     0.950      16.035      15.018     522.973     528.796       0.014       0.330

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     320.101       0.000     320.101    1123.300       0.285       0.236

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.125     524.337       0.000       0.060       0.039       0.254

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864      16.004       1.059     532.895      10.085     230.306       1.785

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  62788.352       0.543     348.092  934107.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.487   EfDer =  0.975

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     98.103    1888.000      16.004     532.895       1.000       1.000       0.980
W Kg/sec =   44.59237

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.335    1862.684       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  75469.062   76978.289       2.220     590.487     265.987     474.134       1.783

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   306.21    -0.11   306.21     0.27   334.03
 MEAN    18.08     0.00    -0.02   306.21    -0.11   306.21     0.27
 HUB     15.21     0.00    -0.02   306.21    -0.11   306.21     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.88    46.36     1.52   338.58   456.58    15.20   525.06     0.41
 MEAN    44.22    42.30     1.92   297.86   427.25    15.20   525.06     0.38
 HUB     39.31    37.84     1.47   250.60   395.75    15.20   525.06     0.35

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   346.52   103.05   330.84  1127.68     0.31
 MEAN    18.01   354.09   125.88   330.96  1127.66     0.31
 HUB     15.22   382.11   190.15   331.43  1127.60     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    336.44   404.88   233.39     0.36  2106.43
 MEAN   296.73   372.46   170.85     0.33  2268.98     1.23
 HUB    250.81   336.94    60.67     0.30  2896.22

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.53     1.03    15.48   538.47     1.01   528.44     0.92     0.89
 MEAN    16.57     1.04    15.48   538.90     1.01   528.43     0.92     0.89
 HUB     16.73     1.05    15.45   540.56     1.01   528.37     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.30    35.20    31.50     3.70     0.93     0.15     2.90
 MEAN    20.82    27.30    23.50     3.80     0.91     0.17     3.30     0.89
 HUB     29.84    10.37     6.50     3.87     0.91     0.21     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.975

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     359.788     126.232     336.917    1127.736       0.319      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.600      15.468     528.498      46.000      20.539      30.600      10.061

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     349.123     126.232     371.243    1128.409       0.309       0.042

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.585      15.518     529.130     511.151       0.024       0.158

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     345.064       0.000     345.064    1128.660       0.306       0.023

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.494     529.365       0.000       0.060       0.069       0.021

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.779      16.533       1.033     539.310       6.414     319.889       2.480

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  39940.652       0.353     221.427  867596.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.487   EfDer =  0.924

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     98.103    1888.000      16.533     539.310       1.000       1.000       0.980
W Kg/sec =   44.59237

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     88.942    1851.574       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  75469.062   76978.289       2.106     545.479     259.019     429.765       1.659

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   326.19    -0.11   326.19     0.29   324.28
 MEAN    17.74      0.00    -0.02   326.19    -0.11   326.19     0.29
 HUB     15.05      0.00    -0.02   326.19    -0.11   326.19     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.40     46.36    -0.96   330.67   464.56    15.60   530.42     0.41
 MEAN    41.87     43.40    -1.53   292.26   438.04    15.60   530.42     0.39
 HUB     37.25     38.84    -1.59   247.96   409.80    15.60   530.42     0.36

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   361.28     75.16    353.37  1131.83      0.32
 MEAN    17.51   368.01    104.43    352.88  1132.35      0.32
 HUB     14.85   395.46    178.40    352.94  1132.80      0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39   433.57   251.23     0.38  1491.18
 MEAN   288.44   397.97   184.01     0.35  1830.17      1.17
 HUB    244.67   359.11    66.27     0.32  2650.91

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     16.89      1.02    15.74   543.26     1.01   532.36      0.92      0.85
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 MEAN    16.97     1.03    15.78   544.15     1.01   532.84     0.92     0.85
 HUB     17.18     1.04    15.79   546.32     1.01   533.26     0.92     0.85
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     12.01    35.41    31.50     3.91     0.93     0.09     2.90
 MEAN    16.49    27.54    23.50     4.04     0.89     0.13     3.28     0.85
 HUB     26.82    10.63     6.50     4.13     0.89     0.18     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.924

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     372.492     105.114     357.353    1132.505       0.329      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.002      15.773     532.990      46.000      16.391      31.500      15.109

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     375.763     105.114     390.188    1132.288       0.332      -0.036

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.970      15.722     532.786     471.992       0.036       0.112

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     365.920       0.000     365.920    1132.936       0.323      -0.051

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.709     533.395       0.000       0.060       0.101      -0.046

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.625      16.888       1.021     544.578       5.268     367.813       2.851

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  32804.090       0.308     181.863  879025.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 4.487   EfDer =  0.857

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     98.103    1888.000      16.888     544.578       1.000       1.000       0.980
W Kg/sec =   44.59237

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     87.497    1842.597       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  75469.062   76978.289       2.015     513.330     254.815     401.059       1.574

     ROTOR LEADING EDGE CONDITIONS, STAGE           4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   344.11    -0.12   344.11     0.30   309.69
 MEAN    16.97     0.00    -0.02   344.11    -0.12   344.11     0.30
 HUB     14.32     0.00    -0.02   344.11    -0.12   344.11     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.69    46.36    -3.67   317.33   468.17    15.84   534.69     0.41
 MEAN    39.11    43.80    -4.69   279.61   443.46    15.84   534.69     0.39
 HUB     34.45    37.84    -3.39   235.93   417.29    15.84   534.69     0.37

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   374.50    45.25   371.76  1134.77     0.33
 MEAN    16.57   379.04    78.56   370.81  1135.72     0.33
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 HUB     13.89   403.13   158.59   370.62  1136.58     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    311.07   457.02   265.82     0.40   856.52
 MEAN   273.07   418.73   194.51     0.37  1304.06     1.12
 HUB    228.85   377.22    70.26     0.33  2204.54

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.08     1.01    15.84   546.84     1.00   535.13     0.92     0.78
 MEAN    17.18     1.02    15.91   548.03     1.01   536.03     0.92     0.78
 HUB     17.39     1.03    15.94   550.41     1.01   536.84     0.92     0.78

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     6.94    35.57    31.50     4.07     0.93     0.04     2.90
 MEAN   11.96    27.68    23.50     4.18     0.88     0.08     3.29     0.78
 HUB    23.17    10.73     6.50     4.23     0.88     0.14     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.857

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     372.261      79.002     363.781    1136.589       0.328       0.049

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.204      15.971     536.855      46.000      12.253      32.400      20.147

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     388.241      79.002     396.198    1135.514       0.342      -0.055

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.156      15.821     535.840     456.573       0.046       0.075

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     370.793       0.000     370.793    1136.685       0.326      -0.106

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.830     536.946       0.000       0.060       0.132      -0.048

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.369      17.042       1.009     548.428       3.850     463.618       3.594

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  23976.404       0.248     132.923  916471.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 4.487   EfDer =  0.796

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     98.103    1888.000      17.042     548.428       1.000       1.000       0.980
W Kg/sec =   44.59237

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.011    1836.117       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  75469.062   76978.289       2.011     509.668     253.400     390.276       1.540

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   345.93    -0.12   345.93     0.30   293.54
 MEAN    15.91     0.00    -0.02   345.93    -0.12   345.93     0.30
 HUB     13.07     0.00    -0.02   345.93    -0.12   345.93     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     41.12    47.36    -6.24   301.84   459.18    15.98   538.44     0.40
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MEAN    37.17    44.80    -7.63   262.18   434.13    15.98   538.44     0.38
HUB     31.92    38.84    -6.92   215.34   407.54    15.98   538.44     0.36
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   374.72    25.53   373.85  1137.70     0.33
MEAN    15.50   377.34    57.88   372.87  1138.75     0.33
HUB     12.59   396.78   136.14   372.70  1139.71     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    295.58   461.18   270.05     0.41   460.20
MEAN   255.34   421.93   197.46     0.37   898.83     1.09
HUB    207.43   379.45    71.29     0.33  1715.54

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.14     1.01    15.90   549.65     1.00   537.92     0.92     0.73
MEAN    17.23     1.01    15.97   550.81     1.00   538.92     0.92     0.73
HUB     17.40     1.02    16.00   552.97     1.01   539.82     0.92     0.73

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP      3.91    35.84    31.50     4.34     0.93     0.01     2.90
MEAN     8.82    27.90    23.50     4.40     0.86     0.05     3.34     0.73
HUB     20.07    10.83     6.50     4.33     0.86     0.11     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.796

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      380.773      58.937     376.184    1138.875       0.334       -0.016

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.232      15.947      539.032      46.000       8.904      33.000      24.096

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      407.142      58.937     411.386    1137.041       0.358       -0.221

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       17.122      15.668     537.298     440.827       0.104       0.050

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      381.449       0.000     381.449    1138.829       0.335       -0.120

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950       15.791      538.989       0.000       0.060       0.146       -0.126

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.087       17.068       1.002      551.139       2.712     602.440       4.670

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  16887.441       0.193      93.622  976021.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    176396.94    977.9271      95.8370      1.1298       0.6572       4.4873       1.0542
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      96.535    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   43.87962

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
      94.305    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  74262.797   75747.898       3.028     831.557     274.637     619.754       2.257

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   218.45    -0.08   218.45     0.20   338.55
  MEAN    17.06     0.00    -0.02   218.45    -0.08   218.45     0.20
  HUB     12.51     0.00    -0.02   218.45    -0.08   218.45     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.28    50.47     6.81   339.90   404.11    14.71   518.82     0.36
  MEAN    52.15    47.20     4.95   281.08   356.05    14.71   518.82     0.32
  HUB     43.35    38.62     4.73   206.11   300.39    14.71   518.82     0.27

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   350.61   176.83   302.75  1121.01     0.31
  MEAN    18.04   366.71   205.12   303.97  1120.12     0.33
  HUB     15.00   413.84   277.66   306.87  1118.14     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   343.87   163.06     0.31  3649.65
  MEAN   297.16   317.60    92.04     0.28  3700.91     1.25
  HUB    247.14   308.38    30.52     0.28  4165.89

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.01     1.06    14.96   532.47     1.02   522.20     0.92     0.91
  MEAN    16.03     1.06    14.88   532.61     1.02   521.37     0.92     0.91
  HUB     16.14     1.07    14.69   533.84     1.02   519.53     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     30.29    28.31    24.20     4.11     0.93     0.22     2.90
  MEAN    34.01    16.85    12.70     4.15     0.92     0.19     3.51     0.91
  HUB     42.14    -5.68    -9.30     3.62     0.92     0.08     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     372.734     204.726     311.477    1120.114       0.333      -0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.050      14.863     521.366      24.000      33.316      35.400       2.084

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     338.418     204.726     395.524    1122.301       0.302       0.181
   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.045      15.063     523.405     528.796       0.014       0.340

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     314.350       0.000     314.350    1123.707       0.280       0.249

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.167     524.717       0.000       0.060       0.038       0.266

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.869      16.015       1.060     532.970      10.160     227.116       1.761

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  63256.129       0.548     345.081  918578.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    96.535    1888.000      16.015     532.970       1.000       1.000       0.980
W Kg/sec =   43.87962

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    89.818    1862.553       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  74262.797   75747.898       2.257     590.487     261.569     474.134       1.813

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   300.74    -0.10   300.74     0.27   334.01
 MEAN    18.08     0.00    -0.02   300.74    -0.10   300.74     0.27
 HUB     15.21     0.00    -0.02   300.74    -0.10   300.74     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.40    46.36     2.04   338.58   452.94    15.24   525.42     0.40
 MEAN    44.73    42.30     2.43   297.86   423.35    15.24   525.42     0.38
 HUB     39.81    37.84     1.97   250.60   391.53    15.24   525.42     0.35

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   341.95   107.57   324.59  1128.30     0.30
 MEAN    18.01   349.55   129.17   324.81  1128.19     0.31
 HUB     15.22   377.47   191.37   325.36  1128.04     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    336.44   397.16   228.87     0.35  2198.66
 MEAN   296.73   365.48   167.56     0.32  2328.16     1.24
 HUB    250.81   330.74    59.44     0.29  2914.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.57     1.03    15.55   538.79     1.01   529.02     0.92     0.90
 MEAN    16.60     1.04    15.53   539.13     1.01   528.93     0.92     0.90
 HUB     16.75     1.05    15.50   540.68     1.01   528.78     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.34    35.19    31.50     3.69     0.93     0.16     2.90
 MEAN    21.69    27.29    23.50     3.79     0.91     0.18     3.30     0.90
 HUB     30.46    10.35     6.50     3.85     0.91     0.22     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     355.102     129.529     330.635    1128.274       0.315      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.630      15.525     529.003      46.000      21.393      30.600       9.207

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     342.386     129.529     366.069    1129.064       0.303       0.056

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.617      15.589     529.744     511.151       0.022       0.169

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     338.319       0.000     338.319    1129.311       0.300       0.039

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.568     529.975       0.000       0.060       0.064       0.038

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.796      16.570       1.035     539.535       6.565     311.574       2.415

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  40874.852       0.361     222.984  852516.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.934

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     96.535    1888.000      16.570     539.535       1.000       1.000       0.980
W Kg/sec =   43.87962

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     87.345    1851.188       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  74262.797   75747.898       2.144     545.479     254.368     429.765       1.690

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   319.88    -0.11   319.88     0.28   324.21
 MEAN    17.74      0.00    -0.02   319.88    -0.11   319.88     0.28
 HUB     15.05      0.00    -0.02   319.88    -0.11   319.88     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.96     46.36    -0.40   330.67   460.15    15.67   530.99     0.41
 MEAN    42.43     43.40    -0.97   292.26   433.36    15.67   530.99     0.38
 HUB     37.79     38.84    -1.05   247.96   404.80    15.67   530.99     0.36

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   355.30    80.47   346.07  1132.75      0.31
 MEAN    17.51   362.28   108.29   345.72  1133.15      0.32
 HUB     14.85   389.82   179.85   345.85  1133.49      0.34

       U2        W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39   424.55   245.92     0.37  1596.27
 MEAN   288.44   389.84   180.15     0.34  1897.67      1.18
 HUB    244.67   351.87    64.82     0.31  2672.44

         Pt2       PR       Ps2     Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     16.96      1.02    15.84   543.76      1.01   533.22      0.92     0.85
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 MEAN    17.03     1.03    15.87   544.56     1.01   533.60     0.92     0.85
 HUB     17.23     1.04    15.87   546.61     1.01   533.92     0.92     0.85
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     13.09    35.40    31.50     3.90     0.93     0.11     2.90
 MEAN    17.39    27.52    23.50     4.02     0.90     0.14     3.28     0.85
 HUB     27.48    10.61     6.50     4.11     0.90     0.19     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.934

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     366.649     108.997     350.073    1133.310       0.324      -0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.061      15.866     533.747      46.000      17.294      31.500      14.206

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     367.785     108.997     383.596    1133.236       0.325      -0.022

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.033      15.833     533.677     471.992       0.033       0.123

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     358.045       0.000     358.045    1133.862       0.316      -0.035

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.824     534.268       0.000       0.060       0.095      -0.030

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.660      16.958       1.023     544.974       5.439     355.608       2.757

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  33869.969       0.318     184.770  863314.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.870

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     96.535     1888.000       16.958     544.974       1.000        1.000        0.980
W Kg/sec =   43.87962

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     85.776     1841.926        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  74262.797   75747.898        2.055     513.330     249.803     401.059       1.606

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   336.80    -0.12   336.80      0.30   309.57
 MEAN    16.97      0.00    -0.02   336.80    -0.12   336.80      0.30
 HUB     14.32      0.00    -0.02   336.80    -0.12   336.80      0.30

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     43.30     46.36    -3.06   317.33   462.82     15.95    535.50      0.41
 MEAN    39.71     43.80    -4.09   279.61   437.82     15.95    535.50      0.39
 HUB     35.02     37.84    -2.82   235.93   411.29     15.95    535.50      0.36

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88    366.96     51.40    363.34  1136.01      0.32
 MEAN    16.57    371.94     83.03    362.55  1136.82      0.33
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 HUB     13.89   396.29   160.24   362.45  1137.54     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    311.07   446.59   259.66     0.39   972.76
 MEAN   273.07   409.34   190.04     0.36  1378.02     1.13
 HUB    228.85   368.88    68.61     0.32  2227.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.18     1.01    15.98   547.55     1.00   536.30     0.92     0.80
 MEAN    17.27     1.02    16.04   548.62     1.01   537.07     0.92     0.80
 HUB     17.47     1.03    16.06   550.87     1.01   537.75     0.92     0.80

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     8.05    35.55    31.50     4.05     0.93     0.05     2.90
 MEAN   12.90    27.66    23.50     4.16     0.88     0.09     3.29     0.80
 HUB    23.85    10.72     6.50     4.22     0.88     0.15     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.870

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     365.373      83.492     355.705    1137.657       0.321       0.049

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.297      16.102     537.864      46.000      13.210      32.400      19.190

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     379.237      83.492     388.319    1136.745       0.334      -0.044

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.254      15.972     537.002     456.573       0.044       0.086

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     362.119       0.000     362.119    1137.866       0.318      -0.093

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.983     538.061       0.000       0.060       0.127      -0.035

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.430      17.147       1.011     549.012       4.038     442.566       3.431

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  25146.562       0.260     137.182  899565.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.808

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     96.535    1888.000      17.147     549.012       1.000       1.000       0.980
W Kg/sec =   43.87962

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     85.144    1835.140       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  74262.797   75747.898       2.055     509.668     247.963     390.276       1.574

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   337.96    -0.12   337.96     0.30   293.38
 MEAN    15.91     0.00    -0.02   337.96    -0.12   337.96     0.30
 HUB     13.07     0.00    -0.02   337.96    -0.12   337.96     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     41.78    47.36    -5.58   301.84   453.20    16.13   539.47     0.40
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 MEAN    37.82    44.80    -6.98   262.18   427.81    16.13   539.47     0.38
 HUB     32.52    38.84    -6.32   215.34   400.80    16.13   539.47     0.35
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   366.15    32.20   364.73  1139.21     0.32
 MEAN    15.50   369.30    62.75   363.93  1140.11     0.32
 HUB     12.59   389.11   137.91   363.85  1140.92     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    295.58   449.89   263.38     0.39   579.77
 MEAN   255.34   411.75   192.59     0.36   974.30     1.10
 HUB    207.43   370.44    69.52     0.32  1737.82

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.27     1.01    16.08   550.55     1.00   539.35     0.92     0.74
 MEAN    17.36     1.01    16.14   551.59     1.00   540.20     0.92     0.74
 HUB     17.52     1.02    16.16   553.61     1.01   540.97     0.92     0.74

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP      5.04    35.83    31.50     4.33     0.93     0.02     2.90
 MEAN     9.78    27.89    23.50     4.39     0.87     0.06     3.34     0.74
 HUB     20.76    10.82     6.50     4.32     0.87     0.12     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.808

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     372.641      63.899     367.122    1140.235       0.327       -0.015

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.357      16.118     540.320      46.000       9.874      33.000      23.126

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     396.774      63.899     401.886    1138.598       0.348       -0.208

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.256      15.864     538.769     440.827       0.101       0.060

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     371.905       0.000     371.905    1140.283       0.326       -0.111

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      15.978     540.366       0.000       0.060       0.144       -0.117

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.173      17.201       1.003     551.915       2.903     565.725       4.385

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  18081.227       0.207      98.638  957600.688

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    181228.75    988.6552     94.3052      1.1386      0.6813       4.9535       1.0557
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.499   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      94.721    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   43.05485

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      92.533    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   72866.938   74324.125       3.086     831.557     269.475     619.754       2.300

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   214.19    -0.07   214.19     0.19   338.55
  MEAN    17.06     0.00    -0.02   214.19    -0.07   214.19     0.19
  HUB     12.51     0.00    -0.02   214.19    -0.07   214.19     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.79    50.47     7.32   339.90   401.82    14.72   518.98     0.36
  MEAN    52.70    47.20     5.50   281.08   353.45    14.72   518.98     0.32
  HUB     43.91    38.62     5.29   206.11   297.30    14.72   518.98     0.27

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   347.01   180.30   296.50  1121.44     0.31
  MEAN    18.04   362.69   207.07   297.76  1120.48     0.32
  HUB     15.00   408.84   277.10   300.60  1118.49     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   336.72   159.60     0.30  3721.16
  MEAN   297.16   311.09    90.09     0.28  3736.03     1.27
  HUB    247.14   302.09    29.96     0.27  4157.43

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.03     1.06    15.00   532.66     1.02   522.60     0.92     0.91
  MEAN    16.04     1.06    14.91   532.70     1.02   521.71     0.92     0.91
  HUB     16.14     1.07    14.72   533.81     1.02   519.85     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     31.30    28.29    24.20     4.09     0.93     0.24     2.90
  MEAN    34.82    16.83    12.70     4.13     0.92     0.21     3.51     0.91
  HUB     42.67    -5.69    -9.30     3.61     0.92     0.09     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     368.505     206.671     305.095    1120.488       0.329      -0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.060      14.899     521.715      24.000      34.114      35.400       1.286

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     331.253     206.671     390.438    1122.823       0.295       0.197
   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.056      15.114     523.892     528.796       0.013       0.352

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     307.759       0.000     307.759    1124.166       0.274       0.263

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.213     525.146       0.000       0.060       0.037       0.281

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.872      16.027       1.061     533.057      10.247     223.461       1.732

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  63795.344       0.552     341.481  900646.562


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.499   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    94.721    1888.000      16.027     533.057       1.000       1.000       0.980
W Kg/sec =   43.05485

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    88.071    1862.402       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  72866.938   74324.125       2.302     590.487     256.481     474.134       1.849

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   294.48    -0.10   294.48     0.26   333.98
 MEAN    18.08     0.00    -0.02   294.48    -0.10   294.48     0.26
 HUB     15.21     0.00    -0.02   294.48    -0.10   294.48     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.99    46.36     2.63   338.58   448.80    15.28   525.81     0.40
 MEAN    45.34    42.30     3.04   297.86   418.93    15.28   525.81     0.37
 HUB     40.41    37.84     2.57   250.60   386.74    15.28   525.81     0.34

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   336.88   112.74   317.45  1128.99     0.30
 MEAN    18.01   344.47   132.94   317.78  1128.79     0.31
 HUB     15.22   372.21   192.74   318.41  1128.54     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    336.44   388.35   223.70     0.34  2304.18
 MEAN   296.73   357.51   163.79     0.32  2396.02     1.26
 HUB    250.81   323.66    58.07     0.29  2935.69

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.61     1.04    15.62   539.15     1.01   529.68     0.92     0.90
 MEAN    16.64     1.04    15.59   539.40     1.01   529.49     0.92     0.90
 HUB     16.77     1.05    15.56   540.83     1.01   529.26     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.55    35.17    31.50     3.67     0.93     0.18     2.90
 MEAN    22.70    27.27    23.50     3.77     0.91     0.19     3.30     0.90
 HUB     31.19    10.34     6.50     3.84     0.91     0.23     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     349.855     133.310     323.461    1128.879       0.310      -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.663      15.588     529.570      46.000      22.398      30.600       8.202

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     334.709     133.310     360.280    1129.802       0.296       0.073

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.652      15.667     530.436     511.151       0.019       0.182

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     330.645       0.000     330.645    1130.042       0.293       0.058

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.650     530.662       0.000       0.060       0.059       0.058

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.814      16.610       1.036     539.793       6.736     302.413       2.344

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  41941.699       0.371     224.503  835154.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.499   EfDer =  0.945

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     94.721    1888.000      16.610     539.793       1.000       1.000       0.980
W Kg/sec =   43.05485

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     85.516    1850.745       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  72866.938   74324.125       2.190     545.479     249.044     429.765       1.726

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   312.70    -0.11   312.70     0.28   324.14
 MEAN    17.74      0.00    -0.02   312.70    -0.11   312.70     0.28
 HUB     15.05      0.00    -0.02   312.70    -0.11   312.70     0.28

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     46.61     46.36      0.25   330.67   455.19     15.75   531.63      0.40
 MEAN    43.08     43.40     -0.32   292.26   428.09     15.75   531.63      0.38
 HUB     38.43     38.84     -0.41   247.96   399.15     15.75   531.63      0.35

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   348.70     86.53   337.79  1133.77      0.31
 MEAN    17.51   355.89    112.69   337.58  1134.05      0.31
 HUB     14.85   383.47    181.48   337.81  1134.27      0.34

       U2        W2        Wu2      MachRel2  DelRCu     Ws1/W2
 TIP    326.39   414.29    239.86      0.37  1716.22
 MEAN   288.44   380.59    175.75      0.34  1974.67      1.20
 HUB    244.67   343.67     63.19      0.30  2696.56

         Pt2        PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     17.04      1.03     15.95   544.33      1.01   534.18      0.92      0.86
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 MEAN    17.10     1.03    15.97   545.02     1.01   534.44     0.92     0.86
 HUB     17.28     1.04    15.97   546.93     1.01   534.65     0.92     0.86
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     14.37    35.38    31.50     3.88     0.93     0.12     2.90
 MEAN    18.46    27.50    23.50     4.00     0.90     0.15     3.28     0.86
 HUB     28.25    10.60     6.50     4.10     0.90     0.20     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.945

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     360.140     113.427     341.812    1134.210       0.318       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.127      15.970     534.595      46.000      18.358      31.500      13.142

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     358.755     113.427     376.259    1134.298       0.316      -0.005

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.103      15.956     534.678     471.992       0.030       0.136

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     349.139       0.000     349.139    1134.901       0.308      -0.015

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.952     535.246       0.000       0.060       0.088      -0.009

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.697      17.035       1.026     545.427       5.634     342.428       2.654

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  35084.117       0.329     187.797  845266.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.499   EfDer =  0.886

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     94.721    1888.000      17.035     545.427       1.000       1.000       0.980
W Kg/sec =   43.05485

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     83.816    1841.161       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  72866.938   74324.125       2.103     513.330     244.095     401.059       1.643

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   328.53    -0.11   328.53     0.29   309.44
 MEAN    16.97     0.00    -0.02   328.53    -0.11   328.53     0.29
 HUB     14.32     0.00    -0.02   328.53    -0.11   328.53     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.02    46.36    -2.34   317.33   456.84    16.07   536.41     0.40
 MEAN    40.41    43.80    -3.39   279.61   431.48    16.07   536.41     0.38
 HUB     35.70    37.84    -2.14   235.93   404.54    16.07   536.41     0.36

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   358.62    58.33   353.84  1137.39     0.32
 MEAN    16.57   364.03    88.04   353.23  1138.04     0.32
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 HUB     13.89   388.64   162.12   353.21  1138.62     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    311.07   434.83   252.74     0.38  1103.44
 MEAN   273.07   398.75   185.03     0.35  1461.12     1.15
 HUB    228.85   359.46    66.73     0.32  2253.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.29     1.02    16.14   548.35     1.01   537.61     0.92     0.81
 MEAN    17.38     1.02    16.19   549.29     1.01   538.23     0.92     0.81
 HUB     17.57     1.03    16.20   551.39     1.01   538.78     0.92     0.81

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     9.36    35.54    31.50     4.04     0.93     0.07     2.90
 MEAN   14.00    27.65    23.50     4.15     0.89     0.11     3.29     0.81
 HUB    24.65    10.70     6.50     4.20     0.89     0.16     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.886

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     357.713      88.538     346.583    1138.849       0.314       0.050

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.401      16.249     538.991      46.000      14.330      32.400      18.070

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     369.094      88.538     379.564    1138.119       0.324      -0.029

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.363      16.142     538.300     456.573       0.041       0.098

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     352.343       0.000     352.343    1139.185       0.309      -0.076

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.155     539.309       0.000       0.060       0.120      -0.018

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.494      17.265       1.013     549.676       4.250     420.670       3.261

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  26464.250       0.273     141.657  880199.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.499   EfDer =  0.823

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     94.721    1888.000      17.265     549.676       1.000       1.000       0.980
W Kg/sec =   43.05485

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.023    1834.031       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  72866.938   74324.125       2.108     509.668     241.788     390.276       1.614

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   328.97    -0.11   328.97     0.29   293.20
 MEAN    15.91     0.00    -0.02   328.97    -0.11   328.97     0.29
 HUB     13.07     0.00    -0.02   328.97    -0.11   328.97     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.55    47.36    -4.81   301.84   446.54    16.29   540.64     0.39
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MEAN    38.57    44.80    -6.23   262.18   420.73    16.29   540.64     0.37
HUB     33.22    38.84    -5.62   215.34   393.24    16.29   540.64     0.34
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   356.70    39.76   354.48  1140.90     0.31
MEAN    15.50   360.37    68.24   353.85  1141.62     0.32
HUB     12.59   380.55   139.97   353.88  1142.27     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    295.58   437.15   255.82     0.38   715.30
MEAN   255.34   400.27   187.10     0.35  1059.32     1.12
HUB    207.43   360.25    67.46     0.32  1763.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.42     1.01    16.28   551.57     1.00   540.94     0.92     0.75
MEAN    17.50     1.01    16.33   552.48     1.01   541.63     0.92     0.75
HUB     17.65     1.02    16.35   554.34     1.01   542.25     0.92     0.75

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP      6.40    35.82    31.50     4.32     0.93     0.04     2.90
MEAN    10.91    27.87    23.50     4.37     0.87     0.07     3.34     0.75
HUB     21.58    10.79     6.50     4.29     0.87     0.13     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.823

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     363.613      69.489     356.911    1141.751       0.318       -0.015

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.500      16.310     541.757      46.000      11.017      33.000      21.983

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     385.126      69.489     391.344    1140.333       0.338       -0.192

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.408      16.085     540.412     440.827       0.096       0.071

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     361.145       0.000     361.145    1141.909       0.316       -0.099

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950      16.191     541.906       0.000       0.060       0.140       -0.105

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.263      17.355       1.005     552.797       3.121     528.723       4.099

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  19435.111       0.222     104.031  936543.438

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    186720.52    999.4683      92.5326      1.1488       0.7073       5.4992       1.0574
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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      93.228    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   42.37622

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
      91.074    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  71718.406   73152.625       3.135     831.557     265.228     619.754       2.337

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   210.69    -0.07   210.69     0.19   338.55
  MEAN    17.06     0.00    -0.02   210.69    -0.07   210.69     0.19
  HUB     12.51     0.00    -0.02   210.69    -0.07   210.69     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.21    50.47     7.74   339.90   399.96    14.74   519.10     0.36
  MEAN    53.15    47.20     5.95   281.08   351.34    14.74   519.10     0.31
  HUB     44.38    38.62     5.76   206.11   294.79    14.74   519.10     0.26

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   344.15   183.12   291.39  1121.78     0.31
  MEAN    18.04   359.46   208.68   292.69  1120.78     0.32
  HUB     15.00   404.79   276.67   295.48  1118.76     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   330.89   156.78     0.29  3779.18
  MEAN   297.16   305.77    88.48     0.27  3764.91     1.29
  HUB    247.14   296.95    29.53     0.27  4150.90

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.05     1.06    15.03   532.81     1.02   522.92     0.92     0.91
  MEAN    16.05     1.06    14.94   532.77     1.02   521.98     0.92     0.91
  HUB     16.14     1.07    14.75   533.80     1.02   520.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     32.15    28.28    24.20     4.08     0.93     0.25     2.90
  MEAN    35.49    16.82    12.70     4.12     0.92     0.22     3.51     0.91
  HUB     43.12    -5.71    -9.30     3.59     0.92     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     365.108     208.270     299.879    1120.787       0.326      -0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.068      14.927     521.994      24.000      34.780      35.400       0.620

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     325.411     208.270     386.353    1123.243       0.290       0.211
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.064      15.154     524.283     528.796       0.013       0.362

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     302.386       0.000     302.386    1124.535       0.269       0.274

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.249     525.491       0.000       0.060       0.037       0.292

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.875      16.036       1.062     533.128      10.318     220.484       1.709

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  64236.898       0.556     338.424  885922.812


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    93.228    1888.000      16.036     533.128       1.000       1.000       0.980
W Kg/sec =   42.37622

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    86.640    1862.278       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  71718.406   73152.625       2.340     590.487     252.315     474.134       1.879

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   289.38    -0.10   289.38     0.26   333.96
 MEAN    18.08     0.00    -0.02   289.38    -0.10   289.38     0.26
 HUB     15.21     0.00    -0.02   289.38    -0.10   289.38     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.49    46.36     3.13   338.58   445.47    15.31   526.13     0.40
 MEAN    45.84    42.30     3.54   297.86   415.35    15.31   526.13     0.37
 HUB     40.90    37.84     3.06   250.60   382.87    15.31   526.13     0.34

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   332.88   116.96   311.65  1129.55     0.29
 MEAN    18.01   340.41   135.98   312.07  1129.27     0.30
 HUB     15.22   367.98   193.88   312.76  1128.95     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    336.44   381.18   219.47     0.34  2390.44
 MEAN   296.73   351.04   160.75     0.31  2450.78     1.27
 HUB    250.81   317.90    56.94     0.28  2952.90

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.65     1.04    15.67   539.45     1.01   530.20     0.92     0.91
 MEAN    16.66     1.04    15.64   539.61     1.01   529.94     0.92     0.91
 HUB     16.79     1.05    15.60   540.94     1.01   529.63     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.57    35.15    31.50     3.65     0.93     0.19     2.90
 MEAN    23.54    27.25    23.50     3.75     0.92     0.20     3.30     0.91
 HUB     31.79    10.32     6.50     3.82     0.92     0.23     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     345.663     136.361     317.630    1129.363       0.306      -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.688      15.637     530.024      46.000      23.234      30.600       7.366

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     328.482     136.361     355.661    1130.393       0.291       0.087

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.680      15.729     530.991     511.151       0.018       0.193

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     324.431       0.000     324.431    1130.628       0.287       0.073

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.715     531.212       0.000       0.060       0.055       0.074

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.827      16.641       1.038     540.003       6.875     295.205       2.288

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  42810.535       0.378     225.542  820938.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.953

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     93.228    1888.000      16.641     540.003       1.000       1.000       0.980
W Kg/sec =   42.37622

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     84.028    1850.384       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  71718.406   73152.625       2.229     545.479     244.709     429.765       1.756

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   306.88    -0.11   306.88     0.27   324.07
 MEAN    17.74      0.00    -0.02   306.88    -0.11   306.88     0.27
 HUB     15.05      0.00    -0.02   306.88    -0.11   306.88     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.15     46.36     0.79   330.67   451.21    15.81   532.14     0.40
 MEAN    43.61     43.40     0.21   292.26   423.85    15.81   532.14     0.37
 HUB     38.95     38.84     0.11   247.96   394.61    15.81   532.14     0.35

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   343.49    91.39   331.11  1134.58      0.30
 MEAN    17.51   350.83   116.25   331.01  1134.76      0.31
 HUB     14.85   378.40   182.80   331.31  1134.89      0.33

       U2        W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39   406.03   235.00     0.36  1812.51
 MEAN   288.44   373.12   172.19     0.33  2036.96      1.21
 HUB    244.67   337.04    61.86     0.30  2716.22

         Pt2       PR       Ps2     Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     17.09      1.03    16.04   544.80      1.01   534.95      0.92     0.87
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 MEAN    17.15     1.03    16.05   545.39     1.01   535.11     0.92     0.87
 HUB     17.32     1.04    16.04   547.19     1.01   535.23     0.92     0.87
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.43    35.36    31.50     3.86     0.93     0.13     2.90
 MEAN    19.35    27.48    23.50     3.98     0.90     0.16     3.28     0.87
 HUB     28.89    10.58     6.50     4.08     0.90     0.21     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.953

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     354.981     117.010     335.142    1134.927       0.313       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.179      16.051     535.271      46.000      19.246      31.500      12.254

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     351.484     117.010     370.449    1135.145       0.310       0.009

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.159      16.054     535.477     471.992       0.028       0.147

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     341.976       0.000     341.976    1135.729       0.301       0.001

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.052     536.028       0.000       0.060       0.082       0.008

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.724      17.096       1.027     545.794       5.791     332.295       2.576

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  36063.344       0.339     189.995  830519.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.898

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     93.228    1888.000      17.096     545.794       1.000       1.000       0.980
W Kg/sec =   42.37622

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     82.229    1840.542       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  71718.406   73152.625       2.144     513.330     239.473     401.059       1.675

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   321.87    -0.11   321.87     0.28   309.34
 MEAN    16.97     0.00    -0.02   321.87    -0.11   321.87     0.28
 HUB     14.32     0.00    -0.02   321.87    -0.11   321.87     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.60    46.36    -1.76   317.33   452.07    16.17   537.14     0.40
 MEAN    40.99    43.80    -2.81   279.61   426.43    16.17   537.14     0.38
 HUB     36.25    37.84    -1.59   235.93   399.15    16.17   537.14     0.35

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   352.06    63.91   346.21  1138.48     0.31
 MEAN    16.57   357.80    92.12   345.73  1139.02     0.31
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HUB     13.89   382.56   163.66   345.79  1139.49     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    311.07   425.38   247.16     0.37  1208.71
MEAN   273.07   390.22   180.95     0.34  1528.65     1.16
HUB    228.85   351.88    65.19     0.31  2274.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.38     1.02    16.27   548.99     1.01   538.64     0.92     0.82
MEAN    17.46     1.02    16.31   549.84     1.01   539.15     0.92     0.82
HUB     17.64     1.03    16.32   551.81     1.01   539.59     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     10.46    35.52    31.50     4.02     0.93     0.08     2.90
MEAN    14.92    27.63    23.50     4.13     0.89     0.12     3.29     0.82
HUB     25.33    10.68     6.50     4.18     0.89     0.17     3.90

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.898

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     351.673      92.637     339.253    1139.796       0.309       0.050

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.484      16.366     539.887      46.000      15.273      32.400      17.127

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     360.963      92.637     372.661    1139.212       0.317      -0.017

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.451      16.276     539.334     456.573       0.038       0.109

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     344.504       0.000     344.504    1140.236       0.302      -0.061

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.292     540.304       0.000       0.060       0.115      -0.004

   STAGE EXIT CONDITIONS, STAGE             4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.542      17.359       1.015     550.215       4.421     404.236       3.134

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  27529.898       0.285     145.038  864416.938


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.837

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     93.228    1888.000      17.359     550.215       1.000       1.000       0.980
W Kg/sec =   42.37622

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.311    1833.133       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  71718.406   73152.625       2.152     509.668     236.800     390.276       1.648

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   321.74    -0.11   321.74     0.28   293.06
 MEAN    15.91     0.00    -0.02   321.74    -0.11   321.74     0.28
 HUB     13.07     0.00    -0.02   321.74    -0.11   321.74     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.18    47.36    -4.18   301.84   441.24    16.43   541.57     0.39
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 MEAN    39.19    44.80    -5.61   262.18   415.11    16.43   541.57     0.36
 HUB     33.81    38.84    -5.03   215.34   387.22    16.43   541.57     0.34
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   349.28    45.81   346.26  1142.23     0.31
 MEAN    15.50   353.31    72.59   345.78  1142.82     0.31
 HUB     12.59   373.73   141.59   345.87  1143.35     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    295.58   426.95   249.77     0.37   823.82
 MEAN   255.34   391.10   182.74     0.34  1126.81     1.13
 HUB    207.43   352.08    65.84     0.31  1784.03

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.54     1.01    16.44   552.39     1.00   542.21     0.92     0.77
 MEAN    17.61     1.01    16.48   553.20     1.01   542.77     0.92     0.77
 HUB     17.76     1.02    16.49   554.94     1.01   543.27     0.92     0.77

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP      7.54    35.80    31.50     4.30     0.93     0.05     2.90
 MEAN    11.86    27.86    23.50     4.36     0.87     0.08     3.34     0.77
 HUB     22.26    10.78     6.50     4.28     0.87     0.13     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.837

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     356.478      73.926     348.729    1142.954       0.312       -0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.615      16.465     542.897      46.000      11.969      33.000      21.031

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     375.821      73.926     383.023    1141.708       0.329       -0.178

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.532      16.263     541.714     440.827       0.091       0.081

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     352.525       0.000     352.525    1143.200       0.308       -0.088

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      16.362     543.131       0.000       0.060       0.136       -0.093

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.331      17.479       1.007     553.509       3.294     502.143       3.893

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  20513.000       0.235     108.070  919413.312

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    191153.69   1007.0703      91.0741      1.1570       0.7272       5.9534       1.0587
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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.499   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      91.455    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   41.57034

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
      89.342    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  70354.531   71761.469       3.196     831.557     260.184     619.754       2.382

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   206.54    -0.07   206.54     0.18   338.55
  MEAN    17.06     0.00    -0.02   206.54    -0.07   206.54     0.18
  HUB     12.51     0.00    -0.02   206.54    -0.07   206.54     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.72    50.47     8.25   339.90   397.79    14.75   519.25     0.36
  MEAN    53.70    47.20     6.50   281.08   348.86    14.75   519.25     0.31
  HUB     44.95    38.62     6.33   206.11   291.84    14.75   519.25     0.26

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   340.86   186.42   285.37  1122.18     0.30
  MEAN    18.04   355.71   210.55   286.70  1121.11     0.32
  HUB     15.00   400.00   276.10   289.43  1119.09     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   324.02   153.48     0.29  3847.35
  MEAN   297.16   299.50    86.61     0.27  3798.67     1.31
  HUB    247.14   290.88    28.96     0.26  4142.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.07     1.06    15.07   532.99     1.02   523.29     0.92     0.91
  MEAN    16.05     1.06    14.97   532.86     1.02   522.30     0.92     0.91
  HUB     16.14     1.07    14.78   533.77     1.02   520.41     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     33.16    28.27    24.20     4.07     0.93     0.27     2.90
  MEAN    36.29    16.81    12.70     4.11     0.93     0.23     3.51     0.91
  HUB     43.65    -5.71    -9.30     3.59     0.93     0.11     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     361.155     210.139     293.725    1121.133       0.322      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.076      14.959     522.316      24.000      35.581      35.400      -0.181

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	318.533	210.139	381.604	1123.727	0.283	0.227

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.073	15.200	524.736	528.796	0.013	0.374

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	296.061	0.000	296.061	1124.961	0.263	0.288

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.290	525.889	0.000	0.060	0.037	0.306

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.876	16.046	1.062	533.210	10.400	217.004	1.682

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
64749.516	0.560	334.638	868473.062

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 6.499 EfDer = 0.993

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
91.455	1888.000	16.046	533.210	1.000	1.000	0.980

W Kg/sec = 41.57034

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
84.949	1862.134	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
70354.531	71761.469	2.387	590.487	247.390	474.134	1.917

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	283.36	-0.10	283.36	0.25	333.93
MEAN	18.08	0.00	-0.02	283.36	-0.10	283.36	0.25	
HUB	15.21	0.00	-0.02	283.36	-0.10	283.36	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.08	46.36	3.72	338.58	441.58	15.35	526.50	0.39
MEAN	46.44	42.30	4.14	297.86	411.18	15.35	526.50	0.37
HUB	41.50	37.84	3.66	250.60	378.34	15.35	526.50	0.34

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	328.31	121.86	304.86	1130.19	0.29
MEAN	18.01	335.75	139.56	305.37	1129.82	0.30
HUB	15.22	363.08	195.22	306.13	1129.41	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	336.44	372.80	214.58	0.33	2490.43	
MEAN	296.73	343.44	157.17	0.30	2515.17	1.29
HUB	250.81	311.14	55.60	0.28	2973.27	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.68	1.04	15.73	539.80	1.01	530.80	0.92	0.91
MEAN	16.69	1.04	15.70	539.87	1.01	530.45	0.92	0.91
HUB	16.81	1.05	15.65	541.08	1.01	530.07	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	21.79	35.14	31.50	3.64	0.93	0.20	2.90	
MEAN	24.56	27.24	23.50	3.74	0.92	0.22	3.30	0.91
HUB	32.53	10.29	6.50	3.79	0.92	0.24	3.92	

blockage3	Cor/U1	Cor/Incid

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      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     340.847     139.948     310.791    1129.918       0.302      -0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.717      15.693     530.545      46.000      24.242      30.600       6.358

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     321.193     139.948     350.358    1131.075       0.284       0.104

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.710      15.799     531.632     511.151       0.016       0.207

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     317.168       0.000     317.168    1131.303       0.280       0.092

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.788     531.847       0.000       0.060       0.050       0.093

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.841      16.675       1.039     540.248       7.038     287.033       2.225

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  43825.309       0.387     226.498  804136.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.499   EfDer =  0.962

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     91.455    1888.000      16.675     540.248       1.000       1.000       0.980
W Kg/sec =   41.57034

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     82.280    1849.964       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  70354.531   71761.469       2.276     545.479     239.617     429.765       1.794

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   300.07    -0.10   300.07     0.27   324.00
 MEAN    17.74      0.00    -0.02   300.07    -0.10   300.07     0.27
 HUB     15.05      0.00    -0.02   300.07    -0.10   300.07     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.79     46.36     1.43   330.67   446.60    15.88   532.73     0.39
 MEAN    44.25     43.40     0.85   292.26   418.95    15.88   532.73     0.37
 HUB     39.58     38.84     0.74   247.96   389.33    15.88   532.73     0.34

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   337.59     97.08   323.33  1135.52      0.30
 MEAN    17.51   345.03    120.36   323.35  1135.58      0.30
 HUB     14.85   372.55    184.37   323.73  1135.60      0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39   396.39   229.30     0.35  1925.29
 MEAN   288.44   364.43   168.07     0.32  2108.98      1.23
 HUB    244.67   329.30    60.29     0.29  2739.49

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     17.16      1.03    16.14   545.34     1.01   535.83      0.92     0.88
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 MEAN    17.21     1.03    16.14   545.83     1.01   535.89     0.92     0.88
 HUB     17.37     1.04    16.12   547.50     1.01   535.91     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.71    35.34    31.50     3.84     0.93     0.15     2.90
 MEAN    20.42    27.46    23.50     3.96     0.91     0.17     3.28     0.88
 HUB     29.66    10.55     6.50     4.05     0.91     0.22     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.962

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     349.067     121.153     327.367    1135.750       0.307       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.237      16.143     536.047      46.000      20.309      31.500      11.191

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     343.030     121.153     363.796    1136.119       0.302       0.026

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.221      16.164     536.396     471.992       0.025       0.161

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     333.657       0.000     333.657    1136.680       0.294       0.021

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.167     536.926       0.000       0.060       0.076       0.028

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.753      17.164       1.029     546.223       5.975     320.990       2.488

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  37206.035       0.349     192.288  813124.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.499   EfDer =  0.912

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     91.455    1888.000      17.164     546.223       1.000       1.000       0.980
W Kg/sec =   41.57034

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.375    1839.819       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  70354.531   71761.469       2.193     513.330     234.073     401.059       1.713

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   314.13    -0.11   314.13     0.28   309.22
 MEAN    16.97     0.00    -0.02   314.13    -0.11   314.13     0.28
 HUB     14.32     0.00    -0.02   314.13    -0.11   314.13     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.30    46.36    -1.06   317.33   446.59    16.28   537.98     0.39
 MEAN    41.68    43.80    -2.12   279.61   420.62    16.28   537.98     0.37
 HUB     36.92    37.84    -0.92   235.93   392.93    16.28   537.98     0.35

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   344.64    70.39   337.38  1139.73     0.30
 MEAN    16.57   350.67    96.80   337.05  1140.13     0.31
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HUB     13.89   375.59   165.45   337.19  1140.47     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    311.07   414.42   240.67     0.36  1331.14
MEAN   273.07   380.36   176.27     0.33  1606.11     1.18
HUB    228.85   343.10    63.40     0.30  2299.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.49     1.02    16.41   549.75     1.01   539.83     0.92     0.83
MEAN    17.56     1.02    16.44   550.47     1.01   540.20     0.92     0.83
HUB     17.73     1.03    16.44   552.31     1.01   540.53     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     11.79    35.50    31.50     4.00     0.93     0.10     2.90
MEAN    16.02    27.61    23.50     4.11     0.89     0.13     3.29     0.83
HUB     26.14    10.65     6.50     4.15     0.89     0.18     3.90

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.912

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     344.777      97.339     330.751    1140.881       0.302       0.051

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.579      16.499     540.915      46.000      16.399      32.400      16.001

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     351.560      97.339     364.786    1140.465       0.308      -0.002

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.551      16.430     540.521     456.573       0.035       0.122

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     335.438       0.000     335.438    1141.441       0.294      -0.043

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.449     541.446       0.000       0.060       0.107       0.015

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.593      17.467       1.018     550.842       4.619     386.420       2.996

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  28764.361       0.297     148.660  845845.188


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.499   EfDer =  0.853

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    91.455    1888.000      17.467     550.842       1.000       1.000       0.980
W Kg/sec =   41.57034

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    79.318    1832.089       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  70354.531   71761.469       2.206     509.668     230.996     390.276       1.690

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   313.38    -0.11   313.38     0.27   292.89
MEAN    15.91     0.00    -0.02   313.38    -0.11   313.38     0.27
HUB     13.07     0.00    -0.02   313.38    -0.11   313.38     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     43.94    47.36    -3.42   301.84   435.18    16.58   542.64     0.38
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MEAN    39.93    44.80    -4.87   262.18   408.66    16.58   542.64     0.36
HUB     34.51    38.84    -4.33   215.34   380.30    16.58   542.64     0.33
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   340.89    52.81   336.78  1143.75     0.30
MEAN    15.50   345.29    77.69   336.44  1144.20     0.30
HUB     12.59   365.92   143.52   336.61  1144.58     0.32

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    295.58   415.16   242.76     0.36   949.44
MEAN   255.34   380.46   177.65     0.33  1205.72     1.15
HUB    207.43   342.62    63.91     0.30  1808.30

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.68     1.01    16.63   553.35     1.00   543.65     0.92     0.78
MEAN    17.74     1.02    16.66   554.03     1.01   544.08     0.92     0.78
HUB     17.88     1.02    16.66   555.63     1.01   544.45     0.92     0.78

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP      8.91    35.79    31.50     4.29     0.93     0.07     2.90
MEAN    13.00    27.84    23.50     4.34     0.88     0.10     3.34     0.78
HUB     23.09    10.75     6.50     4.25     0.88     0.14     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.853

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     348.376      79.114     339.274    1144.328       0.304       -0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.748      16.642     544.203      46.000      13.126      33.000      19.874

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     365.102      79.114     373.575    1143.280       0.319       -0.160

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.675      16.467     543.206     440.827       0.085       0.093

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     342.568       0.000     342.568    1144.680       0.299       -0.072

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950      16.560     544.538       0.000       0.060       0.131       -0.077

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.405      17.624       1.009     554.337       3.495     473.956       3.674

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  21770.000       0.249     112.512  899292.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    196315.22   1014.5946      89.3421      1.1666       0.7490       6.4986       1.0603
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      89.993    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   40.90590

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
      87.914    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  69230.023   70614.477       3.248     831.557     256.025     619.754       2.421

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   203.12    -0.07   203.12     0.18   338.55
  MEAN    17.06     0.00    -0.02   203.12    -0.07   203.12     0.18
  HUB     12.51     0.00    -0.02   203.12    -0.07   203.12     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.14    50.47     8.67   339.90   396.03    14.76   519.36     0.35
  MEAN    54.15    47.20     6.95   281.08   346.85    14.76   519.36     0.31
  HUB     45.43    38.62     6.81   206.11   289.43    14.76   519.36     0.26

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   338.25   189.13   280.44  1122.49     0.30
  MEAN    18.04   352.69   212.10   281.79  1121.38     0.31
  HUB     15.00   396.13   275.67   284.48  1119.34     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   318.40   150.77     0.28  3903.16
  MEAN   297.16   294.35    85.06     0.26  3826.62     1.32
  HUB    247.14   285.91    28.53     0.26  4135.89

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.08     1.06    15.10   533.14     1.02   523.58     0.92     0.91
  MEAN    16.06     1.06    15.00   532.94     1.02   522.55     0.92     0.91
  HUB     16.14     1.07    14.80   533.76     1.02   520.65     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     34.00    28.26    24.20     4.06     0.93     0.28     2.90
  MEAN    36.97    16.80    12.70     4.10     0.93     0.24     3.51     0.91
  HUB     44.10    -5.73    -9.30     3.57     0.93     0.12     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     357.979     211.687     288.682    1121.411       0.319      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.083      14.985     522.575      24.000      36.252      35.400      -0.852

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	312.906	211.687	377.785	1124.118	0.278	0.241

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.080	15.236	525.100	528.796	0.013	0.385

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	290.890	0.000	290.890	1125.305	0.258	0.299

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.323	526.211	0.000	0.060	0.037	0.317

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	16.053	1.063	533.278	10.468	214.150	1.660

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
65173.973	0.564	331.448	854113.688

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 6.953 EfDer = 0.996

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
89.993	1888.000	16.053	533.278	1.000	1.000	0.980

W Kg/sec = 40.90590

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
83.560	1862.015	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
69230.023	70614.477	2.427	590.487	243.345	474.134	1.948

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	278.44	-0.10	278.44	0.25	333.91
MEAN	18.08	0.00	-0.02	278.44	-0.10	278.44	0.25	
HUB	15.21	0.00	-0.02	278.44	-0.10	278.44	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.57	46.36	4.21	338.58	438.44	15.38	526.80	0.39
MEAN	46.94	42.30	4.64	297.86	407.81	15.38	526.80	0.36
HUB	42.00	37.84	4.16	250.60	374.67	15.38	526.80	0.33

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	324.71	125.88	299.32	1130.70	0.29
MEAN	18.01	332.02	142.46	299.90	1130.26	0.29
HUB	15.22	359.10	196.27	300.72	1129.78	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	336.44	365.96	210.56	0.32	2572.40	
MEAN	296.73	337.25	154.27	0.30	2567.46	1.30
HUB	250.81	305.63	54.55	0.27	2989.20	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.71	1.04	15.78	540.09	1.01	531.28	0.92	0.91
MEAN	16.71	1.04	15.74	540.07	1.01	530.87	0.92	0.91
HUB	16.82	1.05	15.68	541.19	1.01	530.42	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	22.81	35.12	31.50	3.62	0.93	0.21	2.90	
MEAN	25.41	27.22	23.50	3.72	0.92	0.23	3.30	0.91
HUB	33.13	10.28	6.50	3.78	0.92	0.25	3.92	

blockage3	Cor/U1	Cor/Incid

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      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     336.996     142.861     305.216    1130.364       0.298      -0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.739      15.736     530.964      46.000      25.083      30.600       5.517

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     315.263     142.861     346.122    1131.623       0.279       0.118

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.734      15.854     532.148     511.151       0.015       0.218

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     311.268       0.000     311.268    1131.845       0.275       0.107

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.845     532.357       0.000       0.060       0.047       0.109

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.850      16.701       1.040     540.449       7.171     280.580       2.175

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  44650.043       0.394     227.072  790342.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.969

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     89.993    1888.000      16.701     540.449       1.000       1.000       0.980
W Kg/sec =   40.90590

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.852    1849.621       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  69230.023   70614.477       2.317     545.479     235.460     429.765       1.825

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   294.54    -0.10   294.54     0.26   323.94
 MEAN    17.74     0.00    -0.02   294.54    -0.10   294.54     0.26
 HUB     15.05     0.00    -0.02   294.54    -0.10   294.54     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.32    46.36     1.96   330.67   442.90    15.93   533.20     0.39
 MEAN    44.79    43.40     1.39   292.26   415.00    15.93   533.20     0.37
 HUB     40.10    38.84     1.26   247.96   385.08    15.93   533.20     0.34

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   332.93   101.66   317.03  1136.26     0.29
 MEAN    17.51   340.43   123.73   317.15  1136.24     0.30
 HUB     14.85   367.85   185.61   317.59  1136.17     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39   388.60   224.72     0.34  2015.99
 MEAN   288.44   357.36   164.70     0.31  2167.92     1.24
 HUB    244.67   323.04    59.06     0.28  2757.77

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.22     1.03    16.22   545.78     1.01   536.53     0.92     0.89
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 MEAN    17.26     1.03    16.21   546.19     1.01   536.51     0.92     0.89
 HUB     17.41     1.04    16.19   547.75     1.01   536.45     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.78    35.33    31.50     3.83     0.93     0.16     2.90
 MEAN    21.31    27.44    23.50     3.94     0.91     0.18     3.28     0.89
 HUB     30.30    10.53     6.50     4.03     0.91     0.22     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.969

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     344.381     124.544     321.072    1136.406       0.303       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.283      16.215     536.667      46.000      21.201      31.500      10.299

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     336.200     124.544     358.527    1136.899       0.296       0.041

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.269      16.251     537.132     471.992       0.023       0.172

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     326.943       0.000     326.943    1137.441       0.287       0.038

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.257     537.645       0.000       0.060       0.070       0.046

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.774      17.218       1.031     546.572       6.123     312.231       2.420

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  38128.238       0.358     193.904  798871.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.923

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     89.993    1888.000      17.218     546.572       1.000       1.000       0.980
W Kg/sec =   40.90590

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     78.870    1839.232       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 69230.023   70614.477       2.235     513.330     229.689     401.059       1.746

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   307.87    -0.11   307.87     0.27   309.12
 MEAN    16.97     0.00    -0.02   307.87    -0.11   307.87     0.27
 HUB     14.32     0.00    -0.02   307.87    -0.11   307.87     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.88    46.36    -0.48   317.33   442.21    16.36   538.66     0.39
 MEAN    42.26    43.80    -1.54   279.61   415.96    16.36   538.66     0.37
 HUB     37.48    37.84    -0.36   235.93   387.95    16.36   538.66     0.34

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   338.81    75.61   330.27  1140.73     0.30
 MEAN    16.57   345.04   100.61   330.05  1141.02     0.30
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 HUB     13.89   369.99   166.82   330.25  1141.26     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    311.07   405.61   235.46     0.36  1429.49
 MEAN   273.07   372.39   172.46     0.33  1669.28     1.19
 HUB    228.85   336.03    62.03     0.29  2318.64

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.57     1.02    16.53   550.35     1.01   540.77     0.92     0.84
 MEAN    17.63     1.02    16.55   550.99     1.01   541.05     0.92     0.84
 HUB     17.79     1.03    16.54   552.71     1.01   541.27     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     12.89    35.49    31.50     3.99     0.93     0.11     2.90
 MEAN    16.95    27.59    23.50     4.09     0.89     0.14     3.29     0.84
 HUB     26.80    10.64     6.50     4.14     0.89     0.19     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.923

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     339.336     101.175     323.902    1141.745       0.297       0.051

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.654      16.604     541.734      46.000      17.347      32.400      15.053

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     344.001     101.175     358.571    1141.464       0.301       0.011

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.629      16.552     541.468     456.573       0.032       0.133

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     328.153       0.000     328.153    1142.401       0.287      -0.027

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.573     542.357       0.000       0.060       0.101       0.031

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.632      17.552       1.019     551.350       4.778     372.953       2.891

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  29755.898       0.308     151.326  830662.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.867

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     89.993    1888.000      17.552     551.350       1.000       1.000       0.980
W Kg/sec =   40.90590

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.706    1831.245       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  69230.023   70614.477       2.252     509.668     226.303     390.276       1.725

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   306.66    -0.11   306.66     0.27   292.76
 MEAN    15.91     0.00    -0.02   306.66    -0.11   306.66     0.27
 HUB     13.07     0.00    -0.02   306.66    -0.11   306.66     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.56    47.36    -2.80   301.84   430.36    16.70   543.50     0.38
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MEAN    40.54    44.80    -4.26   262.18   403.53    16.70   543.50     0.35
HUB     35.09    38.84    -3.75   215.34   374.78    16.70   543.50     0.33
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   334.31    58.45   329.17  1144.95     0.29
MEAN    15.50   338.95    81.78   328.93  1145.29     0.30
HUB     12.59   359.68   144.99   329.16  1145.57     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    295.58   405.69   237.13     0.35  1050.50
MEAN   255.34   371.91   173.55     0.32  1269.12     1.16
HUB    207.43   335.03    62.45     0.29  1826.75

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.80     1.01    16.77   554.13     1.01   544.80     0.92     0.79
MEAN    17.85     1.02    16.80   554.71     1.01   545.11     0.92     0.79
HUB     17.98     1.02    16.79   556.18     1.01   545.38     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     10.07    35.77    31.50     4.27     0.93     0.08     2.90
MEAN    13.96    27.82    23.50     4.32     0.88     0.11     3.34     0.79
HUB     23.77    10.74     6.50     4.24     0.88     0.15     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.867

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     341.979      83.283     331.683    1145.420       0.299       -0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.854      16.782     545.241      46.000      14.095      33.000      18.905

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     356.525      83.283     366.123    1144.528       0.312       -0.144

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.789      16.630     544.392     440.827       0.080       0.104

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     334.583       0.000     334.583    1145.859       0.292       -0.058

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950      16.719     545.659       0.000       0.060       0.125       -0.063

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.460      17.740       1.011     555.007       3.657     453.240       3.513

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  22774.943       0.261     115.824  882872.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    200483.09   1019.5739     87.9141      1.1743      0.7654       6.9531       1.0616
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.042   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      86.549    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   39.34029

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      84.549    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  66580.336   67911.805       3.377     831.557     246.226     619.754       2.517

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   195.10    -0.07   195.10     0.17   338.55
  MEAN    17.06     0.00    -0.02   195.10    -0.07   195.10     0.17
  HUB     12.51     0.00    -0.02   195.10    -0.07   195.10     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.15    50.47     9.68   339.90   391.97    14.79   519.63     0.35
  MEAN    55.24    47.20     8.04   281.08   342.21    14.79   519.63     0.31
  HUB     46.58    38.62     7.96   206.11   283.86    14.79   519.63     0.25

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   332.43   195.42   268.92  1123.21     0.30
  MEAN    18.04   345.79   215.64   270.32  1122.00     0.31
  HUB     15.00   387.12   274.57   272.90  1119.93     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   305.28   144.48     0.27  4032.87
  MEAN   297.16   282.34    81.52     0.25  3890.45     1.36
  HUB    247.14   274.27    27.43     0.24  4119.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.11     1.07    15.16   533.48     1.02   524.25     0.92     0.91
  MEAN    16.08     1.06    15.05   533.11     1.02   523.12     0.92     0.91
  HUB     16.13     1.07    14.85   533.71     1.02   521.20     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     36.00    28.25    24.20     4.05     0.93     0.31     2.90
  MEAN    38.58    16.78    12.70     4.08     0.93     0.27     3.51     0.91
  HUB     45.18    -5.74    -9.30     3.56     0.93     0.14     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     350.706     215.222     276.901    1122.040       0.313      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.097      15.041     523.162      24.000      37.856      35.400      -2.456

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     299.805     215.222     369.058    1125.002       0.266       0.273
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.094      15.318     525.927     528.796       0.013       0.410

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     278.850       0.000     278.850    1126.085       0.248       0.324

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.394     526.940       0.000       0.060       0.039       0.343

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.876      16.066       1.063     533.435      10.625     207.558       1.609

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  66147.141       0.573     323.522  820374.562


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.042   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    86.549    1888.000      16.066     533.435       1.000       1.000       0.980
W Kg/sec =   39.34029

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    80.308    1861.742       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 66580.336   67911.805       2.525     590.487     233.874     474.134       2.027

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   266.98    -0.09   266.98     0.24   333.86
 MEAN    18.08     0.00    -0.02   266.98    -0.09   266.98     0.24
 HUB     15.21     0.00    -0.02   266.98    -0.09   266.98     0.24

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.75    46.36     5.39   338.58   431.25    15.45   527.48     0.38
 MEAN    48.14    42.30     5.84   297.86   400.07    15.45   527.48     0.36
 HUB     43.20    37.84     5.36   250.60   366.23    15.45   527.48     0.33

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   316.78   135.13   286.51  1131.85     0.28
 MEAN    18.01   323.67   149.21   287.23  1131.25     0.29
 HUB     15.22   350.05   198.73   288.17  1130.63     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    336.44   350.16   201.30     0.31  2761.34
 MEAN   296.73   322.90   147.52     0.29  2688.90     1.34
 HUB    250.81   292.83    52.08     0.26  3026.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.78     1.04    15.89   540.74     1.01   532.36     0.92     0.91
 MEAN    16.76     1.04    15.83   540.55     1.01   531.80     0.92     0.91
 HUB     16.85     1.05    15.76   541.44     1.02   531.21     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.25    35.09    31.50     3.59     0.93     0.24     2.90
 MEAN    27.45    27.18    23.50     3.68     0.92     0.25     3.30     0.91
 HUB     34.59    10.24     6.50     3.74     0.92     0.27     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     328.369     149.627     292.297    1131.366       0.290      -0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.786      15.831     531.907      46.000      27.108      30.600       3.492

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     301.559     149.627     336.640    1132.865       0.266       0.152

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.783      15.975     533.317     511.151       0.013       0.246

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     297.664       0.000     297.664    1133.073       0.263       0.144

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.970     533.512       0.000       0.060       0.041       0.147

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      16.756       1.043     540.912       7.478     266.244       2.064

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  46561.008       0.411     227.727  758050.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.042   EfDer =  0.983

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     86.549    1888.000      16.756     540.912       1.000       1.000       0.980
W Kg/sec =   39.34029

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     77.538    1848.829       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  66580.336   67911.805       2.416     545.479     225.808     429.765       1.903

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   281.77    -0.10   281.77     0.25   323.80
 MEAN    17.74      0.00    -0.02   281.77    -0.10   281.77     0.25
 HUB     15.05      0.00    -0.02   281.77    -0.10   281.77     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.57     46.36     3.21   330.67   434.51    16.05   534.28     0.38
 MEAN    46.06     43.40     2.66   292.26   406.04    16.05   534.28     0.36
 HUB     41.36     38.84     2.52   247.96   375.40    16.05   534.28     0.33

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   322.71   112.22   302.57  1137.93      0.28
 MEAN    17.51   330.17   131.40   302.90  1137.71      0.29
 HUB     14.85   357.25   188.48   303.48  1137.46      0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39   370.70   214.17     0.33  2224.98
 MEAN   288.44   341.19   157.04     0.30  2302.05     1.28
 HUB    244.67   308.64    56.19     0.27  2800.41

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     17.33      1.03    16.39   546.80     1.01   538.10      0.92     0.90
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 MEAN    17.36     1.04    16.37   547.00     1.01   537.90     0.92     0.90
 HUB     17.49     1.04    16.33   548.32     1.01   537.66     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.35    35.29    31.50     3.79     0.93     0.19     2.90
 MEAN    23.45    27.40    23.50     3.90     0.91     0.21     3.28     0.90
 HUB     31.84    10.49     6.50     3.99     0.91     0.24     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.983

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     333.928     132.260     306.619    1137.883       0.293       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.382      16.372     538.063      46.000      23.333      31.500       8.167

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     320.577     132.260     346.788    1138.654       0.282       0.076

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.373      16.442     538.792     471.992       0.018       0.200

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     311.619       0.000     311.619    1139.154       0.274       0.078

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.453     539.266       0.000       0.060       0.058       0.087

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.815      17.332       1.034     547.375       6.463     293.248       2.273

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  40247.117       0.378     196.846  765588.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.042   EfDer =  0.947

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     86.549    1888.000      17.332     547.375       1.000       1.000       0.980
W Kg/sec =   39.34029

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     75.406    1837.882       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 66580.336   67911.805       2.338     513.330     219.603     401.059       1.826

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   293.58    -0.10   293.58     0.26   308.89
 MEAN    16.97     0.00    -0.02   293.58    -0.10   293.58     0.26
 HUB     14.32     0.00    -0.02   293.58    -0.10   293.58     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.23    46.36     0.87   317.33   432.38    16.55   540.18     0.38
 MEAN    43.61    43.80    -0.19   279.61   405.50    16.55   540.18     0.36
 HUB     38.80    37.84     0.96   235.93   376.70    16.55   540.18     0.33

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   326.05    87.48   314.09  1142.95     0.29
 MEAN    16.57   332.57   109.25   314.11  1143.01     0.29
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 HUB     13.89   357.51   170.06   314.47  1143.03     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    311.07   385.55   223.59     0.34  1653.48
 MEAN   273.07   354.27   163.82     0.31  1812.35     1.22
 HUB    228.85   319.91    58.79     0.28  2363.63

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.75     1.02    16.78   551.75     1.01   542.87     0.92     0.87
 MEAN    17.80     1.03    16.78   552.17     1.01   542.93     0.92     0.87
 HUB     17.94     1.03    16.76   553.63     1.01   542.96     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.56    35.45    31.50     3.95     0.93     0.14     2.90
 MEAN    19.18    27.54    23.50     4.04     0.90     0.17     3.29     0.87
 HUB     28.40    10.59     6.50     4.09     0.90     0.21     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.947

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     327.297     109.861     308.308    1143.679       0.286       0.051

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.819      16.833     543.571      46.000      19.613      32.400      12.787

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     326.858     109.861     344.827    1143.705       0.286       0.044

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.802      16.819     543.595     456.573       0.026       0.161

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     311.646       0.000     311.646    1144.557       0.272       0.013

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.847     544.406       0.000       0.060       0.086       0.070

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.710      17.739       1.023     552.517       5.141     344.710       2.672

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  32019.203       0.331     156.604  795319.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.042   EfDer =  0.898

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     86.549    1888.000      17.739     552.517       1.000       1.000       0.980
W Kg/sec =   39.34029

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     74.024    1829.311       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  66580.336   67911.805       2.364     509.668     215.578     390.276       1.810

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   291.40    -0.10   291.40     0.25   292.45
 MEAN    15.91     0.00    -0.02   291.40    -0.10   291.40     0.25
 HUB     13.07     0.00    -0.02   291.40    -0.10   291.40     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.02    47.36    -1.34   301.84   419.62    16.96   545.43     0.37
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 MEAN    41.99    44.80    -2.81   262.18   392.05    16.96   545.43     0.34
 HUB     36.48    38.84    -2.36   215.34   362.39    16.96   545.43     0.32
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   319.98    71.20   311.95  1147.64     0.28
 MEAN    15.50   324.98    91.08   311.96  1147.72     0.28
 HUB     12.59   345.81   148.47   312.31  1147.77     0.30

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    295.58   384.26   224.38     0.33  1279.19
 MEAN   255.34   352.56   164.25     0.31  1413.16     1.19
 HUB    207.43   317.83    58.96     0.28  1870.51

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.05     1.02    17.10   555.90     1.01   547.35     0.92     0.82
 MEAN    18.09     1.02    17.10   556.26     1.01   547.44     0.92     0.82
 HUB     18.20     1.03    17.09   557.47     1.01   547.48     0.92     0.82

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     12.86    35.73    31.50     4.23     0.93     0.11     2.90
 MEAN    16.28    27.77    23.50     4.27     0.89     0.14     3.34     0.82
 HUB     25.43    10.69     6.50     4.19     0.89     0.17     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.898

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     327.902      92.753     314.511    1147.857       0.286       -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.091      17.094     547.562      46.000      16.431      33.000      16.569

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     337.218      92.753     349.742    1147.314       0.294       -0.104

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.043      16.992     547.045     440.827       0.068       0.130

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     316.563       0.000     316.563    1148.496       0.276       -0.021

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      17.073     548.172       0.000       0.060       0.111       -0.025

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.575      17.999       1.015     556.541       4.024     411.215       3.188

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  25062.453       0.287     122.579  844739.562

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc   TR
    210036.92   1027.2783     84.5493      1.1914      0.7983       8.0419      1.0645
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.005   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      83.564    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   37.98386

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      81.634    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  64284.684   65570.242       3.498     831.557     237.736     619.754       2.607

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   188.17    -0.06   188.17     0.17   338.55
  MEAN    17.06     0.00    -0.02   188.17    -0.06   188.17     0.17
  HUB     12.51     0.00    -0.02   188.17    -0.06   188.17     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.04    50.47    10.57   339.90   388.57    14.81   519.85     0.35
  MEAN    56.21    47.20     9.01   281.08   338.31    14.81   519.85     0.30
  HUB     47.61    38.62     8.99   206.11   279.14    14.81   519.85     0.25

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   327.76   200.78   259.06  1123.80     0.29
  MEAN    18.04   340.11   218.69   260.48  1122.50     0.30
  HUB     15.00   379.51   273.64   262.97  1120.41     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   294.05   139.12     0.26  4143.38
  MEAN   297.16   272.04    78.47     0.24  3945.33     1.40
  HUB    247.14   264.30    26.50     0.24  4105.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.14     1.07    15.21   533.78     1.02   524.80     0.92     0.91
  MEAN    16.09     1.06    15.09   533.25     1.02   523.59     0.92     0.91
  HUB     16.13     1.07    14.90   533.68     1.02   521.65     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     37.78    28.24    24.20     4.04     0.93     0.33     2.90
  MEAN    40.02    16.77    12.70     4.07     0.93     0.29     3.51     0.91
  HUB     46.14    -5.75    -9.30     3.55     0.93     0.16     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     344.706     218.261     266.804    1122.557       0.307      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.107      15.086     523.644      24.000      39.285      35.400      -3.885

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     288.614     218.261     361.851    1125.733       0.256       0.301
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.103      15.383     526.611     528.796       0.014       0.432

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     268.569       0.000     268.569    1126.730       0.238       0.346

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.450     527.544       0.000       0.060       0.042       0.364

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.872      16.074       1.064     533.568      10.758     201.940       1.565

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  66978.195       0.580     316.291  791248.438


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.005   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    83.564    1888.000      16.074     533.568       1.000       1.000       0.980
W Kg/sec =   37.98386

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    77.510    1861.509       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  64284.684   65570.242       2.616     590.487     225.724     474.134       2.101

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   257.19    -0.09   257.19     0.23   333.82
 MEAN    18.08     0.00    -0.02   257.19    -0.09   257.19     0.23
 HUB     15.21     0.00    -0.02   257.19    -0.09   257.19     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.79    46.36     6.43   338.58   425.26    15.50   528.04     0.38
 MEAN    49.20    42.30     6.90   297.86   393.60    15.50   528.04     0.35
 HUB     44.27    37.84     6.43   250.60   359.15    15.50   528.04     0.32

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   310.51   142.94   275.65  1132.79     0.27
 MEAN    18.01   316.91   154.91   276.47  1132.07     0.28
 HUB     15.22   342.53   200.82   277.49  1131.32     0.30

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    336.44   336.78   193.49     0.30  2920.74
 MEAN   296.73   310.72   141.82     0.27  2791.44     1.37
 HUB    250.81   281.96    49.99     0.25  3058.45

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.83     1.05    15.97   541.30     1.01   533.24     0.92     0.91
 MEAN    16.80     1.04    15.90   540.96     1.01   532.57     0.92     0.91
 HUB     16.87     1.05    15.82   541.66     1.02   531.86     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.41    35.07    31.50     3.57     0.93     0.27     2.90
 MEAN    29.26    27.16    23.50     3.66     0.93     0.27     3.30     0.91
 HUB     35.89    10.21     6.50     3.71     0.93     0.29     3.92


  blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     321.368     155.340     281.330    1132.187       0.284       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.821      15.904     532.679      46.000      28.906      30.600       1.694

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     289.965     155.340     328.953    1133.890       0.256       0.183

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.819      16.070     534.283     511.151       0.011       0.271

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     286.188       0.000     286.188    1134.083       0.252       0.174

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.066     534.464       0.000       0.060       0.038       0.178

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      16.795       1.045     541.305       7.737     254.726       1.975

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  48173.984       0.426     227.492  730294.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 9.005   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     83.564    1888.000      16.795     541.305       1.000       1.000       0.980
W Kg/sec =   37.98386

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     74.718    1848.158       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  64284.684   65570.242       2.507     545.479     217.595     429.765       1.975

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   270.99    -0.09   270.99     0.24   323.68
 MEAN    17.74     0.00    -0.02   270.99    -0.09   270.99     0.24
 HUB     15.05     0.00    -0.02   270.99    -0.09   270.99     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.67    46.36     4.31   330.67   427.60    16.14   535.17     0.38
 MEAN    47.17    43.40     3.77   292.26   398.63    16.14   535.17     0.35
 HUB     42.47    38.84     3.63   247.96   367.38    16.14   535.17     0.32

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   314.68   121.03   290.47  1139.28      0.28
 MEAN    17.51   321.94   137.83   290.94  1138.91      0.28
 HUB     14.85   348.56   190.90   291.64  1138.52      0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39   355.73   205.35     0.31  2399.54
 MEAN   288.44   327.61   150.60     0.29  2414.67     1.31
 HUB    244.67   296.55    53.77     0.26  2836.25

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.43     1.04    16.53   547.65     1.01   539.38     0.92     0.91
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 MEAN    17.43     1.04    16.49   547.69     1.01   539.04     0.92     0.91
 HUB     17.54     1.04    16.44   548.81     1.01   538.66     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.62    35.26    31.50     3.76     0.93     0.22     2.90
 MEAN    25.35    27.37    23.50     3.87     0.92     0.23     3.28     0.91
 HUB     33.21    10.45     6.50     3.95     0.92     0.26     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     325.544     138.739     294.500    1139.086       0.286       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.457      16.493     539.202      46.000      25.225      31.500       6.275

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     307.531     138.739     337.378    1140.092       0.270       0.108

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.452      16.590     540.154     471.992       0.015       0.225

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     298.857       0.000     298.857    1140.555       0.262       0.114

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.605     540.594       0.000       0.060       0.050       0.123

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.842      17.418       1.037     548.053       6.748     278.425       2.158

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  42021.582       0.394     198.439  737067.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 9.005   EfDer =  0.964

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     83.564    1888.000      17.418     548.053       1.000       1.000       0.980
W Kg/sec =   37.98386

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     72.494    1836.745       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  64284.684   65570.242       2.431     513.330     211.121     401.059       1.900

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   281.66    -0.10   281.66     0.25   308.70
 MEAN    16.97     0.00    -0.02   281.66    -0.10   281.66     0.25
 HUB     14.32     0.00    -0.02   281.66    -0.10   281.66     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.42    46.36     2.06   317.33   424.37    16.69   541.43     0.37
 MEAN    44.80    43.80     1.00   279.61   396.95    16.69   541.43     0.35
 HUB     39.96    37.84     2.12   235.93   367.48    16.69   541.43     0.32

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   316.04    97.27   300.70  1144.74     0.28
 MEAN    16.57   322.63   116.40   300.90  1144.62     0.28
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 HUB     13.89   347.38   172.77   301.37  1144.48     0.30

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    311.07   368.96   213.80     0.32  1838.28
 MEAN   273.07   339.25   156.67     0.30  1930.78     1.25
 HUB    228.85   306.55    56.09     0.27  2401.10

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.90     1.03    16.97   552.92     1.01   544.58     0.92     0.88
 MEAN    17.92     1.03    16.96   553.16     1.01   544.47     0.92     0.88
 HUB     18.05     1.04    16.93   554.41     1.01   544.33     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.92    35.41    31.50     3.91     0.93     0.17     2.90
 MEAN    21.15    27.50    23.50     4.00     0.91     0.19     3.29     0.88
 HUB     29.82    10.54     6.50     4.04     0.91     0.23     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.964

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     317.722     117.051     295.376    1145.249       0.277       0.051

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.946      17.010     545.064      46.000      21.617      32.400      10.783

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     312.706     117.051     333.895    1145.527       0.273       0.074

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.934      17.028     545.328     456.573       0.022       0.186

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     298.044       0.000     298.044    1146.312       0.260       0.050

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.060     546.076       0.000       0.060       0.073       0.106

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.763      17.883       1.027     553.494       5.442     323.559       2.508

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  33890.539       0.350     160.041  765142.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 9.005   EfDer =  0.923

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     83.564    1888.000      17.883     553.494       1.000       1.000       0.980
W Kg/sec =   37.98386

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     70.959    1827.694       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  64284.684   65570.242       2.466     509.668     206.652     390.276       1.889

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   278.80    -0.10   278.80     0.24   292.19
 MEAN    15.91     0.00    -0.02   278.80    -0.10   278.80     0.24
 HUB     13.07     0.00    -0.02   278.80    -0.10   278.80     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.28    47.36    -0.08   301.84   410.97    17.16   547.00     0.36
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 MEAN    43.25    44.80    -1.55   262.18   382.78    17.16   547.00     0.33
 HUB     37.69    38.84    -1.15   215.34   352.34    17.16   547.00     0.31
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   308.81    81.66   297.82  1149.79     0.27
 MEAN    15.50   313.92    98.70   298.00  1149.69     0.27
 HUB     12.59   334.63   151.33   298.45  1149.56     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    295.58   366.68   213.92     0.32  1466.73
 MEAN   255.34   336.65   156.63     0.29  1531.19     1.22
 HUB    207.43   303.68    56.11     0.26  1906.45

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.25     1.02    17.36   557.37     1.01   549.41     0.92     0.84
 MEAN    18.27     1.02    17.35   557.55     1.01   549.32     0.92     0.84
 HUB     18.37     1.03    17.32   558.54     1.01   549.19     0.92     0.84

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.33    35.69    31.50     4.19     0.93     0.14     2.90
 MEAN    18.33    27.73    23.50     4.23     0.89     0.16     3.34     0.84
 HUB     26.89    10.65     6.50     4.15     0.89     0.19     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.923

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      316.772     100.513     300.402    1149.824       0.275       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.279      17.339      549.440       46.000      18.500      33.000      14.500

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      321.463     100.513     336.810    1149.562       0.280       -0.068

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       18.243       17.277     549.190     440.827       0.057       0.154

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      301.822       0.000     301.822    1150.631       0.262       0.015

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       17.353      550.212       0.000       0.060       0.097       0.012

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.657       18.205        1.018      557.819       4.325      381.038       2.954

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  26937.855       0.308     127.209  812275.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    218002.17   1029.4727      81.6341      1.2051       0.8204       9.0055       1.0670
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.954   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      80.683    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   36.67420

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      78.819    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  62068.199   63309.430       3.623     831.557     229.539     619.754       2.700

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   181.51    -0.06   181.51     0.16   338.55
  MEAN    17.06     0.00    -0.02   181.51    -0.06   181.51     0.16
  HUB     12.51     0.00    -0.02   181.51    -0.06   181.51     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.90    50.47    11.43   339.90   385.38    14.83   520.06     0.34
  MEAN    57.15    47.20     9.95   281.08   334.64    14.83   520.06     0.30
  HUB     48.64    38.62    10.02   206.11   274.69    14.83   520.06     0.25

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   323.57   205.87   249.64  1124.34     0.29
  MEAN    18.04   334.85   221.56   251.06  1122.97     0.30
  HUB     15.00   372.31   272.72   253.46  1120.86     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   283.34   134.03     0.25  4248.31
  MEAN   297.16   262.20    75.60     0.23  3997.18     1.44
  HUB    247.14   254.74    25.58     0.23  4091.52

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.16     1.07    15.26   534.05     1.02   525.31     0.92     0.91
  MEAN    16.10     1.07    15.13   533.39     1.02   524.02     0.92     0.91
  HUB     16.12     1.07    14.93   533.64     1.02   522.06     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     39.51    28.23    24.20     4.03     0.93     0.36     2.90
  MEAN    41.43    16.76    12.70     4.06     0.94     0.31     3.51     0.91
  HUB     47.10    -5.76    -9.30     3.54     0.94     0.19     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     339.147     221.132     257.140    1123.032       0.302      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.116      15.126     524.087      24.000      40.694      35.400      -5.294

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     277.936     221.132     355.173    1126.408       0.247       0.328
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.111      15.442     527.242     528.796       0.015       0.455

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     258.760       0.000     258.760    1127.325       0.230       0.366

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.499     528.102       0.000       0.060       0.046       0.385

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.867      16.079       1.064     533.694      10.884     196.606       1.524

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  67762.891       0.587     308.964  763214.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.954   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    80.683    1888.000      16.079     533.694       1.000       1.000       0.980
W Kg/sec =   36.67420

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    74.822    1861.290       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  62068.199   63309.430       2.710     590.487     217.899     474.134       2.176

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   247.84    -0.09   247.84     0.22   333.78
 MEAN    18.08     0.00    -0.02   247.84    -0.09   247.84     0.22
 HUB     15.21     0.00    -0.02   247.84    -0.09   247.84     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.80    46.36     7.44   338.58   419.67    15.55   528.56     0.37
 MEAN    50.24    42.30     7.94   297.86   387.55    15.55   528.56     0.34
 HUB     45.33    37.84     7.49   250.60   352.52    15.55   528.56     0.31

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   304.96   150.31   265.35  1133.65     0.27
 MEAN    18.01   310.78   160.29   266.25  1132.82     0.27
 HUB     15.22   335.54   202.77   267.33  1131.96     0.30

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    336.44   324.12   186.13     0.29  3071.03
 MEAN   296.73   299.17   136.44     0.26  2888.34     1.41
 HUB    250.81   271.61    48.04     0.24  3088.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.87     1.05    16.04   541.82     1.02   534.05     0.92     0.91
 MEAN    16.82     1.05    15.97   541.34     1.01   533.27     0.92     0.91
 HUB     16.88     1.05    15.88   541.87     1.02   532.46     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.53    35.05    31.50     3.55     0.93     0.29     2.90
 MEAN    31.05    27.13    23.50     3.63     0.93     0.29     3.30     0.91
 HUB     37.18    10.19     6.50     3.69     0.93     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     315.014     160.739     270.918    1132.939       0.278       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.849      15.967     533.387      46.000      30.681      30.600      -0.081

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     278.989     160.739     321.981    1134.835       0.246       0.213

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.848      16.154     535.174     511.151       0.011       0.297

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     275.351       0.000     275.351    1135.014       0.243       0.204

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.149     535.343       0.000       0.060       0.037       0.208

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      16.825       1.046     541.675       7.981     244.291       1.894

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  49694.980       0.439     226.583  703679.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 9.954   EfDer =  0.996

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     80.683    1888.000      16.825     541.675       1.000       1.000       0.980
W Kg/sec =   36.67420

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     72.035    1847.526       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  62068.199   63309.430       2.600     545.479     209.783     429.765       2.049

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   260.79    -0.09   260.79     0.23   323.57
 MEAN    17.74      0.00    -0.02   260.79    -0.09   260.79     0.23
 HUB     15.05      0.00    -0.02   260.79    -0.09   260.79     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.75     46.36     5.39   330.67   421.21    16.22   535.99     0.37
 MEAN    48.26     43.40     4.86   292.26   391.77    16.22   535.99     0.34
 HUB     43.57     38.84     4.73   247.96   359.92    16.22   535.99     0.32

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   307.61   129.29   279.12  1140.51     0.27
 MEAN    17.51   314.53   143.85   279.71  1140.01     0.28
 HUB     14.85   340.56   193.15   280.50  1139.49     0.30

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39   341.69   197.10     0.30  2563.09
 MEAN   288.44   314.87   144.59     0.28  2519.84     1.34
 HUB    244.67   285.19    51.52     0.25  2869.59

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     17.51     1.04    16.64   548.46     1.01   540.55     0.92     0.91
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 MEAN    17.49     1.04    16.59   548.34     1.01   540.08     0.92     0.91
 HUB     17.59     1.05    16.53   549.27     1.01   539.58     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.85    35.23    31.50     3.73     0.93     0.24     2.90
 MEAN    27.22    27.34    23.50     3.84     0.92     0.25     3.28     0.91
 HUB     34.55    10.41     6.50     3.91     0.92     0.28     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     317.994     144.790     283.118    1140.186       0.279       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.519      16.597     540.244      46.000      27.086      31.500       4.414

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     295.323     144.790     328.907    1141.411       0.259       0.140

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.516      16.719     541.406     471.992       0.013       0.250

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     286.947       0.000     286.947    1141.840       0.251       0.147

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      16.735     541.813       0.000       0.060       0.043       0.157

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.860      17.488       1.039     548.689       7.014     265.321       2.057

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  43680.488       0.410     199.160  709784.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 9.954   EfDer =  0.978

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     80.683    1888.000       17.488     548.689       1.000        1.000        0.980
W Kg/sec =   36.67420

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     69.754    1835.679        1.402       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  62068.199   63309.430        2.527     513.330     203.140     401.059       1.974

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   270.53    -0.09   270.53      0.24   308.52
 MEAN    16.97      0.00    -0.02   270.53    -0.09   270.53      0.24
 HUB     14.32      0.00    -0.02   270.53    -0.09   270.53      0.24

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     49.56    46.36     3.20   317.33   417.06     16.82   542.58      0.36
 MEAN    45.96    43.80     2.16   279.61   389.12     16.82   542.58      0.34
 HUB     41.10    37.84     3.26   235.93   359.02     16.82   542.58      0.31

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   307.28   106.40   288.27  1146.36      0.27
 MEAN    16.57   313.76   123.06   288.62  1146.09      0.27
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 HUB     13.89   338.15   175.25   289.20  1145.79     0.30

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    311.07   353.54   204.67     0.31  2010.62
 MEAN   273.07   325.28   150.01     0.28  2041.21     1.29
 HUB    228.85   294.12    53.60     0.26  2435.57

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.02     1.03    17.14   554.01     1.01   546.12     0.92     0.89
 MEAN    18.03     1.03    17.11   554.09     1.01   545.87     0.92     0.89
 HUB     18.14     1.04    17.07   555.13     1.01   545.58     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.26    35.37    31.50     3.87     0.93     0.20     2.90
 MEAN    23.09    27.46    23.50     3.96     0.91     0.21     3.29     0.89
 HUB     31.22    10.50     6.50     4.00     0.91     0.24     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     309.200     123.755     283.354    1146.679       0.270       0.051

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.054      17.163     546.427      46.000      23.593      32.400       8.807

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     299.603     123.755     324.156    1147.191       0.261       0.104

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.047      17.210     546.915     456.573       0.018       0.211

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     285.475       0.000     285.475    1147.915       0.249       0.086

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.246     547.605       0.000       0.060       0.062       0.142

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.804      18.005       1.030     554.411       5.721     305.393       2.367

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  35633.391       0.368     162.470  736360.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 9.954   EfDer =  0.945

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     80.683    1888.000      18.005     554.411       1.000       1.000       0.980
W Kg/sec =   36.67420

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     68.103    1826.183       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  62068.199   63309.430       2.570     509.668     198.336     390.276       1.968

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   267.15    -0.09   267.15     0.23   291.95
 MEAN    15.91     0.00    -0.02   267.15    -0.09   267.15     0.23
 HUB     13.07     0.00    -0.02   267.15    -0.09   267.15     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.50    47.36     1.14   301.84   403.15    17.34   548.45     0.35
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MEAN    44.47    44.80    -0.33   262.18   374.37    17.34   548.45     0.33
HUB     38.88    38.84     0.04   215.34   343.19    17.34   548.45     0.30
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   299.09    91.31   284.81  1151.75     0.26
MEAN    15.50   304.10   105.72   285.13  1151.48     0.26
HUB     12.59   324.53   153.98   285.68  1151.19     0.28

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    295.58   350.48   204.27     0.30  1639.83
MEAN   255.34   322.00   149.62     0.28  1639.83     1.26
HUB    207.43   290.64    53.45     0.25  1939.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.43     1.02    17.59   558.75     1.01   551.28     0.92     0.86
MEAN    18.43     1.02    17.56   558.75     1.01   551.03     0.92     0.86
HUB     18.51     1.03    17.52   559.54     1.01   550.75     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     17.78    35.65    31.50     4.15     0.93     0.17     2.90
MEAN    20.34    27.69    23.50     4.19     0.90     0.18     3.34     0.86
HUB     28.32    10.60     6.50     4.10     0.90     0.21     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.945

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      306.908     107.656     287.407    1151.609       0.267       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.442      17.552      551.148       46.000      20.535      33.000      12.465

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      307.036     107.656     325.363    1151.602       0.267       -0.030

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       18.416       17.527     551.142     440.827       0.048       0.179

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      288.306       0.000     288.306    1152.575       0.250       0.053

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950       17.600      552.073       0.000       0.060       0.084       0.050

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4       Texit         Del T       Ns         Ns nondim
      0.722       18.384        1.021     559.014       4.603     355.971       2.759

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  28668.412       0.328     130.713  781379.562

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    225440.16   1027.8907      78.8194      1.2169       0.8362       9.9539       1.0692
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.018   EfDer =  0.986

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      77.512    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   35.23265

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      75.721    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   59628.492   60820.934       3.771     831.557     220.517     619.754       2.810

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   174.19    -0.06   174.19     0.16   338.55
  MEAN    17.06     0.00    -0.02   174.19    -0.06   174.19     0.16
  HUB     12.51     0.00    -0.02   174.19    -0.06   174.19     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.87    50.47    12.40   339.90   381.99    14.85   520.28     0.34
  MEAN    58.22    47.20    11.02   281.08   330.73    14.85   520.28     0.30
  HUB     49.81    38.62    11.19   206.11   269.91    14.85   520.28     0.24

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   319.34   211.39   239.36  1124.91     0.28
  MEAN    18.04   329.31   224.66   240.78  1123.45     0.29
  HUB     15.00   364.53   271.66   243.07  1121.33     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   271.67   128.51     0.24  4362.23
  MEAN   297.16   251.46    72.50     0.22  4052.91     1.49
  HUB    247.14   244.30    24.53     0.22  4075.72

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.18     1.07    15.30   534.36     1.02   525.84     0.92     0.90
  MEAN    16.11     1.07    15.17   533.54     1.02   524.48     0.92     0.90
  HUB     16.11     1.07    14.97   533.60     1.02   522.50     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     41.45    28.23    24.20     4.03     0.93     0.38     2.90
  MEAN    43.02    16.76    12.70     4.06     0.94     0.34     3.51     0.90
  HUB     48.18    -5.76    -9.30     3.54     0.94     0.21     4.78

    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.986

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     333.289     224.219     246.592    1123.530       0.297      -0.005

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      16.123      15.167     524.552      24.000      42.279      35.400      -6.879

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     266.313     224.219     348.133    1127.117       0.236       0.359

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.117      15.502     527.906     528.796       0.017       0.480

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     248.082       0.000     248.082    1127.953       0.220       0.387

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.548     528.689       0.000       0.060       0.052       0.406

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      16.081       1.065     533.830      11.020     190.821       1.479

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  68608.000       0.594     300.521  732453.438


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.018   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     77.512    1888.000      16.081     533.830       1.000       1.000       0.980
W Kg/sec =   35.23265

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     71.879    1861.053       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  59628.492   60820.934       2.821     590.487     209.327     474.134       2.265

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   237.66    -0.08   237.66     0.21   333.74
 MEAN    18.08     0.00    -0.02   237.66    -0.08   237.66     0.21
 HUB     15.21     0.00    -0.02   237.66    -0.08   237.66     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.94    46.36     8.58   338.58   413.73    15.59   529.11     0.37
 MEAN    51.42    42.30     9.12   297.86   381.11    15.59   529.11     0.34
 HUB     46.53    37.84     8.69   250.60   345.43    15.59   529.11     0.31

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   299.46   158.29   254.21  1134.54     0.26
 MEAN    18.01   304.48   166.11   255.17  1133.60     0.27
 HUB     15.22   328.14   204.89   256.31  1132.63     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    336.44   310.42   178.15     0.27  3233.93
 MEAN   296.73   286.66   130.62     0.25  2993.12     1.45
 HUB    250.81   260.39    45.92     0.23  3120.36

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.92     1.05    16.11   542.39     1.02   534.90     0.92     0.91
 MEAN    16.85     1.05    16.03   541.75     1.01   534.01     0.92     0.91
 HUB     16.89     1.05    15.93   542.09     1.02   533.09     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.91    35.02    31.50     3.52     0.93     0.32     2.90
 MEAN    33.06    27.11    23.50     3.61     0.93     0.31     3.30     0.91
 HUB     38.64    10.16     6.50     3.66     0.93     0.32     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     308.477     166.576     259.635    1133.724       0.272       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.876      16.028     534.128      46.000      32.683      30.600      -2.083

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     267.126     166.576     314.808    1135.832       0.235       0.248

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.875      16.236     536.116     511.151       0.011       0.326

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     263.664       0.000     263.664    1135.995       0.232       0.235

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.230     536.269       0.000       0.060       0.038       0.240

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      16.851       1.048     542.075       8.246     233.439       1.810

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  51342.516       0.454     224.894  674576.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.018   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     77.512    1888.000      16.851     542.075       1.000       1.000       0.980
W Kg/sec =   35.23265

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     69.123    1846.844       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 59628.492   60820.934       2.710     545.479     201.301     429.765       2.135

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   249.79    -0.09   249.79     0.22   323.45
 MEAN    17.74     0.00    -0.02   249.79    -0.09   249.79     0.22
 HUB     15.05     0.00    -0.02   249.79    -0.09   249.79     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.94    46.36     6.58   330.67   414.48    16.29   536.86     0.36
 MEAN    49.49    43.40     6.09   292.26   384.53    16.29   536.86     0.34
 HUB     44.80    38.84     5.96   247.96   352.03    16.29   536.86     0.31

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   300.57   138.12   266.95  1141.80     0.26
 MEAN    17.51   306.97   150.31   267.65  1141.16     0.27
 HUB     14.85   332.18   195.53   268.53  1140.50     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39   326.67   188.27     0.29  2737.85
 MEAN   288.44   301.19   138.12     0.26  2632.99     1.38
 HUB    244.67   272.99    49.14     0.24  2904.94

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     17.58     1.04    16.75   549.32     1.01   541.78     0.92     0.91
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 MEAN    17.55     1.04    16.69   549.04     1.01   541.17     0.92     0.91
 HUB     17.63     1.05    16.62   549.76     1.01   540.55     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.36    35.19    31.50     3.69     0.93     0.27     2.90
 MEAN    29.32    27.30    23.50     3.80     0.93     0.28     3.28     0.91
 HUB     36.06    10.37     6.50     3.87     0.93     0.30     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     310.297     151.299     270.911    1141.334       0.272       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.577      16.696     541.334      46.000      29.183      31.500       2.317

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     282.274     151.299     320.266    1142.795       0.247       0.176

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.576      16.845     542.721     471.992       0.011       0.280

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     274.247       0.000     274.247    1143.187       0.240       0.184

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.862     543.094       0.000       0.060       0.038       0.195

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4         PR4        Texit        Del T       Ns        Ns nondim
      0.872      17.552       1.042     549.375       7.299     252.020       1.954

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  45456.066       0.427     199.110  680017.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =11.018   EfDer =  0.989

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     77.512    1888.000      17.552     549.375       1.000       1.000       0.980
W Kg/sec =   35.23265

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     66.810    1834.534       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 59628.492   60820.934       2.638     513.330     194.567     401.059       2.061

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   258.64    -0.09   258.64     0.23   308.33
 MEAN    16.97     0.00    -0.02   258.64    -0.09   258.64     0.23
 HUB     14.32     0.00    -0.02   258.64    -0.09   258.64     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.83    46.36     4.47   317.33   409.45    16.94   543.79     0.36
 MEAN    47.24    43.80     3.44   279.61   380.95    16.94   543.79     0.33
 HUB     42.38    37.84     4.54   235.93   350.14    16.94   543.79     0.31

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   298.57   116.02   275.10  1148.04     0.26
 MEAN    16.57   304.75   130.08   275.59  1147.62     0.27
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HUB     13.89   328.56   177.85   276.27  1147.17     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    311.07   337.23   195.04     0.29  2192.19
MEAN   273.07   310.48   142.99     0.27  2157.43     1.32
HUB    228.85   280.93    51.00     0.24  2471.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.14     1.03    17.31   555.17     1.01   547.73     0.92     0.90
MEAN    18.13     1.03    17.27   555.08     1.01   547.33     0.92     0.90
HUB     18.22     1.04    17.21   555.91     1.01   546.90     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     22.87    35.34    31.50     3.84     0.93     0.22     2.90
MEAN    25.27    27.42    23.50     3.92     0.92     0.24     3.29     0.90
HUB     32.77    10.46     6.50     3.96     0.92     0.26     3.90

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     300.555     130.811     270.595    1148.167       0.262       0.050

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.157      17.311     547.847      46.000      25.800      32.400       6.600

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     285.750     130.811     314.268    1148.926       0.249       0.139

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.153      17.387     548.572     456.573       0.014       0.241

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     272.219       0.000     272.219    1149.586       0.237       0.126

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.425     549.202       0.000       0.060       0.051       0.181

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.837      18.120       1.032     555.391       6.016     287.578       2.229

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  37467.109       0.387     164.116  705038.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =11.018   EfDer =  0.965

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     77.512    1888.000      18.120     555.391       1.000       1.000       0.980
W Kg/sec =   35.23265

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     65.069    1824.571       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  59628.492   60820.934       2.690     509.668     189.499     390.276       2.060

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   254.84    -0.09   254.84     0.22   291.69
 MEAN    15.91     0.00    -0.02   254.84    -0.09   254.84     0.22
 HUB     13.07     0.00    -0.02   254.84    -0.09   254.84     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.83    47.36     2.47   301.84   395.10    17.51   549.97     0.34
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MEAN    45.82    44.80     1.02   262.18   365.69    17.51   549.97     0.32
HUB     40.21    38.84     1.37   215.34   333.69    17.51   549.97     0.29
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   289.50   101.45   271.15  1153.76     0.25
MEAN    15.50   294.22   113.12   271.61  1153.34     0.26
HUB     12.59   314.13   156.71   272.25  1152.89     0.27

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    295.58   333.48   194.13     0.29  1821.54
MEAN   255.34   306.59   142.22     0.27  1754.50     1.29
HUB    207.43   276.93    50.72     0.24  1974.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.61     1.03    17.81   560.21     1.01   553.21     0.92     0.88
MEAN    18.59     1.03    17.77   560.03     1.01   552.80     0.92     0.88
HUB     18.65     1.03    17.71   560.61     1.01   552.37     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     20.51    35.60    31.50     4.10     0.93     0.20     2.90
MEAN    22.61    27.64    23.50     4.14     0.91     0.21     3.34     0.88
HUB     29.93    10.55     6.50     4.05     0.91     0.23     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.965

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      297.005     115.195     273.755    1153.457       0.257       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.599      17.760      552.919       46.000      22.821      33.000      10.179

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      291.964     115.195     313.868    1153.715       0.253       0.012

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       18.583      17.773     553.167     440.827       0.038       0.208

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      274.178       0.000     274.178    1154.592       0.237       0.096

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950       17.842      554.008       0.000       0.060       0.069       0.093

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.778       18.557       1.024      560.285       4.894     332.013       2.574

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  30485.326       0.349     133.534  747827.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency      Rotor1Inc   TR
    233359.02   1022.1741      75.7213      1.2284       0.8475     11.0185      1.0717
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.981

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      74.779    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   33.99065

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      73.052    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  57526.504   58676.910       3.909     831.557     212.743     619.754       2.913

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   167.91    -0.06   167.91     0.15   338.55
  MEAN    17.06     0.00    -0.02   167.91    -0.06   167.91     0.15
  HUB     12.51     0.00    -0.02   167.91    -0.06   167.91     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.72    50.47    13.25   339.90   379.16    14.87   520.46     0.34
  MEAN    59.15    47.20    11.95   281.08   327.46    14.87   520.46     0.29
  HUB     50.84    38.62    12.22   206.11   265.89    14.87   520.46     0.24

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   315.99   216.07   230.58  1125.37     0.28
  MEAN    18.04   324.76   227.27   231.98  1123.85     0.29
  HUB     15.00   357.95   270.72   234.18  1121.71     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   261.72   123.83     0.23  4458.65
  MEAN   297.16   242.28    69.89     0.22  4100.12     1.54
  HUB    247.14   235.36    23.58     0.21  4061.47

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.20     1.07    15.34   534.61     1.02   526.27     0.92     0.90
  MEAN    16.11     1.07    15.20   533.66     1.02   524.85     0.92     0.90
  HUB     16.10     1.07    15.00   533.56     1.02   522.86     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     43.14    28.24    24.20     4.04     0.93     0.41     2.90
  MEAN    44.41    16.76    12.70     4.06     0.94     0.36     3.51     0.90
  HUB     49.14    -5.75    -9.30     3.55     0.94     0.23     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     328.472     226.833     237.572    1123.938       0.292      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.128      15.199     524.932      24.000      43.675      35.400      -8.275

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     256.398     226.833     342.335    1127.701       0.227       0.385
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.120      15.549     528.453     528.796       0.018       0.503

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     238.970       0.000     238.970    1128.470       0.212       0.405

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.586     529.174       0.000       0.060       0.059       0.423

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.849      16.081       1.065     533.944      11.134     185.904       1.441

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  69318.977       0.600     292.932  706027.062


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    74.779    1888.000      16.081     533.944       1.000       1.000       0.980
W Kg/sec =   33.99065

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    69.353    1860.854       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 57526.504   58676.910       2.924     590.487     201.970     474.134       2.348

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP    20.55     0.00    -0.02   228.96    -0.08   228.96     0.20   333.70
 MEAN   18.08     0.00    -0.02   228.96    -0.08   228.96     0.20
 HUB    15.21     0.00    -0.02   228.96    -0.08   228.96     0.20

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP    55.94    46.36     9.58   338.58   408.80    15.63   529.57     0.36
 MEAN   52.46    42.30    10.16   297.86   375.75    15.63   529.57     0.33
 HUB    47.59    37.84     9.75   250.60   339.51    15.63   529.57     0.30

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP    20.42   295.18   165.00   244.75  1135.27     0.26
 MEAN   18.01   299.39   171.00   245.75  1134.24     0.26
 HUB    15.22   321.97   206.63   246.92  1133.18     0.28

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP   336.44   298.82   171.43     0.26  3371.00
 MEAN  296.73   276.05   125.73     0.24  3081.20     1.49
 HUB   250.81   250.85    44.19     0.22  3146.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    16.95     1.05    16.17   542.86     1.02   535.59     0.92     0.91
 MEAN   16.87     1.05    16.07   542.10     1.02   534.61     0.92     0.91
 HUB    16.89     1.05    15.97   542.27     1.02   533.61     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    33.99    35.01    31.50     3.51     0.93     0.34     2.90
 MEAN   34.83    27.09    23.50     3.59     0.94     0.33     3.30     0.91
 HUB    39.92    10.15     6.50     3.65     0.94     0.34     3.92


  blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     303.200     171.484     250.046    1134.366       0.267       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.894      16.075     534.734      46.000      34.443      30.600      -3.843

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     257.070     171.484     309.017    1136.654       0.226       0.278

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.892      16.300     536.892     511.151       0.012       0.352

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     253.776       0.000     253.776    1136.802       0.223       0.260

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.291     537.033       0.000       0.060       0.042       0.267

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      16.868       1.049     542.411       8.467     224.614       1.741

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  52723.242       0.466     222.801  649654.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     74.779    1888.000      16.868     542.411       1.000       1.000       0.980
W Kg/sec =   33.99065

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     66.643    1846.272       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 57526.504   58676.910       2.811     545.479     194.079     429.765       2.214

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   240.48    -0.08   240.48     0.21   323.35
 MEAN    17.74     0.00    -0.02   240.48    -0.08   240.48     0.21
 HUB     15.05     0.00    -0.02   240.48    -0.08   240.48     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.98    46.36     7.62   330.67   408.93    16.35   537.58     0.36
 MEAN    50.56    43.40     7.16   292.26   378.54    16.35   537.58     0.33
 HUB     45.89    38.84     7.05   247.96   345.48    16.35   537.58     0.30

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   295.09   145.49   256.73  1142.85     0.26
 MEAN    17.51   300.92   155.70   257.50  1142.10     0.26
 HUB     14.85   325.27   197.51   258.44  1141.34     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39   314.06   180.90     0.27  2883.78
 MEAN   288.44   289.70   132.74     0.25  2727.20     1.42
 HUB    244.67   262.71    47.16     0.23  2934.25

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.64     1.05    16.84   550.04     1.01   542.77     0.92     0.91
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 MEAN    17.59     1.04    16.76   549.63     1.01   542.07     0.92     0.91
 HUB     17.65     1.05    16.68   550.18     1.01   541.34     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.54    35.17    31.50     3.67     0.93     0.29     2.90
 MEAN    31.16    27.27    23.50     3.77     0.93     0.30     3.28     0.91
 HUB     37.39    10.34     6.50     3.84     0.93     0.31     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     304.123     156.720     260.633    1142.271       0.266       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.619      16.770     542.224      46.000      31.019      31.500       0.481

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     271.322     156.720     313.331    1143.930       0.237       0.208

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.618      16.941     543.800     471.992       0.010       0.306

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     263.614       0.000     263.614    1144.292       0.230       0.214

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.956     544.145       0.000       0.060       0.037       0.226

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      17.596       1.043     549.948       7.537     241.405       1.871

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  46935.902       0.441     198.344  654576.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.995

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     74.779    1888.000      17.596     549.948       1.000       1.000       0.980
W Kg/sec =   33.99065

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     64.328    1833.577       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 57526.504   58676.910       2.740     513.330     187.340     401.059       2.141

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   248.67    -0.09   248.67     0.22   308.17
 MEAN    16.97     0.00    -0.02   248.67    -0.09   248.67     0.22
 HUB     14.32     0.00    -0.02   248.67    -0.09   248.67     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.92    46.36     5.56   317.33   403.22    17.03   544.78     0.35
 MEAN    48.36    43.80     4.56   279.61   374.26    17.03   544.78     0.33
 HUB     43.50    37.84     5.66   235.93   342.85    17.03   544.78     0.30

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   291.82   124.03   264.14  1149.41     0.25
 MEAN    16.57   297.60   135.94   264.73  1148.87     0.26
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 HUB     13.89   320.79   180.07   265.48  1148.30     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    311.07   323.65   187.03     0.28  2343.42
 MEAN   273.07   298.14   137.12     0.26  2254.59     1.36
 HUB    228.85   269.93    48.78     0.24  2502.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.23     1.04    17.43   556.15     1.01   549.04     0.92     0.91
 MEAN    18.21     1.03    17.38   555.91     1.01   548.52     0.92     0.91
 HUB     18.28     1.04    17.31   556.57     1.01   547.98     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.15    35.30    31.50     3.80     0.93     0.25     2.90
 MEAN    27.18    27.38    23.50     3.88     0.92     0.26     3.29     0.91
 HUB     34.15    10.41     6.50     3.91     0.92     0.28     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     293.714     136.709     259.958    1149.379       0.256       0.050

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.232      17.421     549.006      46.000      27.739      32.400       4.661

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     274.240     136.709     306.426    1150.346       0.238       0.170

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.230      17.522     549.930     456.573       0.012       0.267

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     261.230       0.000     261.230    1150.954       0.227       0.160

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.560     550.512       0.000       0.060       0.044       0.214

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      18.202       1.034     556.210       6.262     273.632       2.121

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  38999.695       0.403     164.807  678330.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.978

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     74.779    1888.000      18.202     556.210       1.000       1.000       0.980
W Kg/sec =   33.99065

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     62.537    1823.226       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  57526.504   58676.910       2.798     509.668     182.126     390.276       2.143

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   244.62    -0.08   244.62     0.21   291.47
 MEAN    15.91     0.00    -0.02   244.62    -0.08   244.62     0.21
 HUB     13.07     0.00    -0.02   244.62    -0.08   244.62     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.99    47.36     3.63   301.84   388.58    17.64   551.21     0.34
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MEAN    46.99    44.80     2.19   262.18   358.64    17.64   551.21     0.31
HUB     41.37    38.84     2.53   215.34   325.96    17.64   551.21     0.28
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   282.11   109.77   259.88  1155.39     0.24
MEAN    15.50   286.42   119.19   260.44  1154.84     0.25
HUB     12.59   305.76   159.02   261.15  1154.27     0.26

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    295.58   319.47   185.81     0.28  1970.79
MEAN   255.34   293.88   136.15     0.25  1848.51     1.33
HUB    207.43   265.60    48.41     0.23  2003.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.74     1.03    17.98   561.42     1.01   554.78     0.92     0.90
MEAN    18.71     1.03    17.92   561.10     1.01   554.25     0.92     0.90
HUB     18.75     1.03    17.86   561.51     1.01   553.70     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     22.90    35.56    31.50     4.06     0.93     0.23     2.90
MEAN    24.59    27.60    23.50     4.10     0.91     0.23     3.34     0.90
HUB     31.34    10.50     6.50     4.00     0.91     0.24     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.978

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      289.190     121.376     262.486    1154.958       0.250       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.716      17.916      554.361      46.000      24.816      33.000       8.184

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      279.588     121.376     304.798    1155.433       0.242       0.049

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.707      17.959     554.817     440.827       0.031       0.234

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      262.576       0.000     262.576    1156.235       0.227       0.133

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.025     555.588       0.000       0.060       0.059       0.130

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.815      18.685       1.027     561.345       5.134     313.814       2.433

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  31980.922       0.366     135.147  719265.062

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    239958.73   1014.0305     73.0520      1.2368      0.8525     11.9530      1.0737
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =12.956   EfDer =  0.974

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      71.898    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   32.68071

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      70.237    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  55309.539   56415.609       4.065     831.557     204.545     619.754       3.030

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   161.29    -0.06   161.29     0.14   338.55
  MEAN    17.06     0.00    -0.02   161.29    -0.06   161.29     0.14
  HUB     12.51     0.00    -0.02   161.29    -0.06   161.29     0.14

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.62    50.47    14.15   339.90   376.28    14.89   520.64     0.34
  MEAN    60.16    47.20    12.96   281.08   324.12    14.89   520.64     0.29
  HUB     51.96    38.62    13.34   206.11   261.77    14.89   520.64     0.23

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   312.76   220.92   221.38  1125.83     0.28
  MEAN    18.04   320.18   229.98   222.76  1124.25     0.28
  HUB     15.00   351.16   269.74   224.85  1122.10     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   251.32   118.97     0.22  4558.80
  MEAN   297.16   232.67    67.18     0.21  4148.89     1.59
  HUB    247.14   225.99    22.60     0.20  4046.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.22     1.07    15.37   534.88     1.02   526.71     0.92     0.89
  MEAN    16.12     1.07    15.23   533.79     1.02   525.23     0.92     0.89
  HUB     16.09     1.07    15.03   533.52     1.02   523.22     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     44.94    28.25    24.20     4.05     0.93     0.43     2.90
  MEAN    45.91    16.78    12.70     4.08     0.94     0.39     3.51     0.89
  HUB     50.19    -5.74    -9.30     3.56     0.94     0.25     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     323.611     229.534     228.118    1124.348       0.288      -0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.133      15.230     525.315      24.000      45.177      35.400      -9.777

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     246.029     229.534     336.477    1128.291       0.218       0.413
   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.123      15.597     529.007     528.796       0.021       0.528

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     229.436       0.000     229.436    1128.994       0.203       0.422

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.623     529.666       0.000       0.060       0.067       0.441

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.839      16.079       1.064     534.062      11.252     180.767       1.401

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  70056.164       0.606     284.638  678228.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =12.956   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    71.898    1888.000      16.079     534.062       1.000       1.000       0.980
W Kg/sec =   32.68071

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    66.696    1860.647       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 55309.539   56415.609       3.040     590.487     194.232     474.134       2.441

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   219.86    -0.08   219.86     0.19   333.66
 MEAN    18.08     0.00    -0.02   219.86    -0.08   219.86     0.19
 HUB     15.21     0.00    -0.02   219.86    -0.08   219.86     0.19

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.01    46.36    10.65   338.58   403.77    15.66   530.03     0.36
 MEAN    53.57    42.30    11.27   297.86   370.27    15.66   530.03     0.33
 HUB     48.75    37.84    10.91   250.60   333.43    15.66   530.03     0.30

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   291.11   171.95   234.90  1136.01     0.26
 MEAN    18.01   294.39   176.08   235.93  1134.88     0.26
 HUB     15.22   315.72   208.45   237.12  1133.73     0.28

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    336.44   286.77   164.49     0.25  3512.79
 MEAN   296.73   264.99   120.65     0.23  3172.56     1.53
 HUB    250.81   240.87    42.36     0.21  3174.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.98     1.06    16.22   543.36     1.02   536.28     0.92     0.90
 MEAN    16.89     1.05    16.11   542.46     1.02   535.22     0.92     0.90
 HUB     16.89     1.05    16.00   542.46     1.02   534.14     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.20    35.00    31.50     3.50     0.93     0.36     2.90
 MEAN    36.73    27.08    23.50     3.58     0.94     0.36     3.30     0.90
 HUB     41.32    10.13     6.50     3.63     0.94     0.36     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     297.994     176.574     240.046    1135.012       0.263       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.910      16.117     535.344      46.000      36.338      30.600      -5.738

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     246.603     176.574     303.301    1137.487       0.217       0.310

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.907      16.361     537.681     511.151       0.013       0.381

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     243.500       0.000     243.500    1137.622       0.214       0.286

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.348     537.808       0.000       0.060       0.048       0.294

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.860      16.879       1.050     542.760       8.697     215.721       1.672

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  54156.410       0.478     220.037  623512.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =12.956   EfDer =  0.998

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     71.898    1888.000      16.879     542.760       1.000       1.000       0.980
W Kg/sec =   32.68071

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     64.051    1845.679       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  55309.539   56415.609       2.924     545.479     186.532     429.765       2.304

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   230.79    -0.08   230.79     0.20   323.25
 MEAN    17.74      0.00    -0.02   230.79    -0.08   230.79     0.20
 HUB     15.05      0.00    -0.02   230.79    -0.08   230.79     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.09     46.36     8.73   330.67   403.31    16.40   538.31     0.35
 MEAN    51.71     43.40     8.31   292.26   372.46    16.40   538.31     0.33
 HUB     47.06     38.84     8.22   247.96   338.80    16.40   538.31     0.30

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   289.88    153.09    246.16  1143.90      0.25
 MEAN    17.51   294.98    161.26    247.00  1143.05      0.26
 HUB     14.85   318.30    199.54    247.98  1142.18      0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39   301.05   173.30     0.26  3034.29
 MEAN   288.44   277.82   127.18     0.24  2824.43      1.46
 HUB    244.67   252.05    45.12     0.22  2964.43

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     17.69      1.05    16.91   550.79     1.01   543.77     0.92     0.91
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 MEAN    17.63     1.04    16.83   550.23     1.01   542.97     0.92     0.91
 HUB     17.67     1.05    16.74   550.60     1.01   542.14     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.88    35.15    31.50     3.65     0.93     0.32     2.90
 MEAN    33.14    27.24    23.50     3.74     0.93     0.32     3.28     0.91
 HUB     38.82    10.31     6.50     3.81     0.93     0.33     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     298.067     162.313     249.997    1143.215       0.261       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.654      16.838     543.122      46.000      32.994      31.500      -1.494

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     260.018     162.313     306.521    1145.080       0.227       0.242

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.654      17.030     544.896     471.992       0.010       0.335

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     252.662       0.000     252.662    1145.411       0.221       0.246

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.043     545.211       0.000       0.060       0.037       0.257

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      17.631       1.045     550.542       7.782     230.882       1.790

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  48462.855       0.455     196.904  627933.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =12.956   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     71.898    1888.000      17.631     550.542       1.000       1.000       0.980
W Kg/sec =   32.68071

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     61.757    1832.588       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 55309.539   56415.609       2.854     513.330     179.852     401.059       2.230

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   238.40    -0.08   238.40     0.21   308.00
 MEAN    16.97     0.00    -0.02   238.40    -0.08   238.40     0.21
 HUB     14.32     0.00    -0.02   238.40    -0.08   238.40     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.09    46.36     6.73   317.33   396.97    17.11   545.80     0.35
 MEAN    49.56    43.80     5.76   279.61   367.51    17.11   545.80     0.32
 HUB     44.71    37.84     6.87   235.93   335.47    17.11   545.80     0.29

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   285.39   132.21   252.92  1150.78     0.25
 MEAN    16.57   290.59   141.90   253.59  1150.12     0.25
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 HUB     13.89   312.95   182.25   254.41  1149.44     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    311.07   309.77   178.86     0.27  2497.66
 MEAN   273.07   285.51   131.17     0.25  2353.17     1.39
 HUB    228.85   258.64    46.60     0.23  2532.63

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.32     1.04    17.55   557.15     1.01   550.35     0.92     0.91
 MEAN    18.28     1.04    17.48   556.77     1.01   549.72     0.92     0.91
 HUB     18.32     1.04    17.40   557.24     1.01   549.06     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.60    35.27    31.50     3.77     0.93     0.28     2.90
 MEAN    29.23    27.35    23.50     3.85     0.92     0.28     3.29     0.91
 HUB     35.62    10.38     6.50     3.88     0.92     0.30     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     287.030     142.695     249.048    1150.599       0.249       0.049

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.297      17.521     550.174      46.000      29.811      32.400       2.589

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     262.470     142.695     298.751    1151.776       0.228       0.204

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.297      17.646     551.301     456.573       0.010       0.296

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     250.019       0.000     250.019    1152.333       0.217       0.196

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.683     551.834       0.000       0.060       0.039       0.248

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      18.273       1.036     557.054       6.512     260.177       2.017

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  40555.090       0.419     164.775  650410.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =12.956   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     71.898    1888.000      18.273     557.054       1.000       1.000       0.980
W Kg/sec =   32.68071

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     59.940    1821.846       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  55309.539   56415.609       2.920     509.668     174.561     390.276       2.236

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   234.19    -0.08   234.19     0.20   291.25
 MEAN    15.91     0.00    -0.02   234.19    -0.08   234.19     0.20
 HUB     13.07     0.00    -0.02   234.19    -0.08   234.19     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.20    47.36     4.84   301.84   382.10    17.75   552.47     0.33
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 MEAN    48.24    44.80     3.44   262.18   351.60    17.75   552.47     0.30
 HUB     42.61    38.84     3.77   215.34   318.20    17.75   552.47     0.28
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   275.14   118.23   248.44  1157.02     0.24
 MEAN    15.50   278.87   125.40   249.09  1156.35     0.24
 HUB     12.59   297.39   161.28   249.86  1155.67     0.26

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    295.58   305.25   177.35     0.26  2122.44
 MEAN   255.34   280.94   129.94     0.24  1944.63     1.36
 HUB    207.43   254.09    46.15     0.22  2031.61

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.86     1.03    18.13   562.67     1.01   556.35     0.92     0.90
 MEAN    18.81     1.03    18.06   562.20     1.01   555.70     0.92     0.90
 HUB     18.84     1.03    17.99   562.43     1.01   555.04     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.45    35.52    31.50     4.02     0.93     0.25     2.90
 MEAN    26.72    27.55    23.50     4.05     0.92     0.25     3.34     0.90
 HUB     32.84    10.46     6.50     3.96     0.92     0.26     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     281.647     127.696     251.036    1156.462       0.244       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.820      18.058     555.808      46.000      26.961      33.000       6.039

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     267.068     127.696     296.026    1157.157       0.231       0.089

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.816      18.130     556.476     440.827       0.025       0.262

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     250.842       0.000     250.842    1157.886       0.217       0.173

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.192     557.177       0.000       0.060       0.049       0.170

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.845      18.798       1.029     562.432       5.378     296.559       2.299

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  33498.195       0.383     136.103  689448.188

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    246728.72   1002.4581     70.2367      1.2443      0.8535     12.9562      1.0758
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.957   EfDer =  0.967

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      69.072    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   31.39614

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      67.476    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   53135.488   54198.086       4.232     831.557     196.505     619.754       3.154

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   154.83    -0.05   154.83     0.14   338.55
  MEAN    17.06     0.00    -0.02   154.83    -0.05   154.83     0.14
  HUB     12.51     0.00    -0.02   154.83    -0.05   154.83     0.14

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     65.51    50.47    15.04   339.90   373.55    14.91   520.81     0.33
  MEAN    61.16    47.20    13.96   281.08   320.95    14.91   520.81     0.29
  HUB     53.09    38.62    14.47   206.11   257.83    14.91   520.81     0.23

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   309.87   225.61   212.42  1126.27     0.28
  MEAN    18.04   315.89   232.57   213.77  1124.63     0.28
  HUB     15.00   344.61   268.71   215.76  1122.47     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   241.22   114.29     0.21  4655.33
  MEAN   297.16   223.32    64.59     0.20  4195.50     1.64
  HUB    247.14   216.84    21.57     0.19  4031.28

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.23     1.07    15.40   535.13     1.02   527.11     0.92     0.88
  MEAN    16.12     1.07    15.26   533.91     1.02   525.58     0.92     0.88
  HUB     16.08     1.06    15.06   533.48     1.02   523.56     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     46.72    28.28    24.20     4.08     0.93     0.46     2.90
  MEAN    47.41    16.81    12.70     4.11     0.95     0.41     3.51     0.88
  HUB     51.24    -5.71    -9.30     3.59     0.95     0.28     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     319.055     232.116     218.903    1124.730       0.284      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.136      15.257     525.673      24.000      46.678      35.400     -11.278

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	235.943	232.116	330.978	1128.844	0.209	0.441

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.124	15.639	529.525	528.796	0.023	0.553

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	220.155	0.000	220.155	1129.485	0.195	0.440

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.655	530.127	0.000	0.060	0.076	0.458

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.827	16.076	1.064	534.175	11.365	175.789	1.363

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
70757.258	0.612	276.186	651038.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =13.957 EfDer = 0.978

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
69.072	1888.000	16.076	534.175	1.000	1.000	0.980

W Kg/sec = 31.39614

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
64.096	1860.451	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
53135.488	54198.086	3.163	590.487	186.661	474.134	2.540

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	211.00	-0.07	211.00	0.19	333.63
MEAN	18.08	0.00	-0.02	211.00	-0.07	211.00	0.19	
HUB	15.21	0.00	-0.02	211.00	-0.07	211.00	0.19	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.07	46.36	11.71	338.58	399.01	15.69	530.46	0.35
MEAN	54.69	42.30	12.39	297.86	365.08	15.69	530.46	0.32
HUB	49.91	37.84	12.07	250.60	327.65	15.69	530.46	0.29

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	287.55	178.61	225.35	1136.69	0.25
MEAN	18.01	289.82	180.95	226.39	1135.48	0.26
HUB	15.22	309.77	210.15	227.59	1134.25	0.27

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	336.44	275.12	157.82	0.24	3648.80	
MEAN	296.73	254.28	115.78	0.22	3260.24	1.57
HUB	250.81	231.19	40.66	0.20	3200.21	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.00	1.06	16.26	543.83	1.02	536.93	0.92	0.89
MEAN	16.90	1.05	16.15	542.80	1.02	535.79	0.92	0.89
HUB	16.89	1.05	16.03	542.64	1.02	534.63	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.40	35.00	31.50	3.50	0.93	0.39	2.90	
MEAN	38.63	27.09	23.50	3.59	0.94	0.38	3.30	0.89
HUB	42.72	10.13	6.50	3.63	0.94	0.38	3.92	

blockage3	Cor/U1	Cor/Incid

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      0.950       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     293.229     181.460     230.338    1135.613       0.258       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.921      16.153     535.911      46.000      38.231      30.600      -7.631

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     236.465     181.460     298.066    1138.271       0.208       0.342

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.917      16.415     538.423     511.151       0.015       0.411

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     233.557       0.000     233.557    1138.391       0.205       0.311

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.396     538.537       0.000       0.060       0.056       0.319

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.850      16.885       1.050     543.093       8.918     207.404       1.608

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  55526.863       0.491     216.738  598012.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.957   EfDer =  0.994

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     69.072    1888.000      16.885     543.093       1.000       1.000       0.980
W Kg/sec =   31.39614

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     61.530    1845.114       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  53135.488   54198.086       3.044     545.479     179.191     429.765       2.398

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   221.41    -0.08   221.41     0.19   323.15
 MEAN    17.74      0.00    -0.02   221.41    -0.08   221.41     0.19
 HUB     15.05      0.00    -0.02   221.41    -0.08   221.41     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.20     46.36      9.84   330.67   398.01     16.45   539.00      0.35
 MEAN    52.86     43.40      9.46   292.26   366.72     16.45   539.00      0.32
 HUB     48.25     38.84      9.41   247.96   332.48     16.45   539.00      0.29

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   285.32    160.36    235.99   1144.88      0.25
 MEAN    17.51   289.57    166.57    236.87   1143.94      0.25
 HUB     14.85   311.76    201.50    237.89   1142.98      0.27

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39    288.55    166.03     0.25   3178.21
 MEAN   288.44    266.38    121.86     0.23   2917.49      1.50
 HUB    244.67    241.77     43.17     0.21   2993.40

         Pt2       PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     17.73      1.05     16.98    551.50      1.02    544.70      0.92      0.91
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 MEAN    17.66     1.05    16.89   550.81     1.01   543.81     0.92     0.91
 HUB     17.68     1.05    16.79   551.01     1.01   542.90     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.20    35.13    31.50     3.63     0.93     0.34     2.90
 MEAN    35.12    27.22    23.50     3.72     0.94     0.34     3.28     0.91
 HUB     40.27    10.29     6.50     3.79     0.94     0.35     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     292.557     167.667     239.744    1144.096       0.256       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.681      16.894     543.962      46.000      34.967      31.500      -3.467

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     249.149     167.667     300.312    1146.159       0.217       0.276

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.680      17.107     545.925     471.992       0.011       0.365

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     242.149       0.000     242.149    1146.461       0.211       0.275

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.115     546.213       0.000       0.060       0.041       0.287

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      17.656       1.046     551.109       8.017     221.159       1.714

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  49923.648       0.469     194.867  601983.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =13.957   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     69.072    1888.000      17.656     551.109       1.000       1.000       0.980
W Kg/sec =   31.39614

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     59.276    1831.645       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  53135.488   54198.086       2.974     513.330     172.626     401.059       2.323

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   228.54    -0.08   228.54     0.20   307.85
 MEAN    16.97     0.00    -0.02   228.54    -0.08   228.54     0.20
 HUB     14.32     0.00    -0.02   228.54    -0.08   228.54     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.25    46.36     7.89   317.33   391.12    17.17   546.75     0.34
 MEAN    50.75    43.80     6.95   279.61   361.18    17.17   546.75     0.31
 HUB     45.92    37.84     8.08   235.93   328.53    17.17   546.75     0.29

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   279.75   139.98   242.21  1152.06      0.24
 MEAN    16.57   284.26   147.58   242.94  1151.29      0.25
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 HUB     13.89   305.66   184.35   243.81  1150.50     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    311.07   296.54   171.08     0.26  2644.39
 MEAN   273.07   273.44   125.49     0.24  2447.31     1.43
 HUB    228.85   247.84    44.50     0.22  2561.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.38     1.04    17.64   558.11     1.01   551.57     0.92     0.91
 MEAN    18.33     1.04    17.57   557.58     1.01   550.84     0.92     0.91
 HUB     18.36     1.04    17.48   557.89     1.01   550.09     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.03    35.24    31.50     3.74     0.93     0.30     2.90
 MEAN    31.28    27.32    23.50     3.82     0.93     0.30     3.29     0.91
 HUB     37.09    10.34     6.50     3.84     0.93     0.32     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     281.004     148.410     238.616    1151.737       0.244       0.047

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.348      17.603     551.265      46.000      31.880      32.400       0.520

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     251.248     148.410     291.807    1153.117       0.218       0.238

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.348      17.751     552.588     456.573       0.010       0.326

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     239.351       0.000     239.351    1153.626       0.207       0.229

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.785     553.075       0.000       0.060       0.037       0.280

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      18.327       1.038     557.859       6.750     247.964       1.922

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  42038.602       0.434     164.089  623260.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.957   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     69.072    1888.000      18.327     557.859       1.000       1.000       0.980
W Kg/sec =   31.39614

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     57.455    1820.530       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  53135.488   54198.086       3.046     509.668     167.327     390.276       2.332

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   224.25    -0.08   224.25     0.19   291.04
 MEAN    15.91     0.00    -0.02   224.25    -0.08   224.25     0.19
 HUB     13.07     0.00    -0.02   224.25    -0.08   224.25     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.40    47.36     6.04   301.84   376.09    17.85   553.66     0.33
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 MEAN    49.47    44.80     4.67   262.18   345.06    17.85   553.66     0.30
 HUB     43.85    38.84     5.01   215.34   310.96    17.85   553.66     0.27
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   269.05   126.19   237.61  1158.54     0.23
 MEAN    15.50   272.06   131.22   238.33  1157.76     0.23
 HUB     12.59   289.67   163.45   239.15  1156.97     0.25

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    295.58   291.81   169.38     0.25  2265.32
 MEAN   255.34   268.71   124.12     0.23  2034.81     1.40
 HUB    207.43   243.16    43.98     0.21  2058.88

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.96     1.03    18.26   563.85     1.01   557.81     0.92     0.91
 MEAN    18.90     1.03    18.18   563.24     1.01   557.06     0.92     0.91
 HUB     18.90     1.03    18.09   563.31     1.01   556.30     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.97    35.48    31.50     3.98     0.93     0.28     2.90
 MEAN    28.84    27.51    23.50     4.01     0.92     0.28     3.34     0.91
 HUB     34.35    10.42     6.50     3.92     0.92     0.28     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     274.855     133.625     240.186    1157.863       0.237       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.904      18.176     557.158      46.000      29.089      33.000       3.911

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     255.255     133.625     288.116    1158.764       0.220       0.129

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.903      18.274     558.026     440.827       0.021       0.292

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     239.777       0.000     239.777    1159.428       0.207       0.211

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.333     558.666       0.000       0.060       0.042       0.208

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864      18.888       1.031     563.467       5.607     281.244       2.180

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  34928.008       0.400     136.334  660488.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    253174.38    988.2139      67.4759      1.2503      0.8506     13.9573      1.0778
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  0.959

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      66.307    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   30.13945

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      64.775    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  51008.645   52028.707       4.408     831.557     188.639     619.754       3.285

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   148.52    -0.05   148.52     0.13   338.55
  MEAN    17.06     0.00    -0.02   148.52    -0.05   148.52     0.13
  HUB     12.51     0.00    -0.02   148.52    -0.05   148.52     0.13

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     66.40    50.47    15.93   339.90   370.98    14.92   520.97     0.33
  MEAN    62.15    47.20    14.95   281.08   317.95    14.92   520.97     0.28
  HUB     54.23    38.62    15.61   206.11   254.09    14.92   520.97     0.23

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   307.30   230.08   203.72  1126.67     0.27
  MEAN    18.04   311.89   235.03   205.03  1124.98     0.28
  HUB     15.00   338.34   267.70   206.91  1122.81     0.30

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   231.43   109.82     0.21  4747.55
  MEAN   297.16   214.23    62.13     0.19  4239.80     1.70
  HUB    247.14   207.93    20.56     0.19  4016.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.25     1.08    15.43   535.38     1.02   527.49     0.92     0.88
  MEAN    16.12     1.07    15.28   534.03     1.02   525.91     0.92     0.88
  HUB     16.07     1.06    15.09   533.44     1.02   523.88     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     48.48    28.33    24.20     4.13     0.93     0.48     2.90
  MEAN    48.90    16.86    12.70     4.16     0.95     0.43     3.51     0.88
  HUB     52.30    -5.67    -9.30     3.63     0.95     0.30     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.959

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     314.796     234.569     209.937    1125.086       0.280      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.137      15.282     526.005      24.000      48.172      35.400     -12.772

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     226.147     234.569     325.830    1129.361       0.200       0.469
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.123      15.678     530.011     528.796       0.026       0.578

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     211.132       0.000     211.132    1129.945       0.187       0.456

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.683     530.559       0.000       0.060       0.086       0.474

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.815      16.070       1.064     534.282      11.472     170.963       1.325

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  71423.773       0.618     267.629  624502.312


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    66.307    1888.000      16.070     534.282       1.000       1.000       0.980
W Kg/sec =   30.13945

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    61.557    1860.265       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  51008.645   52028.707       3.294     590.487     179.267     474.134       2.645

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   202.38    -0.07   202.38     0.18   333.60
 MEAN    18.08     0.00    -0.02   202.38    -0.07   202.38     0.18
 HUB     15.21     0.00    -0.02   202.38    -0.07   202.38     0.18

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.14    46.36    12.78   338.58   394.51    15.71   530.86     0.35
 MEAN    55.81    42.30    13.51   297.86   360.16    15.71   530.86     0.32
 HUB     51.08    37.84    13.24   250.60   322.17    15.71   530.86     0.29

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   284.50   185.04   216.10  1137.32     0.25
 MEAN    18.01   285.67   185.63   217.14  1136.04     0.25
 HUB     15.22   304.16   211.76   218.33  1134.74     0.27

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    336.44   263.86   151.40     0.23  3779.85
 MEAN   296.73   243.91   111.10     0.21  3344.43     1.62
 HUB    250.81   221.80    39.05     0.20  3224.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.02     1.06    16.30   544.28     1.02   537.53     0.92     0.89
 MEAN    16.91     1.05    16.18   543.13     1.02   536.32     0.92     0.89
 HUB     16.88     1.05    16.06   542.82     1.02   535.09     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.57    35.02    31.50     3.52     0.93     0.41     2.90
 MEAN    40.53    27.10    23.50     3.60     0.94     0.40     3.30     0.89
 HUB     44.12    10.14     6.50     3.64     0.94     0.40     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     288.893     186.150     220.924    1136.173       0.254       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.929      16.184     536.441      46.000      40.117      30.600      -9.517

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     226.649     186.150     293.294    1139.008       0.199       0.374

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.923      16.462     539.121     511.151       0.018       0.441

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     223.937       0.000     223.937    1139.116       0.197       0.334

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.437     539.223       0.000       0.060       0.066       0.342

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.837      16.887       1.051     543.411       9.129     199.583       1.547

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  56843.699       0.502     212.997  573187.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  0.988

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     66.307    1888.000      16.887     543.411       1.000       1.000       0.980
W Kg/sec =   30.13945

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     59.079    1844.573       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  51008.645   52028.707       3.170     545.479     172.054     429.765       2.498

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   212.33    -0.07   212.33     0.19   323.06
 MEAN    17.74      0.00    -0.02   212.33    -0.07   212.33     0.19
 HUB     15.05      0.00    -0.02   212.33    -0.07   212.33     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.30     46.36    10.94   330.67   393.03    16.48   539.65     0.34
 MEAN    54.01     43.40    10.61   292.26   361.30    16.48   539.65     0.32
 HUB     49.44     38.84    10.60   247.96   326.50    16.48   539.65     0.29

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   281.36    167.33    226.20  1145.79      0.25
 MEAN    17.51   284.69    171.69    227.10  1144.76      0.25
 HUB     14.85   305.58    203.31    228.14  1143.72      0.27

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39    276.52    159.06     0.24  3316.23
 MEAN   288.44    255.35    116.75     0.22  3006.99      1.54
 HUB    244.67    231.86     41.36     0.20  3020.23

         Pt2       PR       Ps2      Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     17.76      1.05     17.03   552.19      1.02    545.57      0.92      0.90
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 MEAN    17.68     1.05    16.93   551.37     1.01   544.60     0.92     0.90
 HUB     17.68     1.05    16.83   551.40     1.01   543.60     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.49    35.11    31.50     3.61     0.93     0.37     2.90
 MEAN    37.09    27.21    23.50     3.71     0.94     0.37     3.28     0.90
 HUB     41.71    10.28     6.50     3.78     0.94     0.37     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     287.576     172.816     229.857    1144.918       0.251       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.701      16.940     544.746      46.000      36.937      31.500      -5.437

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     238.690     172.816     294.684    1147.174       0.208       0.310

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.699      17.172     546.894     471.992       0.013       0.395

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     232.048       0.000     232.048    1147.448       0.202       0.302

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.175     547.155       0.000       0.060       0.047       0.314

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      17.672       1.047     551.652       8.241     212.140       1.644

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  51320.566       0.482     192.301  576754.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  0.998

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     66.307    1888.000      17.672     551.652       1.000       1.000       0.980
W Kg/sec =   30.13945

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     56.880    1830.743       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  51008.645   52028.707       3.099     513.330     165.649     401.059       2.421

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   219.05    -0.08   219.05     0.19   307.69
 MEAN    16.97     0.00    -0.02   219.05    -0.08   219.05     0.19
 HUB     14.32     0.00    -0.02   219.05    -0.08   219.05     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.39    46.36     9.03   317.33   385.65    17.23   547.65     0.34
 MEAN    51.93    43.80     8.13   279.61   355.25    17.23   547.65     0.31
 HUB     47.13    37.84     9.29   235.93   322.00    17.23   547.65     0.28

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   274.82   147.37   231.97  1153.24     0.24
 MEAN    16.57   278.54   153.02   232.75  1152.38     0.24
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 HUB     13.89   298.87   186.36   233.65  1151.50     0.26

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    311.07   283.91   163.70     0.25  2783.77
 MEAN   273.07   261.89   120.05     0.23  2537.34     1.48
 HUB    228.85   237.48    42.49     0.21  2589.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.44     1.04    17.72   559.02     1.01   552.71     0.92     0.91
 MEAN    18.37     1.04    17.63   558.37     1.01   551.89     0.92     0.91
 HUB     18.38     1.04    17.54   558.50     1.01   551.04     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.43    35.21    31.50     3.71     0.93     0.33     2.90
 MEAN    33.32    27.29    23.50     3.79     0.93     0.33     3.29     0.91
 HUB     38.58    10.31     6.50     3.81     0.93     0.34     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     275.587     153.876     228.627    1152.800       0.239       0.046

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.387      17.669     552.286      46.000      33.942      32.400      -1.542

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     240.530     153.876     285.539    1154.376       0.208       0.272

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.387      17.839     553.797     456.573       0.010       0.356

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     229.181       0.000     229.181    1154.840       0.198       0.261

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.868     554.243       0.000       0.060       0.037       0.310

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      18.366       1.039     558.629       6.976     236.821       1.836

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  43450.625       0.449     162.812  596901.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     66.307    1888.000      18.366     558.629       1.000       1.000       0.980
W Kg/sec =   30.13945

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     55.076    1819.276       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  51008.645   52028.707       3.178     509.668     160.398     390.276       2.433

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   214.78    -0.07   214.78     0.19   290.84
 MEAN    15.91     0.00    -0.02   214.78    -0.07   214.78     0.19
 HUB     13.07     0.00    -0.02   214.78    -0.07   214.78     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.57    47.36     7.21   301.84   370.51    17.93   554.78     0.32
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MEAN    50.68    44.80     5.88   262.18   338.98    17.93   554.78     0.29
HUB     45.09    38.84     6.25   215.34   304.19    17.93   554.78     0.26
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   263.75   133.72   227.35  1159.95     0.23
MEAN    15.50   265.94   136.72   228.11  1159.08     0.23
HUB     12.59   282.51   165.48   228.97  1158.19     0.24

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    295.58   279.08   161.86     0.24  2400.22
MEAN   255.34   257.10   118.62     0.22  2120.04     1.45
HUB    207.43   232.78    41.95     0.20  2084.37

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.04     1.04    18.37   564.98     1.01   559.17     0.92     0.91
MEAN    18.96     1.03    18.28   564.24     1.01   558.33     0.92     0.91
HUB     18.95     1.03    18.18   564.14     1.01   557.48     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.46    35.45    31.50     3.95     0.93     0.31     2.90
MEAN    30.94    27.47    23.50     3.97     0.92     0.30     3.34     0.91
HUB     35.86    10.38     6.50     3.88     0.92     0.30     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      268.758     139.229     229.883    1159.171       0.232      -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.970      18.272      558.421      46.000      31.201      33.000       1.799

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      244.078     139.229     280.996    1160.268       0.210       0.168

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       18.971      18.394     559.478     440.827       0.019       0.322

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      229.315       0.000     229.315    1160.873       0.198       0.248

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       18.448     560.062       0.000       0.060       0.038       0.244

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      18.957       1.032     564.453       5.824     267.523       2.074

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  36277.180       0.415     135.933  632399.562

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    259315.84    971.6711     64.7751      1.2549      0.8444     14.9533      1.0797
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =16.007   EfDer =  0.950

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      63.430    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   28.83159

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      61.964    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   48795.203   49771.000       4.608     831.557     180.453     619.754       3.434

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   141.96    -0.05   141.96     0.13   338.55
  MEAN    17.06     0.00    -0.02   141.96    -0.05   141.96     0.13
  HUB     12.51     0.00    -0.02   141.96    -0.05   141.96     0.13

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     67.33    50.47    16.86   339.90   368.40    14.94   521.13     0.33
  MEAN    63.21    47.20    16.01   281.08   314.94    14.94   521.13     0.28
  HUB     55.45    38.62    16.83   206.11   250.31    14.94   521.13     0.22

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   304.94   234.68   194.71  1127.07     0.27
  MEAN    18.04   307.95   237.55   195.97  1125.33     0.27
  HUB     15.00   331.93   266.60   197.74  1123.15     0.30

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   221.32   105.21     0.20  4842.54
  MEAN   297.16   204.83    59.61     0.18  4285.34     1.77
  HUB    247.14   198.70    19.46     0.18  3999.55

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.26     1.08    15.45   535.63     1.02   527.86     0.92     0.87
  MEAN    16.12     1.07    15.31   534.15     1.02   526.23     0.92     0.87
  HUB     16.05     1.06    15.11   533.40     1.02   524.19     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     50.32    28.39    24.20     4.19     0.93     0.51     2.90
  MEAN    50.48    16.92    12.70     4.22     0.95     0.46     3.51     0.87
  HUB     53.43    -5.62    -9.30     3.68     0.95     0.33     4.78

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.950

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     310.605     237.091     200.656    1125.437       0.276      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.137      15.304     526.333      24.000      49.758      35.400     -14.358

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     216.022     237.091     320.745    1129.876       0.191       0.497

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.121      15.715     530.494     528.796       0.028       0.605

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     201.795       0.000     201.795    1130.404       0.179       0.473

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.710     530.990       0.000       0.060       0.096       0.491

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.802      16.063       1.063     534.391      11.581     165.964       1.287

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  72104.352       0.624     258.455  596949.812


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =16.007   EfDer =  0.961

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     63.430    1888.000      16.063     534.391       1.000       1.000       0.980
W Kg/sec =   28.83159

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     58.918    1860.075       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  48795.203   49771.000       3.441     590.487     171.581     474.134       2.763

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   193.45    -0.07   193.45     0.17   333.56
 MEAN    18.08     0.00    -0.02   193.45    -0.07   193.45     0.17
 HUB     15.21     0.00    -0.02   193.45    -0.07   193.45     0.17

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.26    46.36    13.90   338.58   390.01    15.74   531.27     0.34
 MEAN    57.00    42.30    14.70   297.86   355.22    15.74   531.27     0.31
 HUB     52.34    37.84    14.50   250.60   316.63    15.74   531.27     0.28

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   281.75   191.61   206.56  1137.95     0.25
 MEAN    18.01   281.71   190.44   207.59  1136.60     0.25
 HUB     15.22   298.53   213.41   208.76  1135.23     0.26

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    336.44   252.28   144.83     0.22  3914.03
 MEAN   296.73   233.22   106.29     0.21  3430.98     1.68
 HUB    250.81   212.09    37.41     0.19  3249.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.04     1.06    16.33   544.75     1.02   538.12     0.92     0.88
 MEAN    16.92     1.05    16.21   543.47     1.02   536.84     0.92     0.88
 HUB     16.87     1.05    16.08   542.99     1.02   535.55     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.85    35.04    31.50     3.54     0.93     0.44     2.90
 MEAN    42.53    27.11    23.50     3.61     0.95     0.42     3.30     0.88
 HUB     45.63    10.16     6.50     3.66     0.95     0.42     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.961

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     284.740     190.973     211.202    1136.728       0.250       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.934      16.210     536.966      46.000      42.120      30.600     -11.520

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     216.528     190.973     288.712    1139.747       0.190       0.408

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.926      16.505     539.822     511.151       0.021       0.473

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     214.021       0.000     214.021    1139.842       0.188       0.357

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.473     539.912       0.000       0.060       0.078       0.366

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.823      16.884       1.051     543.737       9.346     191.730       1.486

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  58192.852       0.514     208.590  547473.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =16.007   EfDer =  0.981

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     63.430    1888.000      16.884     543.737       1.000       1.000       0.980
W Kg/sec =   28.83159

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     56.541    1844.020       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  48795.203   49771.000       3.313     545.479     164.663     429.765       2.610

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   202.96    -0.07   202.96     0.18   322.96
 MEAN    17.74     0.00    -0.02   202.96    -0.07   202.96     0.18
 HUB     15.05     0.00    -0.02   202.96    -0.07   202.96     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.46    46.36    12.10   330.67   388.05    16.51   540.30     0.34
 MEAN    55.23    43.40    11.83   292.26   355.88    16.51   540.30     0.31
 HUB     50.71    38.84    11.87   247.96   320.49    16.51   540.30     0.28

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   277.74   174.41   216.14  1146.70     0.24
 MEAN    17.51   279.99   176.87   217.05  1145.59     0.24
 HUB     14.85   299.42   205.15   218.10  1144.46     0.26

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39   264.22   151.97     0.23  3456.54
 MEAN   288.44   244.05   111.56     0.21  3097.65     1.59
 HUB    244.67   221.65    39.52     0.19  3047.46

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.79     1.05    17.08   552.88     1.02   546.44     0.92     0.90
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 MEAN    17.69     1.05    16.97   551.93     1.02   545.39     0.92     0.90
 HUB     17.68     1.05    16.86   551.80     1.01   544.31     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.90    35.11    31.50     3.61     0.93     0.40     2.90
 MEAN    39.18    27.20    23.50     3.70     0.94     0.39     3.28     0.90
 HUB     43.25    10.27     6.50     3.77     0.94     0.39     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     282.773     178.032     219.693    1145.738       0.247       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.715      16.979     545.528      46.000      39.020      31.500      -7.520

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     227.962     178.032     289.244    1148.191       0.199       0.346

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.711      17.231     547.866     471.992       0.015       0.427

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     221.695       0.000     221.695    1148.437       0.193       0.329

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.227     548.101       0.000       0.060       0.055       0.341

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854      17.681       1.047     552.206       8.469     203.211       1.575

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  52738.746       0.495     189.040  550651.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =16.007   EfDer =  0.994

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     63.430    1888.000      17.681     552.206       1.000       1.000       0.980
W Kg/sec =   28.83159

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     54.413    1829.825       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 48795.203   49771.000       3.239     513.330     158.465     401.059       2.531

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   209.32    -0.07   209.32     0.18   307.54
 MEAN    16.97     0.00    -0.02   209.32    -0.07   209.32     0.18
 HUB     14.32     0.00    -0.02   209.32    -0.07   209.32     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.60    46.36    10.24   317.33   380.21    17.28   548.55     0.33
 MEAN    53.19    43.80     9.39   279.61   349.34    17.28   548.55     0.30
 HUB     48.43    37.84    10.59   235.93   315.46    17.28   548.55     0.27

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   270.28   154.84   221.52  1154.42     0.23
 MEAN    16.57   273.05   158.50   222.34  1153.47     0.24
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 HUB     13.89   292.08   188.31   223.26  1152.50     0.25

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    311.07   271.07   156.22     0.23  2924.85
 MEAN   273.07   250.12   114.57     0.22  2628.22     1.52
 HUB    228.85   226.91    40.54     0.20  2616.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.48     1.05    17.79   559.94     1.01   553.84     0.92     0.91
 MEAN    18.40     1.04    17.69   559.16     1.01   552.93     0.92     0.91
 HUB     18.39     1.04    17.59   559.13     1.01   552.01     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.95    35.19    31.50     3.69     0.93     0.36     2.90
 MEAN    35.48    27.26    23.50     3.76     0.94     0.35     3.29     0.91
 HUB     40.15    10.29     6.50     3.79     0.94     0.36     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     270.397     159.394     218.423    1153.860       0.234       0.044

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.416      17.725     553.305      46.000      36.120      32.400      -3.720

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     229.606     159.394     279.509    1155.635       0.199       0.308

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.416      17.915     555.009     456.573       0.010       0.389

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     218.832       0.000     218.832    1156.054       0.189       0.292

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.939     555.412       0.000       0.060       0.041       0.339

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      18.393       1.040     559.411       7.205     225.973       1.752

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  44874.035       0.464     160.849  569664.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =16.007   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     63.430    1888.000      18.393     559.411       1.000       1.000       0.980
W Kg/sec =   28.83159

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     52.645    1818.004       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  48795.203   49771.000       3.324     509.668     153.318     390.276       2.546

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   205.12    -0.07   205.12     0.18   290.64
 MEAN    15.91     0.00    -0.02   205.12    -0.07   205.12     0.18
 HUB     13.07     0.00    -0.02   205.12    -0.07   205.12     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.81    47.36     8.45   301.84   365.00    17.99   555.90     0.32
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MEAN    51.97    44.80     7.17   262.18   332.94    17.99   555.90     0.29
HUB     46.40    38.84     7.56   215.34   297.45    17.99   555.90     0.26
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   258.91   141.30   216.95  1161.35     0.22
MEAN    15.50   260.11   142.29   217.74  1160.39     0.22
HUB     12.59   275.44   167.55   218.63  1159.41     0.24

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    295.58   266.21   154.27     0.23  2536.27
MEAN   255.34   245.34   113.04     0.21  2206.32     1.49
HUB    207.43   222.24    39.88     0.19  2110.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.11     1.04    18.46   566.12     1.01   560.52     0.92     0.91
MEAN    19.01     1.03    18.36   565.25     1.01   559.60     0.92     0.91
HUB     18.99     1.03    18.25   564.99     1.01   558.66     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.08    35.42    31.50     3.92     0.93     0.34     2.90
MEAN    33.16    27.44    23.50     3.94     0.93     0.33     3.34     0.91
HUB     37.47    10.34     6.50     3.84     0.93     0.32     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      262.962     144.902     219.437    1160.473       0.227       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.022      18.353      559.680       46.000      33.438      33.000      -0.438

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      232.783     144.902     274.198    1161.767       0.200       0.208

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       19.023       18.497     560.929     440.827       0.018       0.354

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      218.750       0.000     218.750    1162.315       0.188       0.284

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950       18.546      561.458       0.000       0.060       0.037       0.280

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4       Texit         Del T       Ns         Ns nondim
      0.880       19.010       1.034     565.454       6.043     254.304       1.971

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  37641.176       0.431     134.923  603400.688

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc   TR
    265551.16    951.8572      61.9643      1.2584       0.8351      16.0072      1.0816
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =16.953   EfDer =  0.941

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      60.888    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   27.67617

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      59.481    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   46839.746   47776.438       4.801     831.557     173.222     619.754       3.578

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   136.19    -0.05   136.19     0.12   338.55
  MEAN    17.06     0.00    -0.02   136.19    -0.05   136.19     0.12
  HUB     12.51     0.00    -0.02   136.19    -0.05   136.19     0.12

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.17    50.47    17.70   339.90   366.21    14.95   521.26     0.33
  MEAN    64.15    47.20    16.95   281.08   312.38    14.95   521.26     0.28
  HUB     56.55    38.62    17.93   206.11   247.08    14.95   521.26     0.22

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   303.07   238.66   186.79  1127.40     0.27
  MEAN    18.04   304.65   239.72   188.00  1125.62     0.27
  HUB     15.00   326.35   265.57   189.68  1123.43     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   212.47   101.24     0.19  4924.50
  MEAN   297.16   196.58    57.44     0.17  4324.43     1.83
  HUB    247.14   190.57    18.43     0.17  3984.17

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.27     1.08    15.47   535.84     1.02   528.17     0.92     0.86
  MEAN    16.12     1.07    15.32   534.26     1.02   526.50     0.92     0.86
  HUB     16.04     1.06    15.13   533.35     1.02   524.46     0.92     0.86

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     51.95    28.46    24.20     4.26     0.93     0.53     2.90
  MEAN    51.89    16.99    12.70     4.29     0.95     0.48     3.51     0.86
  HUB     54.46    -5.55    -9.30     3.75     0.95     0.35     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.941

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     307.082     239.256     192.498    1125.731       0.273       0.000

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      16.136      15.322     526.608      24.000      51.181      35.400     -15.781

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     207.134     239.256     316.462    1130.310       0.183       0.523
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.118      15.745     530.901     528.796       0.031       0.630

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     193.588       0.000     193.588    1130.792       0.171       0.488

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.730     531.355       0.000       0.060       0.106       0.506

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.789      16.056       1.063     534.485      11.675     161.578       1.253

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  72684.984       0.629     250.095  572660.062


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =16.953   EfDer =  0.952

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    60.888    1888.000      16.056     534.485       1.000       1.000       0.980
W Kg/sec =   27.67617

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    56.588    1859.912       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 46839.746   47776.438       3.583     590.487     164.798     474.134       2.877

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   185.60    -0.06   185.60     0.16   333.53
MEAN    18.08     0.00    -0.02   185.60    -0.06   185.60     0.16
HUB     15.21     0.00    -0.02   185.60    -0.06   185.60     0.16

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.27    46.36    14.91   338.58   386.17    15.76   531.61     0.34
MEAN    58.08    42.30    15.78   297.86   351.01    15.76   531.61     0.31
HUB     53.48    37.84    15.64   250.60   311.90    15.76   531.61     0.28

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   279.67   197.31   198.20  1138.47     0.25
MEAN    18.01   278.46   194.57   199.20  1137.07     0.24
HUB     15.22   293.74   214.80   200.35  1135.64     0.26

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    336.44   242.16   139.12     0.21  4030.46
MEAN   296.73   223.87   102.16     0.20  3505.32     1.73
HUB    250.81   203.56    36.01     0.18  3270.89

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.05     1.06    16.35   545.15     1.02   538.62     0.92     0.87
MEAN    16.92     1.05    16.23   543.76     1.02   537.29     0.92     0.87
HUB     16.86     1.05    16.09   543.14     1.02   535.93     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.87    35.07    31.50     3.57     0.93     0.46     2.90
MEAN    44.33    27.15    23.50     3.65     0.95     0.45     3.30     0.87
HUB     46.99    10.19     6.50     3.69     0.95     0.44     3.92


  blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.952

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     281.328     195.114     202.673    1137.195       0.247       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.935      16.228     537.407      46.000      43.911      30.600     -13.311

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     207.662     195.114     284.944    1140.373       0.182       0.438

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.925      16.538     540.416     511.151       0.024       0.502

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     205.332       0.000     205.332    1140.458       0.180       0.377

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.500     540.496       0.000       0.060       0.089       0.386

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.809      16.878       1.051     544.017       9.533     185.030       1.434

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  59357.273       0.524     204.237  524853.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =16.953   EfDer =  0.974

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     60.888    1888.000      16.878     544.017       1.000       1.000       0.980
W Kg/sec =   27.67617

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     54.309    1843.545       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  46839.746   47776.438       3.449     545.479     158.160     429.765       2.717

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   194.75    -0.07   194.75     0.17   322.88
 MEAN    17.74     0.00    -0.02   194.75    -0.07   194.75     0.17
 HUB     15.05     0.00    -0.02   194.75    -0.07   194.75     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.51    46.36    13.15   330.67   383.82    16.54   540.85     0.34
 MEAN    56.33    43.40    12.93   292.26   351.26    16.54   540.85     0.31
 HUB     51.86    38.84    13.02   247.96   315.35    16.54   540.85     0.28

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   274.96   180.57   207.36  1147.46     0.24
 MEAN    17.51   276.16   181.36   208.27  1146.29     0.24
 HUB     14.85   294.20   206.74   209.31  1145.09     0.26

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39   253.50   145.82     0.22  3578.45
 MEAN   288.44   234.18   107.08     0.20  3176.12     1.64
 HUB    244.67   212.72    37.93     0.19  3071.08

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.81     1.06    17.11   553.49     1.02   547.17     0.92     0.89
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 MEAN    17.70     1.05    17.00   552.42     1.02   546.05     0.92     0.89
 HUB     17.68     1.05    16.88   552.14     1.01   544.92     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.05    35.12    31.50     3.62     0.93     0.42     2.90
 MEAN    41.05    27.21    23.50     3.71     0.94     0.41     3.28     0.89
 HUB     44.65    10.27     6.50     3.77     0.94     0.41     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     278.859     182.547     210.806    1146.431       0.243       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.722      17.006     546.190      46.000      40.891      31.500      -9.391

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     218.599     182.547     284.796    1149.055       0.190       0.379

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.717      17.275     548.693     471.992       0.017       0.457

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     212.666       0.000     212.666    1149.279       0.185       0.352

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.264     548.907       0.000       0.060       0.065       0.364

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.842      17.682       1.048     552.684       8.666     195.645       1.517

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  53969.148       0.507     185.698  527715.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =16.953   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     60.888    1888.000      17.682     552.684       1.000       1.000       0.980
W Kg/sec =   27.67617

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     52.252    1829.034       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  46839.746   47776.438       3.373     513.330     152.173     401.059       2.636

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   200.83    -0.07   200.83     0.17   307.41
 MEAN    16.97     0.00    -0.02   200.83    -0.07   200.83     0.17
 HUB     14.32     0.00    -0.02   200.83    -0.07   200.83     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.68    46.36    11.32   317.33   375.59    17.31   549.32     0.33
 MEAN    54.32    43.80    10.52   279.61   344.31    17.31   549.32     0.30
 HUB     49.60    37.84    11.76   235.93   309.89    17.31   549.32     0.27

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   266.77   161.34   212.45  1155.42     0.23
 MEAN    16.57   268.56   163.20   213.28  1154.39     0.23
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 HUB     13.89   286.35   190.03   214.22  1153.35     0.25

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    311.07   259.91   149.73     0.22  3047.35
 MEAN   273.07   239.91   109.86     0.21  2706.11     1.57
 HUB    228.85   217.71    38.82     0.19  2640.45

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.51     1.05    17.83   560.75     1.01   554.80     0.92     0.90
 MEAN    18.42     1.04    17.73   559.84     1.01   553.82     0.92     0.90
 HUB     18.40     1.04    17.62   559.67     1.01   552.82     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.21    35.18    31.50     3.68     0.93     0.38     2.90
 MEAN    37.42    27.25    23.50     3.75     0.94     0.37     3.29     0.90
 HUB     41.58    10.27     6.50     3.77     0.94     0.37     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     266.166     164.122     209.542    1154.759       0.230       0.042

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.433      17.763     554.171      46.000      38.070      32.400      -5.670

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     220.121     164.122     274.571    1156.705       0.190       0.340

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.432      17.972     556.040     456.573       0.012       0.419

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     209.855       0.000     209.855    1157.088       0.181       0.318

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.989     556.409       0.000       0.060       0.047       0.364

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      18.407       1.041     560.086       7.403     216.894       1.681

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  46105.047       0.476     158.639  545757.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =16.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     60.888    1888.000      18.407     560.086       1.000       1.000       0.980
W Kg/sec =   27.67617

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     50.528    1816.907       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  46839.746   47776.438       3.463     509.668     147.155     390.276       2.652

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   196.74    -0.07   196.74     0.17   290.46
 MEAN    15.91     0.00    -0.02   196.74    -0.07   196.74     0.17
 HUB     13.07     0.00    -0.02   196.74    -0.07   196.74     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.91    47.36     9.55   301.84   360.36    18.04   556.85     0.31
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MEAN    53.12    44.80     8.32   262.18   327.85    18.04   556.85     0.28
HUB     47.59    38.84     8.75   215.34   291.73    18.04   556.85     0.25
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   255.15   147.82   207.97  1162.53     0.22
MEAN    15.50   255.38   147.07   208.78  1161.50     0.22
HUB     12.59   269.48   169.28   209.68  1160.45     0.23

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    295.58   255.11   147.76     0.22  2653.17
MEAN   255.34   235.18   108.27     0.20  2280.32     1.54
HUB    207.43   213.12    38.16     0.18  2132.06

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.15     1.04    18.52   567.10     1.01   561.67     0.92     0.91
MEAN    19.05     1.03    18.41   566.12     1.01   560.67     0.92     0.91
HUB     19.00     1.03    18.30   565.73     1.01   559.66     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.40    35.39    31.50     3.89     0.93     0.36     2.90
MEAN    35.16    27.41    23.50     3.91     0.93     0.35     3.34     0.91
HUB     38.91    10.31     6.50     3.81     0.93     0.34     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      258.265     149.768     210.405    1161.575       0.222       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.054      18.408      560.747      46.000      35.443      33.000      -2.443

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      223.046     149.768     268.663    1163.040       0.192       0.244

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       19.055      18.572     562.163     440.827       0.018       0.384

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      209.647       0.000     209.647    1163.541       0.180       0.315

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950       18.615      562.647       0.000       0.060       0.039       0.310

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4       Texit         Del T       Ns         Ns nondim
      0.878       19.042       1.035     566.317       6.230     243.414       1.887

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  38808.930       0.444     133.534  577963.938

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    270925.38    932.2034      59.4811      1.2605       0.8246      16.9529       1.0832
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =17.953   EfDer =  0.930

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      58.238    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   26.47190

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      56.893    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   44801.605   45697.539       5.019     831.557     165.684     619.754       3.741

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   130.18    -0.04   130.18     0.12   338.55
  MEAN    17.06     0.00    -0.02   130.18    -0.04   130.18     0.12
  HUB     12.51     0.00    -0.02   130.18    -0.04   130.18     0.12

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     69.05    50.47    18.58   339.90   364.02    14.96   521.39     0.32
  MEAN    65.15    47.20    17.95   281.08   309.80    14.96   521.39     0.28
  HUB     57.73    38.62    19.11   206.11   243.82    14.96   521.39     0.22

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   301.37   242.75   178.59  1127.73     0.27
  MEAN    18.04   301.41   241.95   179.74  1125.91     0.27
  HUB     15.00   320.67   264.49   181.31  1123.71     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   203.31    97.15     0.18  5008.83
  MEAN   297.16   188.03    55.21     0.17  4364.53     1.90
  HUB    247.14   182.14    17.35     0.16  3967.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.27     1.08    15.49   536.07     1.03   528.48     0.92     0.85
  MEAN    16.12     1.07    15.34   534.36     1.02   526.77     0.92     0.85
  HUB     16.03     1.06    15.14   533.31     1.02   524.72     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     53.66    28.54    24.20     4.34     0.93     0.56     2.90
  MEAN    53.39    17.08    12.70     4.38     0.95     0.51     3.51     0.85
  HUB     55.57    -5.47    -9.30     3.83     0.95     0.38     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.930

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     303.613     241.477     184.037    1126.022       0.270       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.133      15.337     526.881      24.000      52.688      35.400     -17.288

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     197.927     241.477     312.228    1130.743       0.175       0.550
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.114      15.772     531.308     528.796       0.033       0.656

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     185.072       0.000     185.072    1131.180       0.164       0.503

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.749     531.719       0.000       0.060       0.116       0.521

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.775      16.046       1.062     534.580      11.770     157.011       1.217

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  73279.297       0.634     241.169  547392.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =17.953   EfDer =  0.941

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    58.238    1888.000      16.046     534.580       1.000       1.000       0.980
W Kg/sec =   26.47190

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    54.163    1859.746       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  44801.605   45697.539       3.744     590.487     157.734     474.134       3.006

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   177.46    -0.06   177.46     0.16   333.50
 MEAN    18.08     0.00    -0.02   177.46    -0.06   177.46     0.16
 HUB     15.21     0.00    -0.02   177.46    -0.06   177.46     0.16

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.34    46.36    15.98   338.58   382.32    15.77   531.95     0.34
 MEAN    59.22    42.30    16.92   297.86   346.76    15.77   531.95     0.31
 HUB     54.70    37.84    16.86   250.60   307.12    15.77   531.95     0.27

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   277.84   203.14   189.55  1139.00     0.24
 MEAN    18.01   275.36   198.80   190.52  1137.53     0.24
 HUB     15.22   288.89   216.18   191.64  1136.04     0.25

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    336.44   231.73   133.30     0.20  4149.33
 MEAN   296.73   214.22    97.93     0.19  3581.52     1.79
 HUB    250.81   194.74    34.63     0.17  3291.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.06     1.06    16.37   545.56     1.02   539.11     0.92     0.86
 MEAN    16.92     1.05    16.24   544.06     1.02   537.73     0.92     0.86
 HUB     16.85     1.05    16.10   543.29     1.02   536.32     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.98    35.12    31.50     3.62     0.93     0.49     2.90
 MEAN    46.22    27.20    23.50     3.70     0.95     0.47     3.30     0.86
 HUB     48.44    10.24     6.50     3.74     0.95     0.46     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.941

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     278.062     199.360     193.841    1137.657       0.244       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.933      16.243     537.846      46.000      45.804      30.600     -15.204

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     198.493     199.360     281.325    1141.002       0.174       0.470

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.921      16.567     541.013     511.151       0.027       0.534

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     196.341       0.000     196.341    1141.077       0.172       0.398

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.523     541.084       0.000       0.060       0.102       0.407

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.793      16.868       1.051     544.303       9.723     178.258       1.382

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  60544.117       0.535     199.256  501367.406


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =17.953   EfDer =  0.966

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     58.238    1888.000      16.868     544.303       1.000       1.000       0.980
W Kg/sec =   26.47190

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     51.989    1843.060       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  44801.605   45697.539       3.603     545.479     151.406     429.765       2.838

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   186.25    -0.06   186.25     0.16   322.79
 MEAN    17.74      0.00    -0.02   186.25    -0.06   186.25     0.16
 HUB     15.05      0.00    -0.02   186.25    -0.06   186.25     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.61     46.36    14.25   330.67   379.57    16.56   541.41     0.33
 MEAN    57.50     43.40    14.10   292.26   346.61    16.56   541.41     0.30
 HUB     53.10     38.84    14.26   247.96   310.17    16.56   541.41     0.27

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   272.46    186.84    198.30  1148.22      0.24
 MEAN    17.51   272.49    185.94    199.20  1146.98      0.24
 HUB     14.85   288.92    208.29    200.23  1145.72      0.25

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39    242.48    139.54     0.21  3702.67
 MEAN   288.44    224.02    102.50     0.20  3256.30      1.70
 HUB    244.67    203.50     36.38     0.18  3094.10

         Pt2       PR       Ps2      Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     17.82      1.06    17.14    554.10      1.02    547.90      0.92      0.88
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 MEAN    17.71     1.05    17.02   552.92     1.02   546.72     0.92     0.88
 HUB     17.66     1.05    16.90   552.49     1.02   545.52     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.30    35.13    31.50     3.63     0.93     0.45     2.90
 MEAN    43.03    27.23    23.50     3.73     0.95     0.43     3.28     0.88
 HUB     46.13    10.30     6.50     3.80     0.95     0.43     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     275.104     187.160     201.627    1147.121       0.240       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.724      17.027     546.850      46.000      42.869      31.500     -11.369

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     208.943     187.160     280.510    1149.923       0.182       0.412

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.717      17.313     549.525     471.992       0.020       0.489

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     203.354       0.000     203.354    1150.124       0.177       0.375

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.294     549.717       0.000       0.060       0.077       0.386

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.829      17.676       1.048     553.170       8.867     188.072       1.458

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  55218.141       0.518     181.728  503924.906


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =17.953   EfDer =  0.982

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     58.238    1888.000      17.676     553.170       1.000       1.000       0.980
W Kg/sec =   26.47190

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     50.016    1828.229       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 44801.605   45697.539       3.524     513.330     145.662     401.059       2.753

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   192.07    -0.07   192.07     0.17   307.27
 MEAN    16.97     0.00    -0.02   192.07    -0.07   192.07     0.17
 HUB     14.32     0.00    -0.02   192.07    -0.07   192.07     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.82    46.36    12.46   317.33   370.98    17.34   550.09     0.32
 MEAN    55.52    43.80    11.72   279.61   339.27    17.34   550.09     0.29
 HUB     50.86    37.84    13.02   235.93   304.28    17.34   550.09     0.26

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   263.54   167.90   203.13  1156.41     0.23
 MEAN    16.57   264.27   168.05   203.96  1155.32     0.23
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 HUB     13.89   280.62   191.75   204.89  1154.21     0.24

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    311.07   248.51   143.16     0.21  3171.31
 MEAN   273.07   229.41   105.02     0.20  2786.30     1.62
 HUB    228.85   208.23    37.10     0.18  2664.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.53     1.05    17.87   561.56     1.02   555.76     0.92     0.90
 MEAN    18.43     1.04    17.77   560.54     1.01   554.71     0.92     0.90
 HUB     18.39     1.04    17.65   560.22     1.01   553.64     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.58    35.18    31.50     3.68     0.93     0.41     2.90
 MEAN    39.49    27.25    23.50     3.75     0.94     0.40     3.29     0.90
 HUB     43.10    10.26     6.50     3.76     0.94     0.40     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     262.145     168.992     200.404    1155.656       0.227       0.040

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.443      17.793     555.036      46.000      40.139      32.400      -7.739

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     210.376     168.992     269.845    1157.781       0.182       0.374

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.440      18.020     557.078     456.573       0.014       0.452

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     200.639       0.000     200.639    1158.128       0.173       0.344

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.029     557.413       0.000       0.060       0.056       0.388

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854      18.411       1.042     560.774       7.604     207.889       1.612

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  47357.340       0.489     155.857  520984.219


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =17.953   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     58.238    1888.000      18.411     560.774       1.000       1.000       0.980
W Kg/sec =   26.47190

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     48.349    1815.792       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  44801.605   45697.539       3.620     509.668     140.808     390.276       2.772

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   188.14    -0.06   188.14     0.16   290.29
 MEAN    15.91     0.00    -0.02   188.14    -0.06   188.14     0.16
 HUB     13.07     0.00    -0.02   188.14    -0.06   188.14     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.07    47.36    10.71   301.84   355.73    18.07   557.82     0.31
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MEAN    54.34    44.80     9.54   262.18   322.75    18.07   557.82     0.28
HUB     48.87    38.84    10.03   215.34   286.00    18.07   557.82     0.25
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   251.74   154.46   198.78  1163.71     0.22
MEAN    15.50   250.84   151.91   199.60  1162.61     0.22
HUB     12.59   263.53   171.03   200.50  1161.49     0.23

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    295.58   243.78   141.12     0.21  2772.24
MEAN   255.34   224.80   103.42     0.19  2355.34     1.59
HUB    207.43   203.78    36.40     0.18  2154.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.19     1.04    18.57   568.11     1.01   562.82     0.92     0.91
MEAN    19.07     1.04    18.46   567.00     1.01   561.75     0.92     0.91
HUB     19.01     1.03    18.34   566.47     1.01   560.67     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.85    35.37    31.50     3.87     0.93     0.39     2.90
MEAN    37.27    27.39    23.50     3.89     0.94     0.37     3.34     0.91
HUB     40.46    10.29     6.50     3.79     0.94     0.36     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.993

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      253.764     154.700     201.157    1162.679       0.218       -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.076      18.452      561.818       46.000      37.562      33.000      -4.562

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      213.099     154.700     263.331    1164.318       0.183       0.281

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       19.075       18.634     563.403     440.827       0.020       0.416

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      200.352       0.000     200.352    1164.773       0.172       0.346

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950       18.671      563.843       0.000       0.060       0.044       0.339

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.873       19.061       1.035      567.195       6.421     232.713       1.804

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  39995.680       0.458     131.629  551621.438

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    276394.56    909.6400      56.8929      1.2617       0.8119      17.9529       1.0849
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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =19.040   EfDer =  0.917

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      55.401    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   25.18210

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      54.121    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   42618.715   43471.000       5.276     831.557     157.612     619.754       3.932

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   123.76    -0.04   123.76     0.11   338.55
  MEAN    17.06     0.00    -0.02   123.76    -0.04   123.76     0.11
  HUB     12.51     0.00    -0.02   123.76    -0.04   123.76     0.11

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     70.00    50.47    19.53   339.90   361.77    14.98   521.53     0.32
  MEAN    66.24    47.20    19.04   281.08   307.16    14.98   521.53     0.27
  HUB     59.02    38.62    20.40   206.11   240.45    14.98   521.53     0.21

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   299.80   247.03   169.86  1128.06     0.27
  MEAN    18.04   298.10   244.22   170.94  1126.20     0.26
  HUB     15.00   314.74   263.32   172.40  1124.00     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   193.59    92.86     0.17  5097.18
  MEAN   297.16   178.96    52.94     0.16  4405.42     1.99
  HUB    247.14   173.16    16.18     0.15  3950.39

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.28     1.08    15.50   536.30     1.03   528.79     0.92     0.84
  MEAN    16.12     1.07    15.35   534.47     1.02   527.05     0.92     0.84
  HUB     16.01     1.06    15.16   533.27     1.02   524.99     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     55.49    28.67    24.20     4.47     0.93     0.58     2.90
  MEAN    55.01    17.21    12.70     4.51     0.95     0.53     3.51     0.84
  HUB     56.79    -5.36    -9.30     3.94     0.95     0.40     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.917

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     300.072     243.742     175.023    1126.318       0.266       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.126      15.349     527.158      24.000      54.319      35.400     -18.919

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     188.131     243.742     307.902    1131.184       0.166       0.578
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.106      15.797     531.723     528.796       0.036       0.685

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     175.996       0.000     175.996    1131.576       0.156       0.521

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.765     532.092       0.000       0.060       0.125       0.538

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.759      16.034       1.061     534.679      11.869     152.134       1.179

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  73892.992       0.640     231.340  520383.406


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =19.040   EfDer =  0.928

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     55.401    1888.000      16.034     534.679       1.000       1.000       0.980
W Kg/sec =   25.18210

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     51.568    1859.575       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  42618.715   43471.000       3.932     590.487     150.177     474.134       3.157

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   168.77    -0.06   168.77     0.15   333.47
 MEAN    18.08     0.00    -0.02   168.77    -0.06   168.77     0.15
 HUB     15.21     0.00    -0.02   168.77    -0.06   168.77     0.15

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.51    46.36    17.15   338.58   378.36    15.79   532.30     0.33
 MEAN    60.47    42.30    18.17   297.86   342.40    15.79   532.30     0.30
 HUB     56.05    37.84    18.21   250.60   302.18    15.79   532.30     0.27

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   276.25   209.24   180.37  1139.53     0.24
 MEAN    18.01   272.34   203.23   181.29  1138.00     0.24
 HUB     15.22   283.90   217.59   182.36  1136.46     0.25

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    336.44   220.71   127.20     0.19  4273.91
 MEAN   296.73   203.98    93.50     0.18  3661.27     1.86
 HUB    250.81   185.36    33.22     0.16  3313.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.06     1.06    16.38   545.99     1.02   539.62     0.92     0.85
 MEAN    16.91     1.05    16.25   544.37     1.02   538.17     0.92     0.85
 HUB     16.83     1.05    16.11   543.45     1.02   536.72     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.24    35.19    31.50     3.69     0.93     0.51     2.90
 MEAN    48.27    27.28    23.50     3.78     0.95     0.49     3.30     0.85
 HUB     50.03    10.33     6.50     3.83     0.95     0.48     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.928

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     274.878     203.803     184.451    1138.127       0.242       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.926      16.251     538.291      46.000      47.854      30.600     -17.254

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     188.756     203.803     277.785    1141.647       0.165       0.504

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.912      16.592     541.626     511.151       0.030       0.569

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     186.782       0.000     186.782    1141.712       0.164       0.421

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.541     541.688       0.000       0.060       0.115       0.430

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.775      16.853       1.051     544.601       9.922     171.218       1.327

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  61783.770       0.546     193.429  476313.469


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =19.040   EfDer =  0.955

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     55.401    1888.000      16.853     544.601       1.000       1.000       0.980
W Kg/sec =   25.18210

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     49.514    1842.557       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  42618.715   43471.000       3.783     545.479     144.199     429.765       2.980

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   177.21    -0.06   177.21     0.16   322.70
 MEAN    17.74     0.00    -0.02   177.21    -0.06   177.21     0.16
 HUB     15.05     0.00    -0.02   177.21    -0.06   177.21     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.82    46.36    15.46   330.67   375.21    16.57   541.98     0.33
 MEAN    58.78    43.40    15.38   292.26   341.84    16.57   541.98     0.30
 HUB     54.46    38.84    15.62   247.96   304.82    16.57   541.98     0.27

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   270.22   193.43   188.69  1149.00      0.24
 MEAN    17.51   268.92   190.74   189.57  1147.70      0.23
 HUB     14.85   283.55   209.96   190.57  1146.37      0.25

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39   230.83   132.96     0.20  3833.09
 MEAN   288.44   213.26    97.70     0.19  3340.29      1.76
 HUB    244.67   193.71    34.71     0.17  3118.76

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.83     1.06    17.16   554.74     1.02   548.65     0.92     0.87
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 MEAN    17.70     1.05    17.04   553.44     1.02   547.40     0.92     0.87
 HUB     17.64     1.05    16.91   552.85     1.02   546.14     0.92     0.87
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.71    35.17    31.50     3.67     0.93     0.47     2.90
 MEAN    45.18    27.26    23.50     3.76     0.95     0.46     3.28     0.87
 HUB     47.77    10.32     6.50     3.82     0.95     0.45     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.955

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     271.440     191.992     191.882    1147.827       0.236       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.718      17.041     547.526      46.000      45.016      31.500     -13.516

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     198.708     191.992     276.308    1150.817       0.173       0.449

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.710      17.344     550.382     471.992       0.023       0.525

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     193.481       0.000     193.481    1150.996       0.168       0.399

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.317     550.553       0.000       0.060       0.091       0.410

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.812      17.663       1.048     553.679       9.078     180.244       1.397

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  56531.348       0.531     176.985  478570.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =19.040   EfDer =  0.973

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     55.401    1888.000      17.663     553.679       1.000       1.000       0.980
W Kg/sec =   25.18210

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     47.637    1827.390       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 42618.715   43471.000       3.700     513.330     138.734     401.059       2.891

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   182.77    -0.06   182.77     0.16   307.13
 MEAN    16.97     0.00    -0.02   182.77    -0.06   182.77     0.16
 HUB     14.32     0.00    -0.02   182.77    -0.06   182.77     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.06    46.36    13.70   317.33   366.25    17.35   550.89     0.32
 MEAN    56.83    43.80    13.03   279.61   334.10    17.35   550.89     0.29
 HUB     52.24    37.84    14.40   235.93   298.50    17.35   550.89     0.26

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   260.62   174.84   193.27  1157.43      0.23
 MEAN    16.57   260.06   173.10   194.09  1156.27      0.22
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 HUB     13.89   274.72   193.49   195.02  1155.08     0.24

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    311.07   236.45   136.23     0.20  3302.19
 MEAN   273.07   218.32    99.97     0.19  2869.96     1.68
 HUB    228.85   198.20    35.36     0.17  2688.52

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.54     1.05    17.90   562.42     1.02   556.74     0.92     0.89
 MEAN    18.43     1.04    17.79   561.27     1.01   555.62     0.92     0.89
 HUB     18.38     1.04    17.67   560.79     1.01   554.49     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.13    35.18    31.50     3.68     0.93     0.44     2.90
 MEAN    41.73    27.25    23.50     3.75     0.94     0.42     3.29     0.89
 HUB     44.78    10.28     6.50     3.78     0.94     0.42     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     258.222     174.071     190.730    1156.578       0.223       0.037

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.443      17.813     555.925      46.000      42.385      32.400      -9.985

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     200.080     174.071     265.203    1158.891       0.173       0.412

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.439      18.059     558.150     456.573       0.016       0.488

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     190.903       0.000     190.903    1159.201       0.165       0.370

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.058     558.450       0.000       0.060       0.068       0.412

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.840      18.404       1.042     561.493       7.814     198.684       1.540

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  48668.891       0.503     152.370  494605.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =19.040   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     55.401    1888.000      18.404     561.493       1.000       1.000       0.980
W Kg/sec =   25.18210

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     46.040    1814.629       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  42618.715   43471.000       3.801     509.668     134.082     390.276       2.911

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   179.04    -0.06   179.04     0.15   290.10
 MEAN    15.91     0.00    -0.02   179.04    -0.06   179.04     0.15
 HUB     13.07     0.00    -0.02   179.04    -0.06   179.04     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.33    47.36    11.97   301.84   351.00    18.10   558.82     0.30
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MEAN    55.68    44.80    10.88   262.18   317.53    18.10   558.82     0.27
HUB     50.27    38.84    11.43   215.34   280.10    18.10   558.82     0.24
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   248.60   161.37   189.12  1164.92     0.21
MEAN    15.50   246.40   156.97   189.93  1163.75     0.21
HUB     12.59   257.46   172.84   190.81  1162.57     0.22

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    295.58   231.90   134.21     0.20  2896.06
MEAN   255.34   213.89    98.37     0.18  2433.61     1.65
HUB    207.43   193.92    34.59     0.17  2176.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.21     1.04    18.61   569.15     1.01   563.99     0.92     0.90
MEAN    19.08     1.04    18.49   567.93     1.01   562.86     0.92     0.90
HUB     19.01     1.03    18.37   567.25     1.01   561.72     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.47    35.36    31.50     3.86     0.93     0.42     2.90
MEAN    39.57    27.38    23.50     3.88     0.94     0.40     3.34     0.90
HUB     42.17    10.28     6.50     3.78     0.94     0.38     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.987

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      249.376     159.847     191.409    1163.814       0.214       -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.085      18.483      562.920       46.000      39.865      33.000      -6.865

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      202.639     159.847     258.096    1165.635       0.174        0.321

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       19.082      18.684     564.684     440.827       0.024        0.452

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      190.581       0.000     190.581    1166.044       0.163        0.376

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950       18.712      565.080       0.000       0.060       0.052        0.369

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.862       19.065       1.036      568.112       6.619     221.896        1.720

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  41231.086       0.472     129.084  523586.906

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    282108.09    883.2067      54.1208      1.2620       0.7962      19.0400       1.0867
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =19.989   EfDer =  0.903

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      52.957    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   24.07130

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      51.734    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   40738.789   41553.477       5.519     831.557     150.659     619.754       4.114

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   118.23    -0.04   118.23     0.11   338.55
  MEAN    17.06     0.00    -0.02   118.23    -0.04   118.23     0.11
  HUB     12.51     0.00    -0.02   118.23    -0.04   118.23     0.11

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     70.82    50.47    20.35   339.90   359.91    14.99   521.64     0.32
  MEAN    67.19    47.20    19.99   281.08   304.97    14.99   521.64     0.27
  HUB     60.16    38.62    21.54   206.11   237.65    14.99   521.64     0.21

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   298.64   250.63   162.39  1128.33     0.26
  MEAN    18.04   295.44   246.13   163.41  1126.44     0.26
  HUB     15.00   309.71   262.25   164.76  1124.24     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   185.31    89.27     0.16  5171.29
  MEAN   297.16   171.19    51.03     0.15  4439.99     2.07
  HUB    247.14   165.45    15.11     0.15  3934.22

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.28     1.08    15.50   536.50     1.03   529.05     0.92     0.83
  MEAN    16.11     1.07    15.35   534.56     1.02   527.27     0.92     0.83
  HUB     15.99     1.06    15.17   533.22     1.02   525.21     0.92     0.83

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     57.06    28.80    24.20     4.60     0.93     0.61     2.90
  MEAN    56.42    17.34    12.70     4.64     0.95     0.56     3.51     0.83
  HUB     57.86    -5.24    -9.30     4.06     0.95     0.43     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.903

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     297.217     245.657     167.305    1126.557       0.264       0.001

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      16.118      15.355     527.382      24.000      55.743      35.400     -20.343

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	179.751	245.657	304.397	1131.544	0.159	0.603

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.096	15.814	532.062	528.796	0.038	0.710

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	168.216	0.000	168.216	1131.901	0.149	0.537

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.776	532.397	0.000	0.060	0.133	0.553

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.743	16.021	1.061	534.760	11.950	147.939	1.147

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
74401.047	0.644	222.656	497164.406

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =19.989 EfDer = 0.913

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
52.957	1888.000	16.021	534.760	1.000	1.000	0.980

W Kg/sec = 24.07130

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
49.336	1859.433	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
40738.789	41553.477	4.110	590.487	143.678	474.134	3.300

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	161.33	-0.06	161.33	0.14	333.45
MEAN	18.08	0.00	-0.02	161.33	-0.06	161.33	0.14	
HUB	15.21	0.00	-0.02	161.33	-0.06	161.33	0.14	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	64.53	46.36	18.17	338.58	375.10	15.80	532.59	0.33
MEAN	61.56	42.30	19.26	297.86	338.79	15.80	532.59	0.30
HUB	57.23	37.84	19.39	250.60	298.08	15.80	532.59	0.26

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	275.18	214.38	172.52	1139.96	0.24
MEAN	18.01	270.02	206.99	173.40	1138.39	0.24
HUB	15.22	279.76	218.73	174.42	1136.80	0.25

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	336.44	211.34	122.06	0.19	4378.80	
MEAN	296.73	195.25	89.74	0.17	3728.86	1.93
HUB	250.81	177.35	32.09	0.16	3330.51	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.06	1.06	16.38	546.35	1.02	540.02	0.92	0.84
MEAN	16.90	1.05	16.25	544.63	1.02	538.54	0.92	0.84
HUB	16.80	1.05	16.11	543.57	1.02	537.04	0.92	0.84

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	51.17	35.28	31.50	3.78	0.93	0.53	2.90	
MEAN	50.05	27.36	23.50	3.86	0.95	0.52	3.30	0.84
HUB	51.43	10.42	6.50	3.92	0.95	0.50	3.92	

blockage3	Cor/U1	Cor/Incid

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      0.950       1.000       0.913

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     272.419     207.570     176.428    1138.508       0.239       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.913      16.252     538.652      46.000      49.636      30.600     -19.036

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     180.444     207.570     275.037    1142.178       0.158       0.534

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.898      16.606     542.131     511.151       0.032       0.599

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     178.610       0.000     178.610    1142.236       0.156       0.442

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.550     542.186       0.000       0.060       0.126       0.451

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.758      16.835       1.051     544.850      10.090     165.311       1.281

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  62826.160       0.555     188.016  454814.156


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =19.989   EfDer =  0.945

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     52.957    1888.000      16.835     544.850       1.000       1.000       0.980
W Kg/sec =   24.07130

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     47.392    1842.135       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  40738.789   41553.477       3.952     545.479     138.018     429.765       3.114

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   169.47    -0.06   169.47     0.15   322.63
 MEAN    17.74      0.00    -0.02   169.47    -0.06   169.47     0.15
 HUB     15.05      0.00    -0.02   169.47    -0.06   169.47     0.15

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     62.87     46.36     16.51   330.67   371.62     16.58   542.45      0.33
 MEAN    59.90     43.40     16.50   292.26   337.89     16.58   542.45      0.30
 HUB     55.65     38.84     16.81   247.96   300.39     16.58   542.45      0.26

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   268.64    198.97    180.50  1149.64      0.23
 MEAN    17.51   266.14    194.79    181.35  1148.28      0.23
 HUB     14.85   279.06    211.27    182.32  1146.91      0.24

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39    220.94    127.42     0.19  3942.67
 MEAN   288.44    204.10     93.65     0.18  3411.10      1.83
 HUB    244.67    185.35     33.40     0.16  3138.25

         Pt2       PR       Ps2     Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     17.83      1.06    17.16   555.28      1.02   549.26      0.92     0.86
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 MEAN    17.69     1.05    17.04   553.88     1.02   547.96     0.92     0.86
 HUB     17.62     1.05    16.91   553.15     1.02   546.65     0.92     0.86
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.79    35.22    31.50     3.72     0.93     0.50     2.90
 MEAN    47.05    27.31    23.50     3.81     0.95     0.48     3.28     0.86
 HUB     49.21    10.38     6.50     3.88     0.95     0.47     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.945

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     268.587     196.066     183.567    1148.406       0.234       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.707      17.045     548.080      46.000      46.886      31.500     -15.386

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     189.986     196.066     273.014    1151.555       0.165       0.481

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.696      17.363     551.090     471.992       0.026       0.556

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     185.060       0.000     185.060    1151.716       0.161       0.420

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.328     551.244       0.000       0.060       0.103       0.430

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4         PR4        Texit        Del T       Ns        Ns nondim
      0.797      17.644       1.048     554.104       9.254     173.744       1.347

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  57629.016       0.541     172.463  456833.781


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =19.989   EfDer =  0.965

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     52.957    1888.000      17.644     554.104       1.000       1.000       0.980
W Kg/sec =   24.07130

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     45.602    1826.688       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  40738.789   41553.477       3.865     513.330     132.806     401.059       3.020

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   174.84    -0.06   174.84     0.15   307.01
 MEAN    16.97     0.00    -0.02   174.84    -0.06   174.84     0.15
 HUB     14.32     0.00    -0.02   174.84    -0.06   174.84     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.15    46.36    14.79   317.33   362.36    17.36   551.55     0.31
 MEAN    57.99    43.80    14.19   279.61   329.82    17.36   551.55     0.29
 HUB     53.47    37.84    15.63   235.93   293.70    17.36   551.55     0.25

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   258.47   180.63   184.88  1158.26     0.22
 MEAN    16.57   256.77   177.35   185.69  1157.05     0.22
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 HUB     13.89   269.87   194.97   186.60  1155.81     0.23

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    311.07   226.27   130.44     0.20  3411.38
 MEAN   273.07   208.91    95.72     0.18  2940.37     1.74
 HUB    228.85   189.65    33.88     0.16  2708.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.55     1.05    17.91   563.13     1.02   557.55     0.92     0.88
 MEAN    18.42     1.04    17.80   561.88     1.01   556.38     0.92     0.88
 HUB     18.36     1.04    17.67   561.27     1.01   555.19     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.33    35.20    31.50     3.70     0.93     0.46     2.90
 MEAN    43.68    27.27    23.50     3.77     0.95     0.45     3.29     0.88
 HUB     46.26    10.29     6.50     3.79     0.95     0.44     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.965

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     255.166     178.346     182.490    1157.337       0.220       0.035

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.434      17.819     556.658      46.000      44.342      32.400     -11.942

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     191.322     178.346     261.556    1159.808       0.165       0.444

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.428      18.081     559.038     456.573       0.019       0.520

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     182.622       0.000     182.622    1160.090       0.157       0.392

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.072     559.310       0.000       0.060       0.080       0.431

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.826      18.388       1.042     562.095       7.991     191.099       1.481

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  49767.531       0.514     148.936  472010.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =19.989   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     52.957    1888.000      18.388     562.095       1.000       1.000       0.980
W Kg/sec =   24.07130

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     44.070    1813.658       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  40738.789   41553.477       3.971     509.668     128.347     390.276       3.041

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   171.30    -0.06   171.30     0.15   289.94
 MEAN    15.91     0.00    -0.02   171.30    -0.06   171.30     0.15
 HUB     13.07     0.00    -0.02   171.30    -0.06   171.30     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.43    47.36    13.07   301.84   347.11    18.11   559.64     0.30
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MEAN    56.85    44.80    12.05   262.18   313.23    18.11   559.64     0.27
HUB     51.51    38.84    12.67   215.34   275.21    18.11   559.64     0.24
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   246.35   167.21   180.91  1165.92     0.21
MEAN    15.50   242.94   161.25   181.71  1164.70     0.21
HUB     12.59   252.43   174.31   182.58  1163.46     0.22

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    295.58   221.83   128.37     0.19  3000.79
MEAN   255.34   204.63    94.09     0.18  2499.89     1.70
HUB    207.43   185.56    33.12     0.16  2195.30

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.21     1.04    18.62   570.03     1.01   564.97     0.92     0.90
MEAN    19.07     1.04    18.50   568.71     1.01   563.78     0.92     0.90
HUB     18.99     1.03    18.38   567.90     1.01   562.58     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.75    35.36    31.50     3.86     0.93     0.44     2.90
MEAN    41.59    27.38    23.50     3.88     0.94     0.42     3.34     0.90
HUB     43.67    10.28     6.50     3.78     0.94     0.40     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      245.969     164.204     183.133    1164.749       0.211       -0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.081      18.496      563.830      46.000      41.881      33.000      -8.881

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      193.774     164.204     253.991    1166.727       0.166       0.356

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.076      18.712     565.746     440.827       0.028       0.484

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     182.300       0.000     182.300    1167.098       0.156       0.402

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.733     566.106       0.000       0.060       0.062       0.393

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.851      19.056       1.036     568.881       6.786     213.026       1.651

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  42271.766       0.484     126.504  499584.688

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    286895.50    858.5753      51.7336      1.2614      0.7813     19.9894      1.0881
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =21.008   EfDer =  0.885

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      50.368    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   22.89446

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      49.204    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   38747.074   39521.930       5.803     831.557     143.294     619.754       4.325

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   112.39    -0.04   112.39     0.10   338.55
  MEAN    17.06     0.00    -0.02   112.39    -0.04   112.39     0.10
  HUB     12.51     0.00    -0.02   112.39    -0.04   112.39     0.10

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     71.70    50.47    21.23   339.90   358.04    15.00   521.75     0.32
  MEAN    68.21    47.20    21.01   281.08   302.76    15.00   521.75     0.27
  HUB     61.40    38.62    22.78   206.11   234.80    15.00   521.75     0.21

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   297.63   254.37   154.54  1128.61     0.26
  MEAN    18.04   292.78   248.09   155.47  1126.68     0.26
  HUB     15.00   304.49   261.07   156.71  1124.47     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   176.62    85.53     0.16  5248.46
  MEAN   297.16   163.03    49.07     0.14  4475.27     2.16
  HUB    247.14   157.33    13.93     0.14  3916.56

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.27     1.08    15.50   536.70     1.03   529.30     0.92     0.81
  MEAN    16.10     1.07    15.36   534.65     1.02   527.50     0.92     0.81
  HUB     15.97     1.06    15.18   533.18     1.02   525.43     0.92     0.81

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     58.72    28.96    24.20     4.76     0.93     0.63     2.90
  MEAN    57.93    17.52    12.70     4.82     0.95     0.58     3.51     0.81
  HUB     59.03    -5.08    -9.30     4.22     0.95     0.46     4.78

    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.885

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     294.361     247.611     159.175    1126.797       0.261       0.001

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      16.104      15.357     527.607      24.000      57.265      35.400     -21.865

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     170.933     247.611     300.881    1131.908       0.151       0.629

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.082      15.827     532.404     528.796       0.039       0.737

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     160.014       0.000     160.014    1132.229       0.141       0.555

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.783     532.705       0.000       0.060       0.140       0.571

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.725      16.005       1.059     534.844      12.034     143.486       1.112

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  74921.641       0.649     213.252  472604.562


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =21.008   EfDer =  0.895

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     50.368    1888.000      16.005     534.844       1.000       1.000       0.980
W Kg/sec =   22.89446

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     46.976    1859.288       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  38747.074   39521.930       4.316     590.487     136.806     474.134       3.466

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   153.47    -0.05   153.47     0.14   333.42
 MEAN    18.08     0.00    -0.02   153.47    -0.05   153.47     0.14
 HUB     15.21     0.00    -0.02   153.47    -0.05   153.47     0.14

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     65.62    46.36    19.26   338.58   371.79    15.80   532.88     0.33
 MEAN    62.74    42.30    20.44   297.86   335.12    15.80   532.88     0.30
 HUB     58.52    37.84    20.68   250.60   293.91    15.80   532.88     0.26

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   274.34   219.70   164.30  1140.39     0.24
 MEAN    18.01   267.79   210.83   165.12  1138.77     0.24
 HUB     15.22   275.56   219.89   166.07  1137.14     0.24

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    336.44   201.55   116.74     0.18  4487.29
 MEAN   296.73   186.12    85.90     0.16  3798.05     2.00
 HUB    250.81   168.93    30.92     0.15  3348.26

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.04     1.06    16.37   546.72     1.02   540.43     0.92     0.82
 MEAN    16.88     1.05    16.24   544.89     1.02   538.91     0.92     0.82
 HUB     16.77     1.05    16.10   543.70     1.02   537.36     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     53.21    35.40    31.50     3.90     0.93     0.56     2.90
 MEAN    51.93    27.48    23.50     3.98     0.95     0.54     3.30     0.82
 HUB     52.94    10.55     6.50     4.05     0.95     0.52     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.895

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     270.046     211.425     168.000    1138.890       0.237       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.893      16.244     539.016      46.000      51.529      30.600     -20.929

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     171.720     211.425     272.375    1142.716       0.150       0.566

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.877      16.612     542.643     511.151       0.035       0.632

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     170.019       0.000     170.019    1142.767       0.149       0.465

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.551     542.692       0.000       0.060       0.136       0.474

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.738      16.810       1.050     545.106      10.262     159.202       1.234

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  63899.691       0.565     181.880  432110.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =21.008   EfDer =  0.933

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     50.368    1888.000      16.810     545.106       1.000       1.000       0.980
W Kg/sec =   22.89446

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     45.154    1841.703       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  38747.074   39521.930       4.148     545.479     131.501     429.765       3.268

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   161.34    -0.06   161.34     0.14   322.55
 MEAN    17.74      0.00    -0.02   161.34    -0.06   161.34     0.14
 HUB     15.05      0.00    -0.02   161.34    -0.06   161.34     0.14

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     64.00     46.36    17.64   330.67   367.98    16.58   542.93     0.32
 MEAN    61.10     43.40    17.70   292.26   333.88    16.58   542.93     0.29
 HUB     56.96     38.84    18.12   247.96   295.88    16.58   542.93     0.26

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   267.32    204.71    171.91  1150.28      0.23
 MEAN    17.51   263.46    198.95    172.72  1148.87      0.23
 HUB     14.85   274.53    212.63    173.66  1147.45      0.24

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39   210.61   121.67     0.18  4056.48
 MEAN   288.44   194.53    89.49     0.17  3483.85      1.90
 HUB    244.67   176.59    32.04     0.15  3158.40

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.82     1.06    17.16   555.84     1.02   549.87     0.92     0.85
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 MEAN    17.67     1.05    17.04   554.32     1.02   548.53     0.92     0.85
 HUB     17.59     1.05    16.90   553.46     1.02   547.17     0.92     0.85
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.98    35.29    31.50     3.79     0.93     0.52     2.90
 MEAN    49.04    27.39    23.50     3.89     0.95     0.51     3.28     0.85
 HUB     50.76    10.45     6.50     3.95     0.95     0.50     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.933

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     265.838     200.252     174.841    1148.991       0.231       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.686      17.038     548.641      46.000      48.876      31.500     -17.376

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     180.844     200.252     269.824    1152.306       0.157       0.515

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.673      17.371     551.812     471.992       0.029       0.590

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     176.223       0.000     176.223    1152.449       0.153       0.442

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.330     551.949       0.000       0.060       0.116       0.452

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.781      17.615       1.048     554.543       9.436     167.060       1.295

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  58765.027       0.552     167.265  433898.594


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =21.008   EfDer =  0.955

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     50.368    1888.000      17.615     554.543       1.000       1.000       0.980
W Kg/sec =   22.89446

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     43.460    1825.966       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  38747.074   39521.930       4.056     513.330     126.568     401.059       3.169

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   166.51    -0.06   166.51     0.14   306.89
 MEAN    16.97     0.00    -0.02   166.51    -0.06   166.51     0.14
 HUB     14.32     0.00    -0.02   166.51    -0.06   166.51     0.14

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.32    46.36    15.96   317.33   358.41    17.36   552.23     0.31
 MEAN    59.23    43.80    15.43   279.61   325.48    17.36   552.23     0.28
 HUB     54.79    37.84    16.95   235.93   288.82    17.36   552.23     0.25

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   256.62   186.66   176.10  1159.11     0.22
 MEAN    16.57   253.58   181.71   176.88  1157.84     0.22
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 HUB     13.89   264.95   196.47   177.76  1156.55     0.23

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    311.07   215.61   124.40     0.19  3525.25
 MEAN   273.07   199.09    91.36     0.17  3012.55     1.81
 HUB    228.85   180.69    32.38     0.16  2729.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.54     1.05    17.91   563.87     1.02   558.37     0.92     0.87
 MEAN    18.40     1.04    17.79   562.51     1.01   557.14     0.92     0.87
 HUB     18.32     1.04    17.67   561.76     1.01   555.90     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.67    35.24    31.50     3.74     0.93     0.49     2.90
 MEAN    45.77    27.32    23.50     3.82     0.95     0.47     3.29     0.87
 HUB     47.86    10.32     6.50     3.82     0.95     0.46     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.955

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     252.218     182.728     173.851    1158.108       0.218       0.032

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.413      17.814     557.404      46.000      46.426      32.400     -14.026

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     182.155     182.728     258.012    1160.744       0.157       0.478

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.406      18.092     559.945     456.573       0.022       0.554

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     173.947       0.000     173.947    1160.997       0.150       0.414

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.075     560.189       0.000       0.060       0.094       0.451

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.810      18.360       1.042     562.716       8.173     183.363       1.421

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  50903.379       0.526     144.888  448187.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =21.008   EfDer =  0.971

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     50.368    1888.000      18.360     562.716       1.000       1.000       0.980
W Kg/sec =   22.89446

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     42.002    1812.657       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  38747.074   39521.930       4.167     509.668     122.325     390.276       3.190

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   163.18    -0.06   163.18     0.14   289.78
 MEAN    15.91     0.00    -0.02   163.18    -0.06   163.18     0.14
 HUB     13.07     0.00    -0.02   163.18    -0.06   163.18     0.14

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.61    47.36    14.25   301.84   343.18    18.11   560.49     0.30
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MEAN    58.11    44.80    13.31   262.18   308.87    18.11   560.49     0.27
HUB     52.85    38.84    14.01   215.34   270.23    18.11   560.49     0.23
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   244.34   173.21   172.34  1166.94     0.21
MEAN    15.50   239.61   165.65   173.12  1165.66     0.21
HUB     12.59   247.34   175.82   173.96  1164.37     0.21

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    295.58   211.37   122.37     0.18  3108.38
MEAN   255.34   194.97    89.68     0.17  2568.14     1.77
HUB    207.43   176.81    31.61     0.15  2214.37

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.21     1.05    18.63   570.94     1.01   565.95     0.92     0.89
MEAN    19.06     1.04    18.50   569.51     1.01   564.72     0.92     0.89
HUB     18.96     1.03    18.37   568.57     1.01   563.47     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     45.14    35.38    31.50     3.88     0.93     0.47     2.90
MEAN    43.74    27.39    23.50     3.89     0.94     0.45     3.34     0.89
HUB     45.30    10.30     6.50     3.80     0.94     0.42     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.971

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      242.691     168.692     174.476    1165.700       0.208       -0.015

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.063      18.495      564.756       46.000      44.034      33.000     -11.034

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      184.514     168.692     250.005    1167.840       0.158       0.392

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       19.055       18.726     566.831     440.827       0.033       0.519

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      173.650       0.000     173.650    1168.174       0.149       0.427

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       18.740      567.156       0.000       0.060       0.075       0.416

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.836       19.032       1.037     569.674       6.958     204.055       1.582

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  43342.445       0.496     123.367  474288.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    291832.19    830.6509      49.2043      1.2598      0.7637     21.0082      1.0896
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =21.989   EfDer =  0.864

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      47.905    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   21.77515

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      46.799    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  36852.730   37589.707       6.101     831.557     136.288     619.754       4.547

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   106.85    -0.04   106.85     0.10   338.55
  MEAN    17.06     0.00    -0.02   106.85    -0.04   106.85     0.10
  HUB     12.51     0.00    -0.02   106.85    -0.04   106.85     0.10

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     72.55    50.47    22.08   339.90   356.33    15.01   521.86     0.32
  MEAN    69.19    47.20    21.99   281.08   300.74    15.01   521.86     0.27
  HUB     62.60    38.62    23.98   206.11   232.19    15.01   521.86     0.21

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   296.85   257.83   147.12  1128.85     0.26
  MEAN    18.04   290.43   249.91   147.97  1126.89     0.26
  HUB     15.00   299.65   259.92   149.09  1124.69     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   168.46    82.07     0.15  5319.85
  MEAN   297.16   155.33    47.25     0.14  4508.07     2.26
  HUB    247.14   149.64    12.78     0.13  3899.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.26     1.08    15.49   536.89     1.03   529.53     0.92     0.79
  MEAN    16.08     1.06    15.35   534.74     1.02   527.70     0.92     0.79
  HUB     15.94     1.06    15.18   533.13     1.02   525.63     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     60.29    29.15    24.20     4.95     0.93     0.65     2.90
  MEAN    59.37    17.71    12.70     5.01     0.95     0.61     3.51     0.79
  HUB     60.16    -4.90    -9.30     4.40     0.95     0.48     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.864

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     291.830     249.428     151.495    1127.011       0.259       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.086      15.352     527.807      24.000      58.727      35.400     -23.327

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     162.608     249.428     297.750    1132.236       0.144       0.654
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.064      15.834     532.712     528.796       0.040       0.763

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     152.255       0.000     152.255    1132.525       0.134       0.573

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.784     532.984       0.000       0.060       0.144       0.589

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.705      15.985       1.058     534.921      12.111     139.236       1.079

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  75399.297       0.653     204.119  449281.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =21.989   EfDer =  0.873

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    47.905    1888.000      15.985     534.921       1.000       1.000       0.980
W Kg/sec =   21.77515

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    44.737    1859.154       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 36852.730   37589.707       4.532     590.487     130.286     474.134       3.639

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP    20.55     0.00    -0.02   146.04    -0.05   146.04     0.13   333.40
 MEAN   18.08     0.00    -0.02   146.04    -0.05   146.04     0.13
 HUB    15.21     0.00    -0.02   146.04    -0.05   146.04     0.13

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP    66.67    46.36    20.31   338.58   368.78    15.80   533.14     0.33
 MEAN   63.88    42.30    21.58   297.86   331.78    15.80   533.14     0.29
 HUB    59.77    37.84    21.93   250.60   290.09    15.80   533.14     0.26

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP    20.42   273.81   224.63   156.57  1140.77     0.24
 MEAN   18.01   265.92   214.39   157.32  1139.12     0.23
 HUB    15.22   271.73   220.93   158.20  1137.45     0.24

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP   336.44   192.39   111.81     0.17  4587.95
 MEAN  296.73   177.56    82.34     0.16  3862.04     2.08
 HUB   250.81   161.00    29.88     0.14  3363.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    17.02     1.06    16.35   547.06     1.02   540.80     0.92     0.80
 MEAN   16.85     1.05    16.22   545.14     1.02   539.24     0.92     0.80
 HUB    16.74     1.05    16.09   543.82     1.02   537.66     0.92     0.80

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    55.12    35.53    31.50     4.03     0.93     0.58     2.90
 MEAN   53.73    27.63    23.50     4.13     0.95     0.56     3.30     0.80
 HUB    54.39    10.70     6.50     4.20     0.95     0.54     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.873

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     268.034     214.991     160.067    1139.234       0.235       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.863      16.225     539.342      46.000      53.331      30.600     -22.731

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     163.515     214.991     270.108    1143.205       0.143       0.596

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.846      16.607     543.109     511.151       0.036       0.664

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     161.923       0.000     161.923    1143.250       0.142       0.490

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.543     543.152       0.000       0.060       0.143       0.498

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.717      16.777       1.050     545.342      10.421     153.518       1.190

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  64890.348       0.573     175.669  410584.219


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =21.989   EfDer =  0.919

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     47.905    1888.000      16.777     545.342       1.000       1.000       0.980
W Kg/sec =   21.77515

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     43.039    1841.305       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  36852.730   37589.707       4.352     545.479     125.341     429.765       3.429

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   153.67    -0.05   153.67     0.13   322.48
 MEAN    17.74      0.00    -0.02   153.67    -0.05   153.67     0.13
 HUB     15.05      0.00    -0.02   153.67    -0.05   153.67     0.13

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     65.08     46.36    18.72   330.67   364.68    16.57   543.37     0.32
 MEAN    62.27     43.40    18.87   292.26   330.24    16.57   543.37     0.29
 HUB     58.22     38.84    19.38   247.96   291.77    16.57   543.37     0.26

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   266.38    210.03    163.84  1150.86      0.23
 MEAN    17.51   261.20    202.80    164.61  1149.41      0.23
 HUB     14.85   270.41    213.85    165.50  1147.94      0.24

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39   200.96   116.36     0.17  4161.77
 MEAN   288.44   185.56    85.64     0.16  3551.24      1.97
 HUB    244.67   168.34    30.82     0.15  3176.43

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.79     1.06    17.14   556.35     1.02   550.43     0.92     0.84
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 MEAN    17.64     1.05    17.02   554.74     1.02   549.04     0.92     0.84
 HUB     17.55     1.05    16.88   553.75     1.02   547.64     0.92     0.84
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     52.04    35.38    31.50     3.88     0.93     0.55     2.90
 MEAN    50.93    27.49    23.50     3.99     0.95     0.53     3.28     0.84
 HUB     52.26    10.55     6.50     4.05     0.95     0.52     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.919

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     263.507     204.129     166.636    1149.518       0.229       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.654      17.018     549.148      46.000      50.774      31.500     -19.274

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     172.256     204.129     267.097    1152.989       0.149       0.547

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.640      17.367     552.469     471.992       0.031       0.623

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     167.910       0.000     167.910    1153.117       0.146       0.464

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.319     552.592       0.000       0.060       0.127       0.473

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.764      17.577       1.048     554.947       9.605     160.896       1.247

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  59812.418       0.561     161.923  412170.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =21.989   EfDer =  0.944

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     47.905     1888.000       17.577     554.947       1.000        1.000        0.980
W Kg/sec =   21.77515

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     41.439     1825.301        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  36852.730   37589.707        4.253     513.330     120.684     401.059       3.323

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   158.68    -0.05   158.68     0.14   306.78
 MEAN    16.97      0.00    -0.02   158.68    -0.05   158.68     0.14
 HUB     14.32      0.00    -0.02   158.68    -0.05   158.68     0.14

       BetaFlo   BetaBlade Incid   U1        W1       Ps1      Ts1     Rel Mach
 TIP     63.44     46.36    17.08   317.33   354.84     17.35   552.84     0.31
 MEAN    60.43     43.80    16.63   279.61   321.54     17.35   552.84     0.28
 HUB     56.08     37.84    18.24   235.93   284.38     17.35   552.84     0.25

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   255.20   192.23   167.86  1159.88      0.22
 MEAN    16.57   250.88   185.77   168.61  1158.56      0.22
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 HUB     13.89   260.47   197.81   169.46  1157.22     0.23

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    311.07   205.67   118.84     0.18  3630.31
 MEAN   273.07   189.87    87.30     0.16  3079.89     1.87
 HUB    228.85   172.28    31.04     0.15  2748.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.51     1.05    17.90   564.55     1.02   559.11     0.92     0.86
 MEAN    18.37     1.04    17.78   563.10     1.01   557.84     0.92     0.86
 HUB     18.28     1.04    17.65   562.22     1.01   556.55     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.87    35.30    31.50     3.80     0.93     0.51     2.90
 MEAN    47.77    27.37    23.50     3.87     0.95     0.50     3.29     0.86
 HUB     49.41    10.38     6.50     3.88     0.95     0.48     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.944

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     249.737     186.817     165.735    1158.806       0.216       0.030

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.381      17.795     558.081      46.000      48.422      32.400     -16.022

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     173.551     186.817     254.991    1161.598       0.149       0.511

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.371      18.087     560.773     456.573       0.025       0.588

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     165.798       0.000     165.798    1161.825       0.143       0.436

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.062     560.993       0.000       0.060       0.107       0.470

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.795      18.321       1.042     563.288       8.341     176.279       1.367

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  51952.504       0.537     140.644  425634.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =21.989   EfDer =  0.962

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     47.905    1888.000      18.321     563.288       1.000       1.000       0.980
W Kg/sec =   21.77515

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     40.056    1811.735       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  36852.730   37589.707       4.369     509.668     116.656     390.276       3.346

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   155.56    -0.05   155.56     0.13   289.64
 MEAN    15.91     0.00    -0.02   155.56    -0.05   155.56     0.13
 HUB     13.07     0.00    -0.02   155.56    -0.05   155.56     0.13

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.74    47.36    15.38   301.84   339.61    18.09   561.27     0.29
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 MEAN    59.32    44.80    14.52   262.18   304.90    18.09   561.27     0.26
 HUB     54.16    38.84    15.32   215.34   265.69    18.09   561.27     0.23
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   242.82   178.79   164.30  1167.86     0.21
 MEAN    15.50   236.74   169.72   165.05  1166.53     0.20
 HUB     12.59   242.72   177.20   165.87  1165.20     0.21

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    295.58   201.58   116.79     0.17  3208.42
 MEAN   255.34   185.94    85.62     0.16  2631.08     1.83
 HUB    207.43   168.60    30.23     0.14  2231.65

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.18     1.05    18.61   571.78     1.02   566.85     0.92     0.88
 MEAN    19.03     1.04    18.49   570.25     1.01   565.57     0.92     0.88
 HUB     18.92     1.03    18.35   569.19     1.01   564.27     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.42    35.41    31.50     3.91     0.93     0.50     2.90
 MEAN    45.80    27.42    23.50     3.92     0.95     0.47     3.34     0.88
 HUB     46.89    10.33     6.50     3.83     0.95     0.45     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.962

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      239.882     172.830     166.352    1166.566       0.206       -0.016

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.031      18.477      565.601      46.000      46.094      33.000     -13.094

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      175.838     172.830     246.555    1168.856       0.150       0.426

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.020      18.722     567.824     440.827       0.039       0.553

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     165.540       0.000     165.540    1169.158       0.142       0.450

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.729     568.117       0.000       0.060       0.088       0.438

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.822      18.993       1.037     570.405       7.117     195.885       1.518

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  44332.465       0.507     120.016  450351.531

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    296387.03    802.3712     46.7987      1.2572      0.7451     21.9893      1.0910
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 50% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =22.654   EfDer =  0.846

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      46.254    1888.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   21.02436

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      45.185    1880.564       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   35582.078   36293.641       6.319     831.557     131.589     619.754       4.710

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   103.13    -0.04   103.13     0.09   338.55
  MEAN    17.06     0.00    -0.02   103.13    -0.04   103.13     0.09
  HUB     12.51     0.00    -0.02   103.13    -0.04   103.13     0.09

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     73.12    50.47    22.65   339.90   355.23    15.02   521.92     0.32
  MEAN    69.85    47.20    22.65   281.08   299.44    15.02   521.92     0.27
  HUB     63.42    38.62    24.80   206.11   230.51    15.02   521.92     0.21

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   296.44   260.12   142.18  1129.00     0.26
  MEAN    18.04   288.94   251.09   142.96  1127.03     0.26
  HUB     15.00   296.46   259.14   144.01  1124.82     0.26

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    339.90   163.03    79.78     0.14  5367.03
  MEAN   297.16   150.20    46.07     0.13  4529.35     2.33
  HUB    247.14   144.51    12.00     0.13  3887.48

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.25     1.08    15.48   537.01     1.03   529.68     0.92     0.77
  MEAN    16.06     1.06    15.34   534.80     1.02   527.82     0.92     0.77
  HUB     15.93     1.05    15.17   533.10     1.02   525.76     0.92     0.77

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     61.34    29.30    24.20     5.10     0.93     0.67     2.90
  MEAN    60.34    17.86    12.70     5.16     0.95     0.62     3.51     0.77
  HUB     60.94    -4.76    -9.30     4.54     0.95     0.50     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.846

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     290.222     250.607     146.374    1127.148       0.257       0.001

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      16.071      15.345     527.936      24.000      59.712      35.400     -24.312

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     157.059     250.607     295.756    1132.446       0.139       0.671
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.048      15.834     532.910     528.796       0.040       0.781

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     147.075       0.000     147.075    1132.716       0.130       0.587

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.782     533.164       0.000       0.060       0.146       0.602

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.690      15.969       1.057     534.971      12.161     136.371       1.057

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  75710.516       0.655     197.895  433655.688


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =22.654   EfDer =  0.854

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     46.254    1888.000      15.969     534.971       1.000       1.000       0.980
W Kg/sec =   21.02436

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     43.239    1859.067       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  35582.078   36293.641       4.689     590.487     125.924     474.134       3.765

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   141.08    -0.05   141.08     0.12   333.38
 MEAN    18.08     0.00    -0.02   141.08    -0.05   141.08     0.12
 HUB     15.21     0.00    -0.02   141.08    -0.05   141.08     0.12

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     67.38    46.36    21.02   338.58   366.84    15.80   533.31     0.32
 MEAN    64.66    42.30    22.36   297.86   329.62    15.80   533.31     0.29
 HUB     60.63    37.84    22.79   250.60   287.62    15.80   533.31     0.25

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   273.59   227.86   151.44  1141.02     0.24
 MEAN    18.01   264.76   216.69   152.13  1139.34     0.23
 HUB     15.22   269.28   221.61   152.97  1137.65     0.24

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    336.44   186.34   108.58     0.16  4653.93
 MEAN   296.73   171.90    80.04     0.15  3903.46     2.14
 HUB    250.81   155.73    29.20     0.14  3374.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.99     1.06    16.33   547.29     1.02   541.04     0.92     0.78
 MEAN    16.83     1.05    16.20   545.30     1.02   539.45     0.92     0.78
 HUB     16.71     1.05    16.07   543.90     1.02   537.84     0.92     0.78

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     56.39    35.64    31.50     4.14     0.93     0.60     2.90
 MEAN    54.93    27.75    23.50     4.25     0.95     0.58     3.30     0.78
 HUB     55.38    10.81     6.50     4.31     0.95     0.56     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.854

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     266.797     217.298     154.797    1139.453       0.234       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.837      16.205     539.551      46.000      54.535      30.600     -23.935

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     158.069     217.298     268.709    1143.520       0.138       0.616

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.819      16.596     543.409     511.151       0.036       0.686

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     156.539       0.000     156.539    1143.562       0.137       0.507

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.531     543.449       0.000       0.060       0.145       0.515

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.700      16.749       1.049     545.496      10.525     149.770       1.161

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  65536.703       0.579     171.302  396180.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =22.654   EfDer =  0.908

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     46.254    1888.000      16.749     545.496       1.000       1.000       0.980
W Kg/sec =   21.02436

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     41.629    1841.045       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  35582.078   36293.641       4.499     545.479     121.237     429.765       3.545

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   148.58    -0.05   148.58     0.13   322.44
 MEAN    17.74     0.00    -0.02   148.58    -0.05   148.58     0.13
 HUB     15.05     0.00    -0.02   148.58    -0.05   148.58     0.13

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     65.81    46.36    19.45   330.67   362.56    16.55   543.65     0.32
 MEAN    63.06    43.40    19.66   292.26   327.90    16.55   543.65     0.29
 HUB     59.08    38.84    20.24   247.96   289.11    16.55   543.65     0.25

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   265.94   213.55   158.49  1151.23     0.23
 MEAN    17.51   259.84   205.33   159.23  1149.75     0.23
 HUB     14.85   267.74   214.61   160.08  1148.26     0.23

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    326.39   194.56   112.84     0.17  4231.37
 MEAN   288.44   179.62    83.11     0.16  3595.50     2.03
 HUB    244.67   162.88    30.06     0.14  3187.73

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.77     1.06    17.12   556.69     1.02   550.79     0.92     0.83
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 MEAN    17.61     1.05    17.00   555.01     1.02   549.37     0.92     0.83
 HUB     17.51     1.05    16.86   553.93     1.02   547.94     0.92     0.83
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     53.42    35.45    31.50     3.95     0.93     0.56     2.90
 MEAN    52.21    27.56    23.50     4.06     0.95     0.55     3.28     0.83
 HUB     53.28    10.63     6.50     4.13     0.95     0.53     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.908

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     262.103     206.676     161.193    1149.857       0.228       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.624      16.997     549.474      46.000      52.048      31.500     -20.548

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     166.563     206.676     265.440    1153.430       0.144       0.568

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.609      17.354     552.894     471.992       0.033       0.645

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     162.391       0.000     162.391    1153.549       0.141       0.479

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.303     553.009       0.000       0.060       0.134       0.488

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.751      17.544       1.047     555.211       9.715     156.855       1.216

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  60499.496       0.568     158.136  397640.844


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =22.654   EfDer =  0.936

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     46.254    1888.000      17.544     555.211       1.000       1.000       0.980
W Kg/sec =   21.02436

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     40.095    1824.867       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 35582.078   36293.641       4.396     513.330     116.771     401.059       3.435

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   153.47    -0.05   153.47     0.13   306.71
 MEAN    16.97     0.00    -0.02   153.47    -0.05   153.47     0.13
 HUB     14.32     0.00    -0.02   153.47    -0.05   153.47     0.13

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     64.19    46.36    17.83   317.33   352.54    17.33   553.24     0.31
 MEAN    61.24    43.80    17.44   279.61   319.01    17.33   553.24     0.28
 HUB     56.96    37.84    19.12   235.93   281.50    17.33   553.24     0.24

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   254.47   195.91   162.40  1160.37     0.22
 MEAN    16.57   249.24   188.44   163.13  1159.02     0.22
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 HUB     13.89   257.57   198.65   163.95  1157.65     0.22

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    311.07   199.08   115.15     0.17  3699.86
 MEAN   273.07   183.77    84.63     0.16  3124.08     1.92
 HUB    228.85   166.71    30.20     0.14  2760.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.49     1.05    17.88   565.00     1.02   559.59     0.92     0.86
 MEAN    18.34     1.05    17.75   563.48     1.01   558.29     0.92     0.86
 HUB     18.24     1.04    17.62   562.51     1.01   556.97     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     50.34    35.34    31.50     3.84     0.93     0.53     2.90
 MEAN    49.12    27.42    23.50     3.92     0.95     0.51     3.29     0.86
 HUB     50.47    10.44     6.50     3.94     0.95     0.50     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.936

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     248.240     189.500     160.352    1159.256       0.214       0.028

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.349      17.772     558.518      46.000      49.763      32.400     -17.363

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     167.851     189.500     253.148    1162.151       0.144       0.533

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.339      18.074     561.311     456.573       0.027       0.611

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     160.393       0.000     160.393    1162.363       0.138       0.450

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.043     561.515       0.000       0.060       0.116       0.483

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.783      18.285       1.042     563.663       8.452     171.659       1.331

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  52641.984       0.544     137.597  410561.969


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =22.654   EfDer =  0.955

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     46.254    1888.000      18.285     563.663       1.000       1.000       0.980
W Kg/sec =   21.02436

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     38.763    1811.133       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  35582.078   36293.641       4.515     509.668     112.891     390.276       3.457

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   150.50    -0.05   150.50     0.13   289.54
 MEAN    15.91     0.00    -0.02   150.50    -0.05   150.50     0.13
 HUB     13.07     0.00    -0.02   150.50    -0.05   150.50     0.13

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.50    47.36    16.14   301.84   337.33    18.07   561.77     0.29
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MEAN    60.15    44.80    15.35   262.18   302.35    18.07   561.77     0.26
HUB     55.06    38.84    16.22   215.34   262.76    18.07   561.77     0.23
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   242.02   182.47   158.98  1168.45     0.21
MEAN    15.50   234.97   172.35   159.71  1167.10     0.20
HUB     12.59   239.74   178.08   160.50  1165.73     0.21

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    295.58   195.11   113.11     0.17  3274.50
MEAN   255.34   179.98    82.98     0.15  2671.89     1.88
HUB    207.43   163.16    29.35     0.14  2242.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.16     1.05    18.59   572.33     1.02   567.44     0.92     0.87
MEAN    18.99     1.04    18.46   570.73     1.01   566.12     0.92     0.87
HUB     18.88     1.03    18.33   569.60     1.01   564.80     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     48.94    35.43    31.50     3.93     0.93     0.51     2.90
MEAN    47.18    27.46    23.50     3.96     0.95     0.49     3.34     0.87
HUB     47.97    10.36     6.50     3.86     0.95     0.46     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.955

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     238.151     175.514     160.968    1167.127       0.204      -0.017

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.999      18.455     566.149      46.000      47.475      33.000     -14.475

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     170.093     175.514     244.411    1169.515       0.145       0.449

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.987      18.708     568.469     440.827       0.042       0.576

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     160.167       0.000     160.167    1169.797       0.137       0.465

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.710     568.742       0.000       0.060       0.097       0.452

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.811      18.957       1.037     570.884       7.221     190.588       1.477

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  44980.277       0.515     117.571  434358.656

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    299368.97    782.5004     45.1851      1.2548      0.7314     22.6539      1.0920
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 3.458   EfDer =  0.989

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      81.906    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   37.22986

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
      80.014    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63008.605   64268.645       3.569     831.557     233.017     619.754       2.660

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   184.33    -0.06   184.33     0.16   270.77
  MEAN    17.06     0.00    -0.02   184.33    -0.06   184.33     0.16
  HUB     12.51     0.00    -0.02   184.33    -0.06   184.33     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.87    50.47     5.40   271.85   328.50    14.82   519.97     0.29
  MEAN    50.66    47.20     3.46   224.81   290.76    14.82   519.97     0.26
  HUB     41.82    38.62     3.20   164.85   247.33    14.82   519.97     0.22

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   289.55   133.23   257.08  1120.40     0.26
  MEAN    18.04   302.98   159.48   257.61  1119.97     0.27
  HUB     15.00   342.05   223.27   259.13  1118.78     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   292.07   138.61     0.26  2749.89
  MEAN   237.67   269.21    78.18     0.24  2877.48     1.20
  HUB    197.66   260.39    25.61     0.23  3349.78

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.64     1.04    14.93   528.63     1.01   521.63     0.92     0.90
  MEAN    15.67     1.04    14.89   528.90     1.01   521.23     0.92     0.90
  HUB     15.76     1.04    14.77   529.90     1.01   520.13     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     27.40    28.33    24.20     4.13     0.93     0.18     2.90
  MEAN    31.76    16.88    12.70     4.18     0.92     0.15     3.51     0.90
  HUB     40.75    -5.64    -9.30     3.66     0.92     0.05     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     308.197     159.171     263.913    1119.947       0.275      -0.015

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.684      14.879     521.211      24.000      31.095      35.400       4.305

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     288.121     159.171     329.164    1121.020       0.257       0.134
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      15.682      14.977     522.211     528.796       0.013       0.303

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     268.037       0.000     268.037    1122.021       0.239       0.202

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.047     523.144       0.000       0.060       0.043       0.218

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.851      15.657       1.036     529.144       6.334     237.819       1.844

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  39436.422       0.534     182.534  775098.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.458   EfDer =  0.958

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    81.906    1510.000      15.657     529.144       1.000       1.000       0.980
W Kg/sec =   37.22986

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    77.669    1495.023       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63008.605   64268.645       2.611     590.487     226.188     474.134       2.096

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   256.68    -0.09   256.68     0.23   268.10
 MEAN    18.08     0.00    -0.02   256.68    -0.09   256.68     0.23
 HUB     15.21     0.00    -0.02   256.68    -0.09   256.68     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.54    46.36     0.18   270.79   373.18    15.10   523.64     0.33
 MEAN    42.87    42.30     0.57   238.22   350.25    15.10   523.64     0.31
 HUB     38.00    37.84     0.16   200.43   325.71    15.10   523.64     0.29

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   288.30    71.96   279.17  1124.34     0.26
 MEAN    18.01   294.19    93.08   279.07  1124.50     0.26
 HUB     15.22   316.63   149.35   279.20  1124.63     0.28

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    269.08   341.75   197.12     0.30  1471.29
 MEAN   237.32   314.15   144.24     0.28  1677.95     1.19
 HUB    200.60   283.86    51.25     0.25  2274.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     15.94     1.02    15.23   532.26     1.01   525.32     0.92     0.88
 MEAN    15.98     1.02    15.24   532.70     1.01   525.47     0.92     0.88
 HUB     16.10     1.03    15.23   533.96     1.01   525.59     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     14.45    35.22    31.50     3.72     0.93     0.12     2.90
 MEAN    18.45    27.33    23.50     3.83     0.90     0.14     3.30     0.88
 HUB     28.14    10.40     6.50     3.90     0.90     0.19     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.958

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     299.008      93.341     284.066    1124.541       0.266      -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.999      15.230     525.504      46.000      18.190      30.600      12.410

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     294.868      93.341     309.289    1124.761       0.262       0.011

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      15.988      15.241     525.709     511.151       0.024       0.130

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     291.464       0.000     291.464    1124.939       0.259      -0.021

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.214     525.876       0.000       0.060       0.083      -0.025

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.716      15.942       1.018     532.971       3.827     345.072       2.675

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  23827.945       0.329     110.289  720333.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.458   EfDer =  0.891

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     81.906    1510.000      15.942     532.971       1.000       1.000       0.980
W Kg/sec =   37.22986

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     76.557    1489.646       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  63008.605   64268.645       2.447     545.479     222.952     429.765       1.928

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   275.93    -0.10   275.93     0.25   260.89
 MEAN    17.74      0.00    -0.02   275.93    -0.10   275.93     0.25
 HUB     15.05      0.00    -0.02   275.93    -0.10   275.93     0.25

       BetaFlo   BetaBlade Incid   U1        W1       Ps1      Ts1     Rel Mach
 TIP     43.80     46.36    -2.56   264.47   382.27    15.29   526.61     0.34
 MEAN    40.28     43.40    -3.12   233.74   361.69    15.29   526.61     0.32
 HUB     35.72     38.84    -3.12   198.32   339.86    15.29   526.61     0.30

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   303.98     47.26    300.29  1126.39       0.27
 MEAN    17.51   308.86     74.11    299.83  1126.94       0.27
 HUB     14.85   330.49    139.20    299.75  1127.44       0.29

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    261.04    368.62    213.79     0.33    938.04
 MEAN   230.69    338.26    156.58     0.30   1299.02      1.13
 HUB    195.68    305.02     56.48     0.27   2068.51

         Pt2       PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     16.11      1.01     15.32    534.96      1.00    527.24      0.92      0.82
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 MEAN    16.18     1.01    15.35   535.72     1.01   527.75     0.92     0.82
 HUB     16.32     1.02    15.37   537.35     1.01   528.23     0.92     0.82
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP      8.94    35.45    31.50     3.95     0.93     0.06     2.90
 MEAN    13.88    27.57    23.50     4.07     0.89     0.10     3.28     0.82
 HUB     24.91    10.67     6.50     4.17     0.89     0.16     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.891

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     312.658      74.592     303.629    1127.035       0.277      -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.193      15.349     527.845      46.000      13.802      31.500      17.698

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     319.317      74.592     327.914    1126.659       0.283      -0.062

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.172      15.293     527.493     471.992       0.035       0.085

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     311.066       0.000     311.066    1127.123       0.276      -0.093

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.270     527.928       0.000       0.060       0.118      -0.090

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.500      16.101       1.010     536.009       3.038     408.904       3.170

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  18914.244       0.278      87.546  731933.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.458   EfDer =  0.819

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     81.906    1510.000      16.101     536.009       1.000       1.000       0.980
W Kg/sec =   37.22986

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     76.017    1485.419       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  63008.605   64268.645       2.319     513.330     221.378     401.059       1.812

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   293.04    -0.10   293.04     0.26   249.65
 MEAN    16.97     0.00    -0.02   293.04    -0.10   293.04     0.26
 HUB     14.32     0.00    -0.02   293.04    -0.10   293.04     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     40.91    46.36    -5.45   253.79   387.73    15.36   528.84     0.34
 MEAN    37.36    43.80    -6.44   223.63   368.68    15.36   528.84     0.33
 HUB     32.79    37.84    -5.05   188.70   348.59    15.36   528.84     0.31

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   318.04    21.57   317.30  1127.65     0.28
 MEAN    16.57   320.83    52.03   316.59  1128.52     0.28
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HUB     13.89   339.36   122.80   316.37  1129.33     0.30

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    248.79   390.27   227.22     0.35   409.21
MEAN   218.40   357.64   166.36     0.32   864.12     1.09
HUB    183.03   322.05    60.23     0.29  1707.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.17     1.00    15.30   536.87     1.00   528.43     0.92     0.75
MEAN    16.24     1.01    15.36   537.84     1.00   529.24     0.92     0.75
HUB     16.39     1.02    15.39   539.62     1.01   530.00     0.92     0.75

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP      3.89    35.61    31.50     4.11     0.93     0.00     2.90
MEAN     9.33    27.72    23.50     4.22     0.87     0.05     3.29     0.75
HUB     21.21    10.78     6.50     4.28     0.87     0.12     3.90

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.819

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     315.217      52.327     310.843    1129.124       0.279       0.046

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    16.258      15.400     529.814      46.000       9.556      32.400      22.844

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     331.214      52.327     335.322    1128.204       0.294      -0.070

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.228      15.284     528.950     456.573       0.043       0.052

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     316.464       0.000     316.464    1129.054       0.280      -0.133

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.278     529.748       0.000       0.060       0.143      -0.077

   STAGE EXIT CONDITIONS, STAGE             4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.157      16.136       1.002     538.112       2.103     538.644       4.176

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  13093.129       0.212      60.602  764935.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.458   EfDer =  0.771

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    81.906    1510.000      16.136     538.112       1.000       1.000       0.980
W Kg/sec =   37.22986

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    76.002    1482.514       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 63008.605   64268.645       2.303     509.668     221.338     390.276       1.763

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   295.82    -0.10   295.82     0.26   237.01
MEAN    15.91     0.00    -0.02   295.82    -0.10   295.82     0.26
HUB     13.07     0.00    -0.02   295.82    -0.10   295.82     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     39.23    47.36    -8.13   241.41   381.88    15.38   530.80     0.34
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MEAN    35.34    44.80    -9.46   209.69   362.66    15.38   530.80     0.32
HUB     30.22    38.84    -8.62   172.23   342.35    15.38   530.80     0.30

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   319.99     4.93   319.95  1129.05     0.28
MEAN    15.50   321.09    34.91   319.19  1130.01     0.28
HUB     12.59   335.66   104.66   318.92  1130.90     0.30

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    236.40   394.90   231.47     0.35    90.38
MEAN   204.22   361.31   169.30     0.32   542.67     1.06
HUB    165.90   324.75    61.24     0.29  1319.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.15     1.00    15.27   538.30     1.00   529.75     0.92     0.71
MEAN    16.22     1.01    15.33   539.26     1.00   530.65     0.92     0.71
HUB     16.34     1.01    15.37   540.90     1.01   531.49     0.92     0.71

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP      0.88    35.88    31.50     4.38     0.93    -0.03     2.90
MEAN     6.24    27.94    23.50     4.44     0.85     0.02     3.34     0.71
HUB     18.17    10.87     6.50     4.37     0.85     0.09     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.771

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     323.863      35.552     321.906    1130.089       0.287      -0.017

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    16.219      15.319     530.730      46.000       6.302      33.000      26.698

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     346.835      35.552     348.652    1128.719       0.307      -0.214

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.156      15.131     529.443     440.827       0.089       0.031

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    14.701     325.682       0.000     325.682    1129.984       0.288      -0.129

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.202     530.631       0.000       0.060       0.145      -0.137

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
    -0.208      16.106       0.998     539.489       1.377     740.706       5.742

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   8575.180       0.153      39.691  816814.938

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    103846.91    480.6622     80.0137      1.0661      0.5805      3.4576      1.0319
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.035   EfDer =  0.993

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      80.280    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   36.49083

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      78.425    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  61757.855   62992.879       3.641     831.557     228.392     619.754       2.714

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   180.57    -0.06   180.57     0.16   270.77
  MEAN    17.06     0.00    -0.02   180.57    -0.06   180.57     0.16
  HUB     12.51     0.00    -0.02   180.57    -0.06   180.57     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.41    50.47     5.94   271.85   326.41    14.83   520.09     0.29
  MEAN    51.23    47.20     4.03   224.81   288.40    14.83   520.09     0.26
  HUB     42.40    38.62     3.78   164.85   244.54    14.83   520.09     0.22

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   286.15   136.29   251.61  1120.71     0.26
  MEAN    18.04   299.32   161.26   252.17  1120.24     0.27
  HUB     15.00   337.58   222.75   253.66  1119.04     0.30

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   285.80   135.56     0.26  2812.92
  MEAN   237.67   263.49    76.41     0.24  2909.52     1.22
  HUB    197.66   254.89    25.09     0.23  3342.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.66     1.04    14.96   528.76     1.01   521.93     0.92     0.91
  MEAN    15.68     1.04    14.92   528.97     1.01   521.49     0.92     0.91
  HUB     15.76     1.04    14.80   529.88     1.01   520.37     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     28.44    28.31    24.20     4.11     0.93     0.20     2.90
  MEAN    32.60    16.86    12.70     4.16     0.92     0.17     3.51     0.91
  HUB     41.29    -5.65    -9.30     3.65     0.92     0.06     4.78

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     304.362     160.945     258.327    1120.224       0.272      -0.014

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.692      14.907     521.469      24.000      31.924      35.400       3.476

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     281.874     160.945     324.587    1121.406       0.251       0.151

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      15.691      15.015     522.570     528.796       0.012       0.315

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     262.249       0.000     262.249    1122.362       0.234       0.218

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.083     523.462       0.000       0.060       0.041       0.234

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      15.668       1.037     529.206       6.396     233.679       1.811

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  39820.219       0.539     180.652  759296.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.035   EfDer =  0.967

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     80.280    1510.000      15.668     529.206       1.000       1.000       0.980
W Kg/sec =   36.49083

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     76.080    1494.936       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  61757.855   62992.879       2.665     590.487     221.562     474.134       2.140

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   251.16    -0.09   251.16     0.22   268.08
 MEAN    18.08     0.00    -0.02   251.16    -0.09   251.16     0.22
 HUB     15.21     0.00    -0.02   251.16    -0.09   251.16     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.16    46.36     0.80   270.79   369.40    15.13   523.94     0.33
 MEAN    43.50    42.30     1.20   238.22   346.23    15.13   523.94     0.31
 HUB     38.60    37.84     0.76   200.43   321.38    15.13   523.94     0.29

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   283.45    76.53   272.92  1124.87     0.25
 MEAN    18.01   289.43    96.42   272.89  1124.95     0.26
 HUB     15.22   311.84   150.59   273.07  1125.01     0.28

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    269.08   334.01   192.55     0.30  1564.52
 MEAN   237.32   307.12   140.90     0.27  1738.05     1.21
 HUB    200.60   277.61    50.01     0.25  2293.69

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     15.97     1.02    15.28   532.52     1.01   525.81     0.92     0.88
 MEAN    16.01     1.02    15.29   532.88     1.01   525.89     0.92     0.88
 HUB     16.12     1.03    15.28   534.06     1.01   525.94     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.66    35.20    31.50     3.70     0.93     0.13     2.90
 MEAN    19.46    27.31    23.50     3.81     0.91     0.16     3.30     0.88
 HUB     28.87    10.38     6.50     3.88     0.91     0.20     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     294.108      96.689     277.760    1124.997       0.261      -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.024      15.279     525.930      46.000      19.193      30.600      11.407

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     288.174      96.689     303.962    1125.306       0.256       0.026

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.015      15.300     526.219     511.151       0.022       0.142

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     284.770       0.000     284.770    1125.480       0.253      -0.003

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.277     526.381       0.000       0.060       0.077      -0.005

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.745      15.974       1.020     533.154       3.948     333.438       2.585

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  24584.227       0.340     111.531  705186.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.035   EfDer =  0.905

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     80.280    1510.000      15.974     533.154       1.000       1.000       0.980
W Kg/sec =   36.49083

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     74.901    1489.391       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  61757.855   62992.879       2.501     545.479     218.128     429.765       1.970

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   269.64    -0.09   269.64     0.24   260.85
 MEAN    17.74      0.00    -0.02   269.64    -0.09   269.64     0.24
 HUB     15.05      0.00    -0.02   269.64    -0.09   269.64     0.24

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     44.46     46.36    -1.90   264.47   377.75     15.35   527.08      0.34
 MEAN    40.93     43.40    -2.47   233.74   356.91     15.35   527.08      0.32
 HUB     36.35     38.84    -2.49   198.32   334.77     15.35   527.08      0.30

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   297.79     52.51   293.13  1127.15      0.26
 MEAN    17.51   302.95     77.90   292.76  1127.61      0.27
 HUB     14.85   324.75    140.62   292.73  1128.02      0.29

       U2        W2        Wu2      MachRel2  DelRCu     Ws1/W2
 TIP    261.04    359.74    208.53     0.32  1042.03
 MEAN   230.69    330.24    152.79     0.29  1365.41      1.15
 HUB    195.68    297.86     55.07     0.26  2089.54

         Pt2       PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     16.17      1.01     15.40   535.36      1.00   527.95      0.92      0.83
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 MEAN    16.23     1.02    15.43   536.04     1.01   528.38     0.92     0.83
 HUB     16.36     1.02    15.44   537.58     1.01   528.77     0.92     0.83
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     10.16    35.43    31.50     3.93     0.93     0.07     2.90
 MEAN    14.90    27.56    23.50     4.06     0.89     0.11     3.28     0.83
 HUB     25.66    10.65     6.50     4.15     0.89     0.16     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.905

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     306.646      78.411     296.451    1127.707       0.272      -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.242      15.427     528.474      46.000      14.815      31.500      16.685

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     311.568      78.411     321.283    1127.435       0.276      -0.049

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.223      15.384     528.220     471.992       0.033       0.096

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     303.431       0.000     303.431    1127.881       0.269      -0.077

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.364     528.638       0.000       0.060       0.112      -0.073

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.553      16.158       1.012     536.327       3.173     391.238       3.033

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  19755.357       0.290      89.624  716242.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 4.035   EfDer =  0.833

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     80.280     1510.000       16.158     536.327       1.000        1.000        0.980
W Kg/sec =   36.49083

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     74.267     1484.979        1.402       0.249      53.349       56.000        0.050

   CFM        SCFM             A1/A*       Area1        A*      AthrRotor  ChokeMargin
  61757.855   62992.879        2.373     513.330     216.284     401.059       1.854

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   285.91    -0.10   285.91      0.25   249.58
 MEAN    16.97      0.00    -0.02   285.91    -0.10   285.91      0.25
 HUB     14.32      0.00    -0.02   285.91    -0.10   285.91      0.25

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     41.61     46.36    -4.75   253.79   382.37     15.45    529.50      0.34
 MEAN    38.04     43.80    -5.76   223.63   363.04     15.45    529.50      0.32
 HUB     33.44     37.84    -4.40   188.70   342.62     15.45    529.50      0.30

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88    310.47     27.45    309.26   1128.66      0.28
 MEAN    16.57    313.74     56.31    308.65   1129.42      0.28
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 HUB     13.89   332.62   124.39   308.48  1130.12     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    248.79   380.30   221.33     0.34   520.21
 MEAN   218.40   348.62   162.09     0.31   934.87     1.10
 HUB    183.03   314.01    58.64     0.28  1729.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.25     1.01    15.41   537.43     1.00   529.38     0.92     0.76
 MEAN    16.32     1.01    15.46   538.31     1.00   530.09     0.92     0.76
 HUB     16.45     1.02    15.49   539.99     1.01   530.75     0.92     0.76

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     5.07    35.59    31.50     4.09     0.93     0.02     2.90
 MEAN   10.34    27.71    23.50     4.21     0.87     0.06     3.29     0.76
 HUB    21.96    10.76     6.50     4.26     0.87     0.13     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.833

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     308.307      56.622     303.063    1130.001       0.273       0.047

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.330      15.506     530.635      46.000      10.583      32.400      21.817

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     322.703      56.622     327.633    1129.193       0.286      -0.061

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.303      15.403     529.877     456.573       0.041       0.062

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     308.289       0.000     308.289    1130.002       0.273      -0.123

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.397     530.636       0.000       0.060       0.140      -0.067

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.245      16.216       1.004     538.574       2.247     506.298       3.925

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  13988.630       0.226      63.462  748191.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 4.035   EfDer =  0.778

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     80.280    1510.000      16.216     538.574       1.000       1.000       0.980
W Kg/sec =   36.49083

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     74.158    1481.878       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  61757.855   62992.879       2.360     509.668     215.966     390.276       1.807

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   288.25    -0.10   288.25     0.25   236.90
 MEAN    15.91     0.00    -0.02   288.25    -0.10   288.25     0.25
 HUB     13.07     0.00    -0.02   288.25    -0.10   288.25     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     39.96    47.36    -7.40   241.41   376.05    15.50   531.63     0.33
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 MEAN    36.05    44.80    -8.75   209.69   356.51    15.50   531.63     0.32
 HUB     30.87    38.84    -7.97   172.23   335.84    15.50   531.63     0.30
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   311.66    11.17   311.46  1130.26     0.28
 MEAN    15.50   313.32    39.48   310.82  1131.10     0.28
 HUB     12.59   328.35   106.39   310.64  1131.88     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    236.40   384.36   225.23     0.34   202.27
 MEAN   204.22   351.78   164.74     0.31   613.39     1.07
 HUB    165.90   316.29    59.51     0.28  1340.72

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.25     1.00    15.41   539.00     1.00   530.89     0.92     0.71
 MEAN    16.31     1.01    15.47   539.87     1.00   531.67     0.92     0.71
 HUB     16.43     1.01    15.50   541.41     1.01   532.41     0.92     0.71

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP      2.05    35.87    31.50     4.37     0.93    -0.02     2.90
 MEAN     7.24    27.92    23.50     4.42     0.86     0.03     3.34     0.71
 HUB     18.91    10.85     6.50     4.35     0.86     0.10     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.778

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     316.005      40.202     313.438    1131.182       0.279       -0.017

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.312      15.451     531.756      46.000       7.309      33.000      25.691

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     337.434      40.202     339.820    1129.938       0.299       -0.206

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.253      15.277     530.586     440.827       0.088       0.040

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     316.962       0.000     316.962    1131.129       0.280       -0.125

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      15.341     531.705       0.000       0.060       0.146       -0.133

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
     -0.084      16.202       0.999     540.095       1.521     678.543       5.260

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   9473.347       0.170      42.978  798685.312

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    107621.78    488.2462     78.4253      1.0725      0.6130       4.0348       1.0331
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.466   EfDer =  0.995

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      79.082    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   35.94620

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      77.255    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  60836.117   62052.707       3.696     831.557     224.983     619.754       2.755

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   177.81    -0.06   177.81     0.16   270.77
  MEAN    17.06     0.00    -0.02   177.81    -0.06   177.81     0.16
  HUB     12.51     0.00    -0.02   177.81    -0.06   177.81     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.82    50.47     6.35   271.85   324.88    14.84   520.17     0.29
  MEAN    51.67    47.20     4.47   224.81   286.67    14.84   520.17     0.26
  HUB     42.84    38.62     4.22   164.85   242.51    14.84   520.17     0.22

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   283.71   138.53   247.59  1120.94     0.25
  MEAN    18.04   296.64   162.50   248.17  1120.44     0.26
  HUB     15.00   334.35   222.41   249.64  1119.22     0.30

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   281.21   133.32     0.25  2859.06
  MEAN   237.67   259.31    75.17     0.23  2931.89     1.23
  HUB    197.66   250.87    24.75     0.22  3336.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.67     1.04    14.99   528.86     1.01   522.14     0.92     0.91
  MEAN    15.68     1.04    14.94   529.02     1.01   521.67     0.92     0.91
  HUB     15.76     1.04    14.82   529.87     1.01   520.54     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     29.23    28.30    24.20     4.10     0.93     0.21     2.90
  MEAN    33.22    16.85    12.70     4.15     0.92     0.18     3.51     0.91
  HUB     41.70    -5.66    -9.30     3.64     0.92     0.07     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     301.555     162.184     254.227    1120.424       0.269      -0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.698      14.926     521.655      24.000      32.536      35.400       2.864

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     277.300     162.184     321.246    1121.683       0.247       0.163
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      15.697      15.043     522.828     528.796       0.011       0.324

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     258.013       0.000     258.013    1122.607       0.230       0.229

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.108     523.690       0.000       0.060       0.039       0.246

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.863      15.675       1.038     529.251       6.441     230.674       1.788

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  40098.758       0.543     179.200  747667.688


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.466   EfDer =  0.972

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     79.082    1510.000      15.675     529.251       1.000       1.000       0.980
W Kg/sec =   35.94620

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     74.914    1494.873       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  60836.117   62052.707       2.707     590.487     218.164     474.134       2.173

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   247.12    -0.09   247.12     0.22   268.07
 MEAN    18.08     0.00    -0.02   247.12    -0.09   247.12     0.22
 HUB     15.21     0.00    -0.02   247.12    -0.09   247.12     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.63    46.36     1.27   270.79   366.67    15.15   524.15     0.33
 MEAN    43.96    42.30     1.66   238.22   343.31    15.15   524.15     0.31
 HUB     39.06    37.84     1.22   200.43   318.24    15.15   524.15     0.28

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   279.98    79.84   268.36  1125.24     0.25
 MEAN    18.01   286.00    98.83   268.38  1125.28     0.25
 HUB     15.22   308.37   151.50   268.59  1125.28     0.27

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    269.08   328.37   189.24     0.29  1631.99
 MEAN   237.32   302.00   138.49     0.27  1781.45     1.22
 HUB    200.60   273.04    49.09     0.24  2307.62

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     15.99     1.02    15.32   532.71     1.01   526.16     0.92     0.89
 MEAN    16.02     1.02    15.32   533.02     1.01   526.19     0.92     0.89
 HUB     16.13     1.03    15.31   534.14     1.01   526.19     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.57    35.19    31.50     3.69     0.93     0.14     2.90
 MEAN    20.22    27.30    23.50     3.80     0.91     0.16     3.30     0.89
 HUB     29.43    10.36     6.50     3.86     0.91     0.20     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.972

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     290.577      99.107     273.154    1125.323       0.258      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.042      15.314     526.235      46.000      19.942      30.600      10.658

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     283.290      99.107     300.126    1125.697       0.252       0.037

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.034      15.342     526.584     511.151       0.020       0.151

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     279.892       0.000     279.892    1125.868       0.249       0.011

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.322     526.744       0.000       0.060       0.072       0.009

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.765      15.996       1.020     533.287       4.036     325.319       2.522

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  25132.625       0.347     112.317  694062.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.466   EfDer =  0.915

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     79.082    1510.000      15.996     533.287       1.000       1.000       0.980
W Kg/sec =   35.94620

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     73.689    1489.205       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  60836.117   62052.707       2.542     545.479     214.599     429.765       2.003

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   265.05    -0.09   265.05     0.24   260.82
 MEAN    17.74     0.00    -0.02   265.05    -0.09   265.05     0.24
 HUB     15.05     0.00    -0.02   265.05    -0.09   265.05     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.95    46.36    -1.41   264.47   374.49    15.39   527.42     0.33
 MEAN    41.42    43.40    -1.98   233.74   353.46    15.39   527.42     0.31
 HUB     36.82    38.84    -2.02   198.32   331.09    15.39   527.42     0.29

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   293.37    56.28   287.92  1127.70     0.26
 MEAN    17.51   298.72    80.70   287.62  1128.08     0.26
 HUB     14.85   320.61   141.67   287.61  1128.44     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    261.04   353.31   204.76     0.31  1116.78
 MEAN   230.69   324.38   149.99     0.29  1414.38     1.16
 HUB    195.68   292.64    54.02     0.26  2105.11

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.20     1.01    15.46   535.65     1.00   528.46     0.92     0.84
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 MEAN    16.26     1.02    15.49   536.28     1.01   528.83     0.92     0.84
 HUB     16.39     1.02    15.49   537.74     1.01   529.16     0.92     0.84
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     11.06    35.42    31.50     3.92     0.93     0.08     2.90
 MEAN    15.67    27.54    23.50     4.04     0.89     0.12     3.28     0.84
 HUB     26.22    10.64     6.50     4.14     0.89     0.17     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.915

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     302.344      81.228     291.228    1128.187       0.268      -0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.276      15.483     528.924      46.000      15.585      31.500      15.915

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     305.936      81.228     316.536    1127.992       0.271      -0.039

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.260      15.448     528.741     471.992       0.031       0.105

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     297.885       0.000     297.885    1128.425       0.264      -0.064

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      15.431     529.147       0.000       0.060       0.107      -0.060

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.589      16.199       1.013     536.558       3.271     379.128       2.939

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  20366.900       0.299      91.019  704735.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 4.466   EfDer =  0.845

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     79.082    1510.000       16.199     536.558       1.000        1.000        0.980
W Kg/sec =   35.94620

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     72.991    1484.659        1.402       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  60836.117   62052.707        2.415     513.330     212.566     401.059       1.887

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   280.73    -0.10   280.73     0.25   249.53
 MEAN    16.97      0.00    -0.02   280.73    -0.10   280.73     0.25
 HUB     14.32      0.00    -0.02   280.73    -0.10   280.73     0.25

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     42.13    46.36    -4.23   253.79   378.51     15.52   529.98      0.34
 MEAN    38.55    43.80    -5.25   223.63   358.97     15.52   529.98      0.32
 HUB     33.92    37.84    -3.92   188.70   338.31     15.52   529.98      0.30

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   305.07    31.72   303.42  1129.39      0.27
 MEAN    16.57   308.65    59.42   302.88  1130.06      0.27
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HUB     13.89   327.78   125.61   302.75  1130.69     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    248.79   373.07   217.07     0.33   600.76
MEAN   218.40   342.07   158.98     0.30   986.47     1.11
HUB    183.03   308.15    57.42     0.27  1746.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.30     1.01    15.50   537.83     1.00   530.06     0.92     0.77
MEAN    16.37     1.01    15.54   538.65     1.00   530.69     0.92     0.77
HUB     16.50     1.02    15.56   540.25     1.01   531.28     0.92     0.77

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP      5.97    35.58    31.50     4.08     0.93     0.03     2.90
MEAN    11.10    27.69    23.50     4.19     0.88     0.07     3.29     0.77
HUB     22.53    10.74     6.50     4.24     0.88     0.14     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.845

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     303.354      59.754     297.411    1130.628       0.268       0.047

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    16.382      15.582     531.224      46.000      11.360      32.400      21.040

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     316.526      59.754     322.117    1129.903       0.280      -0.053

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.357      15.488     530.543     456.573       0.039       0.070

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     302.350       0.000     302.350    1130.682       0.267      -0.114

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.484     531.275       0.000       0.060       0.136      -0.058

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.304      16.274       1.005     538.910       2.352     484.775       3.758

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  14643.159       0.237      65.440  735930.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 4.466   EfDer =  0.786

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     79.082    1510.000      16.274     538.910       1.000       1.000       0.980
W Kg/sec =   35.94620

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     72.811    1481.416       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  60836.117   62052.707       2.404     509.668     212.045     390.276       1.841

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   282.76    -0.10   282.76     0.25   236.83
 MEAN    15.91     0.00    -0.02   282.76    -0.10   282.76     0.25
 HUB     13.07     0.00    -0.02   282.76    -0.10   282.76     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     40.50    47.36    -6.86   241.41   371.85    15.58   532.23     0.33
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MEAN    36.57    44.80    -8.23   209.69   352.08    15.58   532.23     0.31
HUB     31.36    38.84    -7.48   172.23   331.13    15.58   532.23     0.29
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   305.70    15.71   305.30  1131.13     0.27
MEAN    15.50   307.73    42.79   304.74  1131.88     0.27
HUB     12.59   323.06   107.61   304.61  1132.57     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    236.40   376.71   220.69     0.33   283.66
MEAN   204.22   344.86   161.43     0.30   664.64     1.08
HUB    165.90   310.14    58.29     0.27  1356.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.32     1.00    15.51   539.51     1.00   531.71     0.92     0.72
MEAN    16.38     1.01    15.56   540.32     1.00   532.41     0.92     0.72
HUB     16.49     1.01    15.59   541.78     1.01   533.06     0.92     0.72

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP      2.95    35.86    31.50     4.36     0.93    -0.01     2.90
MEAN     7.99    27.91    23.50     4.41     0.86     0.04     3.34     0.72
HUB     19.46    10.83     6.50     4.33     0.86     0.10     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.786

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     310.362      43.571     307.289    1131.965       0.274      -0.016

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.381      15.546     532.491      46.000       8.070      33.000      24.930

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     330.610      43.571     333.469    1130.813       0.292      -0.199

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.325      15.383     531.407     440.827       0.086       0.047

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     310.617       0.000     310.617    1131.951       0.274      -0.122

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950      15.443     532.478       0.000       0.060       0.146      -0.129

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     -0.001      16.274       1.000     540.535       1.626     639.431       4.957

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  10122.942       0.181      45.239  785420.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    110364.38    493.2157     77.2548      1.0772      0.6359      4.4657      1.0339
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.037   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      77.512    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   35.23265

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
      75.721    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  59628.492   60820.934       3.771     831.557     220.517     619.754       2.810

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   174.19    -0.06   174.19     0.16   270.77
  MEAN    17.06     0.00    -0.02   174.19    -0.06   174.19     0.16
  HUB     12.51     0.00    -0.02   174.19    -0.06   174.19     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.36    50.47     6.89   271.85   322.92    14.85   520.28     0.29
  MEAN    52.24    47.20     5.04   224.81   284.44    14.85   520.28     0.25
  HUB     43.43    38.62     4.81   164.85   239.87    14.85   520.28     0.21

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   280.60   141.40   242.36  1121.24     0.25
  MEAN    18.04   293.24   164.19   242.97  1120.69     0.26
  HUB     15.00   330.15   221.96   244.41  1119.46     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   275.24   130.44     0.25  2918.40
  MEAN   237.67   253.84    73.48     0.23  2962.28     1.25
  HUB    197.66   245.61    24.30     0.22  3330.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.68     1.04    15.01   528.99     1.01   522.41     0.92     0.91
  MEAN    15.69     1.04    14.96   529.08     1.01   521.90     0.92     0.91
  HUB     15.77     1.04    14.84   529.86     1.01   520.76     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     30.26    28.29    24.20     4.09     0.93     0.22     2.90
  MEAN    34.05    16.83    12.70     4.13     0.92     0.19     3.51     0.91
  HUB     42.24    -5.68    -9.30     3.62     0.92     0.08     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     297.985     163.867     248.883    1120.679       0.266      -0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.705      14.951     521.893      24.000      33.361      35.400       2.039

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	271.342	163.867	316.984	1122.038	0.242	0.180

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	15.705	15.077	523.160	528.796	0.011	0.336

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	252.496	0.000	252.496	1122.922	0.225	0.244

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.140	523.984	0.000	0.060	0.038	0.261

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.869	15.684	1.038	529.309	6.499	226.772	1.758

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
40462.793	0.548	177.238	732453.438

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 5.037 EfDer = 0.979

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
77.512	1510.000	15.684	529.309	1.000	1.000	0.980

W Kg/sec = 35.23265

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
73.390	1494.791	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
59628.492	60820.934	2.763	590.487	213.727	474.134	2.218

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	241.86	-0.08	241.86	0.22	268.06
MEAN	18.08	0.00	-0.02	241.86	-0.08	241.86	0.22	
HUB	15.21	0.00	-0.02	241.86	-0.08	241.86	0.22	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.24	46.36	1.88	270.79	363.14	15.18	524.42	0.32
MEAN	44.58	42.30	2.28	238.22	339.54	15.18	524.42	0.30
HUB	39.66	37.84	1.82	200.43	314.17	15.18	524.42	0.28

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	275.59	84.14	262.43	1125.72	0.24
MEAN	18.01	281.62	101.99	262.51	1125.69	0.25
HUB	15.22	303.89	152.67	262.76	1125.63	0.27

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	269.08	321.04	184.93	0.29	1719.95	
MEAN	237.32	295.34	135.34	0.26	1838.26	1.23
HUB	200.60	267.10	47.93	0.24	2325.30	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.02	1.02	15.37	532.95	1.01	526.61	0.92	0.90
MEAN	16.05	1.02	15.36	533.20	1.01	526.58	0.92	0.90
HUB	16.14	1.03	15.35	534.23	1.01	526.52	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	17.78	35.17	31.50	3.67	0.93	0.16	2.90	
MEAN	21.23	27.27	23.50	3.77	0.91	0.18	3.30	0.90
HUB	30.16	10.34	6.50	3.84	0.91	0.21	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.979
    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     286.074     102.272     267.168    1125.740       0.254      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.064      15.358     526.625      46.000      20.947      30.600       9.653

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     276.951     102.272     295.231    1126.199       0.246       0.052

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.058      15.396     527.054     511.151       0.018       0.163

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     273.566       0.000     273.566    1126.365       0.243       0.029

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.379     527.210       0.000       0.060       0.066       0.028

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.787      16.024       1.022     533.460       4.151     315.153       2.443

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  25845.963       0.357     113.212  679534.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.037   EfDer =  0.927

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     77.512    1510.000      16.024     533.460       1.000       1.000       0.980
W Kg/sec =   35.23265

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     72.112    1488.964       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  59628.492   60820.934       2.597     545.479     210.007     429.765       2.046

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   259.10    -0.09   259.10     0.23   260.78
 MEAN    17.74      0.00    -0.02   259.10    -0.09   259.10     0.23
 HUB     15.05      0.00    -0.02   259.10    -0.09   259.10     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.60     46.36    -0.76   264.47   370.30    15.44   527.85     0.33
 MEAN    42.07     43.40    -1.33   233.74   349.02    15.44   527.85     0.31
 HUB     37.44     38.84    -1.40   198.32   326.34    15.44   527.85     0.29

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   287.77     61.22   281.18  1128.39      0.26
 MEAN    17.51   293.32     84.28   280.95  1128.70      0.26
 HUB     14.85   315.31    143.05   280.99  1128.97      0.28

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    261.04   344.95    199.82     0.31  1214.63
 MEAN   230.69   316.81    146.41     0.28  1476.96      1.17
 HUB    195.68   285.88     52.63     0.25  2125.60

         Pt2       PR       Ps2      Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     16.25      1.01    15.53   536.03      1.00   529.11      0.92      0.85
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 MEAN    16.30     1.02    15.55   536.59     1.01   529.40     0.92     0.85
 HUB     16.43     1.03    15.56   537.96     1.01   529.66     0.92     0.85
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     12.28    35.40    31.50     3.90     0.93     0.10     2.90
 MEAN    16.70    27.53    23.50     4.03     0.90     0.13     3.28     0.85
 HUB     26.98    10.61     6.50     4.11     0.90     0.18     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.927

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     296.842      84.829     284.463    1128.801       0.263      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.320      15.553     529.500      46.000      16.605      31.500      14.895

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     298.654      84.829     310.467    1128.705       0.265      -0.024

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.306      15.531     529.409     471.992       0.028       0.117

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     290.716       0.000     290.716    1129.122       0.257      -0.046

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.517     529.800       0.000       0.060       0.100      -0.041

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.633      16.250       1.014     536.859       3.399     364.234       2.824

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  21162.027       0.311      92.695  689725.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.037   EfDer =  0.860

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     77.512    1510.000      16.250     536.859       1.000       1.000       0.980
W Kg/sec =   35.23265

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     71.334    1484.243       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
  59628.492   60820.934       2.471     513.330     207.741     401.059       1.931

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   274.03    -0.09   274.03     0.24   249.46
 MEAN    16.97     0.00    -0.02   274.03    -0.09   274.03     0.24
 HUB     14.32     0.00    -0.02   274.03    -0.09   274.03     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.82    46.36    -3.54   253.79   373.56    15.60   530.59     0.33
 MEAN    39.23    43.80    -4.57   223.63   353.76    15.60   530.59     0.31
 HUB     34.56    37.84    -3.28   188.70   332.77    15.60   530.59     0.29

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   298.21    37.24   295.88  1130.31     0.26
 MEAN    16.57   302.17    63.46   295.43  1130.88     0.27
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HUB     13.89   321.54   127.10   295.35  1131.42     0.28

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    248.79   363.73   211.55     0.32   704.84
MEAN   218.40   333.59   154.94     0.29  1053.35     1.12
HUB    183.03   300.60    55.93     0.27  1766.78

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.37     1.01    15.60   538.35     1.00   530.92     0.92     0.79
MEAN    16.44     1.01    15.64   539.09     1.00   531.46     0.92     0.79
HUB     16.56     1.02    15.66   540.60     1.01   531.96     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP      7.17    35.56    31.50     4.06     0.93     0.04     2.90
MEAN    12.12    27.67    23.50     4.17     0.88     0.08     3.29     0.79
HUB     23.28    10.72     6.50     4.22     0.88     0.14     3.90

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.860

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     297.045      63.815     290.109    1131.429       0.263       0.048

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    16.450      15.679     531.977      46.000      12.406      32.400      19.994

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     308.555      63.815     315.085    1130.810       0.273      -0.042

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.427      15.598     531.395     456.573       0.037       0.080

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     294.681       0.000     294.681    1131.554       0.260      -0.101

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.595     532.094       0.000       0.060       0.131      -0.045

   STAGE EXIT CONDITIONS, STAGE             4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.377      16.350       1.006     539.346       2.487     459.288       3.560

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  15485.085       0.250      67.829  719959.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.037   EfDer =  0.798

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    77.512    1510.000      16.350     539.346       1.000       1.000       0.980
W Kg/sec =   35.23265

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    71.065    1480.817       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  59628.492   60820.934       2.463     509.668     206.959     390.276       1.886

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   275.65    -0.09   275.65     0.24   236.73
 MEAN    15.91     0.00    -0.02   275.65    -0.09   275.65     0.24
 HUB     13.07     0.00    -0.02   275.65    -0.09   275.65     0.24

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     41.22    47.36    -6.14   241.41   366.48    15.69   533.00     0.32
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MEAN    37.27    44.80    -7.53   209.69   346.40    15.69   533.00     0.31
HUB     32.01    38.84    -6.83   172.23   325.08    15.69   533.00     0.29
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   298.13    21.57   297.35  1132.24     0.26
MEAN    15.50   300.59    47.02   296.89  1132.87     0.27
HUB     12.59   316.24   109.11   296.82  1133.47     0.28

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    236.40   366.83   214.83     0.32   388.75
MEAN   204.22   335.94   157.20     0.30   730.20     1.09
HUB    165.90   302.20    56.79     0.27  1374.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.41     1.00    15.64   540.17     1.00   532.75     0.92     0.73
MEAN    16.47     1.01    15.68   540.89     1.00   533.35     0.92     0.73
HUB     16.58     1.01    15.70   542.26     1.01   533.90     0.92     0.73

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP      4.15    35.85    31.50     4.35     0.93     0.01     2.90
MEAN     9.00    27.90    23.50     4.40     0.86     0.05     3.34     0.73
HUB     20.18    10.83     6.50     4.33     0.86     0.11     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.798

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      303.156      47.882     299.350    1132.964       0.268       -0.015

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.470      15.669      533.430      46.000       9.088      33.000      23.912

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      321.808      47.882     325.350    1131.929       0.284       -0.189

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.418      15.521     532.457     440.827       0.083       0.056

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      302.414       0.000     302.414    1133.004       0.267       -0.115

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950      15.576      533.468       0.000       0.060       0.145       -0.121

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.098      16.368       1.001     541.105       1.759     594.999       4.612

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  10955.766       0.196      47.989  768156.688

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    113911.63    498.9630      75.7213      1.0835       0.6644       5.0372       1.0350
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.464   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      76.355    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   34.70680

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      74.591    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  58738.531   59913.176       3.828     831.557     217.226     619.754       2.853

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   171.53    -0.06   171.53     0.15   270.77
  MEAN    17.06     0.00    -0.02   171.53    -0.06   171.53     0.15
  HUB     12.51     0.00    -0.02   171.53    -0.06   171.53     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.75    50.47     7.28   271.85   321.49    14.86   520.35     0.29
  MEAN    52.66    47.20     5.46   224.81   282.82    14.86   520.35     0.25
  HUB     43.87    38.62     5.25   164.85   237.94    14.86   520.35     0.21

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   278.38   143.54   238.52  1121.45     0.25
  MEAN    18.04   290.75   165.36   239.15  1120.86     0.26
  HUB     15.00   327.09   221.63   240.56  1119.63     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   270.84   128.31     0.24  2962.40
  MEAN   237.67   249.84    72.30     0.22  2983.53     1.26
  HUB    197.66   241.75    23.97     0.22  3325.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.69     1.04    15.03   529.08     1.01   522.61     0.92     0.91
  MEAN    15.70     1.04    14.98   529.13     1.01   522.06     0.92     0.91
  HUB     15.76     1.04    14.86   529.85     1.01   520.91     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     31.04    28.28    24.20     4.08     0.93     0.23     2.90
  MEAN    34.66    16.82    12.70     4.12     0.92     0.20     3.51     0.91
  HUB     42.65    -5.69    -9.30     3.61     0.92     0.09     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     295.372     165.044     244.959    1120.864       0.264      -0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.710      14.969     522.065      24.000      33.971      35.400       1.429

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     266.976     165.044     313.872    1122.294       0.238       0.192
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      15.710      15.102     523.398     528.796       0.011       0.345

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     248.455       0.000     248.455    1123.149       0.221       0.255

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.163     524.196       0.000       0.060       0.037       0.272

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.872      15.689       1.039     529.352       6.542     223.932       1.736

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  40728.031       0.551     175.737  721256.188


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.464   EfDer =  0.983

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    76.355    1510.000      15.689     529.352       1.000       1.000       0.980
W Kg/sec =   34.70680

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    72.271    1494.731       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 58738.531   59913.176       2.806     590.487     210.467     474.134       2.253

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   238.01    -0.08   238.01     0.21   268.05
 MEAN    18.08     0.00    -0.02   238.01    -0.08   238.01     0.21
 HUB     15.21     0.00    -0.02   238.01    -0.08   238.01     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.70    46.36     2.34   270.79   360.59    15.21   524.62     0.32
 MEAN    45.04    42.30     2.74   238.22   336.80    15.21   524.62     0.30
 HUB     40.11    37.84     2.27   200.43   311.21    15.21   524.62     0.28

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   272.45    87.28   258.09  1126.06     0.24
 MEAN    18.01   278.47   104.25   258.22  1125.98     0.25
 HUB     15.22   300.65   153.50   258.51  1125.88     0.27

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    269.08   315.69   181.80     0.28  1784.02
 MEAN   237.32   290.49   133.07     0.26  1879.03     1.24
 HUB    200.60   262.76    47.10     0.23  2337.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.04     1.02    15.40   533.13     1.01   526.93     0.92     0.90
 MEAN    16.06     1.02    15.39   533.33     1.01   526.85     0.92     0.90
 HUB     16.15     1.03    15.37   534.30     1.01   526.75     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.68    35.16    31.50     3.66     0.93     0.17     2.90
 MEAN    21.99    27.26    23.50     3.76     0.91     0.18     3.30     0.90
 HUB     30.70    10.33     6.50     3.83     0.91     0.22     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.983

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     282.824     104.543     262.792    1126.040       0.251      -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.080      15.388     526.905      46.000      21.694      30.600       8.906

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     272.323     104.543     291.701    1126.560       0.242       0.064

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.075      15.434     527.392     511.151       0.017       0.173

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     268.953       0.000     268.953    1126.722       0.239       0.043

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.419     527.544       0.000       0.060       0.062       0.043

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.802      16.043       1.023     533.586       4.234     308.027       2.388

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  26362.438       0.364     113.751  668860.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.464   EfDer =  0.936

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     76.355    1510.000      16.043     533.586       1.000       1.000       0.980
W Kg/sec =   34.70680

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     70.959    1488.788       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  58738.531   59913.176       2.640     545.479     206.647     429.765       2.080

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   254.76    -0.09   254.76     0.23   260.74
 MEAN    17.74      0.00    -0.02   254.76    -0.09   254.76     0.23
 HUB     15.05      0.00    -0.02   254.76    -0.09   254.76     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.08     46.36    -0.28   264.47   367.28    15.48   528.17     0.33
 MEAN    42.55     43.40    -0.85   233.74   345.80    15.48   528.17     0.31
 HUB     37.91     38.84    -0.93   198.32   322.91    15.48   528.17     0.29

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   283.77     64.81   276.27  1128.89      0.25
 MEAN    17.51   289.45     86.90   276.10  1129.13      0.26
 HUB     14.85   311.46    143.99   276.17  1129.35      0.28

       U2       W2       Wu2      MachRel2  DelRCu     Ws1/W2
 TIP    261.04   338.87   196.23     0.30  1285.68
 MEAN   230.69   311.30   143.79     0.28  1522.87      1.18
 HUB    195.68   280.97    51.69     0.25  2139.62

         Pt2       PR       Ps2      Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     16.29      1.02    15.59   536.31      1.01   529.58      0.92      0.86
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 MEAN    16.33     1.02    15.60   536.81     1.01   529.81     0.92     0.86
 HUB     16.45     1.03    15.61   538.11     1.01   530.01     0.92     0.86
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     13.20    35.39    31.50     3.89     0.93     0.11     2.90
 MEAN    17.47    27.51    23.50     4.01     0.90     0.14     3.28     0.86
 HUB     27.54    10.60     6.50     4.10     0.90     0.19     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.936

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     292.904      87.470     279.539    1129.240       0.259      -0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.351      15.603     529.911      46.000      17.375      31.500      14.125

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     293.359      87.470     306.121    1129.217       0.260      -0.013

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.339      15.589     529.889     471.992       0.026       0.126

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     285.507       0.000     285.507    1129.621       0.253      -0.033

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.578     530.269       0.000       0.060       0.095      -0.027

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.662      16.287       1.015     537.077       3.491     353.980       2.744

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  21737.088       0.319      93.793  678711.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.464   EfDer =  0.871

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     76.355    1510.000      16.287     537.077       1.000       1.000       0.980
W Kg/sec =   34.70680

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     70.125    1483.942       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 58738.531   59913.176       2.514     513.330     204.220     401.059       1.964

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   269.16    -0.09   269.16     0.24   249.41
 MEAN    16.97     0.00    -0.02   269.16    -0.09   269.16     0.24
 HUB     14.32     0.00    -0.02   269.16    -0.09   269.16     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.33    46.36    -3.03   253.79   370.00    15.66   531.03     0.33
 MEAN    39.73    43.80    -4.07   223.63   349.99    15.66   531.03     0.31
 HUB     35.05    37.84    -2.79   188.70   328.77    15.66   531.03     0.29

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   293.32    41.25   290.40  1130.97     0.26
 MEAN    16.57   297.52    66.39   290.02  1131.47     0.26
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 HUB     13.89   317.04   128.18   289.97  1131.94     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    248.79   356.94   207.54     0.32   780.57
 MEAN   218.40   327.44   152.01     0.29  1101.86     1.13
 HUB    183.03   295.11    54.85     0.26  1781.75

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.43     1.01    15.68   538.73     1.00   531.54     0.92     0.80
 MEAN    16.48     1.01    15.71   539.41     1.00   532.02     0.92     0.80
 HUB     16.61     1.02    15.73   540.85     1.01   532.45     0.92     0.80

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     8.08    35.55    31.50     4.05     0.93     0.05     2.90
 MEAN   12.89    27.66    23.50     4.16     0.88     0.09     3.29     0.80
 HUB    23.85    10.71     6.50     4.21     0.88     0.15     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.871

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     292.525      66.760     284.806    1132.002       0.258       0.048

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.498      15.749     532.515      46.000      13.192      32.400      19.208

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     302.772      66.760     310.045    1131.461       0.268      -0.033

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.478      15.677     532.006     456.573       0.035       0.088

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     289.115       0.000     289.115    1132.178       0.255      -0.091

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.676     532.681       0.000       0.060       0.127      -0.034

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.427      16.404       1.007     539.662       2.585     442.154       3.428

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  16096.673       0.260      69.455  708256.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.464   EfDer =  0.807

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     76.355    1510.000      16.404     539.662       1.000       1.000       0.980
W Kg/sec =   34.70680

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     69.792    1480.384       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  58738.531   59913.176       2.508     509.668     203.252     390.276       1.920

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   270.49    -0.09   270.49     0.24   236.67
 MEAN    15.91     0.00    -0.02   270.49    -0.09   270.49     0.24
 HUB     13.07     0.00    -0.02   270.49    -0.09   270.49     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     41.76    47.36    -5.60   241.41   362.61    15.77   533.55     0.32
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MEAN    37.80    44.80    -7.00   209.69   342.31    15.77   533.55     0.30
HUB     32.50    38.84    -6.34   172.23   320.72    15.77   533.55     0.28
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   292.73    25.84   291.58  1133.03     0.26
MEAN    15.50   295.47    50.10   291.19  1133.59     0.26
HUB     12.59   311.34   110.26   291.16  1134.11     0.27

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    236.40   359.66   210.56     0.32   465.23
MEAN   204.22   329.46   154.11     0.29   777.93     1.10
HUB    165.90   296.43    55.64     0.26  1389.41

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.48     1.00    15.73   540.65     1.00   533.49     0.92     0.74
MEAN    16.53     1.01    15.77   541.31     1.00   534.02     0.92     0.74
HUB     16.64     1.01    15.79   542.60     1.01   534.51     0.92     0.74

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP      5.06    35.83    31.50     4.33     0.93     0.02     2.90
MEAN     9.76    27.89    23.50     4.39     0.87     0.06     3.34     0.74
HUB     20.74    10.82     6.50     4.32     0.87     0.12     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.807

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     297.989      51.020     293.589    1133.679       0.263       -0.015

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.534      15.758     534.103      46.000       9.858      33.000      23.142

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     315.425      51.020     319.524    1132.731       0.278       -0.180

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.486      15.621     533.210     440.827       0.081       0.063

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     296.455       0.000     296.455    1133.760       0.261       -0.108

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      15.673     534.179       0.000       0.060       0.144       -0.114

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.167      16.437       1.002     541.519       1.857     565.971       4.387

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  11564.713       0.207      49.900  755519.062

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    116488.94    502.6368      74.5911      1.0880       0.6842       5.4636       1.0358
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.029   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      74.839    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   34.01785

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      73.110    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  57572.539   58723.867       3.906     831.557     212.914     619.754       2.911

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   168.04    -0.06   168.04     0.15   270.77
  MEAN    17.06     0.00    -0.02   168.04    -0.06   168.04     0.15
  HUB     12.51     0.00    -0.02   168.04    -0.06   168.04     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.28    50.47     7.81   271.85   319.64    14.87   520.45     0.29
  MEAN    53.23    47.20     6.03   224.81   280.72    14.87   520.45     0.25
  HUB     44.46    38.62     5.84   164.85   235.44    14.87   520.45     0.21

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   275.57   146.31   233.51  1121.72     0.25
  MEAN    18.04   287.58   166.95   234.16  1121.09     0.26
  HUB     15.00   323.13   221.20   235.55  1119.84     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   265.12   125.53     0.24  3019.66
  MEAN   237.67   244.60    70.71     0.22  3012.14     1.28
  HUB    197.66   236.72    23.54     0.21  3318.69

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.70     1.04    15.06   529.20     1.01   522.86     0.92     0.91
  MEAN    15.70     1.04    15.00   529.19     1.01   522.28     0.92     0.91
  HUB     15.76     1.04    14.88   529.84     1.01   521.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     32.07    28.26    24.20     4.06     0.93     0.25     2.90
  MEAN    35.49    16.80    12.70     4.10     0.93     0.22     3.51     0.91
  HUB     43.20    -5.71    -9.30     3.59     0.93     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     292.042     166.628     239.841    1121.099       0.260      -0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.716      14.991     522.284      24.000      34.789      35.400       0.611

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     261.286     166.628     309.895    1122.624       0.233       0.208
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      15.716      15.134     523.706     528.796       0.010       0.358

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     243.190       0.000     243.190    1123.441       0.216       0.269

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.191     524.468       0.000       0.060       0.037       0.286

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.874      15.696       1.039     529.408       6.598     220.234       1.707

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  41076.488       0.556     173.722  706605.062


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.029   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    74.839    1510.000      15.696     529.408       1.000       1.000       0.980
W Kg/sec =   34.01785

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    70.808    1494.651       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 57572.539   58723.867       2.864     590.487     206.208     474.134       2.299

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP    20.55     0.00    -0.02   232.99    -0.08   232.99     0.21   268.03
 MEAN   18.08     0.00    -0.02   232.99    -0.08   232.99     0.21
 HUB    15.21     0.00    -0.02   232.99    -0.08   232.99     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP    49.30    46.36     2.94   270.79   357.29    15.23   524.87     0.32
 MEAN   45.65    42.30     3.35   238.22   333.27    15.23   524.87     0.30
 HUB    40.71    37.84     2.87   200.43   307.39    15.23   524.87     0.27

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP    20.42   268.49    91.38   252.46  1126.50     0.24
 MEAN   18.01   274.46   107.26   252.64  1126.36     0.24
 HUB    15.22   296.47   154.60   252.97  1126.20     0.26

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP   269.08   308.73   177.70     0.27  1867.56
 MEAN  237.32   284.15   130.06     0.25  1933.16     1.26
 HUB   200.60   257.11    46.00     0.23  2354.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    16.07     1.02    15.45   533.36     1.01   527.34     0.92     0.90
 MEAN   16.08     1.02    15.43   533.50     1.01   527.21     0.92     0.90
 HUB    16.17     1.03    15.41   534.39     1.01   527.05     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    19.90    35.14    31.50     3.64     0.93     0.18     2.90
 MEAN   23.00    27.24    23.50     3.74     0.92     0.20     3.30     0.90
 HUB    31.43    10.31     6.50     3.81     0.92     0.23     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     278.695     107.559     257.103    1126.422       0.247      -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.099      15.427     527.263      46.000      22.702      30.600       7.898

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     266.311     107.559     287.211    1127.025       0.236       0.080

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.096      15.482     527.827     511.151       0.015       0.186

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     262.967       0.000     262.967    1127.182       0.233       0.062

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.469     527.975       0.000       0.060       0.057       0.062

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.819      16.067       1.024     533.751       4.343     299.013       2.318

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  27040.049       0.373     114.359  654916.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.029   EfDer =  0.947

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     74.839    1510.000      16.067     533.751       1.000       1.000       0.980
W Kg/sec =   34.01785

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     69.456    1488.559       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  57572.539   58723.867       2.697     545.479     202.271     429.765       2.125

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   249.12    -0.09   249.12     0.22   260.70
 MEAN    17.74      0.00    -0.02   249.12    -0.09   249.12     0.22
 HUB     15.05      0.00    -0.02   249.12    -0.09   249.12     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.72     46.36      0.36   264.47   363.39     15.53   528.57     0.32
 MEAN    43.19     43.40     -0.21   233.74   341.67     15.53   528.57     0.30
 HUB     38.53     38.84     -0.31   198.32   318.48     15.53   528.57     0.28

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   278.71     69.48   269.91  1129.53      0.25
 MEAN    17.51   284.53     90.33   269.81  1129.70      0.25
 HUB     14.85   306.54    145.28   269.92  1129.84      0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    261.04   330.98   191.56     0.29  1378.14
 MEAN   230.69   304.13   140.36     0.27  1582.86      1.20
 HUB    195.68   274.59    50.40     0.24  2158.77

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     16.33      1.02    15.66   536.67     1.01   530.18      0.92     0.87
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 MEAN    16.37     1.02    15.67   537.10     1.01   530.34     0.92     0.87
 HUB     16.49     1.03    15.66   538.32     1.01   530.47     0.92     0.87
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     14.44    35.36    31.50     3.86     0.93     0.12     2.90
 MEAN    18.51    27.48    23.50     3.98     0.90     0.15     3.28     0.87
 HUB     28.29    10.58     6.50     4.08     0.90     0.20     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.947

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     287.891      90.921     273.157    1129.804       0.255       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.391      15.666     530.441      46.000      18.410      31.500      13.090

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     286.504      90.921     300.585    1129.875       0.254       0.002

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.381      15.663     530.507     471.992       0.024       0.138

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     278.769       0.000     278.769    1130.264       0.247      -0.014

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.656     530.872       0.000       0.060       0.088      -0.008

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.698      16.334       1.017     537.363       3.612     341.203       2.645

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  22491.170       0.330      95.120  664338.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.029   EfDer =  0.885

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
     74.839     1510.000       16.334     537.363       1.000       1.000       0.980
W Kg/sec =   34.01785

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     68.555     1483.547        1.402       0.249      53.349      56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 57572.539   58723.867        2.571     513.330     199.647     401.059       2.009

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   262.85    -0.09   262.85     0.23   249.34
 MEAN    16.97      0.00    -0.02   262.85    -0.09   262.85     0.23
 HUB     14.32      0.00    -0.02   262.85    -0.09   262.85     0.23

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     44.01     46.36    -2.35   253.79   365.44     15.73   531.59      0.32
 MEAN    40.40     43.80    -3.40   223.63   345.17     15.73   531.59      0.31
 HUB     35.69     37.84    -2.15   188.70   323.62     15.73   531.59      0.29

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2      Ao2          Mach2
 TIP     18.88   287.11    46.46   283.33  1131.82      0.25
 MEAN    16.57   291.61    70.22   283.02  1132.23      0.26
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 HUB     13.89   311.30   129.64   283.02  1132.61     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    248.79   348.15   202.33     0.31   878.91
 MEAN   218.40   319.47   148.18     0.28  1165.40     1.15
 HUB    183.03   288.01    53.39     0.25  1802.01

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.49     1.01    15.77   539.22     1.00   532.34     0.92     0.81
 MEAN    16.55     1.01    15.80   539.83     1.00   532.73     0.92     0.81
 HUB     16.66     1.02    15.81   541.18     1.01   533.08     0.92     0.81

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     9.31    35.53    31.50     4.03     0.93     0.07     2.90
 MEAN   13.93    27.63    23.50     4.13     0.89     0.11     3.29     0.81
 HUB    24.61    10.68     6.50     4.18     0.89     0.16     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.885

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     286.778      70.618     277.947    1132.739       0.253       0.049

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.560      15.837     533.208      46.000      14.255      32.400      18.145

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     295.302      70.618     303.628    1132.298       0.261      -0.021

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.543      15.778     532.793     456.573       0.033       0.100

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     281.923       0.000     281.923    1132.984       0.249      -0.075

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.779     533.438       0.000       0.060       0.121      -0.019

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.488      16.474       1.009     540.076       2.714     421.332       3.266

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  16896.801       0.273      71.461  693002.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.029   EfDer =  0.822

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     74.839    1510.000      16.474     540.076       1.000       1.000       0.980
W Kg/sec =   34.01785

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     68.140    1479.816       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  57572.539   58723.867       2.568     509.668     198.441     390.276       1.967

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   263.82    -0.09   263.82     0.23   236.57
 MEAN    15.91     0.00    -0.02   263.82    -0.09   263.82     0.23
 HUB     13.07     0.00    -0.02   263.82    -0.09   263.82     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.47    47.36    -4.89   241.41   357.66    15.86   534.26     0.32
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 MEAN    38.49    44.80    -6.31   209.69   337.06    15.86   534.26     0.30
 HUB     33.15    38.84    -5.69   172.23   315.11    15.86   534.26     0.28
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   285.86    31.31   284.14  1134.04     0.25
 MEAN    15.50   288.95    54.16   283.83  1134.51     0.25
 HUB     12.59   305.07   111.82   283.84  1134.93     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    236.40   350.42   205.09     0.31   563.43
 MEAN   204.22   321.06   150.06     0.28   840.72     1.12
 HUB    165.90   288.95    54.08     0.25  1409.03

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.57     1.01    15.85   541.27     1.00   534.44     0.92     0.75
 MEAN    16.62     1.01    15.88   541.86     1.00   534.88     0.92     0.75
 HUB     16.71     1.01    15.89   543.06     1.01   535.29     0.92     0.75

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP      6.29    35.82    31.50     4.32     0.93     0.04     2.90
 MEAN    10.80    27.87    23.50     4.37     0.87     0.07     3.34     0.75
 HUB     21.50    10.79     6.50     4.29     0.87     0.13     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.822

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     291.411      55.148     286.145    1134.598       0.257       -0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.619      15.873     534.969      46.000      10.909      33.000      22.091

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     307.186      55.148     312.098    1133.762       0.271       -0.168

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.575      15.750     534.180     440.827       0.077       0.073

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     288.752       0.000     288.752    1134.735       0.254       -0.098

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      15.799     535.098       0.000       0.060       0.141       -0.103

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.251      16.527       1.003     542.061       1.985     531.802       4.122

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  12358.407       0.221      52.267  739056.438

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    119862.92    506.9285     73.1105      1.0940      0.7088      6.0289      1.0368
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      73.715    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   33.50679

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      72.012    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  56707.598   57841.629       3.965     831.557     209.715     619.754       2.955

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   165.46    -0.06   165.46     0.15   270.77
  MEAN    17.06     0.00    -0.02   165.46    -0.06   165.46     0.15
  HUB     12.51     0.00    -0.02   165.46    -0.06   165.46     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.68    50.47     8.21   271.85   318.29    14.88   520.52     0.28
  MEAN    53.65    47.20     6.45   224.81   279.18    14.88   520.52     0.25
  HUB     44.90    38.62     6.28   164.85   233.60    14.88   520.52     0.21

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   273.53   148.34   229.82  1121.91     0.24
  MEAN    18.04   285.27   168.10   230.47  1121.26     0.25
  HUB     15.00   320.21   220.87   231.84  1120.00     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   260.90   123.50     0.23  3061.50
  MEAN   237.67   240.74    69.56     0.21  3032.87     1.30
  HUB    197.66   233.00    23.21     0.21  3313.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.71     1.04    15.08   529.29     1.01   523.04     0.92     0.91
  MEAN    15.71     1.04    15.01   529.23     1.01   522.43     0.92     0.91
  HUB     15.76     1.04    14.89   529.82     1.01   521.26     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     32.84    28.25    24.20     4.05     0.93     0.26     2.90
  MEAN    36.11    16.80    12.70     4.10     0.93     0.23     3.51     0.91
  HUB     43.61    -5.72    -9.30     3.58     0.93     0.11     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     289.608     167.776     236.059    1121.270       0.258      -0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.720      15.007     522.443      24.000      35.403      35.400      -0.003

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     257.087     167.776     306.990    1122.862       0.229       0.221
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      15.720      15.156     523.928     528.796       0.010       0.367

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     239.306       0.000     239.306    1123.652       0.213       0.279

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.212     524.665       0.000       0.060       0.037       0.297

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.876      15.701       1.039     529.448       6.638     217.533       1.686

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  41329.188       0.559     172.165  695750.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.991

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    73.715    1510.000      15.701     529.448       1.000       1.000       0.980
W Kg/sec =   33.50679

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    69.727    1494.594       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 56707.598   57841.629       2.908     590.487     203.058     474.134       2.335

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   229.28    -0.08   229.28     0.20   268.02
 MEAN    18.08     0.00    -0.02   229.28    -0.08   229.28     0.20
 HUB     15.21     0.00    -0.02   229.28    -0.08   229.28     0.20

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.75    46.36     3.39   270.79   354.88    15.25   525.06     0.32
 MEAN    46.11    42.30     3.81   238.22   330.69    15.25   525.06     0.29
 HUB     41.17    37.84     3.33   200.43   304.59    15.25   525.06     0.27

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   265.64    94.38   248.31  1126.82     0.24
 MEAN    18.01   271.56   109.44   248.53  1126.64     0.24
 HUB     15.22   293.42   155.40   248.88  1126.43     0.26

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    269.08   303.61   174.70     0.27  1928.87
 MEAN   237.32   279.50   127.88     0.25  1972.44     1.27
 HUB    200.60   252.95    45.19     0.22  2366.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.09     1.02    15.48   533.53     1.01   527.64     0.92     0.91
 MEAN    16.10     1.03    15.46   533.62     1.01   527.46     0.92     0.91
 HUB     16.18     1.03    15.43   534.46     1.01   527.27     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.81    35.13    31.50     3.63     0.93     0.19     2.90
 MEAN    23.77    27.23    23.50     3.73     0.92     0.20     3.30     0.91
 HUB     31.98    10.29     6.50     3.79     0.92     0.23     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     275.699     109.747     252.915    1126.699       0.245      -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.113      15.455     527.522      46.000      23.457      30.600       7.143

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     261.890     109.747     283.956    1127.361       0.232       0.092

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.110      15.516     528.142     511.151       0.014       0.195

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     258.570       0.000     258.570    1127.515       0.229       0.076

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.505     528.287       0.000       0.060       0.054       0.076

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.831      16.084       1.024     533.871       4.422     292.609       2.268

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  27536.002       0.380     114.707  644601.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.954

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     73.715    1510.000      16.084     533.871       1.000       1.000       0.980
W Kg/sec =   33.50679

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     68.349    1488.391       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
  56707.598   57841.629       2.740     545.479     199.047     429.765       2.159

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   244.98    -0.08   244.98     0.22   260.67
 MEAN    17.74      0.00    -0.02   244.98    -0.08   244.98     0.22
 HUB     15.05      0.00    -0.02   244.98    -0.08   244.98     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.20     46.36     0.84   264.47   360.56    15.56   528.86     0.32
 MEAN    43.67     43.40     0.27   233.74   338.66    15.56   528.86     0.30
 HUB     39.00     38.84     0.16   198.32   315.25    15.56   528.86     0.28

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   275.08     72.89   265.24  1129.99      0.24
 MEAN    17.51   280.97     92.83   265.19  1130.10      0.25
 HUB     14.85   302.96    146.22   265.34  1130.19      0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    261.04   325.20   188.15     0.29  1445.60
 MEAN   230.69   298.89   137.86     0.26  1626.55      1.21
 HUB    195.68   269.91    49.46     0.24  2172.62

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     16.37      1.02    15.70   536.93      1.01   530.61      0.92      0.87
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 MEAN    16.40     1.02    15.71   537.31     1.01   530.72     0.92     0.87
 HUB     16.51     1.03    15.70   538.47     1.01   530.80     0.92     0.87
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.37    35.35    31.50     3.85     0.93     0.13     2.90
 MEAN    19.29    27.47    23.50     3.97     0.90     0.16     3.28     0.87
 HUB     28.86    10.56     6.50     4.06     0.90     0.20     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.954

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     284.271      93.435     268.477    1130.210       0.252       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.419      15.711     530.822      46.000      19.189      31.500      12.311

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     281.485      93.435     296.587    1130.350       0.249       0.013

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.410      15.716     530.954     471.992       0.022       0.147

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     273.838       0.000     273.838    1130.728       0.242       0.000

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.711     531.308       0.000       0.060       0.083       0.006

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4         PR4        Texit        Del T       Ns        Ns nondim
      0.722      16.367       1.018     537.571       3.700     332.292       2.576

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  23040.008       0.338      95.978  653718.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.896

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     73.715    1510.000      16.367     537.571       1.000       1.000       0.980
W Kg/sec =   33.50679

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     67.402    1483.260       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  56707.598   57841.629       2.615     513.330     196.289     401.059       2.043

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   258.24    -0.09   258.24     0.23   249.29
 MEAN    16.97     0.00    -0.02   258.24    -0.09   258.24     0.23
 HUB     14.32     0.00    -0.02   258.24    -0.09   258.24     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.51    46.36    -1.85   253.79   362.13    15.78   532.00     0.32
 MEAN    40.90    43.80    -2.90   223.63   341.66    15.78   532.00     0.30
 HUB     36.17    37.84    -1.67   188.70   319.88    15.78   532.00     0.28

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   282.66    50.23   278.16  1132.42     0.25
 MEAN    16.57   287.33    72.97   277.91  1132.77     0.25
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 HUB     13.89   307.12   130.67   277.93  1133.09     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    248.79   341.76   198.56     0.30   949.98
 MEAN   218.40   313.66   145.43     0.28  1210.94     1.16
 HUB    183.03   282.82    52.36     0.25  1816.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.54     1.01    15.84   539.58     1.00   532.91     0.92     0.82
 MEAN    16.59     1.01    15.86   540.13     1.00   533.24     0.92     0.82
 HUB     16.70     1.02    15.87   541.41     1.01   533.54     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     10.24    35.52    31.50     4.02     0.93     0.08     2.90
 MEAN    14.71    27.62    23.50     4.12     0.89     0.11     3.29     0.82
 HUB     25.18    10.67     6.50     4.17     0.89     0.17     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.896

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     282.626      73.382     272.933    1133.268       0.249       0.049

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.605      15.901     533.706      46.000      15.049      32.400      17.351

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     289.848      73.382     298.993    1132.901       0.256      -0.011

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.589      15.850     533.360     456.573       0.031       0.108

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     276.673       0.000     276.673    1133.563       0.244      -0.063

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.853     533.984       0.000       0.060       0.116      -0.007

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.529      16.525       1.010     540.377       2.806     407.270       3.157

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  17471.531       0.282      72.781  681746.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.833

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     73.715    1510.000      16.525     540.377       1.000       1.000       0.980
W Kg/sec =   33.50679

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     66.930    1479.404       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  56707.598   57841.629       2.615     509.668     194.917     390.276       2.002

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   258.95    -0.09   258.95     0.23   236.51
 MEAN    15.91     0.00    -0.02   258.95    -0.09   258.95     0.23
 HUB     13.07     0.00    -0.02   258.95    -0.09   258.95     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.00    47.36    -4.36   241.41   354.08    15.94   534.78     0.31
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 MEAN    39.01    44.80    -5.79   209.69   333.26    15.94   534.78     0.29
 HUB     33.64    38.84    -5.20   172.23   311.04    15.94   534.78     0.27
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2      C2      Cu2      Cm2      Ao2         Mach2
 TIP     17.94   280.94    35.34   278.71  1134.77     0.25
 MEAN    15.50   284.24    57.04   278.45  1135.17     0.25
 HUB     12.59   300.50   112.89   278.49  1135.53     0.26

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    236.40   343.66   201.06     0.30   635.71
 MEAN   204.22   314.96   147.18     0.28   885.37     1.13
 HUB    165.90   283.50    53.02     0.25  1422.39

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.63     1.01    15.94   541.72     1.00   535.13     0.92     0.76
 MEAN    16.68     1.01    15.97   542.25     1.00   535.50     0.92     0.76
 HUB     16.77     1.01    15.97   543.39     1.01   535.85     0.92     0.76

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP      7.23    35.81    31.50     4.31     0.93     0.05     2.90
 MEAN    11.58    27.86    23.50     4.36     0.87     0.08     3.34     0.76
 HUB     22.06    10.78     6.50     4.28     0.87     0.13     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.833

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      286.659      58.084     280.713    1135.258       0.253       -0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.680      15.955      535.591      46.000      11.690      33.000      21.310

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      301.183      58.084     306.732    1134.502       0.265       -0.158

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.640      15.843     534.878     440.827       0.074       0.081

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     283.131       0.000     283.131    1135.436       0.249       -0.089

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      15.890     535.759       0.000       0.060       0.137       -0.094

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.308      16.593       1.004     542.453       2.077     509.275       3.948

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  12930.881       0.231      53.866  726920.562

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    122307.61    509.4965     72.0121      1.0984      0.7258      6.4532      1.0376
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.009   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      72.259    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   32.84494

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
      70.590    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  55587.480   56699.109        4.045     831.557     205.572     619.754       3.015

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   162.12    -0.06   162.12     0.14   270.77
  MEAN    17.06     0.00    -0.02   162.12    -0.06   162.12     0.14
  HUB     12.51     0.00    -0.02   162.12    -0.06   162.12     0.14

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.19    50.47     8.72   271.85   316.57    14.89   520.61     0.28
  MEAN    54.21    47.20     7.01   224.81   277.21    14.89   520.61     0.25
  HUB     45.49    38.62     6.87   164.85   231.25    14.89   520.61     0.21

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   271.00   150.98   225.04  1122.16     0.24
  MEAN    18.04   282.34   169.61   225.72  1121.47     0.25
  HUB     15.00   316.45   220.42   227.06  1120.20     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   255.45   120.87     0.23  3115.82
  MEAN   237.67   235.75    68.05     0.21  3060.06     1.32
  HUB    197.66   228.20    22.76     0.20  3307.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.72     1.04    15.10   529.41     1.01   523.27     0.92     0.91
  MEAN    15.71     1.04    15.03   529.29     1.01   522.63     0.92     0.91
  HUB     15.76     1.04    14.91   529.81     1.01   521.45     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     33.86    28.24    24.20     4.04     0.93     0.28     2.90
  MEAN    36.92    16.78    12.70     4.08     0.93     0.24     3.51     0.91
  HUB     44.15    -5.72    -9.30     3.58     0.93     0.12     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     286.532     169.281     231.180    1121.485       0.255      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.726      15.027     522.644      24.000      36.213      35.400      -0.813

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     251.676     169.281     303.310    1123.165       0.224       0.237
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      15.726      15.184     524.211     528.796       0.010       0.379

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     234.302       0.000     234.302    1123.920       0.208       0.293

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.237     524.916       0.000       0.060       0.037       0.310

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.877      15.706       1.040     529.501       6.691     214.050       1.659

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  41658.266       0.564     170.108  681709.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.009   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    72.259    1510.000      15.706     529.501       1.000       1.000       0.980
W Kg/sec =   32.84494

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    68.330    1494.520       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 55587.480   56699.109       2.967     590.487     198.989     474.134       2.383

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   224.51    -0.08   224.51     0.20   268.01
 MEAN    18.08     0.00    -0.02   224.51    -0.08   224.51     0.20
 HUB     15.21     0.00    -0.02   224.51    -0.08   224.51     0.20

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.35    46.36     3.99   270.79   351.81    15.28   525.29     0.31
 MEAN    46.71    42.30     4.41   238.22   327.40    15.28   525.29     0.29
 HUB     41.77    37.84     3.93   200.43   301.00    15.28   525.29     0.27

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   262.10    98.26   242.98  1127.22     0.23
 MEAN    18.01   267.90   112.28   243.24  1126.98     0.24
 HUB     15.22   289.56   156.48   243.63  1126.72     0.26

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    269.08   297.02   170.82     0.26  2007.96
 MEAN   237.32   273.50   125.05     0.24  2023.48     1.29
 HUB    200.60   247.60    44.12     0.22  2383.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.11     1.03    15.51   533.75     1.01   528.01     0.92     0.91
 MEAN    16.11     1.03    15.49   533.78     1.01   527.79     0.92     0.91
 HUB     16.19     1.03    15.46   534.55     1.01   527.54     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.02    35.11    31.50     3.61     0.93     0.20     2.90
 MEAN    24.78    27.21    23.50     3.71     0.92     0.22     3.30     0.91
 HUB     32.71    10.26     6.50     3.76     0.92     0.24     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     271.931     112.591     247.527    1127.050       0.241      -0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.130      15.489     527.851      46.000      24.459      30.600       6.141

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     256.209     112.591     279.857    1127.790       0.227       0.108

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.128      15.558     528.544     511.151       0.013       0.208

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     252.925       0.000     252.925    1127.939       0.224       0.094

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.550     528.684       0.000       0.060       0.049       0.095

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.843      16.105       1.025     534.027       4.526     284.570       2.206

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  28179.789       0.389     115.070  631279.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.009   EfDer =  0.963

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     72.259    1510.000      16.105     534.027       1.000       1.000       0.980
W Kg/sec =   32.84494

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     66.924    1488.173       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  55587.480   56699.109       2.799     545.479     194.896     429.765       2.205

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   239.66    -0.08   239.66     0.21   260.64
 MEAN    17.74      0.00    -0.02   239.66    -0.08   239.66     0.21
 HUB     15.05      0.00    -0.02   239.66    -0.08   239.66     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.83     46.36     1.47   264.47   356.97    15.61   529.23     0.32
 MEAN    44.29     43.40     0.89   233.74   334.83    15.61   529.23     0.30
 HUB     39.62     38.84     0.78   198.32   311.13    15.61   529.23     0.28

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   270.54     77.28   259.27  1130.57      0.24
 MEAN    17.51   276.49     96.02   259.28  1130.62      0.24
 HUB     14.85   298.42    147.41   259.46  1130.64      0.26

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    261.04   317.79    183.76     0.28  1532.52
 MEAN   230.69   292.16    134.66     0.26  1682.53      1.23
 HUB    195.68   263.92     48.27     0.23  2190.30

         Pt2       PR       Ps2     Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     16.41     1.02     15.77   537.27      1.01   531.16      0.92     0.88
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 MEAN    16.44     1.02    15.77   537.59     1.01   531.20     0.92     0.88
 HUB     16.54     1.03    15.76   538.66     1.01   531.23     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.60    35.33    31.50     3.83     0.93     0.15     2.90
 MEAN    20.32    27.45    23.50     3.95     0.91     0.17     3.28     0.88
 HUB     29.60    10.54     6.50     4.04     0.91     0.21     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.963

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     279.710      96.655     262.479    1130.726       0.247       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.454      15.767     531.306      46.000      20.216      31.500      11.284

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     275.060      96.655     291.548    1130.955       0.243       0.029

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.447      15.783     531.522     471.992       0.020       0.160

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     267.532       0.000     267.532    1131.318       0.236       0.019

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.780     531.863       0.000       0.060       0.076       0.026

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.750      16.408       1.019     537.841       3.813     321.314       2.491

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  23745.441       0.348      96.962  640013.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.009   EfDer =  0.910

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     72.259    1510.000      16.408     537.841       1.000       1.000       0.980
W Kg/sec =   32.84494

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     65.922    1482.888       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  55587.480   56699.109       2.674     513.330     191.980     401.059       2.089

     ROTOR LEADING EDGE CONDITIONS, STAGE           4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   252.33    -0.09   252.33     0.22   249.23
 MEAN    16.97     0.00    -0.02   252.33    -0.09   252.33     0.22
 HUB     14.32     0.00    -0.02   252.33    -0.09   252.33     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.18    46.36    -1.18   253.79   357.95    15.85   532.52     0.32
 MEAN    41.56    43.80    -2.24   223.63   337.22    15.85   532.52     0.30
 HUB     36.80    37.84    -1.04   188.70   315.13    15.85   532.52     0.28

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   277.08    55.08   271.55  1133.19     0.24
 MEAN    16.57   281.96    76.53   271.37  1133.46     0.25
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HUB     13.89   301.84   132.02   271.43  1133.70     0.27

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    248.79   333.56   193.71     0.29  1041.55
MEAN   218.40   306.22   141.87     0.27  1269.86     1.17
HUB    183.03   276.19    51.01     0.24  1835.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.60     1.01    15.93   540.04     1.00   533.63     0.92     0.83
MEAN    16.65     1.01    15.94   540.53     1.00   533.89     0.92     0.83
HUB     16.75     1.02    15.95   541.72     1.01   534.12     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     11.47    35.50    31.50     4.00     0.93     0.09     2.90
MEAN    15.75    27.60    23.50     4.10     0.89     0.13     3.29     0.83
HUB     25.94    10.64     6.50     4.14     0.89     0.18     3.90

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.910

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     277.412      76.960     266.524    1133.940       0.245       0.049

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    16.661      15.981     534.339      46.000      16.106      32.400      16.294

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     282.884      76.960     293.166    1133.668       0.250       0.002

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.647      15.941     534.083     456.573       0.029       0.120

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     269.969       0.000     269.969    1134.301       0.238      -0.047

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.947     534.679       0.000       0.060       0.109       0.010

   STAGE EXIT CONDITIONS, STAGE             4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.579      16.589       1.011     540.766       2.925     390.196       3.025

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  18215.031       0.294      74.380  667235.688


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.009   EfDer =  0.848

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    72.259    1510.000      16.589     540.766       1.000       1.000       0.980
W Kg/sec =   32.84494

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    65.379    1478.872       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 55587.480   56699.109       2.677     509.668     190.401     390.276       2.050

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   252.72    -0.09   252.72     0.22   236.42
MEAN    15.91     0.00    -0.02   252.72    -0.09   252.72     0.22
HUB     13.07     0.00    -0.02   252.72    -0.09   252.72     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     43.70    47.36    -3.66   241.41   349.55    16.03   535.43     0.31
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MEAN    39.70    44.80    -5.10   209.69   328.44    16.03   535.43     0.29
HUB     34.29    38.84    -4.55   172.23   305.87    16.03   535.43     0.27
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   274.78    40.46   271.78  1135.69     0.24
MEAN    15.50   278.31    60.80   271.59  1136.00     0.24
HUB     12.59   294.74   114.31   271.67  1136.28     0.26

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    236.40   335.05   195.94     0.30   727.45
MEAN   204.22   307.13   143.42     0.27   943.58     1.14
HUB    165.90   276.52    51.59     0.24  1440.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.72     1.01    16.05   542.31     1.00   536.00     0.92     0.78
MEAN    16.76     1.01    16.07   542.76     1.00   536.29     0.92     0.78
HUB     16.84     1.02    16.07   543.81     1.01   536.56     0.92     0.78

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP      8.47    35.79    31.50     4.29     0.93     0.06     2.90
MEAN    12.62    27.84    23.50     4.34     0.88     0.09     3.34     0.78
HUB     22.82    10.75     6.50     4.25     0.88     0.14     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.848

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      280.692      61.911     273.779    1136.096       0.247       -0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.758      16.060      536.381      46.000      12.742      33.000      20.258

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      293.528      61.911     299.986    1135.444       0.259       -0.143

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.722      15.962     535.765     440.827       0.070       0.091

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     275.955       0.000     275.955    1136.329       0.243       -0.076

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950      16.006     536.601       0.000       0.060       0.133       -0.080

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.378      16.678       1.005     542.961       2.195     482.636       3.741

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  13667.574       0.245      55.810  711287.188

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    125466.11    512.3301     70.5897      1.1040      0.7463      7.0089      1.0385
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.976   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      69.767    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   31.71247

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      68.156    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  53670.859   54744.160       4.190     831.557     198.485     619.754       3.122

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   156.42    -0.05   156.42     0.14   270.77
  MEAN    17.06     0.00    -0.02   156.42    -0.05   156.42     0.14
  HUB     12.51     0.00    -0.02   156.42    -0.05   156.42     0.14

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.09    50.47     9.62   271.85   313.68    14.90   520.77     0.28
  MEAN    55.18    47.20     7.98   224.81   273.91    14.90   520.77     0.24
  HUB     46.51    38.62     7.89   164.85   227.29    14.90   520.77     0.20

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   266.86   155.42   216.93  1122.57     0.24
  MEAN    18.04   277.47   172.13   217.62  1121.82     0.25
  HUB     15.00   310.15   219.70   218.92  1120.53     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   246.20   116.43     0.22  3207.34
  MEAN   237.67   227.28    65.53     0.20  3105.53     1.36
  HUB    197.66   220.03    22.05     0.20  3296.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.74     1.04    15.13   529.60     1.01   523.65     0.92     0.91
  MEAN    15.72     1.04    15.06   529.38     1.01   522.95     0.92     0.91
  HUB     15.76     1.04    14.94   529.79     1.01   521.75     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     35.62    28.22    24.20     4.02     0.93     0.30     2.90
  MEAN    38.34    16.76    12.70     4.06     0.93     0.26     3.51     0.91
  HUB     45.10    -5.75    -9.30     3.55     0.93     0.14     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     281.405     171.799     222.876    1121.841       0.251      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.734      15.059     522.976      24.000      37.626      35.400      -2.226

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     242.482     171.799     297.174    1123.667       0.216       0.265
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      15.733      15.230     524.679     528.796       0.010       0.401

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     225.803       0.000     225.803    1124.365       0.201       0.315

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.278     525.332       0.000       0.060       0.038       0.333

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.876      15.714       1.040     529.590       6.780     208.178       1.614

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  42212.297       0.571     166.427  657727.938


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.976   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    69.767    1510.000      15.714     529.590       1.000       1.000       0.980
W Kg/sec =   31.71247

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    65.948    1494.394       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 53670.859   54744.160       3.075     590.487     192.053     474.134       2.469

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   216.39    -0.07   216.39     0.19   267.99
 MEAN    18.08     0.00    -0.02   216.39    -0.07   216.39     0.19
 HUB     15.21     0.00    -0.02   216.39    -0.07   216.39     0.19

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.38    46.36     5.02   270.79   346.69    15.31   525.68     0.31
 MEAN    47.76    42.30     5.46   238.22   321.88    15.31   525.68     0.29
 HUB     42.82    37.84     4.98   200.43   295.00    15.31   525.68     0.26

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   256.35   104.78   233.96  1127.89     0.23
 MEAN    18.01   261.91   117.06   234.29  1127.56     0.23
 HUB     15.22   283.09   158.24   234.74  1127.21     0.25

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    269.08   285.88   164.30     0.25  2141.22
 MEAN   237.32   263.35   120.26     0.23  2109.58     1.32
 HUB    200.60   238.53    42.35     0.21  2410.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.15     1.03    15.58   534.12     1.01   528.63     0.92     0.91
 MEAN    16.14     1.03    15.54   534.06     1.01   528.33     0.92     0.91
 HUB     16.20     1.03    15.50   534.69     1.01   528.00     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.13    35.08    31.50     3.58     0.93     0.23     2.90
 MEAN    26.55    27.17    23.50     3.67     0.92     0.24     3.30     0.91
 HUB     33.99    10.23     6.50     3.73     0.92     0.26     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     265.739     117.388     238.405    1127.627       0.236      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.156      15.543     528.392      46.000      26.215      30.600       4.385

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     246.604     117.388     273.118    1128.500       0.219       0.137

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.156      15.627     529.211     511.151       0.011       0.232

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     243.398       0.000     243.398    1128.640       0.216       0.125

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.621     529.342       0.000       0.060       0.043       0.128

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      16.136       1.027     534.290       4.700     271.598       2.105

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  29261.381       0.404     115.367  608573.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.976   EfDer =  0.976

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     69.767    1510.000      16.136     534.290       1.000       1.000       0.980
W Kg/sec =   31.71247

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     64.507    1487.807       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  53670.859   54744.160       2.904     545.479     187.859     429.765       2.288

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   230.68    -0.08   230.68     0.20   260.57
 MEAN    17.74     0.00    -0.02   230.68    -0.08   230.68     0.20
 HUB     15.05     0.00    -0.02   230.68    -0.08   230.68     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.91    46.36     2.55   264.47   351.00    15.67   529.85     0.31
 MEAN    45.39    43.40     1.99   233.74   328.46    15.67   529.85     0.29
 HUB     40.70    38.84     1.86   198.32   304.26    15.67   529.85     0.27

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   263.20    84.64   249.21  1131.52     0.23
 MEAN    17.51   269.15   101.40   249.32  1131.46     0.24
 HUB     14.85   290.90   149.47   249.57  1131.38     0.26

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    261.04   305.33   176.40     0.27  1678.27
 MEAN   230.69   280.84   129.29     0.25  1776.61     1.25
 HUB    195.68   253.81    46.22     0.22  2220.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.47     1.02    15.86   537.84     1.01   532.06     0.92     0.89
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 MEAN    16.49     1.02    15.85   538.05     1.01   532.00     0.92     0.89
 HUB     16.58     1.03    15.84   538.99     1.01   531.92     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.76    35.29    31.50     3.79     0.93     0.17     2.90
 MEAN    22.13    27.41    23.50     3.91     0.91     0.19     3.28     0.89
 HUB     30.92    10.49     6.50     3.99     0.91     0.23     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.976

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     272.240     102.067     252.383    1131.574       0.241       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.509      15.856     532.104      46.000      22.019      31.500       9.481

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     264.263     102.067     283.289    1131.954       0.233       0.057

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.504      15.889     532.461     471.992       0.017       0.182

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     256.950       0.000     256.950    1132.293       0.227       0.052

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.891     532.780       0.000       0.060       0.065       0.060

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.792      16.472       1.021     538.294       4.004     303.908       2.356

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  24932.818       0.366      98.301  616690.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.976   EfDer =  0.932

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     69.767    1510.000      16.472     538.294       1.000       1.000       0.980
W Kg/sec =   31.71247

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     63.426    1482.263       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  53670.859   54744.160       2.779     513.330     184.712     401.059       2.171

     ROTOR LEADING EDGE CONDITIONS, STAGE           4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   242.41    -0.08   242.41     0.21   249.12
 MEAN    16.97     0.00    -0.02   242.41    -0.08   242.41     0.21
 HUB     14.32     0.00    -0.02   242.41    -0.08   242.41     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.32    46.36    -0.04   253.79   351.02    15.95   533.39     0.31
 MEAN    42.70    43.80    -1.10   223.63   329.86    15.95   533.39     0.29
 HUB     37.91    37.84     0.07   188.70   307.25    15.95   533.39     0.27

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   268.06    63.23   260.49  1134.45     0.24
 MEAN    16.57   273.17    82.47   260.42  1134.60     0.24
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 HUB     13.89   293.11   134.27   260.54  1134.71     0.26

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    248.79   319.82   185.56     0.28  1195.41
 MEAN   218.40   293.76   135.92     0.26  1368.33     1.20
 HUB    183.03   265.07    48.76     0.23  1866.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.70     1.01    16.07   540.82     1.00   534.82     0.92     0.85
 MEAN    16.74     1.02    16.07   541.19     1.01   534.96     0.92     0.85
 HUB     16.83     1.02    16.07   542.24     1.01   535.07     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     13.64    35.46    31.50     3.96     0.93     0.12     2.90
 MEAN    17.57    27.56    23.50     4.06     0.90     0.15     3.29     0.85
 HUB     27.26    10.60     6.50     4.10     0.90     0.19     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.932

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     268.893      82.938     255.783    1135.046       0.237       0.050

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.751      16.109     535.381      46.000      17.965      32.400      14.435

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     271.235      82.938     283.632    1134.934       0.239       0.026

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.741      16.088     535.275     456.573       0.025       0.141

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     258.761       0.000     258.761    1135.519       0.228      -0.016

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.098     535.827       0.000       0.060       0.097       0.041

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.655      16.692       1.013     541.419       3.125     363.940       2.821

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  19460.674       0.314      76.726  642582.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.976   EfDer =  0.874

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     69.767    1510.000      16.692     541.419       1.000       1.000       0.980
W Kg/sec =   31.71247

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     62.774    1477.979       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  53670.859   54744.160       2.788     509.668     182.812     390.276       2.135

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   242.30    -0.08   242.30     0.21   236.28
 MEAN    15.91     0.00    -0.02   242.30    -0.08   242.30     0.21
 HUB     13.07     0.00    -0.02   242.30    -0.08   242.30     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.90    47.36    -2.46   241.41   342.09    16.17   536.52     0.30
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MEAN    40.88    44.80    -3.92   209.69   320.49    16.17   536.52     0.28
HUB     35.42    38.84    -3.42   172.23   297.32    16.17   536.52     0.26
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   264.80    49.05   260.21  1137.21     0.23
MEAN    15.50   268.64    67.09   260.12  1137.38     0.24
HUB     12.59   285.19   116.62   260.26  1137.53     0.25

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    236.40   320.64   187.35     0.28   881.53
MEAN   204.22   294.06   137.13     0.26  1041.01     1.17
HUB    165.90   264.88    49.28     0.23  1469.32

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.85     1.01    16.23   543.28     1.00   537.43     0.92     0.80
MEAN    16.88     1.01    16.24   543.62     1.00   537.60     0.92     0.80
HUB     16.96     1.02    16.23   544.53     1.01   537.74     0.92     0.80

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     10.68    35.75    31.50     4.25     0.93     0.09     2.90
MEAN    14.46    27.80    23.50     4.30     0.88     0.11     3.34     0.80
HUB     24.14    10.72     6.50     4.22     0.88     0.16     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.874

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      270.949      68.317     262.195    1137.473       0.238       -0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.885      16.230      537.681      46.000      14.604      33.000      18.396

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      280.767      68.317     288.959    1136.994       0.247       -0.117

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.857      16.156     537.229     440.827       0.062       0.111

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      263.974       0.000     263.974    1137.802       0.232       -0.049

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950      16.198      537.993       0.000       0.060       0.122       -0.054

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.486      16.817       1.008     543.812       2.393     442.945       3.434

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  14900.367       0.267      58.746  684755.312

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    130767.54    515.5668      68.1558      1.1132       0.7772       7.9764       1.0402
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      67.306    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   30.59380

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      65.752    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  51777.590   52813.035       4.343     831.557     191.483     619.754       3.237

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   150.80    -0.05   150.80     0.13   270.77
  MEAN    17.06     0.00    -0.02   150.80    -0.05   150.80     0.13
  HUB     12.51     0.00    -0.02   150.80    -0.05   150.80     0.13

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.99    50.47    10.52   271.85   310.92    14.92   520.91     0.28
  MEAN    56.15    47.20     8.95   224.81   270.74    14.92   520.91     0.24
  HUB     47.56    38.62     8.94   164.85   223.45    14.92   520.91     0.20

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   263.04   159.76   208.97  1122.95     0.23
  MEAN    18.04   272.84   174.58   209.67  1122.15     0.24
  HUB     15.00   304.02   218.95   210.93  1120.84     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   237.13   112.08     0.21  3296.98
  MEAN   237.67   218.96    63.09     0.20  3149.59     1.40
  HUB    197.66   212.00    21.29     0.19  3284.87

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.76     1.04    15.17   529.79     1.01   524.01     0.92     0.91
  MEAN    15.73     1.04    15.09   529.48     1.01   523.26     0.92     0.91
  HUB     15.76     1.04    14.97   529.76     1.01   522.04     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     37.40    28.21    24.20     4.01     0.93     0.33     2.90
  MEAN    39.78    16.75    12.70     4.05     0.93     0.29     3.51     0.91
  HUB     46.07    -5.76    -9.30     3.54     0.93     0.16     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     276.525     174.239     214.725    1122.178       0.246      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.740      15.088     523.290      24.000      39.058      35.400      -3.658

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	233.476	174.239	291.325	1124.142	0.208	0.293

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	15.740	15.273	525.124	528.796	0.011	0.424

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	217.481	0.000	217.481	1124.787	0.193	0.337

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.314	525.726	0.000	0.060	0.041	0.355

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.872	15.719	1.041	529.677	6.867	202.472	1.570

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
42749.992	0.578	162.601	634089.188

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
67.306	1510.000	15.719	529.677	1.000	1.000	0.980

W Kg/sec = 30.59380

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
63.605	1494.272	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
51777.590	52813.035	3.188	590.487	185.230	474.134	2.560

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	208.44	-0.07	208.44	0.19	267.96
MEAN	18.08	0.00	-0.02	208.44	-0.07	208.44	0.19	
HUB	15.21	0.00	-0.02	208.44	-0.07	208.44	0.19	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.42	46.36	6.06	270.79	341.78	15.35	526.05	0.30
MEAN	48.82	42.30	6.52	238.22	316.59	15.35	526.05	0.28
HUB	43.89	37.84	6.05	200.43	289.22	15.35	526.05	0.26

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	251.10	111.14	225.16	1128.51	0.22
MEAN	18.01	256.29	121.70	225.55	1128.10	0.23
HUB	15.22	276.89	159.91	226.05	1127.67	0.25

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	269.08	275.04	157.94	0.24	2270.87	
MEAN	237.32	253.46	115.62	0.22	2193.12	1.35
HUB	200.60	229.68	40.69	0.20	2435.38	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.18	1.03	15.63	534.48	1.01	529.22	0.92	0.91
MEAN	16.16	1.03	15.59	534.32	1.01	528.83	0.92	0.91
HUB	16.21	1.03	15.55	534.83	1.01	528.43	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	26.27	35.05	31.50	3.55	0.93	0.25	2.90	
MEAN	28.35	27.14	23.50	3.64	0.93	0.26	3.30	0.91
HUB	35.28	10.20	6.50	3.70	0.93	0.28	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000
    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     259.937     122.042     229.505    1128.170       0.230      -0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.179      15.591     528.901      46.000      28.002      30.600       2.598

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     237.250     122.042     266.799    1129.174       0.210       0.167

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.179      15.688     529.843     511.151       0.010       0.256

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     234.137       0.000     234.137    1129.305       0.207       0.156

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.684     529.966       0.000       0.060       0.039       0.159

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      16.162       1.028     534.544       4.868     259.622       2.013

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  30309.139       0.419     115.282  586250.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.986

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     67.306    1510.000      16.162     534.544       1.000       1.000       0.980
W Kg/sec =   30.59380

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     62.147    1487.453       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  51777.590   52813.035       3.014     545.479     180.984     429.765       2.375

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   221.95    -0.08   221.95     0.20   260.51
 MEAN    17.74      0.00    -0.02   221.95    -0.08   221.95     0.20
 HUB     15.05      0.00    -0.02   221.95    -0.08   221.95     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.00     46.36     3.64   264.47   345.32    15.73   530.43     0.31
 MEAN    46.49     43.40     3.09   233.74   322.39    15.73   530.43     0.29
 HUB     41.79     38.84     2.95   198.32   297.69    15.73   530.43     0.26

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   256.46    91.75   239.48  1132.42      0.23
 MEAN    17.51   262.32   106.63   239.67  1132.26      0.23
 HUB     14.85   283.76   151.44   239.98  1132.08      0.25

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    261.04   293.28   169.29     0.26  1819.09
 MEAN   230.69   269.87   124.06     0.24  1868.11      1.28
 HUB    195.68   244.02    44.25     0.22  2249.98

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     16.53     1.02    15.95   538.39     1.01   532.90     0.92     0.90
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 MEAN    16.54     1.02    15.93   538.50     1.01   532.75     0.92     0.90
 HUB     16.62     1.03    15.91   539.31     1.01   532.58     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.96    35.26    31.50     3.76     0.93     0.20     2.90
 MEAN    23.99    27.37    23.50     3.87     0.91     0.21     3.28     0.90
 HUB     32.25    10.45     6.50     3.95     0.91     0.25     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     265.286     107.332     242.604    1132.373       0.234       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.558      15.936     532.855      46.000      23.865      31.500       7.635

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     253.828     107.332     275.588    1132.901       0.224       0.087

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.555      15.985     533.352     471.992       0.014       0.206

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     246.742       0.000     246.742    1133.215       0.218       0.087

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.991     533.648       0.000       0.060       0.056       0.095

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.824      16.529       1.023     538.733       4.189     288.191       2.234

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  26082.184       0.383      99.205  593798.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.951

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     67.306    1510.000      16.529     538.733       1.000       1.000       0.980
W Kg/sec =   30.59380

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     61.005    1481.659       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  51777.590   52813.035       2.889     513.330     177.661     401.059       2.257

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   232.83    -0.08   232.83     0.21   249.02
 MEAN    16.97     0.00    -0.02   232.83    -0.08   232.83     0.21
 HUB     14.32     0.00    -0.02   232.83    -0.08   232.83     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.48    46.36     1.12   253.79   344.48    16.05   534.21     0.30
 MEAN    43.85    43.80     0.05   223.63   322.89    16.05   534.21     0.28
 HUB     39.03    37.84     1.19   188.70   299.75    16.05   534.21     0.26

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   259.76    71.07   249.85  1135.64     0.23
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 MEAN    16.57   264.98    88.18   249.87  1135.67     0.23
 HUB     13.89   284.85   136.42   250.06  1135.67     0.25
       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    248.79   306.61   177.72     0.27  1343.34
 MEAN   218.40   281.77   130.22     0.25  1462.88     1.23
 HUB    183.03   254.37    46.61     0.22  1895.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.79     1.02    16.19   541.58     1.01   535.94     0.92     0.87
 MEAN    16.82     1.02    16.19   541.83     1.01   535.97     0.92     0.87
 HUB     16.91     1.02    16.18   542.75     1.01   535.97     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.88    35.42    31.50     3.92     0.93     0.15     2.90
 MEAN    19.44    27.53    23.50     4.03     0.90     0.17     3.29     0.87
 HUB     28.61    10.56     6.50     4.06     0.90     0.21     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.951

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     260.971      88.678     245.442    1136.086       0.230       0.050

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.833      16.225     536.362      46.000      19.865      32.400      12.535

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     260.046      88.678     274.750    1136.128       0.229       0.052

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.826      16.222     536.403     456.573       0.021       0.164

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     248.007       0.000     248.007    1136.669       0.218       0.018

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.236     536.913       0.000       0.060       0.084       0.074

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.718      16.785       1.015     542.050       3.317     341.077       2.644

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  20656.529       0.334      78.568  618431.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.900

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     67.306    1510.000      16.785     542.050       1.000       1.000       0.980
W Kg/sec =   30.59380

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     60.259    1477.118       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  51777.590   52813.035       2.904     509.668     175.488     390.276       2.224

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   232.30    -0.08   232.30     0.20   236.14
 MEAN    15.91     0.00    -0.02   232.30    -0.08   232.30     0.20
 HUB     13.07     0.00    -0.02   232.30    -0.08   232.30     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.11    47.36    -1.25   241.41   335.08    16.30   537.54     0.29
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 MEAN    42.08    44.80    -2.72   209.69   312.99    16.30   537.54     0.28
 HUB     36.57    38.84    -2.27   172.23   289.23    16.30   537.54     0.25
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   255.63    57.29   249.12  1138.63     0.22
 MEAN    15.50   259.62    73.07   249.13  1138.68     0.23
 HUB     12.59   276.20   118.88   249.31  1138.71     0.24

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    236.40   306.83   179.11     0.27  1029.23
 MEAN   204.22   281.54   131.15     0.25  1133.69     1.19
 HUB    165.90   253.71    47.02     0.22  1497.72

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.98     1.01    16.39   544.23     1.00   538.77     0.92     0.82
 MEAN    17.00     1.01    16.39   544.45     1.00   538.82     0.92     0.82
 HUB     17.07     1.02    16.38   545.22     1.01   538.85     0.92     0.82

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     12.95    35.71    31.50     4.21     0.93     0.11     2.90
 MEAN    16.35    27.76    23.50     4.26     0.89     0.14     3.34     0.82
 HUB     25.49    10.68     6.50     4.18     0.89     0.17     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.900

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     261.885      74.410     251.092    1138.767       0.230       -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.003      16.387     538.905      46.000      16.507      33.000      16.493

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     268.574      74.410     278.691    1138.454       0.236       -0.087

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.982      16.335     538.609     440.827       0.054       0.132

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     252.512       0.000     252.512    1139.193       0.222       -0.019

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      16.376     539.308       0.000       0.060       0.110       -0.023

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.578      16.946       1.010     544.633       2.582     409.594       3.175

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  16081.101       0.288      61.165  658799.188

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    135878.94    516.8214      65.7516      1.1218       0.8024       8.9529       1.0417
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.991

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      64.714    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   29.41550

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      63.219    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  49783.426   50778.988       4.517     831.557     184.108     619.754       3.366

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   144.89    -0.05   144.89     0.13   270.77
  MEAN    17.06     0.00    -0.02   144.89    -0.05   144.89     0.13
  HUB     12.51     0.00    -0.02   144.89    -0.05   144.89     0.13

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.95    50.47    11.48   271.85   308.09    14.93   521.06     0.28
  MEAN    57.20    47.20    10.00   224.81   267.49    14.93   521.06     0.24
  HUB     48.70    38.62    10.08   164.85   219.51    14.93   521.06     0.20

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   259.31   164.28   200.64  1123.34     0.23
  MEAN    18.04   268.16   177.10   201.35  1122.48     0.24
  HUB     15.00   297.67   218.13   202.55  1121.16     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   227.65   107.57     0.20  3390.06
  MEAN   237.67   210.26    60.56     0.19  3195.08     1.44
  HUB    197.66   203.58    20.47     0.18  3272.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.77     1.04    15.20   529.99     1.01   524.37     0.92     0.91
  MEAN    15.73     1.04    15.12   529.57     1.01   523.57     0.92     0.91
  HUB     15.75     1.04    15.00   529.74     1.01   522.34     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     39.31    28.20    24.20     4.00     0.93     0.35     2.90
  MEAN    41.33    16.74    12.70     4.04     0.94     0.31     3.51     0.91
  HUB     47.12    -5.77    -9.30     3.53     0.94     0.19     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     271.585     176.759     206.190    1122.516       0.242      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.746      15.117     523.605      24.000      40.605      35.400      -5.205

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     224.065     176.759     285.392    1124.623       0.199       0.324
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      15.745      15.314     525.572     528.796       0.012       0.448

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     208.786       0.000     208.786    1125.214       0.186       0.359

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.349     526.125       0.000       0.060       0.046       0.377

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.866      15.723       1.041     529.766       6.956     196.557       1.524

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  43304.410       0.586     158.367  609243.188


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    64.714    1510.000      15.723     529.766       1.000       1.000       0.980
W Kg/sec =   29.41550

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    61.146    1494.147       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  49783.426   50778.988       3.316     590.487     178.070     474.134       2.663

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   200.13    -0.07   200.13     0.18   267.94
 MEAN    18.08     0.00    -0.02   200.13    -0.07   200.13     0.18
 HUB     15.21     0.00    -0.02   200.13    -0.07   200.13     0.18

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.54    46.36     7.18   270.79   336.78    15.38   526.42     0.30
 MEAN    49.97    42.30     7.67   238.22   311.18    15.38   526.42     0.28
 HUB     45.05    37.84     7.21   200.43   283.29    15.38   526.42     0.25

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   245.99   117.69   216.02  1129.13     0.22
 MEAN    18.01   250.70   126.48   216.45  1128.64     0.22
 HUB     15.22   270.60   161.68   216.99  1128.13     0.24

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    269.08   263.78   151.39     0.23  2404.61
 MEAN   237.32   243.18   110.84     0.22  2279.17     1.39
 HUB    200.60   220.45    38.92     0.20  2462.28

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.21     1.03    15.68   534.86     1.01   529.80     0.92     0.91
 MEAN    16.18     1.03    15.64   534.59     1.01   529.34     0.92     0.91
 HUB     16.22     1.03    15.58   534.98     1.01   528.86     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.58    35.02    31.50     3.52     0.93     0.28     2.90
 MEAN    30.30    27.12    23.50     3.62     0.93     0.28     3.30     0.91
 HUB     36.69    10.17     6.50     3.67     0.93     0.29     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     254.150     126.837     220.238    1128.715       0.225       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.199      15.637     529.413      46.000      29.938      30.600       0.662

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     227.527     126.837     260.492    1129.856       0.201       0.199

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.200      15.748     530.484     511.151       0.009       0.284

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     224.530       0.000     224.530    1129.977       0.199       0.188

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.744     530.597       0.000       0.060       0.037       0.193

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      16.184       1.029     534.807       5.042     247.781       1.921

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  31392.619       0.434     114.804  562844.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.994

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     64.714    1510.000      16.184     534.807       1.000       1.000       0.980
W Kg/sec =   29.41550

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     59.686    1487.087       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  49783.426   50778.988       3.138     545.479     173.817     429.765       2.473

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   212.88    -0.07   212.88     0.19   260.45
 MEAN    17.74      0.00    -0.02   212.88    -0.07   212.88     0.19
 HUB     15.05      0.00    -0.02   212.88    -0.07   212.88     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.18     46.36     4.82   264.47   339.56    15.79   531.02     0.30
 MEAN    47.68     43.40     4.28   233.74   316.21    15.79   531.02     0.28
 HUB     42.98     38.84     4.14   198.32   290.99    15.79   531.02     0.26

     ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   249.91    99.09   229.43  1133.32      0.22
 MEAN    17.51   255.54   112.00   229.69  1133.06      0.23
 HUB     14.85   276.51   153.40   230.06  1132.79      0.24

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    261.04   280.83   161.95     0.25  1964.38
 MEAN   230.69   258.54   118.69     0.23  1962.02      1.32
 HUB    195.68   233.91    42.29     0.21  2279.03

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     16.59      1.02    16.03   538.97     1.01   533.75     0.92     0.91
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 MEAN    16.59     1.02    16.01   538.96     1.01   533.51     0.92     0.91
 HUB     16.65     1.03    15.97   539.63     1.01   533.25     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.36    35.22    31.50     3.72     0.93     0.22     2.90
 MEAN    25.99    27.33    23.50     3.83     0.92     0.24     3.28     0.91
 HUB     33.69    10.42     6.50     3.92     0.92     0.26     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     258.386     112.734     232.497    1133.173       0.228       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.602      16.011     533.609      46.000      25.868      31.500       5.632

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     243.066     112.734     267.937    1133.854       0.214       0.119

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.601      16.077     534.251     471.992       0.012       0.232

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     236.234       0.000     236.234    1134.145       0.208       0.123

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.085     534.525       0.000       0.060       0.047       0.132

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.849      16.580       1.024     539.185       4.378     273.043       2.117

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  27260.432       0.400      99.693  569834.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.968

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     64.714    1510.000      16.580     539.185       1.000       1.000       0.980
W Kg/sec =   29.41550

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     58.499    1481.037       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  49783.426   50778.988       3.013     513.330     170.363     401.059       2.354

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   222.97    -0.08   222.97     0.20   248.92
 MEAN    16.97     0.00    -0.02   222.97    -0.08   222.97     0.20
 HUB     14.32     0.00    -0.02   222.97    -0.08   222.97     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.71    46.36     2.35   253.79   337.88    16.14   535.03     0.30
 MEAN    45.09    43.80     1.29   223.63   315.85    16.14   535.03     0.28
 HUB     40.25    37.84     2.41   188.70   292.15    16.14   535.03     0.26

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   251.68    79.07   238.93  1136.82     0.22
 MEAN    16.57   256.89    94.06   239.05  1136.74     0.23
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HUB     13.89   276.54   138.61   239.30  1136.63     0.24

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    248.79   293.08   169.72     0.26  1494.29
MEAN   218.40   269.45   124.33     0.24  1560.31     1.26
HUB    183.03   243.38    44.42     0.21  1926.37

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.88     1.02    16.31   542.35     1.01   537.06     0.92     0.89
MEAN    16.90     1.02    16.30   542.49     1.01   536.98     0.92     0.89
HUB     16.97     1.02    16.28   543.26     1.01   536.88     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     18.31    35.39    31.50     3.89     0.93     0.17     2.90
MEAN    21.48    27.48    23.50     3.98     0.91     0.19     3.29     0.89
HUB     30.08    10.52     6.50     4.02     0.91     0.23     3.90

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.968

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     253.163      94.593     234.827    1137.127       0.223       0.050

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    16.910      16.335     537.347      46.000      21.941      32.400      10.459

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     248.584      94.593     265.973    1137.330       0.219       0.082

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.906      16.351     537.539     456.573       0.017       0.190

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     237.008       0.000     237.008    1137.827       0.208       0.055

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.369     538.008       0.000       0.060       0.071       0.110

   STAGE EXIT CONDITIONS, STAGE             4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.771      16.872       1.018     542.699       3.514     319.662       2.478

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  21881.273       0.354      80.021  593194.312


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.925

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     64.714    1510.000      16.872     542.699       1.000       1.000       0.980
W Kg/sec =   29.41550

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     57.672    1476.235       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  49783.426   50778.988       3.035     509.668     167.955     390.276       2.324

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   222.05    -0.08   222.05     0.20   236.00
MEAN    15.91     0.00    -0.02   222.05    -0.08   222.05     0.20
HUB     13.07     0.00    -0.02   222.05    -0.08   222.05     0.20

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     47.40    47.36     0.04   241.41   328.06    16.43   538.58     0.29
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MEAN    43.37    44.80    -1.43   209.69   305.47    16.43   538.58     0.27
HUB     37.81    38.84    -1.03   172.23   281.06    16.43   538.58     0.25
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   246.71    65.67   237.80  1140.04     0.22
MEAN    15.50   250.75    79.26   237.90  1139.98     0.22
HUB     12.59   267.20   121.21   238.13  1139.89     0.23

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    236.40   292.74   170.73     0.26  1179.59
MEAN   204.22   268.72   124.96     0.24  1229.51     1.22
HUB    165.90   242.29    44.70     0.21  1526.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.10     1.01    16.55   545.20     1.00   540.11     0.92     0.85
MEAN    17.11     1.01    16.54   545.30     1.00   540.05     0.92     0.85
HUB     17.17     1.02    16.53   545.93     1.01   539.97     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     15.44    35.68    31.50     4.18     0.93     0.14     2.90
MEAN    18.43    27.71    23.50     4.21     0.90     0.16     3.34     0.85
HUB     26.98    10.63     6.50     4.13     0.90     0.19     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.925

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      252.975      80.711     239.754    1140.063       0.222       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.117      16.539      540.131      46.000      18.605      33.000      14.395

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      256.159      80.711     268.573    1139.920       0.225       -0.053

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.102      16.510     539.996     440.827       0.046       0.156

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     240.833       0.000     240.833    1140.591       0.211       0.017

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.549     540.632       0.000       0.060       0.097       0.014

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.660      17.072       1.012     545.476       2.777     379.254       2.940

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  17291.123       0.309      63.235  631711.062

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    141129.86    516.1194     63.2192      1.1301      0.8230     10.0038      1.0434
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.987

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      62.420    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   28.37290

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      60.978    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   48018.895   48979.168       4.683     831.557     177.583     619.754       3.490

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   139.67    -0.05   139.67     0.12   270.77
  MEAN    17.06     0.00    -0.02   139.67    -0.05   139.67     0.12
  HUB     12.51     0.00    -0.02   139.67    -0.05   139.67     0.12

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.81    50.47    12.34   271.85   305.67    14.94   521.18     0.27
  MEAN    58.15    47.20    10.95   224.81   264.70    14.94   521.18     0.24
  HUB     49.73    38.62    11.11   164.85   216.10    14.94   521.18     0.19

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   256.23   168.19   193.31  1123.66     0.23
  MEAN    18.04   264.20   179.33   194.02  1122.75     0.24
  HUB     15.00   292.14   217.37   195.18  1121.42     0.26

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   219.35   103.66     0.20  3470.73
  MEAN   237.67   202.60    58.34     0.18  3235.22     1.48
  HUB    197.66   196.17    19.71     0.17  3261.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.79     1.04    15.22   530.16     1.01   524.67     0.92     0.90
  MEAN    15.74     1.04    15.14   529.66     1.01   523.83     0.92     0.90
  HUB     15.74     1.04    15.02   529.71     1.01   522.58     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     41.03    28.20    24.20     4.00     0.93     0.38     2.90
  MEAN    42.75    16.73    12.70     4.03     0.94     0.33     3.51     0.90
  HUB     48.08    -5.77    -9.30     3.53     0.94     0.21     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     267.410     178.982     198.679    1122.800       0.238      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.750      15.140     523.870      24.000      42.014      35.400      -6.614

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	215.796	178.982	280.361	1125.030	0.192	0.351

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	15.748	15.349	525.953	528.796	0.013	0.471

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	201.146	0.000	201.146	1125.576	0.179	0.378

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.377	526.464	0.000	0.060	0.051	0.396

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.859	15.724	1.041	529.843	7.033	191.392	1.484

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
43785.484	0.592	154.450	587301.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =10.953 EfDer = 0.996

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
62.420	1510.000	15.724	529.843	1.000	1.000	0.980

W Kg/sec = 28.37290

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
58.978	1494.037	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
48018.895	48979.168	3.438	590.487	171.755	474.134	2.761

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	192.83	-0.07	192.83	0.17	267.92
MEAN	18.08	0.00	-0.02	192.83	-0.07	192.83	0.17	
HUB	15.21	0.00	-0.02	192.83	-0.07	192.83	0.17	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.55	46.36	8.19	270.79	332.49	15.41	526.74	0.30
MEAN	51.02	42.30	8.72	238.22	306.54	15.41	526.74	0.27
HUB	46.12	37.84	8.28	200.43	278.17	15.41	526.74	0.25

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	241.86	123.40	208.01	1129.65	0.21
MEAN	18.01	246.05	130.68	208.48	1129.10	0.22
HUB	15.22	265.19	163.18	209.04	1128.52	0.23

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	269.08	253.95	145.67	0.22	2521.28	
MEAN	237.32	234.17	106.64	0.21	2354.72	1.42
HUB	200.60	212.36	37.42	0.19	2485.06	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.23	1.03	15.72	535.18	1.01	530.29	0.92	0.91
MEAN	16.20	1.03	15.67	534.83	1.01	529.77	0.92	0.91
HUB	16.23	1.03	15.61	535.10	1.01	529.23	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.68	35.00	31.50	3.50	0.93	0.30	2.90	
MEAN	32.08	27.09	23.50	3.59	0.93	0.30	3.30	0.91
HUB	37.98	10.15	6.50	3.65	0.93	0.31	3.92	

blockage3	Cor/U1	Cor/Incid

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      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     249.335     131.046     212.121    1129.175       0.221       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.214      15.672     529.844      46.000      31.707      30.600      -1.107

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     219.024     131.046     255.234    1130.438       0.194       0.229

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.215      15.796     531.030     511.151       0.009       0.309

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     216.143       0.000     216.143    1130.549       0.191       0.216

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.791     531.135       0.000       0.060       0.037       0.221

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      16.200       1.030     535.036       5.194     237.871       1.844

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  32336.996       0.447     114.067  542220.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.998

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     62.420    1510.000      16.200     535.036       1.000       1.000       0.980
W Kg/sec =   28.37290

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     57.527    1486.769       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  48018.895   48979.168       3.256     545.479     167.532     429.765       2.565

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   204.96    -0.07   204.96     0.18   260.39
 MEAN    17.74     0.00    -0.02   204.96    -0.07   204.96     0.18
 HUB     15.05     0.00    -0.02   204.96    -0.07   204.96     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.23    46.36     5.87   264.47   334.65    15.83   531.53     0.30
 MEAN    48.76    43.40     5.36   233.74   310.93    15.83   531.53     0.27
 HUB     44.07    38.84     5.23   198.32   285.25    15.83   531.53     0.25

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   244.57   105.42   220.69  1134.08     0.22
 MEAN    17.51   249.89   116.63   221.01  1133.74     0.22
 HUB     14.85   270.36   155.14   221.42  1133.39     0.24

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    261.04   270.04   155.62     0.24  2089.74
 MEAN   230.69   248.70   114.06     0.22  2042.97     1.35
 HUB    195.68   225.10    40.54     0.20  2304.85

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     16.63     1.03    16.10   539.46     1.01   534.46     0.92     0.91
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 MEAN    16.62     1.03    16.07   539.36     1.01   534.15     0.92     0.91
 HUB     16.67     1.03    16.03   539.91     1.01   533.81     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.53    35.19    31.50     3.69     0.93     0.25     2.90
 MEAN    27.82    27.30    23.50     3.80     0.92     0.26     3.28     0.91
 HUB     35.02    10.38     6.50     3.88     0.92     0.28     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     252.633     117.391     223.703    1133.850       0.223       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.636      16.070     534.248      46.000      27.689      31.500       3.811

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     233.722     117.391     261.547    1134.665       0.206       0.150

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.636      16.151     535.016     471.992       0.010       0.257

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     227.129       0.000     227.129    1134.934       0.200       0.155

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.160     535.270       0.000       0.060       0.042       0.165

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864      16.618       1.026     539.578       4.542     260.637       2.020

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  28280.182       0.415      99.756  548747.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.980

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     62.420    1510.000      16.618     539.578       1.000       1.000       0.980
W Kg/sec =   28.37290

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     56.317    1480.498       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 48018.895   48979.168       3.130     513.330     164.008     401.059       2.445

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   214.42    -0.07   214.42     0.19   248.83
 MEAN    16.97     0.00    -0.02   214.42    -0.07   214.42     0.19
 HUB     14.32     0.00    -0.02   214.42    -0.07   214.42     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.82    46.36     3.46   253.79   332.30    16.21   535.74     0.29
 MEAN    46.21    43.80     2.41   223.63   309.86    16.21   535.74     0.27
 HUB     41.36    37.84     3.52   188.70   285.67    16.21   535.74     0.25

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   245.08    85.98   229.51  1137.82     0.22
 MEAN    16.57   250.17    99.12   229.69  1137.64     0.22
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 HUB     13.89   269.51   140.49   229.99  1137.44     0.24

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    248.79   281.39   162.80     0.25  1624.77
 MEAN   218.40   258.82   119.28     0.23  1644.04     1.29
 HUB    183.03   233.89    42.54     0.21  1952.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.95     1.02    16.41   543.02     1.01   538.00     0.92     0.90
 MEAN    16.96     1.02    16.39   543.06     1.01   537.83     0.92     0.90
 HUB     17.02     1.02    16.37   543.71     1.01   537.64     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.54    35.35    31.50     3.85     0.93     0.20     2.90
 MEAN    23.34    27.44    23.50     3.94     0.91     0.21     3.29     0.90
 HUB     31.42    10.48     6.50     3.98     0.91     0.24     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     246.686      99.676     225.651    1138.008       0.217       0.050

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.970      16.422     538.179      46.000      23.832      32.400       8.568

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     238.699      99.676     258.674    1138.350       0.210       0.110

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.967      16.454     538.503     456.573       0.014       0.214

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     227.536       0.000     227.536    1138.809       0.200       0.089

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.474     538.938       0.000       0.060       0.061       0.144

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.809      16.940       1.019     543.261       3.683     302.583       2.346

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  22937.250       0.371      80.910  571021.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.946

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     62.420    1510.000      16.940     543.261       1.000       1.000       0.980
W Kg/sec =   28.37290

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     55.434    1475.471       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  48018.895   48979.168       3.157     509.668     161.437     390.276       2.418

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   213.23    -0.07   213.23     0.19   235.88
 MEAN    15.91     0.00    -0.02   213.23    -0.07   213.23     0.19
 HUB     13.07     0.00    -0.02   213.23    -0.07   213.23     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.56    47.36     1.20   241.41   322.15    16.53   539.46     0.28
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MEAN    44.53    44.80    -0.27   209.69   299.11    16.53   539.46     0.26
HUB     38.94    38.84     0.10   172.23   274.14    16.53   539.46     0.24
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   239.46    72.93   228.08  1141.24     0.21
MEAN    15.50   243.40    84.55   228.24  1141.07     0.21
HUB     12.59   259.62   123.21   228.52  1140.89     0.23

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    236.40   280.61   163.47     0.25  1309.79
MEAN   204.22   257.71   119.67     0.23  1311.46     1.25
HUB    165.90   232.48    42.69     0.20  1552.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.20     1.02    16.68   546.03     1.01   541.24     0.92     0.87
MEAN    17.20     1.02    16.67   546.04     1.01   541.09     0.92     0.87
HUB     17.25     1.02    16.64   546.55     1.01   540.92     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     17.73    35.63    31.50     4.13     0.93     0.17     2.90
MEAN    20.33    27.67    23.50     4.17     0.90     0.18     3.34     0.87
HUB     28.33    10.58     6.50     4.08     0.90     0.21     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.946

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      245.598      86.099     230.011    1141.156       0.215       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.208      16.660      541.168      46.000      20.522      33.000      12.478

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      245.522      86.099     260.181    1141.159       0.215       -0.021

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.197      16.651     541.171     440.827       0.039       0.179

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     230.824       0.000     230.824    1141.776       0.202       0.052

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.689     541.756       0.000       0.060       0.084       0.048

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.721      17.172       1.014     546.206       2.944     355.671       2.757

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  18333.889       0.328      64.672  607938.938

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    145673.80    513.8544     60.9785      1.1367      0.8362     10.9531      1.0447
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.963   EfDer =  0.981

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      60.027    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   27.28491

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      58.640    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   46177.566   47101.020       4.869     831.557     170.773     619.754       3.629

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   134.23    -0.05   134.23     0.12   270.77
  MEAN    17.06     0.00    -0.02   134.23    -0.05   134.23     0.12
  HUB     12.51     0.00    -0.02   134.23    -0.05   134.23     0.12

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.72    50.47    13.25   271.85   303.22    14.96   521.31     0.27
  MEAN    59.16    47.20    11.96   224.81   261.87    14.96   521.30     0.23
  HUB     50.85    38.62    12.23   164.85   212.62    14.96   521.31     0.19

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   253.27   172.23   185.70  1123.98     0.23
  MEAN    18.04   260.23   181.58   186.41  1123.03     0.23
  HUB     15.00   286.46   216.55   187.52  1121.69     0.26

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   210.73    99.62     0.19  3554.01
  MEAN   237.67   194.66    56.09     0.17  3275.76     1.53
  HUB    197.66   188.47    18.90     0.17  3248.89

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.80     1.05    15.25   530.33     1.01   524.98     0.92     0.90
  MEAN    15.74     1.04    15.16   529.74     1.01   524.09     0.92     0.90
  HUB     15.74     1.04    15.04   529.69     1.01   522.83     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     42.84    28.21    24.20     4.01     0.93     0.40     2.90
  MEAN    44.25    16.75    12.70     4.05     0.94     0.36     3.51     0.90
  HUB     49.11    -5.75    -9.30     3.55     0.94     0.23     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.981

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     263.205     181.227     190.877    1123.084       0.234      -0.005

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      15.754      15.162     524.135      24.000      43.514      35.400      -8.114

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	207.219	181.227	275.287	1125.438	0.184	0.380

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	15.751	15.382	526.335	528.796	0.015	0.496

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	193.222	0.000	193.222	1125.939	0.172	0.398

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.404	526.803	0.000	0.060	0.058	0.416

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.849	15.724	1.041	529.922	7.112	186.072	1.442

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
44275.301	0.599	150.189	564445.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =11.963 EfDer = 0.992

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
60.027	1510.000	15.724	529.922	1.000	1.000	0.980

W Kg/sec = 27.28491

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
56.720	1493.927	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
46177.566	47101.020	3.575	590.487	165.181	474.134	2.870

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	185.25	-0.06	185.25	0.16	267.90
MEAN	18.08	0.00	-0.02	185.25	-0.06	185.25	0.16	
HUB	15.21	0.00	-0.02	185.25	-0.06	185.25	0.16	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.63	46.36	9.27	270.79	328.15	15.43	527.06	0.29
MEAN	52.14	42.30	9.84	238.22	301.82	15.43	527.06	0.27
HUB	47.26	37.84	9.42	200.43	272.97	15.43	527.06	0.24

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	237.93	129.30	199.73	1130.18	0.21
MEAN	18.01	241.47	134.97	200.23	1129.55	0.21
HUB	15.22	259.73	164.72	200.82	1128.91	0.23

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	269.08	243.78	139.78	0.22	2641.64	
MEAN	237.32	224.87	102.35	0.20	2431.89	1.46
HUB	200.60	203.99	35.87	0.18	2508.56	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.26	1.03	15.76	535.51	1.01	530.78	0.92	0.91
MEAN	16.21	1.03	15.70	535.07	1.01	530.20	0.92	0.91
HUB	16.23	1.03	15.64	535.23	1.01	529.60	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.92	34.99	31.50	3.49	0.93	0.32	2.90	
MEAN	33.98	27.08	23.50	3.58	0.94	0.32	3.30	0.91
HUB	39.36	10.13	6.50	3.63	0.94	0.33	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992
    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     244.584     135.345     203.723    1129.633       0.217       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.227      15.705     530.275      46.000      33.598      30.600      -2.998

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     210.240     135.345     250.038    1131.022       0.186       0.262

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.228      15.841     531.579     511.151       0.009       0.337

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     207.491       0.000     207.491    1131.124       0.183       0.245

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.835     531.675       0.000       0.060       0.040       0.251

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      16.212       1.031     535.271       5.349     228.034       1.768

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  33307.977       0.460     112.986  520780.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.963   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     60.027    1510.000      16.212     535.271       1.000       1.000       0.980
W Kg/sec =   27.28491

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     55.292    1486.443       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  46177.566   47101.020       3.388     545.479     161.023     429.765       2.669

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   196.78    -0.07   196.78     0.17   260.33
 MEAN    17.74     0.00    -0.02   196.78    -0.07   196.78     0.17
 HUB     15.05     0.00    -0.02   196.78    -0.07   196.78     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.35    46.36     6.99   264.47   329.70    15.87   532.04     0.29
 MEAN    49.91    43.40     6.51   233.74   305.60    15.87   532.04     0.27
 HUB     45.23    38.84     6.39   198.32   279.43    15.87   532.04     0.25

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   239.48   111.93   211.71  1134.84     0.21
 MEAN    17.51   244.37   121.42   212.07  1134.42     0.22
 HUB     14.85   264.19   156.93   212.53  1133.99     0.23

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    261.04   258.95   149.11     0.23  2218.68
 MEAN   230.69   238.57   109.27     0.21  2126.83     1.39
 HUB    195.68   216.03    38.75     0.19  2331.44

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.67     1.03    16.16   539.97     1.01   535.18     0.92     0.91
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 MEAN    16.65     1.03    16.12   539.77     1.01   534.78     0.92     0.91
 HUB     16.69     1.03    16.07   540.21     1.01   534.38     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.86    35.16    31.50     3.66     0.93     0.27     2.90
 MEAN    29.79    27.26    23.50     3.76     0.93     0.28     3.28     0.91
 HUB     36.44    10.33     6.50     3.83     0.93     0.30     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     247.014     122.216     214.661    1134.526       0.218       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.666      16.124     534.886      46.000      29.655      31.500       1.845

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     224.130     122.216     255.286    1135.481       0.197       0.183

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.667      16.219     535.786     471.992       0.009       0.284

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     217.798       0.000     217.798    1135.728       0.192       0.189

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.228     536.020       0.000       0.060       0.038       0.199

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      16.651       1.027     539.982       4.711     248.490       1.926

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  29331.471       0.430      99.497  526852.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.963   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     60.027    1510.000      16.651     539.982       1.000       1.000       0.980
W Kg/sec =   27.28491

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     54.071    1479.945       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  46177.566   47101.020       3.260     513.330     157.467     401.059       2.547

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   205.65    -0.07   205.65     0.18   248.73
 MEAN    16.97     0.00    -0.02   205.65    -0.07   205.65     0.18
 HUB     14.32     0.00    -0.02   205.65    -0.07   205.65     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.99    46.36     4.63   253.79   326.71    16.27   536.45     0.29
 MEAN    47.41    43.80     3.61   223.63   303.86    16.27   536.45     0.27
 HUB     42.55    37.84     4.71   188.70   279.15    16.27   536.45     0.25

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   238.76    93.06   219.88  1138.81     0.21
 MEAN    16.57   243.61   104.33   220.13  1138.54     0.21
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 HUB     13.89   262.48   142.43   220.48  1138.26     0.23

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    248.79   269.44   155.73     0.24  1758.28
 MEAN   218.40   247.93   114.06     0.22  1730.42     1.32
 HUB    183.03   224.18    40.60     0.20  1979.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.02     1.02    16.50   543.70     1.01   538.94     0.92     0.91
 MEAN    17.01     1.02    16.48   543.64     1.01   538.69     0.92     0.91
 HUB     17.06     1.02    16.44   544.17     1.01   538.42     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.94    35.31    31.50     3.81     0.93     0.22     2.90
 MEAN    25.36    27.39    23.50     3.89     0.92     0.24     3.29     0.91
 HUB     32.86    10.43     6.50     3.93     0.92     0.26     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     240.381     104.921     216.275    1138.888       0.211       0.049

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.024      16.503     539.013      46.000      25.879      32.400       6.521

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     228.615     104.921     251.542    1139.375       0.201       0.141

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.023      16.551     539.474     456.573       0.011       0.240

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     217.891       0.000     217.891    1139.797       0.191       0.126

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.573     539.874       0.000       0.060       0.051       0.180

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.839      17.001       1.021     543.839       3.857     286.242       2.219

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  24021.344       0.388      81.484  548030.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =11.963   EfDer =  0.964

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     60.027    1510.000      17.001     543.839       1.000       1.000       0.980
W Kg/sec =   27.28491

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     53.145    1474.687       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  46177.566   47101.020       3.293     509.668     154.771     390.276       2.522

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   204.23    -0.07   204.23     0.18   235.75
 MEAN    15.91     0.00    -0.02   204.23    -0.07   204.23     0.18
 HUB     13.07     0.00    -0.02   204.23    -0.07   204.23     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.78    47.36     2.42   241.41   316.26    16.62   540.36     0.28
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 MEAN    45.77    44.80     0.97   209.69   292.76    16.62   540.36     0.26
 HUB     40.15    38.84     1.31   172.23   267.20    16.62   540.36     0.23
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   232.49    80.26   218.20  1142.43     0.20
 MEAN    15.50   236.22    89.93   218.43  1142.17     0.21
 HUB     12.59   252.05   125.21   218.75  1141.90     0.22

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    236.40   268.31   156.14     0.23  1441.15
 MEAN   204.22   246.52   114.29     0.22  1394.83     1.29
 HUB    165.90   222.50    40.69     0.19  1577.36

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.30     1.02    16.80   546.89     1.01   542.37     0.92     0.88
 MEAN    17.29     1.02    16.78   546.79     1.01   542.13     0.92     0.88
 HUB     17.32     1.02    16.75   547.18     1.01   541.87     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.19    35.59    31.50     4.09     0.93     0.19     2.90
 MEAN    22.38    27.62    23.50     4.12     0.91     0.20     3.34     0.88
 HUB     29.79    10.54     6.50     4.04     0.91     0.22     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.964

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     238.404      91.580     220.113    1142.249       0.209       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.292      16.774     542.206      46.000      22.590      33.000      10.410

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     234.746      91.580     251.977    1142.401       0.205       0.015

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.286      16.784     542.350     440.827       0.032       0.204

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     220.686       0.000     220.686    1142.964       0.193       0.090

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.821     542.885       0.000       0.060       0.071       0.087

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.773      17.265       1.016     546.952       3.113     333.799       2.588

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  19387.684       0.347      65.766  583311.188

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    150323.78    509.9237     58.6402      1.1428      0.8452     11.9632      1.0462
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =12.978   EfDer =  0.974

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      57.667    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   26.21243

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      56.335    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   44362.473   45249.625       5.069     831.557     164.060     619.754       3.778

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   128.89    -0.04   128.89     0.12   270.77
  MEAN    17.06     0.00    -0.02   128.89    -0.04   128.89     0.12
  HUB     12.51     0.00    -0.02   128.89    -0.04   128.89     0.12

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.64    50.47    14.17   271.85   300.89    14.97   521.42     0.27
  MEAN    60.18    47.20    12.98   224.81   259.17    14.97   521.42     0.23
  HUB     51.99    38.62    13.37   164.85   209.29    14.97   521.42     0.19

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   250.62   176.19   178.24  1124.29     0.22
  MEAN    18.04   256.51   183.79   178.94  1123.30     0.23
  HUB     15.00   280.97   215.74   179.99  1121.94     0.25

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   202.28    95.65     0.18  3635.75
  MEAN   237.67   186.87    53.88     0.17  3315.52     1.58
  HUB    197.66   180.90    18.08     0.16  3236.69

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.81     1.05    15.27   530.51     1.01   525.26     0.92     0.89
  MEAN    15.75     1.04    15.18   529.83     1.01   524.33     0.92     0.89
  HUB     15.73     1.04    15.06   529.66     1.01   523.07     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     44.67    28.22    24.20     4.02     0.93     0.43     2.90
  MEAN    45.77    16.76    12.70     4.06     0.94     0.38     3.51     0.89
  HUB     50.16    -5.74    -9.30     3.56     0.94     0.25     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     259.259     183.429     183.218    1123.351       0.231      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.756      15.182     524.385      24.000      45.033      35.400      -9.633

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     198.812     183.429     270.504    1125.826       0.177       0.409
   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      15.753      15.413     526.697     528.796       0.016       0.521

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     185.453       0.000     185.453    1126.284       0.165       0.416

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.428     527.126       0.000       0.060       0.066       0.434

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.839      15.723       1.041     529.999       7.189     180.859       1.402

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  44755.234       0.606     145.850  541954.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =12.978   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     57.667    1510.000      15.723     529.999       1.000       1.000       0.980
W Kg/sec =   26.21243

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     54.499    1493.818       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  44362.473   45249.625       3.721     590.487     158.712     474.134       2.987

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   177.82    -0.06   177.82     0.16   267.88
 MEAN    18.08     0.00    -0.02   177.82    -0.06   177.82     0.16
 HUB     15.21     0.00    -0.02   177.82    -0.06   177.82     0.16

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.71    46.36    10.35   270.79   324.01    15.45   527.36     0.29
 MEAN    53.27    42.30    10.97   238.22   297.32    15.45   527.36     0.26
 HUB     48.43    37.84    10.59   200.43   267.98    15.45   527.36     0.24

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   234.43   135.02   191.64  1130.67     0.21
 MEAN    18.01   237.24   139.14   192.16  1129.98     0.21
 HUB     15.22   254.52   166.21   192.76  1129.28     0.23

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    269.08   233.88   134.06     0.21  2758.34
 MEAN   237.32   215.79    98.18     0.19  2507.04     1.51
 HUB    200.60   195.80    34.39     0.17  2531.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.28     1.04    15.79   535.84     1.01   531.25     0.92     0.90
 MEAN    16.22     1.03    15.73   535.31     1.01   530.60     0.92     0.90
 HUB     16.23     1.03    15.66   535.36     1.01   529.95     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.17    34.97    31.50     3.47     0.93     0.35     2.90
 MEAN    35.91    27.06    23.50     3.56     0.94     0.35     3.30     0.90
 HUB     40.77    10.11     6.50     3.61     0.94     0.35     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     240.193     139.532     195.508    1130.065       0.213       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.238      15.734     530.681      46.000      35.515      30.600      -4.915

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     201.660     139.532     245.226    1131.578       0.178       0.294

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.238      15.881     532.103     511.151       0.010       0.366

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     199.050       0.000     199.050    1131.671       0.176       0.272

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.873     532.190       0.000       0.060       0.045       0.278

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.863      16.220       1.032     535.499       5.501     218.790       1.696

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  34249.691       0.473     111.614  499723.844


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =12.978   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     57.667    1510.000      16.220     535.499       1.000       1.000       0.980
W Kg/sec =   26.21243

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     53.103    1486.126       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  44362.473   45249.625       3.527     545.479     154.647     429.765       2.779

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   188.81    -0.07   188.81     0.17   260.28
 MEAN    17.74      0.00    -0.02   188.81    -0.07   188.81     0.17
 HUB     15.05      0.00    -0.02   188.81    -0.07   188.81     0.17

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     54.48     46.36      8.12   264.47   325.00     15.91   532.52      0.29
 MEAN    51.08     43.40      7.68   233.74   300.52     15.91   532.52      0.27
 HUB     46.42     38.84      7.58   198.32   273.87     15.91   532.52      0.24

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   234.91   118.24   202.99  1135.55      0.21
 MEAN    17.51   239.26   126.02   203.39  1135.06      0.21
 HUB     14.85   258.29   158.59   203.87  1134.56      0.23

       U2        W2        Wu2      MachRel2  DelRCu     Ws1/W2
 TIP    261.04   248.18   142.80      0.22  2343.61
 MEAN   230.69   228.74   104.67      0.20  2207.32      1.43
 HUB    195.68   207.22    37.09      0.18  2356.04

         Pt2       PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     16.70      1.03    16.21   540.46      1.01   535.85      0.92      0.91
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 MEAN    16.68     1.03    16.17   540.17     1.01   535.39     0.92     0.91
 HUB     16.71     1.03    16.11   540.49     1.01   534.91     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.22    35.13    31.50     3.63     0.93     0.30     2.90
 MEAN    31.78    27.23    23.50     3.73     0.93     0.30     3.28     0.91
 HUB     37.88    10.31     6.50     3.81     0.93     0.32     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     241.808     126.847     205.866    1135.165       0.213       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.690      16.170     535.489      46.000      31.640      31.500      -0.140

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     214.817     126.847     249.472    1136.255       0.189       0.217

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.691      16.279     536.518     471.992       0.008       0.313

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     208.754       0.000     208.754    1136.482       0.184       0.221

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.288     536.733       0.000       0.060       0.037       0.232

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      16.676       1.028     540.372       4.873     237.294       1.839

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  30342.082       0.445      98.880  505372.969


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =12.978   EfDer =  0.996

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     57.667    1510.000      16.676     540.372       1.000       1.000       0.980
W Kg/sec =   26.21243

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     51.885    1479.410       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  44362.473   45249.625       3.397     513.330     151.102     401.059       2.654

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   197.14    -0.07   197.14     0.17   248.64
 MEAN    16.97     0.00    -0.02   197.14    -0.07   197.14     0.17
 HUB     14.32     0.00    -0.02   197.14    -0.07   197.14     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.17    46.36     5.81   253.79   321.42    16.33   537.13     0.28
 MEAN    48.61    43.80     4.81   223.63   298.17    16.33   537.13     0.26
 HUB     43.76    37.84     5.92   188.70   272.94    16.33   537.13     0.24

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   233.06    99.83   210.59  1139.75     0.20
 MEAN    16.57   237.53   109.29   210.89  1139.40     0.21
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HUB     13.89   255.86   144.31   211.28  1139.03     0.22

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    248.79   257.95   148.95     0.23  1886.14
MEAN   218.40   237.44   109.10     0.21  1812.59     1.36
HUB    183.03   214.80    38.72     0.19  2005.47

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.07     1.02    16.58   544.36     1.01   539.83     0.92     0.91
MEAN    17.06     1.02    16.55   544.21     1.01   539.50     0.92     0.91
HUB     17.10     1.03    16.51   544.62     1.01   539.15     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.36    35.27    31.50     3.77     0.93     0.25     2.90
MEAN    27.40    27.35    23.50     3.85     0.92     0.26     3.29     0.91
HUB     34.33    10.38     6.50     3.88     0.92     0.28     3.90

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     234.557     109.910     207.213    1139.719       0.206       0.049

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.069      16.572     539.801      46.000      27.942      32.400       4.458

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     218.889     109.910     244.934    1140.345       0.192       0.173

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.069      16.636     540.395     456.573       0.010       0.268

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     208.604       0.000     208.604    1140.733       0.183       0.162

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.657     540.762       0.000       0.060       0.043       0.215

   STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      17.051       1.022     544.396       4.024     271.513       2.105

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  25058.686       0.405      81.662  525502.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =12.978   EfDer =  0.978

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     57.667    1510.000      17.051     544.396       1.000       1.000       0.980
W Kg/sec =   26.21243

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     50.932    1473.932       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  44362.473   45249.625       3.436     509.668     148.327     390.276       2.631

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   195.56    -0.07   195.56     0.17   235.63
 MEAN    15.91     0.00    -0.02   195.56    -0.07   195.56     0.17
 HUB     13.07     0.00    -0.02   195.56    -0.07   195.56     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.00    47.36     3.64   241.41   310.73    16.70   541.20     0.27
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MEAN    47.01    44.80     2.21   209.69   286.78    16.70   541.20     0.25
HUB     41.38    38.84     2.54   172.23   260.64    16.70   541.20     0.23
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   226.23    87.28   208.72  1143.55     0.20
MEAN    15.50   229.60    95.06   209.00  1143.20     0.20
HUB     12.59   244.93   127.11   209.36  1142.85     0.21

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    236.40   256.51   149.12     0.22  1567.08
MEAN   204.22   235.79   109.16     0.21  1474.24     1.32
HUB    165.90   212.93    38.79     0.19  1601.26

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.38     1.02    16.91   547.71     1.01   543.44     0.92     0.90
MEAN    17.36     1.02    16.88   547.52     1.01   543.11     0.92     0.90
HUB     17.38     1.02    16.84   547.78     1.01   542.77     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     22.69    35.54    31.50     4.04     0.93     0.22     2.90
MEAN    24.46    27.58    23.50     4.08     0.91     0.23     3.34     0.90
HUB     31.26    10.50     6.50     4.00     0.91     0.24     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.978

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      231.788      96.801     210.607    1143.278       0.203       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.364      16.873      543.184      46.000      24.685      33.000       8.315

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      224.426      96.801     244.412    1143.573       0.196       0.052

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.361      16.900     543.465     440.827       0.026       0.231

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      210.981       0.000     210.981    1144.088       0.184       0.129

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.937     543.954       0.000       0.060       0.059       0.126

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.814      17.344       1.017     547.671       3.275     314.467       2.438

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  20394.719       0.365      66.463  559202.688

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    154800.41    504.4689     56.3352      1.1481      0.8493     12.9783      1.0476
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.972   EfDer =  0.967

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      55.401    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   25.18210

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      54.121    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   42618.715   43471.000       5.276     831.557     157.612     619.754       3.932

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   123.76    -0.04   123.76     0.11   270.77
  MEAN    17.06     0.00    -0.02   123.76    -0.04   123.76     0.11
  HUB     12.51     0.00    -0.02   123.76    -0.04   123.76     0.11

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     65.53    50.47    15.06   271.85   298.73    14.98   521.53     0.27
  MEAN    61.17    47.20    13.97   224.81   256.66    14.98   521.53     0.23
  HUB     53.11    38.62    14.49   164.85   206.17    14.98   521.53     0.18

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   248.26   179.88   171.10  1124.57     0.22
  MEAN    18.04   253.05   185.81   171.78  1123.54     0.23
  HUB     15.00   275.81   214.97   172.79  1122.17     0.25

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   194.25    91.96     0.17  3711.87
  MEAN   237.67   179.44    51.85     0.16  3352.06     1.64
  HUB    197.66   173.65    17.31     0.15  3225.13

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.82     1.05    15.29   530.67     1.02   525.52     0.92     0.88
  MEAN    15.75     1.04    15.20   529.91     1.01   524.56     0.92     0.88
  HUB     15.72     1.04    15.08   529.64     1.01   523.28     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     46.43    28.26    24.20     4.06     0.93     0.45     2.90
  MEAN    47.25    16.80    12.70     4.10     0.95     0.41     3.51     0.88
  HUB     51.21    -5.72    -9.30     3.58     0.95     0.28     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     255.596     185.452     175.888    1123.596       0.227      -0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.758      15.200     524.614      24.000      46.516      35.400     -11.116

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     190.777     185.452     266.061    1126.181       0.169       0.437
   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      15.753      15.441     527.030     528.796       0.018       0.546

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     178.024       0.000     178.024    1126.601       0.158       0.433

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.449     527.423       0.000       0.060       0.075       0.451

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.827      15.721       1.041     530.070       7.260     175.914       1.364

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  45199.832       0.612     141.509  520383.406


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.972   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    55.401    1510.000      15.721     530.070       1.000       1.000       0.980
W Kg/sec =   25.18210

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    52.368    1493.717       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  42618.715   43471.000       3.872     590.487     152.506     474.134       3.109

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   170.71    -0.06   170.71     0.15   267.86
 MEAN    18.08     0.00    -0.02   170.71    -0.06   170.71     0.15
 HUB     15.21     0.00    -0.02   170.71    -0.06   170.71     0.15

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.78    46.36    11.42   270.79   320.16    15.47   527.64     0.28
 MEAN    54.38    42.30    12.08   238.22   293.12    15.47   527.64     0.26
 HUB     49.59    37.84    11.75   200.43   263.32    15.47   527.64     0.23

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   231.40   140.40   183.93  1131.12     0.20
 MEAN    18.01   233.47   143.12   184.46  1130.38     0.21
 HUB     15.22   249.70   167.63   185.06  1129.62     0.22

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    269.08   224.48   128.68     0.20  2868.24
 MEAN   237.32   207.12    94.21     0.18  2578.58     1.55
 HUB    200.60   187.98    32.97     0.17  2552.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.29     1.04    15.82   536.14     1.01   531.67     0.92     0.90
 MEAN    16.23     1.03    15.76   535.53     1.01   530.98     0.92     0.90
 HUB     16.23     1.03    15.68   535.47     1.01   530.27     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.36    34.98    31.50     3.48     0.93     0.37     2.90
 MEAN    37.81    27.05    23.50     3.55     0.94     0.37     3.30     0.90
 HUB     42.17    10.10     6.50     3.60     0.94     0.37     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     236.258     143.518     187.671    1130.460       0.209       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.246      15.758     531.052      46.000      37.406      30.600      -6.806

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     193.482     143.518     240.900    1132.093       0.171       0.327

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.245      15.916     532.587     511.151       0.012       0.395

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     191.012       0.000     191.012    1132.177       0.169       0.297

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.905     532.667       0.000       0.060       0.052       0.304

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.853      16.225       1.032     535.714       5.644     210.279       1.630

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  35141.613       0.485     110.019  479564.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.972   EfDer =  0.996

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     55.401    1510.000      16.225     535.714       1.000       1.000       0.980
W Kg/sec =   25.18210

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     51.011    1485.828       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  42618.715   43471.000       3.672     545.479     148.556     429.765       2.893

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   181.20    -0.06   181.20     0.16   260.23
 MEAN    17.74      0.00    -0.02   181.20    -0.06   181.20     0.16
 HUB     15.05      0.00    -0.02   181.20    -0.06   181.20     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.59     46.36     9.23   264.47   320.64    15.94   532.97     0.28
 MEAN    52.22     43.40     8.82   233.74   295.81    15.94   532.97     0.26
 HUB     47.59     38.84     8.75   198.32   268.68    15.94   532.97     0.24

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   230.92   124.14   194.71  1136.20      0.20
 MEAN    17.51   234.68   130.36   195.14  1135.65      0.21
 HUB     14.85   252.88   160.21   195.65  1135.08      0.22

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    261.04   238.02   136.90     0.21  2460.50
 MEAN   230.69   219.42   100.33     0.19  2283.29     1.47
 HUB    195.68   198.84    35.47     0.18  2380.13

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     16.73     1.03    16.26   540.92     1.01   536.47     0.92     0.91
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 MEAN    16.69     1.03    16.20   540.55     1.01   535.95     0.92     0.91
 HUB     16.71     1.03    16.15   540.75     1.01   535.41     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.52    35.11    31.50     3.61     0.93     0.32     2.90
 MEAN    33.74    27.21    23.50     3.71     0.93     0.32     3.28     0.91
 HUB     39.31    10.28     6.50     3.78     0.93     0.34     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     237.129     131.217     197.515    1135.752       0.209       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.709      16.208     536.044      46.000      33.598      31.500      -2.098

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     205.988     131.217     244.232    1136.972       0.181       0.251

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.709      16.331     537.196     471.992       0.009       0.342

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     200.193       0.000     200.193    1137.180       0.176       0.251

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      16.337     537.393       0.000       0.060       0.038       0.263

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.876      16.694       1.029     540.740       5.026     227.140       1.761

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  31294.918       0.459      97.976  484829.031


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =13.972   EfDer =  0.999

   W act       RPM act        Pt          Tt           POTS        POTH       AeroBl
     55.401    1510.000      16.694     540.740       1.000       1.000       0.980
W Kg/sec =   25.18210

   W cor       RPM cor        GAMMA       Cp          R           Blades       THK
     49.808    1478.907       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 42618.715   43471.000       3.539     513.330     145.053     401.059       2.765

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   189.08    -0.07   189.08     0.17   248.56
 MEAN    16.97     0.00    -0.02   189.08    -0.07   189.08     0.17
 HUB     14.32     0.00    -0.02   189.08    -0.07   189.08     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.32    46.36     6.96   253.79   316.54    16.37   537.75     0.28
 MEAN    49.79    43.80     5.99   223.63   292.90    16.37   537.75     0.26
 HUB     44.95    37.84     7.11   188.70   267.18    16.37   537.75     0.23

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   228.08   106.24   201.83  1140.61     0.20
 MEAN    16.57   232.07   113.94   202.17  1140.18     0.20
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 HUB     13.89   249.73   146.02   202.59  1139.74     0.22

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    248.79   247.09   142.55     0.22  2007.04
 MEAN   218.40   227.56   104.46     0.20  1889.57     1.40
 HUB    183.03   205.95    37.02     0.18  2029.10

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.12     1.03    16.65   544.99     1.01   540.64     0.92     0.91
 MEAN    17.09     1.02    16.60   544.74     1.01   540.24     0.92     0.91
 HUB     17.12     1.03    16.56   545.03     1.01   539.83     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.76    35.23    31.50     3.73     0.93     0.28     2.90
 MEAN    29.41    27.32    23.50     3.82     0.92     0.28     3.29     0.91
 HUB     35.78    10.35     6.50     3.85     0.92     0.30     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     229.333     114.583     198.656    1140.484       0.201       0.048

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.104      16.628     540.528      46.000      29.976      32.400       2.424

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     209.723     114.583     238.983    1141.243       0.184       0.206

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.105      16.706     541.247     456.573       0.008       0.297

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     199.866       0.000     199.866    1141.598       0.175       0.196

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.728     541.584       0.000       0.060       0.039       0.248

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      17.090       1.024     544.920       4.180     258.417       2.003

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  26031.779       0.421      81.499  503979.906


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.972   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     55.401    1510.000      17.090     544.920       1.000       1.000       0.980
W Kg/sec =   25.18210

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     48.843    1473.224       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  42618.715   43471.000       3.583     509.668     142.243     390.276       2.744

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   187.41    -0.06   187.41     0.16   235.52
 MEAN    15.91     0.00    -0.02   187.41    -0.06   187.41     0.16
 HUB     13.07     0.00    -0.02   187.41    -0.06   187.41     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.19    47.36     4.83   241.41   305.66    16.77   541.99     0.27
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 MEAN    48.22    44.80     3.42   209.69   281.28    16.77   541.99     0.25
 HUB     42.59    38.84     3.75   172.23   254.57    16.77   541.99     0.22
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   220.77    93.85   199.83  1144.57     0.19
 MEAN    15.50   223.69    99.87   200.16  1144.15     0.20
 HUB     12.59   238.40   128.90   200.55  1143.72     0.21

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    236.40   245.46   142.54     0.21  1684.94
 MEAN   204.22   225.72   104.34     0.20  1548.80     1.36
 HUB    165.90   203.93    37.00     0.18  1623.73

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.45     1.02    17.00   548.49     1.01   544.42     0.92     0.90
 MEAN    17.42     1.02    16.96   548.20     1.01   544.02     0.92     0.90
 HUB     17.43     1.02    16.91   548.36     1.01   543.61     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.16    35.50    31.50     4.00     0.93     0.25     2.90
 MEAN    26.52    27.53    23.50     4.03     0.92     0.25     3.34     0.90
 HUB     32.73    10.45     6.50     3.95     0.92     0.26     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      225.879     101.703     201.688    1144.225       0.197       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.422      16.954      544.086      46.000      26.760      33.000       6.240

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      214.766     101.703     237.630    1144.655       0.188       0.089

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.421      16.998     544.495     440.827       0.021       0.258

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     201.902       0.000     201.902    1145.125       0.176       0.167

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.034     544.942       0.000       0.060       0.050       0.164

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.843      17.408       1.019     548.347       3.427     297.563       2.307

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  21339.025       0.382      66.807  536187.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    159007.17    497.8099     54.1208      1.1523      0.8493     13.9717      1.0488
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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  0.959

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      53.200    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   24.18199

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      51.971    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   40926.113   41744.547       5.494     831.557     151.352     619.754       4.095

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   118.78    -0.04   118.78     0.11   270.77
  MEAN    17.06     0.00    -0.02   118.78    -0.04   118.78     0.11
  HUB     12.51     0.00    -0.02   118.78    -0.04   118.78     0.11

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     66.40    50.47    15.93   271.85   296.70    14.99   521.63     0.26
  MEAN    62.15    47.20    14.95   224.81   254.29    14.99   521.63     0.23
  HUB     54.23    38.62    15.61   164.85   203.22    14.99   521.63     0.18

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   246.21   183.46   164.20  1124.82     0.22
  MEAN    18.04   249.89   187.80   164.86  1123.76     0.22
  HUB     15.00   270.84   214.15   165.82  1122.39     0.24

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   186.47    88.38     0.17  3785.71
  MEAN   237.67   172.24    49.87     0.15  3387.81     1.69
  HUB    197.66   166.64    16.49     0.15  3212.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.83     1.05    15.31   530.82     1.02   525.76     0.92     0.88
  MEAN    15.75     1.04    15.22   529.98     1.01   524.77     0.92     0.88
  HUB     15.72     1.04    15.09   529.61     1.01   523.48     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     48.17    28.29    24.20     4.09     0.93     0.48     2.90
  MEAN    48.72    16.83    12.70     4.13     0.95     0.43     3.51     0.88
  HUB     52.25    -5.68    -9.30     3.62     0.95     0.30     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.959

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     252.238     187.432     168.799    1123.822       0.224      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.759      15.215     524.824      24.000      47.994      35.400     -12.594

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     183.014     187.432     261.964    1126.513       0.162       0.465
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
    0.950      15.754      15.465     527.341     528.796       0.020       0.571

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     170.842       0.000     170.842    1126.897       0.152       0.450

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
    0.950      15.467     527.701       0.000       0.060       0.085       0.468

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.815      15.718       1.040     530.139       7.329     171.134       1.327

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  45626.566       0.617     137.172  499476.562


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  0.972

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    53.200    1510.000      15.718     530.139       1.000       1.000       0.980
W Kg/sec =   24.18199

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    50.302    1493.621       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 40926.113   41744.547       4.031     590.487     146.489     474.134       3.237

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   163.84    -0.06   163.84     0.15   267.85
 MEAN    18.08     0.00    -0.02   163.84    -0.06   163.84     0.15
 HUB     15.21     0.00    -0.02   163.84    -0.06   163.84     0.15

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.83    46.36    12.47   270.79   316.55    15.49   527.90     0.28
 MEAN    55.49    42.30    13.19   238.22   289.17    15.49   527.90     0.26
 HUB     50.74    37.84    12.90   200.43   258.91    15.49   527.90     0.23

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   228.80   145.59   176.50  1131.53     0.20
 MEAN    18.01   230.02   146.87   177.02  1130.74     0.20
 HUB     15.22   245.11   168.89   177.63  1129.94     0.22

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    269.08   215.40   123.48     0.19  2974.21
 MEAN   237.32   198.79    90.45     0.18  2646.17     1.60
 HUB    200.60   180.44    31.70     0.16  2571.92

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.30     1.04    15.85   536.43     1.01   532.06     0.92     0.89
 MEAN    16.24     1.03    15.78   535.74     1.01   531.32     0.92     0.89
 HUB     16.22     1.03    15.70   535.58     1.01   530.56     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.52    34.98    31.50     3.48     0.93     0.40     2.90
 MEAN    39.68    27.06    23.50     3.56     0.94     0.39     3.30     0.89
 HUB     43.56    10.12     6.50     3.62     0.94     0.39     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.972

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     232.659     147.284     180.105    1130.827       0.206       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.251      15.778     531.398      46.000      39.275      30.600      -8.675

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     185.599     147.284     236.938    1132.575       0.164       0.359

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.249      15.947     533.042     511.151       0.013       0.424

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     183.269       0.000     183.269    1132.651       0.162       0.320

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.932     533.113       0.000       0.060       0.061       0.328

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.842      16.226       1.032     535.919       5.780     202.357       1.569

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  35988.309       0.497     108.195  460056.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  0.992

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     53.200    1510.000      16.226     535.919       1.000       1.000       0.980
W Kg/sec =   24.18199

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     48.989    1485.545       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  40926.113   41744.547       3.823     545.479     142.668     429.765       3.012

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   173.88    -0.06   173.88     0.15   260.18
 MEAN    17.74     0.00    -0.02   173.88    -0.06   173.88     0.15
 HUB     15.05     0.00    -0.02   173.88    -0.06   173.88     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.68    46.36    10.32   264.47   316.56    15.96   533.39     0.28
 MEAN    53.36    43.40     9.96   233.74   291.37    15.96   533.39     0.26
 HUB     48.77    38.84     9.93   198.32   263.79    15.96   533.39     0.23

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   227.45    129.82   186.76  1136.81      0.20
 MEAN    17.51   230.52    134.51   187.21  1136.20      0.20
 HUB     14.85   247.77    161.70   187.73  1135.57      0.22

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    261.04   228.25   131.22     0.20  2572.94
 MEAN   230.69   210.47    96.18     0.19  2355.82      1.51
 HUB    195.68   190.78    33.99     0.17  2402.07

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     16.75     1.03    16.29   541.36     1.01   537.04     0.92     0.91
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 MEAN    16.71     1.03    16.24   540.90     1.01   536.47     0.92     0.91
 HUB     16.72     1.03    16.17   541.00     1.01   535.88     0.92     0.91
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.80    35.09    31.50     3.59     0.93     0.35     2.90
 MEAN    35.70    27.19    23.50     3.69     0.94     0.35     3.28     0.91
 HUB     40.74    10.26     6.50     3.76     0.94     0.36     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     232.887     135.390     189.488    1136.298       0.205       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.722      16.239     536.561      46.000      35.546      31.500      -4.046

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     197.514     135.390     239.462    1137.644       0.174       0.285

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.723      16.374     537.832     471.992       0.009       0.371

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     191.984       0.000     191.984    1137.834       0.169       0.280

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.377     538.012       0.000       0.060       0.042       0.291

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      16.707       1.030     541.090       5.172     217.773       1.688

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  32204.037       0.473      96.818  464968.219


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     53.200    1510.000      16.707     541.090       1.000       1.000       0.980
W Kg/sec =   24.18199

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     47.810    1478.428       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  40926.113   41744.547       3.687     513.330     139.235     401.059       2.880

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   181.36    -0.06   181.36     0.16   248.48
 MEAN    16.97     0.00    -0.02   181.36    -0.06   181.36     0.16
 HUB     14.32     0.00    -0.02   181.36    -0.06   181.36     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.46    46.36     8.10   253.79   311.98    16.41   538.34     0.27
 MEAN    50.97    43.80     7.17   223.63   287.97    16.41   538.34     0.25
 HUB     46.15    37.84     8.31   188.70   261.76    16.41   538.34     0.23

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   223.68   112.29   193.45  1141.40     0.20
 MEAN    16.57   227.14   118.41   193.83  1140.91     0.20
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 HUB     13.89   244.02   147.66   194.28  1140.41     0.21

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    248.79   236.76   136.50     0.21  2121.19
 MEAN   218.40   218.10    99.99     0.19  1963.58     1.43
 HUB    183.03   197.47    35.37     0.17  2051.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.15     1.03    16.70   545.58     1.01   541.40     0.92     0.91
 MEAN    17.12     1.02    16.65   545.25     1.01   540.94     0.92     0.91
 HUB     17.14     1.03    16.60   545.43     1.01   540.46     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.13    35.21    31.50     3.71     0.93     0.30     2.90
 MEAN    31.42    27.29    23.50     3.79     0.93     0.30     3.29     0.91
 HUB     37.24    10.32     6.50     3.82     0.93     0.32     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     224.633     119.076     190.475    1141.198       0.197       0.046

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.132      16.675     541.205      46.000      32.012      32.400       0.388

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     200.970     119.076     233.599    1142.084       0.176       0.239

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.133      16.766     542.046     456.573       0.008       0.326

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     191.535       0.000     191.535    1142.410       0.168       0.229

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.786     542.356       0.000       0.060       0.037       0.279

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      17.119       1.025     545.419       4.329     246.531       1.911

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  26958.111       0.436      81.047  483192.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     53.200    1510.000      17.119     545.419       1.000       1.000       0.980
W Kg/sec =   24.18199

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     46.845    1472.549       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  40926.113   41744.547       3.736     509.668     136.423     390.276       2.861

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   179.62    -0.06   179.62     0.16   235.41
 MEAN    15.91     0.00    -0.02   179.62    -0.06   179.62     0.16
 HUB     13.07     0.00    -0.02   179.62    -0.06   179.62     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.36    47.36     6.00   241.41   300.95    16.83   542.72     0.26
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MEAN    49.42    44.80     4.62   209.69   276.15    16.83   542.72     0.24
HUB     43.81    38.84     4.97   172.23   248.89    16.83   542.72     0.22
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   215.97   100.08   191.38  1145.53     0.19
MEAN    15.50   218.34   104.45   191.74  1145.04     0.19
HUB     12.59   232.35   130.62   192.16  1144.55     0.20

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    236.40   234.97   136.32     0.21  1796.56
MEAN   204.22   216.14    99.77     0.19  1619.70     1.40
HUB    165.90   195.37    35.28     0.17  1645.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.50     1.02    17.07   549.22     1.01   545.33     0.92     0.91
MEAN    17.46     1.02    17.03   548.85     1.01   544.87     0.92     0.91
HUB     17.47     1.02    16.97   548.90     1.01   544.39     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     27.61    35.46    31.50     3.96     0.93     0.28     2.90
MEAN    28.58    27.49    23.50     3.99     0.92     0.27     3.34     0.91
HUB     34.21    10.40     6.50     3.90     0.92     0.28     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      220.549     106.365     193.206    1145.108       0.193       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.469      17.022      544.928       46.000      28.834      33.000       4.166

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      205.600     106.365     231.484    1145.667       0.179       0.127

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       17.470      17.081     545.460     440.827       0.018       0.286

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      193.293       0.000     193.293    1146.097       0.169       0.204

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       17.115      545.870       0.000       0.060       0.043       0.201

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4       Texit         Del T       Ns         Ns nondim
      0.862       17.458        1.020     548.990       3.570     282.465       2.190

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  22235.426       0.398      66.849  513974.156

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    163012.45    490.0809      51.9714      1.1556       0.8457      14.9530       1.0501
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =16.008   EfDer =  0.950

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      50.875    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   23.12513

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      49.700    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   39137.469   39920.137       5.745     831.557     144.737     619.754       4.282

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   113.54    -0.04   113.54     0.10   270.77
  MEAN    17.06     0.00    -0.02   113.54    -0.04   113.54     0.10
  HUB     12.51     0.00    -0.02   113.54    -0.04   113.54     0.10

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     67.33    50.47    16.86   271.85   294.64    15.00   521.73     0.26
  MEAN    63.21    47.20    16.01   224.81   251.88    15.00   521.73     0.22
  HUB     55.45    38.62    16.83   164.85   200.20    15.00   521.73     0.18

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   244.26   187.17   156.93  1125.08     0.22
  MEAN    18.04   246.70   189.82   157.57  1123.98     0.22
  HUB     15.00   265.72   213.29   158.47  1122.60     0.24

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   178.32    84.67     0.16  3862.21
  MEAN   237.67   164.68    47.85     0.15  3424.23     1.76
  HUB    197.66   159.24    15.63     0.14  3199.87

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.84     1.05    15.32   530.99     1.02   526.00     0.92     0.87
  MEAN    15.75     1.04    15.23   530.06     1.01   524.98     0.92     0.87
  HUB     15.71     1.04    15.11   529.58     1.01   523.69     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     50.02    28.35    24.20     4.15     0.93     0.50     2.90
  MEAN    50.30    16.89    12.70     4.19     0.95     0.46     3.51     0.87
  HUB     53.39    -5.63    -9.30     3.67     0.95     0.33     4.78

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.950

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     248.835     189.449     161.332    1124.050       0.221      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.759      15.230     525.037      24.000      49.583      35.400     -14.183

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     174.847     189.449     257.803    1126.849       0.155       0.495

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      15.753      15.490     527.656     528.796       0.023       0.598

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     163.281       0.000     163.281    1127.198       0.145       0.467

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.484     527.982       0.000       0.060       0.095       0.485

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.802      15.713       1.040     530.209       7.399     166.113       1.288

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  46066.223       0.623     132.441  477415.469


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =16.008   EfDer =  0.963

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     50.875    1510.000      15.713     530.209       1.000       1.000       0.980
W Kg/sec =   23.12513

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     48.120    1493.521       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  39137.469   39920.137       4.214     590.487     140.136     474.134       3.383

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   156.60    -0.05   156.60     0.14   267.83
 MEAN    18.08     0.00    -0.02   156.60    -0.05   156.60     0.14
 HUB     15.21     0.00    -0.02   156.60    -0.05   156.60     0.14

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.96    46.36    13.60   270.79   312.86    15.50   528.16     0.28
 MEAN    56.69    42.30    14.39   238.22   285.13    15.50   528.16     0.25
 HUB     52.01    37.84    14.17   200.43   254.39    15.50   528.16     0.23

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   226.38   150.98   168.68  1131.95     0.20
 MEAN    18.01   226.64   150.79   169.21  1131.12     0.20
 HUB     15.22   240.44   170.23   169.81  1130.26     0.21

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    269.08   205.92   118.10     0.18  3084.13
 MEAN   237.32   190.05    86.54     0.17  2716.62     1.65
 HUB    200.60   172.50    30.37     0.15  2592.22

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.32     1.04    15.87   536.74     1.01   532.46     0.92     0.88
 MEAN    16.24     1.03    15.79   535.96     1.01   531.67     0.92     0.88
 HUB     16.22     1.03    15.71   535.70     1.01   530.87     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.83    35.00    31.50     3.50     0.93     0.42     2.90
 MEAN    41.71    27.09    23.50     3.59     0.95     0.41     3.30     0.88
 HUB     45.07    10.14     6.50     3.64     0.95     0.41     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.963

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     229.130     151.209     172.152    1131.197       0.203       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.255      15.796     531.746      46.000      41.294      30.600     -10.694

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     177.320     151.209     233.038    1133.066       0.156       0.394

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.252      15.976     533.505     511.151       0.016       0.457

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     175.139       0.000     175.139    1133.134       0.155       0.344

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.957     533.569       0.000       0.060       0.073       0.352

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.827      16.225       1.033     536.131       5.922     194.276       1.506

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  36870.348       0.509     106.003  439504.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =16.008   EfDer =  0.985

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     50.875    1510.000      16.225     536.131       1.000       1.000       0.980
W Kg/sec =   23.12513

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     46.860    1485.250       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  39137.469   39920.137       3.997     545.479     136.468     429.765       3.149

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   166.19    -0.06   166.19     0.15   260.12
 MEAN    17.74      0.00    -0.02   166.19    -0.06   166.19     0.15
 HUB     15.05      0.00    -0.02   166.19    -0.06   166.19     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.86     46.36    11.50   264.47   312.40    15.98   533.82     0.28
 MEAN    54.59     43.40    11.19   233.74   286.85    15.98   533.82     0.25
 HUB     50.05     38.84    11.21   198.32   258.79    15.98   533.82     0.23

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   224.19    135.73    178.44  1137.42       0.20
 MEAN    17.51   226.44    138.82    178.90  1136.76       0.20
 HUB     14.85   242.58    163.24    179.43  1136.07       0.21

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    261.04   218.04   125.31     0.19  2690.02
 MEAN   230.69   201.11    91.87     0.18  2431.32      1.56
 HUB    195.68   182.34    32.44     0.16  2424.97

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     16.77     1.03     16.32   541.82     1.01   537.63     0.92     0.90
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 MEAN    16.72     1.03    16.26   541.28     1.01   536.99     0.92     0.90
 HUB     16.72     1.03    16.20   541.26     1.01   536.35     0.92     0.90
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.26    35.08    31.50     3.58     0.93     0.38     2.90
 MEAN    37.81    27.18    23.50     3.68     0.94     0.37     3.28     0.90
 HUB     42.29    10.25     6.50     3.75     0.94     0.38     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     228.724     139.733     181.078    1136.852       0.201       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.733      16.267     537.086      46.000      37.657      31.500      -6.157

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     188.646     139.733     234.761    1138.330       0.166       0.322

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.733      16.414     538.483     471.992       0.011       0.403

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     183.403       0.000     183.403    1138.502       0.161       0.309

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.414     538.645       0.000       0.060       0.049       0.320

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.861      16.714       1.030     541.455       5.324     208.324       1.615

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  33150.777       0.486      95.309  444061.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =16.008   EfDer =  0.997

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     50.875    1510.000      16.714     541.455       1.000       1.000       0.980
W Kg/sec =   23.12513

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     45.715    1477.931       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 39137.469   39920.137       3.856     513.330     133.134     401.059       3.012

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   173.27    -0.06   173.27     0.15   248.40
 MEAN    16.97     0.00    -0.02   173.27    -0.06   173.27     0.15
 HUB     14.32     0.00    -0.02   173.27    -0.06   173.27     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.68    46.36     9.32   253.79   307.35    16.45   538.95     0.27
 MEAN    52.24    43.80     8.44   223.63   282.95    16.45   538.95     0.25
 HUB     47.45    37.84     9.61   188.70   256.23    16.45   538.95     0.22

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   219.51   118.56   184.73  1142.21     0.19
 MEAN    16.57   222.28   123.01   185.13  1141.66     0.19
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HUB     13.89   238.23   149.36   185.60  1141.09     0.21

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    248.79   226.02   130.22     0.20  2239.65
MEAN   218.40   208.26    95.38     0.18  2039.84     1.48
HUB    183.03   188.63    33.68     0.17  2075.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.18     1.03    16.75   546.19     1.01   542.17     0.92     0.91
MEAN    17.14     1.03    16.69   545.77     1.01   541.65     0.92     0.91
HUB     17.15     1.03    16.64   545.85     1.01   541.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.69    35.18    31.50     3.68     0.93     0.33     2.90
MEAN    33.60    27.26    23.50     3.76     0.93     0.33     3.29     0.91
HUB     38.82    10.28     6.50     3.78     0.93     0.34     3.90

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     220.013     123.706     181.941    1141.923       0.193       0.045

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.154      16.715     541.895      46.000      34.213      32.400      -1.813

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     191.856     123.706     228.280    1142.943       0.168       0.275

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.155      16.821     542.864     456.573       0.008       0.358

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     182.871       0.000     182.871    1143.239       0.160       0.262

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.837     543.145       0.000       0.060       0.038       0.311

   STAGE EXIT CONDITIONS, STAGE             4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.877      17.141       1.026     545.938       4.483     234.742       1.820

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  27916.738       0.451      80.261  461330.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =16.008   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     50.875    1510.000      17.141     545.938       1.000       1.000       0.980
W Kg/sec =   23.12513

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     44.761    1471.850       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  39137.469   39920.137       3.910     509.668     130.354     390.276       2.994

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   171.52    -0.06   171.52     0.15   235.30
 MEAN    15.91     0.00    -0.02   171.52    -0.06   171.52     0.15
 HUB     13.07     0.00    -0.02   171.52    -0.06   171.52     0.15

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.61    47.36     7.25   241.41   296.19    16.87   543.48     0.26
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MEAN    50.73    44.80     5.93   209.69   270.95    16.87   543.48     0.24
HUB     45.13    38.84     6.29   172.23   243.11    16.87   543.48     0.21
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   211.41   106.51   182.62  1146.50     0.18
MEAN    15.50   213.09   109.16   183.01  1145.95     0.19
HUB     12.59   226.22   132.36   183.45  1145.38     0.20

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    236.40   224.10   129.89     0.20  1911.91
MEAN   204.22   206.22    95.05     0.18  1692.68     1.44
HUB    165.90   186.50    33.54     0.16  1667.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.55     1.02    17.14   549.98     1.01   546.25     0.92     0.91
MEAN    17.50     1.02    17.08   549.52     1.01   545.73     0.92     0.91
HUB     17.50     1.02    17.03   549.47     1.01   545.19     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.25    35.42    31.50     3.92     0.93     0.30     2.90
MEAN    30.81    27.45    23.50     3.95     0.92     0.30     3.34     0.91
HUB     35.81    10.36     6.50     3.86     0.92     0.30     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      215.322     111.163     184.408    1146.006       0.188       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.508      17.081      545.784      46.000      31.082      33.000       1.918

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      196.114     111.163     225.429    1146.698       0.171       0.167

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.510      17.156     546.444     440.827       0.015       0.318

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     184.390       0.000     184.390    1147.089       0.161       0.243

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.187     546.817       0.000       0.060       0.038       0.239

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      17.500       1.021     549.656       3.719     267.728       2.075

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  23158.809       0.414      66.582  490625.156

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    167162.89    480.5948     49.7001      1.1584      0.8386     16.0081      1.0513
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =17.044   EfDer =  0.940

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      48.631    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   22.10507

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      47.508    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  37411.094   38159.238       6.010     831.557     138.353     619.754       4.480

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   108.48    -0.04   108.48     0.10   270.77
  MEAN    17.06     0.00    -0.02   108.48    -0.04   108.48     0.10
  HUB     12.51     0.00    -0.02   108.48    -0.04   108.48     0.10

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.25    50.47    17.78   271.85   292.73    15.01   521.83     0.26
  MEAN    64.24    47.20    17.04   224.81   249.64    15.01   521.83     0.22
  HUB     56.66    38.62    18.04   164.85   197.37    15.01   521.83     0.18

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   242.56   190.66   149.95  1125.32     0.22
  MEAN    18.04   243.78   191.73   150.56  1124.19     0.22
  HUB     15.00   260.83   212.38   151.41  1122.80     0.23

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   170.52    81.19     0.15  3934.03
  MEAN   237.67   157.41    45.93     0.14  3458.71     1.83
  HUB    197.66   152.12    14.73     0.14  3186.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.84     1.05    15.34   531.14     1.02   526.22     0.92     0.86
  MEAN    15.75     1.04    15.24   530.13     1.01   525.17     0.92     0.86
  HUB     15.70     1.04    15.12   529.55     1.01   523.87     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     51.82    28.43    24.20     4.23     0.93     0.53     2.90
  MEAN    51.86    16.97    12.70     4.27     0.95     0.48     3.51     0.86
  HUB     54.52    -5.56    -9.30     3.74     0.95     0.35     4.78

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.940

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     245.724     191.359     154.149    1124.258       0.219      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.759      15.242     525.231      24.000      51.147      35.400     -15.747

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     166.999     191.359     253.982    1127.158       0.148       0.523

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      15.751      15.511     527.945     528.796       0.025       0.625

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     156.008       0.000     156.008    1127.475       0.138       0.483

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.499     528.242       0.000       0.060       0.106       0.501

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.788      15.708       1.040     530.275       7.465     161.304       1.250

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  46473.199       0.629     127.717  456152.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =17.044   EfDer =  0.954

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     48.631    1510.000      15.708     530.275       1.000       1.000       0.980
W Kg/sec =   22.10507

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     46.016    1493.429       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  37411.094   38159.238       4.406     590.487     134.009     474.134       3.538

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   149.64    -0.05   149.64     0.13   267.81
 MEAN    18.08     0.00    -0.02   149.64    -0.05   149.64     0.13
 HUB     15.21     0.00    -0.02   149.64    -0.05   149.64     0.13

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.08    46.36    14.72   270.79   309.43    15.52   528.40     0.27
 MEAN    57.87    42.30    15.57   238.22   281.36    15.52   528.40     0.25
 HUB     53.26    37.84    15.42   200.43   250.16    15.52   528.40     0.22

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   224.37   156.09   161.19  1132.34     0.20
 MEAN    18.01   223.67   154.54   161.70  1131.45     0.20
 HUB     15.22   236.09   171.47   162.29  1130.56     0.21

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    269.08   196.85   112.99     0.17  3188.34
 MEAN   237.32   181.65    82.78     0.16  2784.23     1.71
 HUB    200.60   164.88    29.13     0.15  2611.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.32     1.04    15.88   537.02     1.01   532.82     0.92     0.87
 MEAN    16.25     1.03    15.81   536.17     1.01   531.99     0.92     0.87
 HUB     16.21     1.03    15.73   535.80     1.01   531.15     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.08    35.03    31.50     3.53     0.93     0.45     2.90
 MEAN    43.70    27.11    23.50     3.61     0.95     0.44     3.30     0.87
 HUB     46.58    10.17     6.50     3.67     0.95     0.43     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.954

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     226.014     154.976     164.514    1131.535       0.200       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.256      15.809     532.064      46.000      43.290      30.600     -12.690

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     169.376     154.976     229.578    1133.522       0.149       0.428

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.252      16.000     533.935     511.151       0.018       0.489

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     167.339       0.000     167.339    1133.583       0.148       0.367

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.976     533.992       0.000       0.060       0.085       0.375

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.812      16.222       1.033     536.331       6.056     186.734       1.448

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  37707.910       0.521     103.629  419726.594


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =17.044   EfDer =  0.978

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     48.631    1510.000      16.222     536.331       1.000       1.000       0.980
W Kg/sec =   22.10507

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     44.812    1484.974       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  37411.094   38159.238       4.180     545.479     130.502     429.765       3.293

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   158.80    -0.05   158.80     0.14   260.08
 MEAN    17.74     0.00    -0.02   158.80    -0.05   158.80     0.14
 HUB     15.05     0.00    -0.02   158.80    -0.05   158.80     0.14

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.02    46.36    12.66   264.47   308.53    16.00   534.22     0.27
 MEAN    55.81    43.40    12.41   233.74   282.63    16.00   534.22     0.25
 HUB     51.32    38.84    12.48   198.32   254.10    16.00   534.22     0.22

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   221.41   141.29   170.47  1137.99      0.19
 MEAN    17.51   222.80   142.91   170.94  1137.27      0.20
 HUB     14.85   237.74   164.68   171.47  1136.54      0.21

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    261.04   208.33   119.76     0.18  2799.96
 MEAN   230.69   192.16    87.78     0.17  2502.75      1.61
 HUB    195.68   174.25    31.01     0.15  2446.26

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     16.79     1.03    16.35   542.26     1.01   538.16     0.92     0.89
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 MEAN    16.73     1.03    16.28   541.63     1.01   537.48     0.92     0.89
 HUB     16.72     1.03    16.21   541.51     1.01   536.79     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.65    35.09    31.50     3.59     0.93     0.40     2.90
 MEAN    39.90    27.18    23.50     3.68     0.94     0.40     3.28     0.89
 HUB     43.84    10.25     6.50     3.75     0.94     0.40     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     225.005     143.843     173.022    1137.363       0.198       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.739      16.288     537.569      46.000      39.739      31.500      -8.239

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     180.164     143.843     230.542    1138.967       0.158       0.358

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.738      16.448     539.087     471.992       0.012       0.436

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     175.200       0.000     175.200    1139.123       0.154       0.335

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      16.442     539.234       0.000       0.060       0.059       0.346

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.849      16.716       1.030     541.798       5.467     199.634       1.548

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  34041.258       0.500      93.552  423958.469


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =17.044   EfDer =  0.993

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     48.631    1510.000       16.716     541.798       1.000        1.000        0.980
W Kg/sec =   22.10507

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     43.707    1477.463        1.402       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 37411.094   38159.238         4.033     513.330     127.285     401.059       3.151

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   165.54    -0.06   165.54      0.15   248.32
 MEAN    16.97      0.00    -0.02   165.54    -0.06   165.54      0.15
 HUB     14.32      0.00    -0.02   165.54    -0.06   165.54      0.15

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     56.89    46.36    10.53   253.79   303.06     16.47   539.51      0.27
 MEAN    53.50    43.80     9.70   223.63   278.28     16.47   539.51      0.24
 HUB     48.75    37.84    10.91   188.70   251.06     16.47   539.51      0.22

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   215.93   124.51   176.42  1142.96      0.19
 MEAN    16.57   217.94   127.39   176.84  1142.35      0.19
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 HUB     13.89   232.85   150.93   177.32  1141.72     0.20

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    248.79   215.80   124.27     0.19  2351.90
 MEAN   218.40   198.88    91.01     0.17  2112.32     1.53
 HUB    183.03   180.20    32.10     0.16  2097.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.21     1.03    16.78   546.77     1.01   542.88     0.92     0.91
 MEAN    17.16     1.03    16.73   546.27     1.01   542.30     0.92     0.91
 HUB     17.15     1.03    16.66   546.24     1.01   541.71     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.21    35.16    31.50     3.66     0.93     0.36     2.90
 MEAN    35.77    27.23    23.50     3.73     0.94     0.35     3.29     0.91
 HUB     40.40    10.26     6.50     3.76     0.94     0.36     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     215.911     128.107     173.799    1142.593       0.189       0.043

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.169      16.746     542.533      46.000      36.394      32.400      -3.994

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     183.173     128.107     223.526    1143.741       0.160       0.311

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.170      16.864     543.624     456.573       0.009       0.391

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     174.627       0.000     174.627    1144.010       0.153       0.293

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.877     543.880       0.000       0.060       0.042       0.340

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      17.155       1.026     546.426       4.629     224.008       1.736

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  28824.045       0.466      79.214  440325.406


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =17.044   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     48.631    1510.000      17.155     546.426       1.000       1.000       0.980
W Kg/sec =   22.10507

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     42.772    1471.192       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  37411.094   38159.238       4.092     509.668     124.563     390.276       3.133

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   163.81    -0.06   163.81     0.14   235.20
 MEAN    15.91     0.00    -0.02   163.81    -0.06   163.81     0.14
 HUB     13.07     0.00    -0.02   163.81    -0.06   163.81     0.14

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.85    47.36     8.49   241.41   291.79    16.91   544.19     0.25
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MEAN    52.01    44.80     7.21   209.69   266.14    16.91   544.19     0.23
HUB     46.44    38.84     7.60   172.23   237.73    16.91   544.19     0.21
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   207.50   112.57   174.32  1147.39     0.18
MEAN    15.50   208.41   113.60   174.72  1146.78     0.18
HUB     12.59   220.53   133.95   175.18  1146.16     0.19

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    236.40   213.82   123.83     0.19  2020.48
MEAN   204.22   196.82    90.62     0.17  1761.42     1.49
HUB    165.90   178.07    31.95     0.16  1687.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.59     1.03    17.19   550.70     1.01   547.11     0.92     0.91
MEAN    17.53     1.02    17.13   550.15     1.01   546.53     0.92     0.91
HUB     17.51     1.02    17.07   550.00     1.01   545.94     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.85    35.39    31.50     3.89     0.93     0.33     2.90
MEAN    33.03    27.41    23.50     3.91     0.93     0.32     3.34     0.91
HUB     37.40    10.34     6.50     3.84     0.93     0.32     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      210.663     115.683     176.057    1146.836       0.184       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.536      17.127      546.578      46.000      33.308      33.000      -0.308

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      187.128     115.683     219.998    1147.656       0.163       0.207

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.538      17.215     547.360     440.827       0.014       0.350

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     175.963       0.000     175.963    1148.011       0.153       0.280

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.243     547.698       0.000       0.060       0.037       0.275

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      17.529       1.022     550.284       3.858     254.530       1.973

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  24025.539       0.430      66.027  468204.812

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    171071.94    470.1384     47.5078      1.1603      0.8288     17.0439      1.0526
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =17.953   EfDer =  0.930

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      46.692    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   21.22345

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      45.613    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  35919.027   36637.328       6.260     831.557     132.835     619.754       4.666

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   104.12    -0.04   104.12     0.09   270.77
  MEAN    17.06     0.00    -0.02   104.12    -0.04   104.12     0.09
  HUB     12.51     0.00    -0.02   104.12    -0.04   104.12     0.09

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     69.05    50.47    18.58   271.85   291.14    15.02   521.90     0.26
  MEAN    65.15    47.20    17.95   224.81   247.78    15.02   521.90     0.22
  HUB     57.73    38.62    19.11   164.85   195.00    15.02   521.90     0.17

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   241.30   193.68   143.93  1125.51     0.21
  MEAN    18.04   241.38   193.34   144.52  1124.36     0.21
  HUB     15.00   256.68   211.59   145.32  1122.97     0.23

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   163.79    78.17     0.15  3996.26
  MEAN   237.67   151.16    44.32     0.13  3487.72     1.89
  HUB    197.66   145.98    13.93     0.13  3174.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.84     1.05    15.34   531.27     1.02   526.41     0.92     0.85
  MEAN    15.75     1.04    15.25   530.19     1.01   525.33     0.92     0.85
  HUB     15.69     1.04    15.13   529.53     1.01   524.03     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     53.38    28.51    24.20     4.31     0.93     0.55     2.90
  MEAN    53.22    17.05    12.70     4.35     0.95     0.50     3.51     0.85
  HUB     55.52    -5.48    -9.30     3.82     0.95     0.38     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.930

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     243.163     192.966     147.961    1124.430       0.216      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.757      15.251     525.392      24.000      52.520      35.400     -17.120

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     160.242     192.966     250.825    1127.415       0.142       0.548
   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      15.748      15.527     528.186     528.796       0.027       0.649

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     149.741       0.000     149.741    1127.705       0.133       0.498

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.510     528.458       0.000       0.060       0.115       0.515

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.775      15.702       1.039     530.331       7.521     157.142       1.218

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  46821.656       0.634     123.543  437797.812


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =17.953   EfDer =  0.944

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    46.692    1510.000      15.702     530.331       1.000       1.000       0.980
W Kg/sec =   21.22345

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    44.199    1493.351       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 35919.027   36637.328       4.588     590.487     128.715     474.134       3.684

    ROTOR LEADING EDGE CONDITIONS, STAGE            2
       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   143.63    -0.05   143.63     0.13   267.80
MEAN    18.08     0.00    -0.02   143.63    -0.05   143.63     0.13
HUB     15.21     0.00    -0.02   143.63    -0.05   143.63     0.13

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     62.06    46.36    15.70   270.79   306.57    15.53   528.61     0.27
MEAN    58.92    42.30    16.62   238.22   278.22    15.53   528.61     0.25
HUB     54.38    37.84    16.54   200.43   246.62    15.53   528.61     0.22

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   222.89   160.42   154.74  1132.65     0.20
MEAN    18.01   221.26   157.66   155.24  1131.74     0.20
HUB     15.22   232.47   172.53   155.81  1130.80     0.21

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    269.08   189.07   108.66     0.17  3276.87
MEAN   237.32   174.48    79.66     0.15  2840.38     1.76
HUB    200.60   158.32    28.07     0.14  2627.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.33     1.04    15.89   537.27     1.01   533.12     0.92     0.86
MEAN    16.25     1.03    15.82   536.34     1.01   532.25     0.92     0.86
HUB     16.20     1.03    15.73   535.89     1.01   531.38     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.03    35.08    31.50     3.58     0.93     0.47     2.90
MEAN    45.44    27.16    23.50     3.66     0.95     0.46     3.30     0.86
HUB     47.92    10.21     6.50     3.71     0.95     0.45     3.92


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.944
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     223.476     158.104     157.939    1131.815       0.197       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.255      15.819     532.329      46.000      45.030      30.600     -14.430

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     162.546     158.104     226.756    1133.902       0.143       0.458

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.251      16.019     534.293     511.151       0.020       0.518

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     160.629       0.000     160.629    1133.957       0.142       0.386

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.991     534.345       0.000       0.060       0.097       0.395

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.798      16.217       1.033     536.500       6.170     180.423       1.399

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  38413.988       0.531     101.359  402675.844


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =17.953   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     46.692    1510.000      16.217     536.500       1.000       1.000       0.980
W Kg/sec =   21.22345

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     43.045    1484.739       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  35919.027   36637.328       4.351     545.479     125.357     429.765       3.428

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   152.45    -0.05   152.45     0.13   260.04
 MEAN    17.74     0.00    -0.02   152.45    -0.05   152.45     0.13
 HUB     15.05     0.00    -0.02   152.45    -0.05   152.45     0.13

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.04    46.36    13.68   264.47   305.30    16.01   534.56     0.27
 MEAN    56.89    43.40    13.49   233.74   279.11    16.01   534.56     0.25
 HUB     52.46    38.84    13.62   198.32   250.18    16.01   534.56     0.22

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   219.34   146.06   163.63  1138.46     0.19
 MEAN    17.51   219.91   146.40   164.10  1137.70     0.19
 HUB     14.85   233.72   165.90   164.63  1136.92     0.21

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    261.04   199.99   114.98     0.18  2894.55
 MEAN   230.69   184.48    84.29     0.16  2563.86     1.66
 HUB    195.68   167.30    29.78     0.15  2464.37

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.80     1.04    16.37   542.63     1.01   538.61     0.92     0.89
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 MEAN    16.73     1.03    16.30   541.93     1.01   537.89     0.92     0.89
 HUB     16.71     1.03    16.22   541.72     1.01   537.15     0.92     0.89
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.75    35.09    31.50     3.59     0.93     0.43     2.90
 MEAN    41.74    27.19    23.50     3.69     0.94     0.42     3.28     0.89
 HUB     45.22    10.25     6.50     3.75     0.94     0.42     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     222.046     147.359     166.102    1137.787       0.195       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.741      16.302     537.972      46.000      41.578      31.500     -10.078

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     172.884     147.359     227.164    1139.501       0.152       0.390

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.739      16.472     539.593     471.992       0.014       0.465

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     168.163       0.000     168.163    1139.643       0.148       0.357

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.462     539.728       0.000       0.060       0.069       0.368

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4         PR4        Texit        Del T       Ns        Ns nondim
      0.836      16.715       1.031     542.090       5.589     192.373       1.491

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  34804.789       0.511      91.835  406640.281


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =17.953   EfDer =  0.987

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     46.692    1510.000      16.715     542.090       1.000       1.000       0.980
W Kg/sec =   21.22345

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     41.979    1477.065       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 35919.027   36637.328       4.199     513.330     122.253     401.059       3.281

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   158.91    -0.05   158.91     0.14   248.25
 MEAN    16.97     0.00    -0.02   158.91    -0.05   158.91     0.14
 HUB     14.32     0.00    -0.02   158.91    -0.05   158.91     0.14

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.95    46.36    11.59   253.79   299.49    16.49   539.98     0.26
 MEAN    54.61    43.80    10.81   223.63   274.38    16.49   539.98     0.24
 HUB     49.91    37.84    12.07   188.70   246.74    16.49   539.98     0.22

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   213.20   129.58   169.31  1143.58     0.19
 MEAN    16.57   214.44   131.06   169.73  1142.92     0.19
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 HUB     13.89   228.37   152.25   170.22  1142.25     0.20

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    248.79   207.07   119.21     0.18  2447.45
 MEAN   218.40   190.89    87.34     0.17  2173.03     1.57
 HUB    183.03   172.98    30.78     0.15  2115.52

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.22     1.03    16.81   547.27     1.01   543.47     0.92     0.90
 MEAN    17.17     1.03    16.75   546.69     1.01   542.85     0.92     0.90
 HUB     17.15     1.03    16.68   546.57     1.01   542.21     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.43    35.15    31.50     3.65     0.93     0.38     2.90
 MEAN    37.67    27.23    23.50     3.73     0.94     0.38     3.29     0.90
 HUB     41.81    10.25     6.50     3.75     0.94     0.38     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     212.603     131.793     166.825    1143.152       0.186       0.041

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.177      16.767     543.067      46.000      38.309      32.400      -5.909

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     175.745     131.793     219.672    1144.410       0.154       0.343

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.177      16.896     544.262     456.573       0.010       0.420

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     167.579       0.000     167.579    1144.656       0.146       0.318

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.905     544.496       0.000       0.060       0.048       0.363

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.863      17.160       1.027     546.841       4.752     215.193       1.668

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  29591.078       0.478      78.079  422242.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =17.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     46.692    1510.000      17.160     546.841       1.000       1.000       0.980
W Kg/sec =   21.22345

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     41.068    1470.633       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  35919.027   36637.328       4.261     509.668     119.602     390.276       3.263

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   157.22    -0.05   157.22     0.14   235.11
 MEAN    15.91     0.00    -0.02   157.22    -0.05   157.22     0.14
 HUB     13.07     0.00    -0.02   157.22    -0.05   157.22     0.14

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.93    47.36     9.57   241.41   288.13    16.94   544.78     0.25
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MEAN    53.15    44.80     8.35   209.69   262.13    16.94   544.78     0.23
HUB     47.62    38.84     8.78   172.23   233.24    16.94   544.78     0.20
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   204.49   117.69   167.24  1148.14     0.18
MEAN    15.50   204.66   117.38   167.65  1147.48     0.18
HUB     12.59   215.83   135.35   168.12  1146.81     0.19

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    236.40   205.09   118.71     0.18  2112.29
MEAN   204.22   188.81    86.84     0.16  1819.92     1.53
HUB    165.90   170.87    30.55     0.15  1704.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.61     1.03    17.22   551.31     1.01   547.82     0.92     0.91
MEAN    17.55     1.02    17.16   550.69     1.01   547.19     0.92     0.91
HUB     17.52     1.02    17.10   550.45     1.01   546.56     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.13    35.37    31.50     3.87     0.93     0.36     2.90
MEAN    35.00    27.38    23.50     3.88     0.93     0.35     3.34     0.91
HUB     38.84    10.30     6.50     3.80     0.93     0.34     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      206.944     119.529     168.934    1147.529       0.180       -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.553      17.158      547.241      46.000      35.281      33.000      -2.281

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      179.474     119.529     215.634    1148.458       0.156       0.242

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.555      17.258     548.128     440.827       0.015       0.379

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     168.790       0.000     168.790    1148.784       0.147       0.310

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.282     548.438       0.000       0.060       0.038       0.304

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      17.545       1.022     550.818       3.976     243.764       1.890

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  24763.012       0.443      65.339  448911.938

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    174394.52    460.1547     45.6130      1.1614      0.8183     17.9529      1.0536
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =19.026   EfDer =  0.917

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      44.436    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   20.19796

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      43.409    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   34183.461   34867.055       6.578     831.557     126.417     619.754       4.902

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02    99.04    -0.03    99.04     0.09   270.77
  MEAN    17.06     0.00    -0.02    99.04    -0.03    99.04     0.09
  HUB     12.51     0.00    -0.02    99.04    -0.03    99.04     0.09

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     69.98    50.47    19.51   271.85   289.36    15.02   521.99     0.26
  MEAN    66.23    47.20    19.03   224.81   245.69    15.02   521.99     0.22
  HUB     59.01    38.62    20.39   164.85   192.34    15.02   521.99     0.17

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   239.99   197.08   136.96  1125.73     0.21
  MEAN    18.04   238.73   195.14   137.51  1124.55     0.21
  HUB     15.00   251.97   210.65   138.25  1123.15     0.22

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   156.04    74.77     0.14  4066.38
  MEAN   237.67   143.94    42.52     0.13  3520.21     1.98
  HUB    197.66   138.86    12.99     0.12  3160.17

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.85     1.05    15.35   531.42     1.02   526.61     0.92     0.84
  MEAN    15.75     1.04    15.26   530.26     1.01   525.50     0.92     0.84
  HUB     15.68     1.04    15.14   529.50     1.01   524.20     0.92     0.84

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     55.20    28.63    24.20     4.43     0.93     0.58     2.90
  MEAN    54.83    17.18    12.70     4.48     0.95     0.53     3.51     0.84
  HUB     56.72    -5.37    -9.30     3.93     0.95     0.40     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.917

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     240.321     194.765     140.786    1124.619       0.214       0.000

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      15.753      15.259     525.569      24.000      54.139      35.400     -18.739

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	152.416	194.765	247.314	1127.700	0.135	0.578

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	15.743	15.543	528.453	528.796	0.028	0.678

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	142.473	0.000	142.473	1127.961	0.126	0.515

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.520	528.698	0.000	0.060	0.124	0.532

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.759	15.695	1.039	530.393	7.583	152.321	1.181

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
47210.012	0.639	118.549	416473.094

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =19.026 EfDer = 0.931

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
44.436	1510.000	15.695	530.393	1.000	1.000	0.980

W Kg/sec = 20.19796

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
42.086	1493.263	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
34183.461	34867.055	4.818	590.487	122.563	474.134	3.868

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	136.67	-0.05	136.67	0.12	267.78
MEAN	18.08	0.00	-0.02	136.67	-0.05	136.67	0.12	
HUB	15.21	0.00	-0.02	136.67	-0.05	136.67	0.12	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	63.22	46.36	16.86	270.79	303.37	15.53	528.83	0.27
MEAN	60.16	42.30	17.86	238.22	274.68	15.53	528.83	0.24
HUB	55.72	37.84	17.88	200.43	242.63	15.53	528.83	0.22

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	221.47	165.41	147.27	1133.00	0.20
MEAN	18.01	218.74	161.29	147.75	1132.05	0.19
HUB	15.22	228.40	173.70	148.31	1131.08	0.20

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	269.08	180.10	103.67	0.16	3378.57	
MEAN	237.32	166.17	76.03	0.15	2905.69	1.83
HUB	200.60	150.73	26.90	0.13	2644.98	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.33	1.04	15.90	537.54	1.01	533.45	0.92	0.85
MEAN	16.24	1.03	15.82	536.54	1.01	532.55	0.92	0.85
HUB	16.19	1.03	15.74	535.99	1.01	531.63	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	48.32	35.14	31.50	3.64	0.93	0.50	2.90	
MEAN	47.51	27.23	23.50	3.73	0.95	0.48	3.30	0.85
HUB	49.51	10.28	6.50	3.78	0.95	0.47	3.92	

blockage3	Cor/U1	Cor/Incid

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      0.950       1.000       0.931

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     220.814     161.743     150.326    1132.125       0.195       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.251      15.825     532.621      46.000      47.095      30.600     -16.495

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     154.642     161.743     223.775    1134.328       0.136       0.493

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.246      16.036     534.696     511.151       0.023       0.553

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     152.861       0.000     152.861    1134.376       0.135       0.409

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.003     534.741       0.000       0.060       0.111       0.418

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.780      16.208       1.033     536.693       6.300     173.257       1.343

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  39225.688       0.542      98.499  382891.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =19.026   EfDer =  0.960

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     44.436    1510.000      16.208     536.693       1.000       1.000       0.980
W Kg/sec =   20.19796

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     40.995    1484.473       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  34183.461   34867.055       4.569     545.479     119.387     429.765       3.600

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   145.09    -0.05   145.09     0.13   259.99
 MEAN    17.74      0.00    -0.02   145.09    -0.05   145.09     0.13
 HUB     15.05      0.00    -0.02   145.09    -0.05   145.09     0.13

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     61.26     46.36    14.90   264.47   301.69     16.02   534.93      0.27
 MEAN    58.18     43.40    14.78   233.74   275.15     16.02   534.93      0.24
 HUB     53.82     38.84    14.98   198.32   245.76     16.02   534.93      0.22

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   217.26    151.49    155.73   1138.98      0.19
 MEAN    17.51   216.81    150.37    156.19   1138.18      0.19
 HUB     14.85   229.18    167.23    156.71   1137.35      0.20

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    261.04    190.40    109.55     0.17   3002.11
 MEAN   230.69    175.63     80.32     0.15   2633.27     1.72
 HUB    195.68    159.28     28.45     0.14   2484.12

         Pt2       PR       Ps2      Tt2        TR       Ts2      Eff2uCor   Eff2incCor
 TIP     16.80      1.04     16.38    543.05      1.01    539.10      0.92      0.88
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 MEAN    16.73     1.03    16.31   542.27     1.01   538.34     0.92     0.88
 HUB     16.70     1.03    16.23   541.95     1.01   537.56     0.92     0.88
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.21    35.12    31.50     3.62     0.93     0.45     2.90
 MEAN    43.91    27.21    23.50     3.71     0.95     0.44     3.28     0.88
 HUB     46.86    10.29     6.50     3.79     0.95     0.44     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.960

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     218.867     151.352     158.099    1138.260       0.192       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.740      16.313     538.421      46.000      43.751      31.500     -12.251

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     164.476     151.352     223.517    1140.099       0.144       0.428

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.737      16.495     540.162     471.992       0.017       0.501

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     160.033       0.000     160.033    1140.226       0.140       0.382

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.480     540.282       0.000       0.060       0.082       0.393

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.821      16.708       1.031     542.421       5.728     184.251       1.428

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  35669.023       0.523      89.568  386558.344


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =19.026   EfDer =  0.979

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     44.436    1510.000      16.708     542.421       1.000       1.000       0.980
W Kg/sec =   20.19796

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     39.979    1476.613       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 34183.461   34867.055       4.409     513.330     116.428     401.059       3.445

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   151.25    -0.05   151.25     0.13   248.17
 MEAN    16.97     0.00    -0.02   151.25    -0.05   151.25     0.13
 HUB     14.32     0.00    -0.02   151.25    -0.05   151.25     0.13

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.21    46.36    12.85   253.79   295.49    16.50   540.51     0.26
 MEAN    55.93    43.80    12.13   223.63   270.01    16.50   540.51     0.24
 HUB     51.29    37.84    13.45   188.70   241.87    16.50   540.51     0.21

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   210.41   135.34   161.11  1144.27     0.18
 MEAN    16.57   210.72   135.30   161.54  1143.56     0.18
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 HUB     13.89   223.36   153.75   162.02  1142.84     0.20

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    248.79   197.05   113.45     0.17  2556.17
 MEAN   218.40   181.65    83.09     0.16  2243.40     1.63
 HUB    183.03   164.64    29.29     0.14  2136.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.23     1.03    16.83   547.83     1.01   544.13     0.92     0.90
 MEAN    17.17     1.03    16.77   547.17     1.01   543.46     0.92     0.90
 HUB     17.15     1.03    16.70   546.94     1.01   542.78     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.03    35.15    31.50     3.65     0.93     0.41     2.90
 MEAN    39.95    27.22    23.50     3.72     0.94     0.40     3.29     0.90
 HUB     43.50    10.25     6.50     3.75     0.94     0.40     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     209.105     136.065     158.780    1143.777       0.183       0.038

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.180      16.783     543.662      46.000      40.595      32.400      -8.195

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     167.185     136.065     215.557    1145.162       0.146       0.381

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.179      16.925     544.980     456.573       0.011       0.456

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     159.461       0.000     159.461    1145.383       0.139       0.346

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.929     545.190       0.000       0.060       0.059       0.389

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.851      17.160       1.027     547.314       4.893     205.385       1.592

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  30469.092       0.492      76.511  401288.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =19.026   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     44.436    1510.000      17.160     547.314       1.000       1.000       0.980
W Kg/sec =   20.19796

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     39.102    1469.998       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  34183.461   34867.055       4.476     509.668     113.876     390.276       3.427

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   149.62    -0.05   149.62     0.13   235.00
 MEAN    15.91     0.00    -0.02   149.62    -0.05   149.62     0.13
 HUB     13.07     0.00    -0.02   149.62    -0.05   149.62     0.13

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.21    47.36    10.85   241.41   284.06    16.96   545.44     0.25
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 MEAN    54.50    44.80     9.70   209.69   257.64    16.96   545.44     0.22
 HUB     49.03    38.84    10.19   172.23   228.18    16.96   545.44     0.20
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   201.46   123.59   159.10  1148.97     0.18
 MEAN    15.50   200.60   121.62   159.52  1148.26     0.17
 HUB     12.59   210.55   136.88   159.99  1147.55     0.18

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    236.40   195.04   112.81     0.17  2218.06
 MEAN   204.22   179.64    82.59     0.16  1885.68     1.59
 HUB    165.90   162.60    29.02     0.14  1723.99

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.63     1.03    17.26   552.01     1.01   548.62     0.92     0.91
 MEAN    17.56     1.02    17.19   551.30     1.01   547.94     0.92     0.91
 HUB     17.52     1.02    17.12   550.96     1.01   547.26     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.84    35.34    31.50     3.84     0.93     0.39     2.90
 MEAN    37.32    27.37    23.50     3.87     0.94     0.37     3.34     0.91
 HUB     40.55    10.28     6.50     3.78     0.94     0.36     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      202.923     123.853     160.743    1148.307       0.177       -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.564      17.185      547.986       46.000      37.614      33.000      -4.614

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      170.688     123.853     210.889    1149.360       0.149        0.284

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       17.565       17.296     548.992     440.827       0.017        0.415

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      160.559       0.000     160.559    1149.654       0.140        0.344

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       17.317      549.272       0.000       0.060       0.044        0.337

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4           PR4       Texit         Del T       Ns         Ns nondim
      0.872       17.555        1.023     551.425       4.111     231.938        1.798

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  25601.209       0.458      64.287  426564.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    178175.02    447.4138      43.4090       1.1620       0.8038      19.0260       1.0547
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =19.972   EfDer =  0.903

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      42.475    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   19.30702

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      41.494    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  32675.617   33329.062       6.881     831.557     120.840     619.754       5.129

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02    94.64    -0.03    94.64     0.08   270.77
  MEAN    17.06     0.00    -0.02    94.64    -0.03    94.64     0.08
  HUB     12.51     0.00    -0.02    94.64    -0.03    94.64     0.08

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     70.81    50.47    20.34   271.85   287.88    15.03   522.06     0.26
  MEAN    67.17    47.20    19.97   224.81   243.95    15.03   522.06     0.22
  HUB     60.14    38.62    21.52   164.85   190.11    15.03   522.06     0.17

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   239.03   199.98   130.93  1125.91     0.21
  MEAN    18.04   236.58   196.70   131.45  1124.70     0.21
  HUB     15.00   247.95   209.81   132.14  1123.30     0.22

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   149.36    71.87     0.13  4126.24
  MEAN   237.67   137.68    40.96     0.12  3548.33     2.06
  HUB    197.66   132.69    12.15     0.12  3147.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.85     1.05    15.36   531.54     1.02   526.77     0.92     0.83
  MEAN    15.74     1.04    15.26   530.32     1.01   525.65     0.92     0.83
  HUB     15.67     1.04    15.15   529.47     1.01   524.34     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     56.79    28.76    24.20     4.56     0.93     0.60     2.90
  MEAN    56.25    17.31    12.70     4.61     0.95     0.55     3.51     0.83
  HUB     57.80    -5.26    -9.30     4.04     0.95     0.43     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.903

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     238.019     196.323     134.576    1124.775       0.212       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.747      15.263     525.714      24.000      55.570      35.400     -20.170

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     145.646     196.323     244.449    1127.937       0.129       0.603
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      15.738      15.555     528.674     528.796       0.030       0.703

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     136.178       0.000     136.178    1128.174       0.121       0.532

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.527     528.897       0.000       0.060       0.132       0.548

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.743      15.687       1.038     530.446       7.636     148.119       1.148

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  47541.371       0.643     114.115  397967.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =19.972   EfDer =  0.918

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    42.475    1510.000      15.687     530.446       1.000       1.000       0.980
W Kg/sec =   19.30702

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    40.252    1493.188       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  32675.617   33329.062       5.037     590.487     117.223     474.134       4.045

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   130.64    -0.04   130.64     0.12   267.77
 MEAN    18.08     0.00    -0.02   130.64    -0.04   130.64     0.12
 HUB     15.21     0.00    -0.02   130.64    -0.04   130.64     0.12

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     64.25    46.36    17.89   270.79   300.70    15.54   529.02     0.27
 MEAN    61.26    42.30    18.96   238.22   271.73    15.54   529.02     0.24
 HUB     56.91    37.84    19.07   200.43   239.28    15.54   529.02     0.21

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   220.49   169.65   140.83  1133.29     0.19
 MEAN    18.01   216.72   164.33   141.28  1132.30     0.19
 HUB     15.22   224.96   174.62   141.81  1131.30     0.20

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    269.08   172.39    99.43     0.15  3465.25
 MEAN   237.32   159.02    72.99     0.14  2960.42     1.90
 HUB    200.60   144.17    25.97     0.13  2658.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.33     1.04    15.91   537.78     1.01   533.72     0.92     0.84
 MEAN    16.24     1.04    15.83   536.71     1.01   532.79     0.92     0.84
 HUB     16.18     1.03    15.74   536.07     1.01   531.85     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     50.30    35.22    31.50     3.72     0.93     0.52     2.90
 MEAN    49.31    27.32    23.50     3.82     0.95     0.51     3.30     0.84
 HUB     50.92    10.38     6.50     3.88     0.95     0.49     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.918

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     218.676     164.793     143.745    1132.380       0.193       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.245      15.827     532.862      46.000      48.903      30.600     -18.302

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     147.815     164.793     221.373    1134.683       0.130       0.524

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.238      16.046     535.031     511.151       0.025       0.584

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     146.145       0.000     146.145    1134.726       0.129       0.430

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.010     535.072       0.000       0.060       0.122       0.439

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.763      16.197       1.033     536.856       6.410     167.212       1.296

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  39908.574       0.551      95.794  365742.844


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =19.972   EfDer =  0.951

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     42.475    1510.000      16.197     536.856       1.000       1.000       0.980
W Kg/sec =   19.30702

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     39.219    1484.247       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  32675.617   33329.062       4.776     545.479     114.214     429.765       3.763

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   138.72    -0.05   138.72     0.12   259.95
 MEAN    17.74     0.00    -0.02   138.72    -0.05   138.72     0.12
 HUB     15.05     0.00    -0.02   138.72    -0.05   138.72     0.12

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.33    46.36    15.97   264.47   298.68    16.03   535.25     0.26
 MEAN    59.32    43.40    15.92   233.74   271.85    16.03   535.25     0.24
 HUB     55.03    38.84    16.19   198.32   242.06    16.03   535.25     0.21

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   215.76   156.14   148.92  1139.42     0.19
 MEAN    17.51   214.34   153.73   149.36  1138.57     0.19
 HUB     14.85   225.42   168.38   149.87  1137.71     0.20

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    261.04   182.16   104.90     0.16  3094.01
 MEAN   230.69   168.02    76.96     0.15  2692.07     1.78
 HUB    195.68   152.34    27.30     0.13  2501.22

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     16.80     1.04    16.39   543.40     1.01   539.52     0.92     0.87
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 MEAN    16.72     1.03    16.32   542.55     1.01   538.72     0.92     0.87
 HUB     16.69     1.03    16.24   542.15     1.01   537.91     0.92     0.87
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.36    35.16    31.50     3.66     0.93     0.48     2.90
 MEAN    45.83    27.26    23.50     3.76     0.95     0.47     3.28     0.87
 HUB     48.33    10.32     6.50     3.82     0.95     0.46     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.951

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     216.335     154.735     151.188    1138.653       0.190       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.734      16.318     538.794      46.000      45.664      31.500     -14.164

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     157.221     154.735     220.593    1140.600       0.138       0.461

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.730      16.509     540.638     471.992       0.019       0.533

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     153.016       0.000     153.016    1140.715       0.134       0.403

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.489     540.747       0.000       0.060       0.095       0.414

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.806      16.698       1.031     542.702       5.847     177.423       1.375

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  36405.926       0.534      87.386  369164.094


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =19.972   EfDer =  0.971

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     42.475    1510.000      16.698     542.702       1.000       1.000       0.980
W Kg/sec =   19.30702

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     38.248    1476.231       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 32675.617   33329.062       4.608     513.330     111.389     401.059       3.601

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   144.63    -0.05   144.63     0.13   248.11
 MEAN    16.97     0.00    -0.02   144.63    -0.05   144.63     0.13
 HUB     14.32     0.00    -0.02   144.63    -0.05   144.63     0.13

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.33    46.36    13.97   253.79   292.15    16.51   540.96     0.26
 MEAN    57.11    43.80    13.31   223.63   266.36    16.51   540.96     0.23
 HUB     52.54    37.84    14.70   188.70   237.79    16.51   540.96     0.21

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   208.37   140.31   154.05  1144.85     0.18
 MEAN    16.57   207.74   138.90   154.47  1144.10     0.18
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 HUB     13.89   219.16   154.98   154.95  1143.34     0.19

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    248.79   188.41   108.48     0.16  2649.96
 MEAN   218.40   173.73    79.50     0.15  2302.96     1.69
 HUB    183.03   157.47    28.05     0.14  2153.45

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.24     1.03    16.84   548.31     1.01   544.68     0.92     0.89
 MEAN    17.17     1.03    16.78   547.58     1.01   543.97     0.92     0.89
 HUB     17.14     1.03    16.70   547.26     1.01   543.25     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.33    35.15    31.50     3.65     0.93     0.44     2.90
 MEAN    41.96    27.23    23.50     3.73     0.94     0.43     3.29     0.89
 HUB     45.01    10.26     6.50     3.76     0.94     0.42     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     206.318     139.681     151.843    1144.299       0.180       0.036

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.177      16.791     544.161      46.000      42.611      32.400     -10.211

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     159.813     139.681     212.252    1145.793       0.139       0.415

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.176      16.944     545.583     456.573       0.013       0.489

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     152.471       0.000     152.471    1145.994       0.133       0.370

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.942     545.774       0.000       0.060       0.070       0.411

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.837      17.153       1.027     547.715       5.013     197.218       1.529

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  31217.861       0.504      74.933  383149.969


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =19.972   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.475    1510.000      17.153     547.715       1.000       1.000       0.980
W Kg/sec =   19.30702

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     37.406    1469.459       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  32675.617   33329.062       4.679     509.668     108.935     390.276       3.583

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   143.08    -0.05   143.08     0.12   234.92
 MEAN    15.91     0.00    -0.02   143.08    -0.05   143.08     0.12
 HUB     13.07     0.00    -0.02   143.08    -0.05   143.08     0.12

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.35    47.36    11.99   241.41   280.66    16.97   546.01     0.24
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MEAN    55.70    44.80    10.90   209.69   253.89    16.97   546.01     0.22
HUB     50.29    38.84    11.45   172.23   223.94    16.97   546.01     0.20

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   199.16   128.56   152.11  1149.66     0.17
MEAN    15.50   197.41   125.32   152.53  1148.92     0.17
HUB     12.59   206.17   138.19   153.00  1148.16     0.18

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    236.40   186.46   107.84     0.16  2307.27
MEAN   204.22   171.73    78.90     0.15  1942.91     1.64
HUB    165.90   155.49    27.71     0.14  1740.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.64     1.03    17.27   552.60     1.01   549.29     0.92     0.90
MEAN    17.56     1.02    17.20   551.83     1.01   548.57     0.92     0.90
HUB     17.52     1.02    17.13   551.40     1.01   547.85     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.20    35.33    31.50     3.83     0.93     0.41     2.90
MEAN    39.41    27.35    23.50     3.85     0.94     0.40     3.34     0.90
HUB     42.09    10.27     6.50     3.77     0.94     0.38     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.987

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     199.774     127.615     153.701    1148.956       0.174       -0.012

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.566      17.199     548.608      46.000      39.702      33.000      -6.702

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
    15.219     163.144     127.615     207.127    1150.118       0.142       0.320

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.566      17.321     549.719     440.827       0.019       0.447

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     153.494       0.000     153.494    1150.385       0.133       0.372

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.337     549.974       0.000       0.060       0.052       0.364

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.862      17.554       1.023     551.941       4.226     222.169       1.722

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  26316.613       0.471      63.168  407227.562

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    181390.34    435.3960     41.4943      1.1620      0.7894     19.9719      1.0557
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =20.987   EfDer =  0.885

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      40.399    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   18.36311

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
      39.466    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   31078.115   31699.609       7.235     831.557     114.932     619.754       5.392

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02    89.99    -0.03    89.99     0.08   270.77
  MEAN    17.06     0.00    -0.02    89.99    -0.03    89.99     0.08
  HUB     12.51     0.00    -0.02    89.99    -0.03    89.99     0.08

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     71.69    50.47    21.22   271.85   286.38    15.04   522.13     0.26
  MEAN    68.19    47.20    20.99   224.81   242.18    15.04   522.13     0.22
  HUB     61.38    38.62    22.76   164.85   187.84    15.04   522.13     0.17

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   238.20   203.03   124.57  1126.08     0.21
  MEAN    18.04   234.41   198.27   125.04  1124.86     0.21
  HUB     15.00   243.76   208.87   125.68  1123.45     0.22

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   142.31    68.82     0.13  4189.15
  MEAN   237.67   131.10    39.40     0.12  3576.53     2.15
  HUB    197.66   126.18    11.21     0.11  3133.41

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.84     1.05    15.36   531.68     1.02   526.94     0.92     0.81
  MEAN    15.73     1.04    15.26   530.38     1.01   525.79     0.92     0.81
  HUB     15.66     1.04    15.15   529.44     1.01   524.48     0.92     0.81

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     58.47    28.92    24.20     4.72     0.93     0.63     2.90
  MEAN    57.76    17.49    12.70     4.79     0.95     0.58     3.51     0.81
  HUB     58.96    -5.10    -9.30     4.20     0.95     0.46     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.885

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     235.685     197.885     128.021    1124.931       0.210       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.739      15.264     525.861      24.000      57.099      35.400     -21.699

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     138.506     197.885     241.541    1128.175       0.123       0.630
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      15.729      15.564     528.898     528.796       0.031       0.731

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     129.529       0.000     129.529    1128.390       0.115       0.550

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.532     529.099       0.000       0.060       0.139       0.566

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.725      15.676       1.038     530.500       7.690     143.663       1.114

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  47879.566       0.648     109.308  378381.344


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =20.987   EfDer =  0.900

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    40.399    1510.000      15.676     530.500       1.000       1.000       0.980
W Kg/sec =   18.36311

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    38.311    1493.111       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 31078.115   31699.609       5.292     590.487     111.571     474.134       4.250

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   124.27    -0.04   124.27     0.11   267.76
 MEAN    18.08     0.00    -0.02   124.27    -0.04   124.27     0.11
 HUB     15.21     0.00    -0.02   124.27    -0.04   124.27     0.11

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     65.35    46.36    18.99   270.79   297.98    15.54   529.21     0.26
 MEAN    62.46    42.30    20.16   238.22   268.72    15.54   529.21     0.24
 HUB     58.21    37.84    20.37   200.43   235.86    15.54   529.21     0.21

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   219.70   174.08   134.04  1133.58     0.19
 MEAN    18.01   214.82   167.52   134.47  1132.56     0.19
 HUB     15.22   221.47   175.60   134.97  1131.53     0.20

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    269.08   164.29    95.00     0.14  3555.59
 MEAN   237.32   151.50    69.80     0.13  3017.88     1.97
 HUB    200.60   137.26    25.00     0.12  2673.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.32     1.04    15.90   538.03     1.01   533.99     0.92     0.82
 MEAN    16.23     1.04    15.82   536.89     1.01   533.03     0.92     0.82
 HUB     16.16     1.03    15.74   536.16     1.01   532.06     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     52.40    35.33    31.50     3.83     0.93     0.55     2.90
 MEAN    51.25    27.43    23.50     3.93     0.95     0.53     3.30     0.82
 HUB     52.45    10.49     6.50     3.99     0.95     0.51     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.900

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     216.655     167.995     136.811    1132.637       0.191       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.233      15.823     533.104      46.000      50.841      30.600     -20.241

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     140.626     167.995     219.085    1135.045       0.124       0.557

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.226      16.052     535.373     511.151       0.027       0.618

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     139.065       0.000     139.065    1135.083       0.123       0.454

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.013     535.410       0.000       0.060       0.133       0.462

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.743      16.182       1.032     537.025       6.524     160.929       1.248

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  40622.602       0.561      92.740  347613.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =20.987   EfDer =  0.939

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     40.399    1510.000      16.182     537.025       1.000       1.000       0.980
W Kg/sec =   18.36311

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     37.342    1484.014       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  31078.115   31699.609       5.016     545.479     108.749     429.765       3.952

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   132.01    -0.05   132.01     0.12   259.91
 MEAN    17.74      0.00    -0.02   132.01    -0.05   132.01     0.12
 HUB     15.05      0.00    -0.02   132.01    -0.05   132.01     0.12

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.48     46.36    17.12   264.47   295.63    16.03   535.57     0.26
 MEAN    60.55     43.40    17.15   233.74   268.49    16.03   535.57     0.24
 HUB     56.36     38.84    17.52   198.32   238.28    16.03   535.57     0.21

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   214.49   160.98   141.74  1139.86      0.19
 MEAN    17.51   211.97   157.22   142.17  1138.97      0.19
 HUB     14.85   221.54   169.49   142.66  1138.08      0.19

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    261.04   173.50   100.06     0.15  3189.96
 MEAN   230.69   160.03    73.47     0.14  2753.23      1.85
 HUB    195.68   145.05    26.19     0.13  2517.65

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     16.80      1.04    16.39   543.78     1.01   539.93      0.92     0.86
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 MEAN    16.71     1.03    16.31   542.85     1.01   539.10     0.92     0.86
 HUB     16.67     1.03    16.23   542.35     1.01   538.25     0.92     0.86
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.64    35.22    31.50     3.72     0.93     0.51     2.90
 MEAN    47.88    27.33    23.50     3.83     0.95     0.49     3.28     0.86
 HUB     49.91    10.40     6.50     3.90     0.95     0.48     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.939

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     213.904     158.254     143.911    1139.052       0.188       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.723      16.316     539.173      46.000      47.718      31.500     -16.218

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     149.589     158.254     217.764    1141.112       0.131       0.497

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.718      16.518     541.125     471.992       0.022       0.568

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     145.629       0.000     145.629    1141.215       0.128       0.426

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.493     541.223       0.000       0.060       0.109       0.436

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.789      16.682       1.031     542.994       5.969     170.411       1.321

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  37167.898       0.545      84.853  350785.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =20.987   EfDer =  0.962

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     40.399    1510.000      16.682     542.994       1.000       1.000       0.980
W Kg/sec =   18.36311

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     36.423    1475.834       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 31078.115   31699.609       4.839     513.330     106.074     401.059       3.781

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   137.66    -0.05   137.66     0.12   248.04
 MEAN    16.97     0.00    -0.02   137.66    -0.05   137.66     0.12
 HUB     14.32     0.00    -0.02   137.66    -0.05   137.66     0.12

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.53    46.36    15.17   253.79   288.76    16.51   541.41     0.25
 MEAN    58.39    43.80    14.59   223.63   262.64    16.51   541.41     0.23
 HUB     53.90    37.84    16.06   188.70   233.61    16.51   541.41     0.20

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   206.49   145.39   146.63  1145.43     0.18
 MEAN    16.57   204.87   142.65   147.04  1144.65     0.18
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HUB     13.89   214.89   156.27   147.51  1143.85     0.19

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    248.79   179.41   103.39     0.16  2745.94
MEAN   218.40   165.40    75.75     0.14  2365.11     1.75
HUB    183.03   149.91    26.76     0.13  2171.33

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.24     1.03    16.85   548.80     1.01   545.24     0.92     0.88
MEAN    17.16     1.03    16.78   548.00     1.01   544.49     0.92     0.88
HUB     17.12     1.03    16.70   547.59     1.01   543.73     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.76    35.19    31.50     3.69     0.93     0.46     2.90
MEAN    44.13    27.25    23.50     3.75     0.95     0.45     3.29     0.88
HUB     46.65    10.28     6.50     3.78     0.95     0.44     3.90

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.962

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     203.650     143.455     144.548    1144.829       0.178       0.033

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.168      16.792     544.668      46.000      44.783      32.400     -12.383

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     152.067     143.455     209.054    1146.438       0.133       0.452

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.165      16.955     546.200     456.573       0.016       0.524

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     145.125       0.000     145.125    1146.619       0.127       0.394

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.948     546.372       0.000       0.060       0.083       0.433

   STAGE EXIT CONDITIONS, STAGE             4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.822      17.139       1.027     548.131       5.137     188.909       1.464

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  31990.936       0.517      73.035  363996.406


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =20.987   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    40.399    1510.000      17.139     548.131       1.000       1.000       0.980
W Kg/sec =   18.36311

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    35.620    1468.902       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 31078.115   31699.609       4.913     509.668     103.735     390.276       3.762

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   136.20    -0.05   136.20     0.12   234.83
MEAN    15.91     0.00    -0.02   136.20    -0.05   136.20     0.12
HUB     13.07     0.00    -0.02   136.20    -0.05   136.20     0.12

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.57    47.36    13.21   241.41   277.22    16.97   546.58     0.24
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 MEAN    57.00    44.80    12.20   209.69   250.08    16.97   546.58     0.22
 HUB     51.67    38.84    12.83   172.23   219.61    16.97   546.58     0.19
      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   197.12   133.77   144.78  1150.37     0.17
 MEAN    15.50   194.29   129.10   145.20  1149.59     0.17
 HUB     12.59   201.70   139.53   145.65  1148.79     0.18

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    236.40   177.47   102.63     0.15  2400.64
 MEAN   204.22   163.48    75.11     0.14  2001.54     1.70
 HUB    165.90   148.02    26.37     0.13  1757.34

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.64     1.03    17.28   553.21     1.01   549.97     0.92     0.90
 MEAN    17.56     1.02    17.21   552.37     1.01   549.21     0.92     0.90
 HUB     17.50     1.02    17.13   551.85     1.01   548.45     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.74    35.33    31.50     3.83     0.93     0.44     2.90
 MEAN    41.64    27.35    23.50     3.85     0.94     0.42     3.34     0.90
 HUB     43.77    10.26     6.50     3.76     0.94     0.40     4.06

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      196.701     131.471     146.310    1149.619       0.171       -0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.560      17.204      549.245      46.000      41.942      33.000      -8.942

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      155.235     131.471     203.427    1150.894       0.135       0.359

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.559      17.337     550.463     440.827       0.023       0.483

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     146.088       0.000     146.088    1151.134       0.127       0.400

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.348     550.694       0.000       0.060       0.062       0.390

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.849      17.545       1.024     552.476       4.345     212.288       1.646

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  27058.602       0.484      61.774  386815.656

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    184719.59    421.7102     39.4656      1.1614      0.7723     20.9874      1.0567
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =21.966   EfDer =  0.864

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      38.424    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   17.46534

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      37.536    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   29558.711   30149.822       7.607     831.557     109.313     619.754       5.670

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02    85.56    -0.03    85.56     0.08   270.77
  MEAN    17.06     0.00    -0.02    85.56    -0.03    85.56     0.08
  HUB     12.51     0.00    -0.02    85.56    -0.03    85.56     0.08

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     72.53    50.47    22.06   271.85   285.02    15.05   522.20     0.25
  MEAN    69.17    47.20    21.97   224.81   240.56    15.05   522.20     0.21
  HUB     62.57    38.62    23.95   164.85   185.75    15.05   522.20     0.17

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   237.52   205.82   118.55  1126.24     0.21
  MEAN    18.04   232.51   199.76   118.98  1125.00     0.21
  HUB     15.00   239.86   207.94   119.56  1123.59     0.21

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   135.69    66.02     0.12  4246.76
  MEAN   237.67   124.87    37.91     0.11  3603.34     2.25
  HUB    197.66   120.00    10.28     0.11  3119.48

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.84     1.05    15.35   531.80     1.02   527.09     0.92     0.79
  MEAN    15.72     1.04    15.26   530.44     1.01   525.92     0.92     0.79
  HUB     15.64     1.04    15.15   529.41     1.01   524.61     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     60.06    29.11    24.20     4.91     0.93     0.65     2.90
  MEAN    59.22    17.67    12.70     4.97     0.95     0.60     3.51     0.79
  HUB     60.10    -4.92    -9.30     4.38     0.95     0.48     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.864

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     233.638     199.370     121.813    1125.070       0.208       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.728      15.262     525.991      24.000      58.575      35.400     -23.175

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     131.747     199.370     238.968    1128.391       0.117       0.656
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      15.718      15.568     529.100     528.796       0.032       0.757

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     123.227       0.000     123.227    1128.584       0.109       0.569

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.534     529.282       0.000       0.060       0.144       0.584

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.705      15.664       1.037     530.550       7.740     139.410       1.081

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  48188.887       0.652     104.635  359771.094


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =21.966   EfDer =  0.879

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    38.424    1510.000      15.664     530.550       1.000       1.000       0.980
W Kg/sec =   17.46534

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    36.469    1493.042       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  29558.711   30149.822       5.560     590.487     106.204     474.134       4.464

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   118.23    -0.04   118.23     0.10   267.74
 MEAN    18.08     0.00    -0.02   118.23    -0.04   118.23     0.10
 HUB     15.21     0.00    -0.02   118.23    -0.04   118.23     0.10

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     66.42    46.36    20.06   270.79   295.51    15.54   529.38     0.26
 MEAN    63.61    42.30    21.31   238.22   265.98    15.54   529.38     0.24
 HUB     59.47    37.84    21.63   200.43   232.73    15.54   529.38     0.21

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   219.15   178.15   127.63  1133.84     0.19
 MEAN    18.01   213.21   170.49   128.02  1132.80     0.19
 HUB     15.22   218.30   176.48   128.49  1131.74     0.19

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    269.08   156.71    90.93     0.14  3638.69
 MEAN   237.32   144.42    66.83     0.13  3071.26     2.05
 HUB    200.60   130.73    24.11     0.12  2687.22

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.31     1.04    15.89   538.25     1.01   534.24     0.92     0.80
 MEAN    16.21     1.03    15.81   537.05     1.01   533.25     0.92     0.80
 HUB     16.14     1.03    15.73   536.24     1.01   532.26     0.92     0.80

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     54.38    35.47    31.50     3.97     0.93     0.57     2.90
 MEAN    53.10    27.57    23.50     4.07     0.95     0.55     3.30     0.80
 HUB     53.94    10.63     6.50     4.13     0.95     0.54     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.879

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     214.937     170.969     130.259    1132.867       0.190       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.216      15.813     533.322      46.000      52.697      30.600     -22.097

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     133.838     170.969     217.124    1135.373       0.118       0.589

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.208      16.051     535.684     511.151       0.029       0.650

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     132.370       0.000     132.370    1135.408       0.117       0.478

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.009     535.717       0.000       0.060       0.141       0.486

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.722      16.162       1.032     537.180       6.630     155.087       1.202

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  41281.516       0.570      89.637  330405.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =21.966   EfDer =  0.925

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     38.424    1510.000      16.162     537.180       1.000       1.000       0.980
W Kg/sec =   17.46534

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     35.564    1483.799       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  29558.711   30149.822       5.267     545.479     103.572     429.765       4.149

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   125.67    -0.04   125.67     0.11   259.87
 MEAN    17.74      0.00    -0.02   125.67    -0.04   125.67     0.11
 HUB     15.05      0.00    -0.02   125.67    -0.04   125.67     0.11

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     64.59     46.36    18.23   264.47   292.85    16.02   535.86     0.26
 MEAN    61.74     43.40    18.34   233.74   265.42    16.02   535.86     0.23
 HUB     57.64     38.84    18.80   198.32   234.82    16.02   535.86     0.21

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   213.52   165.45   134.97  1140.25     0.19
 MEAN    17.51   209.96   160.48   135.38  1139.34     0.18
 HUB     14.85   218.04   170.55   135.85  1138.41     0.19

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    261.04   165.39    95.59     0.15  3278.43
 MEAN   230.69   152.50    70.21     0.13  2810.24     1.93
 HUB    195.68   138.15    25.13     0.12  2533.34

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     16.79     1.04    16.38   544.12     1.01   540.31     0.92     0.85
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 MEAN    16.70     1.03    16.31   543.13     1.01   539.45     0.92     0.85
 HUB     16.64     1.03    16.22   542.54     1.01   538.57     0.92     0.85
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     50.79    35.31    31.50     3.81     0.93     0.53     2.90
 MEAN    49.85    27.41    23.50     3.91     0.95     0.52     3.28     0.85
 HUB     51.46    10.48     6.50     3.98     0.95     0.50     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.925

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     211.833     161.534     137.040    1139.412       0.186       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.705      16.307     539.516      46.000      49.690      31.500     -18.190

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     142.387     161.534     215.331    1141.579       0.125       0.531

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.700      16.519     541.570     471.992       0.024       0.601

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     138.654       0.000     138.654    1141.672       0.121       0.449

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.489     541.658       0.000       0.060       0.121       0.458

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4         PR4        Texit        Del T       Ns        Ns nondim
      0.772      16.660       1.031     543.263       6.083     163.927       1.271

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  37876.262       0.556      82.243  333351.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =21.966   EfDer =  0.951

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.424    1510.000      16.660     543.263       1.000       1.000       0.980
W Kg/sec =   17.46534

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     34.696    1475.469       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  29558.711   30149.822       5.080     513.330     101.045     401.059       3.969

     ROTOR LEADING EDGE CONDITIONS, STAGE           4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   131.08    -0.05   131.08     0.11   247.98
 MEAN    16.97     0.00    -0.02   131.08    -0.05   131.08     0.11
 HUB     14.32     0.00    -0.02   131.08    -0.05   131.08     0.11

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.69    46.36    16.33   253.79   285.68    16.51   541.83     0.25
 MEAN    59.63    43.80    15.83   223.63   259.25    16.51   541.83     0.23
 HUB     55.22    37.84    17.38   188.70   229.79    16.51   541.83     0.20

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   205.05   150.17   139.63  1145.97     0.18
 MEAN    16.57   202.36   146.09   140.03  1145.14     0.18
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HUB     13.89   210.98   157.41   140.48  1144.31     0.18

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    248.79   170.94    98.62     0.15  2836.09
MEAN   218.40   157.59    72.31     0.14  2422.06     1.82
HUB    183.03   142.80    25.62     0.12  2187.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.23     1.03    16.84   549.27     1.01   545.75     0.92     0.87
MEAN    17.14     1.03    16.77   548.39     1.01   544.97     0.92     0.87
HUB     17.10     1.03    16.69   547.89     1.01   544.17     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     47.08    35.23    31.50     3.73     0.93     0.49     2.90
MEAN    46.21    27.31    23.50     3.81     0.95     0.48     3.29     0.87
HUB     48.25    10.34     6.50     3.84     0.95     0.47     3.90

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.951

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     201.332     146.913     137.663    1145.312       0.176       0.031

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.151      16.784     545.130      46.000      46.862      32.400     -14.462

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     144.764     146.913     206.253    1147.028       0.126       0.487

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.147      16.957     546.765     456.573       0.018       0.559

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     138.197       0.000     138.197    1147.191       0.120       0.416

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.944     546.920       0.000       0.060       0.097       0.453

   STAGE EXIT CONDITIONS, STAGE             4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.806      17.117       1.027     548.515       5.252     181.304       1.405

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  32706.602       0.528      71.018  345837.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =21.966   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    38.424    1510.000      17.117     548.515       1.000       1.000       0.980
W Kg/sec =   17.46534

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    33.933    1468.388       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 29558.711   30149.822       5.157     509.668      98.822     390.276       3.949

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   129.71    -0.04   129.71     0.11   234.75
MEAN    15.91     0.00    -0.02   129.71    -0.04   129.71     0.11
HUB     13.07     0.00    -0.02   129.71    -0.04   129.71     0.11

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.76    47.36    14.40   241.41   274.09    16.96   547.11     0.24
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MEAN    58.27    44.80    13.47   209.69   246.60    16.96   547.11     0.21
HUB     53.02    38.84    14.18   172.23   215.64    16.96   547.11     0.19
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   195.49   138.59   137.88  1151.02     0.17
MEAN    15.50   191.62   132.64   138.28  1150.20     0.17
HUB     12.59   197.63   140.76   138.72  1149.36     0.17

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    236.40   169.05    97.81     0.15  2487.07
MEAN   204.22   155.71    71.57     0.14  2056.34     1.77
HUB    165.90   140.99    25.15     0.12  1772.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.63     1.03    17.28   553.78     1.01   550.59     0.92     0.89
MEAN    17.54     1.02    17.20   552.87     1.01   549.80     0.92     0.89
HUB     17.48     1.02    17.13   552.27     1.01   549.01     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     45.15    35.35    31.50     3.85     0.93     0.47     2.90
MEAN    43.81    27.37    23.50     3.87     0.94     0.45     3.34     0.89
HUB     45.42    10.27     6.50     3.77     0.94     0.43     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.970

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      194.068     135.074     139.346    1150.223       0.169       -0.015

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.545      17.199      549.826      46.000      44.108      33.000     -11.108

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      147.791     135.074     200.218    1151.604       0.128       0.397

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.542      17.341     551.147     440.827       0.027       0.518

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      139.116       0.000     139.116    1151.821       0.121       0.425

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.348     551.354       0.000       0.060       0.075       0.415

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.835      17.526       1.024     552.970       4.455     203.304       1.576

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  27746.592       0.496      60.248  367470.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    187799.88    407.7812     37.5361      1.1601      0.7540     21.9660      1.0577
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =23.000   EfDer =  0.837

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      36.362    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   16.52840

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      35.523    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   27973.025   28532.426       8.038     831.557     103.449     619.754       5.991

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02    80.94    -0.03    80.94     0.07   270.77
  MEAN    17.06     0.00    -0.02    80.94    -0.03    80.94     0.07
  HUB     12.51     0.00    -0.02    80.94    -0.03    80.94     0.07

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     73.42    50.47    22.95   271.85   283.67    15.05   522.26     0.25
  MEAN    70.20    47.20    23.00   224.81   238.96    15.05   522.26     0.21
  HUB     63.85    38.62    25.23   164.85   183.67    15.05   522.26     0.16

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   237.01   208.71   112.30  1126.40     0.21
  MEAN    18.04   230.62   201.22   112.68  1125.13     0.20
  HUB     15.00   235.87   206.93   113.19  1123.73     0.21

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   128.83    63.13     0.11  4306.36
  MEAN   237.67   118.43    36.45     0.11  3629.67     2.36
  HUB    197.66   113.57     9.27     0.10  3104.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.82     1.05    15.34   531.93     1.02   527.23     0.92     0.77
  MEAN    15.71     1.04    15.25   530.49     1.01   526.05     0.92     0.77
  HUB     15.62     1.03    15.15   529.38     1.01   524.73     0.92     0.77

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     61.72    29.34    24.20     5.14     0.93     0.67     2.90
  MEAN    60.75    17.92    12.70     5.22     0.95     0.63     3.51     0.77
  HUB     61.32    -4.68    -9.30     4.62     0.95     0.51     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.837

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     231.605     200.828     115.364    1125.208       0.206       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.712      15.254     526.120      24.000      60.125      35.400     -24.725

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     124.730     200.828     236.410    1128.605       0.111       0.683
  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      15.701      15.568     529.301     528.796       0.032       0.786

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     116.675       0.000     116.675    1128.778       0.103       0.591

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.531     529.463       0.000       0.060       0.146       0.605

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.681      15.648       1.036     530.600       7.790     134.946       1.046

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  48500.102       0.656      99.662  340366.938


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =23.000   EfDer =  0.850

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    36.362    1510.000      15.648     530.600       1.000       1.000       0.980
W Kg/sec =   16.52840

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    34.549    1492.971       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  27973.025   28532.426       5.869     590.487     100.615     474.134       4.712

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   111.95    -0.04   111.95     0.10   267.73
 MEAN    18.08     0.00    -0.02   111.95    -0.04   111.95     0.10
 HUB     15.21     0.00    -0.02   111.95    -0.04   111.95     0.10

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     67.54    46.36    21.18   270.79   293.06    15.54   529.55     0.26
 MEAN    64.83    42.30    22.53   238.22   263.25    15.54   529.55     0.23
 HUB     60.82    37.84    22.98   200.43   229.60    15.54   529.55     0.20

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   218.83   182.33   121.00  1134.10     0.19
 MEAN    18.01   211.72   173.49   121.35  1133.03     0.19
 HUB     15.22   215.11   177.32   121.78  1131.94     0.19

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    269.08   148.89    86.75     0.13  3723.98
 MEAN   237.32   137.12    63.83     0.12  3125.29     2.14
 HUB    200.60   123.98    23.28     0.11  2699.90

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.29     1.04    15.87   538.48     1.01   534.48     0.92     0.78
 MEAN    16.18     1.03    15.79   537.22     1.01   533.47     0.92     0.78
 HUB     16.11     1.03    15.71   536.31     1.01   532.45     0.92     0.78

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     56.43    35.64    31.50     4.14     0.93     0.60     2.90
 MEAN    55.03    27.74    23.50     4.24     0.95     0.58     3.30     0.78
 HUB     55.52    10.82     6.50     4.32     0.95     0.56     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.850

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     213.342     173.979     123.474    1133.094       0.188       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.190      15.794     533.536      46.000      54.636      30.600     -24.036

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     126.812     173.979     215.291    1135.701       0.112       0.622

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.182      16.041     535.994     511.151       0.029       0.685

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     125.431       0.000     125.431    1135.732       0.110       0.506

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.998     536.023       0.000       0.060       0.146       0.514

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.695      16.135       1.031     537.337       6.737     149.106       1.156

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  41949.156       0.579      86.200  312481.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =23.000   EfDer =  0.909

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     36.362    1510.000      16.135     537.337       1.000       1.000       0.980
W Kg/sec =   16.52840

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     33.719    1483.582       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  27973.025   28532.426       5.555     545.479      98.197     429.765       4.377

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   119.09    -0.04   119.09     0.10   259.83
 MEAN    17.74     0.00    -0.02   119.09    -0.04   119.09     0.10
 HUB     15.05     0.00    -0.02   119.09    -0.04   119.09     0.10

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     65.76    46.36    19.40   264.47   290.08    16.01   536.15     0.26
 MEAN    63.01    43.40    19.61   233.74   262.37    16.01   536.15     0.23
 HUB     59.02    38.84    20.18   198.32   231.36    16.01   536.15     0.20

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   212.82   170.05   127.97  1140.65     0.19
 MEAN    17.51   208.07   163.77   128.35  1139.70     0.18
 HUB     14.85   214.55   171.59   128.80  1138.75     0.19

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    261.04   157.02    90.99     0.14  3369.52
 MEAN   230.69   144.75    66.92     0.13  2867.74     2.01
 HUB    195.68   131.03    24.10     0.12  2548.67

         Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     16.76     1.04    16.36   544.47     1.01   540.69     0.92     0.83
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 MEAN    16.67     1.03    16.29   543.41     1.01   539.79     0.92     0.83
 HUB     16.61     1.03    16.20   542.73     1.01   538.89     0.92     0.83
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     53.04    35.41    31.50     3.91     0.93     0.56     2.90
 MEAN    51.91    27.54    23.50     4.04     0.95     0.54     3.28     0.83
 HUB     53.11    10.60     6.50     4.10     0.95     0.53     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.909

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     209.893     164.842     129.931    1139.770       0.184       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.677      16.287     539.857      46.000      51.754      31.500     -20.254

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     134.943     164.842     213.032    1142.046       0.118       0.566

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.671      16.509     542.015     471.992       0.026       0.637

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     131.433       0.000     131.433    1142.128       0.115       0.473

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.475     542.093       0.000       0.060       0.133       0.482

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4         PR4        Texit        Del T       Ns        Ns nondim
      0.752      16.628       1.031     543.536       6.198     157.340       1.220

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  38596.367       0.566      79.311  315203.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =23.000   EfDer =  0.939

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     36.362    1510.000      16.628     543.536       1.000       1.000       0.980
W Kg/sec =   16.52840

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     32.906    1475.098       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 27973.025   28532.426       5.357     513.330      95.831     401.059       4.185

     ROTOR LEADING EDGE CONDITIONS, STAGE           4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   124.26    -0.04   124.26     0.11   247.92
 MEAN    16.97     0.00    -0.02   124.26    -0.04   124.26     0.11
 HUB     14.32     0.00    -0.02   124.26    -0.04   124.26     0.11

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.92    46.36    17.56   253.79   282.62    16.49   542.25     0.25
 MEAN    60.95    43.80    17.15   223.63   255.87    16.49   542.25     0.22
 HUB     56.64    37.84    18.80   188.70   225.97    16.49   542.25     0.20

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   203.89   155.05   132.40  1146.50     0.18
 MEAN    16.57   200.06   149.64   132.78  1145.64     0.17
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 HUB     13.89   207.09   158.56   133.21  1144.77     0.18

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    248.79   162.22    93.74     0.14  2928.17
 MEAN   218.40   149.52    68.76     0.13  2480.86     1.90
 HUB    183.03   135.44    24.47     0.12  2203.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.20     1.03    16.83   549.73     1.01   546.26     0.92     0.86
 MEAN    17.11     1.03    16.75   548.79     1.01   545.44     0.92     0.86
 HUB     17.06     1.03    16.67   548.20     1.01   544.62     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.51    35.30    31.50     3.80     0.93     0.52     2.90
 MEAN    48.42    27.38    23.50     3.88     0.95     0.50     3.29     0.86
 HUB     49.97    10.41     6.50     3.91     0.95     0.49     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.939

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     199.215     150.483     130.543    1145.794       0.174       0.028

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.122      16.764     545.592      46.000      49.058      32.400     -16.658

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     137.219     150.483     203.652    1147.621       0.120       0.524

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.118      16.948     547.333     456.573       0.021       0.596

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     131.032       0.000     131.032    1147.767       0.114       0.440

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.929     547.472       0.000       0.060       0.112       0.474

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.788      17.084       1.027     548.906       5.370     173.617       1.346

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  33439.703       0.540      68.714  326943.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =23.000   EfDer =  0.960

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     36.362    1510.000      17.084     548.906       1.000       1.000       0.980
W Kg/sec =   16.52840

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     32.186    1467.865       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  27973.025   28532.426       5.437     509.668      93.735     390.276       4.164

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   123.00    -0.04   123.00     0.11   234.66
 MEAN    15.91     0.00    -0.02   123.00    -0.04   123.00     0.11
 HUB     13.07     0.00    -0.02   123.00    -0.04   123.00     0.11

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.01    47.36    15.65   241.41   270.97    16.95   547.64     0.24
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MEAN    59.61    44.80    14.81   209.69   243.14    16.95   547.64     0.21
HUB     54.47    38.84    15.63   172.23   211.67    16.95   547.64     0.18
     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   194.15   143.51   130.75  1151.66     0.17
MEAN    15.50   189.08   136.21   131.14  1150.81     0.16
HUB     12.59   193.56   141.98   131.56  1149.94     0.17

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    236.40   160.39    92.89     0.14  2575.41
MEAN   204.22   147.72    68.00     0.13  2111.63     1.84
HUB    165.90   133.72    23.92     0.12  1788.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.61     1.03    17.26   554.36     1.01   551.21     0.92     0.88
MEAN    17.51     1.03    17.19   553.37     1.01   550.39     0.92     0.88
HUB     17.45     1.02    17.11   552.69     1.01   549.56     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     47.66    35.39    31.50     3.89     0.93     0.50     2.90
MEAN    46.09    27.41    23.50     3.91     0.95     0.48     3.34     0.88
HUB     47.18    10.31     6.50     3.81     0.95     0.45     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.960

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      191.582     138.709     132.149    1150.829       0.166       -0.017

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.517      17.181      550.408      46.000      46.387      33.000     -13.387

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      140.106     138.709     197.155    1152.318       0.122       0.436

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       17.513      17.333     551.834     440.827       0.032       0.556

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      131.917       0.000     131.917    1152.512       0.114       0.451

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       17.334      552.020       0.000       0.060       0.090       0.439

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.818      17.493       1.024     553.473       4.567     194.317       1.506

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  28444.816       0.509      58.451  347348.781

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    190930.14    392.3380      35.5225      1.1580      0.7323     23.0000      1.0587
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    P&W Fan Hub + 4 Stage LPC 40% Design RPM (corrected) 2-21-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =23.990   EfDer =  0.804

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      34.412    1510.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   15.64173

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
      33.617    1504.053       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   26472.395   27001.787       8.494     831.557      97.900     619.754       6.330

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02    76.58    -0.03    76.58     0.07   270.77
  MEAN    17.06     0.00    -0.02    76.58    -0.03    76.58     0.07
  HUB     12.51     0.00    -0.02    76.58    -0.03    76.58     0.07

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     74.27    50.47    23.80   271.85   282.45    15.06   522.32     0.25
  MEAN    71.19    47.20    23.99   224.81   237.52    15.06   522.32     0.21
  HUB     65.09    38.62    26.47   164.85   181.79    15.06   522.32     0.16

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   236.64   211.36   106.42  1126.54     0.21
  MEAN    18.04   228.94   202.53   106.75  1125.26     0.20
  HUB     15.00   232.21   205.98   107.20  1123.85     0.21

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    271.85   122.41    60.48     0.11  4360.94
  MEAN   237.67   112.38    35.13     0.10  3653.37     2.48
  HUB    197.66   107.52     8.33     0.10  3090.10

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     15.80     1.05    15.32   532.04     1.02   527.36     0.92     0.74
  MEAN    15.69     1.04    15.24   530.54     1.01   526.17     0.92     0.74
  HUB     15.60     1.03    15.14   529.35     1.01   524.85     0.92     0.74

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     63.27    29.61    24.20     5.41     0.93     0.70     2.90
  MEAN    62.21    18.22    12.70     5.52     0.95     0.65     3.51     0.74
  HUB     62.51    -4.44    -9.30     4.86     0.95     0.54     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.804

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     229.795     202.141     109.292    1125.331       0.204       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     15.691      15.241     526.235      24.000      61.601      35.400     -26.201

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     118.127     202.141     234.126    1128.796       0.105       0.708
   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      15.681      15.561     529.480     528.796       0.032       0.813

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     110.500       0.000     110.500    1128.951       0.098       0.614

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.524     529.625       0.000       0.060       0.146       0.628

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.653      15.629       1.035     530.645       7.835     130.690       1.013

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  48781.301       0.660      94.862  322019.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =23.990   EfDer =  0.814

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    34.412    1510.000      15.629     530.645       1.000       1.000       0.980
W Kg/sec =   15.64173

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    32.737    1492.908       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 26472.395   27001.787       6.194     590.487      95.339     474.134       4.973

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP    20.55     0.00    -0.02   106.03    -0.04   106.03     0.09   267.72
 MEAN   18.08     0.00    -0.02   106.03    -0.04   106.03     0.09
 HUB    15.21     0.00    -0.02   106.03    -0.04   106.03     0.09

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP    68.62    46.36    22.26   270.79   290.84    15.53   529.71     0.26
 MEAN   66.01    42.30    23.71   238.22   260.79    15.53   529.71     0.23
 HUB    62.12    37.84    24.28   200.43   226.78    15.53   529.71     0.20

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP    20.42   218.70   186.15   114.79  1134.33     0.19
 MEAN   18.01   210.48   176.23   115.10  1133.23     0.19
 HUB    15.22   212.22   178.05   115.47  1132.12     0.19

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP   269.08   141.62    82.93     0.12  3801.89
 MEAN  237.32   130.31    61.09     0.11  3174.51     2.24
 HUB   200.60   117.65    22.54     0.10  2711.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    16.25     1.04    15.84   538.69     1.02   534.70     0.92     0.74
 MEAN   16.15     1.03    15.76   537.36     1.01   533.66     0.92     0.74
 HUB    16.07     1.03    15.68   536.38     1.01   532.62     0.92     0.74

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    58.34    35.85    31.50     4.35     0.93     0.62     2.90
 MEAN   56.85    27.96    23.50     4.46     0.95     0.60     3.30     0.74
 HUB    57.04    11.05     6.50     4.55     0.95     0.58     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.814

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     212.004     176.722     117.112    1133.295       0.187      -0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.154      15.764     533.727      46.000      56.468      30.600     -25.868

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     120.228     176.722     213.741    1135.995       0.106       0.653

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.146      16.020     536.273     511.151       0.029       0.718

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     118.918       0.000     118.918    1136.023       0.105       0.537

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.977     536.299       0.000       0.060       0.146       0.544

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.664      16.100       1.030     537.480       6.835     143.553       1.113

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  42557.109       0.588      82.758  295549.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =23.990   EfDer =  0.888

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     34.412    1510.000      16.100     537.480       1.000       1.000       0.980
W Kg/sec =   15.64173

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     31.983    1483.385       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
  26472.395   27001.787       5.856     545.479      93.143     429.765       4.614

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   112.91    -0.04   112.91     0.10   259.80
 MEAN    17.74     0.00    -0.02   112.91    -0.04   112.91     0.10
 HUB     15.05     0.00    -0.02   112.91    -0.04   112.91     0.10

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     66.88    46.36    20.52   264.47   287.60    15.99   536.42     0.25
 MEAN    64.22    43.40    20.82   233.74   259.62    15.99   536.42     0.23
 HUB     60.35    38.84    21.51   198.32   228.24    15.99   536.42     0.20

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     19.81   212.38   174.25   121.42  1141.00     0.19
 MEAN    17.51   206.57   166.85   121.78  1140.02     0.18
 HUB     14.85   211.37   172.48   122.19  1139.04     0.19

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    261.04   149.25    86.80     0.13  3452.59
 MEAN   230.69   137.49    63.83     0.12  2921.71     2.10
 HUB    195.68   124.37    23.20     0.11  2561.87

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.73     1.04    16.33   544.79     1.01   541.02     0.92     0.81
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 MEAN    16.63     1.03    16.25   543.66     1.01   540.10     0.92     0.81
 HUB     16.57     1.03    16.17   542.90     1.01   539.17     0.92     0.81
         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     55.13    35.56    31.50     4.06     0.93     0.58     2.90
 MEAN    53.88    27.66    23.50     4.16     0.95     0.57     3.28     0.81
 HUB     54.69    10.75     6.50     4.25     0.95     0.55     3.87

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.888

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     208.334     167.948     123.275    1140.087       0.183       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.638      16.254     540.160      46.000      53.721      31.500     -22.221

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     127.977     167.948     211.150    1142.467       0.112       0.600

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.631      16.486     542.417     471.992       0.028       0.672

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     124.668       0.000     124.668    1142.540       0.109       0.499

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.449     542.487       0.000       0.060       0.141       0.506

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4         PR4        Texit        Del T       Ns        Ns nondim
      0.731      16.587       1.030     543.785       6.304     151.269       1.173

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  39256.395       0.576      76.340  298069.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =23.990   EfDer =  0.925

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     34.412    1510.000      16.587     543.785       1.000       1.000       0.980
W Kg/sec =   15.64173

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     31.226    1474.761       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  26472.395   27001.787       5.645     513.330      90.939     401.059       4.410

     ROTOR LEADING EDGE CONDITIONS, STAGE           4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   117.87    -0.04   117.87     0.10   247.86
 MEAN    16.97     0.00    -0.02   117.87    -0.04   117.87     0.10
 HUB     14.32     0.00    -0.02   117.87    -0.04   117.87     0.10

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     65.09    46.36    18.73   253.79   279.87    16.46   542.62     0.24
 MEAN    62.21    43.80    18.41   223.63   252.83    16.46   542.62     0.22
 HUB     58.01    37.84    20.17   188.70   222.52    16.46   542.62     0.19

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   203.09   159.56   125.63  1146.97     0.18
 MEAN    16.57   198.10   152.87   125.99  1146.08     0.17
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 HUB     13.89   203.62   159.64   126.40  1145.19     0.18

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    248.79   154.09    89.22     0.13  3013.36
 MEAN   218.40   142.01    65.53     0.12  2534.38     1.98
 HUB    183.03   128.55    23.39     0.11  2217.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.17     1.04    16.80   550.16     1.01   546.72     0.92     0.85
 MEAN    17.07     1.03    16.72   549.15     1.01   545.87     0.92     0.85
 HUB     17.01     1.03    16.64   548.48     1.01   545.02     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     51.79    35.38    31.50     3.88     0.93     0.55     2.90
 MEAN    50.51    27.48    23.50     3.98     0.95     0.53     3.29     0.85
 HUB     51.63    10.48     6.50     3.98     0.95     0.51     3.90

   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.925

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     197.433     153.732     123.879    1146.227       0.172       0.025

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.082      16.731     546.008      46.000      51.138      32.400     -18.738

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     130.162     153.732     201.434    1148.157       0.113       0.559

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.077      16.924     547.848     456.573       0.023       0.632

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     124.325       0.000     124.325    1148.287       0.108       0.464

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.901     547.972       0.000       0.060       0.124       0.495

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.770      17.040       1.027     549.263       5.478     166.580       1.291

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  34114.625       0.551      66.341  309116.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =23.990   EfDer =  0.949

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     34.412    1510.000      17.040     549.263       1.000       1.000       0.980
W Kg/sec =   15.64173

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     30.549    1467.388       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  26472.395   27001.787       5.729     509.668      88.967     390.276       4.387

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   116.71    -0.04   116.71     0.10   234.59
 MEAN    15.91     0.00    -0.02   116.71    -0.04   116.71     0.10
 HUB     13.07     0.00    -0.02   116.71    -0.04   116.71     0.10

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     64.20    47.36    16.84   241.41   268.17    16.92   548.13     0.23
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MEAN    60.91    44.80    16.11   209.69   240.02    16.92   548.13     0.21
HUB     55.88    38.84    17.04   172.23   208.08    16.92   548.13     0.18

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   193.21   148.10   124.09  1152.25     0.17
MEAN    15.50   186.97   139.53   124.46  1151.36     0.16
HUB     12.59   189.89   143.07   124.86  1150.46     0.17

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    236.40   152.30    88.30     0.13  2657.67
MEAN   204.22   140.26    64.68     0.12  2163.05     1.92
HUB    165.90   126.93    22.83     0.11  1801.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.57     1.03    17.23   554.89     1.01   551.77     0.92     0.87
MEAN    17.47     1.03    17.15   553.84     1.01   550.92     0.92     0.87
HUB     17.40     1.02    17.07   553.08     1.01   550.06     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     50.04    35.43    31.50     3.93     0.93     0.53     2.90
MEAN    48.27    27.46    23.50     3.96     0.95     0.50     3.34     0.87
HUB     48.89    10.36     6.50     3.86     0.95     0.47     4.06

  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.949

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     189.524     142.091     125.418    1151.375       0.165      -0.019

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.476      17.148     550.935      46.000      48.566      33.000     -15.566

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     132.922     142.091     194.571    1152.966       0.115       0.473

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.471      17.309     552.459     440.827       0.037       0.593

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     125.184       0.000     125.184    1153.140       0.109       0.475

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.305     552.626       0.000       0.060       0.104       0.461

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.801      17.449       1.024     553.934       4.671     186.117       1.443

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  29092.445       0.521      56.574  328367.781

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    193801.88    376.8753     33.6169      1.1550      0.7085     23.9903      1.0595
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Appendix E.—Compressor Flow Analysis of Fan-Core and LPC Along Engine Operating Line; Baseline Blockages

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NPSS: Vehicle Mach number .20, Altitude 0 ft, dT 22R, Thrust 101%, Thrust 29113.9 Lbf

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*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*****************************************************************

Fan Core + 4 Stage LPC 101.8% RPM  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 5.373   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     178.766    3922.913      15.106     544.988       1.000       1.000       0.980
 W Kg/sec =  81.2573624

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     178.317    3827.130       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 143366.906  140271.828       1.601     831.557     519.337     619.754       1.193

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   447.08    -0.15   447.08     0.40   688.98
  MEAN    17.06     0.00    -0.02   447.08    -0.15   447.08     0.40
  HUB     12.51     0.00    -0.02   447.08    -0.15   447.08     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.67    50.47     7.20   706.24   835.99    13.55   528.30     0.74
  MEAN    52.57    47.20     5.37   584.03   735.64    13.55   528.30     0.65
  HUB     43.78    38.62     5.16   428.27   619.21    13.55   528.30     0.55

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   701.69   388.62   584.24  1148.45     0.61
  MEAN    18.04   739.85   434.48   598.85  1142.66     0.65
  HUB     15.00   853.66   576.37   629.71  1131.67     0.75

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    706.24   665.00   317.62     0.58  8020.44
  MEAN   617.44   626.17   182.97     0.55  7838.85     1.30
  HUB    513.51   632.84    62.86     0.56  8647.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.37     1.28    15.05   589.09     1.08   548.01     0.92     0.91
  MEAN    19.27     1.28    14.53   588.09     1.08   542.42     0.92     0.91
  HUB     19.74     1.31    13.53   592.54     1.09   531.77     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     33.63    28.53    24.20     4.33     0.93     0.28     2.90
  MEAN    35.96    16.99    12.70     4.29     0.92     0.24     3.51     0.91
  HUB     42.47    -5.70    -9.30     3.60     0.92     0.08     4.78

    blockage3   Cor/Incid
       0.950       0.998
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       ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
      18.071     752.840     433.632     615.411    1142.563       0.659      -0.007

      Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      19.409      14.498     542.597      24.000      35.169      35.400       0.231

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
      18.071     638.063     433.632     771.467    1156.509       0.552       0.264

    BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
       0.950      19.329      15.714     555.924     528.796       0.026       0.418

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
      18.083     583.193       0.000     583.193    1162.313       0.502       0.335

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      16.201     561.517       0.000       0.060       0.043       0.359

     STAGE EXIT CONDITIONS, STAGE   1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.872      19.244       1.274     589.909      44.921     221.405       1.716

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 279690.312       0.561    2825.499 1748433.875

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc = 5.373   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     178.766    3922.913      19.244     589.909       1.000       1.000       0.980
W Kg/sec =  81.2573624

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     145.630    3678.530       1.401       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 143366.906  140271.828       1.392     590.487     424.164     474.134       1.118

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   552.70    -0.19   552.70     0.47   659.66
 MEAN    18.08     0.00    -0.02   552.70    -0.19   552.70     0.47
 HUB     15.21     0.00    -0.02   552.70    -0.19   552.70     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.85    46.36     5.49   703.51   894.80    16.49   564.42     0.77
 MEAN    48.24    42.30     5.94   618.89   829.90    16.49   564.42     0.71
 HUB     43.30    37.84     5.46   520.70   759.48    16.49   564.42     0.65

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   628.33   311.41   545.73  1193.34     0.53
 MEAN    18.01   644.76   328.50   554.80  1189.14     0.54
 HUB     15.22   702.25   416.99   565.03  1185.04     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    699.06   669.40   387.65     0.56  6362.91
 MEAN   616.55   625.11   288.05     0.53  5919.78     1.44
 HUB    521.14   574.55   104.15     0.48  6350.80

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.14     1.20    19.15   624.87     1.06   591.93     0.92     0.91
 MEAN    22.85     1.19    18.70   622.44     1.06   587.76     0.92     0.91
 HUB     23.13     1.20    18.23   624.80     1.06   583.67     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.71    35.39    31.50     3.89     0.93     0.31     2.90
 MEAN    30.63    27.44    23.50     3.94     0.92     0.31     3.30     0.91
 HUB     36.43    10.44     6.50     3.94     0.92     0.31     3.92

   blockage3   Cor/Incid
      0.950       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     17.960     653.699     329.426     564.624    1189.679       0.549       0.005

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
     22.995      18.725     588.383      46.000      30.261      30.600       0.339

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     17.960     565.911     329.426     654.810    1198.676       0.472       0.230

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.944      19.693     597.317     511.151       0.022       0.315

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     17.823     558.092       0.000     558.092    1199.412       0.465       0.230

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.722     598.050       0.000       0.060       0.037       0.236

    STAGE EXIT CONDITIONS, STAGE   2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.878      22.879       1.189     624.038      34.129     254.767       1.975

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 212659.531       0.435    2148.338 1577454.625

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc = 5.373   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    178.766    3922.913      22.879     624.038       1.000       1.000       0.980
W Kg/sec =  81.2573624

   W cor      RPM cor        GAMMA        Cp          R           Blades       THK
    125.983    3576.526       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 143366.906  140271.828       1.486     545.479     366.967     429.765       1.171

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   523.34    -0.18   523.34     0.44   626.39
 MEAN    17.74     0.00    -0.02   523.34    -0.18   523.34     0.44
 HUB     15.05     0.00    -0.02   523.34    -0.18   523.34     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.71    46.36     6.35   687.07   863.83    20.09   601.20     0.72
 MEAN    49.25    43.40     5.85   607.26   801.79    20.09   601.20     0.67
 HUB     44.56    38.84     5.72   515.22   734.52    20.09   601.20     0.61

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   604.81   307.04   521.08  1227.96     0.49
 MEAN    17.51   619.83   323.84   528.51  1224.24     0.51
 HUB     14.85   674.55   408.27   536.97  1220.58     0.55
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    678.17   639.74   371.14     0.52  6086.02
 MEAN   599.32   595.99   275.48     0.49  5672.49     1.45
 HUB    508.37   546.22   100.11     0.45  6065.45

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.04     1.18    22.90   657.45     1.05   626.95     0.92     0.91
 MEAN    26.74     1.17    22.44   655.18     1.05   623.15     0.92     0.91
 HUB     27.02     1.18    21.95   657.34     1.05   619.40     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.51    35.46    31.50     3.96     0.93     0.32     2.90
 MEAN    31.50    27.53    23.50     4.03     0.92     0.32     3.28     0.91
 HUB     37.25    10.56     6.50     4.06     0.92     0.33     3.87

   blockage3   Cor/Incid
      0.950       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     626.100     325.963     534.555    1224.995       0.511       0.011

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     26.887      22.494     623.969      46.000      31.374      31.500       0.126

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     543.834     325.963     634.041    1232.848       0.441       0.233

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      26.841      23.482     631.995     471.992       0.020       0.333

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.121     526.849       0.000     526.849    1234.327       0.427       0.249

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.613     633.512       0.000       0.060       0.037       0.262

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      26.767       1.170     656.659      32.621     246.343       1.910

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 203420.391       0.442    2055.002 1513481.125

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc = 5.373   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    178.766    3922.913      26.767     656.659       1.000       1.000       0.980
W Kg/sec =  81.2573624

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    110.463    3486.558       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 143366.906  140271.828       1.595     513.330     321.789     401.059       1.246

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   492.82    -0.17   492.82     0.40   585.99
 MEAN    16.97     0.00    -0.02   492.82    -0.17   492.82     0.40
 HUB     14.32     0.00    -0.02   492.82    -0.17   492.82     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.23    46.36     6.87   659.34   823.31    23.99   636.42     0.67
 MEAN    49.70    43.80     5.90   580.97   761.97    23.99   636.42     0.62
 HUB     44.86    37.84     7.02   490.23   695.25    23.99   636.42     0.56
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      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   574.30   295.19   492.62  1259.50     0.46
MEAN    16.57   586.14   307.18   499.20  1255.88     0.47
HUB     13.89   634.15   381.44   506.61  1252.30     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    646.34   604.97   351.15     0.48  5576.43
MEAN   567.39   562.95   260.21     0.45  5094.01     1.47
HUB    475.51   515.27    94.07     0.41  5300.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     30.97     1.16    26.85   687.25     1.05   659.76     0.92     0.91
MEAN    30.59     1.14    26.34   684.60     1.04   655.97     0.92     0.91
HUB     30.75     1.15    25.81   685.74     1.04   652.22     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.93    35.48    31.50     3.98     0.93     0.33     2.90
MEAN    31.61    27.53    23.50     4.03     0.92     0.32     3.29     0.91
HUB     36.98    10.52     6.50     4.02     0.92     0.33     3.90

   blockage3   Cor/Incid
      0.950       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     577.644     308.905     488.109    1257.844       0.459       0.054

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     30.724      26.586     658.056      46.000      32.328      32.400       0.072

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     16.481     504.984     308.905     591.972    1264.093       0.399       0.261

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      30.689      27.491     664.611     456.573       0.018       0.351

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     16.096     479.022       0.000     479.022    1266.116       0.378       0.257

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.726     666.740       0.000       0.060       0.037       0.314

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      30.606       1.143     685.863      29.204     251.801       1.952

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 182273.438       0.436    1841.370 1500989.875

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc = 5.373   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    178.766    3922.913      30.606     685.863       1.000       1.000       0.980
W Kg/sec =  81.2573624

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     98.731    3411.521       1.400       0.250      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 143366.906  140271.828       1.772     509.668     287.642     390.276       1.357
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ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	445.70	-0.15	445.70	0.35	545.39
MEAN	15.91	0.00	-0.02	445.70	-0.15	445.70	0.35	
HUB	13.07	0.00	-0.02	445.70	-0.15	445.70	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.61	47.36	7.25	627.16	769.53	28.10	669.32	0.61
MEAN	50.72	44.80	5.92	544.76	703.98	28.10	669.32	0.56
HUB	45.12	38.84	6.28	447.44	631.65	28.10	669.32	0.50

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	535.53	292.51	448.59	1288.54	0.42
MEAN	15.50	540.92	292.36	455.10	1284.42	0.42
HUB	12.59	577.03	345.43	462.21	1280.34	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	614.16	551.98	321.64	0.43	5250.48	
MEAN	530.54	513.66	238.18	0.40	4533.36	1.50
HUB	431.00	470.06	85.57	0.37	4351.02	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	34.91	1.14	31.00	714.64	1.04	690.76	0.92	0.91
MEAN	34.30	1.12	30.36	710.71	1.04	686.34	0.92	0.91
HUB	34.15	1.12	29.70	709.71	1.03	681.98	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.11	35.64	31.50	4.14	0.93	0.35	2.90	
MEAN	32.72	27.63	23.50	4.13	0.92	0.33	3.34	0.91
HUB	36.77	10.49	6.50	3.99	0.92	0.32	4.06	

blockage3	Cor/Incid
0.950	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	547.114	297.724	459.015	1284.797	0.426	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
34.372	30.342	686.758	46.000	32.968	33.000	0.032

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	480.430	297.724	565.201	1290.123	0.372	0.202

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	34.317	31.183	692.464	440.827	0.033	0.364

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	448.376	0.000	448.376	1292.431	0.347	0.298

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	31.563	694.944	0.000	0.060	0.037	0.295

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.880	34.304	1.121	711.686	25.823	261.493	2.027

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
161317.828	0.428	1629.672	1528239.000

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
1039361.50	10499.8799	178.3165	2.2709	0.8662	5.3730	1.3059

NPSS: Vehicle Mach number .78, Altitude 35000ft, dT 22R, Thrust 100%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

Fan Core + 4 Stage LPC, 110% RPM  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 3.001   EfDer =  0.986

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     75.716    3925.360       5.183     466.396       1.000       1.000       0.980
 W Kg/sec =  34.4165916

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     203.644    4139.618       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  151464.953   59412.191       1.402     831.557     593.179     619.754       1.045

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   487.03    -0.17   487.03     0.47   745.24
  MEAN    17.06     0.00    -0.02   487.03    -0.17   487.03     0.47
  HUB     12.51     0.00    -0.02   487.03    -0.17   487.03     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.43    50.47     4.96   706.69   858.39     4.45   446.61     0.83
  MEAN    50.20    47.20     3.00   584.40   760.86     4.45   446.61     0.73
  HUB     41.36    38.62     2.74   428.53   648.83     4.45   446.61     0.63

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   734.79   356.77   642.36  1054.78     0.70
  MEAN    18.04   779.21   415.94   658.91  1049.51     0.74
  HUB     15.00   915.00   584.34   704.11  1036.53     0.88

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    706.69   731.48   349.91     0.69  7363.73
  MEAN   617.83   689.15   201.89     0.66  7504.80     1.21
  HUB    513.83   707.63    70.52     0.68  8767.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      6.75     1.30     4.88   506.97     1.09   462.00     0.92     0.90
  MEAN     6.78     1.31     4.70   507.75     1.09   457.20     0.92     0.90
  HUB      7.08     1.37     4.26   514.71     1.10   445.13     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     29.05    28.58    24.20     4.38     0.93     0.22     2.90
  MEAN    32.26    17.03    12.70     4.33     0.91     0.17     3.51     0.90
  HUB     39.69    -5.72    -9.30     3.58     0.91     0.01     4.78

    blockage3   Cor/Incid
       0.950       0.986

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
      18.071     799.099     415.134     682.805    1047.867       0.763      -0.019

      Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
       6.846       4.657     456.555      24.000      31.299      35.400       4.101
```

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	711.260	415.134	823.545	1060.488	0.671	0.181

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	6.791	5.022	467.619	528.796	0.035	0.366

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	644.845	0.000	644.845	1068.976	0.603	0.263

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.251	475.130	0.000	0.060	0.068	0.283

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.827	6.716	1.296	509.809	43.413	237.479	1.841

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
269917.781	0.540	1154.926	858232.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 3.001 EfDer = 0.988

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
75.716	3925.360	6.716	509.809	1.000	1.000	0.980

W Kg/sec = 34.4165916

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
164.308	3959.441	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
151464.953	59412.191	1.234	590.487	478.607	474.134	0.991

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	606.06	-0.21	606.06	0.56	710.04
MEAN	18.08	0.00	-0.02	606.06	-0.21	606.06	0.56	
HUB	15.21	0.00	-0.02	606.06	-0.21	606.06	0.56	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.28	46.36	2.92	703.94	929.05	5.41	479.18	0.87
MEAN	45.63	42.30	3.33	619.27	866.64	5.41	479.18	0.81
HUB	40.70	37.84	2.86	521.02	799.37	5.41	479.18	0.74

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	652.61	277.86	590.51	1102.90	0.59
MEAN	18.01	672.14	303.61	599.66	1099.36	0.61
HUB	15.22	733.76	407.26	610.36	1095.99	0.67

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	699.49	725.58	421.63	0.66	5678.20	
MEAN	616.93	676.59	313.33	0.62	5471.77	1.38
HUB	521.47	620.95	114.21	0.57	6202.82	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	8.11	1.21	6.40	541.09	1.06	505.59	0.92	0.90
MEAN	8.06	1.20	6.26	539.95	1.06	502.30	0.92	0.90
HUB	8.25	1.23	6.11	543.98	1.07	499.12	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.20	35.53	31.50	4.03	0.93	0.27	2.90	
MEAN	26.85	27.59	23.50	4.09	0.92	0.27	3.30	0.90
HUB	33.71	10.60	6.50	4.10	0.92	0.29	3.92	

```
   blockage3   Cor/Incid
      0.950       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     683.085     304.462     611.481    1099.576       0.621       0.000

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      8.119       6.258     502.766      46.000      26.469      30.600       4.131

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     614.862     304.462     686.114    1107.620       0.555       0.161

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       8.085       6.557     510.149     511.151       0.028       0.260

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     607.246       0.000     607.246    1108.464       0.548       0.160

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.559     510.925       0.000       0.060       0.050       0.162

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.848       8.044       1.198     541.672      31.863     281.460       2.182

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 198166.812       0.405     847.918  778611.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc = 3.001   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     75.716    3925.360       8.044     541.672       1.000       1.000       0.980
W Kg/sec =  34.4165916

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    141.400    3841.222       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 151464.953   59412.191       1.324     545.479     411.895     429.765       1.043

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   565.58    -0.19   565.58     0.51   672.75
 MEAN    17.74     0.00    -0.02   565.58    -0.19   565.58     0.51
 HUB     15.05     0.00    -0.02   565.58    -0.19   565.58     0.51

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.56    46.36     4.20   687.50   890.40     6.74   515.01     0.80
 MEAN    47.06    43.40     3.66   607.64   830.27     6.74   515.01     0.75
 HUB     42.36    38.84     3.52   515.54   765.42     6.74   515.01     0.69

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   623.45   280.18   556.95  1139.48     0.55
 MEAN    17.51   641.23   303.81   564.69  1136.18     0.56
 HUB     14.85   699.66   400.39   573.76  1132.98     0.62

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    678.60   684.79   398.42     0.60  5554.18
 MEAN   599.69   637.51   295.88     0.56  5322.06     1.40
 HUB    508.69   583.89   108.30     0.52  5948.79
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      9.58     1.19     7.81   572.26     1.06   539.86     0.92     0.91
MEAN     9.51     1.18     7.66   570.98     1.05   536.71     0.92     0.91
HUB      9.69     1.20     7.49   574.43     1.06   533.64     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     26.70    35.58    31.50     4.08     0.93     0.28     2.90
MEAN    28.28    27.65    23.50     4.15     0.92     0.29     3.28     0.91
HUB     34.91    10.69     6.50     4.19     0.92     0.30     3.87

  blockage3   Cor/Incid
     0.950       0.990

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     648.064     305.800     571.379    1136.912       0.570       0.010

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     9.573       7.679     537.545      46.000      28.156      31.500       3.344

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     582.561     305.800     657.944    1143.996       0.509       0.176

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       9.545       7.996     544.265     471.992       0.025       0.289

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
    17.121     563.374       0.000     563.374    1145.921       0.492       0.198

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       8.062     546.098       0.000       0.060       0.042       0.210

   STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862       9.512       1.182     572.555      30.883     267.456       2.073

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 192139.766       0.417     822.129  736052.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc = 3.001   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     75.716    3925.360       9.512     572.555       1.000       1.000       0.980
W Kg/sec =  34.4165916

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    122.939    3736.190       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 151464.953   59412.191       1.433     513.330     358.138     401.059       1.120

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   524.53    -0.18   524.53     0.46   627.94
MEAN    16.97     0.00    -0.02   524.53    -0.18   524.53     0.46
HUB     14.32     0.00    -0.02   524.53    -0.18   524.53     0.46

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.52    46.36     5.16   659.76   843.00     8.25   549.63     0.73
MEAN    47.95    43.80     4.15   581.34   783.13     8.25   549.63     0.68
HUB     43.09    37.84     5.25   490.53   718.28     8.25   549.63     0.62

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	587.70	275.28	519.24	1173.17	0.50
MEAN	16.57	602.08	292.22	526.42	1169.71	0.51
HUB	13.89	653.38	375.60	534.63	1166.33	0.56

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	646.74	638.43	371.46	0.54	5200.83	
MEAN	567.74	594.16	275.53	0.51	4846.21	1.42
HUB	475.81	543.94	100.21	0.47	5219.60	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	11.11	1.17	9.36	601.18	1.05	572.40	0.92	0.91
MEAN	11.00	1.16	9.18	599.23	1.05	569.03	0.92	0.91
HUB	11.12	1.17	8.98	601.28	1.05	565.72	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.93	35.58	31.50	4.08	0.93	0.30	2.90	
MEAN	29.03	27.63	23.50	4.13	0.92	0.30	3.29	0.91
HUB	35.09	10.62	6.50	4.12	0.92	0.31	3.90	

blockage3	Cor/Incid
0.950	0.993

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	591.924	293.859	513.830	1172.048	0.505	0.058

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
11.055	9.288	571.368	46.000	29.765	32.400	2.635

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	532.221	293.859	607.958	1177.771	0.452	0.220

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	11.034	9.591	576.961	456.573	0.021	0.316

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	503.731	0.000	503.731	1180.278	0.427	0.219

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	9.705	579.420	0.000	0.060	0.039	0.280

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.868	11.000	1.156	600.565	28.010	268.754	2.083

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
174343.281	0.417	745.981	721232.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 3.001 EfDer = 0.995

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
75.716	3925.360	11.000	600.565	1.000	1.000	0.980

W Kg/sec = 34.4165916

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
108.876	3648.024	1.400	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
151464.953	59412.191	1.607	509.668	317.190	390.276	1.230

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	467.24	-0.16	467.24	0.39	583.20
MEAN	15.91	0.00	-0.02	467.24	-0.16	467.24	0.39	
HUB	13.07	0.00	-0.02	467.24	-0.16	467.24	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.34	47.36	5.98	627.56	782.52	9.88	582.38	0.66
MEAN	49.41	44.80	4.61	545.10	718.07	9.88	582.38	0.61
HUB	43.79	38.84	4.95	447.72	647.23	9.88	582.38	0.55

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	543.42	279.34	466.12	1204.52	0.45
MEAN	15.50	551.29	282.22	473.57	1200.30	0.46
HUB	12.59	590.48	341.48	481.73	1196.16	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	614.54	574.14	335.20	0.48	5014.26	
MEAN	530.87	534.88	248.65	0.45	4376.36	1.47
HUB	431.27	490.03	89.79	0.41	4301.32	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	12.70	1.15	11.04	628.15	1.05	603.55	0.92	0.91
MEAN	12.47	1.13	10.79	624.64	1.04	599.33	0.92	0.91
HUB	12.44	1.13	10.53	624.23	1.04	595.19	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.93	35.72	31.50	4.22	0.93	0.33	2.90	
MEAN	30.79	27.70	23.50	4.20	0.92	0.31	3.34	0.91
HUB	35.33	10.56	6.50	4.06	0.92	0.31	4.06	

blockage3	Cor/Incid
0.950	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	557.522	287.399	477.737	1200.733	0.464	-0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
12.501	10.784	599.782	46.000	31.030	33.000	1.970

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	500.362	287.399	577.027	1205.764	0.415	0.165

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	12.470	11.076	604.818	440.827	0.038	0.339

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	465.602	0.000	465.602	1208.549	0.385	0.270

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	11.256	607.615	0.000	0.060	0.038	0.268

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.873	12.470	1.134	625.672	25.107	274.250	2.126

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
156360.391	0.414	669.036	726623.062

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
990928.00	4239.9907	203.6437	2.4061	0.8368	3.0010	1.3415

NPSS: Vehicle Mach number .78, Altitude 35000ft, dT 22R,Thrust 75.6%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

Fan Core + 4 Stage LPC  102% RPM  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 5.418   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     66.665    3658.843       5.183     466.396       1.000       1.000       0.980
 W Kg/sec =  30.3021374

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    179.298    3858.553       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  133357.531   52309.551       1.592     831.557     522.265     619.754       1.187

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   416.31    -0.14   416.31     0.40   694.64
  MEAN    17.06     0.00    -0.02   416.31    -0.14   416.31     0.40
  HUB     12.51     0.00    -0.02   416.31    -0.14   416.31     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.71    50.47     7.24   658.70   779.36     4.64   451.94     0.75
  MEAN    52.62    47.20     5.42   544.72   685.71     4.64   451.94     0.66
  HUB     43.83    38.62     5.21   399.44   577.04     4.64   451.94     0.55

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   653.10   363.64   542.50  1062.68     0.61
  MEAN    18.04   688.69   405.79   556.45  1057.18     0.65
  HUB     15.00   794.84   537.37   585.67  1046.82     0.76

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    658.70   617.55   295.06     0.58  7504.94
  MEAN   575.88   581.87   170.09     0.55  7321.24     1.31
  HUB    478.94   588.58    58.43     0.56  8062.36

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      6.68     1.29     5.18   504.94     1.08   469.38     0.92     0.91
  MEAN     6.64     1.28     4.99   504.00     1.08   464.46     0.92     0.91
  HUB      6.81     1.31     4.64   507.81     1.09   455.17     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     33.83    28.54    24.20     4.34     0.93     0.29     2.90
  MEAN    36.10    17.00    12.70     4.30     0.92     0.24     3.51     0.91
  HUB     42.54    -5.70    -9.30     3.60     0.92     0.09     4.78

    blockage3   Cor/Incid
       0.950       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     700.727     405.000     571.834    1057.095       0.663      -0.006

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.692       4.983     464.632      24.000      35.308      35.400       0.092
```

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	591.883	405.000	717.182	1070.359	0.553	0.268

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	6.664	5.413	476.366	528.796	0.026	0.421

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	540.932	0.000	540.932	1075.754	0.503	0.338

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.582	481.179	0.000	0.060	0.043	0.363

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.872	6.634	1.280	505.582	39.186	220.999	1.713

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
243637.312	0.562	917.851	733623.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 5.418 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
66.665	3658.843	6.634	505.582	1.000	1.000	0.980

W Kg/sec = 30.3021374

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
145.831	3706.005	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
133357.531	52309.551	1.390	590.487	424.786	474.134	1.116

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	512.61	-0.18	512.61	0.48	664.59
MEAN	18.08	0.00	-0.02	512.61	-0.18	512.61	0.48	
HUB	15.21	0.00	-0.02	512.61	-0.18	512.61	0.48	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.01	46.36	5.65	656.15	832.78	5.68	483.67	0.77
MEAN	48.40	42.30	6.10	577.23	772.11	5.68	483.67	0.72
HUB	43.46	37.84	5.62	485.65	706.25	5.68	483.67	0.65

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	583.69	293.56	504.50	1105.34	0.53
MEAN	18.01	598.83	308.53	513.24	1101.28	0.54
HUB	15.22	652.21	389.63	523.04	1097.33	0.59

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	652.00	618.87	358.44	0.56	5998.05	
MEAN	575.05	578.31	266.52	0.53	5559.72	1.44
HUB	486.06	531.85	96.43	0.48	5934.10	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	8.02	1.21	6.63	536.38	1.06	507.98	0.92	0.91
MEAN	7.91	1.19	6.47	534.13	1.06	504.23	0.92	0.91
HUB	8.00	1.21	6.30	536.05	1.06	500.59	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.19	35.39	31.50	3.89	0.93	0.32	2.90	
MEAN	31.01	27.44	23.50	3.94	0.93	0.31	3.30	0.91
HUB	36.68	10.45	6.50	3.95	0.93	0.32	3.92	

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      blockage3   Cor/Incid
      0.950       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     607.041     309.392     522.279    1101.801       0.551       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.961       6.477     504.793      46.000      30.642      30.600      -0.042

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     522.760     309.392     607.454    1110.432       0.471       0.237

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       7.944       6.824     512.733     511.151       0.022       0.321

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     515.548       0.000     515.548    1111.108       0.464       0.237

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.834     513.358       0.000       0.060       0.037       0.244

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879       7.921       1.194     535.521      29.939     252.823       1.960

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 186192.328       0.438     701.439  660105.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc = 5.418   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     66.665    3658.843       7.921     535.521       1.000       1.000       0.980
W Kg/sec =  30.3021374

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    125.703    3600.922       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 133357.531   52309.551       1.490     545.479     366.166     429.765       1.174

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   483.48    -0.17   483.48     0.43   630.66
 MEAN    17.74     0.00    -0.02   483.48    -0.17   483.48     0.43
 HUB     15.05     0.00    -0.02   483.48    -0.17   483.48     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.97    46.36     6.61   640.82   802.88     6.96   516.03     0.72
 MEAN    49.52    43.40     6.12   566.38   744.80     6.96   516.03     0.67
 HUB     44.84    38.84     6.00   480.54   681.78     6.96   516.03     0.61

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   561.13   290.62   480.00  1138.34     0.49
 MEAN    17.51   574.80   305.05   487.18  1134.72     0.51
 HUB     14.85   625.38   381.83   495.28  1131.16     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    632.52   589.32   341.90     0.52  5760.61
 MEAN   558.97   549.38   253.92     0.48  5343.33     1.47
 HUB    474.15   503.82    92.33     0.45  5672.63
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      9.41     1.19     7.97   565.09     1.06   538.84     0.92     0.91
MEAN     9.30     1.17     7.80   562.95     1.05   535.41     0.92     0.91
HUB      9.39     1.18     7.62   564.64     1.05   532.04     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.19    35.46    31.50     3.96     0.93     0.33     2.90
MEAN    32.05    27.53    23.50     4.03     0.93     0.32     3.28     0.91
HUB     37.63    10.56     6.50     4.06     0.93     0.33     3.87

  blockage3   Cor/Incid
     0.950       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     580.561     307.052     492.717    1135.432       0.511       0.012

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     9.348       7.820     536.127      46.000      31.930      31.500      -0.430

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     500.541     307.052     587.215    1143.043       0.438       0.244

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       9.332       8.179     543.339     471.992       0.020       0.342

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
    17.121     484.962       0.000     484.962    1144.389       0.424       0.258

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       8.224     544.619       0.000       0.060       0.037       0.272

   STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880       9.306       1.175     564.226      28.705     243.499       1.888

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 178578.312       0.446     672.755  632062.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc = 5.418   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     66.665    3658.843       9.306     564.226       1.000       1.000       0.980
W Kg/sec =  30.3021374

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    109.831    3508.128       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 133357.531   52309.551       1.604     513.330     319.947     401.059       1.254

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   453.72    -0.16   453.72     0.40   589.61
 MEAN    16.97     0.00    -0.02   453.72    -0.16   453.72     0.40
 HUB     14.32     0.00    -0.02   453.72    -0.16   453.72     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.59    46.36     7.23   614.96   764.35     8.35   547.07     0.67
 MEAN    50.07    43.80     6.27   541.86   706.86     8.35   547.07     0.62
 HUB     45.23    37.84     7.39   457.23   644.26     8.35   547.07     0.56

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	532.24	280.36	452.41	1168.43	0.46
MEAN	16.57	542.79	290.12	458.75	1164.89	0.47
HUB	13.89	586.95	357.07	465.84	1161.41	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	602.83	555.57	322.47	0.48	5296.25	
MEAN	529.19	517.31	239.07	0.44	4811.06	1.48
HUB	443.50	473.79	86.43	0.41	4961.99	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	10.82	1.16	9.38	591.40	1.05	567.79	0.92	0.91
MEAN	10.67	1.15	9.20	588.91	1.04	564.36	0.92	0.91
HUB	10.72	1.15	9.00	589.69	1.05	560.98	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.79	35.48	31.50	3.98	0.93	0.34	2.90	
MEAN	32.31	27.53	23.50	4.03	0.93	0.33	3.29	0.91
HUB	37.47	10.51	6.50	4.01	0.93	0.33	3.90	

blockage3	Cor/Incid
0.950	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	535.111	291.752	448.581	1166.703	0.459	0.054

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
10.722	9.281	566.135	46.000	33.039	32.400	-0.639

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	463.434	291.752	547.622	1172.834	0.395	0.273

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	10.709	9.616	572.100	456.573	0.018	0.362

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	439.699	0.000	439.699	1174.663	0.374	0.269

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	9.695	573.886	0.000	0.060	0.037	0.325

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.880	10.681	1.148	589.999	25.773	248.011	1.923

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
160405.359	0.441	604.292	626124.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 5.418 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
66.665	3658.843	10.681	589.999	1.000	1.000	0.980

W Kg/sec = 30.3021374

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
97.856	3430.648	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
133357.531	52309.551	1.788	509.668	285.075	390.276	1.369

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	409.20	-0.14	409.20	0.35	548.45
MEAN	15.91	0.00	-0.02	409.20	-0.14	409.20	0.35	
HUB	13.07	0.00	-0.02	409.20	-0.14	409.20	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.03	47.36	7.67	584.95	713.99	9.82	576.05	0.61
MEAN	51.16	44.80	6.36	508.09	652.49	9.82	576.05	0.55
HUB	45.57	38.84	6.73	417.32	584.57	9.82	576.05	0.50

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	496.28	278.17	410.99	1196.09	0.41
MEAN	15.50	500.55	276.56	417.21	1192.09	0.42
HUB	12.59	533.32	323.56	423.96	1188.14	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	572.81	505.69	294.64	0.42	4993.03	
MEAN	494.83	470.85	218.27	0.39	4288.26	1.52
HUB	401.99	431.15	78.43	0.36	4075.50	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	12.24	1.15	10.87	615.61	1.04	595.09	0.92	0.91
MEAN	12.01	1.12	10.64	611.99	1.04	591.12	0.92	0.91
HUB	11.94	1.12	10.40	610.90	1.04	587.20	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.09	35.64	31.50	4.14	0.93	0.36	2.90	
MEAN	33.54	27.62	23.50	4.12	0.93	0.34	3.34	0.91
HUB	37.35	10.48	6.50	3.98	0.93	0.33	4.06	

blockage3	Cor/Incid
0.950	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	506.342	281.631	420.792	1192.440	0.425	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
12.034	10.630	591.473	46.000	33.794	33.000	-0.794

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	439.825	281.631	522.267	1197.714	0.367	0.218

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	12.015	10.946	596.717	440.827	0.033	0.377

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	410.600	0.000	410.600	1199.790	0.342	0.311

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	11.075	598.787	0.000	0.060	0.037	0.308

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.882	12.010	1.124	612.833	22.834	256.911	1.992

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
142176.656	0.433	535.620	637265.125

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
910990.00	3431.9570	179.2984	2.3173	0.8664	5.4177	1.3140

NPSS: Vehicle Mach number .78, Altitude 35000ft, dT 22R, Thrust 72.9%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

Fan Core + 4 Stage LPC 101.9% RPM   12-20-2010

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 5.775   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      65.459    3627.254       5.183     466.396       1.000       1.000       0.980
 W Kg/sec =  29.7538643

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     176.054    3825.240       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  130944.633   51363.086       1.622     831.557     512.815     619.754       1.209

      ROTOR LEADING EDGE CONDITIONS, STAGE   1

         R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   407.40    -0.14   407.40     0.39   688.64
  MEAN    17.06     0.00    -0.02   407.40    -0.14   407.40     0.39
  HUB     12.51     0.00    -0.02   407.40    -0.14   407.40     0.39

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.05    50.47     7.58   653.02   769.80     4.66   452.55     0.74
  MEAN    52.98    47.20     5.78   540.02   676.57     4.66   452.55     0.65
  HUB     44.20    38.62     5.58   395.99   568.24     4.66   452.55     0.54

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   643.62   364.66   530.35  1063.56     0.61
  MEAN    18.04   677.98   404.71   543.94  1058.04     0.64
  HUB     15.00   780.78   531.84   571.63  1047.95     0.75

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    653.02   603.67   288.36     0.57  7525.84
  MEAN   570.91   568.77   166.20     0.54  7301.75     1.32
  HUB    474.81   574.47    57.04     0.55  7979.39

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      6.67     1.29     5.21   504.72     1.08   470.18     0.92     0.91
  MEAN     6.63     1.28     5.03   503.57     1.08   465.26     0.92     0.91
  HUB      6.77     1.31     4.68   507.03     1.09   456.23     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     34.51    28.53    24.20     4.33     0.93     0.30     2.90
  MEAN    36.65    16.99    12.70     4.29     0.92     0.25     3.51     0.91
  HUB     42.94    -5.70    -9.30     3.60     0.92     0.10     4.78

    blockage3   Cor/Incid
       0.950       0.999

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
      18.071     689.410     403.924     558.688    1058.045       0.652       -0.005

      Pt3         Ps3         Ts3        Vane No.     Alpha3     Vane A3      Incid3
       6.674       5.017     465.467      24.000      35.866      35.400      -0.466
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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth          Machth      cp 2-Th
     18.071     578.119     403.924     705.249    1071.332       0.540       0.278

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.647       5.452     477.232     528.796       0.026       0.428

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     18.083     528.890       0.000     528.890    1076.422       0.491       0.347

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.612     481.777       0.000       0.060       0.041       0.372

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.875       6.620        1.277     505.105      38.709     218.732       1.696

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 240673.172       0.564     890.279  717923.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc = 5.775   EfDer =  1.000

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     65.459     3627.254        6.620     505.105        1.000        1.000       0.980
W Kg/sec =  29.7538643

   W cor       RPM cor         GAMMA         Cp          R            Blades        THK
    143.431     3675.743        1.401        0.248      53.349       56.000        0.050

   CFM        SCFM            A1/A*       Area1        A*        AthrRotor   ChokeMargin
 130944.633   51363.086        1.413     590.487     417.794     474.134        1.135

     ROTOR LEADING EDGE CONDITIONS, STAGE   2
        R1       Stator    Alfa     C1       CU1        Cm1      Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   501.56    -0.17   501.56      0.46   659.16
 MEAN    18.08      0.00    -0.02   501.56    -0.17   501.56      0.46
 HUB     15.21      0.00    -0.02   501.56    -0.17   501.56      0.46

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     52.37     46.36     6.01   650.48   821.54      5.71   484.13      0.76
 MEAN    48.77     42.30     6.47   572.24   761.07      5.71   484.13      0.71
 HUB     43.84     37.84     6.00   481.45   695.36      5.71   484.13      0.64

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     20.42   575.82   295.41   494.27  1105.56      0.52
 MEAN    18.01   590.30   309.13   502.89  1101.46      0.54
 HUB     15.22   642.55   387.54   512.53  1097.47      0.59

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    646.37   606.20   350.96      0.55  6035.75
 MEAN   570.08   566.56   260.96      0.51  5570.49      1.45
 HUB    481.87   521.14    94.32      0.47  5902.16

        Pt2        PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP      8.00      1.21      6.65    535.83      1.06   508.18      0.92      0.91
 MEAN     7.89      1.19      6.48    533.46      1.06   504.41      0.92      0.91
 HUB      7.97      1.20      6.32    535.15      1.06   500.73      0.92      0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.86    35.38    31.50     3.88     0.93     0.32     2.90
 MEAN    31.58    27.43    23.50     3.93     0.93     0.32     3.30     0.91
 HUB     37.09    10.43     6.50     3.93     0.93     0.32     3.92
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   blockage3   Cor/Incid
      0.950       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     598.264     309.995     511.686    1101.993       0.543       0.006

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.936       6.493     504.968      46.000      31.209      30.600      -0.609

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     511.997     309.995     598.529    1110.673       0.461       0.247

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       7.919       6.845     512.955     511.151       0.021       0.329

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     505.011       0.000     505.011    1111.314       0.454       0.245

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.853     513.547       0.000       0.060       0.037       0.252

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880       7.896       1.193     534.814      29.708     249.367       1.933

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 184759.281       0.442     683.447  645573.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc = 5.775   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     65.459    3627.254       7.896     534.814       1.000       1.000       0.980
W Kg/sec =  29.7538643

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    123.736    3572.193       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 130944.633   51363.086       1.513     545.479     360.435     429.765       1.192

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   473.90    -0.16   473.90     0.43   625.63
 MEAN    17.74     0.00    -0.02   473.90    -0.16   473.90     0.43
 HUB     15.05     0.00    -0.02   473.90    -0.16   473.90     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.29    46.36     6.93   635.29   792.71     6.97   516.09     0.71
 MEAN    49.84    43.40     6.44   561.49   734.87     6.97   516.09     0.66
 HUB     45.16    38.84     6.32   476.39   672.08     6.97   516.09     0.60

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   554.04   291.74   471.01  1138.14     0.49
 MEAN    17.51   567.15   305.13   478.07  1134.49     0.50
 HUB     14.85   616.71   379.60   486.04  1130.91     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    627.06   578.17   335.32     0.51  5782.69
 MEAN   554.15   539.04   249.02     0.48  5344.64     1.48
 HUB    470.06   494.38    90.46     0.44  5639.46
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      9.37     1.19     7.97   564.24     1.06   538.65     0.92     0.91
MEAN     9.26     1.17     7.80   562.01     1.05   535.20     0.92     0.91
HUB      9.34     1.18     7.63   563.51     1.05   531.81     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.77    35.45    31.50     3.95     0.93     0.33     2.90
MEAN    32.55    27.51    23.50     4.01     0.93     0.33     3.28     0.91
HUB     37.99    10.54     6.50     4.04     0.93     0.34     3.87

  blockage3   Cor/Incid
     0.950       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     572.805     307.130     483.504    1135.194       0.505       0.012

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     9.307       7.821     535.901      46.000      32.424      31.500      -0.924

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     491.058     307.130     579.195    1142.848       0.430       0.252

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       9.292       8.184     543.151     471.992       0.020       0.349

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    17.121     475.898       0.000     475.898    1144.133       0.416       0.266

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       8.225     544.373       0.000       0.060       0.037       0.279

   STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881       9.266       1.173     563.254      28.441     240.659       1.866

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 176933.516       0.450     654.498  619019.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc = 5.775   EfDer =  1.000

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     65.459    3627.254       9.266     563.254       1.000       1.000       0.980
W Kg/sec =  29.7538643

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    108.215    3480.838       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 130944.633   51363.086       1.628     513.330     315.236     401.059       1.272

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   445.46    -0.15   445.46     0.39   585.03
MEAN    16.97     0.00    -0.02   445.46    -0.15   445.46     0.39
HUB     14.32     0.00    -0.02   445.46    -0.15   445.46     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.85    46.36     7.49   609.65   755.18     8.35   546.72     0.66
MEAN    50.34    43.80     6.54   537.19   697.97     8.35   546.72     0.61
HUB     45.51    37.84     7.67   453.28   635.64     8.35   546.72     0.55

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	525.87	280.87	444.58	1167.82	0.45
MEAN	16.57	535.93	289.82	450.80	1164.28	0.46
HUB	13.89	579.17	354.84	457.75	1160.79	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	597.62	545.88	316.75	0.47	5305.86	
MEAN	524.63	508.28	234.80	0.44	4806.12	1.49
HUB	439.67	465.54	84.83	0.40	4930.89	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	10.76	1.16	9.37	590.24	1.05	567.20	0.92	0.91
MEAN	10.62	1.15	9.18	587.70	1.04	563.76	0.92	0.91
HUB	10.65	1.15	8.99	588.34	1.04	560.38	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.28	35.47	31.50	3.97	0.93	0.34	2.90	
MEAN	32.74	27.51	23.50	4.01	0.93	0.33	3.29	0.91
HUB	37.78	10.50	6.50	4.00	0.93	0.34	3.90	

blockage3	Cor/Incid
0.950	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	528.527	291.454	440.902	1166.031	0.453	0.053

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
10.664	9.261	565.480	46.000	33.466	32.400	-1.066

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	455.408	291.454	540.687	1172.197	0.389	0.280

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	10.652	9.598	571.476	456.573	0.018	0.368

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	432.208	0.000	432.208	1173.956	0.368	0.275

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	9.673	573.192	0.000	0.060	0.037	0.330

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.881	10.623	1.146	588.761	25.506	245.532	1.903

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
158741.516	0.444	587.204	613923.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 5.775 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
65.459	3627.254	10.623	588.761	1.000	1.000	0.980

W Kg/sec = 29.7538643

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
96.504	3404.604	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
130944.633	51363.086	1.813	509.668	281.137	390.276	1.388

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	402.37	-0.14	402.37	0.34	544.29
MEAN	15.91	0.00	-0.02	402.37	-0.14	402.37	0.34	
HUB	13.07	0.00	-0.02	402.37	-0.14	402.37	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.25	47.36	7.89	579.90	705.93	9.80	575.27	0.60
MEAN	51.39	44.80	6.59	503.71	644.80	9.80	575.27	0.55
HUB	45.81	38.84	6.97	413.71	577.22	9.80	575.27	0.49

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	490.81	278.02	404.47	1195.06	0.41
MEAN	15.50	494.61	275.86	410.54	1191.10	0.42
HUB	12.59	526.61	321.44	417.13	1187.17	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	567.87	497.60	289.85	0.42	4990.24	
MEAN	490.56	463.29	214.70	0.39	4277.41	1.53
HUB	398.52	424.19	77.08	0.36	4048.69	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	12.16	1.14	10.83	614.13	1.04	594.06	0.92	0.91
MEAN	11.93	1.12	10.60	610.51	1.04	590.13	0.92	0.91
HUB	11.86	1.12	10.36	609.35	1.03	586.24	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.50	35.63	31.50	4.13	0.93	0.36	2.90	
MEAN	33.90	27.61	23.50	4.11	0.93	0.34	3.34	0.91
HUB	37.62	10.47	6.50	3.97	0.93	0.33	4.06	

blockage3	Cor/Incid
0.950	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	500.360	280.921	414.058	1191.435	0.420	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
11.956	10.590	590.471	46.000	34.155	33.000	-1.155

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	432.722	280.921	515.912	1196.728	0.362	0.224

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	11.938	10.906	595.729	440.827	0.033	0.382

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	404.105	0.000	404.105	1198.730	0.337	0.317

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	11.030	597.724	0.000	0.060	0.037	0.313

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.882	11.933	1.123	611.330	22.569	254.785	1.975

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
140522.172	0.436	519.808	625532.562

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
901629.62	3335.2358	176.0543	2.3024	0.8678	5.7753	1.3108

NPSS: Vehicle Mach number .78, Altitude 35000ft, dT 22R, Thrust 69.9%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

Fan Core + 4 Stage LPC 101% RPM   12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 6.133   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     64.262    3595.869       5.183     466.396       1.000       1.000       0.980
 W Kg/sec =  29.2099094

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     172.836    3792.142       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  128550.719   50424.074       1.652     831.557     503.440     619.754       1.231

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   398.66    -0.14   398.66     0.38   682.68
  MEAN    17.06     0.00    -0.02   398.66    -0.14   398.66     0.38
  HUB     12.51     0.00    -0.02   398.66    -0.14   398.66     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.38    50.47     7.91   647.37   760.39     4.69   453.14     0.73
  MEAN    53.33    47.20     6.13   535.35   667.59     4.69   453.14     0.64
  HUB     44.57    38.62     5.95   392.56   559.59     4.69   453.14     0.54

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   634.42   365.50   518.56  1064.36     0.60
  MEAN    18.04   667.58   403.56   531.79  1058.84     0.63
  HUB     15.00   767.13   526.38   558.04  1049.01     0.73

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    647.37   590.21   281.87     0.55  7543.12
  MEAN   565.97   556.04   162.41     0.53  7280.91     1.34
  HUB    470.70   560.81    55.69     0.53  7897.48

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      6.66     1.29     5.24   504.47     1.08   470.91     0.92     0.91
  MEAN     6.61     1.28     5.06   503.15     1.08   465.99     0.92     0.91
  HUB      6.74     1.30     4.72   506.26     1.09   457.22     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     35.18    28.53    24.20     4.33     0.93     0.31     2.90
  MEAN    37.19    16.98    12.70     4.28     0.93     0.26     3.51     0.91
  HUB     43.33    -5.70    -9.30     3.60     0.93     0.11     4.78

   blockage3   Cor/Incid
      0.950       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     678.461     402.774     545.970    1058.920       0.641      -0.004

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.655       5.048     466.238      24.000      36.417      35.400      -1.017

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	564.883	402.774	693.771	1072.211	0.527	0.288

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	6.629	5.486	478.015	528.796	0.025	0.436

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	517.283	0.000	517.283	1077.018	0.480	0.355

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.640	482.311	0.000	0.060	0.040	0.380

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	6.605	1.274	504.627	38.231	216.513	1.678

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
237696.703	0.567	863.194	702522.688

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 6.133 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
64.262	3595.869	6.605	504.627	1.000	1.000	0.980

W Kg/sec = 29.2099094

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
141.071	3645.667	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
128550.719	50424.074	1.437	590.487	410.919	474.134	1.154

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	490.89	-0.17	490.89	0.45	653.77
MEAN	18.08	0.00	-0.02	490.89	-0.17	490.89	0.45	
HUB	15.21	0.00	-0.02	490.89	-0.17	490.89	0.45	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.73	46.36	6.37	644.86	810.57	5.73	484.53	0.75
MEAN	49.14	42.30	6.84	567.29	750.32	5.73	484.53	0.70
HUB	44.21	37.84	6.37	477.29	684.79	5.73	484.53	0.63

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	568.22	297.01	484.42	1105.71	0.51
MEAN	18.01	582.03	309.56	492.89	1101.58	0.53
HUB	15.22	633.16	385.38	502.36	1097.56	0.58

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	640.78	594.00	343.76	0.54	6068.48	
MEAN	565.15	555.22	255.59	0.50	5578.17	1.46
HUB	477.70	510.77	92.31	0.47	5869.24	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	7.98	1.21	6.66	535.25	1.06	508.33	0.92	0.91
MEAN	7.86	1.19	6.50	532.78	1.06	504.53	0.92	0.91
HUB	7.93	1.20	6.33	534.24	1.06	500.82	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.51	35.36	31.50	3.86	0.93	0.33	2.90	
MEAN	32.13	27.41	23.50	3.91	0.93	0.32	3.30	0.91
HUB	37.49	10.41	6.50	3.91	0.93	0.33	3.92	

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   blockage3   Cor/Incid
      0.950       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     589.771     310.426     501.464    1102.122       0.535       0.006

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.907       6.506     505.086      46.000      31.759      30.600      -1.159

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     501.656     310.426     589.935    1110.837       0.452       0.256

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       7.891       6.860     513.106     511.151       0.021       0.337

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     494.890       0.000     494.890    1111.446       0.445       0.253

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.867     513.668       0.000       0.060       0.037       0.261

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880       7.869       1.191     534.090      29.464     246.085       1.908

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 183239.094       0.446     665.431  631406.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc = 6.133   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     64.262    3595.869       7.869     534.090       1.000       1.000       0.980
W Kg/sec =  29.2099094

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    121.819    3543.681       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 128550.719   50424.074       1.537     545.479     354.852     429.765       1.211

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   464.68    -0.16   464.68     0.42   620.64
 MEAN    17.74     0.00    -0.02   464.68    -0.16   464.68     0.42
 HUB     15.05     0.00    -0.02   464.68    -0.16   464.68     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.59    46.36     7.23   629.79   782.80     6.98   516.09     0.70
 MEAN    50.15    43.40     6.75   556.63   725.22     6.98   516.09     0.65
 HUB     45.47    38.84     6.63   472.27   662.66     6.98   516.09     0.59

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   547.19   292.62   462.37  1137.86     0.48
 MEAN    17.51   559.73   305.03   469.32  1134.20     0.49
 HUB     14.85   608.29   377.31   477.13  1130.60     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    621.64   567.49   329.02     0.50  5799.96
 MEAN   549.35   529.11   244.33     0.47  5342.79     1.48
 HUB    465.99   485.30    88.68     0.43  5605.52
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      9.33     1.19     7.97   563.35     1.05   538.39     0.92     0.91
MEAN     9.21     1.17     7.80   561.04     1.05   534.93     0.92     0.91
HUB      9.28     1.18     7.62   562.37     1.05   531.52     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.33    35.44    31.50     3.94     0.93     0.34     2.90
MEAN    33.02    27.50    23.50     4.00     0.93     0.33     3.28     0.91
HUB     38.34    10.53     6.50     4.03     0.93     0.34     3.87

  blockage3   Cor/Incid
     0.950       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     565.292     307.027     474.646    1134.891       0.498       0.012

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     9.262       7.817     535.614      46.000      32.897      31.500      -1.397

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     481.979     307.027     571.463    1142.572       0.422       0.260

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       9.247       8.181     542.887     471.992       0.020       0.356

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
    17.121     467.216       0.000     467.216    1143.800       0.408       0.272

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       8.220     544.056       0.000       0.060       0.037       0.286

   STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881       9.222       1.172     562.254      28.164     237.986       1.845

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 175208.562       0.453     636.269  606269.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc = 6.133   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     64.262    3595.869       9.222     562.254       1.000       1.000       0.980
W Kg/sec =  29.2099094

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    106.652    3453.787       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 128550.719   50424.074       1.652     513.330     310.683     401.059       1.291

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   437.52    -0.15   437.52     0.38   580.48
MEAN    16.97     0.00    -0.02   437.52    -0.15   437.52     0.38
HUB     14.32     0.00    -0.02   437.52    -0.15   437.52     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.11    46.36     7.75   604.38   746.24     8.34   546.30     0.65
MEAN    50.60    43.80     6.80   532.54   689.34     8.34   546.30     0.60
HUB     45.77    37.84     7.93   449.36   627.29     8.34   546.30     0.55

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	519.72	281.17	437.09	1167.13	0.45
MEAN	16.57	529.28	289.35	443.19	1163.60	0.45
HUB	13.89	571.65	352.56	449.99	1160.11	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	592.45	536.60	311.28	0.46	5311.48	
MEAN	520.09	499.66	230.74	0.43	4798.15	1.50
HUB	435.87	457.64	83.31	0.39	4899.22	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	10.70	1.16	9.34	589.04	1.05	566.53	0.92	0.91
MEAN	10.55	1.14	9.16	586.45	1.04	563.10	0.92	0.91
HUB	10.58	1.15	8.96	586.96	1.04	559.73	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.75	35.46	31.50	3.96	0.93	0.35	2.90	
MEAN	33.14	27.50	23.50	4.00	0.93	0.34	3.29	0.91
HUB	38.08	10.49	6.50	3.99	0.93	0.34	3.90	

blockage3	Cor/Incid
0.950	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	522.130	290.974	433.537	1165.294	0.448	0.053

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
10.599	9.234	564.762	46.000	33.868	32.400	-1.468

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	447.739	290.974	533.981	1171.482	0.382	0.286

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	10.588	9.572	570.775	456.573	0.018	0.373

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	425.046	0.000	425.046	1173.174	0.362	0.280

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	9.643	572.426	0.000	0.060	0.037	0.335

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.881	10.560	1.145	587.483	25.229	243.221	1.885

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
157012.297	0.447	570.189	601966.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 6.133 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
64.262	3595.869	10.560	587.483	1.000	1.000	0.980

W Kg/sec = 29.2099094

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
95.206	3378.814	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
128550.719	50424.074	1.838	509.668	277.355	390.276	1.407

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	395.83	-0.14	395.83	0.34	540.16
MEAN	15.91	0.00	-0.02	395.83	-0.14	395.83	0.34	
HUB	13.07	0.00	-0.02	395.83	-0.14	395.83	0.34	

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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.46    47.36     8.10   574.88   698.09     9.76   574.43     0.59
MEAN    51.60    44.80     6.80   499.35   637.31     9.76   574.43     0.54
HUB     46.03    38.84     7.19   410.13   570.09     9.76   574.43     0.49

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   485.49   277.68   398.23  1193.96     0.41
MEAN    15.50   488.87   275.04   404.16  1190.03     0.41
HUB     12.59   520.10   319.25   410.59  1186.13     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    562.96   489.87   285.28     0.41  4984.05
MEAN   486.31   456.05   211.27     0.38  4264.69     1.54
HUB    395.07   417.53    75.82     0.35  4021.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     12.08     1.14    10.78   612.61     1.04   592.97     0.92     0.91
MEAN    11.85     1.12    10.55   608.98     1.04   589.07     0.92     0.91
HUB     11.77     1.11    10.31   607.75     1.03   585.22     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.89    35.62    31.50     4.12     0.93     0.37     2.90
MEAN    34.24    27.60    23.50     4.10     0.93     0.35     3.34     0.91
HUB     37.87    10.46     6.50     3.96     0.93     0.34     4.06


   blockage3   Cor/Incid
      0.950       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     494.574     280.087     407.620    1190.359       0.415      -0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     11.871      10.541     589.400      46.000      34.494      33.000      -1.494

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     425.952     280.087     509.788    1195.661       0.356       0.230

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      11.853      10.857     594.663     440.827       0.033       0.387

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     14.701     397.908       0.000     397.908    1197.595       0.332       0.321

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.976     596.588       0.000       0.060       0.037       0.318

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.882      11.848       1.122     609.779      22.296     252.819       1.960

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 138820.156       0.438     504.124  614000.750

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    891976.88   3239.2070    172.8357      2.2860      0.8688      6.1325      1.3074
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NPSS: Vehicle Mach number .78, Altitude 39000ft, dT 22R, Thrust 100%

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*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*****************************************************************

Fan Core + 4 Stage LPC  110% RPM  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 2.982   EfDer =  0.985

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     62.872    3906.939       4.281     462.029       1.000       1.000       0.980
 W Kg/sec =  28.5783615

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     203.750    4139.618       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  150833.062   49333.855       1.401     831.557     593.507     619.754       1.044

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   485.07    -0.17   485.07     0.47   745.24
  MEAN    17.06     0.00    -0.02   485.07    -0.17   485.07     0.47
  HUB     12.51     0.00    -0.02   485.07    -0.17   485.07     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.41    50.47     4.94   703.37   854.55     3.68   442.41     0.83
  MEAN    50.18    47.20     2.98   581.66   757.50     3.68   442.41     0.73
  HUB     41.34    38.62     2.72   426.52   646.03     3.68   442.41     0.63

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   731.67   354.80   639.89  1049.72     0.70
  MEAN    18.04   775.91   413.82   656.35  1044.49     0.74
  HUB     15.00   911.19   581.66   701.39  1031.58     0.88

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    703.37   728.67   348.57     0.69  7322.94
  MEAN   614.93   686.47   201.11     0.66  7466.44     1.21
  HUB    511.42   704.90    70.24     0.68  8727.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      5.57     1.30     4.03   502.20     1.09   457.62     0.92     0.90
  MEAN     5.60     1.31     3.88   502.98     1.09   452.87     0.92     0.90
  HUB      5.85     1.37     3.52   509.90     1.10   440.92     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     29.01    28.58    24.20     4.38     0.93     0.22     2.90
  MEAN    32.23    17.04    12.70     4.34     0.91     0.17     3.51     0.90
  HUB     39.67    -5.72    -9.30     3.58     0.91     0.01     4.78

     blockage3   Cor/Incid
     0.950       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     795.769     413.012     680.199    1042.841       0.763      -0.019

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.655       3.845     452.226      24.000      31.266      35.400       4.134
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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth          Machth      cp 2-Th
     18.071     708.703     413.012     820.267    1055.359       0.672       0.180

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.609       4.145     463.148     528.796       0.035       0.366

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     18.083     642.503       0.000     642.503    1063.828       0.604       0.262

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       4.334     470.606       0.000       0.060       0.068       0.282

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.827       5.547        1.296     505.026      42.997     237.624       1.842

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 267294.281       0.540     949.690  717879.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc = 2.982   EfDer =  0.988

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     62.872    3906.939       5.547     505.026       1.000       1.000       0.980
W Kg/sec =  28.5783615

   W cor      RPM cor        GAMMA        Cp          R           Blades       THK
    164.418    3959.478       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 150833.062   49333.855       1.233     590.487     478.942     474.134       0.990

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   603.81    -0.21   603.81     0.57   710.04
 MEAN    18.08     0.00    -0.02   603.81    -0.21   603.81     0.57
 HUB     15.21     0.00    -0.02   603.81    -0.21   603.81     0.57

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.25    46.36     2.89   700.64   925.08     4.47   474.63     0.87
 MEAN    45.60    42.30     3.30   616.37   862.99     4.47   474.63     0.81
 HUB     40.67    37.84     2.83   518.58   796.07     4.47   474.63     0.75

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   649.92   276.09   588.36  1097.59     0.59
 MEAN    18.01   669.37   301.86   597.45  1094.08     0.61
 HUB     15.22   730.71   405.21   608.06  1090.74     0.67

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    696.21   722.96   420.12     0.66  5642.02
 MEAN   614.04   674.09   312.18     0.62  5440.15     1.38
 HUB    519.02   618.62   113.81     0.57  6171.75

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.70     1.21     5.28   535.96     1.06   500.77     0.92     0.90
 MEAN     6.65     1.20     5.17   534.86     1.06   497.53     0.92     0.90
 HUB      6.81     1.23     5.04   538.87     1.07   494.39     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.14    35.53    31.50     4.03     0.93     0.27     2.90
 MEAN    26.80    27.59    23.50     4.09     0.92     0.27     3.30     0.90
 HUB     33.68    10.60     6.50     4.10     0.92     0.29     3.92
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   blockage3   Cor/Incid
      0.950       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     680.293     302.702     609.237    1094.287       0.622       0.000

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.704       5.166     497.984      46.000      26.421      30.600       4.179

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     612.702     302.702     683.398    1102.263       0.556       0.160

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.676       5.411     505.269     511.151       0.028       0.259

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     605.140       0.000     605.140    1103.101       0.549       0.159

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.413     506.037       0.000       0.060       0.050       0.160

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.848       6.642       1.197     536.564      31.538     281.813       2.185

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 196113.141       0.405     696.785  651329.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc = 2.982   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     62.872    3906.939       6.642     536.564       1.000       1.000       0.980
W Kg/sec =  28.5783615

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    141.523    3841.350       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 150833.062   49333.855       1.323     545.479     412.266     429.765       1.042

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   563.58    -0.19   563.58     0.51   672.77
 MEAN    17.74     0.00    -0.02   563.58    -0.19   563.58     0.51
 HUB     15.05     0.00    -0.02   563.58    -0.19   563.58     0.51

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.53    46.36     4.17   684.28   886.64     5.57   510.09     0.80
 MEAN    47.03    43.40     3.63   604.78   826.81     5.57   510.09     0.75
 HUB     42.33    38.84     3.49   513.12   762.31     5.57   510.09     0.69

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   620.91   278.36   555.02  1133.97     0.55
 MEAN    17.51   638.63   302.02   562.70  1130.69     0.56
 HUB     14.85   696.82   398.38   571.70  1127.53     0.62

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    675.41   682.42   397.05     0.60  5518.24
 MEAN   596.88   635.27   294.86     0.56  5290.80     1.40
 HUB    506.30   581.80   107.92     0.52  5918.85
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      7.91     1.19     6.45   566.81     1.06   534.69     0.92     0.91
MEAN     7.85     1.18     6.32   565.57     1.05   531.59     0.92     0.91
HUB      8.00     1.20     6.18   569.01     1.06   528.56     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     26.64    35.58    31.50     4.08     0.93     0.28     2.90
MEAN    28.22    27.65    23.50     4.15     0.92     0.29     3.28     0.91
HUB     34.87    10.69     6.50     4.19     0.92     0.30     3.87

  blockage3   Cor/Incid
     0.950       0.990

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     645.446     304.003     569.370    1131.422       0.570       0.010

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     7.904       6.338     532.410      46.000      28.099      31.500       3.401

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     580.601     304.003     655.374    1138.441       0.510       0.175

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       7.880       6.598     539.036     471.992       0.025       0.288

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
    17.121     561.482       0.000     561.482    1140.361       0.492       0.197

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       6.653     540.856       0.000       0.060       0.042       0.209

   STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.861       7.853       1.182     567.131      30.567     267.828       2.076

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 190133.984       0.417     675.542  615715.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc = 2.982   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     62.872    3906.939       7.853     567.131       1.000       1.000       0.980
W Kg/sec =  28.5783615

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    123.068    3736.398       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 150833.062   49333.855       1.432     513.330     358.524     401.059       1.119

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   522.73    -0.18   522.73     0.46   627.98
MEAN    16.97     0.00    -0.02   522.73    -0.18   522.73     0.46
HUB     14.32     0.00    -0.02   522.73    -0.18   522.73     0.46

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.49    46.36     5.13   656.66   839.46     6.80   544.37     0.73
MEAN    47.91    43.80     4.11   578.61   779.90     6.80   544.37     0.68
HUB     43.06    37.84     5.22   488.23   715.40     6.80   544.37     0.63

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	585.32	273.48	517.50	1167.47	0.50
MEAN	16.57	599.67	290.46	524.63	1164.05	0.52
HUB	13.89	650.78	373.71	532.78	1160.70	0.56

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	643.70	636.29	370.22	0.55	5166.84	
MEAN	565.08	592.15	274.61	0.51	4817.17	1.42
HUB	473.57	542.06	99.86	0.47	5193.39	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	9.17	1.17	7.72	595.44	1.05	566.90	0.92	0.91
MEAN	9.08	1.16	7.57	593.53	1.05	563.57	0.92	0.91
HUB	9.18	1.17	7.41	595.59	1.05	560.31	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.86	35.58	31.50	4.08	0.93	0.30	2.90	
MEAN	28.97	27.63	23.50	4.13	0.92	0.30	3.29	0.91
HUB	35.05	10.62	6.50	4.12	0.92	0.31	3.90	

blockage3	Cor/Incid
0.950	0.993

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	589.521	292.097	512.069	1166.379	0.505	0.058

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
9.126	7.665	565.898	46.000	29.702	32.400	2.698

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	530.470	292.097	605.573	1172.044	0.453	0.219

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	9.108	7.913	571.408	456.573	0.021	0.315

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	502.059	0.000	502.059	1174.548	0.427	0.218

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	8.008	573.852	0.000	0.060	0.039	0.279

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.868	9.080	1.156	594.852	27.721	269.160	2.087

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
172510.750	0.416	612.927	603315.062

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 2.982 EfDer = 0.995

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
62.872	3906.939	9.080	594.852	1.000	1.000	0.980

W Kg/sec = 28.5783615

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
109.005	3648.298	1.400	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
150833.062	49333.855	1.605	509.668	317.573	390.276	1.229

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	465.67	-0.16	465.67	0.40	583.24
MEAN	15.91	0.00	-0.02	465.67	-0.16	465.67	0.40	
HUB	13.07	0.00	-0.02	465.67	-0.16	465.67	0.40	

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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.30    47.36     5.94   624.61   779.22     8.15   576.79     0.66
MEAN    49.37    44.80     4.57   542.55   715.11     8.15   576.79     0.61
HUB     43.75    38.84     4.91   445.61   644.64     8.15   576.79     0.55

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   541.17   277.55   464.57  1198.67     0.45
MEAN    15.50   549.08   280.56   471.98  1194.48     0.46
HUB     12.59   588.16   339.76   480.10  1190.37     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    611.65   572.24   334.11     0.48  4982.18
MEAN   528.38   533.09   247.82     0.45  4350.57     1.47
HUB    429.25   488.37    89.49     0.41  4279.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     10.48     1.15     9.11   622.14     1.05   597.75     0.92     0.91
MEAN    10.29     1.13     8.90   618.68     1.04   593.57     0.92     0.91
HUB     10.27     1.13     8.69   618.29     1.04   589.48     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.86    35.72    31.50     4.22     0.93     0.33     2.90
MEAN    30.73    27.70    23.50     4.20     0.92     0.31     3.34     0.91
HUB     35.29    10.56     6.50     4.06     0.92     0.31     4.06

  blockage3   Cor/Incid
     0.950       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    15.219     555.276     285.706     476.135    1194.914       0.465      -0.004

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
    10.318       8.898     594.025      46.000      30.966      33.000       2.034

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    15.219     498.745     285.706     574.782    1199.895       0.416       0.163

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950      10.292       9.138     598.987     440.827       0.038       0.338

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
    14.701     464.075       0.000     464.075    1202.676       0.386       0.269

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       9.287     601.767       0.000       0.060       0.038       0.267

   STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      10.292       1.134     619.702      24.850     274.664       2.129

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 154722.484       0.414     549.725  607815.875

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    980774.69   3484.6689    203.7504      2.4040      0.8363      2.9818      1.3413
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NPSS: Vehicle Mach number .78, Altitude 39000ft, dT 22R, Thrust 84%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

Fan Core + 4 Stage LPC 105% RPM  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 4.462   EfDer =  0.995

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     58.065    3729.144       4.281     462.029       1.000       1.000       0.980
 W Kg/sec =  26.3933182

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     188.172    3951.235       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  139300.672   45561.887       1.517     831.557     548.129     619.754       1.131

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   439.18    -0.15   439.18     0.42   711.32
  MEAN    17.06     0.00    -0.02   439.18    -0.15   439.18     0.42
  HUB     12.51     0.00    -0.02   439.18    -0.15   439.18     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.81    50.47     6.34   671.36   802.37     3.78   445.95     0.77
  MEAN    51.66    47.20     4.46   555.19   708.01     3.78   445.95     0.68
  HUB     42.84    38.62     4.22   407.11   598.95     3.78   445.95     0.58

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   677.26   358.70   574.46  1055.01     0.64
  MEAN    18.04   715.95   406.62   589.27  1049.60     0.68
  HUB     15.00   831.32   550.33   623.08  1038.50     0.80

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    671.36   654.04   312.66     0.62  7403.12
  MEAN   586.95   616.24   180.32     0.59  7336.46     1.27
  HUB    488.14   626.18    62.19     0.60  8256.88

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      5.54     1.29     4.20   500.79     1.08   462.57     0.92     0.91
  MEAN     5.52     1.29     4.04   500.44     1.08   457.74     0.92     0.91
  HUB      5.70     1.33     3.73   505.26     1.09   447.73     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     31.98    28.56    24.20     4.36     0.93     0.26     2.90
  MEAN    34.61    17.01    12.70     4.31     0.92     0.21     3.51     0.91
  HUB     41.45    -5.70    -9.30     3.60     0.92     0.06     4.78

   blockage3   Cor/Incid
      0.950       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     729.947     405.834     606.730    1049.174       0.696      -0.010

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.569       4.030     457.735      24.000      33.778      35.400       1.622

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	628.949	405.834	748.518	1062.208	0.592	0.238

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	5.541	4.370	469.179	528.796	0.028	0.400

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	573.126	0.000	573.126	1068.523	0.536	0.312

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	4.527	474.774	0.000	0.060	0.049	0.336

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.861	5.507	1.286	502.162	40.133	227.265	1.762

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
249489.438	0.554	818.655	649957.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 4.462 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
58.065	3729.144	5.507	502.162	1.000	1.000	0.980

W Kg/sec = 26.3933182

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
152.495	3790.054	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
139300.672	45561.887	1.329	590.487	444.209	474.134	1.067

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	541.83	-0.19	541.83	0.51	679.66
MEAN	18.08	0.00	-0.02	541.83	-0.19	541.83	0.51	
HUB	15.21	0.00	-0.02	541.83	-0.19	541.83	0.51	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.99	46.36	4.63	668.76	860.85	4.63	477.69	0.80
MEAN	47.36	42.30	5.06	588.32	799.95	4.63	477.69	0.75
HUB	42.42	37.84	4.58	494.98	734.01	4.63	477.69	0.68

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	603.68	286.26	531.49	1099.25	0.55
MEAN	18.01	620.48	304.86	540.43	1095.36	0.57
HUB	15.22	676.63	393.38	550.53	1091.61	0.62

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	664.53	652.35	378.26	0.59	5849.36	
MEAN	586.10	609.23	281.24	0.56	5493.84	1.42
HUB	495.40	559.90	102.02	0.51	5991.29	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.65	1.21	5.42	532.78	1.06	502.40	0.92	0.91
MEAN	6.58	1.19	5.29	530.92	1.06	498.83	0.92	0.91
HUB	6.68	1.21	5.16	533.52	1.06	495.37	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.31	35.44	31.50	3.94	0.93	0.30	2.90	
MEAN	29.43	27.49	23.50	3.99	0.92	0.30	3.30	0.91
HUB	35.55	10.50	6.50	4.00	0.92	0.31	3.92	

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   blockage3   Cor/Incid
      0.950       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     629.432     305.713     550.204    1095.824       0.574       0.004

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.626       5.297     499.378      46.000      29.058      30.600       1.542

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     551.429     305.713     630.503    1104.217       0.499       0.210

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.608       5.573     507.056     511.151       0.023       0.299

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     543.612       0.000     543.612    1104.994       0.492       0.212

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.584     507.770       0.000       0.060       0.037       0.218

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874       6.589       1.196     532.406      30.244     262.945       2.038

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188062.594       0.426     617.094  586128.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc = 4.462   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     58.065    3729.144       6.589     532.406       1.000       1.000       0.980
W Kg/sec =  26.3933182

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    131.245    3680.831       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 139300.672   45561.887       1.427     545.479     382.321     429.765       1.124

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   508.77    -0.18   508.77     0.46   644.66
 MEAN    17.74     0.00    -0.02   508.77    -0.18   508.77     0.46
 HUB     15.05     0.00    -0.02   508.77    -0.18   508.77     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.09    46.36     5.73   653.14   828.04     5.70   510.83     0.75
 MEAN    48.62    43.40     5.22   577.26   769.59     5.70   510.83     0.69
 HUB     43.92    38.84     5.08   489.77   706.32     5.70   510.83     0.64

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   578.91   285.37   503.69  1133.26     0.51
 MEAN    17.51   594.06   302.84   511.08  1129.74     0.53
 HUB     14.85   647.20   386.01   519.49  1126.32     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    644.68   618.71   359.30     0.55  5656.75
 MEAN   569.71   576.56   266.87     0.51  5304.88     1.44
 HUB    483.26   528.51    97.25     0.47  5734.86
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     7.83     1.19     6.56   562.01     1.06   534.08     0.92     0.91
 MEAN    7.75     1.18     6.42   560.16     1.05   530.75     0.92     0.91
 HUB     7.85     1.19     6.28   562.41     1.06   527.51     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    29.53    35.50    31.50     4.00     0.93     0.31     2.90
 MEAN   30.65    27.57    23.50     4.07     0.92     0.31     3.28     0.91
 HUB    36.61    10.60     6.50     4.10     0.92     0.32     3.87

   blockage3   Cor/Incid
      0.950       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     600.108     304.832     516.921    1130.481       0.531       0.012

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.798       6.436     531.512      46.000      30.528      31.500       0.972

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     525.674     304.832     607.664    1137.885       0.462       0.219

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       7.783       6.723     538.496     471.992       0.021       0.322

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.121     508.939       0.000     508.939    1139.408       0.447       0.237

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.767     539.939       0.000       0.060       0.037       0.251

    STAGE EXIT CONDITIONS, STAGE   3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.877       7.761       1.178     561.528      29.122     251.879       1.953

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 181140.719       0.436     594.381  558909.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc = 4.462   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     58.065    3729.144       7.761     561.528       1.000       1.000       0.980
W Kg/sec =  26.3933182

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    114.434    3584.113       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 139300.672   45561.887       1.540     513.330     333.366     401.059       1.203

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   475.44    -0.16   475.44     0.42   602.38
 MEAN    16.97     0.00    -0.02   475.44    -0.16   475.44     0.42
 HUB     14.32     0.00    -0.02   475.44    -0.16   475.44     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.82    46.36     6.46   626.78   786.83     6.89   542.69     0.69
 MEAN    49.28    43.80     5.48   552.28   728.86     6.89   542.69     0.64
 HUB     44.44    37.84     6.60   466.01   665.86     6.89   542.69     0.58

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	548.01	276.92	472.90	1164.34	0.47
MEAN	16.57	559.91	289.09	479.51	1160.84	0.48
HUB	13.89	606.38	361.37	486.94	1157.41	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	614.41	580.98	337.49	0.50	5231.41	
MEAN	539.36	540.90	250.27	0.47	4794.09	1.46
HUB	452.02	495.31	90.65	0.43	5021.73	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	9.04	1.16	7.76	588.89	1.05	563.87	0.92	0.91
MEAN	8.93	1.15	7.61	586.60	1.04	560.48	0.92	0.91
HUB	8.98	1.16	7.45	587.79	1.05	557.16	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.35	35.51	31.50	4.01	0.93	0.32	2.90	
MEAN	31.08	27.56	23.50	4.06	0.92	0.32	3.29	0.91
HUB	36.58	10.55	6.50	4.05	0.92	0.32	3.90	

blockage3	Cor/Incid
0.950	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	551.455	290.714	468.602	1162.818	0.474	0.056

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
8.968	7.688	562.424	46.000	31.815	32.400	0.585

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	484.507	290.714	565.032	1168.776	0.415	0.254

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	8.956	7.957	568.203	456.573	0.019	0.344

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	459.311	0.000	459.311	1170.812	0.392	0.251

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	8.032	570.185	0.000	0.060	0.037	0.308

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	8.931	1.151	587.763	26.235	255.369	1.980

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
163247.859	0.432	535.669	551769.062

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 4.462 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
58.065	3729.144	8.931	587.763	1.000	1.000	0.980

W Kg/sec = 26.3933182

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
101.731	3503.211	1.400	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
139300.672	45561.887	1.720	509.668	296.376	390.276	1.317

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	427.00	-0.15	427.00	0.36	560.05
MEAN	15.91	0.00	-0.02	427.00	-0.15	427.00	0.36	
HUB	13.07	0.00	-0.02	427.00	-0.15	427.00	0.36	

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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.40    47.36     7.04   596.19   733.45     8.15   572.58     0.63
MEAN    50.50    44.80     5.70   517.86   671.31     8.15   572.58     0.57
HUB     44.90    38.84     6.06   425.34   602.80     8.15   572.58     0.51

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   509.59   276.73   427.90  1193.03     0.43
MEAN    15.50   515.14   276.75   434.49  1188.98     0.43
HUB     12.59   550.02   327.81   441.67  1185.00     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    583.82   526.69   307.09     0.44  4967.27
MEAN   504.34   490.49   227.59     0.41  4291.24     1.50
HUB    409.72   449.20    81.91     0.38  4129.03

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     10.26     1.15     9.05   613.73     1.04   592.10     0.92     0.91
MEAN    10.07     1.13     8.85   610.20     1.04   588.10     0.92     0.91
HUB     10.02     1.12     8.65   609.35     1.04   584.15     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.89    35.67    31.50     4.17     0.93     0.35     2.90
MEAN    32.49    27.65    23.50     4.15     0.92     0.33     3.34     0.91
HUB     36.58    10.51     6.50     4.01     0.92     0.32     4.06

  blockage3   Cor/Incid
     0.950       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     521.042     281.821     438.249    1189.360       0.438      -0.004

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     10.092       8.845     588.481      46.000      32.743      33.000       0.257

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     458.362     281.821     538.070    1194.516       0.384       0.198

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      10.074       9.100     593.594     440.827       0.034       0.362

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     14.701     427.461       0.000     427.461    1196.808       0.357       0.296

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       9.221     595.874       0.000       0.060       0.037       0.293

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      10.071       1.128     611.093      23.331     263.237       2.041

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 145242.031       0.426     476.586  559796.062

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    927182.62   3042.3855    188.1720      2.3524      0.8599      4.4621      1.3226
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NPSS: Vehicle Mach number .78, Altitude 39000ft, dT 22R, Thrust 79.8%

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*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*****************************************************************

Fan Core + 4 Stage LPC 103.8% RPM   12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 4.921   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     56.721    3685.085       4.281     462.029       1.000       1.000       0.980
 W Kg/sec =  25.7823181

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     183.816    3904.552       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  136075.891   44507.141       1.553     831.557     535.440     619.754       1.157

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   426.89    -0.15   426.89     0.41   702.92
  MEAN    17.06     0.00    -0.02   426.89    -0.15   426.89     0.41
  HUB     12.51     0.00    -0.02   426.89    -0.15   426.89     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.25    50.47     6.78   663.43   789.03     3.81   446.83     0.76
  MEAN    52.12    47.20     4.92   548.63   695.26     3.81   446.83     0.67
  HUB     43.31    38.62     4.69   402.30   586.68     3.81   446.83     0.57

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   663.56   360.22   557.27  1056.35     0.63
  MEAN    18.04   700.66   405.18   571.62  1050.90     0.67
  HUB     15.00   811.14   542.54   602.99  1040.21     0.78

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    663.43   634.41   303.20     0.60  7434.46
  MEAN   580.01   597.76   174.83     0.57  7310.32     1.29
  HUB    482.38   605.98    60.16     0.58  8139.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      5.53     1.29     4.24   500.49     1.08   463.80     0.92     0.91
  MEAN     5.51     1.29     4.09   499.85     1.08   458.94     0.92     0.91
  HUB      5.66     1.32     3.79   504.14     1.09   449.36     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     32.88    28.55    24.20     4.35     0.93     0.27     2.90
  MEAN    35.33    17.01    12.70     4.31     0.92     0.23     3.51     0.91
  HUB     41.98    -5.70    -9.30     3.60     0.92     0.07     4.78

   blockage3   Cor/Incid
      0.950       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     713.586     404.392     587.938    1050.665       0.679      -0.008

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.549       4.074     459.038      24.000      34.521      35.400       0.879

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	608.963	404.392	731.005	1063.787	0.572	0.253

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	5.523	4.422	470.575	528.796	0.027	0.410

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	555.722	0.000	555.722	1069.615	0.520	0.325

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	4.570	475.745	0.000	0.060	0.045	0.350

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.867	5.495	1.283	501.495	39.466	224.216	1.738

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
245343.625	0.557	786.415	631771.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 4.921 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
56.721	3685.085	5.495	501.495	1.000	1.000	0.980

W Kg/sec = 25.7823181

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
149.212	3747.765	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
136075.891	44507.141	1.359	590.487	434.645	474.134	1.091

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	526.02	-0.18	526.02	0.49	672.08
MEAN	18.08	0.00	-0.02	526.02	-0.18	526.02	0.49	
HUB	15.21	0.00	-0.02	526.02	-0.18	526.02	0.49	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.49	46.36	5.13	660.86	844.79	4.66	478.43	0.79
MEAN	47.87	42.30	5.57	581.37	784.15	4.66	478.43	0.73
HUB	42.93	37.84	5.09	489.13	718.42	4.66	478.43	0.67

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	592.21	289.15	516.82	1099.69	0.54
MEAN	18.01	608.19	305.92	525.65	1095.72	0.56
HUB	15.22	662.86	390.55	535.59	1091.88	0.61

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	656.68	634.17	367.52	0.58	5908.27	
MEAN	579.17	592.44	273.25	0.54	5512.83	1.43
HUB	489.55	544.66	99.00	0.50	5948.10	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.64	1.21	5.45	532.05	1.06	502.82	0.92	0.91
MEAN	6.56	1.19	5.32	530.01	1.06	499.18	0.92	0.91
HUB	6.65	1.21	5.18	532.26	1.06	495.64	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	29.23	35.42	31.50	3.92	0.93	0.31	2.90	
MEAN	30.20	27.47	23.50	3.97	0.92	0.30	3.30	0.91
HUB	36.10	10.47	6.50	3.97	0.92	0.31	3.92	

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   blockage3   Cor/Incid
      0.950       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     616.737     306.776     535.026    1096.214       0.563       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.602       5.325     499.732      46.000      29.829      30.600       0.771

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     535.847     306.776     617.449    1104.706       0.485       0.223

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.587       5.607     507.504     511.151       0.022       0.310

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     528.348       0.000     528.348    1105.430       0.478       0.224

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.616     508.170       0.000       0.060       0.037       0.230

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877       6.568       1.195     531.442      29.947     257.926       1.999

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 186212.703       0.432     596.879  569031.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc = 4.921   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     56.721    3685.085       6.568     531.442       1.000       1.000       0.980
W Kg/sec =  25.7823181

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    128.506    3640.641       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 136075.891   44507.141       1.457     545.479     374.341     429.765       1.148

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   495.00    -0.17   495.00     0.45   637.62
 MEAN    17.74     0.00    -0.02   495.00    -0.17   495.00     0.45
 HUB     15.05     0.00    -0.02   495.00    -0.17   495.00     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.52    46.36     6.16   645.42   813.52     5.73   511.02     0.73
 MEAN    49.06    43.40     5.66   570.44   755.39     5.73   511.02     0.68
 HUB     44.37    38.84     5.53   483.98   692.41     5.73   511.02     0.62

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   568.62   287.26   490.73  1133.11     0.50
 MEAN    17.51   583.03   303.19   498.00  1129.54     0.52
 HUB     14.85   634.80   383.00   506.24  1126.06     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    637.06   602.64   349.80     0.53  5694.06
 MEAN   562.98   561.69   259.80     0.50  5310.79     1.45
 HUB    477.55   515.00    94.56     0.46  5690.08
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      7.81     1.19     6.57   560.88     1.06   533.94     0.92     0.91
MEAN     7.72     1.17     6.43   558.90     1.05   530.57     0.92     0.91
HUB      7.80     1.19     6.29   560.86     1.06   527.28     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.34    35.48    31.50     3.98     0.93     0.32     2.90
MEAN    31.33    27.55    23.50     4.05     0.92     0.32     3.28     0.91
HUB     37.11    10.58     6.50     4.08     0.92     0.33     3.87

  blockage3   Cor/Incid
     0.950       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     588.913     305.177     503.673    1130.270       0.521       0.012

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     7.762       6.450     531.310      46.000      31.212      31.500       0.288

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     511.924     305.177     595.986    1137.758       0.450       0.231

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       7.748       6.742     538.374     471.992       0.020       0.332

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    17.121     495.807       0.000     495.807    1139.188       0.435       0.248

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       6.783     539.728       0.000       0.060       0.037       0.261

   STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879       7.726       1.176     560.217      28.775     247.728       1.920

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 178983.734       0.441     573.707  543741.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc = 4.921   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     56.721    3685.085       7.726     560.217       1.000       1.000       0.980
W Kg/sec =  25.7823181

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    112.155    3545.908       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 136075.891   44507.141       1.571     513.330     326.726     401.059       1.228

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   463.53    -0.16   463.53     0.41   595.96
 MEAN    16.97     0.00    -0.02   463.53    -0.16   463.53     0.41
 HUB     14.32     0.00    -0.02   463.53    -0.16   463.53     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.20    46.36     6.84   619.37   773.74     6.90   542.31     0.68
 MEAN    49.67    43.80     5.87   545.75   716.16     6.90   542.31     0.63
 HUB     44.82    37.84     6.98   460.51   653.51     6.90   542.31     0.57

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	538.81	277.92	461.61	1163.61	0.46
MEAN	16.57	550.04	288.88	468.07	1160.10	0.47
HUB	13.89	595.24	358.32	475.31	1156.65	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	607.15	566.99	329.23	0.49	5250.16	
MEAN	532.99	527.90	244.11	0.46	4790.57	1.47
HUB	446.68	483.45	88.36	0.42	4979.39	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	8.99	1.16	7.76	587.35	1.05	563.16	0.92	0.91
MEAN	8.87	1.15	7.61	584.98	1.04	559.77	0.92	0.91
HUB	8.92	1.15	7.45	585.95	1.05	556.43	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.05	35.50	31.50	4.00	0.93	0.33	2.90	
MEAN	31.68	27.54	23.50	4.04	0.92	0.32	3.29	0.91
HUB	37.01	10.53	6.50	4.03	0.92	0.33	3.90	

blockage3	Cor/Incid
0.950	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	541.992	290.505	457.561	1161.990	0.466	0.055

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
8.915	7.680	561.619	46.000	32.411	32.400	-0.011

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	472.896	290.505	554.998	1168.019	0.405	0.263

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	8.904	7.953	567.462	456.573	0.018	0.353

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	448.488	0.000	448.488	1169.945	0.383	0.260

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	8.023	569.336	0.000	0.060	0.037	0.316

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	8.880	1.149	586.096	25.879	251.742	1.951

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
161028.422	0.437	516.154	537724.312

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 4.921 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
56.721	3685.085	8.880	586.096	1.000	1.000	0.980

W Kg/sec = 25.7823181

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
99.812	3466.741	1.400	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
136075.891	44507.141	1.753	509.668	290.782	390.276	1.342

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	417.17	-0.14	417.17	0.36	554.22
MEAN	15.91	0.00	-0.02	417.17	-0.14	417.17	0.36	
HUB	13.07	0.00	-0.02	417.17	-0.14	417.17	0.36	

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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.70    47.36     7.34   589.14   722.00     8.14   571.60     0.62
MEAN    50.82    44.80     6.02   511.74   660.34     8.14   571.60     0.56
HUB     45.22    38.84     6.38   420.31   592.29     8.14   571.60     0.51

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   501.73   276.74   418.51  1191.71     0.42
MEAN    15.50   506.64   275.94   424.90  1187.70     0.43
HUB     12.59   540.41   324.90   431.84  1183.74     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    576.92   515.03   300.18     0.43  4967.33
MEAN   498.38   479.60   222.44     0.40  4278.75     1.51
HUB    404.87   439.18    79.97     0.37  4092.38

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     10.19     1.15     9.02   611.76     1.04   590.79     0.92     0.91
MEAN    10.00     1.13     8.82   608.20     1.04   586.82     0.92     0.91
HUB      9.95     1.12     8.62   607.24     1.04   582.91     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.47    35.65    31.50     4.15     0.93     0.35     2.90
MEAN    33.00    27.63    23.50     4.13     0.93     0.34     3.34     0.91
HUB     36.96    10.49     6.50     3.99     0.93     0.32     4.06

  blockage3   Cor/Incid
     0.950       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    15.219     512.469     281.003     428.557    1188.064       0.431      -0.004

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
    10.019       8.816     587.192      46.000      33.253      33.000      -0.253

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    15.219     448.081     281.003     528.904    1193.264       0.376       0.208

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950      10.003       9.075     592.343     440.827       0.034       0.369

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
    14.701     418.092       0.000     418.092    1195.442       0.350       0.304

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       9.188     594.507       0.000       0.060       0.037       0.300

   STAGE EXIT CONDITIONS, STAGE   5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.881       9.999       1.126     609.067      22.971     260.131       2.017

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 142999.484       0.430     458.365  546435.625

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    914568.00   2931.5203    183.8159      2.3356      0.8636      4.9209      1.3182
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NPSS: Vehicle Mach number .78, Altitude 39000ft, dT 22R, Thrust 76.8%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

Fan Core + 4 Stage LPC 103% RPM  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 5.255   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     55.758    3653.958       4.281     462.029       1.000       1.000       0.980
 W Kg/sec =  25.3443623

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     180.693    3871.571       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  133764.422   43751.113       1.580     831.557     526.344     619.754       1.177

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   418.21    -0.14   418.21     0.40   696.98
  MEAN    17.06     0.00    -0.02   418.21    -0.14   418.21     0.40
  HUB     12.51     0.00    -0.02   418.21    -0.14   418.21     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.56    50.47     7.09   657.82   779.63     3.83   447.45     0.75
  MEAN    52.46    47.20     5.26   543.99   686.28     3.83   447.45     0.66
  HUB     43.66    38.62     5.04   398.90   578.05     3.83   447.45     0.56

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   654.07   361.22   545.28  1057.24     0.62
  MEAN    18.04   690.01   404.11   559.29  1051.78     0.66
  HUB     15.00   797.13   537.07   589.04  1041.37     0.77

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    657.82   620.73   296.60     0.59  7455.00
  MEAN   575.11   584.85   171.00     0.56  7291.06     1.30
  HUB    478.30   591.97    58.77     0.57  8057.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      5.52     1.29     4.26   500.27     1.08   464.62     0.92     0.91
  MEAN     5.49     1.28     4.11   499.43     1.08   459.76     0.92     0.91
  HUB      5.63     1.32     3.82   503.37     1.09   450.44     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     33.52    28.54    24.20     4.34     0.93     0.28     2.90
  MEAN    35.85    17.00    12.70     4.30     0.92     0.23     3.51     0.91
  HUB     42.36    -5.70    -9.30     3.60     0.92     0.08     4.78

    blockage3   Cor/Incid
       0.950       0.998

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
      18.071     702.270     403.329     574.899    1051.654       0.668      -0.007

      Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
       5.534       4.103     459.902      24.000      35.052      35.400       0.348
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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth          Machth      cp 2-Th
     18.071     595.211     403.329     718.993    1064.814       0.559       0.263

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.510       4.456     471.484     528.796       0.026       0.417

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     18.083     543.726       0.000     543.726    1070.321       0.508       0.334

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       4.598     476.373       0.000       0.060       0.044       0.359

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.870       5.484       1.281     501.023      38.995     222.043       1.721

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 242412.547       0.560     763.821  618925.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc = 5.255   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     55.758    3653.958       5.484     501.023       1.000       1.000       0.980
W Kg/sec =  25.3443623

   W cor      RPM cor        GAMMA        Cp          R           Blades       THK
    146.885    3717.857       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 133764.422   43751.113       1.380     590.487     427.867     474.134       1.108

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   515.08    -0.18   515.08     0.48   666.71
 MEAN    18.08     0.00    -0.02   515.08    -0.18   515.08     0.48
 HUB     15.21     0.00    -0.02   515.08    -0.18   515.08     0.48

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.84    46.36     5.48   655.27   833.62     4.68   478.91     0.78
 MEAN    48.23    42.30     5.93   576.46   773.18     4.68   478.91     0.72
 HUB     43.29    37.84     5.45   485.00   707.60     4.68   478.91     0.66

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   584.33   291.04   506.69  1099.94     0.53
 MEAN    18.01   599.68   306.54   515.42  1095.92     0.55
 HUB     15.22   653.29   388.51   525.22  1092.03     0.60

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    651.13   621.61   360.09     0.57  5946.67
 MEAN   574.28   580.81   267.74     0.53  5523.90     1.44
 HUB    485.41   534.08    96.90     0.49  5916.97

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.63     1.21     5.47   531.52     1.06   503.06     0.92     0.91
 MEAN     6.54     1.19     5.34   529.35     1.06   499.38     0.92     0.91
 HUB      6.62     1.21     5.20   531.37     1.06   495.80     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.87    35.40    31.50     3.90     0.93     0.31     2.90
 MEAN    30.74    27.45    23.50     3.95     0.92     0.31     3.30     0.91
 HUB     36.49    10.45     6.50     3.95     0.92     0.32     3.92
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   blockage3   Cor/Incid
      0.950       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     607.967     307.396     524.529    1096.437       0.554       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.583       5.342     499.934      46.000      30.372      30.600       0.228

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     525.134     307.396     608.488    1104.984       0.475       0.233

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.569       5.627     507.759     511.151       0.022       0.317

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     517.855       0.000     517.855    1105.673       0.468       0.232

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.635     508.392       0.000       0.060       0.037       0.239

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879       6.550       1.194     530.749      29.725     254.486       1.973

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 184834.625       0.436     582.398  557057.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc = 5.255   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     55.758    3653.958       6.550     530.749       1.000       1.000       0.980
W Kg/sec =  25.3443623

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    126.585    3612.246       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 133764.422   43751.113       1.479     545.479     368.745     429.765       1.165

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   485.50    -0.17   485.50     0.44   632.64
 MEAN    17.74     0.00    -0.02   485.50    -0.17   485.50     0.44
 HUB     15.05     0.00    -0.02   485.50    -0.17   485.50     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.82    46.36     6.46   639.97   803.42     5.74   511.10     0.72
 MEAN    49.37    43.40     5.97   565.62   745.54     5.74   511.10     0.67
 HUB     44.68    38.84     5.84   479.90   682.77     5.74   511.10     0.62

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   561.53   288.41   481.81  1132.94     0.50
 MEAN    17.51   575.40   303.28   488.98  1129.35     0.51
 HUB     14.85   626.19   380.80   497.09  1125.83     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    631.68   591.58   343.26     0.52  5716.85
 MEAN   558.23   551.46   254.95     0.49  5312.37     1.46
 HUB    473.52   505.67    92.72     0.45  5657.43
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      7.78     1.19     6.58   560.06     1.06   533.78     0.92     0.91
MEAN     7.69     1.17     6.44   557.99     1.05   530.39     0.92     0.91
HUB      7.77     1.19     6.29   559.76     1.05   527.08     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.91    35.47    31.50     3.97     0.93     0.33     2.90
MEAN    31.81    27.54    23.50     4.04     0.92     0.32     3.28     0.91
HUB     37.45    10.57     6.50     4.07     0.92     0.33     3.87


   blockage3   Cor/Incid
      0.950       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     17.392     581.175     305.271     494.544    1130.063       0.514        0.012

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.732       6.455     531.115      46.000      31.686      31.500      -0.186

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     17.392     502.497     305.271     587.957    1137.599       0.442        0.240

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       7.719       6.750     538.221     471.992       0.020        0.339

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4          Mach4        cp 3-4
     17.121     486.800       0.000     486.800    1138.966       0.427        0.255

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       6.788     539.515       0.000       0.060       0.037        0.269

    STAGE EXIT CONDITIONS, STAGE   3
       Eff4        Pt4          PR4        Texit         Del T        Ns         Ns nondim
       0.880       7.697        1.175     559.267      28.518     244.910        1.899

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 177384.141       0.445     558.922  533067.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc = 5.255   EfDer =  1.000

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     55.758     3653.958        7.697     559.267       1.000        1.000        0.980
W Kg/sec =  25.3443623

   W cor       RPM cor         GAMMA         Cp          R           Blades        THK
    110.570     3518.942        1.401        0.249      53.349      56.000        0.050

   CFM         SCFM            A1/A*       Area1       A*        AthrRotor   ChokeMargin
 133764.422   43751.113         1.594     513.330     322.108     401.059        1.245

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1       Stator    Alfa     C1       CU1        Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   455.34    -0.16   455.34     0.40   591.43
 MEAN    16.97      0.00    -0.02   455.34    -0.16   455.34     0.40
 HUB     14.32      0.00    -0.02   455.34    -0.16   455.34     0.40

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     53.45     46.36     7.09   614.14   764.65      6.90   541.99     0.67
 MEAN    49.93     43.80     6.13   541.14   707.34      6.90   541.99     0.62
 HUB     45.09     37.84     7.25   456.62   644.96      6.90   541.99     0.57

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000
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         R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   532.47   278.46   453.86  1163.03     0.46
 MEAN    16.57   543.21   288.60   460.21  1159.52     0.47
 HUB     13.89   587.56   356.15   467.31  1156.06     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    602.02   557.38   323.56     0.48  5260.39
 MEAN   528.49   518.98   239.89     0.45  4785.86     1.48
 HUB    442.91   475.30    86.76     0.41  4949.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     8.95     1.16     7.75   586.23     1.05   562.60     0.92     0.91
 MEAN    8.83     1.15     7.60   583.80     1.04   559.21     0.92     0.91
 HUB     8.87     1.15     7.44   584.63     1.05   555.87     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    31.53    35.49    31.50     3.99     0.93     0.33     2.90
 MEAN   32.09    27.53    23.50     4.03     0.93     0.33     3.29     0.91
 HUB    37.31    10.52     6.50     4.02     0.93     0.33     3.90

   blockage3   Cor/Incid
      0.950       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     535.442     290.222     449.966    1161.349       0.461       0.054

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      8.872       7.668     560.996      46.000      32.821      32.400      -0.421

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     16.481     464.940     290.222     548.086    1167.416       0.398       0.270

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       8.861       7.944     566.873     456.573       0.018       0.359

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     16.096     441.068       0.000     441.068    1169.270       0.377       0.265

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       8.010     568.675       0.000       0.060       0.037       0.322

    STAGE EXIT CONDITIONS, STAGE   4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.880       8.838       1.148     584.885      25.618     249.286       1.932

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 159406.094       0.440     502.275  527800.938

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc = 5.255   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     55.758    3653.958       8.838     584.885       1.000       1.000       0.980
W Kg/sec =  25.3443623

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     98.484    3441.014       1.400       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 133764.422   43751.113       1.776     509.668     286.914     390.276       1.360

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   410.41    -0.14   410.41     0.35   550.11
 MEAN    15.91     0.00    -0.02   410.41    -0.14   410.41     0.35
 HUB     13.07     0.00    -0.02   410.41    -0.14   410.41     0.35
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.92    47.36     7.56   584.17   714.04     8.12   570.86     0.61
MEAN    51.04    44.80     6.24   507.41   652.72     8.12   570.86     0.56
HUB     45.45    38.84     6.61   416.76   585.02     8.12   570.86     0.50

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   496.29   276.60   412.07  1190.72     0.42
MEAN    15.50   500.75   275.26   418.31  1186.73     0.42
HUB     12.59   533.75   322.78   425.10  1182.80     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    572.05   507.04   295.45     0.43  4964.72
MEAN   494.17   472.13   218.91     0.40  4268.13     1.52
HUB    401.45   432.32    78.68     0.37  4065.61

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     10.13     1.15     8.99   610.32     1.04   589.80     0.92     0.91
MEAN     9.94     1.12     8.79   606.75     1.04   585.86     0.92     0.91
HUB      9.89     1.12     8.60   605.71     1.04   581.98     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.87    35.64    31.50     4.14     0.93     0.36     2.90
MEAN    33.35    27.62    23.50     4.12     0.93     0.34     3.34     0.91
HUB     37.21    10.49     6.50     3.99     0.93     0.33     4.06

  blockage3   Cor/Incid
     0.950       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    15.219     506.536     280.308     421.907    1187.088       0.427      -0.005

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     9.961       8.789     586.223      46.000      33.599      33.000      -0.599

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    15.219     441.051     280.308     522.588    1192.310       0.370       0.214

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       9.945       9.048     591.391     440.827       0.034       0.374

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
    14.701     411.676       0.000     411.676    1194.411       0.345       0.309

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       9.157     593.478       0.000       0.060       0.037       0.305

   STAGE EXIT CONDITIONS, STAGE   5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.881       9.941       1.125     607.594      22.709     258.050       2.000

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 141366.438       0.432     445.433  536950.625

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    905403.81   2852.8484    180.6934      2.3221      0.8656      5.2552      1.3151
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NPSS: Vehicle Mach number .78, Altitude 39000ft, dT 22R, Thrust 10%

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*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*****************************************************************

Fan Core + 4 Stage LPC 70% RPM  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.825   EfDer =  0.931

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.450    2473.594       4.281     462.029       1.000       1.000       0.980
 W Kg/sec =  11.1138172

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     79.236    2620.910       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  58657.359   19185.406       3.603     831.557     230.809     619.754       2.685

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   171.56    -0.06   171.56     0.16   471.83
  MEAN    17.06     0.00    -0.02   171.56    -0.06   171.56     0.16
  HUB     12.51     0.00    -0.02   171.56    -0.06   171.56     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.93    50.47    18.46   445.32   477.28     4.20   459.57     0.45
  MEAN    65.02    47.20    17.82   368.26   406.32     4.20   459.57     0.39
  HUB     57.58    38.62    18.96   270.04   319.98     4.20   459.57     0.30

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   393.97   319.58   230.40  1065.38     0.37
  MEAN    18.04   393.95   317.38   233.39  1061.97     0.37
  HUB     15.00   420.05   346.48   237.47  1057.89     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    445.32   262.48   125.74     0.25  6594.16
  MEAN   389.33   244.23    71.95     0.23  5725.21     1.92
  HUB    323.79   238.55    22.69     0.23  5197.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      4.95     1.16     4.50   484.93     1.05   471.99     0.92     0.85
  MEAN     4.86     1.13     4.41   481.91     1.04   468.97     0.92     0.85
  HUB      4.80     1.12     4.31   480.08     1.04   465.37     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     54.21    28.62    24.20     4.42     0.93     0.57     2.90
  MEAN    53.67    17.13    12.70     4.43     0.95     0.51     3.51     0.85
  HUB     55.57    -5.46    -9.30     3.84     0.95     0.38     4.78

    blockage3   Cor/Incid
       0.950       0.931

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
      18.071     396.786     316.759     238.961    1062.208       0.374       0.002

      Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
       4.863       4.416     469.180      24.000      52.969      35.400     -17.569
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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth          Machth      cp 2-Th
     18.071     252.396     316.759     405.019    1071.019       0.236       0.554

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       4.846       4.662     476.995     528.796       0.047       0.671

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     18.083     236.243       0.000     236.243    1071.758       0.220       0.515

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       4.653     477.653       0.000       0.060       0.117       0.534

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.777       4.813        1.124     482.307      20.278     157.215       1.219

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 126060.102       0.636     174.179  253895.594


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.825   EfDer =  0.934

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     24.450    2473.594       4.813     482.307       1.000       1.000       0.980
W Kg/sec =  11.1138172

   W cor      RPM cor        GAMMA        Cp          R           Blades       THK
     72.004    2565.221       1.401       0.248      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1       A*        AthrRotor   ChokeMargin
  58657.359   19185.406       2.815     590.487     209.743     474.134       2.261

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   226.32    -0.08   226.32     0.21   460.01
 MEAN    18.08     0.00    -0.02   226.32    -0.08   226.32     0.21
 HUB     15.21     0.00    -0.02   226.32    -0.08   226.32     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.97    46.36    16.61   443.60   498.06     4.67   478.04     0.46
 MEAN    59.89    42.30    17.59   390.24   451.18     4.67   478.04     0.42
 HUB     55.43    37.84    17.59   328.33   398.83     4.67   478.04     0.37

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   361.73   273.85   236.34  1086.41     0.33
 MEAN    18.01   357.06   265.50   238.75  1083.60     0.33
 HUB     15.22   373.24   284.57   241.51  1080.77     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    440.79   289.35   166.94     0.27  5593.60
 MEAN   388.77   268.69   123.26     0.25  4783.09     1.86
 HUB    328.61   245.49    44.04     0.23  4333.13

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      5.42     1.13     5.02   501.73     1.04   490.82     0.92     0.85
 MEAN     5.33     1.11     4.94   498.92     1.03   488.29     0.92     0.85
 HUB      5.28     1.10     4.86   497.35     1.03   485.74     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.20    35.24    31.50     3.74     0.93     0.51     2.90
 MEAN    48.04    27.31    23.50     3.81     0.95     0.49     3.30     0.85
 HUB     49.68    10.33     6.50     3.83     0.95     0.48     3.92
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   blockage3   Cor/Incid
      0.950       0.934

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     17.960     360.397     266.247     242.896     1083.846       0.333        0.005

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.336       4.943     488.504      46.000      47.626      30.600     -17.026

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     17.960     245.452     266.247     362.124     1090.268       0.225        0.499

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       5.324       5.139     494.310     511.151        0.041        0.572

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4        cp 3-4
     17.823     243.351       0.000     243.351     1090.363       0.223        0.426

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       5.114     494.396       0.000       0.060        0.114        0.436

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.783       5.295         1.100      499.333       17.026     173.460        1.345

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 105856.484       0.545     146.263  229636.766


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.825   EfDer =  0.954

   W act       RPM act         Pt          Tt            POTS         POTH        AeroBl
     24.450     2473.594        5.295      499.333        1.000        1.000        0.980
W Kg/sec =  11.1138172

   W cor       RPM cor         GAMMA         Cp          R            Blades       THK
     66.605     2521.107        1.401        0.248       53.349       56.000       0.050

   CFM        SCFM             A1/A*       Area1        A*        AthrRotor   ChokeMargin
  58657.359   19185.406         2.811      545.479      194.018      429.765        2.215

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1       Stator    Alfa      C1       CU1        Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00     -0.02   230.60     -0.08   230.60      0.21   441.54
 MEAN    17.74      0.00     -0.02   230.60     -0.08   230.60      0.21
 HUB     15.05      0.00     -0.02   230.60     -0.08   230.60      0.21

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     61.98     46.36     15.62   433.23    490.85      5.13   494.90      0.45
 MEAN    58.95     43.40     15.55   382.91    447.05      5.13   494.90      0.41
 HUB     54.64     38.84     15.80   324.87    398.46      5.13   494.90      0.37

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP      19.81   352.42    257.69    240.40   1103.84      0.32
 MEAN     17.51   350.15    252.49    242.60   1101.39      0.32
 HUB      14.85   368.85    275.65    245.09   1098.92      0.34

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP     427.62    294.40    169.93      0.27   5106.46
 MEAN    377.90    273.09    125.41      0.25   4421.62      1.80
 HUB     320.55    249.17     44.91      0.23   4094.58
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      5.89     1.11     5.49   517.06     1.04   506.71     0.92     0.87
MEAN     5.81     1.10     5.41   514.69     1.03   504.46     0.92     0.87
HUB      5.77     1.09     5.34   513.55     1.03   502.21     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.99    35.25    31.50     3.75     0.93     0.49     2.90
MEAN    46.14    27.34    23.50     3.84     0.95     0.47     3.28     0.87
HUB     48.36    10.38     6.50     3.88     0.95     0.46     3.87

  blockage3   Cor/Incid
     0.950       0.954

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     353.383     254.146     245.538    1101.634       0.321       0.007

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     5.818       5.418     504.689      46.000      45.987      31.500     -14.487

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     251.443     254.146     357.511    1107.229       0.227       0.466

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       5.809       5.604     509.829     471.992       0.033       0.548

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    17.121     245.161       0.000     245.161    1107.511       0.221       0.417

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       5.588     510.089       0.000       0.060       0.097       0.429

   STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.809       5.783       1.092     515.100      15.766     178.264       1.382

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98033.219       0.536     135.454  227683.906


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.825   EfDer =  0.967

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.450    2473.594       5.783     515.100       1.000       1.000       0.980
W Kg/sec =  11.1138172

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     61.940    2482.224       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  58657.359   19185.406       2.845     513.330     180.432     401.059       2.223

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   231.32    -0.08   231.32     0.21   417.19
 MEAN    16.97     0.00    -0.02   231.32    -0.08   231.32     0.21
 HUB     14.32     0.00    -0.02   231.32    -0.08   231.32     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.91    46.36    14.55   415.75   475.84     5.61   510.64     0.43
 MEAN    57.74    43.80    13.94   366.33   433.32     5.61   510.64     0.39
 HUB     53.20    37.84    15.36   309.11   386.15     5.61   510.64     0.35

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   337.91   237.80   240.08  1119.46     0.30
 MEAN    16.57   335.79   232.69   242.09  1117.22     0.30
 HUB     13.89   353.37   255.29   244.34  1114.97     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.55   294.02   169.75     0.26  4491.22
 MEAN   357.77   272.49   125.07     0.24  3857.97     1.75
 HUB    299.83   248.36    44.54     0.22  3547.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     6.34     1.10     5.95   530.69     1.03   521.17     0.92     0.88
 MEAN    6.26     1.08     5.88   528.49     1.03   519.09     0.92     0.88
 HUB     6.22     1.08     5.80   527.41     1.02   517.00     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    44.73    35.26    31.50     3.76     0.93     0.47     2.90
 MEAN   43.87    27.32    23.50     3.82     0.95     0.45     3.29     0.88
 HUB    46.26    10.33     6.50     3.83     0.95     0.44     3.90

  blockage3   Cor/Incid
     0.950       0.967

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    16.481     333.582     234.001     237.740    1117.754       0.298       0.036

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     6.271       5.895     519.590      46.000      44.546      32.400     -12.146

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    16.481     247.088     234.001     340.307    1122.248       0.220       0.448

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       6.264       6.056     523.777     456.573       0.026       0.529

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
    16.096     235.954       0.000     235.954    1122.728       0.210       0.400

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       6.053     524.225       0.000       0.060       0.082       0.440

   STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.828       6.242       1.080     528.866      13.766     191.730       1.486

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  85609.484       0.515     118.288  232489.141

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.825   EfDer =  0.977

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.450    2473.594       6.242     528.866       1.000       1.000       0.980
W Kg/sec =  11.1138172

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     58.139    2449.705       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  58657.359   19185.406       3.009     509.668     169.362     390.276       2.304

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   221.06    -0.08   221.06     0.20   391.63
 MEAN    15.91     0.00    -0.02   221.06    -0.08   221.06     0.20
 HUB     13.07     0.00    -0.02   221.06    -0.08   221.06     0.20
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	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.80	47.36	13.44	395.46	453.12	6.08	524.79	0.40
MEAN	57.24	44.80	12.44	343.50	408.55	6.08	524.79	0.36
HUB	51.93	38.84	13.09	282.13	358.48	6.08	524.79	0.32

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	320.73	223.90	229.65	1133.37	0.28
MEAN	15.50	315.55	214.34	231.58	1131.10	0.28
HUB	12.59	327.34	229.21	233.69	1128.82	0.29

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	387.26	281.82	163.36	0.25	4018.13	
MEAN	334.53	260.92	120.19	0.23	3323.00	1.74
HUB	271.77	237.54	42.56	0.21	2886.74	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.77	1.08	6.41	542.81	1.03	534.24	0.92	0.89
MEAN	6.68	1.07	6.33	540.40	1.02	532.10	0.92	0.89
HUB	6.62	1.06	6.24	538.89	1.02	529.96	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.27	35.43	31.50	3.93	0.93	0.46	2.90	
MEAN	42.79	27.43	23.50	3.93	0.94	0.44	3.34	0.89
HUB	44.45	10.32	6.50	3.82	0.94	0.41	4.06	

blockage3	Cor/Incid
0.950	0.977

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	319.619	218.272	233.482	1131.194	0.283	-0.012

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
6.683	6.322	532.185	46.000	43.072	33.000	-10.072

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	245.332	218.272	328.375	1134.905	0.216	0.371

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	6.675	6.461	535.683	440.827	0.042	0.509

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	230.645	0.000	230.645	1135.522	0.203	0.422

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	6.476	536.266	0.000	0.060	0.069	0.413

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.846	6.665	1.068	540.700	11.834	209.170	1.621

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
73602.820	0.491	101.698	243426.609

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
489162.12	675.8823	79.2363	1.5569	0.7933	17.8248	1.1703

NPSS: Vehicle Mach number .730, Altitude 38334ft, dT 22R, Thrust 10%

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*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*****************************************************************

Fan Core + 4 Stage LPC 68.4% RPM  12-20-2010

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.827   EfDer =  0.931

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.812    2412.301       4.216     455.811       1.000       1.000       0.980
 W Kg/sec =  10.8236361

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     77.826    2573.339       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57224.609   18684.477       3.668     831.557     226.700     619.754       2.734

      ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   167.29    -0.06   167.29     0.16   463.27
  MEAN    17.06     0.00    -0.02   167.29    -0.06   167.29     0.16
  HUB     12.51     0.00    -0.02   167.29    -0.06   167.29     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.94    50.47    18.47   434.29   465.45     4.14   453.48     0.45
  MEAN    65.03    47.20    17.83   359.14   396.24     4.14   453.48     0.38
  HUB     57.58    38.62    18.96   263.35   312.04     4.14   453.48     0.30

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   384.29   311.52   225.03  1057.78     0.36
  MEAN    18.04   384.30   309.48   227.83  1054.52     0.36
  HUB     15.00   409.70   337.91   231.67  1050.61     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    434.29   256.34   122.77     0.24  6427.82
  MEAN   379.68   238.40    70.20     0.23  5582.79     1.92
  HUB    315.77   232.72    22.14     0.22  5069.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      4.85     1.15     4.42   477.58     1.05   465.27     0.92     0.85
  MEAN     4.76     1.13     4.34   474.72     1.04   462.40     0.92     0.85
  HUB      4.71     1.12     4.24   472.98     1.04   458.98     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     54.16    28.62    24.20     4.42     0.93     0.56     2.90
  MEAN    53.64    17.13    12.70     4.43     0.95     0.51     3.51     0.85
  HUB     55.57    -5.46    -9.30     3.84     0.95     0.38     4.78

    blockage3   Cor/Incid
       0.950       0.931

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
      18.071     387.072     308.880     233.276    1054.744       0.367       0.002

      Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
       4.767       4.344     462.601      24.000      52.939      35.400     -17.539
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STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	246.720	308.880	395.320	1063.166	0.232	0.553

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	4.752	4.577	470.018	528.796	0.046	0.670

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	230.918	0.000	230.918	1063.878	0.217	0.514

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	4.568	470.647	0.000	0.060	0.117	0.533

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.777	4.721	1.120	475.094	19.282	157.228	1.219

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
119867.625	0.636	161.298	249715.391

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =17.827 EfDer = 0.935

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
23.812	2412.301	4.721	475.094	1.000	1.000	0.980

W Kg/sec = 10.8236361

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
70.966	2520.577	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
57224.609	18684.477	2.857	590.487	206.715	474.134	2.294

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	221.23	-0.08	221.23	0.21	452.01
MEAN	18.08	0.00	-0.02	221.23	-0.08	221.23	0.21	
HUB	15.21	0.00	-0.02	221.23	-0.08	221.23	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.92	46.36	16.56	432.60	485.96	4.58	471.01	0.46
MEAN	59.84	42.30	17.54	380.57	440.27	4.58	471.01	0.41
HUB	55.36	37.84	17.52	320.19	389.25	4.58	471.01	0.37

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	352.93	266.47	231.41	1077.89	0.33
MEAN	18.01	348.48	258.52	233.68	1075.21	0.32
HUB	15.22	364.39	277.40	236.28	1072.51	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	429.87	283.28	163.40	0.26	5442.91	
MEAN	379.13	262.97	120.61	0.24	4657.36	1.85
HUB	320.46	240.17	43.06	0.22	4224.08	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	5.29	1.12	4.91	493.53	1.04	483.14	0.92	0.86
MEAN	5.21	1.10	4.84	490.87	1.03	480.74	0.92	0.86
HUB	5.16	1.09	4.76	489.40	1.03	478.33	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	49.03	35.23	31.50	3.73	0.93	0.51	2.90	
MEAN	47.89	27.30	23.50	3.80	0.95	0.49	3.30	0.86
HUB	49.58	10.33	6.50	3.83	0.95	0.47	3.92	

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   blockage3   Cor/Incid
      0.950       0.935

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     351.753     259.249     237.740    1075.443       0.327       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.215       4.842     480.947      46.000      47.478      30.600     -16.878

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     240.481     259.249     353.611    1081.569       0.222       0.497

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.203       5.027     486.442     511.151       0.040       0.569

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.823     238.383       0.000     238.383    1081.662       0.220       0.424

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.003     486.525       0.000       0.060       0.113       0.434

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.784       5.176       1.096     491.263      16.170     173.855       1.348

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 100528.281       0.544     135.275  226051.516


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.827   EfDer =  0.955

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.812    2412.301       5.176     491.263       1.000       1.000       0.980
W Kg/sec =  10.8236361

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     65.820    2478.748       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57224.609   18684.477       2.845     545.479     191.727     429.765       2.242

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   225.91    -0.08   225.91     0.21   434.12
 MEAN    17.74     0.00    -0.02   225.91    -0.08   225.91     0.21
 HUB     15.05     0.00    -0.02   225.91    -0.08   225.91     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.87    46.36    15.51   422.50   479.17     5.02   487.01     0.44
 MEAN    58.83    43.40    15.43   373.42   436.50     5.02   487.01     0.40
 HUB     54.52    38.84    15.68   316.82   389.18     5.02   487.01     0.36

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   343.97   250.37   235.86  1094.54     0.31
 MEAN    17.51   341.94   245.58   237.94  1092.21     0.31
 HUB     14.85   360.40   268.60   240.29  1089.86     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    417.03   288.80   166.66     0.26  4961.36
 MEAN   368.54   267.83   122.96     0.25  4300.57     1.79
 HUB    312.61   244.29    44.01     0.22  3989.95
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      5.74     1.11     5.36   508.06     1.03   498.20     0.92     0.87
MEAN     5.66     1.09     5.29   505.83     1.03   496.08     0.92     0.87
HUB      5.62     1.09     5.21   504.77     1.03   493.95     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.71    35.24    31.50     3.74     0.93     0.49     2.90
MEAN    45.91    27.33    23.50     3.83     0.95     0.47     3.28     0.87
HUB     48.18    10.38     6.50     3.88     0.95     0.46     3.87

  blockage3   Cor/Incid
     0.950       0.955

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     345.105     247.187     240.824    1092.448       0.316       0.007

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     5.669       5.290     496.292      46.000      45.747      31.500     -14.247

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     246.838     247.187     349.329    1097.772       0.225       0.462

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       5.660       5.464     501.141     471.992       0.032       0.543

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    17.121     240.635       0.000     240.635    1098.048       0.219       0.414

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       5.450     501.394       0.000       0.060       0.096       0.425

   STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.811       5.636       1.089     506.221      14.958     179.004       1.388

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93001.711       0.535     125.147  224344.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.827   EfDer =  0.968

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     23.812    2412.301       5.636     506.221       1.000       1.000       0.980
W Kg/sec =  10.8236361

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     61.357    2441.852       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57224.609   18684.477       2.872     513.330     178.731     401.059       2.244

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   227.06    -0.08   227.06     0.21   410.40
 MEAN    16.97     0.00    -0.02   227.06    -0.08   227.06     0.21
 HUB     14.32     0.00    -0.02   227.06    -0.08   227.06     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.75    46.36    14.39   405.45   464.77     5.47   501.92     0.42
 MEAN    57.57    43.80    13.77   357.26   423.37     5.47   501.92     0.39
 HUB     53.02    37.84    15.18   301.45   377.46     5.47   501.92     0.34

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	329.97	230.64	235.97	1109.47	0.30
MEAN	16.57	328.15	226.05	237.87	1107.34	0.30
HUB	13.89	345.62	248.70	240.00	1105.20	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	397.45	288.97	166.80	0.26	4356.08	
MEAN	348.90	267.72	122.85	0.24	3747.90	1.74
HUB	292.40	243.95	43.70	0.22	3455.58	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.16	1.09	5.79	520.97	1.03	511.89	0.92	0.89
MEAN	6.09	1.08	5.73	518.91	1.03	509.93	0.92	0.89
HUB	6.05	1.07	5.65	517.92	1.02	507.96	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.35	35.26	31.50	3.76	0.93	0.46	2.90	
MEAN	43.54	27.31	23.50	3.81	0.94	0.45	3.29	0.89
HUB	46.02	10.32	6.50	3.82	0.94	0.44	3.90	

blockage3	Cor/Incid
0.950	0.968

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	325.958	227.324	233.607	1107.857	0.294	0.037

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
6.095	5.739	510.410	46.000	44.219	32.400	-11.819

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	242.980	227.324	332.739	1112.120	0.218	0.443

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	6.089	5.890	514.345	456.573	0.025	0.523

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	232.001	0.000	232.001	1112.590	0.209	0.396

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.887	514.780	0.000	0.060	0.080	0.436

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.830	6.069	1.077	519.267	13.046	192.879	1.495

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
81124.805	0.514	109.165	229280.578

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =17.827 EfDer = 0.979

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
23.812	2412.301	6.069	519.267	1.000	1.000	0.980

W Kg/sec = 10.8236361

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
57.711	2410.983	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
57224.609	18684.477	3.032	509.668	168.111	390.276	2.322

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	217.36	-0.07	217.36	0.20	385.44
MEAN	15.91	0.00	-0.02	217.36	-0.07	217.36	0.20	
HUB	13.07	0.00	-0.02	217.36	-0.07	217.36	0.20	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.60	47.36	13.24	385.66	442.76	5.91	515.33	0.40
MEAN	57.03	44.80	12.23	334.99	399.39	5.91	515.33	0.36
HUB	51.70	38.84	12.86	275.14	350.70	5.91	515.33	0.32

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	313.29	216.89	226.07	1122.77	0.28
MEAN	15.50	308.54	207.98	227.91	1120.61	0.28
HUB	12.59	320.42	223.19	229.91	1118.44	0.29

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	377.66	277.41	160.77	0.25	3892.34	
MEAN	326.24	256.77	118.27	0.23	3224.32	1.73
HUB	265.04	233.69	41.85	0.21	2810.89	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.56	1.08	6.22	532.44	1.03	524.26	0.92	0.90
MEAN	6.48	1.07	6.14	530.18	1.02	522.25	0.92	0.90
HUB	6.42	1.06	6.07	528.78	1.02	520.22	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.81	35.42	31.50	3.92	0.93	0.46	2.90	
MEAN	42.38	27.43	23.50	3.93	0.94	0.43	3.34	0.90
HUB	44.15	10.32	6.50	3.82	0.94	0.41	4.06	

blockage3	Cor/Incid
0.950	0.979

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	312.489	211.790	229.770	1120.697	0.279	-0.012

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
6.482	6.141	522.330	46.000	42.668	33.000	-9.668

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	241.582	211.790	321.273	1124.205	0.215	0.365

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	6.475	6.270	525.605	440.827	0.040	0.502

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	227.113	0.000	227.113	1124.809	0.202	0.417

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	6.284	526.170	0.000	0.060	0.067	0.408

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.848	6.466	1.065	530.470	11.203	210.777	1.634

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
69671.578	0.488	93.753	240253.609

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
464194.00	624.6370	77.8263	1.5335	0.7949	17.8275	1.1638

NPSS: Vehicle Mach number .714, Altitude 37357ft, dT 22R, Thrust 10%

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*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*****************************************************************

Fan Core + 4 Stage LPC 68% RPM  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.818   EfDer =  0.932

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.497    2391.282       4.355     453.909       1.000       1.000       0.980
 W Kg/sec =  11.1347723

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     77.357    2556.257       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  56760.699   19221.580       3.690     831.557     225.331     619.754       2.750

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   165.90    -0.06   165.90     0.16   460.19
  MEAN    17.06     0.00    -0.02   165.90    -0.06   165.90     0.16
  HUB     12.51     0.00    -0.02   165.90    -0.06   165.90     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.93    50.47    18.46   430.50   461.42     4.28   451.61     0.44
  MEAN    65.02    47.20    17.82   356.01   392.82     4.28   451.61     0.38
  HUB     57.57    38.62    18.95   261.06   309.36     4.28   451.61     0.30

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   381.00   308.70   223.29  1055.43     0.36
  MEAN    18.04   381.02   306.73   226.04  1052.22     0.36
  HUB     15.00   406.21   334.97   229.79  1048.38     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    430.50   254.35   121.80     0.24  6369.74
  MEAN   376.37   236.53    69.65     0.22  5533.10     1.92
  HUB    313.02   230.84    21.95     0.22  5025.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      5.00     1.15     4.57   475.29     1.05   463.19     0.92     0.85
  MEAN     4.91     1.13     4.48   472.48     1.04   460.38     0.92     0.85
  HUB      4.86     1.12     4.38   470.78     1.04   457.02     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     54.12    28.61    24.20     4.41     0.93     0.56     2.90
  MEAN    53.61    17.12    12.70     4.42     0.95     0.51     3.51     0.85
  HUB     55.55    -5.46    -9.30     3.84     0.95     0.38     4.78

   blockage3   Cor/Incid
      0.950       0.932

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     383.772     306.131     231.441    1052.441       0.365       0.002

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      4.916       4.484     460.571      24.000      52.910      35.400     -17.510
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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth          Machth      cp 2-Th
     18.071     244.899     306.131     392.035    1060.727       0.231       0.552

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       4.900       4.721     467.852     528.796       0.046       0.669

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     18.083     229.206       0.000     229.206    1061.430       0.216       0.514

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       4.713     468.472       0.000       0.060       0.117       0.533

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.777       4.868        1.118     472.853      18.944     157.285       1.219

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 117765.969       0.635     163.026  257676.047


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.818   EfDer =  0.935

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     24.497    2391.282       4.868     472.853       1.000       1.000       0.980
W Kg/sec =  11.1347723

   W cor      RPM cor        GAMMA        Cp          R           Blades       THK
     70.623    2504.528       1.401       0.248      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1       A*        AthrRotor   ChokeMargin
  56760.699   19221.580       2.870     590.487     205.715     474.134       2.305

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   219.59    -0.08   219.59     0.21   449.13
 MEAN    18.08     0.00    -0.02   219.59    -0.08   219.59     0.21
 HUB     15.21     0.00    -0.02   219.59    -0.08   219.59     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.89    46.36    16.53   428.83   481.86     4.73   468.83     0.45
 MEAN    59.80    42.30    17.50   377.25   436.58     4.73   468.83     0.41
 HUB     55.33    37.84    17.49   317.40   386.02     4.73   468.83     0.36

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   349.93   263.87   229.83  1075.22     0.33
 MEAN    18.01   345.59   256.09   232.06  1072.59     0.32
 HUB     15.22   361.42   274.92   234.61  1069.93     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    426.12   281.34   162.26     0.26  5389.69
 MEAN   375.83   261.13   119.74     0.24  4613.58     1.85
 HUB    317.67   238.47    42.75     0.22  4186.28

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      5.45     1.12     5.06   490.95     1.04   480.74     0.92     0.86
 MEAN     5.36     1.10     4.99   488.34     1.03   478.38     0.92     0.86
 HUB      5.31     1.09     4.91   486.91     1.03   476.01     0.92     0.86

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.94    35.22    31.50     3.72     0.93     0.51     2.90
 MEAN    47.82    27.29    23.50     3.79     0.95     0.49     3.30     0.86
 HUB     49.52    10.33     6.50     3.83     0.95     0.47     3.92
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   blockage3   Cor/Incid
      0.950       0.935

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     348.841     256.811     236.090    1072.812       0.325       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.371       4.991     478.584      46.000      47.407      30.600     -16.807

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     238.897     256.811     350.748    1078.834       0.221       0.496

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.360       5.180     483.972     511.151       0.039       0.568

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     236.798       0.000     236.798    1078.927       0.219       0.423

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.155     484.055       0.000       0.060       0.113       0.433

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.785       5.331       1.095     488.731      15.878     174.063       1.349

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98714.586       0.544     136.653  233332.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.818   EfDer =  0.955

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.497    2391.282       5.331     488.731       1.000       1.000       0.980
W Kg/sec =  11.1347723

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     65.564    2463.509       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  56760.699   19221.580       2.856     545.479     190.981     429.765       2.250

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   224.41    -0.08   224.41     0.21   431.46
 MEAN    17.74     0.00    -0.02   224.41    -0.08   224.41     0.21
 HUB     15.05     0.00    -0.02   224.41    -0.08   224.41     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.82    46.36    15.46   418.82   475.22     5.17   484.53     0.44
 MEAN    58.78    43.40    15.38   370.16   432.94     5.17   484.53     0.40
 HUB     54.46    38.84    15.62   314.06   386.06     5.17   484.53     0.36

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   341.09   247.77   234.43  1091.60     0.31
 MEAN    17.51   339.18   243.16   236.46  1089.31     0.31
 HUB     14.85   357.58   266.19   238.77  1087.00     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.39   287.03   165.63     0.26  4909.78
 MEAN   365.32   266.15   122.16     0.24  4258.30     1.79
 HUB    309.89   242.73    43.70     0.22  3954.10
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      5.90     1.11     5.51   505.21     1.03   495.51     0.92     0.87
MEAN     5.82     1.09     5.44   503.02     1.03   493.43     0.92     0.87
HUB      5.79     1.09     5.37   502.00     1.03   491.34     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.58    35.24    31.50     3.74     0.93     0.49     2.90
MEAN    45.80    27.32    23.50     3.82     0.95     0.47     3.28     0.87
HUB     48.11    10.37     6.50     3.87     0.95     0.46     3.87

  blockage3   Cor/Incid
     0.950       0.955

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     342.322     244.758     239.328    1089.544       0.314       0.007

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     5.833       5.447     493.642      46.000      45.643      31.500     -14.143

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     245.386     244.758     346.584    1094.773       0.224       0.460

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       5.824       5.624     498.392     471.992       0.032       0.541

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    17.121     239.204       0.000     239.204    1095.047       0.218       0.413

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       5.610     498.642       0.000       0.060       0.095       0.424

   STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.811       5.799       1.088     503.413      14.682     179.338       1.390

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91289.070       0.534     126.373  231651.781


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.818   EfDer =  0.969

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.497    2391.282       5.799     503.413       1.000       1.000       0.980
W Kg/sec =  11.1347723

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     61.172    2427.319       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  56760.699   19221.580       2.881     513.330     178.189     401.059       2.251

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   225.72    -0.08   225.72     0.21   407.96
 MEAN    16.97     0.00    -0.02   225.72    -0.08   225.72     0.21
 HUB     14.32     0.00    -0.02   225.72    -0.08   225.72     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.69    46.36    14.33   401.92   461.03     5.63   499.17     0.42
 MEAN    57.49    43.80    13.69   354.14   420.02     5.63   499.17     0.38
 HUB     52.94    37.84    15.10   298.83   374.56     5.63   499.17     0.34

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	327.28	228.11	234.68	1106.28	0.30
MEAN	16.57	325.57	223.70	236.55	1104.19	0.29
HUB	13.89	343.01	246.39	238.63	1102.09	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	393.99	287.38	165.87	0.26	4308.27	
MEAN	345.86	266.23	122.16	0.24	3708.95	1.74
HUB	289.85	242.56	43.46	0.22	3423.47	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.33	1.09	5.96	517.87	1.03	508.94	0.92	0.89
MEAN	6.26	1.08	5.89	515.86	1.02	507.02	0.92	0.89
HUB	6.22	1.07	5.82	514.90	1.02	505.09	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.19	35.25	31.50	3.75	0.93	0.46	2.90	
MEAN	43.40	27.31	23.50	3.81	0.94	0.45	3.29	0.89
HUB	45.92	10.32	6.50	3.82	0.94	0.44	3.90	

blockage3	Cor/Incid
0.950	0.969

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	323.381	224.961	232.309	1104.705	0.293	0.037

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
6.265	5.903	507.493	46.000	44.079	32.400	-11.679

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	241.699	224.961	330.191	1108.886	0.218	0.441

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	6.260	6.056	511.342	456.573	0.025	0.521

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	230.765	0.000	230.765	1109.353	0.208	0.394

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	6.054	511.772	0.000	0.060	0.079	0.435

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.831	6.239	1.076	516.212	12.799	193.379	1.499

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
79591.383	0.513	110.180	236822.812

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =17.818 EfDer = 0.979

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
24.497	2391.282	6.239	516.212	1.000	1.000	0.980

W Kg/sec = 11.1347723

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
57.579	2397.038	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
56760.699	19221.580	3.039	509.668	167.725	390.276	2.327

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	216.21	-0.07	216.21	0.19	383.21
MEAN	15.91	0.00	-0.02	216.21	-0.07	216.21	0.19	
HUB	13.07	0.00	-0.02	216.21	-0.07	216.21	0.19	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.51	47.36	13.15	382.30	439.27	6.08	512.32	0.40
MEAN	56.94	44.80	12.14	332.07	396.32	6.08	512.32	0.36
HUB	51.60	38.84	12.76	272.74	348.10	6.08	512.32	0.31

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	310.76	214.39	224.97	1119.37	0.28
MEAN	15.50	306.19	205.74	226.77	1117.25	0.27
HUB	12.59	318.11	221.08	228.73	1115.11	0.29

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	374.37	276.05	159.98	0.25	3847.53	
MEAN	323.40	255.48	117.66	0.23	3189.63	1.72
HUB	262.73	232.49	41.64	0.21	2784.43	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.74	1.08	6.39	529.12	1.03	521.07	0.92	0.90
MEAN	6.65	1.07	6.32	526.92	1.02	519.10	0.92	0.90
HUB	6.60	1.06	6.24	525.56	1.02	517.12	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.62	35.42	31.50	3.92	0.93	0.45	2.90	
MEAN	42.22	27.42	23.50	3.92	0.94	0.43	3.34	0.90
HUB	44.03	10.32	6.50	3.82	0.94	0.41	4.06	

blockage3	Cor/Incid
0.950	0.979

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	310.098	209.511	228.618	1117.335	0.278	-0.012

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
6.658	6.311	519.182	46.000	42.503	33.000	-9.503

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	240.426	209.511	318.903	1120.771	0.215	0.363

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	6.651	6.441	522.380	440.827	0.039	0.499

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	226.023	0.000	226.023	1121.371	0.202	0.414

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	6.456	522.940	0.000	0.060	0.066	0.406

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.849	6.642	1.065	527.199	10.987	211.452	1.639

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
68327.234	0.488	94.587	248226.281

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
455688.25	630.8181	77.3570	1.5253	0.7956	17.8175	1.1615

NPSS: Vehicle Mach number .669, Altitude 34281ft, dT 22R, Thrust 10%

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*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*****************************************************************

Fan Core + 4 Stage LPC 66.5% RPM  12-20-2010

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.772   EfDer =  0.932

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.683    2345.841       4.843     455.824       1.000       1.000       0.980
 W Kg/sec =  12.128727

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     75.921    2502.408       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  55824.570   20937.410       3.760     831.557     221.145     619.754       2.802

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   163.09    -0.06   163.09     0.16   450.50
  MEAN    17.06     0.00    -0.02   163.09    -0.06   163.09     0.16
  HUB     12.51     0.00    -0.02   163.09    -0.06   163.09     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.89    50.47    18.42   422.32   452.77     4.76   453.61     0.43
  MEAN    64.97    47.20    17.77   349.24   385.50     4.76   453.61     0.37
  HUB     57.52    38.62    18.90   256.10   303.66     4.76   453.61     0.29

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   373.92   302.43   219.89  1057.19     0.35
  MEAN    18.04   374.07   300.72   222.48  1054.12     0.35
  HUB     15.00   398.90   328.70   226.01  1050.43     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    422.32   250.45   119.90     0.24  6240.25
  MEAN   369.22   232.79    68.50     0.22  5424.70     1.91
  HUB    307.07   227.04    21.63     0.22  4931.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      5.53     1.14     5.07   476.37     1.05   464.71     0.92     0.85
  MEAN     5.43     1.12     4.98   473.69     1.04   462.02     0.92     0.85
  HUB      5.38     1.11     4.87   472.06     1.04   458.79     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     53.98    28.60    24.20     4.40     0.93     0.56     2.90
  MEAN    53.50    17.11    12.70     4.41     0.95     0.51     3.51     0.85
  HUB     55.49    -5.47    -9.30     3.83     0.95     0.38     4.78

    blockage3   Cor/Incid
       0.950       0.932

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
      18.071     376.789     300.133     227.795    1054.330       0.357       0.002

      Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
       5.440       4.980     462.201      24.000      52.802      35.400     -17.402
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STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	241.406	300.133	385.171	1062.261	0.227	0.551

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	5.424	5.232	469.181	528.796	0.045	0.666

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	225.914	0.000	225.914	1062.944	0.213	0.512

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.223	469.785	0.000	0.060	0.116	0.531

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.778	5.390	1.113	474.042	18.218	157.521	1.221

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
113262.836	0.635	170.788	279643.094

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =17.772 EfDer = 0.936

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
26.683	2345.841	5.390	474.042	1.000	1.000	0.980

W Kg/sec = 12.128727

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
69.572	2453.853	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
55824.570	20937.410	2.914	590.487	202.649	474.134	2.340

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	216.45	-0.07	216.45	0.20	440.04
MEAN	18.08	0.00	-0.02	216.45	-0.07	216.45	0.20	
HUB	15.21	0.00	-0.02	216.45	-0.07	216.45	0.20	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.78	46.36	16.42	420.69	473.17	5.24	470.13	0.44
MEAN	59.68	42.30	17.38	370.09	428.80	5.24	470.13	0.40
HUB	55.20	37.84	17.36	311.37	379.27	5.24	470.13	0.36

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	343.52	257.88	226.95	1076.16	0.32
MEAN	18.01	339.48	250.56	229.05	1073.64	0.32
HUB	15.22	355.26	269.50	231.46	1071.10	0.33

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	418.02	277.77	160.15	0.26	5267.41	
MEAN	368.69	257.72	118.12	0.24	4513.98	1.84
HUB	311.63	235.27	42.13	0.22	4103.77	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.00	1.11	5.59	491.39	1.04	481.55	0.92	0.86
MEAN	5.91	1.10	5.52	488.91	1.03	479.29	0.92	0.86
HUB	5.86	1.09	5.43	487.55	1.03	477.03	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	48.65	35.21	31.50	3.71	0.93	0.51	2.90	
MEAN	47.57	27.28	23.50	3.78	0.95	0.49	3.30	0.86
HUB	49.34	10.32	6.50	3.82	0.95	0.47	3.92	

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   blockage3   Cor/Incid
      0.950       0.936

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     342.697     251.267     233.037    1073.854       0.319       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.922       5.519     479.488      46.000      47.156      30.600     -16.556

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     236.076     251.267     344.771    1079.602       0.219       0.492

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.911       5.717     484.635     511.151       0.038       0.563

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     233.952       0.000     233.952    1079.694       0.217       0.420

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.691     484.718       0.000       0.060       0.111       0.429

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.786       5.881       1.091     489.282      15.241     174.807       1.355

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94761.523       0.542     142.890  253511.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.772   EfDer =  0.957

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.683    2345.841       5.881     489.282       1.000       1.000       0.980
W Kg/sec =  12.128727

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     64.779    2415.333       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  55824.570   20937.410       2.891     545.479     188.690     429.765       2.278

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   221.73    -0.08   221.73     0.21   423.02
 MEAN    17.74     0.00    -0.02   221.73    -0.08   221.73     0.21
 HUB     15.05     0.00    -0.02   221.73    -0.08   221.73     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.65    46.36    15.29   410.86   466.94     5.71   485.18     0.43
 MEAN    58.60    43.40    15.20   363.13   425.54     5.71   485.18     0.39
 HUB     54.27    38.84    15.43   308.09   379.65     5.71   485.18     0.35

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   335.04   241.70   232.01  1091.83     0.31
 MEAN    17.51   333.43   237.59   233.93  1089.65     0.31
 HUB     14.85   351.82   260.82   236.12  1087.45     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    405.54   284.03   163.84     0.26  4789.60
 MEAN   358.38   263.28   120.79     0.24  4160.75     1.78
 HUB    304.00   240.03    43.18     0.22  3874.32
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      6.48     1.10     6.07   505.05     1.03   495.69     0.92     0.88
MEAN     6.40     1.09     6.00   502.98     1.03   493.71     0.92     0.88
HUB      6.36     1.08     5.92   502.04     1.03   491.72     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.17    35.23    31.50     3.73     0.93     0.48     2.90
MEAN    45.44    27.31    23.50     3.81     0.95     0.47     3.28     0.88
HUB     47.85    10.36     6.50     3.86     0.95     0.46     3.87

  blockage3   Cor/Incid
     0.950       0.957

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     336.533     239.150     236.774    1089.873       0.309       0.007

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     6.411       6.000     493.913      46.000      45.286      31.500     -13.786

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     243.018     239.150     340.955    1094.848       0.222       0.454

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       6.402       6.186     498.433     471.992       0.031       0.535

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    17.121     236.850       0.000     236.850    1095.119       0.216       0.408

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       6.171     498.680       0.000       0.060       0.092       0.420

   STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.814       6.376       1.084     503.358      14.075     180.488       1.399

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  87523.867       0.532     131.977  251979.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.772   EfDer =  0.970

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     26.683    2345.841       6.376     503.358       1.000       1.000       0.980
W Kg/sec =  12.128727

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     60.601    2381.323       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  55824.570   20937.410       2.908     513.330     176.524     401.059       2.272

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   223.51    -0.08   223.51     0.20   400.23
MEAN    16.97     0.00    -0.02   223.51    -0.08   223.51     0.20
HUB     14.32     0.00    -0.02   223.51    -0.08   223.51     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.46    46.36    14.10   394.28   453.29     6.19   499.19     0.41
MEAN    57.25    43.80    13.45   347.41   413.16     6.19   499.19     0.38
HUB     52.68    37.84    14.84   293.15   368.70     6.19   499.19     0.34

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	321.69	222.08	232.73	1105.87	0.29
MEAN	16.57	320.34	218.24	234.50	1103.89	0.29
HUB	13.89	337.87	241.33	236.47	1101.89	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	386.50	284.95	164.42	0.26	4194.27	
MEAN	339.29	263.90	121.05	0.24	3618.37	1.72
HUB	284.35	240.36	43.02	0.22	3353.11	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.94	1.09	6.54	517.17	1.03	508.54	0.92	0.89
MEAN	6.86	1.08	6.47	515.27	1.02	506.71	0.92	0.89
HUB	6.82	1.07	6.39	514.40	1.02	504.88	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.66	35.24	31.50	3.74	0.93	0.46	2.90	
MEAN	42.94	27.30	23.50	3.80	0.94	0.44	3.29	0.89
HUB	45.58	10.31	6.50	3.81	0.94	0.43	3.90	

blockage3	Cor/Incid
0.950	0.970

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	318.127	219.466	230.302	1104.388	0.288	0.037

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
6.867	6.482	507.172	46.000	43.620	32.400	-11.220

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	239.824	219.466	325.086	1108.347	0.216	0.433

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	6.861	6.641	510.815	456.573	0.023	0.513

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	228.936	0.000	228.936	1108.808	0.206	0.389

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	6.640	511.241	0.000	0.060	0.076	0.430

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.834	6.840	1.073	515.611	12.253	195.036	1.512

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
76202.234	0.510	114.905	257876.391

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =17.772 EfDer = 0.981

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
26.683	2345.841	6.840	515.611	1.000	1.000	0.980

W Kg/sec = 12.128727

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
57.174	2352.857	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
55824.570	20937.410	3.060	509.668	166.542	390.276	2.343

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	214.50	-0.07	214.50	0.19	376.15
MEAN	15.91	0.00	-0.02	214.50	-0.07	214.50	0.19	
HUB	13.07	0.00	-0.02	214.50	-0.07	214.50	0.19	

```
      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.24    47.36    12.88   375.03   432.11     6.66   511.77     0.39
MEAN    56.64    44.80    11.84   325.76   390.10     6.66   511.77     0.35
HUB     51.29    38.84    12.45   267.56   342.99     6.66   511.77     0.31

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   305.56   208.36   223.49  1118.40     0.27
MEAN    15.50   301.48   200.43   225.20  1116.38     0.27
HUB     12.59   313.69   216.44   227.06  1114.35     0.28

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    367.26   274.22   158.89     0.25  3739.41
MEAN   317.26   253.70   116.83     0.23  3107.35     1.71
HUB    257.73   230.79    41.29     0.21  2725.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      7.37     1.08     6.99   527.92     1.02   520.14     0.92     0.90
MEAN     7.28     1.06     6.92   525.84     1.02   518.26     0.92     0.90
HUB      7.22     1.06     6.83   524.58     1.02   516.38     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.99    35.41    31.50     3.91     0.93     0.45     2.90
MEAN    41.67    27.42    23.50     3.92     0.94     0.43     3.34     0.90
HUB     43.63    10.31     6.50     3.81     0.94     0.40     4.06

  blockage3   Cor/Incid
     0.950       0.981

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    15.219     305.288     204.105     227.029    1116.467       0.273      -0.012

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     7.280       6.911     518.344      46.000      41.956      33.000      -8.956

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    15.219     238.926     204.105     314.236    1119.705       0.213       0.354

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       7.274       7.046     521.355     440.827       0.037       0.490

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
    14.701     224.603       0.000     224.603    1120.299       0.200       0.408

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       7.063     521.909       0.000       0.060       0.063       0.399

   STAGE EXIT CONDITIONS, STAGE   5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.852       7.264       1.062     526.115      10.504     213.682       1.656

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  65330.379       0.484      98.511  270542.188

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    437080.81    659.0707     75.9212      1.4999      0.7980     17.7720      1.1542
```

NPSS: Vehicle Mach number .608, Altitude 30029ft, dT 22R, Thrust 10%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

Fan Core + 4 Stage LPC 64.3% RPM  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.588   EfDer =  0.934

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     29.736    2290.277       5.597     465.619       1.000       1.000       0.980
 W Kg/sec =  13.5162277

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     73.999    2417.302       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54992.988   23332.605       3.858     831.557     215.543     619.754       2.875

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   160.56    -0.06   160.56     0.15   435.18
  MEAN    17.06     0.00    -0.02   160.56    -0.06   160.56     0.15
  HUB     12.51     0.00    -0.02   160.56    -0.06   160.56     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.73    50.47    18.26   412.32   442.53     5.51   463.47     0.42
  MEAN    64.79    47.20    17.59   340.97   376.93     5.51   463.47     0.36
  HUB     57.30    38.62    18.68   250.03   297.19     5.51   463.47     0.28

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   365.53   294.11   217.05  1067.71     0.34
  MEAN    18.04   366.07   293.02   219.43  1064.83     0.34
  HUB     15.00   390.83   321.19   222.68  1061.37     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    412.32   247.15   118.21     0.23  6068.70
  MEAN   360.48   229.56    67.45     0.22  5285.90     1.90
  HUB    299.80   223.70    21.39     0.21  4818.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      6.33     1.13     5.83   485.13     1.04   473.98     0.92     0.85
  MEAN     6.23     1.11     5.74   482.61     1.04   471.43     0.92     0.85
  HUB      6.17     1.10     5.62   481.11     1.03   468.37     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     53.57    28.57    24.20     4.37     0.93     0.56     2.90
  MEAN    53.17    17.09    12.70     4.39     0.95     0.50     3.51     0.85
  HUB     55.27    -5.49    -9.30     3.81     0.95     0.37     4.78

    blockage3   Cor/Incid
       0.950       0.934

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     368.789     292.453     224.671    1065.026       0.346       0.002

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.239       5.742     471.606      24.000      52.467      35.400     -17.067
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STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	238.670	292.453	377.481	1072.445	0.223	0.545

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	6.222	6.011	478.198	528.796	0.042	0.659

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	223.299	0.000	223.299	1073.109	0.208	0.507

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	6.001	478.791	0.000	0.060	0.114	0.526

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.780	6.185	1.105	482.950	17.331	158.399	1.228

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
107761.336	0.634	181.081	306431.938

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =17.588 EfDer = 0.940

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
29.736	2290.277	6.185	482.950	1.000	1.000	0.980

W Kg/sec = 13.5162277

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
68.192	2373.532	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
54992.988	23332.605	2.973	590.487	198.629	474.134	2.387

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	213.96	-0.07	213.96	0.20	425.64
MEAN	18.08	0.00	-0.02	213.96	-0.07	213.96	0.20	
HUB	15.21	0.00	-0.02	213.96	-0.07	213.96	0.20	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.49	46.36	16.13	410.72	463.18	6.02	479.13	0.43
MEAN	59.37	42.30	17.07	361.32	419.98	6.02	479.13	0.39
HUB	54.87	37.84	17.03	303.99	371.80	6.02	479.13	0.35

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	335.96	249.54	224.95	1085.50	0.31
MEAN	18.01	332.50	243.07	226.89	1083.15	0.31
HUB	15.22	348.54	262.66	229.10	1080.78	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	408.12	275.23	158.58	0.25	5097.10	
MEAN	359.95	255.22	116.89	0.24	4378.96	1.82
HUB	304.25	232.85	41.59	0.22	3999.66	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.84	1.11	6.40	499.33	1.03	489.92	0.92	0.86
MEAN	6.74	1.09	6.32	497.03	1.03	487.80	0.92	0.86
HUB	6.69	1.08	6.23	495.81	1.03	485.67	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	47.97	35.18	31.50	3.68	0.93	0.50	2.90	
MEAN	46.97	27.26	23.50	3.76	0.95	0.48	3.30	0.86
HUB	48.90	10.29	6.50	3.79	0.95	0.46	3.92	

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   blockage3   Cor/Incid
      0.950       0.940

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     335.703     243.750     230.831    1083.355       0.310       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.754       6.319     487.990      46.000      46.559      30.600     -15.959

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     234.273     243.750     338.079    1088.694       0.215       0.482

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.743       6.529     492.811     511.151       0.036       0.552

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.823     232.075       0.000     232.075    1088.788       0.213       0.412

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.502     492.897       0.000       0.060       0.107       0.422

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.791       6.711       1.085     497.389      14.439     176.683       1.370

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  89788.820       0.539     150.880  278327.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.588   EfDer =  0.960

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     29.736    2290.277       6.711     497.389       1.000       1.000       0.980
W Kg/sec =  13.5162277

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     63.781    2338.827       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54992.988   23332.605       2.936     545.479     185.782     429.765       2.313

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   219.96    -0.08   219.96     0.20   409.62
 MEAN    17.74     0.00    -0.02   219.96    -0.08   219.96     0.20
 HUB     15.05     0.00    -0.02   219.96    -0.08   219.96     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.27    46.36    14.91   401.13   457.55     6.52   493.35     0.42
 MEAN    58.19    43.40    14.79   354.53   417.29     6.52   493.35     0.38
 HUB     53.83    38.84    14.99   300.80   372.70     6.52   493.35     0.34

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   328.01   233.10   230.76  1100.16     0.30
 MEAN    17.51   327.01   229.93   232.53  1098.14     0.30
 HUB     14.85   345.73   254.01   234.54  1096.09     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    395.93   282.42   162.83     0.26  4619.31
 MEAN   349.89   261.65   119.97     0.24  4026.54     1.75
 HUB    296.80   238.42    42.79     0.22  3773.12
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      7.35     1.09     6.91   512.24     1.03   503.26     0.92     0.88
MEAN     7.26     1.08     6.83   510.33     1.03   501.41     0.92     0.88
HUB      7.23     1.08     6.74   509.52     1.02   499.55     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     45.29    35.21    31.50     3.71     0.93     0.47     2.90
MEAN    44.68    27.29    23.50     3.79     0.95     0.46     3.28     0.88
HUB     47.28    10.34     6.50     3.84     0.95     0.45     3.87

  blockage3   Cor/Incid
     0.950       0.960

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     330.080     231.434     235.354    1098.351       0.301       0.007

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     7.274       6.832     501.608      46.000      44.519      31.500     -13.019

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     241.968     231.434     334.828    1102.944       0.219       0.441

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       7.266       7.026     505.812     471.992       0.028       0.521

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    17.121     235.742       0.000     235.742    1103.214       0.214       0.399

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       7.012     506.060       0.000       0.060       0.087       0.410

   STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.819       7.239       1.079     510.694      13.306     183.056       1.419

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  82747.680       0.528     139.048  277172.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.588   EfDer =  0.974

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     29.736    2290.277       7.239     510.694       1.000       1.000       0.980
W Kg/sec =  13.5162277

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     59.916    2308.158       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54992.988   23332.605       2.941     513.330     174.525     401.059       2.298

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   222.48    -0.08   222.48     0.20   387.93
 MEAN    16.97     0.00    -0.02   222.48    -0.08   222.48     0.20
 HUB     14.32     0.00    -0.02   222.48    -0.08   222.48     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.98    46.36    13.62   384.94   444.67     7.04   506.57     0.40
 MEAN    56.74    43.80    12.94   339.18   405.70     7.04   506.57     0.37
 HUB     52.15    37.84    14.31   286.21   362.56     7.04   506.57     0.33

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	315.35	213.37	232.20	1113.28	0.28
MEAN	16.57	314.69	210.61	233.82	1111.45	0.28
HUB	13.89	332.64	234.78	235.65	1109.60	0.30

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	377.34	284.25	163.97	0.26	4029.98	
MEAN	331.25	263.11	120.64	0.24	3491.91	1.70
HUB	277.61	239.51	42.83	0.22	3262.17	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	7.83	1.08	7.40	523.65	1.03	515.35	0.92	0.89
MEAN	7.75	1.07	7.33	521.92	1.02	513.66	0.92	0.89
HUB	7.71	1.07	7.25	521.18	1.02	511.95	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.58	35.23	31.50	3.73	0.93	0.44	2.90	
MEAN	42.01	27.29	23.50	3.79	0.94	0.43	3.29	0.89
HUB	44.89	10.30	6.50	3.80	0.94	0.42	3.90	

blockage3	Cor/Incid
0.950	0.974

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	312.401	211.794	229.647	1111.935	0.281	0.038

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
7.757	7.343	514.109	46.000	42.684	32.400	-10.284

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	239.491	211.794	319.707	1115.558	0.215	0.418

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	7.753	7.507	517.464	456.573	0.021	0.497

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	228.545	0.000	228.545	1116.018	0.205	0.378

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	7.508	517.891	0.000	0.060	0.070	0.420

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.840	7.731	1.068	522.247	11.553	198.534	1.539

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
71854.359	0.505	120.743	284142.188

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =17.588 EfDer = 0.985

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
29.736	2290.277	7.731	522.247	1.000	1.000	0.980

W Kg/sec = 13.5162277

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
56.732	2282.486	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
54992.988	23332.605	3.084	509.668	165.253	390.276	2.362

ROTOR LEADING EDGE CONDITIONS, STAGE 5

R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP 18.32	0.00	-0.02	214.15	-0.07	214.15	0.19	364.90
MEAN 15.91	0.00	-0.02	214.15	-0.07	214.15	0.19	
HUB 13.07	0.00	-0.02	214.15	-0.07	214.15	0.19	

```
      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.68    47.36    12.32   366.15   424.24     7.54   518.42     0.38
MEAN    56.05    44.80    11.25   318.04   383.48     7.54   518.42     0.34
HUB     50.66    38.84    11.82   261.22   337.84     7.54   518.42     0.30

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   299.75   199.64   223.59  1124.99     0.27
MEAN    15.50   296.55   192.98   225.17  1123.13     0.26
HUB     12.59   309.42   210.39   226.89  1121.25     0.28

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    358.56   274.31   158.92     0.24  3582.92
MEAN   309.74   253.64   116.76     0.23  2991.89     1.68
HUB    251.63   230.61    41.24     0.21  2649.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      8.28     1.07     7.88   533.76     1.02   526.27     0.92     0.90
MEAN     8.19     1.06     7.80   531.86     1.02   524.53     0.92     0.90
HUB      8.14     1.05     7.72   530.76     1.02   522.78     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.76    35.40    31.50     3.90     0.93     0.43     2.90
MEAN    40.60    27.41    23.50     3.91     0.94     0.41     3.34     0.90
HUB     42.84    10.30     6.50     3.80     0.94     0.39     4.06

  blockage3   Cor/Incid
     0.950       0.985

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    15.219     300.236     196.518     226.985    1123.217       0.267      -0.011

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     8.194       7.796     524.611      46.000      40.885      33.000      -7.885

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    15.219     239.165     196.518     309.547    1126.154       0.212       0.337

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       8.189       7.935     527.358     440.827       0.033       0.472

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    14.701     224.802       0.000     224.802    1126.747       0.200       0.394

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       7.955     527.914       0.000       0.060       0.057       0.386

   STAGE EXIT CONDITIONS, STAGE   5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.858       8.179       1.058     532.128       9.881     218.210       1.692

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  61462.891       0.478     103.282  298538.656

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    413615.06    695.0353     73.9994      1.4614      0.8034     17.5884      1.1428
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NPSS: Vehicle Mach number .552 Altitude 25666ft, dT 22R, Thrust 10%

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*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*****************************************************************

Fan Core + 4 Stage LPC 61.9% RPM  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.343   EfDer =  0.937

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.308    2233.031       6.504     476.516       1.000       1.000       0.980
 W Kg/sec =  15.1399994

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     72.156    2329.777       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54246.914   26135.666       3.957     831.557     210.171     619.754       2.949

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   158.29    -0.05   158.29     0.15   419.42
  MEAN    17.06     0.00    -0.02   158.29    -0.05   158.29     0.15
  HUB     12.51     0.00    -0.02   158.29    -0.05   158.29     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.51    50.47    18.04   402.01   432.11     6.40   474.43     0.40
  MEAN    64.54    47.20    17.34   332.45   368.26     6.40   474.43     0.34
  HUB     57.01    38.62    18.39   243.78   290.71     6.40   474.43     0.27

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   357.01   285.36   214.53  1079.33     0.33
  MEAN    18.04   358.01   284.97   216.71  1076.65     0.33
  HUB     15.00   382.81   313.49   219.70  1073.40     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    402.01   244.20   116.65     0.23  5888.15
  MEAN   351.47   226.68    66.50     0.21  5140.60     1.87
  HUB    292.30   220.72    21.18     0.21  4702.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      7.29     1.12     6.76   494.97     1.04   484.34     0.92     0.86
  MEAN     7.19     1.10     6.66   492.63     1.03   481.93     0.92     0.86
  HUB      7.13     1.10     6.53   491.26     1.03   479.03     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     53.06    28.54    24.20     4.34     0.93     0.55     2.90
  MEAN    52.75    17.06    12.70     4.36     0.95     0.50     3.51     0.86
  HUB     54.98    -5.51    -9.30     3.79     0.95     0.36     4.78

   blockage3   Cor/Incid
      0.950       0.937

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     360.731     284.414     221.891    1076.831       0.335       0.001

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.195       6.657     482.095      24.000      52.040      35.400     -16.640
```

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	236.289	284.414	369.762	1083.730	0.218	0.538

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	7.178	6.944	488.293	528.796	0.040	0.650

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	221.009	0.000	221.009	1084.377	0.204	0.502

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	6.935	488.876	0.000	0.060	0.111	0.521

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.784	7.139	1.098	492.950	16.434	159.560	1.237

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
102200.523	0.632	192.368	337077.094

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =17.343 EfDer = 0.943

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
33.308	2233.031	7.139	492.950	1.000	1.000	0.980

W Kg/sec = 15.1399994

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
66.863	2290.611	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
54246.914	26135.666	3.032	590.487	194.755	474.134	2.435

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	211.79	-0.07	211.79	0.20	410.77
MEAN	18.08	0.00	-0.02	211.79	-0.07	211.79	0.20	
HUB	15.21	0.00	-0.02	211.79	-0.07	211.79	0.20	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.13	46.36	15.77	400.46	453.07	6.95	489.21	0.42
MEAN	58.99	42.30	16.69	352.29	411.11	6.95	489.21	0.38
HUB	54.46	37.84	16.62	296.40	364.34	6.95	489.21	0.34

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	328.30	240.70	223.26	1095.93	0.30
MEAN	18.01	325.49	235.17	225.03	1093.76	0.30
HUB	15.22	341.86	255.55	227.07	1091.57	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	397.92	273.06	157.22	0.25	4916.54	
MEAN	350.96	253.08	115.79	0.23	4236.63	1.80
HUB	296.65	230.76	41.10	0.21	3891.35	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	7.83	1.10	7.36	508.36	1.03	499.37	0.92	0.86
MEAN	7.74	1.08	7.27	506.23	1.03	497.39	0.92	0.86
HUB	7.69	1.08	7.18	505.14	1.02	495.40	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	47.15	35.15	31.50	3.65	0.93	0.49	2.90	
MEAN	46.26	27.23	23.50	3.73	0.95	0.47	3.30	0.86
HUB	48.38	10.26	6.50	3.76	0.95	0.46	3.92	

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   blockage3   Cor/Incid
      0.950       0.943

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     328.681     235.825     228.949    1093.955       0.300       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.747       7.276     497.565      46.000      45.848      30.600     -15.248

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     232.794     235.825     331.371    1098.881       0.212       0.471

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       7.736       7.497     502.056     511.151       0.033       0.539

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.823     230.516       0.000     230.516    1098.977       0.210       0.403

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       7.470     502.144       0.000       0.060       0.102       0.413

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.796       7.702       1.079     506.576      13.626     178.985       1.387

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  84743.211       0.535     159.509  306742.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.343   EfDer =  0.964

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.308    2233.031       7.702     506.576       1.000       1.000       0.980
W Kg/sec =  15.1399994

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     62.820    2259.595       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54246.914   26135.666       2.981     545.479     182.980     429.765       2.349

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   218.50    -0.08   218.50     0.20   395.74
 MEAN    17.74     0.00    -0.02   218.50    -0.08   218.50     0.20
 HUB     15.05     0.00    -0.02   218.50    -0.08   218.50     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.81    46.36    14.45   391.10   448.07     7.49   502.59     0.41
 MEAN    57.71    43.40    14.31   345.67   409.00     7.49   502.59     0.37
 HUB     53.32    38.84    14.48   293.28   365.79     7.49   502.59     0.33

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   320.94   224.02   229.82  1109.58     0.29
 MEAN    17.51   320.60   221.86   231.44  1107.72     0.29
 HUB     14.85   339.68   246.90   233.29  1105.83     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    386.04   281.18   162.01     0.25  4439.41
 MEAN   341.15   260.37   119.29     0.24  3885.32     1.73
 HUB    289.38   237.12    42.49     0.21  3667.52
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      8.37     1.09     7.90   520.49     1.03   511.90     0.92     0.88
MEAN     8.29     1.08     7.82   518.75     1.02   510.18     0.92     0.88
HUB      8.25     1.07     7.73   518.07     1.02   508.44     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.27    35.18    31.50     3.68     0.93     0.46     2.90
MEAN    43.79    27.27    23.50     3.77     0.95     0.45     3.28     0.88
HUB     46.62    10.32     6.50     3.82     0.95     0.44     3.87

  blockage3   Cor/Incid
     0.950       0.964

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     323.641     223.315     234.252    1107.920       0.292       0.007

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     8.300       7.823     510.365      46.000      43.631      31.500     -12.131

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     241.245     223.315     328.738    1112.125       0.217       0.426

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       8.293       8.025     514.247     471.992       0.026       0.506

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
    17.121     234.950       0.000     234.950    1112.396       0.211       0.388

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       8.012     514.497       0.000       0.060       0.082       0.400

   STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.825       8.266       1.073     519.101      12.525     186.113       1.443

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  77907.352       0.523     146.642  306044.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.343   EfDer =  0.978

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.308    2233.031       8.266     519.101       1.000       1.000       0.980
W Kg/sec =  15.1399994

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     59.260    2232.168       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54246.914   26135.666       2.974     513.330     172.612     401.059       2.323

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   221.74    -0.08   221.74     0.20   375.16
MEAN    16.97     0.00    -0.02   221.74    -0.08   221.74     0.20
HUB     14.32     0.00    -0.02   221.74    -0.08   221.74     0.20

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.43    46.36    13.07   375.32   435.99     8.04   515.00     0.39
MEAN    56.16    43.80    12.36   330.71   398.23     8.04   515.00     0.36
HUB     51.54    37.84    13.70   279.05   356.49     8.04   515.00     0.32

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	309.04	204.18	231.98	1121.77	0.28
MEAN	16.57	309.10	202.57	233.47	1120.09	0.28
HUB	13.89	327.50	227.96	235.14	1118.40	0.29

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	367.91	283.94	163.73	0.25	3856.43	
MEAN	322.97	262.69	120.41	0.23	3358.62	1.66
HUB	270.67	238.98	42.71	0.21	3167.52	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	8.88	1.07	8.43	531.18	1.02	523.22	0.92	0.89
MEAN	8.80	1.06	8.35	529.62	1.02	521.66	0.92	0.89
HUB	8.77	1.06	8.26	529.03	1.02	520.08	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.35	35.21	31.50	3.71	0.93	0.43	2.90	
MEAN	40.95	27.28	23.50	3.78	0.94	0.42	3.29	0.89
HUB	44.11	10.29	6.50	3.79	0.94	0.41	3.90	

blockage3	Cor/Incid
0.950	0.978

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	306.719	203.706	229.303	1120.564	0.274	0.039

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
8.813	8.366	522.098	46.000	41.617	32.400	-9.217

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	239.488	203.706	314.405	1123.845	0.213	0.400

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	8.809	8.534	525.161	456.573	0.019	0.479

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	228.470	0.000	228.470	1124.305	0.203	0.365

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	8.538	525.591	0.000	0.060	0.064	0.408

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.847	8.788	1.063	529.944	10.843	202.642	1.571

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
67449.977	0.498	126.959	314274.094

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =17.343 EfDer = 0.989

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
33.308	2233.031	8.788	529.944	1.000	1.000	0.980

W Kg/sec = 15.1399994

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
56.318	2209.215	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
54246.914	26135.666	3.107	509.668	164.045	390.276	2.379

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	214.08	-0.07	214.08	0.19	353.18
MEAN	15.91	0.00	-0.02	214.08	-0.07	214.08	0.19	
HUB	13.07	0.00	-0.02	214.08	-0.07	214.08	0.19	

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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.06    47.36    11.70   357.00   416.33     8.57   526.12     0.37
MEAN    55.39    44.80    10.59   310.09   376.88     8.57   526.12     0.34
HUB     49.96    38.84    11.12   254.69   332.77     8.57   526.12     0.30

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   294.00   190.41   224.01  1132.65     0.26
MEAN    15.50   291.70   185.09   225.46  1130.95     0.26
HUB     12.59   305.27   204.06   227.04  1129.23     0.27

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    349.59   274.81   159.18     0.24  3417.32
MEAN   302.00   253.97   116.91     0.22  2869.57     1.64
HUB    245.34   230.76    41.28     0.20  2570.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      9.36     1.07     8.93   540.65     1.02   533.44     0.92     0.90
MEAN     9.27     1.05     8.85   538.93     1.02   531.84     0.92     0.90
HUB      9.22     1.05     8.76   538.00     1.02   530.22     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.37    35.40    31.50     3.90     0.93     0.42     2.90
MEAN    39.38    27.41    23.50     3.91     0.94     0.40     3.34     0.90
HUB     41.95    10.30     6.50     3.80     0.94     0.38     4.06

  blockage3   Cor/Incid
     0.950       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    15.219     295.252     188.480     227.264    1131.038       0.261      -0.011

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     9.273       8.844     531.923      46.000      39.670      33.000      -6.670

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    15.219     239.754     188.480     304.970    1133.668       0.211       0.317

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       9.269       8.985     534.399     440.827       0.029       0.452

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
    14.701     225.330       0.000     225.330    1134.261       0.199       0.378

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       9.008     534.958       0.000       0.060       0.051       0.370

   STAGE EXIT CONDITIONS, STAGE   5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.865       9.260       1.054     539.193       9.248     223.514       1.733

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  57539.148       0.471     108.304  330685.344

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    389840.22    733.7827     72.1560      1.4237      0.8094     17.3431      1.1315
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NPSS: Vehicle Mach number .490, Altitude 20047ft, dT 22R, Thrust 10%

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*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*****************************************************************

Fan Core + 4 Stage LPC 59.4% RPM  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.097   EfDer =  0.939

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.694    2175.917       7.909     491.734       1.000       1.000       0.980
 W Kg/sec =  17.5884094

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     70.026    2234.782       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  53479.402   30362.273       4.077     831.557     203.961     619.754       3.039

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   155.95    -0.05   155.95     0.14   402.32
  MEAN    17.06     0.00    -0.02   155.95    -0.05   155.95     0.14
  HUB     12.51     0.00    -0.02   155.95    -0.05   155.95     0.14

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.30    50.47    17.83   391.73   421.68     7.80   489.71     0.39
  MEAN    64.30    47.20    17.10   323.95   359.58     7.80   489.71     0.33
  HUB     56.72    38.62    18.10   237.55   284.21     7.80   489.71     0.26

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   348.48   276.63   211.93  1095.61     0.32
  MEAN    18.04   349.96   276.98   213.91  1093.13     0.32
  HUB     15.00   374.76   305.80   216.63  1090.10     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    391.73   241.17   115.10     0.22  5708.04
  MEAN   342.48   223.71    65.50     0.20  4996.54     1.85
  HUB    284.83   217.64    20.98     0.20  4587.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      8.78     1.11     8.19   509.16     1.04   499.03     0.92     0.86
  MEAN     8.67     1.10     8.07   506.99     1.03   496.77     0.92     0.86
  HUB      8.61     1.09     7.93   505.74     1.03   494.02     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     52.54    28.51    24.20     4.31     0.93     0.54     2.90
  MEAN    52.32    17.02    12.70     4.32     0.95     0.49     3.51     0.86
  HUB     54.69    -5.53    -9.30     3.77     0.95     0.36     4.78

   blockage3   Cor/Incid
      0.950       0.939

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     352.692     276.442     219.023    1093.294       0.323       0.001

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      8.680       8.075     496.920      24.000      51.610      35.400     -16.210
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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth          Machth      cp 2-Th
     18.071     233.819     276.442     362.066    1099.674       0.213       0.530

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       8.663       8.394     502.736     528.796       0.038       0.642

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     18.083     218.638       0.000     218.638    1100.301       0.199       0.496

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       8.384     503.310       0.000       0.060       0.109       0.515

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.787       8.618        1.090     507.298      15.564     160.732       1.246

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96804.938       0.631     211.680  382159.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.097   EfDer =  0.947

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     38.694     2175.917        8.618     507.298       1.000        1.000       0.980
W Kg/sec =  17.5884094

   W cor       RPM cor         GAMMA         Cp          R            Blades        THK
     65.270     2200.234        1.401       0.248      53.349       56.000        0.050

   CFM        SCFM            A1/A*       Area1       A*        AthrRotor   ChokeMargin
  53479.402   30362.273        3.106     590.487     190.111     474.134        2.494

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1       Stator    Alfa     C1       CU1        Cm1      Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   209.53    -0.07    209.53      0.19   394.56
 MEAN    18.08      0.00    -0.02   209.53    -0.07    209.53      0.19
 HUB     15.21      0.00    -0.02   209.53    -0.07    209.53      0.19

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     61.77     46.36    15.41   390.21   442.97      8.40   503.64      0.40
 MEAN    58.61     42.30    16.31   343.28   402.23      8.40   503.64      0.37
 HUB     54.05     37.84    16.21   288.81   356.87      8.40   503.64      0.32

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     20.42   320.70    231.91    221.51  1111.02      0.29
 MEAN    18.01   318.52    227.32    223.13  1109.02      0.29
 HUB     15.22   335.17    248.44    224.97  1107.00      0.30

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    387.74    270.84    155.84      0.24  4737.04
 MEAN   341.98    250.87    114.67      0.23  4095.24      1.77
 HUB    289.06    228.61     40.62      0.21  3783.13

         Pt2        PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP      9.38      1.09      8.86    521.76      1.03    513.18      0.92      0.87
 MEAN     9.28      1.08      8.76    519.80      1.02    511.34      0.92      0.87
 HUB      9.23      1.07      8.66    518.85      1.02    509.48      0.92      0.87

         Alfa2   Beta FLO Beta BLADE Deviat    Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.31     35.13     31.50      3.63      0.93      0.48      2.90
 MEAN    45.53     27.20     23.50      3.70      0.95      0.46      3.30      0.87
 HUB     47.84     10.23      6.50      3.73      0.95      0.45      3.92
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   blockage3   Cor/Incid
      0.950       0.947

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     321.709     227.953     227.011    1109.199       0.290       0.004

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      9.291       8.764     511.501      46.000      45.119      30.600     -14.519

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     231.263     227.953     324.724    1113.714       0.208       0.459

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       9.280       9.005     515.674     511.151       0.030       0.526

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.823     228.904       0.000     228.904    1113.812       0.206       0.394

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       8.976     515.764       0.000       0.060       0.097       0.404

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.801       9.244       1.073     520.135      12.838     181.374       1.406

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79859.430       0.531     174.626  348435.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.097   EfDer =  0.968

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.694    2175.917       9.244     520.135       1.000       1.000       0.980
W Kg/sec =  17.5884094

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     61.616    2172.913       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  53479.402   30362.273       3.039     545.479     179.471     429.765       2.395

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   217.00    -0.07   217.00     0.19   380.56
 MEAN    17.74     0.00    -0.02   217.00    -0.07   217.00     0.19
 HUB     15.05     0.00    -0.02   217.00    -0.07   217.00     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.35    46.36    13.99   381.10   438.61     9.00   516.21     0.39
 MEAN    57.21    43.40    13.81   336.83   400.74     9.00   516.21     0.36
 HUB     52.80    38.84    13.96   285.78   358.88     9.00   516.21     0.32

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   313.97   214.94   228.86  1123.63     0.28
 MEAN    17.51   314.27   213.80   230.33  1121.93     0.28
 HUB     14.85   333.65   239.79   232.01  1120.21     0.30

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    376.16   279.95   161.22     0.25  4259.49
 MEAN   332.42   259.08   118.62     0.23  3744.19     1.70
 HUB    281.98   235.81    42.19     0.21  3561.99
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      9.98     1.08     9.45   533.14     1.02   524.91     0.92     0.89
MEAN     9.89     1.07     9.36   531.56     1.02   523.33     0.92     0.89
HUB      9.86     1.07     9.27   531.01     1.02   521.72     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.20    35.16    31.50     3.66     0.93     0.45     2.90
MEAN    42.87    27.25    23.50     3.75     0.94     0.43     3.28     0.89
HUB     45.95    10.31     6.50     3.81     0.94     0.43     3.87

  blockage3   Cor/Incid
     0.950       0.968

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     317.272     215.201     233.131    1122.120       0.283       0.007

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     9.902       9.367     523.506      46.000      42.710      31.500     -11.210

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     240.510     215.201     322.733    1125.942       0.214       0.410

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       9.895       9.585     527.078     471.992       0.023       0.490

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    17.121     234.150       0.000     234.150    1126.211       0.208       0.377

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       9.573     527.330       0.000       0.060       0.076       0.388

   STAGE EXIT CONDITIONS, STAGE   3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.832       9.866       1.067     531.903      11.768     189.347       1.468

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  73214.117       0.517     160.094  348315.406


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.097   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.694    2175.917       9.866     531.903       1.000       1.000       0.980
W Kg/sec =  17.5884094

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     58.383    2148.741       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  53479.402   30362.273       3.019     513.330     170.055     401.059       2.358

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   221.00    -0.08   221.00     0.20   361.14
 MEAN    16.97     0.00    -0.02   221.00    -0.08   221.00     0.20
 HUB     14.32     0.00    -0.02   221.00    -0.08   221.00     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.86    46.36    12.50   365.72   427.37     9.60   527.83     0.38
 MEAN    55.56    43.80    11.76   322.25   390.81     9.60   527.83     0.35
 HUB     50.90    37.84    13.06   271.91   350.46     9.60   527.83     0.31

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	302.88	194.96	231.79	1134.87	0.27
MEAN	16.57	303.65	194.55	233.14	1133.35	0.27
HUB	13.89	322.47	221.19	234.65	1131.81	0.28

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	358.50	283.68	163.54	0.25	3682.39	
MEAN	314.71	262.28	120.17	0.23	3225.67	1.63
HUB	263.75	238.48	42.56	0.21	3073.39	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	10.54	1.07	10.03	543.14	1.02	535.49	0.92	0.90
MEAN	10.45	1.06	9.94	541.75	1.02	534.06	0.92	0.90
HUB	10.42	1.06	9.85	541.28	1.02	532.61	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.07	35.20	31.50	3.70	0.93	0.41	2.90	
MEAN	39.84	27.27	23.50	3.77	0.94	0.40	3.29	0.90
HUB	43.31	10.28	6.50	3.78	0.94	0.40	3.90	

blockage3	Cor/Incid
0.950	0.982

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	301.183	195.640	228.989	1133.812	0.266	0.040

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
10.464	9.963	534.492	46.000	40.509	32.400	-8.109

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	239.521	195.640	309.266	1136.757	0.211	0.382

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	10.461	10.142	537.273	456.573	0.017	0.460

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	228.436	0.000	228.436	1137.215	0.201	0.351

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	10.149	537.705	0.000	0.060	0.058	0.395

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.854	10.439	1.058	542.058	10.155	207.026	1.605

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
63185.410	0.492	138.165	358310.688

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =17.097 EfDer = 0.992

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
38.694	2175.917	10.439	542.058	1.000	1.000	0.980

W Kg/sec = 17.5884094

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
55.703	2128.519	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
53479.402	30362.273	3.141	509.668	162.251	390.276	2.405

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	214.06	-0.07	214.06	0.19	340.28
MEAN	15.91	0.00	-0.02	214.06	-0.07	214.06	0.19	
HUB	13.07	0.00	-0.02	214.06	-0.07	214.06	0.19	

```
      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.40    47.36    11.04   347.87   408.52    10.18   538.24     0.36
MEAN    54.69    44.80     9.89   302.16   370.37    10.18   538.24     0.33
HUB     49.23    38.84    10.39   248.18   327.80    10.18   538.24     0.29

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   288.48   181.15   224.51  1144.92     0.25
MEAN    15.50   287.04   177.18   225.82  1143.38     0.25
HUB     12.59   301.24   197.73   227.26  1141.82     0.26

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    340.65   275.40   159.51     0.24  3251.11
MEAN   294.28   254.38   117.09     0.22  2747.09     1.61
HUB    239.06   230.99    41.34     0.20  2490.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     11.06     1.06    10.58   551.98     1.02   545.04     0.92     0.91
MEAN    10.96     1.05    10.49   550.44     1.02   543.57     0.92     0.91
HUB     10.91     1.05    10.39   549.66     1.01   542.09     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.90    35.39    31.50     3.89     0.93     0.40     2.90
MEAN    38.12    27.41    23.50     3.91     0.94     0.38     3.34     0.91
HUB     41.02    10.31     6.50     3.81     0.94     0.37     4.06

  blockage3   Cor/Incid
     0.950       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    15.219     290.460     180.432     227.620    1143.470       0.254      -0.010

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
    10.966      10.484     543.656      46.000      38.404      33.000      -5.404

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    15.219     240.434     180.432     300.607    1145.797       0.210       0.295

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950      10.963      10.632     545.871     440.827       0.025       0.432

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
    14.701     225.950       0.000     225.950    1146.388       0.197       0.360

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      10.660     546.435       0.000       0.060       0.046       0.353

   STAGE EXIT CONDITIONS, STAGE   5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.870      10.953       1.049     550.693       8.635     229.252       1.777

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  53735.012       0.463     117.500  377602.969

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    366798.91    802.0649     70.0257      1.3849      0.8153     17.0975      1.1199
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NPSS: Vehicle Mach number .446, Altitude 15435ft, dT 22R, Thrust 10%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

Fan Core + 4 Stage LPC 57% RPM  12-20-2010

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.231   EfDer =  0.938

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      42.897    2115.958       9.306     504.972       1.000       1.000       0.980
 W Kg/sec =  19.4987736

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
      66.858    2144.528       1.401       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51743.078   33660.070       4.270     831.557     194.732     619.754       3.183

      ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   150.74    -0.05   150.74     0.14   386.07
  MEAN    17.06     0.00    -0.02   150.74    -0.05   150.74     0.14
  HUB     12.51     0.00    -0.02   150.74    -0.05   150.74     0.14

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.41    50.47    17.94   380.94   409.73     9.18   503.08     0.37
  MEAN    64.43    47.20    17.23   315.02   349.28     9.18   503.08     0.32
  HUB     56.88    38.62    18.26   231.00   275.88     9.18   503.08     0.25

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   338.76   269.39   205.39  1109.68     0.31
  MEAN    18.04   339.97   269.58   207.14  1107.36     0.31
  HUB     15.00   363.70   297.26   209.55  1104.54     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    380.94   233.72   111.54     0.21  5558.65
  MEAN   333.04   216.64    63.46     0.20  4863.08     1.86
  HUB    276.98   210.53    20.28     0.19  4459.57

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     10.25     1.10     9.61   521.47     1.03   511.90     0.92     0.86
  MEAN    10.13     1.09     9.49   519.41     1.03   509.76     0.92     0.86
  HUB     10.06     1.08     9.33   518.21     1.03   507.17     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     52.68    28.51    24.20     4.31     0.93     0.54     2.90
  MEAN    52.46    17.03    12.70     4.33     0.95     0.49     3.51     0.86
  HUB     54.82    -5.53    -9.30     3.77     0.95     0.36     4.78

    blockage3   Cor/Incid
       0.950       0.938

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
      18.071     342.601     269.059     212.091    1107.512       0.309       0.001

      Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      10.138       9.487     509.903      24.000      51.752      35.400     -16.352
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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth          Machth      cp 2-Th
     18.071     226.881     269.059     351.948    1113.467       0.204       0.533

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      10.120       9.831     515.401     528.796       0.036       0.643

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     18.083     212.146       0.000     212.146    1114.050       0.190       0.496

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       9.820     515.941       0.000       0.060       0.110       0.515

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.785      10.071       1.082     519.697      14.725     160.167       1.242

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91607.359       0.631     222.071  414914.406


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.231   EfDer =  0.946

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     42.897    2115.958      10.071     519.697       1.000       1.000       0.980
W Kg/sec =  19.4987736

   W cor      RPM cor        GAMMA        Cp          R           Blades       THK
     62.672    2113.929       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51743.078   33660.070       3.235     590.487     182.541     474.134       2.597

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   203.34    -0.07   203.34     0.18   379.09
 MEAN    18.08     0.00    -0.02   203.34    -0.07   203.34     0.18
 HUB     15.21     0.00    -0.02   203.34    -0.07   203.34     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.82    46.36    15.46   379.46   430.57     9.84   516.25     0.39
 MEAN    58.66    42.30    16.36   333.82   390.93     9.84   516.25     0.35
 HUB     54.10    37.84    16.26   280.86   346.79     9.84   516.25     0.31

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   311.94   225.48   215.56  1124.03     0.28
 MEAN    18.01   309.78   221.07   217.00  1122.17     0.28
 HUB     15.22   325.88   241.63   218.66  1120.29     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    377.06   263.53   151.58     0.23  4605.66
 MEAN   332.56   243.97   111.49     0.22  3982.72     1.77
 HUB    281.10   222.19    39.46     0.20  3679.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     10.90     1.08    10.33   533.37     1.03   525.25     0.92     0.87
 MEAN    10.78     1.07    10.22   531.52     1.02   523.51     0.92     0.87
 HUB     10.73     1.06    10.11   530.62     1.02   521.76     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.29    35.11    31.50     3.61     0.93     0.48     2.90
 MEAN    45.53    27.19    23.50     3.69     0.95     0.46     3.30     0.87
 HUB     47.86    10.23     6.50     3.73     0.95     0.45     3.92
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   blockage3   Cor/Incid
      0.950       0.946

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     312.876     221.690     220.783    1122.337       0.279       0.004

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     10.795      10.227     523.666      46.000      45.117      30.600     -14.517

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     225.244     221.690     316.040    1126.545       0.200       0.458

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      10.784      10.487     527.601     511.151       0.029       0.525

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     222.902       0.000     222.902    1126.639       0.198       0.393

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.455     527.688       0.000       0.060       0.097       0.403

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.801      10.744       1.067     531.834      12.137     181.186       1.405

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  75519.141       0.531     183.071  378816.094


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.231   EfDer =  0.968

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.897    2115.958      10.744     531.834       1.000       1.000       0.980
W Kg/sec =  19.4987736

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     59.428    2089.668       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51743.078   33660.070       3.151     545.479     173.095     429.765       2.483

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   211.34    -0.07   211.34     0.19   365.98
 MEAN    17.74     0.00    -0.02   211.34    -0.07   211.34     0.19
 HUB     15.05     0.00    -0.02   211.34    -0.07   211.34     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.31    46.36    13.95   370.60   426.69    10.48   528.11     0.38
 MEAN    57.17    43.40    13.77   327.54   389.87    10.48   528.11     0.35
 HUB     52.75    38.84    13.91   277.90   349.19    10.48   528.11     0.31

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   305.58   208.42   223.47  1135.77     0.27
 MEAN    17.51   305.94   207.53   224.79  1134.19     0.27
 HUB     14.85   324.85   233.07   226.29  1132.60     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    365.80   273.32   157.37     0.24  4130.32
 MEAN   323.26   252.83   115.73     0.22  3634.48     1.69
 HUB    274.21   230.00    41.14     0.20  3462.23
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     11.53     1.07    10.96   544.09     1.02   536.30     0.92     0.89
MEAN    11.43     1.06    10.87   542.62     1.02   534.81     0.92     0.89
HUB     11.40     1.06    10.77   542.11     1.02   533.30     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.00    35.15    31.50     3.65     0.93     0.44     2.90
MEAN    42.71    27.24    23.50     3.74     0.94     0.43     3.28     0.89
HUB     45.85    10.30     6.50     3.80     0.94     0.43     3.87

  blockage3   Cor/Incid
     0.950       0.968

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     308.872     208.895     227.519    1134.375       0.272       0.007

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
    11.449      10.873     534.981      46.000      42.556      31.500     -11.056

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     235.021     208.895     314.439    1137.922       0.207       0.408

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950      11.442      11.106     538.332     471.992       0.022       0.486

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
    17.121     228.777       0.000     228.777    1138.177       0.201       0.374

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      11.093     538.573       0.000       0.060       0.075       0.386

   STAGE EXIT CONDITIONS, STAGE   3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.832      11.411       1.062     542.940      11.106     189.744       1.471

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  69112.211       0.517     167.539  379277.906


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.231   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.897    2115.958      11.411     542.940       1.000       1.000       0.980
W Kg/sec =  19.4987736

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     56.540    2068.185       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51743.078   33660.070       3.117     513.330     164.684     401.059       2.435

    ROTOR LEADING EDGE CONDITIONS, STAGE   4

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   215.97    -0.07   215.97     0.19   347.60
MEAN    16.97     0.00    -0.02   215.97    -0.07   215.97     0.19
HUB     14.32     0.00    -0.02   215.97    -0.07   215.97     0.19

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.74    46.36    12.38   355.64   416.14    11.13   539.05     0.37
MEAN    55.43    43.80    11.63   313.37   380.64    11.13   539.05     0.33
HUB     50.77    37.84    12.93   264.42   341.47    11.13   539.05     0.30

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	295.09	188.51	227.02	1146.23	0.26
MEAN	16.57	295.95	188.41	228.23	1144.82	0.26
HUB	13.89	314.43	214.83	229.59	1143.40	0.27

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	348.62	277.81	160.11	0.24	3560.51	
MEAN	306.04	256.76	117.63	0.22	3124.00	1.63
HUB	256.48	233.34	41.65	0.20	2985.09	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	12.12	1.06	11.58	553.50	1.02	546.24	0.92	0.90
MEAN	12.03	1.05	11.49	552.21	1.02	544.90	0.92	0.90
HUB	12.01	1.05	11.39	551.80	1.02	543.55	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.70	35.19	31.50	3.69	0.93	0.41	2.90	
MEAN	39.54	27.27	23.50	3.77	0.94	0.40	3.29	0.90
HUB	43.10	10.28	6.50	3.78	0.94	0.40	3.90	

blockage3	Cor/Incid
0.950	0.983

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	293.532	189.473	224.190	1145.257	0.256	0.040

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
12.049	11.510	545.317	46.000	40.203	32.400	-7.803

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	234.748	189.473	301.673	1147.974	0.204	0.376

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	12.046	11.699	547.907	456.573	0.016	0.455

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	223.873	0.000	223.873	1148.410	0.195	0.346

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	11.707	548.323	0.000	0.060	0.057	0.391

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.855	12.022	1.054	552.504	9.564	208.125	1.613

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
59524.824	0.490	144.298	390720.344

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =17.231 EfDer = 0.993

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
42.897	2115.958	12.022	552.504	1.000	1.000	0.980

W Kg/sec = 19.4987736

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
54.135	2050.207	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
51743.078	33660.070	3.232	509.668	157.681	390.276	2.475

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	209.82	-0.07	209.82	0.18	327.76
MEAN	15.91	0.00	-0.02	209.82	-0.07	209.82	0.18	
HUB	13.07	0.00	-0.02	209.82	-0.07	209.82	0.18	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.20	47.36	10.84	338.28	398.13	11.75	548.83	0.35
MEAN	54.48	44.80	9.68	293.84	361.12	11.75	548.83	0.31
HUB	49.01	38.84	10.17	241.34	319.85	11.75	548.83	0.28

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	281.28	174.64	220.50	1155.57	0.24
MEAN	15.50	280.11	171.23	221.69	1154.15	0.24
HUB	12.59	294.22	191.95	222.98	1152.71	0.26

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	331.27	270.47	156.63	0.23	3134.35	
MEAN	286.17	249.71	114.94	0.22	2654.77	1.60
HUB	232.48	226.63	40.52	0.20	2417.65	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	12.68	1.05	12.16	561.80	1.02	555.20	0.92	0.91
MEAN	12.57	1.05	12.07	560.38	1.01	553.84	0.92	0.91
HUB	12.52	1.04	11.97	559.68	1.01	552.46	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.38	35.39	31.50	3.89	0.93	0.40	2.90	
MEAN	37.68	27.41	23.50	3.91	0.94	0.38	3.34	0.91
HUB	40.72	10.30	6.50	3.80	0.94	0.36	4.06	

blockage3	Cor/Incid
0.950	0.993

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	283.424	174.367	223.439	1154.234	0.246	-0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
12.581	12.064	553.920	46.000	37.968	33.000	-4.968

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	236.222	174.367	293.606	1156.364	0.204	0.288

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	12.580	12.219	555.966	440.827	0.024	0.424

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	222.009	0.000	222.009	1156.929	0.192	0.353

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	12.249	556.509	0.000	0.060	0.045	0.347

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.872	12.568	1.045	560.620	8.116	231.166	1.792

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
50519.910	0.460	122.469	412300.812

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
346283.44	839.4484	66.8582	1.3505	0.8157	17.2314	1.1102

NPSS: Vehicle Mach number .406, Altitude 10735ft, dT 22R, Thrust 10%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

Fan Core + 4 Stage LPC 54.1% RPM 12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.207   EfDer =  0.938

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     47.600    2034.808      11.013     518.948       1.000       1.000       0.980
 W Kg/sec =  21.6363182

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     63.549    2034.322       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  49858.051   37350.039       4.493     831.557     185.091     619.754       3.348

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   145.12    -0.05   145.12     0.13   366.23
  MEAN    17.06     0.00    -0.02   145.12    -0.05   145.12     0.13
  HUB     12.51     0.00    -0.02   145.12    -0.05   145.12     0.13

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.39    50.47    17.92   366.33   394.07    10.88   517.19     0.35
  MEAN    64.41    47.20    17.21   302.94   335.95    10.88   517.19     0.30
  HUB     56.85    38.62    18.23   222.14   265.38    10.88   517.19     0.24

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   325.96   258.71   198.30  1124.16     0.29
  MEAN    18.04   327.21   259.12   199.81  1122.05     0.29
  HUB     15.00   349.99   285.89   201.90  1119.49     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    366.33   225.62   107.62     0.20  5338.24
  MEAN   320.27   208.96    61.15     0.19  4674.29     1.85
  HUB    266.36   202.84    19.53     0.18  4288.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     12.01     1.09    11.33   534.18     1.03   525.32     0.92     0.86
  MEAN    11.89     1.08    11.20   532.29     1.03   523.35     0.92     0.86
  HUB     11.81     1.07    11.04   531.19     1.02   520.97     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     52.53    28.49    24.20     4.29     0.93     0.54     2.90
  MEAN    52.36    17.02    12.70     4.32     0.95     0.49     3.51     0.86
  HUB     54.77    -5.53    -9.30     3.77     0.95     0.36     4.78

    blockage3   Cor/Incid
       0.950       0.938

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     329.753     258.614     204.588    1122.188       0.294       0.000

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     11.896      11.203     523.479      24.000      51.653      35.400     -16.253
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STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	219.400	258.614	339.142	1127.596	0.195	0.531

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	11.879	11.569	528.536	528.796	0.034	0.640

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	205.119	0.000	205.119	1128.135	0.182	0.494

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	11.555	529.042	0.000	0.060	0.109	0.512

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.786	11.825	1.074	532.553	13.605	160.330	1.243

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
84661.461	0.631	227.732	450677.219

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =17.207 EfDer = 0.948

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
47.600	2034.808	11.825	532.553	1.000	1.000	0.980

W Kg/sec = 21.6363182

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
59.956	2008.169	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
49858.051	37350.039	3.381	590.487	174.626	474.134	2.715

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	196.63	-0.07	196.63	0.17	360.12
MEAN	18.08	0.00	-0.02	196.63	-0.07	196.63	0.17	
HUB	15.21	0.00	-0.02	196.63	-0.07	196.63	0.17	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.69	46.36	15.33	364.91	414.57	11.58	529.33	0.37
MEAN	58.52	42.30	16.22	321.02	376.51	11.58	529.33	0.33
HUB	53.95	37.84	16.11	270.08	334.13	11.58	529.33	0.30

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	300.38	215.64	209.11	1137.19	0.26
MEAN	18.01	298.50	211.78	210.36	1135.51	0.26
HUB	15.22	314.24	232.14	211.80	1133.81	0.28

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	362.60	255.58	146.96	0.22	4404.84	
MEAN	319.80	236.48	108.03	0.21	3815.34	1.76
HUB	270.32	215.21	38.18	0.19	3534.83	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	12.69	1.07	12.09	545.12	1.02	537.59	0.92	0.87
MEAN	12.57	1.06	11.98	543.44	1.02	536.01	0.92	0.87
HUB	12.52	1.06	11.87	542.64	1.02	534.40	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.88	35.10	31.50	3.60	0.93	0.47	2.90	
MEAN	45.19	27.18	23.50	3.68	0.95	0.46	3.30	0.87
HUB	47.62	10.22	6.50	3.72	0.95	0.44	3.92	

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   blockage3   Cor/Incid
      0.950       0.948

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     301.511     212.372     214.025    1135.662       0.265       0.004

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     12.588      11.986     536.148      46.000      44.778      30.600     -14.178

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     218.748     212.372     304.881    1139.461       0.192       0.453

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      12.578      12.258     539.741     511.151       0.027       0.518

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     216.403       0.000     216.403    1139.550       0.190       0.388

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      12.224     539.826       0.000       0.060       0.095       0.398

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.803      12.536       1.060     543.734      11.181     182.181       1.412

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  69586.898       0.529     187.183  412153.656


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.207   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     47.600    2034.808      12.536     543.734       1.000       1.000       0.980
W Kg/sec =  21.6363182

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     57.148    1987.414       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  49858.051   37350.039       3.277     545.479     166.450     429.765       2.582

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   205.21    -0.07   205.21     0.18   348.07
 MEAN    17.74     0.00    -0.02   205.21    -0.07   205.21     0.18
 HUB     15.05     0.00    -0.02   205.21    -0.07   205.21     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.07    46.36    13.71   356.38   411.30    12.26   540.22     0.36
 MEAN    56.92    43.40    13.52   314.98   375.99    12.26   540.22     0.33
 HUB     52.49    38.84    13.65   267.24   337.00    12.26   540.22     0.30

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   294.63   198.60   217.63  1147.83     0.26
 MEAN    17.51   295.26   198.28   218.78  1146.41     0.26
 HUB     14.85   313.85   223.75   220.08  1144.97     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    351.77   266.13   153.16     0.23  3935.74
 MEAN   310.86   246.05   112.59     0.21  3472.41     1.68
 HUB    263.69   223.68    39.94     0.20  3323.76
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     13.36     1.07    12.76   554.96     1.02   547.72     0.92     0.89
MEAN    13.26     1.06    12.66   553.64     1.02   546.37     0.92     0.89
HUB     13.23     1.06    12.55   553.22     1.02   545.00     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.38    35.14    31.50     3.64     0.93     0.44     2.90
MEAN    42.19    27.23    23.50     3.73     0.94     0.43     3.28     0.89
HUB     45.47    10.29     6.50     3.79     0.94     0.42     3.87

  blockage3   Cor/Incid
     0.950       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     298.106     199.579     221.440    1146.576       0.260       0.007

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     13.274      12.664     546.526      46.000      42.028      31.500     -10.528

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     229.112     199.579     303.849    1149.755       0.199       0.398

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      13.268      12.905     549.560     471.992       0.020       0.477

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.121     222.975       0.000     222.975    1149.997       0.194       0.367

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      12.893     549.792       0.000       0.060       0.072       0.379

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.835      13.236       1.056     553.940      10.206     191.524       1.485

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  63530.492       0.513     170.892  413416.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.207   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     47.600    2034.808      13.236     553.940       1.000       1.000       0.980
W Kg/sec =  21.6363182

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     54.632    1969.020       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  49858.051   37350.039       3.226     513.330     159.125     401.059       2.520

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   210.52    -0.07   210.52     0.18   330.93
MEAN    16.97     0.00    -0.02   210.52    -0.07   210.52     0.18
HUB     14.32     0.00    -0.02   210.52    -0.07   210.52     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.39    46.36    12.03   342.00   401.66    12.93   550.24     0.35
MEAN    55.07    43.80    11.27   301.35   367.66    12.93   550.24     0.32
HUB     50.39    37.84    12.55   254.28   330.18    12.93   550.24     0.29

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	284.98	178.81	221.90	1157.28	0.25
MEAN	16.57	286.18	179.43	222.94	1156.03	0.25
HUB	13.89	304.43	206.03	224.12	1154.76	0.26

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	335.25	271.50	156.44	0.23	3377.36	
MEAN	294.30	250.80	114.87	0.22	2975.14	1.61
HUB	246.65	227.77	40.62	0.20	2862.77	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	13.97	1.06	13.40	563.57	1.02	556.80	0.92	0.90
MEAN	13.88	1.05	13.30	562.43	1.02	555.59	0.92	0.90
HUB	13.86	1.05	13.21	562.11	1.01	554.37	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.86	35.18	31.50	3.68	0.93	0.40	2.90	
MEAN	38.83	27.26	23.50	3.76	0.94	0.39	3.29	0.90
HUB	42.59	10.27	6.50	3.77	0.94	0.39	3.90	

blockage3	Cor/Incid
0.950	0.985

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	283.774	180.443	219.016	1156.432	0.245	0.041

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
13.900	13.329	555.985	46.000	39.484	32.400	-7.084

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	229.641	180.443	292.052	1158.841	0.198	0.364

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	13.898	13.522	558.304	456.573	0.014	0.442

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	218.974	0.000	218.974	1159.255	0.189	0.337

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	13.533	558.703	0.000	0.060	0.053	0.382

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.859	13.874	1.048	562.703	8.763	210.964	1.635

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
54552.492	0.485	146.741	426609.344

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =17.207 EfDer = 0.995

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
47.600	2034.808	13.874	562.703	1.000	1.000	0.980

W Kg/sec = 21.6363182

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
52.529	1953.629	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
49858.051	37350.039	3.331	509.668	153.000	390.276	2.551

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	205.26	-0.07	205.26	0.18	312.32
MEAN	15.91	0.00	-0.02	205.26	-0.07	205.26	0.18	
HUB	13.07	0.00	-0.02	205.26	-0.07	205.26	0.18	

```
      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.76    47.36    10.40   325.31   384.71    13.57   559.19     0.33
MEAN    54.01    44.80     9.21   282.57   349.31    13.57   559.19     0.30
HUB     48.52    38.84     9.68   232.08   309.88    13.57   559.19     0.27

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   271.98   164.96   216.24  1165.72     0.23
MEAN    15.50   271.35   162.56   217.27  1164.46     0.23
HUB     12.59   285.47   183.84   218.39  1163.18     0.25

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    318.56   265.24   153.60     0.23  2960.74
MEAN   275.19   244.73   112.63     0.21  2520.42     1.58
HUB    223.56   221.98    39.72     0.19  2315.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     14.55     1.05    14.01   571.15     1.02   564.98     0.92     0.91
MEAN    14.45     1.04    13.91   569.89     1.01   563.75     0.92     0.91
HUB     14.40     1.04    13.81   569.31     1.01   562.51     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.34    35.39    31.50     3.89     0.93     0.38     2.90
MEAN    36.80    27.40    23.50     3.90     0.93     0.37     3.34     0.91
HUB     40.09    10.31     6.50     3.81     0.93     0.36     4.06

  blockage3   Cor/Incid
     0.950       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    15.219     274.505     165.541     218.973    1164.541       0.236      -0.010

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
    14.453      13.904     563.830      46.000      37.089      33.000      -4.089

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    15.219     231.761     165.541     284.810    1166.403       0.199       0.273

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950      14.452      14.059     565.635     440.827       0.021       0.410

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
    14.701     217.828       0.000     217.828    1166.942       0.187       0.340

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      14.093     566.158       0.000       0.060       0.042       0.334

   STAGE EXIT CONDITIONS, STAGE   5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.875      14.440       1.041     570.116       7.413     235.292       1.824

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  46154.109       0.455     124.151  450869.812

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    318485.44    856.6983     63.5491      1.3112      0.8186     17.2075      1.0986
```

Appendix F.—Fan and LPC Compressor Performance Along Engine Operating Line: Plot File

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Flow Rate (corrected, lbm/sec), Pressure Ratio, Efficiency, Rotor 1 Incidence
(degrees), Temperature Ratio

ZONE T="Vehicle Mach No. = .78,  Altitude 35K ft, Thrust 100%", I=1.0
203.6437      2.4061      0.8368      3.0010      1.3415
ZONE T="Vehicle Mach No. = .78,  Altitude 35K ft, Thrust 75.6%", I=1.0
179.2984      2.3173      0.8664      5.4177      1.3140
ZONE T="Vehicle Mach No. = .78,  Altitude 35K ft, Thrust 72.9%", I=1.0
176.0543      2.3024      0.8678      5.7753      1.3108
ZONE T="Vehicle Mach No. = .78,  Altitude 35K ft, Thrust 69.9%", I=1.0
172.8357      2.2860      0.8688      6.1325      1.3074
ZONE T="Vehicle Mach No. = .78,  Altitude 39K ft, Thrust 100%", I=1.0
203.7504      2.4040      0.8363      2.9818      1.3413
ZONE T="Vehicle Mach No. = .78,  Altitude 39K ft, Thrust 84%", I=1.0
188.1720      2.3524      0.8599      4.4621      1.3226
ZONE T="Vehicle Mach No. = .78,  Altitude 39K ft, Thrust 79.8%", I=1.0
183.8159      2.3356      0.8636      4.9209      1.3182
ZONE T="Vehicle Mach No. = .78,  Altitude 39K ft, Thrust 76.8%", I=1.0
180.6934      2.3221      0.8656      5.2552      1.3151
ZONE T="Vehicle Mach No. = .78,  Altitude 39K ft, Thrust 10%", I=1.0
79.2363      1.5569      0.7933     17.8248      1.1703
ZONE T="Vehicle Mach No. = .73,  Altitude 38K ft, Thrust 10%", I=1.0
77.8263      1.5335      0.7949     17.8275      1.1638
ZONE T="Vehicle Mach No. = .71,  Altitude 37K ft, Thrust 10%", I=1.0
77.3570      1.5253      0.7956     17.8175      1.1615
ZONE T="Vehicle Mach No. = .67,  Altitude 34K ft, Thrust 10%", I=1.0
75.9212      1.4999      0.7980     17.7720      1.1542
ZONE T="Vehicle Mach No. = .61,  Altitude 30K ft, Thrust 10%", I=1.0
73.9994      1.4614      0.8034     17.5884      1.1428
ZONE T="Vehicle Mach No. = .55,  Altitude 25K ft, Thrust 10%", I=1.0
72.1560      1.4237      0.8094     17.3431      1.1315
ZONE T="Vehicle Mach No. = .49,  Altitude 20K ft, Thrust 10%", I=1.0
70.0257      1.3849      0.8153     17.0975      1.1199
ZONE T="Vehicle Mach No. = .45,  Altitude 15K ft, Thrust 10%", I=1.0
66.8582      1.3505      0.8157     17.2314      1.1102
ZONE T="Vehicle Mach No. = .41,  Altitude 10K ft, Thrust 10%", I=1.0
63.5491      1.3112      0.8186     17.2075      1.0986
ZONE T="Vehicle Mach No. = .20,  Altitude 0K ft, Thrust 100%", I=1.0
178.3165      2.2709      0.8662      5.3730      1.3059
```

Appendix G.—NPSS Engine Analysis Through Flight Trajectory; Baseline Blockages

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**********************************************************************************************************************
Date:03/26/11    Time:14:00:32    Model:                                  Turbofan Engine -  COMDES ON    converge = 1   CASE:    0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 18/ 44/ 2/15    Run by: Philip C Jorgenson      PC:     0
Temperature Stator 1 inlet: 542.60    Stator 1 exit: 561.52    Stator 2 inlet: 588.38    Stator 2 exit: 598.05
            Stator 3 inlet: 623.97    Stator 3 exit: 633.51    Stator 4 inlet: 658.06    Stator 4 exit: 666.74
            Stator 5 inlet: 686.76    Stator 5 exit: 694.94            Unblocked   Percent Blockage: 0.00

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.200       0.0    22.00   1165.98    29113.9    0.4162   12117.95    5.5224    227.95   26.718     29113.9     100.0   3000.0
2821.2   1975.5


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN      gamt
FS0   Ambient.Fl_O          1165.98    15.113    544.99    130.50   0.0000   1162.18    14.696    540.67   10039.8   0.2000   1.39973
FS1   Inlet.Fl_O            1165.98    15.113    544.99    130.50   0.0000   1162.18    12.142    511.96    4162.5   0.5681   1.39973
FS12  Splitter.Fl_02         987.21    15.106    544.99    130.50   0.0000    984.49    12.138    511.98    3526.9   0.5679   1.39973
FS2   Splitter.Fl_01         178.77    15.106    544.99    130.50   0.0000    178.27    12.125    511.83     637.7   0.5693   1.39973
FS14  Fan.Fl_O               987.21    23.636    627.89    150.42   0.0000    675.35    19.794    596.91    2600.0   0.5101   1.39817
FS25  LPC.Fl_O               178.77    34.304    711.08    170.49   0.0000     89.67    30.663    688.79     412.5   0.4041   1.39555
FS3   HPC.Fl_O               170.10   403.806   1505.62    370.96   0.0000     10.55   363.040   1464.52      49.7   0.3996   1.35025
FS36  Bleed3.Fl_O            131.82   403.806   1505.62    370.96   0.0000      8.17   380.171   1482.21      49.3   0.3000   1.35025
FS4   Burner.Fl_O             135.19   394.506   3000.00    822.52   0.0255     12.11   372.471   2962.56      74.8   0.3006   1.27905
FS45  HPT.Fl_O               180.04    92.960   1984.78    512.14   0.0191     55.68    83.728   1935.52     264.7   0.4011   1.31530
FS49  LPT.Fl_O               182.13    22.579   1446.97    362.15   0.0188    198.00    19.756   1398.55     851.6   0.4499   1.34050
FS5   TEGV.Fl_O              182.13    22.579   1446.97    362.15   0.0188    198.00    19.756   1398.55     851.6   0.4499   1.34050
FS8   Core_Nozz.Fl_O         182.13    22.579   1446.97    362.15   0.0188    198.00    14.696   1296.17     603.2   0.8202   1.34050
FS17  FanDuctLkg.Fl_O        987.21    23.636    627.89    150.42   0.0000    675.35    19.794    596.91    2600.0   0.5101   1.39817
FS171 Bleed15.Fl_O           987.21    23.636    627.89    150.42   0.0000    675.35    19.270    592.37    2475.2   0.5483   1.39817
FS172 FanDuct.Fl_O           987.21    23.636    627.89    150.42   0.0000    675.35    19.270    592.37    2475.2   0.5483   1.39817
FS173 Byp_Nozz.Fl_O          987.21    23.636    627.89    150.42   0.0000    675.35    14.696    547.97    2002.6   0.8546   1.39817

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc        TR    efPoly        pwr      SMN      SMW
Fan       984.49   1.565   0.9005   3827.019    1.1521    0.9056   -27822.9    61.01    27.66
LPC       178.27   2.271   0.8662   3827.019    1.3048    0.8808   -10113.9     2.74     2.10
HPC        89.67  11.771   0.8614  10138.103    2.1174    0.8983   -49474.4    31.29    30.17
HPT        12.11   4.244   0.9117    216.725    1.3392    0.8972    49474.4
LPT        55.68   4.117   0.9143     88.055    1.3682    0.8990    37936.8
```

TURBOMACHINERY MAP DATA

	WcMap	PRmap	effMap	NcMap	R/Parm	s_WcDes	s_PRdes	s_effDes	s_NcDes
Fan	1143.86	1.552	0.9023	3790.520	0.0600	0.8607	1.0235	0.9980	0.9905
LPC	142.65	2.449	0.8400	1.011	180.0000	1.2497	0.8768	1.0311	0.0003
HPC	81.55	11.264	0.8703	9867.595	13.0189	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.176	0.9117	1.305	4.1756	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.369	0.9211	0.992	3.3695	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	10039.81	8261.0

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4499	851.64
FanDuct	0.0000	0.5483	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.5224	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11870.5	21889.9	49474.4
LP_Shaft	3922.9	50790.9	37936.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	6.5786	1117.62	270.72	92.960
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	2.0916	1117.62	270.72	22.579
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	1077.78	260.70	115.595
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1321.69	322.84	263.395
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	1077.78	260.70	115.595
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1505.62	370.96	403.806
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	1077.78	260.70	115.595

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	20.4115	1505.62	370.96	394.506
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	17.8605	1505.62	370.96	222.022
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1505.62	370.96	403.806
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1505.62	370.96	403.806
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1505.62	370.96	403.806
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	627.89	150.42	23.636
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	627.89	150.42	23.636
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	627.89	150.42	23.636
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	627.89	150.42	23.636
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	627.89	150.42	23.636

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	3000.00	0.9995	0.0230	3.36610	0.02553

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.536	0.9800	1.0000	0.9800	603.19	0.820	1393.2	7887.0
Byp_Nozz	1.608	0.9800	1.0000	0.9800	2002.63	0.855	961.0	29487.8

```
**********************************************************************************************************************
Date:07/26/11    Time:14:00:32    Model:                                    Turbofan Engine -  COMDES ON    converge = 1   CASE:    0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 20/ 33/ 1/18    Run by: Philip C Jorgenson      PC:     0
Temperature Stator 1 inlet: 456.56    Stator 1 exit: 475.13    Stator 2 inlet: 502.76    Stator 2 exit: 510.92
            Stator 3 inlet: 537.54    Stator 3 exit: 546.09    Stator 4 inlet: 571.37    Stator 4 exit: 579.42
            Stator 5 inlet: 599.78    Stator 5 exit: 607.61             Unblocked   Percent Blockage: 0.00

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    35000.0    22.00     477.01      8371.8     0.5976    5003.07    5.3000    779.49   32.228      8371.8     100.0   2874.1
2696.7   1876.6


                                        FLOW STATION DATA
                                    W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           477.01     5.185    466.40    111.64   0.0000   1281.99     3.458    415.85    3926.2   0.7800    1.40014
FS1   Inlet.Fl_O             477.01     5.185    466.40    111.64   0.0000   1281.99     3.822    427.49    4162.5   0.6748    1.40014
FS12  Splitter.Fl_02         401.30     5.183    466.40    111.64   0.0000   1079.04     3.850    428.42    3526.9   0.6660    1.40014
FS2   Splitter.Fl_01          75.72     5.183    466.40    111.64   0.0000    203.59     3.638    421.57     637.7   0.7295    1.40014
FS14  Fan.Fl_O               401.30     8.814    550.80    131.90   0.0000    689.50     7.302    521.98    2600.0   0.5256    1.39972
FS25  LPC.Fl_O                75.72    12.471    626.54    150.09   0.0000     98.07    10.840    602.00     412.5   0.4522    1.39820
FS3   HPC.Fl_O                72.04   167.114   1392.79    341.31   0.0000     10.38   150.849   1355.71      49.7   0.3910    1.35667
FS36  Bleed3.Fl_O             55.83   167.114   1392.79    341.31   0.0000      8.05   157.661   1371.60      49.3   0.2941    1.35667
FS4   Burner.Fl_O             57.22   163.265   2874.12    782.48   0.0249     12.13   154.126   2837.79      74.8   0.3005    1.28295
FS45  HPT.Fl_O                76.22    38.399   1885.83    483.69   0.0186     55.62    34.596   1838.71     264.7   0.4000    1.31936
FS49  LPT.Fl_O                77.11     8.962   1356.87    337.80   0.0184    204.50     7.752   1307.04     851.6   0.4682    1.34611
FS5   TEGV.Fl_O               77.11     8.962   1356.87    337.80   0.0184    204.50     7.752   1307.04     851.6   0.4682    1.34611
FS8   Core_Nozz.Fl_O          77.11     8.962   1356.87    337.80   0.0184    204.50     4.796   1152.88     603.2   1.0000    1.34611
FS17  FanDuctLkg.Fl_O        401.30     8.814    550.80    131.90   0.0000    689.50     7.302    521.98    2600.0   0.5256    1.39972
FS171 Bleed15.Fl_O           401.30     8.814    550.80    131.90   0.0000    689.50     7.092    517.65    2475.2   0.5661    1.39972
FS172 FanDuct.Fl_O           401.30     8.814    550.80    131.90   0.0000    689.50     7.092    517.65    2475.2   0.5661    1.39972
FS173 Byp_Nozz.Fl_O          401.30     8.814    550.80    131.90   0.0000    689.50     4.672    458.99    2002.6   1.0000    1.39972

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1079.04   1.701   0.9114   4139.480   1.1810   0.9171   -11498.7   36.80   23.18
LPC        203.59   2.406   0.8368   4139.480   1.3434   0.8537    -4119.1    3.06    2.59
HPC         98.07  13.401   0.8581  10416.991   2.2230   0.8978   -19988.1   25.13   24.38
HPT         12.13   4.252   0.9120    213.559   1.3438   0.8973    19988.1
LPT         55.62   4.284   0.9159     90.391   1.3860   0.9002    15617.5

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1253.72   1.685   0.9132   4100.000    0.0638      0.8607    1.0235    0.9980    0.9905
```

LPC	166.92	2.761	0.8444	1.093	180.0000	1.2198	0.7987	0.9910	0.0003
HPC	89.19	12.816	0.8670	10139.042	13.5840	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.183	0.9120	1.286	4.1834	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.497	0.9227	1.019	3.4967	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3926.23	11556.7

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4682	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.3000	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11449.1	9169.3	19988.1
LP_Shaft	3925.3	20896.2	15617.5

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.7864	1017.82	245.70	38.399
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.8859	1017.82	245.70	8.962
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	979.37	236.14	46.492
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1214.98	295.42	108.349
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	979.37	236.14	46.492
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1392.79	341.31	167.114
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	979.37	236.14	46.492

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	8.6453	1392.79	341.31	163.265
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	7.5648	1392.79	341.31	91.842
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1392.79	341.31	167.114
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1392.79	341.31	167.114
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1392.79	341.31	167.114
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2874.12	0.9995	0.0230	1.38974	0.02489

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.592	0.9805	1.0000	0.9800	603.19	1.000	1607.6	4659.6
Byp_Nozz	2.549	0.9823	1.0000	0.9800	2002.63	1.000	1029.2	15269.0

```
****************************************************************************************************************************************
Date:07/26/11    Time:14:02:56    Model:                                    Turbofan Engine -  COMDES ON    converge = 1   CASE:    0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 12/ 25/ 1/10    Run by: Philip C Jorgenson      PC:    75
Temperature Stator 1 inlet: 464.63    Stator 1 exit: 481.18    Stator 2 inlet: 504.80    Stator 2 exit: 513.36
            Stator 3 inlet: 536.13    Stator 3 exit: 544.62    Stator 4 inlet: 566.14    Stator 4 exit: 573.89
            Stator 5 inlet: 591.48    Stator 5 exit: 598.79             Unblocked   Percent Blockage: 0.00

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.780   35000.0    22.00    440.33     6329.1    0.5909    3739.58    5.6051    779.49   26.927      8371.8      75.6   2603.5
2446.3   1694.7


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O          440.33     5.185    466.40    111.64   0.0000   1183.40     3.458    415.85    3624.3  0.7800    1.40014
FS1   Inlet.Fl_O            440.33     5.185    466.40    111.64   0.0000   1183.40     4.113    436.54    4162.5  0.5849    1.40014
FS12  Splitter.Fl_02        373.66     5.183    466.40    111.64   0.0000   1004.73     4.105    436.36    3526.9  0.5868    1.40014
FS2   Splitter.Fl_01         66.66     5.183    466.40    111.64   0.0000    179.25     4.144    437.54     637.7  0.5744    1.40014
FS14  Fan.Fl_O              373.66     8.101    537.01    128.58   0.0000    689.71     6.711    508.88    2600.0  0.5258    1.39974
FS25  LPC.Fl_O               66.66    12.010    613.52    146.96   0.0000     88.72    10.767    594.69     412.5  0.3984    1.39847
FS3   HPC.Fl_O               63.43   139.624   1308.86    319.53   0.0000     10.61   125.364   1271.85      49.7  0.4004    1.36172
FS36  Bleed3.Fl_O            49.16   139.624   1308.86    319.53   0.0000      8.22   131.359   1287.79      49.3  0.3005    1.36172
FS4   Burner.Fl_O            50.20   136.409   2603.52    695.88   0.0211     12.12   128.791   2569.76      74.8  0.2990    1.29335
FS45  HPT.Fl_O               66.92    31.901   1702.63    430.93   0.0158     55.86    28.715   1658.73     264.7  0.4003    1.32907
FS49  LPT.Fl_O               67.70     7.437   1218.21    300.38   0.0156    205.05     6.428   1172.26     851.6  0.4678    1.35654
FS5   TEGV.Fl_O              67.70     7.437   1218.21    300.38   0.0156    205.05     6.428   1172.26     851.6  0.4678    1.35654
FS8   Core_Nozz.Fl_O         67.70     7.437   1218.21    300.38   0.0156    205.05     3.968   1030.68     603.2  1.0000    1.35654
FS17  FanDuctLkg.Fl_O        373.66     8.101    537.01    128.58   0.0000    689.71     6.711    508.88    2600.0  0.5258    1.39974
FS171 Bleed15.Fl_O           373.66     8.101    537.01    128.58   0.0000    689.71     6.518    504.66    2475.2  0.5661    1.39974
FS172 FanDuct.Fl_O           373.66     8.101    537.01    128.58   0.0000    689.71     6.518    504.66    2475.2  0.5661    1.39974
FS173 Byp_Nozz.Fl_O          373.66     8.101    537.01    128.58   0.0000    689.71     4.296    447.51    2002.6  1.0000    1.39974

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1004.73   1.563   0.9077   3858.483   1.1514   0.9120    -8956.0   61.45   29.08
LPC        179.25   2.317   0.8664   3858.483   1.3154   0.8808    -3331.1    2.46    1.89
HPC         88.72  11.625   0.8614  10113.444   2.1334   0.8987   -15881.9   31.66   30.50
HPT         12.12   4.276   0.9089    215.569   1.3540   0.8932    15881.9
LPT         55.86   4.290   0.9119     88.672   1.3944   0.8953    12287.1

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1167.38   1.550   0.9095   3821.684    0.0591      0.8607    1.0235    0.9980    0.9905
```

LPC	144.69	2.481	0.8399	1.019	180.0000	1.2389	0.8898	1.0315	0.0003
HPC	80.69	11.125	0.8703	9843.594	12.9898	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.207	0.9089	1.298	4.2071	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.501	0.9187	0.999	3.5007	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3624.27	10667.9

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4678	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.6051	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	10999.4	7583.5	15881.9
LP_Shaft	3658.9	17637.4	12287.1

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.4533	967.67	233.24	31.901
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7800	967.67	233.24	7.437
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	932.77	224.61	40.085
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1146.87	278.11	91.131
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	932.77	224.61	40.085
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1308.86	319.53	139.624
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	932.77	224.61	40.085

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.6118	1308.86	319.53	136.409
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.6605	1308.86	319.53	76.630
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1308.86	319.53	139.624
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1308.86	319.53	139.624
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1308.86	319.53	139.624
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	537.01	128.58	8.101
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	537.01	128.58	8.101
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	537.01	128.58	8.101
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	537.01	128.58	8.101
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	537.01	128.58	8.101

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2603.52	0.9995	0.0230	1.03877	0.02113

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.151	0.9815	1.0000	0.9800	603.19	1.000	1525.3	3517.0
Byp_Nozz	2.343	0.9829	1.0000	0.9800	2002.63	1.000	1016.2	13480.1

```
**********************************************************************************************************************************
Date:07/26/11    Time:14:04:20    Model:                                    Turbofan Engine -  COMDES ON    converge = 1   CASE:    0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    72
Temperature Stator 1 inlet: 465.47    Stator 1 exit: 481.78    Stator 2 inlet: 504.97    Stator 2 exit: 513.55
            Stator 3 inlet: 535.90    Stator 3 exit: 544.37    Stator 4 inlet: 565.48    Stator 4 exit: 573.19
            Stator 5 inlet: 590.47    Stator 5 exit: 597.72             Unblocked   Percent Blockage: 0.00

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    35000.0    22.00    435.80      6086.3     0.5914    3599.66    5.6576    779.49   26.274      8371.8       72.7   2572.5
2417.6   1674.2


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           435.80     5.185    466.40    111.64   0.0000   1171.22     3.458    415.85    3587.0   0.7800    1.40014
FS1   Inlet.Fl_O             435.80     5.185    466.40    111.64   0.0000   1171.22     4.144    437.46    4162.5   0.5752    1.40014
FS12  Splitter.Fl_02         370.34     5.183    466.40    111.64   0.0000    995.80     4.132    437.16    3526.9   0.5784    1.40014
FS2   Splitter.Fl_01          65.46     5.183    466.40    111.64   0.0000    176.01     4.195    439.05     637.7   0.5582    1.40014
FS14  Fan.Fl_O               370.34     8.016    535.30    128.17   0.0000    689.72     6.641    507.27    2600.0   0.5258    1.39975
FS25  LPC.Fl_O                65.46    11.933    611.99    146.59   0.0000     87.57    10.733    593.77     412.5   0.3921    1.39851
FS3   HPC.Fl_O                62.28   136.241   1299.06    317.00   0.0000     10.63   122.247   1262.06      49.7   0.4016    1.36234
FS36  Bleed3.Fl_O             48.27   136.241   1299.06    317.00   0.0000      8.24   128.132   1278.00      49.3   0.3013    1.36234
FS4   Burner.Fl_O             49.27   133.103   2572.52    686.15   0.0207     12.12   125.672   2539.06      74.8   0.2988    1.29457
FS45  HPT.Fl_O                65.69    31.107   1681.93    425.06   0.0155     55.89    27.997   1638.40     264.7   0.4004    1.33028
FS49  LPT.Fl_O                66.46     7.252   1202.82    296.29   0.0153    205.10     6.267   1157.33     851.6   0.4677    1.35778
FS5   TEGV.Fl_O               66.46     7.252   1202.82    296.29   0.0153    205.10     6.267   1157.33     851.6   0.4677    1.35778
FS8   Core_Nozz.Fl_O          66.46     7.252   1202.82    296.29   0.0153    205.10     3.868   1017.18     603.2   1.0000    1.35778
FS17  FanDuctLkg.Fl_O         370.34     8.016    535.30    128.17   0.0000    689.72     6.641    507.27    2600.0   0.5258    1.39975
FS171 Bleed15.Fl_O            370.34     8.016    535.30    128.17   0.0000    689.72     6.450    503.06    2475.2   0.5661    1.39975
FS172 FanDuct.Fl_O            370.34     8.016    535.30    128.17   0.0000    689.72     6.450    503.06    2475.2   0.5661    1.39975
FS173 Byp_Nozz.Fl_O           370.34     8.016    535.30    128.17   0.0000    689.72     4.251    446.09    2002.6   1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff          Nc       TR    efPoly        pwr     SMN     SMW
Fan         995.80   1.547   0.9072    3825.126   1.1477    0.9114    -8661.7   65.05   29.85
LPC         176.01   2.302   0.8678    3825.126   1.3122    0.8821    -3236.8    2.76    2.11
HPC          87.57  11.418   0.8614   10082.376   2.1227    0.8985   -15399.4   32.50   31.26
HPT          12.12   4.279   0.9083     215.929   1.3552    0.8926    15399.4
LPT          55.89   4.290   0.9112      88.445   1.3952    0.8945    11898.5

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        1157.00   1.534   0.9091   3788.644    0.0585      0.8607    1.0235    0.9980    0.9905
```

LPC	142.53	2.448	0.8400	1.010	180.0000	1.2349	0.8997	1.0331	0.0003
HPC	79.64	10.927	0.8703	9813.354	12.9197	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.210	0.9083	1.300	4.2099	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.501	0.9180	0.997	3.5006	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3586.99	10558.2

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4677	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.6576	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	10951.9	7384.9	15399.4
LP_Shaft	3627.3	17228.5	11898.5

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.4089	961.82	231.80	31.107
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7659	961.82	231.80	7.252
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	927.35	223.27	39.280
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1138.93	276.10	89.004
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	927.35	223.27	39.280
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1299.06	317.00	136.241
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	927.35	223.27	39.280

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.4741	1299.06	317.00	133.103
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.5400	1299.06	317.00	74.761
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1299.06	317.00	136.241
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1299.06	317.00	136.241
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1299.06	317.00	136.241
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	535.30	128.17	8.016
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	535.30	128.17	8.016
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	535.30	128.17	8.016
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	535.30	128.17	8.016
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	535.30	128.17	8.016

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2572.52	0.9995	0.0230	0.99991	0.02071

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.097	0.9812	1.0000	0.9800	603.19	1.000	1515.8	3378.1
Byp_Nozz	2.318	0.9829	1.0000	0.9800	2002.63	1.000	1014.6	13266.4

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**********************************************************************************************************************
Date:07/26/11    Time:14:05:20    Model:                                    Turbofan Engine -  COMDES ON    converge = 1   CASE:    0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    69
Temperature Stator 1 inlet: 466.24    Stator 1 exit: 482.31    Stator 2 inlet: 505.09    Stator 2 exit: 513.67
            Stator 3 inlet: 535.61    Stator 3 exit: 544.06    Stator 4 inlet: 564.76    Stator 4 exit: 572.43
            Stator 5 inlet: 589.40    Stator 5 exit: 596.59             Unblocked   Percent Blockage: 0.00

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    35000.0    22.00    431.44      5851.9     0.5921    3464.86    5.7137    779.49   25.634      8371.8       69.9    2542.1
2389.5   1654.0


                                        FLOW STATION DATA
                                  W         Pt         Tt         ht      FAR        Wc         Ps         Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           431.44      5.185     466.40     111.64   0.0000   1159.51      3.458     415.85    3551.1   0.7800    1.40014
FS1   Inlet.Fl_O             431.44      5.185     466.40     111.64   0.0000   1159.51      4.172     438.31    4162.5   0.5662    1.40014
FS12  Splitter.Fl_02         367.18      5.183     466.40     111.64   0.0000    987.30      4.156     437.90    3526.9   0.5706    1.40014
FS2   Splitter.Fl_01          64.26      5.183     466.40     111.64   0.0000    172.79      4.242     440.46     637.7   0.5427    1.40014
FS14  Fan.Fl_O               367.18      7.935     533.61     127.77   0.0000    689.72      6.574     505.66    2600.0   0.5257    1.39975
FS25  LPC.Fl_O                64.26     11.848     610.41     146.21   0.0000     86.47     10.690     592.77     412.5   0.3861    1.39854
FS3   HPC.Fl_O                61.15    132.920    1289.35     314.49   0.0000     10.66    119.191    1252.38      49.7   0.4027    1.36293
FS36  Bleed3.Fl_O             47.39    132.920    1289.35     314.49   0.0000      8.26    124.968    1268.32      49.3   0.3021    1.36293
FS4   Burner.Fl_O             48.35    129.859    2542.07     676.63   0.0203     12.11    122.612    2508.92      74.8   0.2986    1.29577
FS45  HPT.Fl_O                64.47     30.329    1661.63     419.32   0.0152     55.92     27.293    1618.46     264.7   0.4004    1.33150
FS49  LPT.Fl_O                65.22      7.073    1187.83     292.32   0.0150    205.10      6.113    1142.81     851.6   0.4675    1.35893
FS5   TEGV.Fl_O               65.22      7.073    1187.83     292.32   0.0150    205.10      6.113    1142.81     851.6   0.4675    1.35893
FS8   Core_Nozz.Fl_O          65.22      7.073    1187.83     292.32   0.0150    205.10      3.769    1004.04     603.2   1.0000    1.35893
FS17  FanDuctLkg.Fl_O        367.18      7.935     533.61     127.77   0.0000    689.72      6.574     505.66    2600.0   0.5257    1.39975
FS171 Bleed15.Fl_O           367.18      7.935     533.61     127.77   0.0000    689.72      6.385     501.47    2475.2   0.5660    1.39975
FS172 FanDuct.Fl_O           367.18      7.935     533.61     127.77   0.0000    689.72      6.385     501.47    2475.2   0.5660    1.39975
FS173 Byp_Nozz.Fl_O          367.18      7.935     533.61     127.77   0.0000    689.72      4.208     444.67    2002.6   1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
               Wc       PR       eff          Nc        TR    efPoly        pwr      SMN      SMW
Fan         987.30    1.531    0.9075    3792.029    1.1441    0.9115    -8376.4    71.51    30.60
LPC         172.79    2.286    0.8688    3792.029    1.3088    0.8832    -3142.9     3.06     2.33
HPC          86.47   11.219    0.8614   10051.745    2.1123    0.8983   -14929.6    33.31    32.02
HPT          12.11    4.282    0.9077     216.278    1.3562    0.8918    14929.6
LPT          55.92    4.288    0.9105      88.214    1.3958    0.8935    11519.3

TURBOMACHINERY MAP DATA
            WcMap    PRmap    effMap      NcMap     R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1147.12    1.519    0.9094    3755.864     0.0579      0.8607    1.0235    0.9980    0.9905
```

LPC	140.39	2.415	0.8401	1.002	180.0000	1.2308	0.9089	1.0341	0.0003
HPC	78.65	10.738	0.8704	9783.541	12.8516	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.213	0.9078	1.302	4.2127	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.500	0.9172	0.994	3.4996	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3551.12	10452.6

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4675	851.64
FanDuct	0.0000	0.5660	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.7137	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	10904.5	7190.8	14929.6
LP_Shaft	3595.9	16825.1	11519.3

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.3648	955.99	230.35	30.329
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7519	955.99	230.35	7.073
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	921.93	221.94	38.484
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1131.04	274.11	86.913
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	921.93	221.94	38.484
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1289.35	314.49	132.920
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	921.93	221.94	38.484

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.3374	1289.35	314.49	129.859
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.4204	1289.35	314.49	72.928
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1289.35	314.49	132.920
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1289.35	314.49	132.920
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1289.35	314.49	132.920
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	533.61	127.77	7.935
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	533.61	127.77	7.935
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	533.61	127.77	7.935
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	533.61	127.77	7.935
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	533.61	127.77	7.935

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2542.07	0.9995	0.0230	0.96246	0.02031

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.045	0.9808	1.0000	0.9800	603.19	1.000	1506.6	3242.2
Byp_Nozz	2.295	0.9829	1.0000	0.9800	2002.63	1.000	1013.0	13062.4

```
**********************************************************************************************************************************
Date:07/26/11    Time:14:06:41    Model:                                    Turbofan Engine -  COMDES ON    converge = 1   CASE:    0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 20/ 33/ 1/18    Run by: Philip C Jorgenson      PC:    69
Temperature Stator 1 inlet: 452.23    Stator 1 exit: 470.61    Stator 2 inlet: 497.99    Stator 2 exit: 506.04
            Stator 3 inlet: 532.41    Stator 3 exit: 540.86    Stator 4 inlet: 565.90    Stator 4 exit: 573.85
            Stator 5 inlet: 594.03    Stator 5 exit: 601.77             Unblocked   Percent Blockage: 0.00

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780   39000.0    22.00    395.93     6923.4    0.5938    4111.04    5.2974    775.82   32.256      6923.4     100.0   2850.8
2674.6   1859.9


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN      gamt
FS0   Ambient.Fl_O          395.93     4.283    462.03    110.60   0.0000   1282.12     2.854    411.97    3930.2   0.7800   1.40005
FS1   Inlet.Fl_O            395.93     4.283    462.03    110.60   0.0000   1282.12     3.157    423.48    4162.5   0.6750   1.40005
FS12  Splitter.Fl_02        333.05     4.281    462.03    110.60   0.0000   1079.06     3.180    424.41    3526.9   0.6660   1.40005
FS2   Splitter.Fl_01         62.87     4.281    462.03    110.60   0.0000    203.70     3.003    417.52     637.7   0.7305   1.40005
FS14  Fan.Fl_O              333.05     7.280    545.71    130.67   0.0000    689.60     6.031    517.14    2600.0   0.5257   1.39973
FS25  LPC.Fl_O               62.87    10.292    620.48    148.64   0.0000     98.20     8.941    596.09     412.5   0.4529   1.39833
FS3   HPC.Fl_O               59.82   138.161   1380.91    338.22   0.0000     10.38   124.713   1344.09      49.7   0.3909   1.35737
FS36  Bleed3.Fl_O            46.36   138.161   1380.91    338.22   0.0000      8.05   130.346   1359.87      49.3   0.2940   1.35737
FS4   Burner.Fl_O             47.50   134.979   2850.78    774.97   0.0246     12.13   127.424   2814.66      74.8   0.3004   1.28375
FS45  HPT.Fl_O               63.28    31.734   1869.08    478.84   0.0184     55.63    28.590   1822.28     264.7   0.3999   1.32018
FS49  LPT.Fl_O               64.01     7.404   1344.03    334.31   0.0182    204.54     6.404   1294.55     851.6   0.4682   1.34702
FS5   TEGV.Fl_O              64.01     7.404   1344.03    334.31   0.0182    204.54     6.404   1294.55     851.6   0.4682   1.34702
FS8   Core_Nozz.Fl_O         64.01     7.404   1344.03    334.31   0.0182    204.54     3.961   1141.55     603.2   1.0000   1.34702
FS17  FanDuctLkg.Fl_O       333.05     7.280    545.71    130.67   0.0000    689.60     6.031    517.14    2600.0   0.5257   1.39973
FS171 Bleed15.Fl_O          333.05     7.280    545.71    130.67   0.0000    689.60     5.857    512.85    2475.2   0.5662   1.39973
FS172 FanDuct.Fl_O          333.05     7.280    545.71    130.67   0.0000    689.60     5.857    512.85    2475.2   0.5662   1.39973
FS173 Byp_Nozz.Fl_O         333.05     7.280    545.71    130.67   0.0000    689.60     3.860    454.75    2002.6   1.0000   1.39973

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1079.06   1.701   0.9114   4139.480   1.1811   0.9169    -9461.0   36.81   23.19
LPC        203.70   2.404   0.8363   4139.480   1.3429   0.8542    -3383.8    3.06    2.59
HPC         98.20  13.425   0.8581  10422.072   2.2255   0.8979   -16455.0   25.06   24.31
HPT         12.13   4.253   0.9119    213.497   1.3446   0.8972    16455.0
LPT         55.63   4.286   0.9157     90.369   1.3868   0.8998    12844.8

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1253.74   1.685   0.9132   4100.000    0.0638      0.8607    1.0235    0.9980    0.9905
```

LPC	166.92	2.761	0.8444	1.093	180.0000	1.2204	0.7974	0.9904	0.0003
HPC	89.31	12.839	0.8669	10143.987	13.5912	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.185	0.9119	1.285	4.1851	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.498	0.9225	1.018	3.4980	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3930.22	9547.0

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4682	851.64
FanDuct	0.0000	0.5662	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.2974	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11399.2	7581.6	16455.0
LP_Shaft	3906.9	17267.4	12844.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.3137	1008.68	243.43	31.734
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7356	1008.68	243.43	7.404
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.51	233.95	38.423
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1204.37	292.72	89.571
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.51	233.95	38.423
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1380.91	338.22	138.161
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.51	233.95	38.423

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.1787	1380.91	338.22	134.979
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.2815	1380.91	338.22	75.923
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.91	338.22	138.161
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.91	338.22	138.161
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.91	338.22	138.161
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2850.78	0.9995	0.0230	1.14196	0.02463

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.594	0.9805	1.0000	0.9800	603.19	1.000	1600.1	3851.2
Byp_Nozz	2.551	0.9825	1.0000	0.9800	2002.63	1.000	1024.4	12619.1

```
****************************************************************************************************************************************
Date:07/26/11    Time:14:09:01    Model:                                    Turbofan Engine -  COMDES ON    converge = 1   CASE:    0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 10/ 23/ 1/ 8    Run by: Philip C Jorgenson      PC:    84
Temperature Stator 1 inlet: 457.73    Stator 1 exit: 474.77    Stator 2 inlet: 499.37    Stator 2 exit: 507.76
            Stator 3 inlet: 531.50    Stator 3 exit: 539.93    Stator 4 inlet: 562.41    Stator 4 exit: 570.17
            Stator 5 inlet: 588.47    Stator 5 exit: 595.86             Unblocked   Percent Blockage: 0.00

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    376.28      5815.6    0.5868    3412.47    5.4802    775.82   28.782      6923.4       84.0   2672.3
2509.4   1739.6


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           376.28     4.283    462.03    110.60   0.0000   1218.51     2.854    411.97    3735.2   0.7800    1.40005
FS1   Inlet.Fl_O             376.28     4.283    462.03    110.60   0.0000   1218.51     3.321    429.63    4162.5   0.6142    1.40005
FS12  Splitter.Fl_02         318.22     4.281    462.03    110.60   0.0000   1030.99     3.323    429.78    3526.9   0.6127    1.40005
FS2   Splitter.Fl_01          58.07     4.281    462.03    110.60   0.0000    188.13     3.297    428.81     637.7   0.6227    1.40005
FS14  Fan.Fl_O               318.22     6.897    536.69    128.51   0.0000    689.71     5.713    508.59    2600.0   0.5258    1.39974
FS25  LPC.Fl_O                58.07    10.071    611.78    146.54   0.0000     92.03     8.936    591.27     412.5   0.4169    1.39851
FS3   HPC.Fl_O                 55.25   123.282   1325.63    323.86   0.0000     10.53   110.897   1288.86      49.7   0.3971    1.36070
FS36  Bleed3.Fl_O              42.82   123.282   1325.63    323.86   0.0000      8.16   116.097   1304.67      49.3   0.2982    1.36070
FS4   Burner.Fl_O              43.77   120.443   2672.29    717.67   0.0221     12.12   113.710   2637.85      74.8   0.2995    1.29062
FS45  HPT.Fl_O                 58.34    28.210   1747.86    443.85   0.0165     55.79    25.399   1703.18     264.7   0.4002    1.32655
FS49  LPT.Fl_O                 59.01     6.577   1252.23    309.49   0.0163    204.91     5.685   1205.32     851.6   0.4679    1.35391
FS5   TEGV.Fl_O                59.01     6.577   1252.23    309.49   0.0163    204.91     5.685   1205.32     851.6   0.4679    1.35391
FS8   Core_Nozz.Fl_O           59.01     6.577   1252.23    309.49   0.0163    204.91     3.511   1060.59     603.2   1.0000    1.35391
FS17  FanDuctLkg.Fl_O         318.22     6.897    536.69    128.51   0.0000    689.71     5.713    508.59    2600.0   0.5258    1.39974
FS171 Bleed15.Fl_O            318.22     6.897    536.69    128.51   0.0000    689.71     5.550    504.37    2475.2   0.5661    1.39974
FS172 FanDuct.Fl_O            318.22     6.897    536.69    128.51   0.0000    689.71     5.550    504.37    2475.2   0.5661    1.39974
FS173 Byp_Nozz.Fl_O           318.22     6.897    536.69    128.51   0.0000    689.71     3.658    447.24    2002.6   1.0000    1.39974

TURBOMACHINERY PERFORMANCE DATA
                Wc       PR       eff          Nc        TR     efPoly        pwr      SMN      SMW
Fan        1030.99    1.611    0.9119    3951.084    1.1616    0.9164    -8064.8    54.89    26.94
LPC         188.13    2.352    0.8599    3951.084    1.3241    0.8757    -2953.1     1.70     1.34
HPC          92.03   12.242    0.8603   10205.119    2.1669    0.8985   -14214.7    29.22    28.26
HPT          12.12    4.270    0.9102     214.401    1.3516    0.8949    14214.6
LPT          55.79    4.289    0.9131      89.197    1.3924    0.8965    11017.9

TURBOMACHINERY MAP DATA
             WcMap    PRmap    effMap       NcMap     R/Parm      s_WcDes    s_PRdes   s_effDes    s_NcDes
Fan        1197.89    1.597    0.9138    3913.401     0.0608       0.8607     1.0235     0.9980     0.9905
```

LPC	150.67	2.572	0.8397	1.044	180.0000	1.2486	0.8603	1.0241	0.0003
HPC	83.70	11.712	0.8692	9932.823	13.2001	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.201	0.9102	1.291	4.2008	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.500	0.9199	1.005	3.5005	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3735.23	9073.4

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4679	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.4802	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11083.3	6736.0	14214.6
LP_Shaft	3729.1	15517.7	11017.9

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.1368	975.57	235.20	28.210
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6794	975.57	235.20	6.577
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.74	226.34	34.977
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1159.48	281.31	80.262
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.74	226.34	34.977
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1325.63	323.86	123.282
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.74	226.34	34.977

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.6300	1325.63	323.86	120.443
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.8014	1325.63	323.86	67.685
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.63	323.86	123.282
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.63	323.86	123.282
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.63	323.86	123.282
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	536.69	128.51	6.897
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	536.69	128.51	6.897
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	536.69	128.51	6.897
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	536.69	128.51	6.897
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	536.69	128.51	6.897

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2672.29	0.9995	0.0230	0.94791	0.02214

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.304	0.9817	1.0000	0.9800	603.19	1.000	1545.9	3232.1
Byp_Nozz	2.417	0.9830	1.0000	0.9800	2002.63	1.000	1015.9	11656.9

```
**********************************************************************************************************************
Date:07/26/11    Time:14:10:32    Model:                                    Turbofan Engine -  COMDES ON    converge = 1   CASE:    0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    79
Temperature Stator 1 inlet: 459.04    Stator 1 exit: 475.74    Stator 2 inlet: 499.73    Stator 2 exit: 508.17
            Stator 3 inlet: 531.31    Stator 3 exit: 539.73    Stator 4 inlet: 561.62    Stator 4 exit: 569.33
            Stator 5 inlet: 587.19    Stator 5 exit: 594.50             Unblocked   Percent Blockage: 0.00

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    370.94      5524.9     0.5863    3239.12    5.5397    775.82   27.862      6923.4       79.8   2626.4
2467.0   1709.1


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           370.94     4.283    462.03    110.60   0.0000   1201.20     2.854    411.97    3682.2   0.7800    1.40005
FS1   Inlet.Fl_O             370.94     4.283    462.03    110.60   0.0000   1201.20     3.360    431.07    4162.5   0.5995    1.40005
FS12  Splitter.Fl_02         314.22     4.281    462.03    110.60   0.0000   1018.03     3.357    431.04    3526.9   0.5997    1.40005
FS2   Splitter.Fl_01          56.72     4.281    462.03    110.60   0.0000    183.77     3.361    431.20     637.7   0.5981    1.40005
FS14  Fan.Fl_O               314.22     6.795    534.32    127.94   0.0000    689.72     5.629    506.34    2600.0   0.5257    1.39975
FS25  LPC.Fl_O                56.72    10.000    609.74    146.05   0.0000     90.38     8.919    590.17     412.5   0.4076    1.39858
FS3   HPC.Fl_O                 53.97   119.338   1311.39    320.18   0.0000     10.57   107.249   1274.64      49.7   0.3987    1.36157
FS36  Bleed3.Fl_O              41.83   119.338   1311.39    320.18   0.0000      8.19   112.327   1290.45      49.3   0.2994    1.36157
FS4   Burner.Fl_O              42.73   116.590   2626.43    703.16   0.0215     12.12   110.075   2592.44      74.8   0.2992    1.29240
FS45  HPT.Fl_O                 56.96    27.282   1717.13    435.08   0.0161     55.83    24.561   1673.01     264.7   0.4002    1.32830
FS49  LPT.Fl_O                 57.62     6.358   1229.00    303.28   0.0159    205.00     5.496   1182.75     851.6   0.4678    1.35567
FS5   TEGV.Fl_O                57.62     6.358   1229.00    303.28   0.0159    205.00     5.496   1182.75     851.6   0.4678    1.35567
FS8   Core_Nozz.Fl_O           57.62     6.358   1229.00    303.28   0.0159    205.00     3.393   1040.17     603.2   1.0000    1.35567
FS17  FanDuctLkg.Fl_O         314.22     6.795    534.32    127.94   0.0000    689.72     5.629    506.34    2600.0   0.5257    1.39975
FS171 Bleed15.Fl_O            314.22     6.795    534.32    127.94   0.0000    689.72     5.468    502.14    2475.2   0.5661    1.39975
FS172 FanDuct.Fl_O            314.22     6.795    534.32    127.94   0.0000    689.72     5.468    502.14    2475.2   0.5661    1.39975
FS173 Byp_Nozz.Fl_O           314.22     6.795    534.32    127.94   0.0000    689.72     3.604    445.27    2002.6   1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
                Wc       PR       eff         Nc        TR    efPoly        pwr      SMN      SMW
Fan       1018.03    1.587    0.9110   3904.432    1.1565    0.9153    -7710.2    58.36    27.99
LPC        183.77    2.336    0.8636   3904.432    1.3197    0.8791    -2845.4     2.07     1.61
HPC         90.38   11.934    0.8610  10159.669    2.1507    0.8987   -13635.4    30.42    29.36
HPT         12.12    4.274    0.9094    214.944    1.3532    0.8939    13635.3
LPT         55.83    4.291    0.9124     88.929    1.3939    0.8957    10555.6

TURBOMACHINERY MAP DATA
             WcMap    PRmap    effMap      NcMap     R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1182.84    1.574    0.9129   3867.194     0.0599      0.8607    1.0235    0.9980    0.9905
```

LPC	147.66	2.526	0.8398	1.031	180.0000	1.2446	0.8754	1.0283	0.0003
HPC	82.20	11.419	0.8699	9888.585	13.0959	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.205	0.9094	1.294	4.2047	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.501	0.9191	1.002	3.5014	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3682.18	8944.5

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4678	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.5397	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11015.6	6501.2	13635.3
LP_Shaft	3685.1	15044.3	10555.6

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.0873	967.15	233.12	27.282
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6636	967.15	233.12	6.358
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.94	224.41	34.054
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1147.97	278.39	77.789
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.94	224.41	34.054
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1311.39	320.18	119.338
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.94	224.41	34.054

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.4764	1311.39	320.18	116.590
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.6670	1311.39	320.18	65.506
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.39	320.18	119.338
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.39	320.18	119.338
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.39	320.18	119.338
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2626.43	0.9995	0.0230	0.89975	0.02151

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.228	0.9816	1.0000	0.9800	603.19	1.000	1531.9	3068.7
Byp_Nozz	2.381	0.9831	1.0000	0.9800	2002.63	1.000	1013.6	11400.7

```
****************************************************************************************************************************
Date:07/26/11    Time:14:11:31    Model:                                    Turbofan Engine -  COMDES ON    converge = 1   CASE:    0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    76
Temperature Stator 1 inlet: 459.90    Stator 1 exit: 476.37    Stator 2 inlet: 499.93    Stator 2 exit: 508.39
            Stator 3 inlet: 531.11    Stator 3 exit: 539.51    Stator 4 inlet: 560.99    Stator 4 exit: 568.67
            Stator 5 inlet: 586.22    Stator 5 exit: 593.48             Unblocked   Percent Blockage: 0.00

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    366.97     5317.2     0.5869    3120.82    5.5816    775.82   27.215      6923.4       76.8   2594.8
2437.7   1688.0


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          366.97     4.283    462.03    110.60   0.0000   1188.37     2.854    411.97    3642.8   0.7800    1.40005
FS1   Inlet.Fl_O            366.97     4.283    462.03    110.60   0.0000   1188.37     3.387    432.08    4162.5   0.5889    1.40005
FS12  Splitter.Fl_02        311.22     4.281    462.03    110.60   0.0000   1008.31     3.382    431.95    3526.9   0.5903    1.40005
FS2   Splitter.Fl_01         55.76     4.281    462.03    110.60   0.0000    180.65     3.405    432.77     637.7   0.5816    1.40005
FS14  Fan.Fl_O              311.22     6.720    532.72    127.55   0.0000    689.73     5.567    504.82    2600.0   0.5257    1.39975
FS25  LPC.Fl_O               55.76     9.941    608.24    145.69   0.0000     89.26     8.897    589.28     412.5   0.4014    1.39875
FS3   HPC.Fl_O               53.05   116.569   1301.46    317.62   0.0000     10.59   104.692   1264.72      49.7   0.3999    1.36219
FS36  Bleed3.Fl_O            41.12   116.569   1301.46    317.62   0.0000      8.21   109.684   1280.54      49.3   0.3001    1.36219
FS4   Burner.Fl_O            41.98   113.885   2594.76    693.20   0.0211     12.12   107.524   2561.09      74.8   0.2990    1.29364
FS45  HPT.Fl_O               55.97    26.631   1695.95    429.06   0.0157     55.85    23.972   1652.21     264.7   0.4002    1.32939
FS49  LPT.Fl_O               56.62     6.206   1213.05    299.03   0.0155    205.06     5.364   1167.27     851.6   0.4678    1.35689
FS5   TEGV.Fl_O              56.62     6.206   1213.05    299.03   0.0155    205.06     5.364   1167.27     851.6   0.4678    1.35689
FS8   Core_Nozz.Fl_O         56.62     6.206   1213.05    299.03   0.0155    205.06     3.311   1026.18     603.2   1.0000    1.35689
FS17  FanDuctLkg.Fl_O       311.22     6.720    532.72    127.55   0.0000    689.73     5.567    504.82    2600.0   0.5257    1.39975
FS171 Bleed15.Fl_O          311.22     6.720    532.72    127.55   0.0000    689.73     5.408    500.63    2475.2   0.5660    1.39975
FS172 FanDuct.Fl_O          311.22     6.720    532.72    127.55   0.0000    689.73     5.408    500.63    2475.2   0.5660    1.39975
FS173 Byp_Nozz.Fl_O         311.22     6.720    532.72    127.55   0.0000    689.73     3.564    443.93    2002.6   1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1008.31   1.570   0.9083   3871.456   1.1530   0.9125    -7466.9   60.55   28.78
LPC        180.65   2.322   0.8656   3871.456   1.3164   0.8810    -2768.4    2.35    1.81
HPC         89.26  11.726   0.8613  10128.152   2.1397   0.8988   -13234.5   31.25   30.12
HPT         12.12   4.276   0.9089    215.314   1.3544   0.8932    13234.4
LPT         55.85   4.291   0.9118     88.727   1.3948   0.8952    10235.4

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1171.54   1.557   0.9101   3834.533    0.0593      0.8607    1.0235    0.9980    0.9905
```

LPC	145.53	2.493	0.8399	1.023	180.0000	1.2414	0.8853	1.0306	0.0003
HPC	81.18	11.221	0.8703	9857.910	13.0246	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.207	0.9089	1.296	4.2074	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.502	0.9186	1.000	3.5018	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3642.83	8848.9

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4678	851.64
FanDuct	0.0000	0.5660	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.5816	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	10967.8	6337.5	13234.4
LP_Shaft	3654.0	14712.1	10235.4

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.0519	961.25	231.65	26.631
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6524	961.25	231.65	6.206
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.46	223.06	33.399
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1139.93	276.36	76.051
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.46	223.06	33.399
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1301.46	317.62	116.569
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.46	223.06	33.399

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.3664	1301.46	317.62	113.885
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.5708	1301.46	317.62	63.976
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.46	317.62	116.569
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.46	317.62	116.569
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.46	317.62	116.569
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2594.76	0.9995	0.0230	0.86689	0.02108

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.175	0.9814	1.0000	0.9800	603.19	1.000	1522.1	2954.4
Byp_Nozz	2.355	0.9831	1.0000	0.9800	2002.63	1.000	1012.1	11211.7

```
****************************************************************************************************************************************
Date:07/26/11    Time:14:12:21    Model:                                        Turbofan Engine -  COMDES ON    converge = 1   CASE:    0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  3/ 16/ 1/ 1    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 469.18    Stator 1 exit: 477.65    Stator 2 inlet: 488.50    Stator 2 exit: 494.40
            Stator 3 inlet: 504.69    Stator 3 exit: 510.09    Stator 4 inlet: 519.59    Stator 4 exit: 524.23
            Stator 5 inlet: 532.19    Stator 5 exit: 536.27             Unblocked   Percent Blockage: 0.00

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    258.20      692.4    1.0453     723.69    9.5603    775.82    9.701      6923.4       10.0   1742.7
1647.8   1144.6


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          258.20     4.283    462.03    110.60   0.0000    836.13     2.854    411.97    2563.1   0.7800    1.40005
FS1   Inlet.Fl_O            258.20     4.283    462.03    110.60   0.0000    836.13     3.903    449.92    4162.5   0.3669    1.40005
FS12  Splitter.Fl_02        233.75     4.281    462.03    110.60   0.0000    757.33     3.839    447.87    3526.9   0.3976    1.40005
FS2   Splitter.Fl_01         24.45     4.281    462.03    110.60   0.0000     79.22     4.145    457.78     637.7   0.2154    1.40005
FS14  Fan.Fl_O              233.75     4.864    481.24    115.20   0.0000    680.26     4.058    456.95    2600.0   0.5154    1.40045
FS25  LPC.Fl_O               24.45     6.665    541.41    129.64   0.0000     55.08     6.419    535.62     412.5   0.2326    1.39974
FS3   HPC.Fl_O               23.26    41.554    988.55    238.42   0.0000     11.36    36.589    954.33      49.7   0.4328    1.38178
FS36  Bleed3.Fl_O            18.03    41.554    988.55    238.42   0.0000      8.80    38.703    969.31      49.3   0.3222    1.38178
FS4   Burner.Fl_O            18.23    40.597   1742.69    439.86   0.0111     12.10    38.343   1718.11      74.8   0.2940    1.33044
FS45  HPT.Fl_O               24.37     9.738   1148.85    280.62   0.0083     54.73     8.813   1118.49     264.7   0.3847    1.36585
FS49  LPT.Fl_O               24.65     3.293    896.35    216.92   0.0082    144.64     3.090    880.74     851.6   0.3045    1.38178
FS5   TEGV.Fl_O              24.65     3.293    896.35    216.92   0.0082    144.64     3.090    880.74     851.6   0.3045    1.38178
FS8   Core_Nozz.Fl_O         24.65     3.293    896.35    216.92   0.0082    144.64     2.854    861.44     603.2   0.4602    1.38178
FS17  FanDuctLkg.Fl_O       233.75     4.864    481.24    115.20   0.0000    680.26     4.058    456.95    2600.0   0.5154    1.40045
FS171 Bleed15.Fl_O          233.75     4.864    481.24    115.20   0.0000    680.26     3.948    453.36    2475.2   0.5544    1.40045
FS172 FanDuct.Fl_O          233.75     4.864    481.24    115.20   0.0000    680.26     3.948    453.36    2475.2   0.5544    1.40045
FS173 Byp_Nozz.Fl_O         233.75     4.864    481.24    115.20   0.0000    680.26     2.854    413.51    2002.6   0.9054    1.40045

TURBOMACHINERY PERFORMANCE DATA
                Wc       PR       eff          Nc        TR    efPoly         pwr      SMN      SMW
Fan         757.33    1.136    0.9061    2620.831    1.0416    0.9086     -1523.9  ---.--    54.85
LPC          79.22    1.557    0.7934    2620.831    1.1718    0.8031      -658.8     7.65     4.40
HPC          55.08    6.234    0.8208    8994.376    1.8259    0.8592     -3671.9    60.09    56.89
HPT          12.10    4.169    0.8769     220.129    1.3656    0.8550      3671.9
LPT          54.73    2.957    0.8551      72.979    1.2796    0.8359      2182.7

TURBOMACHINERY MAP DATA
             WcMap    PRmap    effMap       NcMap     R/Parm      s_WcDes    s_PRdes   s_effDes    s_NcDes
Fan         879.93    1.133    0.9079    2595.836     0.0415       0.8607     1.0235     0.9980     0.9905
```

LPC	78.89	1.585	0.8407	0.692	180.0000	1.0041	0.9524	0.9437	0.0003
HPC	50.10	5.988	0.8293	8754.385	11.0422	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.102	0.8769	1.325	4.1025	12.6513	0.9790	1.0000	0.0003
LPT	0.84	2.488	0.8614	0.822	2.4879	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2563.08	6226.1

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.3045	851.64
FanDuct	0.0000	0.5544	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5603	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9189.4	2098.6	3671.9
LP_Shaft	2473.6	4634.4	2182.7

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.8998	766.95	184.03	9.738
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2861	766.95	184.03	3.293
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.54	178.59	14.341
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	882.80	212.31	28.296
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.54	178.59	14.341
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	988.55	238.42	41.554
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.54	178.59	14.341

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7917	988.55	238.42	40.597
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.4428	988.55	238.42	22.945
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.55	238.42	41.554
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.55	238.42	41.554
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.55	238.42	41.554
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1742.69	0.9995	0.0230	0.20102	0.01115

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.154	0.9800	1.0000	0.9800	603.19	0.460	645.2	494.3
Byp_Nozz	1.704	0.9800	1.0000	0.9800	2002.63	0.905	884.2	6424.1

```
****************************************************************************************************************************************
Date:07/26/11    Time:14:14:10    Model:                                        Turbofan Engine -  COMDES ON    converge = 1   CASE:    0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  4/ 17/ 1/ 2    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 462.60    Stator 1 exit: 470.65    Stator 2 inlet: 480.95    Stator 2 exit: 486.52
            Stator 3 inlet: 496.29    Stator 3 exit: 501.39    Stator 4 inlet: 510.41    Stator 4 exit: 514.78
            Stator 5 inlet: 522.33    Stator 5 exit: 526.17             Unblocked   Percent Blockage: 0.00

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.730    38334.0    22.00    252.14      700.6    0.9992     700.10    9.5888    726.09    9.531      7006.2       10.0   1721.3
1626.7   1131.4


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          252.14     4.218    455.81    109.10   0.0000    823.47     2.947    411.97    2590.1   0.7300    1.39992
FS1   Inlet.Fl_O            252.14     4.218    455.81    109.10   0.0000    823.47     3.856    444.28    4162.5   0.3604    1.39992
FS12  Splitter.Fl_02        228.33     4.216    455.81    109.10   0.0000    746.08     3.795    442.33    3526.9   0.3905    1.39992
FS2   Splitter.Fl_01         23.81     4.216    455.81    109.10   0.0000     77.81     4.087    451.78     637.7   0.2114    1.39992
FS14  Fan.Fl_O              228.33     4.772    474.06    113.48   0.0000    672.24     4.004    450.89    2600.0   0.5068    1.40030
FS25  LPC.Fl_O               23.81     6.466    531.32    127.22   0.0000     54.78     6.229    525.71     412.5   0.2312    1.39975
FS3   HPC.Fl_O               22.66    40.203    969.78    233.77   0.0000     11.32    35.434    936.40      49.7   0.4310    1.38281
FS36  Bleed3.Fl_O            17.56    40.203    969.78    233.77   0.0000      8.78    37.464    951.00      49.3   0.3210    1.38281
FS4   Burner.Fl_O            17.75    39.277   1721.33    433.93   0.0111     12.10    37.095   1696.98      74.8   0.2940    1.33149
FS45  HPT.Fl_O               23.73     9.521   1135.66    277.23   0.0083     54.20     8.636   1106.28     264.7   0.3801    1.36671
FS49  LPT.Fl_O               24.01     3.348    894.72    216.51   0.0082    138.39     3.161    880.59     851.6   0.2898    1.38190
FS5   TEGV.Fl_O              24.01     3.348    894.72    216.51   0.0082    138.39     3.161    880.59     851.6   0.2898    1.38190
FS8   Core_Nozz.Fl_O         24.01     3.348    894.72    216.51   0.0082    138.39     2.947    863.52     603.2   0.4346    1.38190
FS17  FanDuctLkg.Fl_O       228.33     4.772    474.06    113.48   0.0000    672.24     4.004    450.89    2600.0   0.5068    1.40030
FS171 Bleed15.Fl_O          228.33     4.772    474.06    113.48   0.0000    672.24     3.901    447.52    2475.2   0.5445    1.40030
FS172 FanDuct.Fl_O          228.33     4.772    474.06    113.48   0.0000    672.24     3.901    447.52    2475.2   0.5445    1.40030
FS173 Byp_Nozz.Fl_O         228.33     4.772    474.06    113.48   0.0000    672.24     2.947    413.46    2002.6   0.8565    1.40030

TURBOMACHINERY PERFORMANCE DATA
                Wc       PR       eff         Nc        TR     efPoly        pwr      SMN      SMW
Fan         746.08    1.132    0.9063   2573.261    1.0400    0.9087    -1414.1  ---.--    54.44
LPC          77.81    1.534    0.7949   2573.261    1.1657    0.8034     -610.3     7.69     2.59
HPC          54.78    6.218    0.8207   8984.992    1.8252    0.8591    -3502.5    59.75    56.53
HPT          12.10    4.125    0.8761    219.190    1.3630    0.8541     3502.5
LPT          54.20    2.843    0.8506     71.582    1.2670    0.8317     2024.4

TURBOMACHINERY MAP DATA
             WcMap    PRmap    effMap      NcMap     R/Parm      s_WcDes    s_PRdes   s_effDes    s_NcDes
Fan         866.86    1.129    0.9082   2548.719     0.0416       0.8607     1.0235     0.9980     0.9905
```

LPC	75.44	1.561	0.8322	0.680	180.0000	1.0313	0.9503	0.9551	0.0003
HPC	49.82	5.972	0.8292	8745.252	11.0666	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.060	0.8761	1.320	4.0597	12.6513	0.9790	1.0000	0.0003
LPT	0.83	2.401	0.8569	0.807	2.4013	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2590.08	5690.1

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2898	851.64
FanDuct	0.0000	0.5445	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5888	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9093.9	2022.9	3502.5
LP_Shaft	2412.3	4407.5	2024.4

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.8763	752.37	180.49	9.521
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2786	752.37	180.49	3.348
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	730.40	175.17	13.888
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	866.00	208.19	27.383
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	730.40	175.17	13.888
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	969.78	233.77	40.203
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	730.40	175.17	13.888

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7188	969.78	233.77	39.277
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.3790	969.78	233.77	22.256
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	969.78	233.77	40.203
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	969.78	233.77	40.203
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	969.78	233.77	40.203
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	474.06	113.48	4.772
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	474.06	113.48	4.772
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	474.06	113.48	4.772
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	474.06	113.48	4.772
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	474.06	113.48	4.772

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1721.33	0.9995	0.0230	0.19447	0.01108

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.136	0.9800	1.0000	0.9800	603.19	0.435	609.9	455.1
Byp_Nozz	1.619	0.9800	1.0000	0.9800	2002.63	0.857	836.4	5935.7

```
**********************************************************************************************************************
Date:07/26/11    Time:14:15:47    Model:                                    Turbofan Engine -  COMDES ON    converge = 1   CASE:    0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 460.57    Stator 1 exit: 468.47    Stator 2 inlet: 478.58    Stator 2 exit: 484.06
            Stator 3 inlet: 493.64    Stator 3 exit: 498.64    Stator 4 inlet: 507.49    Stator 4 exit: 511.77
            Stator 5 inlet: 519.18    Stator 5 exit: 522.94             Unblocked   Percent Blockage: 0.00

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.714   37357.0    22.00    259.47      730.1    0.9841     718.46    9.5920    710.17    9.472      7300.9      10.0   1714.2
1619.8   1126.9


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht       FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          259.47     4.357    453.91    108.65    0.0000    818.74     3.088    411.97    2600.1   0.7140    1.39988
FS1   Inlet.Fl_O            259.47     4.357    453.91    108.65    0.0000    818.74     3.988    442.57    4162.5   0.3579    1.39988
FS12  Splitter.Fl_02        234.97     4.355    453.91    108.65    0.0000    741.82     3.926    440.66    3526.9   0.3878    1.39988
FS2   Splitter.Fl_01         24.50     4.355    453.91    108.65    0.0000     77.34     4.223    449.94     637.7   0.2100    1.39988
FS14  Fan.Fl_O              234.97     4.923    471.86    112.95    0.0000    669.07     4.140    449.09    2600.0   0.5035    1.40026
FS25  LPC.Fl_O               24.50     6.642    528.09    126.44    0.0000     54.69     6.400    522.53     412.5   0.2308    1.39976
FS3   HPC.Fl_O               23.31    41.268    963.73    232.27    0.0000     11.31    36.383    930.62      49.7   0.4304    1.38314
FS36  Bleed3.Fl_O            18.06    41.268    963.73    232.27    0.0000      8.77    38.462    945.10      49.3   0.3206    1.38314
FS4   Burner.Fl_O            18.26    40.318   1714.24    431.96    0.0110     12.10    38.077   1689.96      74.8   0.2940    1.33184
FS45  HPT.Fl_O               24.41     9.805   1131.25    276.10    0.0082     54.03     8.901   1102.19     264.7   0.3786    1.36700
FS49  LPT.Fl_O               24.70     3.493    894.10    216.35    0.0081    136.40     3.304    880.42     851.6   0.2852    1.38194
FS5   TEGV.Fl_O              24.70     3.493    894.10    216.35    0.0081    136.40     3.304    880.42     851.6   0.2852    1.38194
FS8   Core_Nozz.Fl_O         24.70     3.493    894.10    216.35    0.0081    136.40     3.089    864.01     603.2   0.4267    1.38194
FS17  FanDuctLkg.Fl_O       234.97     4.923    471.86    112.95    0.0000    669.07     4.140    449.09    2600.0   0.5035    1.40026
FS171 Bleed15.Fl_O          234.97     4.923    471.86    112.95    0.0000    669.07     4.035    445.80    2475.2   0.5407    1.40026
FS172 FanDuct.Fl_O          234.97     4.923    471.86    112.95    0.0000    669.07     4.035    445.80    2475.2   0.5407    1.40026
FS173 Byp_Nozz.Fl_O         234.97     4.923    471.86    112.95    0.0000    669.07     3.088    413.45    2002.6   0.8410    1.40026

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       741.82   1.130   0.9065   2556.183   1.0396    0.9088    -1431.7  ---.--   54.25
LPC        77.34   1.525   0.7956   2556.183   1.1634    0.8037     -616.8    7.70    2.49
HPC        54.69   6.213   0.8207   8982.149   1.8249    0.8592    -3578.8   59.65   56.42
HPT        12.10   4.112   0.8758    218.905   1.3621    0.8539     3578.8
LPT        54.03   2.807   0.8491     71.097   1.2629    0.8303     2048.5

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        861.90   1.127   0.9083   2531.804    0.0416      0.8607    1.0235    0.9980    0.9905
```

LPC	74.20	1.553	0.8292	0.675	180.0000	1.0423	0.9498	0.9595	0.0003
HPC	49.74	5.967	0.8291	8742.485	11.0741	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.046	0.8758	1.318	4.0464	12.6513	0.9790	1.0000	0.0003
LPT	0.83	2.373	0.8554	0.801	2.3734	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2600.06	5727.2

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2852	851.64
FanDuct	0.0000	0.5407	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5920	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9063.4	2073.9	3578.8
LP_Shaft	2391.3	4499.3	2048.5

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.9015	747.69	179.36	9.805
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2866	747.69	179.36	3.493
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.86	174.06	14.260
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	860.60	206.87	28.110
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.86	174.06	14.260
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	963.73	232.27	41.268
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.86	174.06	14.260

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7970	963.73	232.27	40.318
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.4474	963.73	232.27	22.865
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	963.73	232.27	41.268
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	963.73	232.27	41.268
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	963.73	232.27	41.268
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	471.86	112.95	4.923
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	471.86	112.95	4.923
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	471.86	112.95	4.923
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	471.86	112.95	4.923
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	471.86	112.95	4.923

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1714.24	0.9995	0.0230	0.19957	0.01105

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.131	0.9800	1.0000	0.9800	603.19	0.427	599.0	459.8
Byp_Nozz	1.594	0.9800	1.0000	0.9800	2002.63	0.841	821.2	5997.4

```
**********************************************************************************************************************
Date:07/26/11    Time:14:17:26    Model:                                    Turbofan Engine -  COMDES ON    converge = 1   CASE:    0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 462.20    Stator 1 exit: 469.79    Stator 2 inlet: 479.49    Stator 2 exit: 484.72
            Stator 3 inlet: 493.91    Stator 3 exit: 498.68    Stator 4 inlet: 507.17    Stator 4 exit: 511.24
            Stator 5 inlet: 518.34    Stator 5 exit: 521.91            Unblocked   Percent Blockage: 0.00

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.669   34281.0    22.00    282.88      832.2    0.9479     788.85    9.6013    670.64    9.284      8322.3      10.0   1717.3
1622.2   1130.5


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht       FAR        Wc        Ps        Ts      Aphy       MN      gamt
FS0   Ambient.Fl_O          282.88     4.846    455.82    109.11    0.0000    804.26     3.578    418.42    2631.6   0.6690   1.39992
FS1   Inlet.Fl_O            282.88     4.846    455.82    109.11    0.0000    804.26     4.451    444.90    4162.5   0.3505   1.39992
FS12  Splitter.Fl_02        256.19     4.843    455.82    109.11    0.0000    728.76     4.385    443.07    3526.9   0.3795   1.39992
FS2   Splitter.Fl_01         26.68     4.843    455.82    109.11    0.0000     75.90     4.702    451.99     637.7   0.2059   1.39992
FS14  Fan.Fl_O              256.19     5.452    473.24    113.28    0.0000    659.67     4.615    451.25    2600.0   0.4936   1.40028
FS25  LPC.Fl_O               26.68     7.264    527.02    126.19    0.0000     54.41     7.003    521.52     412.5   0.2296   1.39976
FS3   HPC.Fl_O               25.39    44.986    960.93    231.57    0.0000     11.29    39.689    928.09      49.7   0.4292   1.38329
FS36  Bleed3.Fl_O            19.68    44.986    960.93    231.57    0.0000      8.75    41.942    942.44      49.3   0.3198   1.38329
FS4   Burner.Fl_O            19.90    43.950   1717.32    432.85    0.0111     12.11    41.507   1693.01      74.8   0.2941   1.33163
FS45  HPT.Fl_O               26.59    10.794   1134.86    277.04    0.0083     53.55     9.819   1106.31     264.7   0.3746   1.36673
FS49  LPT.Fl_O               26.90     3.998    905.45    219.18    0.0082    130.67     3.800    892.84     851.6   0.2722   1.38110
FS5   TEGV.Fl_O              26.90     3.998    905.45    219.18    0.0082    130.67     3.800    892.84     851.6   0.2722   1.38110
FS8   Core_Nozz.Fl_O         26.90     3.998    905.45    219.18    0.0082    130.67     3.578    878.01     603.2   0.4045   1.38110
FS17  FanDuctLkg.Fl_O       256.19     5.452    473.24    113.28    0.0000    659.67     4.615    451.25    2600.0   0.4936   1.40028
FS171 Bleed15.Fl_O          256.19     5.452    473.24    113.28    0.0000    659.67     4.504    448.11    2475.2   0.5294   1.40028
FS172 FanDuct.Fl_O          256.19     5.452    473.24    113.28    0.0000    659.67     4.504    448.11    2475.2   0.5294   1.40028
FS173 Byp_Nozz.Fl_O         256.19     5.452    473.24    113.28    0.0000    659.67     3.578    419.87    2002.6   0.7976   1.40028

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan         728.76   1.126   0.9066   2502.336   1.0382    0.9089    -1514.1  ---.--   53.74
LPC          75.90   1.500   0.7980   2502.336   1.1562    0.8055     -644.7    7.76    2.32
HPC          54.41   6.193   0.8204   8973.363   1.8233    0.8589    -3882.3   59.47   56.23
HPT          12.11   4.072   0.8761    218.271   1.3592    0.8544     3882.3
LPT          53.55   2.700   0.8464     69.635   1.2508    0.8281     2158.8

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         846.73   1.123   0.9085   2478.470    0.0417      0.8607    1.0235    0.9980    0.9905
```

LPC	70.28	1.527	0.8197	0.661	180.0000	1.0799	0.9492	0.9736	0.0003
HPC	49.49	5.948	0.8289	8733.933	11.0883	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.007	0.8761	1.314	4.0070	12.6513	0.9790	1.0000	0.0003
LPT	0.82	2.292	0.8527	0.785	2.2925	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2631.63	5896.3

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2722	851.64
FanDuct	0.0000	0.5294	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.6013	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9045.3	2254.2	3882.3
LP_Shaft	2345.8	4833.4	2158.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.9819	745.73	178.88	10.794
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3122	745.73	178.88	3.998
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.98	173.61	15.563
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	858.19	206.28	30.652
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.98	173.61	15.563
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	960.93	231.57	44.986
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.98	173.61	15.563

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.0467	960.93	231.57	43.950
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.6659	960.93	231.57	24.985
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	960.93	231.57	44.986
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	960.93	231.57	44.986
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	960.93	231.57	44.986
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	473.24	113.28	5.452
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	473.24	113.28	5.452
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	473.24	113.28	5.452
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	473.24	113.28	5.452
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	473.24	113.28	5.452

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1717.32	0.9995	0.0230	0.21913	0.01114

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.117	0.9800	1.0000	0.9800	603.19	0.405	572.4	478.6
Byp_Nozz	1.524	0.9800	1.0000	0.9800	2002.63	0.798	784.9	6249.9

```
**********************************************************************************************************************
Date:07/26/11    Time:14:19:11    Model:                                    Turbofan Engine -  COMDES ON    converge = 1   CASE:    0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 12/ 25/ 1/10    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 471.61    Stator 1 exit: 478.79    Stator 2 inlet: 487.99    Stator 2 exit: 492.90
            Stator 3 inlet: 501.61    Stator 3 exit: 506.06    Stator 4 inlet: 514.11    Stator 4 exit: 517.89
            Stator 5 inlet: 524.61    Stator 5 exit: 527.91             Unblocked   Percent Blockage: 0.00

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.608    30029.0    22.00    314.03      995.1    0.9037     899.23    9.5609    620.50    9.019      9951.0       10.0   1742.1
1645.1   1149.1


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           314.03     5.599    465.62    111.46   0.0000    780.92     4.358    433.58    2686.1   0.6080    1.40012
FS1   Inlet.Fl_O             314.03     5.599    465.62    111.46   0.0000    780.92     5.172    455.17    4162.5   0.3387    1.40012
FS12  Splitter.Fl_02         284.30     5.597    465.62    111.46   0.0000    707.32     5.101    453.45    3526.9   0.3662    1.40012
FS2   Splitter.Fl_01          29.74     5.597    465.62    111.46   0.0000     73.98     5.442    461.91     637.7   0.2004    1.40012
FS14  Fan.Fl_O               284.30     6.259    482.58    115.52   0.0000    643.85     5.355    461.53    2600.0   0.4774    1.40048
FS25  LPC.Fl_O                29.74     8.179    532.87    127.59   0.0000     54.16     7.887    527.37     412.5   0.2284    1.39975
FS3   HPC.Fl_O                28.29    50.502    970.72    234.00   0.0000     11.26    44.587    937.76      49.7   0.4280    1.38276
FS36  Bleed3.Fl_O             21.93    50.502    970.72    234.00   0.0000      8.73    47.102    952.15      49.3   0.3190    1.38276
FS4   Burner.Fl_O             22.18    49.339   1742.09    439.81   0.0114     12.11    46.596   1717.49      74.8   0.2943    1.33030
FS45  HPT.Fl_O                29.64    12.253   1153.53    281.87   0.0085     53.01    11.170   1125.26     264.7   0.3704    1.36543
FS49  LPT.Fl_O                29.99     4.803    933.21    226.13   0.0084    123.08     4.593    921.83     851.6   0.2552    1.37919
FS5   TEGV.Fl_O               29.99     4.803    933.21    226.13   0.0084    123.08     4.593    921.83     851.6   0.2552    1.37919
FS8   Core_Nozz.Fl_O          29.99     4.803    933.21    226.13   0.0084    123.08     4.358    908.70     603.2   0.3769    1.37919
FS17  FanDuctLkg.Fl_O        284.30     6.259    482.58    115.52   0.0000    643.85     5.355    461.53    2600.0   0.4774    1.40048
FS171 Bleed15.Fl_O           284.30     6.259    482.58    115.52   0.0000    643.85     5.237    458.60    2475.2   0.5112    1.40048
FS172 FanDuct.Fl_O           284.30     6.259    482.58    115.52   0.0000    643.85     5.237    458.60    2475.2   0.5112    1.40048
FS173 Byp_Nozz.Fl_O          284.30     6.259    482.58    115.52   0.0000    643.85     4.358    435.01    2002.6   0.7395    1.40048

TURBOMACHINERY PERFORMANCE DATA
               Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan        707.32   1.118   0.9068   2417.232   1.0364    0.9090    -1636.1  ---.--   52.80
LPC         73.98   1.461   0.8033   2417.232   1.1444    0.8103     -678.7    7.89    2.03
HPC         54.16   6.175   0.8202   8965.220   1.8217    0.8586    -4368.2   59.28   56.02
HPT         12.11   4.027   0.8777    217.715   1.3556    0.8565     4368.2
LPT         53.01   2.551   0.8434     67.433   1.2334    0.8253     2314.8

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         821.83   1.116   0.9086   2394.178    0.0420      0.8607    1.0235    0.9980    0.9905
```

LPC	64.10	1.485	0.8046	0.638	180.0000	1.1541	0.9513	0.9985	0.0003
HPC	49.25	5.931	0.8286	8726.008	11.1033	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.963	0.8777	1.311	3.9629	12.6513	0.9790	1.0000	0.0003
LPT	0.82	2.179	0.8497	0.760	2.1793	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2686.13	6056.4

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2552	851.64
FanDuct	0.0000	0.5112	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5609	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9087.1	2524.7	4368.2
LP_Shaft	2290.3	5308.5	2314.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.0943	753.62	180.79	12.253
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3479	753.62	180.79	4.803
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	867.09	208.46	34.419
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	970.72	234.00	50.502
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.3952	970.72	234.00	49.339
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.9709	970.72	234.00	28.126
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.72	234.00	50.502
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.72	234.00	50.502
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.72	234.00	50.502
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1742.09	0.9995	0.0230	0.24979	0.01139

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.102	0.9800	1.0000	0.9800	603.19	0.377	542.1	505.2
Byp_Nozz	1.436	0.9800	1.0000	0.9800	2002.63	0.739	740.8	6546.3

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**********************************************************************************************************************
Date:07/26/11    Time:14:20:48    Model:                                    Turbofan Engine -  COMDES ON    converge = 1   CASE:    0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 12/ 25/ 1/10    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 482.10    Stator 1 exit: 488.88    Stator 2 inlet: 497.56    Stator 2 exit: 502.14
            Stator 3 inlet: 510.37    Stator 3 exit: 514.50    Stator 4 inlet: 522.10    Stator 4 exit: 525.59
            Stator 5 inlet: 531.92    Stator 5 exit: 534.96             Unblocked   Percent Blockage: 0.00

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.552   25666.0     22.00     348.88      1194.7    0.8611    1028.70    9.4744    573.44    8.758      11946.9      10.0   1767.3
1668.7   1167.7


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht       FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           348.88     6.507    476.52    114.07    0.0000    755.23     5.297    449.14    2752.3    0.5520    1.40035
FS1   Inlet.Fl_O             348.88     6.507    476.52    114.07    0.0000    755.23     6.045    466.60    4162.5    0.3259    1.40035
FS12  Splitter.Fl_02         315.57     6.504    476.52    114.07    0.0000    683.47     5.971    465.01    3526.9    0.3517    1.40035
FS2   Splitter.Fl_01          33.31     6.504    476.52    114.07    0.0000     72.14     6.333    472.91     637.7    0.1952    1.40035
FS14  Fan.Fl_O               315.57     7.231    493.15    118.06    0.0000    625.36     6.258    473.18    2600.0    0.4591    1.40071
FS25  LPC.Fl_O                33.31     9.260    539.61    129.21    0.0000     53.92     8.932    534.10     412.5    0.2274    1.39974
FS3   HPC.Fl_O                 31.69    56.991    981.96    236.79    0.0000     11.24    50.340    948.79      49.7    0.4272    1.38214
FS36  Bleed3.Fl_O              24.56    56.991    981.96    236.79    0.0000      8.71    53.166    963.27      49.3    0.3185    1.38214
FS4   Burner.Fl_O              24.85    55.678   1767.27    446.90    0.0116     12.11    52.582   1742.39      74.8    0.2944    1.32897
FS45  HPT.Fl_O                 33.20    13.953   1172.32    286.73    0.0087     52.58    12.741   1144.19     264.7    0.3670    1.36414
FS49  LPT.Fl_O                 33.59     5.768    960.82    233.06    0.0086    116.50     5.543    950.42     851.6    0.2407    1.37750
FS5   TEGV.Fl_O                33.59     5.768    960.82    233.06    0.0086    116.50     5.543    950.42     851.6    0.2407    1.37750
FS8   Core_Nozz.Fl_O           33.59     5.768    960.82    233.06    0.0086    116.50     5.297    938.67     603.2    0.3533    1.37750
FS17  FanDuctLkg.Fl_O         315.57     7.231    493.15    118.06    0.0000    625.36     6.258    473.18    2600.0    0.4591    1.40071
FS171 Bleed15.Fl_O            315.57     7.231    493.15    118.06    0.0000    625.36     6.134    470.47    2475.2    0.4906    1.40071
FS172 FanDuct.Fl_O            315.57     7.231    493.15    118.06    0.0000    625.36     6.134    470.47    2475.2    0.4906    1.40071
FS173 Byp_Nozz.Fl_O           315.57     7.231    493.15    118.06    0.0000    625.36     5.297    450.56    2002.6    0.6873    1.40071

TURBOMACHINERY PERFORMANCE DATA
               Wc      PR       eff         Nc        TR    efPoly        pwr      SMN      SMW
Fan        683.47   1.112    0.9066   2329.709    1.0349    0.9089    -1780.4  ---.--    51.54
LPC         72.14   1.424    0.8094   2329.709    1.1324    0.8163     -713.4     8.10     1.72
HPC         53.92   6.155    0.8199   8957.658    1.8198    0.8582    -4946.8    59.19    55.91
HPT         12.11   3.991    0.8791    217.340    1.3526    0.8585     4946.8
LPT         52.58   2.419    0.8400     65.219    1.2172    0.8226     2493.9

TURBOMACHINERY MAP DATA
            WcMap   PRmap    effMap      NcMap     R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        794.11   1.109    0.9085   2307.490     0.0424      0.8607    1.0235    0.9980    0.9905
```

LPC	57.74	1.442	0.7890	0.615	180.0000	1.2493	0.9583	1.0258	0.0003
HPC	49.04	5.912	0.8283	8718.647	11.1115	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.928	0.8791	1.308	3.9276	12.6513	0.9790	1.0000	0.0003
LPT	0.81	2.079	0.8462	0.735	2.0788	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2752.31	6218.1

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2407	851.64
FanDuct	0.0000	0.4906	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.4744	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9136.7	2843.6	4946.8
LP_Shaft	2233.0	5865.6	2493.9

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.2257	762.70	183.00	13.953
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3897	762.70	183.00	5.768
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	740.53	177.62	19.760
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	877.32	210.97	38.853
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	740.53	177.62	19.760
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	981.96	236.79	56.991
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	740.53	177.62	19.760

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.8031	981.96	236.79	55.678
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	3.3278	981.96	236.79	31.811
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	981.96	236.79	56.991
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	981.96	236.79	56.991
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	981.96	236.79	56.991
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	493.15	118.06	7.231
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	493.15	118.06	7.231
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	493.15	118.06	7.231
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	493.15	118.06	7.231
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	493.15	118.06	7.231

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1767.27	0.9995	0.0230	0.28575	0.01163

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.089	0.9800	1.0000	0.9800	603.19	0.353	516.2	538.9
Byp_Nozz	1.365	0.9800	1.0000	0.9800	2002.63	0.687	700.8	6873.8

```
**********************************************************************************************************************
Date:07/26/11    Time:14:22:42    Model:                                    Turbofan Engine -  COMDES ON    converge = 1   CASE:    0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 14/ 27/ 1/12    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 496.92    Stator 1 exit: 503.31    Stator 2 inlet: 511.50    Stator 2 exit: 515.76
            Stator 3 inlet: 523.50    Stator 3 exit: 527.33    Stator 4 inlet: 534.49    Stator 4 exit: 537.70
            Stator 5 inlet: 543.65    Stator 5 exit: 546.43             Unblocked   Percent Blockage: 0.00

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.490    20047.0    22.00     399.42      1508.8     0.8143    1228.64    9.3226    520.34    8.454     15087.7       10.0    1802.8
1702.0   1194.4


                                        FLOW STATION DATA
                                    W         Pt         Tt         ht      FAR        Wc         Ps         Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           399.42      7.913     491.73     117.72   0.0000     722.30      6.740     469.18    2850.8   0.4900    1.40068
FS1   Inlet.Fl_O             399.42      7.913     491.73     117.72   0.0000     722.30      7.403     482.46    4162.5   0.3098    1.40068
FS12  Splitter.Fl_02         360.73      7.909     491.73     117.72   0.0000     652.66      7.323     481.03    3526.9   0.3333    1.40068
FS2   Splitter.Fl_01          38.69      7.909     491.73     117.72   0.0000      70.01      7.714     488.24     637.7   0.1891    1.40068
FS14  Fan.Fl_O               360.73      8.767     508.18     121.66   0.0000     598.56      7.703     489.73    2600.0   0.4337    1.40000
FS25  LPC.Fl_O                38.69     10.953     550.41     131.80   0.0000      53.48     10.572     544.88     412.5   0.2254    1.39972
FS3   HPC.Fl_O                36.82     66.894     999.04     241.03   0.0000      11.23     59.118     965.48      49.7   0.4265    1.38121
FS36  Bleed3.Fl_O             28.53     66.894     999.04     241.03   0.0000       8.70     62.421     980.12      49.3   0.3180    1.38121
FS4   Burner.Fl_O             28.87     65.353    1802.77     456.92   0.0120      12.11     61.719    1777.49      74.8   0.2946    1.32717
FS45  HPT.Fl_O                38.58     16.576    1199.12     293.70   0.0089      52.01     15.171    1171.16     264.7   0.3626    1.36231
FS49  LPT.Fl_O                39.04      7.255     996.47     242.05   0.0088     109.60      7.006     987.03     851.6   0.2257    1.37532
FS5   TEGV.Fl_O               39.04      7.255     996.47     242.05   0.0088     109.60      7.006     987.03     851.6   0.2257    1.37532
FS8   Core_Nozz.Fl_O          39.04      7.255     996.47     242.05   0.0088     109.60      6.740     976.56     603.2   0.3294    1.37532
FS17  FanDuctLkg.Fl_O         360.73      8.767     508.18     121.66   0.0000     598.56      7.703     489.73    2600.0   0.4337    1.40000
FS171 Bleed15.Fl_O            360.73      8.767     508.18     121.66   0.0000     598.56      7.571     487.32    2475.2   0.4624    1.40000
FS172 FanDuct.Fl_O            360.73      8.767     508.18     121.66   0.0000     598.56      7.571     487.32    2475.2   0.4624    1.40000
FS173 Byp_Nozz.Fl_O           360.73      8.767     508.18     121.66   0.0000     598.56      6.740     470.67    2002.6   0.6309    1.40000

TURBOMACHINERY PERFORMANCE DATA
                Wc       PR       eff          Nc        TR     efPoly         pwr      SMN      SMW
Fan         652.66    1.108    0.9089    2234.707    1.0334    0.9078     -2012.8   ---.--    49.22
LPC          70.01    1.385    0.8153    2234.707    1.1193    0.8232      -771.0     8.44     1.36
HPC          53.48    6.107    0.8191    8943.353    1.8151    0.8576     -5834.8    59.30    55.98
HPT          12.11    3.943    0.8809     216.985    1.3484    0.8608      5834.8
LPT          52.01    2.285    0.8364      62.836    1.2003    0.8208      2783.9

TURBOMACHINERY MAP DATA
             WcMap    PRmap    effMap       NcMap     R/Parm      s_WcDes    s_PRdes   s_effDes    s_NcDes
Fan         758.31    1.106    0.9108    2213.394     0.0433       0.8607     1.0235     0.9980     0.9905
```

LPC	50.84	1.396	0.7722	0.590	180.0000	1.3770	0.9728	1.0558	0.0003
HPC	48.64	5.867	0.8276	8704.724	11.1098	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.881	0.8809	1.306	3.8809	12.6513	0.9790	1.0000	0.0003
LPT	0.80	1.977	0.8426	0.708	1.9767	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2850.78	6459.7

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2257	851.64
FanDuct	0.0000	0.4624	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.3226	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9213.0	3326.3	5834.8
LP_Shaft	2175.9	6719.6	2783.9

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.4239	776.77	186.42	16.576
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.4527	776.77	186.42	7.255
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	754.28	180.95	23.260
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	892.98	214.81	45.636
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	754.28	180.95	23.260
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	999.04	241.03	66.894
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	754.28	180.95	23.260

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	4.4181	999.04	241.03	65.353
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	3.8659	999.04	241.03	37.452
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	999.04	241.03	66.894
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	999.04	241.03	66.894
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	999.04	241.03	66.894
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1802.77	0.9995	0.0230	0.34129	0.01196

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.076	0.9800	1.0000	0.9800	603.19	0.329	490.4	595.0
Byp_Nozz	1.301	0.9800	1.0000	0.9800	2002.63	0.631	657.7	7373.5

```
**********************************************************************************************************************************
Date:07/26/11    Time:14:24:45    Model:                                    Turbofan Engine -  COMDES ON    converge = 1   CASE:    0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 16/ 29/ 1/14    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 509.90    Stator 1 exit: 515.94    Stator 2 inlet: 523.67    Stator 2 exit: 527.69
            Stator 3 inlet: 534.98    Stator 3 exit: 538.57    Stator 4 inlet: 545.32    Stator 4 exit: 548.32
            Stator 5 inlet: 553.92    Stator 5 exit: 556.51             Unblocked   Percent Blockage: 0.00

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.446    15435.0    22.00    442.47     1740.6     0.7964    1386.26    9.3145    481.90    8.015     17405.9       10.0   1824.3
1722.0   1213.9


                                        FLOW STATION DATA
                                    W         Pt         Tt         ht      FAR        Wc         Ps         Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           442.47      9.311     504.97     120.89   0.0000    689.09      8.149     485.63    2919.1   0.4460    1.40036
FS1   Inlet.Fl_O             442.47      9.311     504.97     120.89   0.0000    689.09      8.769     496.39    4162.5   0.2938    1.40036
FS12  Splitter.Fl_02         399.57      9.306     504.97     120.89   0.0000    622.60      8.684     495.08    3526.9   0.3158    1.40036
FS2   Splitter.Fl_01          42.90      9.306     504.97     120.89   0.0000     66.84      9.098     501.71     637.7   0.1802    1.40036
FS14  Fan.Fl_O               399.57     10.281     520.78     124.69   0.0000    572.30      9.159     503.86    2600.0   0.4099    1.39977
FS25  LPC.Fl_O                42.90     12.568     559.89     134.08   0.0000     52.12     12.154     554.56     412.5   0.2193    1.39970
FS3   HPC.Fl_O                40.82     74.624    1008.42     243.36   0.0000     11.21     65.979     974.72      49.7   0.4257    1.38041
FS36  Bleed3.Fl_O             31.63     74.624    1008.42     243.36   0.0000      8.69     69.651     989.42      49.3   0.3175    1.38041
FS4   Burner.Fl_O             32.02     72.905    1824.25     463.01   0.0122     12.10     68.851    1798.73      74.8   0.2947    1.32625
FS45  HPT.Fl_O                42.78     18.856    1218.74     298.81   0.0091     51.11     17.318    1191.52     264.7   0.3554    1.36088
FS49  LPT.Fl_O                43.28      8.691    1025.59     249.42   0.0090    102.91      8.430    1017.12     851.6   0.2113    1.37317
FS5   TEGV.Fl_O               43.28      8.691    1025.59     249.42   0.0090    102.91      8.430    1017.12     851.6   0.2113    1.37317
FS8   Core_Nozz.Fl_O          43.28      8.691    1025.59     249.42   0.0090    102.91      8.149    1007.84     603.2   0.3071    1.37317
FS17  FanDuctLkg.Fl_O        399.57     10.281     520.78     124.69   0.0000    572.30      9.159     503.86    2600.0   0.4099    1.39977
FS171 Bleed15.Fl_O           399.57     10.281     520.78     124.69   0.0000    572.30      9.023     501.71    2475.2   0.4360    1.39977
FS172 FanDuct.Fl_O           399.57     10.281     520.78     124.69   0.0000    572.30      9.023     501.71    2475.2   0.4360    1.39977
FS173 Byp_Nozz.Fl_O          399.57     10.281     520.78     124.69   0.0000    572.30      8.149     487.09    2002.6   0.5880    1.39977

TURBOMACHINERY PERFORMANCE DATA
               Wc      PR      eff          Nc       TR    efPoly        pwr     SMN      SMW
Fan        622.60   1.105   0.9099    2144.466   1.0313    0.9114    -2146.2  ---.--    46.99
LPC         66.84   1.350   0.8157    2144.466   1.1087    0.8246     -800.2    8.94     0.99
HPC         52.12   5.938   0.8161    8898.137   1.8011    0.8547    -6472.1   60.24    56.75
HPT         12.10   3.866   0.8815     216.452   1.3420    0.8617     6472.1
LPT         51.11   2.169   0.8325      60.611   1.1852    0.8172     2946.4

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        723.38   1.102   0.9118   2124.014    0.0442      0.8607    1.0235    0.9980    0.9905
```

LPC	44.28	1.351	0.7562	0.566	180.0000	1.5095	0.9973	1.0787	0.0003
HPC	47.40	5.705	0.8245	8660.714	11.0684	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.806	0.8815	1.303	3.8062	12.6513	0.9790	1.0000	0.0003
LPT	0.79	1.889	0.8387	0.683	1.8890	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2919.11	6627.3

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2113	851.64
FanDuct	0.0000	0.4360	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.3145	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9244.9	3676.8	6472.1
LP_Shaft	2116.0	7313.4	2946.4

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.5786	786.25	188.72	18.856
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.5019	786.25	188.72	8.691
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	763.76	183.26	26.220
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	902.42	217.13	51.042
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	763.76	183.26	26.220
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1008.42	243.36	74.624
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	763.76	183.26	26.220

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	4.8980	1008.42	243.36	72.905
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	4.2859	1008.42	243.36	41.989
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1008.42	243.36	74.624
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1008.42	243.36	74.624
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1008.42	243.36	74.624
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	520.78	124.69	10.281
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	520.78	124.69	10.281
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	520.78	124.69	10.281
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	520.78	124.69	10.281
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	520.78	124.69	10.281

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1824.25	0.9995	0.0230	0.38507	0.01217

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.067	0.9800	1.0000	0.9800	603.19	0.307	464.1	624.4
Byp_Nozz	1.262	0.9800	1.0000	0.9800	2002.63	0.588	623.5	7743.5

```
**********************************************************************************************************************
Date:07/26/11    Time:14:26:57    Model:                                    Turbofan Engine -  COMDES ON    converge = 1   CASE:    0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 19/ 32/ 1/17    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 523.48    Stator 1 exit: 529.04    Stator 2 inlet: 536.15    Stator 2 exit: 539.83
            Stator 3 inlet: 546.53    Stator 3 exit: 549.79    Stator 4 inlet: 555.99    Stator 4 exit: 558.70
            Stator 5 inlet: 563.83    Stator 5 exit: 566.16             Unblocked   Percent Blockage: 0.00

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.406    10735.0    22.00    489.85      2003.2     0.7777    1557.96    9.2910    446.20    7.554     20032.3       10.0   1842.0
1738.8   1230.8


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           489.85    11.019    518.95    124.25   0.0000    653.50     9.822    502.39    2996.0   0.4060    1.39978
FS1   Inlet.Fl_O             489.85    11.019    518.95    124.25   0.0000    653.50    10.446    511.10    4162.5   0.2772    1.39978
FS12  Splitter.Fl_02         442.25    11.013    518.95    124.25   0.0000    590.29    10.357    509.92    3526.9   0.2976    1.39978
FS2   Splitter.Fl_01          47.60    11.013    518.95    124.25   0.0000     63.53    10.791    515.93     637.7   0.1710    1.39978
FS14  Fan.Fl_O               442.25    12.085    534.12    127.89   0.0000    545.75    10.900    518.61    2600.0   0.3868    1.39975
FS25  LPC.Fl_O                47.60    14.441    569.62    136.41   0.0000     50.76    13.990    564.49     412.5   0.2133    1.39968
FS3   HPC.Fl_O                45.29    83.232   1017.61    245.65   0.0000     11.20    73.606    983.68      49.7   0.4255    1.37981
FS36  Bleed3.Fl_O             35.10    83.232   1017.61    245.65   0.0000      8.68    77.695    998.48      49.3   0.3174    1.37981
FS4   Burner.Fl_O             35.53    81.316   1842.02    468.06   0.0123     12.10    76.796   1816.31      74.8   0.2947    1.32540
FS45  HPT.Fl_O                47.48    21.393   1235.67    303.23   0.0092     50.34    19.706   1209.07     264.7   0.3493    1.35973
FS49  LPT.Fl_O                48.03    10.389   1052.82    256.33   0.0091     96.80    10.114   1045.19     851.6   0.1982    1.37143
FS5   TEGV.Fl_O               48.03    10.389   1052.82    256.33   0.0091     96.80    10.114   1045.19     851.6   0.1982    1.37143
FS8   Core_Nozz.Fl_O          48.03    10.389   1052.82    256.33   0.0091     96.80     9.822   1036.94     603.2   0.2870    1.37143
FS17  FanDuctLkg.Fl_O        442.25    12.085    534.12    127.89   0.0000    545.75    10.900    518.61    2600.0   0.3868    1.39975
FS171 Bleed15.Fl_O           442.25    12.085    534.12    127.89   0.0000    545.75    10.760    516.69    2475.2   0.4108    1.39975
FS172 FanDuct.Fl_O           442.25    12.085    534.12    127.89   0.0000    545.75    10.760    516.69    2475.2   0.4108    1.39975
FS173 Byp_Nozz.Fl_O          442.25    12.085    534.12    127.89   0.0000    545.75     9.822    503.75    2002.6   0.5491    1.39975

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR       eff         Nc        TR    efPoly        pwr      SMN      SMW
Fan         590.29   1.097    0.9093   2034.263    1.0292    0.9108    -2279.5  ---.--    45.03
LPC          63.53   1.311    0.8186   2034.263    1.0976    0.8270     -819.3    9.96     0.51
HPC          50.76   5.764    0.8128   8853.262    1.7865    0.8515    -7178.4   61.40    57.72
HPT          12.10   3.801    0.8818    216.174    1.3364    0.8624     7178.4
LPT          50.34   2.059    0.8287     57.886    1.1704    0.8140     3098.8

TURBOMACHINERY MAP DATA
             WcMap   PRmap    effMap      NcMap     R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         685.85   1.095    0.9111   2014.862     0.0450      0.8607    1.0235    0.9980    0.9905
```

LPC	36.28	1.298	0.7366	0.537	180.0000	1.7515	1.0460	1.1113	0.0003
HPC	46.17	5.539	0.8212	8617.037	11.0151	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.742	0.8818	1.301	3.7422	12.6513	0.9790	1.0000	0.0003
LPT	0.77	1.805	0.8348	0.652	1.8051	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2995.97	6793.5

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.1982	851.64
FanDuct	0.0000	0.4108	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.2910	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9277.9	4063.6	7178.4
LP_Shaft	2034.8	7998.4	3098.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.7517	795.75	191.03	21.393
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.5569	795.75	191.03	10.389
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	911.76	219.43	57.092
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	5.4350	1017.61	245.65	81.316
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	4.7557	1017.61	245.65	47.040
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1842.02	0.9995	0.0230	0.43277	0.01233

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.058	0.9800	1.0000	0.9800	603.19	0.287	439.7	656.4
Byp_Nozz	1.230	0.9800	1.0000	0.9800	2002.63	0.549	592.2	8140.2

Appendix H.—NPSS Engine Analysis Along Vehicle Flight Trajectory; Parametrically Varying Blockages 10% Blockage

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**********************************************************************************************************************************

Date:02/23/11    Time:08:00:38    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 34/ 2/ 5    Run by: Philip C Jorgenson      PC:   100
Temperature Stator 1 inlet: 456.56    Stator 1 exit: 475.13    Stator 2 inlet: 502.77    Stator 2 exit: 510.93
            Stator 3 inlet: 537.55    Stator 3 exit: 546.10    Stator 4 inlet: 571.37    Stator 4 exit: 579.42
            Stator 5 inlet: 599.78    Stator 5 exit: 607.62             Unblocked   Percent Blockage: 0.10

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.780   35000.0    22.00    477.01     8371.9    0.5976    5003.20    5.2999    779.49   32.229      8371.8     100.0   2874.1
2696.7   1876.6


                                        FLOW STATION DATA
                              W        Pt        Tt       ht     FAR       Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O         477.01     5.185    466.40   111.64  0.0000  1281.99     3.458    415.85    3926.2  0.7800   1.40014
FS1   Inlet.Fl_O           477.01     5.185    466.40   111.64  0.0000  1281.99     3.822    427.49    4162.5  0.6748   1.40014
FS12  Splitter.Fl_02       401.29     5.183    466.40   111.64  0.0000  1079.03     3.850    428.42    3526.9  0.6660   1.40014
FS2   Splitter.Fl_01        75.72     5.183    466.40   111.64  0.0000   203.59     3.638    421.57     637.7  0.7295   1.40014
FS14  Fan.Fl_O             401.29     8.814    550.80   131.90  0.0000   689.50     7.302    521.98    2600.0  0.5256   1.39972
FS25  LPC.Fl_O              75.72    12.470    626.53   150.09  0.0000    98.07    10.840    601.99     412.5  0.4522   1.39820
FS3   HPC.Fl_O              72.04   167.116   1392.78   341.31  0.0000    10.38   150.851   1355.71      49.7  0.3910   1.35667
FS36  Bleed3.Fl_O           55.83   167.116   1392.78   341.31  0.0000     8.05   157.663   1371.60      49.3  0.2941   1.35667
FS4   Burner.Fl_O           57.22   163.267   2874.15   782.49  0.0249    12.13   154.128   2837.81      74.8  0.3005   1.28295
FS45  HPT.Fl_O              76.22    38.400   1885.85   483.69  0.0186    55.62    34.596   1838.73     264.7  0.4000   1.31936
FS49  LPT.Fl_O              77.11     8.963   1356.88   337.80  0.0184   204.50     7.752   1307.05     851.6  0.4682   1.34611
FS5   TEGV.Fl_O             77.11     8.963   1356.88   337.80  0.0184   204.50     7.752   1307.05     851.6  0.4682   1.34611
FS8   Core_Nozz.Fl_O        77.11     8.963   1356.88   337.80  0.0184   204.50     4.796   1152.89     603.2  1.0000   1.34611
FS17  FanDuctLkg.Fl_O       401.29     8.814    550.80   131.90  0.0000   689.50     7.302    521.98    2600.0  0.5256   1.39972
FS171 Bleed15.Fl_O          401.29     8.814    550.80   131.90  0.0000   689.50     7.092    517.65    2475.2  0.5661   1.39972
FS172 FanDuct.Fl_O          401.29     8.814    550.80   131.90  0.0000   689.50     7.092    517.65    2475.2  0.5661   1.39972
FS173 Byp_Nozz.Fl_O         401.29     8.814    550.80   131.90  0.0000   689.50     4.672    458.99    2002.6  1.0000   1.39972

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff        Nc       TR   efPoly       pwr     SMN     SMW
Fan       1079.03   1.701   0.9114   4139.514   1.1810   0.9171   -11498.7   36.79   23.18
LPC        203.59   2.406   0.8368   4139.514   1.3433   0.8537    -4118.9    3.06    2.59
HPC         98.07  13.401   0.8581  10417.139   2.2230   0.8978   -19988.3   25.13   24.38
HPT         12.13   4.252   0.9120    213.560   1.3438   0.8973    19988.3
LPT         55.62   4.284   0.9159     90.391   1.3860   0.9002    15617.7
```

TURBOMACHINERY MAP DATA

	WcMap	PRmap	effMap	NcMap	R/Parm	s_WcDes	s_PRdes	s_effDes	s_NcDes
Fan	1253.73	1.685	0.9132	4100.034	0.0638	0.8607	1.0235	0.9980	0.9905
LPC	166.92	2.761	0.8444	1.093	180.0000	1.2197	0.7986	0.9910	0.0003
HPC	89.19	12.817	0.8670	10139.185	13.5840	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.183	0.9120	1.286	4.1834	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.497	0.9227	1.019	3.4967	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3926.21	11556.7

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4682	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.2999	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11449.2	9169.3	19988.3
LP_Shaft	3925.4	20896.4	15617.7

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.7864	1017.82	245.70	38.400
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.8859	1017.82	245.70	8.963
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	979.36	236.14	46.492
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1214.97	295.42	108.350
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	979.36	236.14	46.492
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	979.36	236.14	46.492

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	8.6453	1392.78	341.31	163.267
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	7.5649	1392.78	341.31	91.843
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2874.15	0.9995	0.0230	1.38978	0.02489

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.592	0.9805	1.0000	0.9800	603.19	1.000	1607.6	4659.7
Byp_Nozz	2.549	0.9823	1.0000	0.9800	2002.63	1.000	1029.2	15268.9

```
**********************************************************************************************************************************
Date:02/23/11    Time:08:01:48    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    75
Temperature Stator 1 inlet: 464.92    Stator 1 exit: 481.52    Stator 2 inlet: 497.01    Stator 2 exit: 505.87
            Stator 3 inlet: 535.98    Stator 3 exit: 543.98    Stator 4 inlet: 565.51    Stator 4 exit: 573.22
            Stator 5 inlet: 590.81    Stator 5 exit: 598.09               Stage2   Percent Blockage: 0.10

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    35000.0    22.00    440.25      6329.2    0.5915    3743.56    5.6246    779.49   26.875      8371.8       75.6   2609.2
2451.5   1698.3


                                        FLOW STATION DATA
                                    W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           440.25     5.185    466.40    111.64   0.0000   1183.20     3.458    415.85    3623.7   0.7800    1.40014
FS1   Inlet.Fl_O             440.25     5.185    466.40    111.64   0.0000   1183.20     4.114    436.56    4162.5   0.5847    1.40014
FS12  Splitter.Fl_02         373.80     5.183    466.40    111.64   0.0000   1005.10     4.104    436.32    3526.9   0.5872    1.40014
FS2   Splitter.Fl_01          66.46     5.183    466.40    111.64   0.0000    178.70     4.153    437.81     637.7   0.5715    1.40014
FS14  Fan.Fl_O               373.80     8.105    537.08    128.60   0.0000    689.71     6.713    508.95    2600.0   0.5258    1.39974
FS25  LPC.Fl_O                66.46    11.915    612.92    146.81   0.0000     89.11    10.668    593.90     412.5   0.4005    1.39849
FS3   HPC.Fl_O                63.23   139.353   1309.91    319.80   0.0000     10.60   125.145   1272.94      49.7   0.4001    1.36166
FS36  Bleed3.Fl_O             49.01   139.353   1309.91    319.80   0.0000      8.21   131.117   1288.86      49.3   0.3003    1.36166
FS4   Burner.Fl_O             50.05   136.144   2609.25    697.69   0.0212     12.12   128.540   2575.43      74.8   0.2990    1.29312
FS45  HPT.Fl_O                66.72    31.835   1706.24    431.96   0.0158     55.86    28.655   1662.26     264.7   0.4004    1.32890
FS49  LPT.Fl_O                67.50     7.423   1221.04    301.14   0.0156    205.03     6.416   1175.01     851.6   0.4678    1.35632
FS5   TEGV.Fl_O               67.50     7.423   1221.04    301.14   0.0156    205.03     6.416   1175.01     851.6   0.4678    1.35632
FS8   Core_Nozz.Fl_O          67.50     7.423   1221.04    301.14   0.0156    205.03     3.961   1033.16     603.2   1.0000    1.35632
FS17  FanDuctLkg.Fl_O         373.80     8.105    537.08    128.60   0.0000    689.71     6.713    508.95    2600.0   0.5258    1.39974
FS171 Bleed15.Fl_O            373.80     8.105    537.08    128.60   0.0000    689.71     6.521    504.73    2475.2   0.5661    1.39974
FS172 FanDuct.Fl_O            373.80     8.105    537.08    128.60   0.0000    689.71     6.521    504.73    2475.2   0.5661    1.39974
FS173 Byp_Nozz.Fl_O           373.80     8.105    537.08    128.60   0.0000    689.71     4.298    447.56    2002.6   1.0000    1.39974

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1005.10   1.564   0.9077   3859.821   1.1515   0.9121    -8967.7   61.35   29.05
LPC        178.70   2.299   0.8605   3859.821   1.3142   0.8756    -3307.1    2.45    1.88
HPC         89.11  11.696   0.8614  10123.872   2.1372   0.8988   -15870.7   31.39   30.25
HPT         12.12   4.277   0.9090    215.449   1.3539   0.8934    15870.9
LPT         55.86   4.289   0.9119     88.609   1.3941   0.8953    12274.5

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1167.81   1.551   0.9096   3823.008    0.0591      0.8607    1.0235    0.9980    0.9905
```

LPC	144.77	2.482	0.8399	1.019	180.0000	1.2343	0.8765	1.0245	0.0003
HPC	81.05	11.192	0.8703	9853.744	13.0129	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.208	0.9090	1.297	4.2077	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.500	0.9187	0.999	3.4999	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3623.68	10666.2

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4678	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.6246	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11005.3	7574.2	15870.9
LP_Shaft	3660.2	17613.2	12274.5

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.4456	967.92	233.31	31.835
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7776	967.92	233.31	7.423
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	932.95	224.66	39.951
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1147.55	278.28	90.926
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	932.95	224.66	39.951
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1309.91	319.80	139.353
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	932.95	224.66	39.951

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.5881	1309.91	319.80	136.144
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.6398	1309.91	319.80	76.479
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1309.91	319.80	139.353
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1309.91	319.80	139.353
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1309.91	319.80	139.353
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	537.08	128.60	8.105
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	537.08	128.60	8.105
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	537.08	128.60	8.105
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	537.08	128.60	8.105
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	537.08	128.60	8.105

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2609.25	0.9995	0.0230	1.03988	0.02122

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.147	0.9815	1.0000	0.9800	603.19	1.000	1527.0	3506.6
Byp_Nozz	2.344	0.9829	1.0000	0.9800	2002.63	1.000	1016.3	13488.8

```
**********************************************************************************************************************************
Date:02/23/11    Time:08:02:48    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    72
Temperature Stator 1 inlet: 465.69    Stator 1 exit: 482.05    Stator 2 inlet: 497.55    Stator 2 exit: 506.43
            Stator 3 inlet: 535.75    Stator 3 exit: 543.75    Stator 4 inlet: 564.87    Stator 4 exit: 572.55
            Stator 5 inlet: 589.83    Stator 5 exit: 597.05               Stage2   Percent Blockage: 0.10

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.780   35000.0    22.00    435.74     6086.3    0.5919    3602.59    5.6742    779.49   26.230      8371.8      72.7   2577.1
2421.8   1677.0


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O           435.74     5.185    466.40    111.64   0.0000   1171.08     3.458    415.85    3586.5  0.7800    1.40014
FS1   Inlet.Fl_O             435.74     5.185    466.40    111.64   0.0000   1171.08     4.144    437.47    4162.5  0.5751    1.40014
FS12  Splitter.Fl_02         370.46     5.183    466.40    111.64   0.0000    996.11     4.131    437.13    3526.9  0.5787    1.40014
FS2   Splitter.Fl_01          65.29     5.183    466.40    111.64   0.0000    175.55     4.202    439.26     637.7  0.5559    1.40014
FS14  Fan.Fl_O               370.46     8.019    535.37    128.19   0.0000    689.72     6.643    507.33    2600.0  0.5258    1.39975
FS25  LPC.Fl_O                65.29    11.851    611.40    146.45   0.0000     87.90    10.650    593.04     412.5  0.3939    1.39852
FS3   HPC.Fl_O                62.12   136.010   1299.82    317.19   0.0000     10.63   122.060   1262.86      49.7  0.4013    1.36230
FS36  Bleed3.Fl_O             48.14   136.010   1299.82    317.19   0.0000      8.23   127.927   1278.78      49.3  0.3011    1.36230
FS4   Burner.Fl_O             49.14   132.878   2577.07    687.59   0.0208     12.12   125.459   2543.58      74.8  0.2988    1.29438
FS45  HPT.Fl_O                65.52    31.051   1684.76    425.87   0.0155     55.89    27.946   1641.17     264.7  0.4005    1.33010
FS49  LPT.Fl_O                66.29     7.240   1205.03    296.88   0.0153    205.09     6.257   1159.47     851.6  0.4677    1.35758
FS5   TEGV.Fl_O               66.29     7.240   1205.03    296.88   0.0153    205.09     6.257   1159.47     851.6  0.4677    1.35758
FS8   Core_Nozz.Fl_O          66.29     7.240   1205.03    296.88   0.0153    205.09     3.862   1019.12     603.2  1.0000    1.35758
FS17  FanDuctLkg.Fl_O        370.46     8.019    535.37    128.19   0.0000    689.72     6.643    507.33    2600.0  0.5258    1.39975
FS171 Bleed15.Fl_O           370.46     8.019    535.37    128.19   0.0000    689.72     6.453    503.12    2475.2  0.5661    1.39975
FS172 FanDuct.Fl_O           370.46     8.019    535.37    128.19   0.0000    689.72     6.453    503.12    2475.2  0.5661    1.39975
FS173 Byp_Nozz.Fl_O          370.46     8.019    535.37    128.19   0.0000    689.72     4.253    446.14    2002.6  1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan         996.11   1.547   0.9072   3826.296   1.1479    0.9114    -8672.3   64.83   29.82
LPC         175.55   2.287   0.8631   3826.296   1.3109    0.8780    -3215.2    2.75    2.10
HPC          87.90  11.477   0.8614  10091.497   2.1260    0.8986   -15389.3   32.26   31.04
HPT          12.12   4.279   0.9084    215.830   1.3551    0.8927    15389.2
LPT          55.89   4.289   0.9112     88.398   1.3950    0.8945    11887.6

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1157.37   1.535   0.9091   3789.803    0.0585      0.8607    1.0235    0.9980    0.9905
```

LPC	142.61	2.449	0.8400	1.011	180.0000	1.2310	0.8881	1.0275	0.0003
HPC	79.94	10.983	0.8703	9822.232	12.9395	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.210	0.9084	1.299	4.2104	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.500	0.9180	0.996	3.5000	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3586.54	10556.9

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4677	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.6742	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	10956.6	7377.0	15389.2
LP_Shaft	3628.4	17207.4	11887.6

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.4026	961.93	231.82	31.051
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7639	961.93	231.82	7.240
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	927.39	223.29	39.166
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1139.38	276.22	88.830
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	927.39	223.29	39.166
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1299.82	317.19	136.010
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	927.39	223.29	39.166

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.4545	1299.82	317.19	132.878
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.5228	1299.82	317.19	74.633
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1299.82	317.19	136.010
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1299.82	317.19	136.010
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1299.82	317.19	136.010
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	535.37	128.19	8.019
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	535.37	128.19	8.019
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	535.37	128.19	8.019
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	535.37	128.19	8.019
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	535.37	128.19	8.019

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2577.07	0.9995	0.0230	1.00072	0.02079

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.094	0.9812	1.0000	0.9800	603.19	1.000	1517.2	3369.2
Byp_Nozz	2.319	0.9829	1.0000	0.9800	2002.63	1.000	1014.6	13274.0

```
**********************************************************************************************************************
Date:02/23/11    Time:08:04:11    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  7/ 33/ 2/ 4    Run by: Philip C Jorgenson      PC:    69
Temperature Stator 1 inlet: 466.42    Stator 1 exit: 482.53    Stator 2 inlet: 498.01    Stator 2 exit: 506.91
            Stator 3 inlet: 535.47    Stator 3 exit: 543.47    Stator 4 inlet: 564.19    Stator 4 exit: 571.83
            Stator 5 inlet: 588.81    Stator 5 exit: 595.97               Stage2   Percent Blockage: 0.10

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.780   35000.0    22.00    431.40     5851.9    0.5924    3466.80    5.7277    779.49   25.596      8371.8      69.9   2545.5
2392.6   1656.1


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O          431.40     5.185    466.40    111.64   0.0000   1159.42     3.458    415.85    3550.8  0.7800    1.40014
FS1   Inlet.Fl_O            431.40     5.185    466.40    111.64   0.0000   1159.42     4.172    438.31    4162.5  0.5661    1.40014
FS12  Splitter.Fl_02        367.28     5.183    466.40    111.64   0.0000    987.58     4.155    437.87    3526.9  0.5708    1.40014
FS2   Splitter.Fl_01         64.12     5.183    466.40    111.64   0.0000    172.42     4.247    440.62     637.7  0.5409    1.40014
FS14  Fan.Fl_O              367.28     7.938    533.66    127.78   0.0000    689.72     6.576    505.72    2600.0  0.5257    1.39975
FS25  LPC.Fl_O               64.12    11.780    609.85    146.08   0.0000     86.74    10.621    592.10     412.5  0.3876    1.39856
FS3   HPC.Fl_O               61.01   132.724   1289.82    314.61   0.0000     10.65   119.031   1252.88      49.7  0.4025    1.36291
FS36  Bleed3.Fl_O            47.29   132.724   1289.82    314.61   0.0000      8.26   124.792   1268.80      49.3  0.3019    1.36291
FS4   Burner.Fl_O            48.25   129.668   2545.52    677.72   0.0204     12.11   122.431   2512.34      74.8  0.2987    1.29562
FS45  HPT.Fl_O               64.34    30.282   1663.75    419.92   0.0152     55.92    27.250   1620.53     264.7  0.4005    1.33136
FS49  LPT.Fl_O               65.09     7.062   1189.47    292.75   0.0150    205.10     6.104   1144.39     851.6  0.4675    1.35880
FS5   TEGV.Fl_O              65.09     7.062   1189.47    292.75   0.0150    205.10     6.104   1144.39     851.6  0.4675    1.35880
FS8   Core_Nozz.Fl_O         65.09     7.062   1189.47    292.75   0.0150    205.10     3.764   1005.48     603.2  1.0000    1.35880
FS17  FanDuctLkg.Fl_O       367.28     7.938    533.66    127.78   0.0000    689.72     6.576    505.72    2600.0  0.5257    1.39975
FS171 Bleed15.Fl_O          367.28     7.938    533.66    127.78   0.0000    689.72     6.387    501.52    2475.2  0.5660    1.39975
FS172 FanDuct.Fl_O          367.28     7.938    533.66    127.78   0.0000    689.72     6.387    501.52    2475.2  0.5660    1.39975
FS173 Byp_Nozz.Fl_O         367.28     7.938    533.66    127.78   0.0000    689.72     4.210    444.72    2002.6  1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan         987.58   1.532   0.9075   3793.165   1.1442    0.9115    -8385.7   71.28   30.57
LPC         172.42   2.273   0.8653   3793.165   1.3076    0.8801    -3124.1    3.05    2.32
HPC          86.74  11.266   0.8614  10059.161   2.1150    0.8984   -14919.7   33.12   31.84
HPT          12.11   4.282   0.9078    216.193   1.3561    0.8919    14919.8
LPT          55.92   4.288   0.9105     88.184   1.3957    0.8935    11509.8

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        1147.45   1.519   0.9093   3756.989    0.0580      0.8607    1.0235    0.9980    0.9905
```

LPC	140.46	2.416	0.8401	1.002	180.0000	1.2275	0.8990	1.0300	0.0003
HPC	78.89	10.783	0.8703	9790.759	12.8676	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.213	0.9078	1.301	4.2130	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.499	0.9172	0.994	3.4993	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3550.83	10451.8

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4675	851.64
FanDuct	0.0000	0.5660	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.7277	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	10907.6	7184.0	14919.8
LP_Shaft	3596.9	16806.1	11509.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.3597	955.97	230.35	30.282
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7502	955.97	230.35	7.062
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	921.85	221.92	38.388
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1131.27	274.17	86.766
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	921.85	221.92	38.388
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1289.82	314.61	132.724
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	921.85	221.92	38.388

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.3216	1289.82	314.61	129.668
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.4066	1289.82	314.61	72.819
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1289.82	314.61	132.724
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1289.82	314.61	132.724
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1289.82	314.61	132.724
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	533.66	127.78	7.938
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	533.66	127.78	7.938
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	533.66	127.78	7.938
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	533.66	127.78	7.938
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	533.66	127.78	7.938

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2545.52	0.9995	0.0230	0.96300	0.02037

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.042	0.9808	1.0000	0.9800	603.19	1.000	1507.6	3234.6
Byp_Nozz	2.295	0.9829	1.0000	0.9800	2002.63	1.000	1013.0	13069.1

```
**********************************************************************************************************************************
Date:02/23/11    Time:08:06:53    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 34/ 2/ 5    Run by: Philip C Jorgenson      PC:   100
Temperature Stator 1 inlet: 452.23    Stator 1 exit: 470.61    Stator 2 inlet: 497.98    Stator 2 exit: 506.04
            Stator 3 inlet: 532.41    Stator 3 exit: 540.86    Stator 4 inlet: 565.90    Stator 4 exit: 573.85
            Stator 5 inlet: 594.03    Stator 5 exit: 601.77             Unblocked   Percent Blockage: 0.10

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00     395.93      6923.5     0.5938    4111.14    5.2972    775.82   32.257      6923.4     100.0   2850.8
2674.6   1859.9


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           395.93     4.283    462.03    110.60   0.0000   1282.12     2.854    411.97    3930.2   0.7800    1.40005
FS1   Inlet.Fl_O             395.93     4.283    462.03    110.60   0.0000   1282.12     3.157    423.48    4162.5   0.6750    1.40005
FS12  Splitter.Fl_02         333.05     4.281    462.03    110.60   0.0000   1079.06     3.180    424.41    3526.9   0.6660    1.40005
FS2   Splitter.Fl_01          62.87     4.281    462.03    110.60   0.0000    203.70     3.002    417.52     637.7   0.7305    1.40005
FS14  Fan.Fl_O               333.05     7.280    545.71    130.67   0.0000    689.60     6.031    517.14    2600.0   0.5257    1.39973
FS25  LPC.Fl_O                62.87    10.292    620.49    148.64   0.0000     98.19     8.942    596.10     412.5   0.4529    1.39833
FS3   HPC.Fl_O                59.82   138.165   1380.91    338.22   0.0000     10.38   124.716   1344.10      49.7   0.3909    1.35737
FS36  Bleed3.Fl_O             46.36   138.165   1380.91    338.22   0.0000      8.05   130.349   1359.88      49.3   0.2940    1.35737
FS4   Burner.Fl_O             47.51   134.983   2850.79    774.98   0.0246     12.13   127.427   2814.67      74.8   0.3004    1.28375
FS45  HPT.Fl_O                63.28    31.735   1869.09    478.84   0.0184     55.63    28.591   1822.29     264.7   0.3999    1.32018
FS49  LPT.Fl_O                64.01     7.404   1344.03    334.31   0.0182    204.54     6.404   1294.56     851.6   0.4682    1.34702
FS5   TEGV.Fl_O               64.01     7.404   1344.03    334.31   0.0182    204.54     6.404   1294.56     851.6   0.4682    1.34702
FS8   Core_Nozz.Fl_O          64.01     7.404   1344.03    334.31   0.0182    204.54     3.961   1141.55     603.2   1.0000    1.34702
FS17  FanDuctLkg.Fl_O        333.05     7.280    545.71    130.67   0.0000    689.60     6.031    517.14    2600.0   0.5257    1.39973
FS171 Bleed15.Fl_O           333.05     7.280    545.71    130.67   0.0000    689.60     5.857    512.85    2475.2   0.5662    1.39973
FS172 FanDuct.Fl_O           333.05     7.280    545.71    130.67   0.0000    689.60     5.857    512.85    2475.2   0.5662    1.39973
FS173 Byp_Nozz.Fl_O          333.05     7.280    545.71    130.67   0.0000    689.60     3.860    454.75    2002.6   1.0000    1.39973

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1079.06   1.701   0.9114   4139.521   1.1811    0.9169    -9461.1   36.80   23.19
LPC        203.70   2.404   0.8363   4139.521   1.3430    0.8542    -3384.0    3.06    2.59
HPC         98.19  13.425   0.8581  10422.043   2.2255    0.8979   -16455.4   25.06   24.31
HPT         12.13   4.253   0.9119    213.496   1.3446    0.8972    16455.4
LPT         55.63   4.286   0.9157     90.370   1.3868    0.8998    12845.2

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1253.75   1.685   0.9132   4100.041    0.0638      0.8607    1.0235    0.9980    0.9905
```

LPC	166.92	2.761	0.8444	1.093	180.0000	1.2204	0.7974	0.9904	0.0003
HPC	89.31	12.839	0.8669	10143.959	13.5912	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.185	0.9119	1.285	4.1851	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.498	0.9225	1.018	3.4980	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3930.22	9547.0

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4682	851.64
FanDuct	0.0000	0.5662	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.2972	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11399.2	7581.7	16455.4
LP_Shaft	3907.0	17267.7	12845.2

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.3137	1008.68	243.43	31.735
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7356	1008.68	243.43	7.404
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.51	233.95	38.424
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1204.38	292.72	89.573
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.51	233.95	38.424
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1380.91	338.22	138.165
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.51	233.95	38.424

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.1788	1380.91	338.22	134.983
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.2816	1380.91	338.22	75.925
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.91	338.22	138.165
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.91	338.22	138.165
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.91	338.22	138.165
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2850.79	0.9995	0.0230	1.14198	0.02463

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.594	0.9805	1.0000	0.9800	603.19	1.000	1600.1	3851.4
Byp_Nozz	2.551	0.9825	1.0000	0.9800	2002.63	1.000	1024.4	12619.2

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**********************************************************************************************************************
Date:02/23/11    Time:08:08:01    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    84
Temperature Stator 1 inlet: 457.73    Stator 1 exit: 474.77    Stator 2 inlet: 499.37    Stator 2 exit: 507.77
            Stator 3 inlet: 531.51    Stator 3 exit: 539.93    Stator 4 inlet: 562.42    Stator 4 exit: 570.18
            Stator 5 inlet: 588.48    Stator 5 exit: 595.87             Unblocked   Percent Blockage: 0.10

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    376.28      5815.7    0.5868    3412.51    5.4802    775.82   28.783      6923.4       84.0   2672.3
2509.4   1739.6


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           376.28     4.283    462.03    110.60   0.0000   1218.51     2.854    411.97    3735.3   0.7800    1.40005
FS1   Inlet.Fl_O             376.28     4.283    462.03    110.60   0.0000   1218.51     3.321    429.63    4162.5   0.6143    1.40005
FS12  Splitter.Fl_02         318.22     4.281    462.03    110.60   0.0000   1030.99     3.323    429.78    3526.9   0.6128    1.40005
FS2   Splitter.Fl_01          58.07     4.281    462.03    110.60   0.0000    188.13     3.297    428.81     637.7   0.6227    1.40005
FS14  Fan.Fl_O               318.22     6.897    536.70    128.51   0.0000    689.71     5.713    508.59    2600.0   0.5258    1.39974
FS25  LPC.Fl_O                58.07    10.071    611.78    146.54   0.0000     92.03     8.936    591.27     412.5   0.4169    1.39851
FS3   HPC.Fl_O                55.25   123.283   1325.64    323.86   0.0000     10.53   110.898   1288.87      49.7   0.3971    1.36070
FS36  Bleed3.Fl_O             42.82   123.283   1325.64    323.86   0.0000      8.16   116.098   1304.68      49.3   0.2982    1.36070
FS4   Burner.Fl_O             43.77   120.444   2672.31    717.68   0.0221     12.12   113.711   2637.87      74.8   0.2995    1.29062
FS45  HPT.Fl_O                58.34    28.210   1747.88    443.86   0.0165     55.79    25.399   1703.19     264.7   0.4002    1.32655
FS49  LPT.Fl_O                59.01     6.577   1252.24    309.50   0.0163    204.91     5.685   1205.33     851.6   0.4679    1.35390
FS5   TEGV.Fl_O               59.01     6.577   1252.24    309.50   0.0163    204.91     5.685   1205.33     851.6   0.4679    1.35390
FS8   Core_Nozz.Fl_O          59.01     6.577   1252.24    309.50   0.0163    204.91     3.511   1060.59     603.2   1.0000    1.35390
FS17  FanDuctLkg.Fl_O         318.22     6.897    536.70    128.51   0.0000    689.71     5.713    508.59    2600.0   0.5258    1.39974
FS171 Bleed15.Fl_O            318.22     6.897    536.70    128.51   0.0000    689.71     5.550    504.37    2475.2   0.5661    1.39974
FS172 FanDuct.Fl_O            318.22     6.897    536.70    128.51   0.0000    689.71     5.550    504.37    2475.2   0.5661    1.39974
FS173 Byp_Nozz.Fl_O           318.22     6.897    536.70    128.51   0.0000    689.71     3.658    447.25    2002.6   1.0000    1.39974

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan        1030.99   1.611   0.9119   3951.112   1.1616    0.9164    -8065.0   54.89   26.94
LPC         188.13   2.352   0.8599   3951.112   1.3241    0.8757    -2953.1    1.70    1.34
HPC          92.03  12.242   0.8603  10205.138   2.1669    0.8985   -14214.8   29.22   28.26
HPT          12.12   4.270   0.9102    214.401   1.3516    0.8949    14214.8
LPT          55.79   4.289   0.9131     89.198   1.3924    0.8965    11018.1

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        1197.90   1.597   0.9138   3913.429    0.0608      0.8607    1.0235    0.9980    0.9905
```

LPC	150.68	2.572	0.8397	1.044	180.0000	1.2486	0.8603	1.0241	0.0003
HPC	83.70	11.712	0.8692	9932.842	13.2002	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.201	0.9102	1.291	4.2008	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.501	0.9199	1.005	3.5005	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3735.25	9073.4

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4679	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.4802	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11083.4	6736.0	14214.8
LP_Shaft	3729.1	15517.8	11018.1

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.1368	975.58	235.20	28.210
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6794	975.58	235.20	6.577
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.75	226.34	34.977
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1159.49	281.31	80.263
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.75	226.34	34.977
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1325.64	323.86	123.283
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.75	226.34	34.977

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.6300	1325.64	323.86	120.444
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.8014	1325.64	323.86	67.686
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.64	323.86	123.283
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.64	323.86	123.283
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.64	323.86	123.283
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2672.31	0.9995	0.0230	0.94792	0.02214

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.304	0.9817	1.0000	0.9800	603.19	1.000	1545.9	3232.1
Byp_Nozz	2.417	0.9830	1.0000	0.9800	2002.63	1.000	1015.9	11657.1

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**********************************************************************************************************************
Date:02/23/11    Time:08:09:01    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    79
Temperature Stator 1 inlet: 459.04    Stator 1 exit: 475.75    Stator 2 inlet: 499.73    Stator 2 exit: 508.17
            Stator 3 inlet: 531.31    Stator 3 exit: 539.73    Stator 4 inlet: 561.62    Stator 4 exit: 569.34
            Stator 5 inlet: 587.19    Stator 5 exit: 594.51             Unblocked   Percent Blockage: 0.10

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    370.94      5524.8     0.5863    3239.11    5.5397    775.82   27.860      6923.4       79.8   2626.4
2466.9   1709.0


                                        FLOW STATION DATA
                                    W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           370.94     4.283    462.03    110.60   0.0000   1201.21     2.854    411.97    3682.2   0.7800    1.40005
FS1   Inlet.Fl_O             370.94     4.283    462.03    110.60   0.0000   1201.21     3.360    431.07    4162.5   0.5995    1.40005
FS12  Splitter.Fl_02         314.22     4.281    462.03    110.60   0.0000   1018.04     3.357    431.04    3526.9   0.5997    1.40005
FS2   Splitter.Fl_01          56.72     4.281    462.03    110.60   0.0000    183.77     3.361    431.20     637.7   0.5981    1.40005
FS14  Fan.Fl_O               314.22     6.795    534.32    127.94   0.0000    689.72     5.629    506.34    2600.0   0.5257    1.39975
FS25  LPC.Fl_O                56.72     9.999    609.71    146.04   0.0000     90.39     8.918    590.14     412.5   0.4077    1.39858
FS3   HPC.Fl_O                53.97   119.329   1311.34    320.17   0.0000     10.57   107.239   1274.58      49.7   0.3987    1.36157
FS36  Bleed3.Fl_O             41.83   119.329   1311.34    320.17   0.0000      8.19   112.318   1290.39      49.3   0.2994    1.36157
FS4   Burner.Fl_O             42.73   116.581   2626.39    703.15   0.0215     12.12   110.066   2592.39      74.8   0.2992    1.29240
FS45  HPT.Fl_O                56.96    27.280   1717.10    435.07   0.0161     55.83    24.558   1672.97     264.7   0.4002    1.32830
FS49  LPT.Fl_O                57.62     6.358   1228.97    303.27   0.0159    205.01     5.495   1182.72     851.6   0.4679    1.35567
FS5   TEGV.Fl_O               57.62     6.358   1228.97    303.27   0.0159    205.01     5.495   1182.72     851.6   0.4679    1.35567
FS8   Core_Nozz.Fl_O          57.62     6.358   1228.97    303.27   0.0159    205.01     3.393   1040.15     603.2   1.0000    1.35567
FS17  FanDuctLkg.Fl_O        314.22     6.795    534.32    127.94   0.0000    689.72     5.629    506.34    2600.0   0.5257    1.39975
FS171 Bleed15.Fl_O           314.22     6.795    534.32    127.94   0.0000    689.72     5.468    502.14    2475.2   0.5661    1.39975
FS172 FanDuct.Fl_O           314.22     6.795    534.32    127.94   0.0000    689.72     5.468    502.14    2475.2   0.5661    1.39975
FS173 Byp_Nozz.Fl_O          314.22     6.795    534.32    127.94   0.0000    689.72     3.604    445.27    2002.6   1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1018.04   1.587   0.9110   3904.461   1.1565   0.9153    -7710.5   58.36   27.99
LPC        183.77   2.336   0.8636   3904.461   1.3196   0.8791    -2844.8    2.07    1.61
HPC         90.39  11.934   0.8610  10159.711   2.1507   0.8987   -13634.8   30.42   29.36
HPT         12.12   4.273   0.9094    214.941   1.3532   0.8939    13635.0
LPT         55.83   4.291   0.9124     88.931   1.3939   0.8957    10555.4

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1182.85   1.574   0.9129   3867.223    0.0599      0.8607    1.0235    0.9980    0.9905
```

LPC	147.66	2.526	0.8398	1.031	180.0000	1.2446	0.8752	1.0284	0.0003
HPC	82.21	11.419	0.8699	9888.626	13.0958	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.205	0.9094	1.294	4.2047	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.501	0.9191	1.002	3.5014	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3682.22	8944.6

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4679	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.5397	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11015.4	6501.1	13635.0
LP_Shaft	3685.1	15043.8	10555.4

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.0873	967.11	233.11	27.280
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6636	967.11	233.11	6.358
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.90	224.40	34.051
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1147.92	278.38	77.784
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.90	224.40	34.051
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1311.34	320.17	119.329
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.90	224.40	34.051

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.4764	1311.34	320.17	116.581
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.6670	1311.34	320.17	65.501
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.34	320.17	119.329
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.34	320.17	119.329
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.34	320.17	119.329
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2626.39	0.9995	0.0230	0.89975	0.02151

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.228	0.9816	1.0000	0.9800	603.19	1.000	1531.8	3068.5
Byp_Nozz	2.381	0.9831	1.0000	0.9800	2002.63	1.000	1013.6	11400.9

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**********************************************************************************************************************
Date:02/23/11    Time:08:10:03    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    76
Temperature Stator 1 inlet: 459.90    Stator 1 exit: 476.37    Stator 2 inlet: 499.93    Stator 2 exit: 508.38
            Stator 3 inlet: 531.11    Stator 3 exit: 539.51    Stator 4 inlet: 560.99    Stator 4 exit: 568.66
            Stator 5 inlet: 586.21    Stator 5 exit: 593.46             Unblocked   Percent Blockage: 0.10

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780   39000.0    22.00    366.97     5317.2    0.5870    3120.99    5.5814    775.82   27.216      6923.4       76.8   2594.8
2437.8   1688.1


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          366.97     4.283    462.03    110.60   0.0000   1188.36     2.854    411.97    3642.8   0.7800    1.40005
FS1   Inlet.Fl_O            366.97     4.283    462.03    110.60   0.0000   1188.36     3.387    432.08    4162.5   0.5889    1.40005
FS12  Splitter.Fl_02        311.21     4.281    462.03    110.60   0.0000   1008.30     3.382    431.95    3526.9   0.5903    1.40005
FS2   Splitter.Fl_01         55.76     4.281    462.03    110.60   0.0000    180.65     3.405    432.77     637.7   0.5816    1.40005
FS14  Fan.Fl_O              311.21     6.720    532.72    127.55   0.0000    689.73     5.567    504.82    2600.0   0.5257    1.39975
FS25  LPC.Fl_O               55.76     9.941    608.24    145.69   0.0000     89.27     8.896    589.28     412.5   0.4014    1.39875
FS3   HPC.Fl_O               53.05   116.571   1301.48    317.62   0.0000     10.60   104.694   1264.74      49.7   0.3999    1.36219
FS36  Bleed3.Fl_O            41.12   116.571   1301.48    317.62   0.0000      8.21   109.686   1280.56      49.3   0.3001    1.36219
FS4   Burner.Fl_O            41.98   113.887   2594.82    693.22   0.0211     12.12   107.525   2561.14      74.8   0.2990    1.29364
FS45  HPT.Fl_O               55.97    26.632   1695.99    429.07   0.0157     55.85    23.972   1652.24     264.7   0.4002    1.32939
FS49  LPT.Fl_O               56.63     6.206   1213.09    299.04   0.0155    205.06     5.364   1167.30     851.6   0.4678    1.35689
FS5   TEGV.Fl_O              56.63     6.206   1213.09    299.04   0.0155    205.06     5.364   1167.30     851.6   0.4678    1.35689
FS8   Core_Nozz.Fl_O         56.63     6.206   1213.09    299.04   0.0155    205.06     3.311   1026.21     603.2   1.0000    1.35689
FS17  FanDuctLkg.Fl_O       311.21     6.720    532.72    127.55   0.0000    689.73     5.567    504.82    2600.0   0.5257    1.39975
FS171 Bleed15.Fl_O          311.21     6.720    532.72    127.55   0.0000    689.73     5.408    500.63    2475.2   0.5660    1.39975
FS172 FanDuct.Fl_O          311.21     6.720    532.72    127.55   0.0000    689.73     5.408    500.63    2475.2   0.5660    1.39975
FS173 Byp_Nozz.Fl_O         311.21     6.720    532.72    127.55   0.0000    689.73     3.564    443.93    2002.6   1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1008.30   1.570   0.9083   3871.424   1.1530    0.9125    -7466.7   60.55   28.78
LPC        180.65   2.322   0.8656   3871.424   1.3164    0.8810    -2768.5    2.35    1.81
HPC         89.27  11.727   0.8614  10128.426   2.1398    0.8988   -13235.3   31.26   30.13
HPT         12.12   4.276   0.9089    215.317   1.3544    0.8932    13235.1
LPT         55.85   4.291   0.9118     88.725   1.3948    0.8952    10235.9

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1171.53   1.557   0.9101   3834.501    0.0593      0.8607    1.0235    0.9980    0.9905
```

LPC	145.52	2.493	0.8399	1.023	180.0000	1.2414	0.8853	1.0305	0.0003
HPC	81.19	11.221	0.8703	9858.177	13.0238	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.207	0.9089	1.296	4.2075	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.502	0.9186	1.000	3.5018	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3642.82	8848.9

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4678	851.64
FanDuct	0.0000	0.5660	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.5814	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	10968.1	6337.6	13235.1
LP_Shaft	3653.9	14712.9	10235.9

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.0519	961.26	231.66	26.632
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6524	961.26	231.66	6.206
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1139.95	276.36	76.052
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.571
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.3666	1301.48	317.62	113.887
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.5709	1301.48	317.62	63.977
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.571
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.571
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.571
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2594.82	0.9995	0.0230	0.86694	0.02108

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.175	0.9814	1.0000	0.9800	603.19	1.000	1522.1	2954.5
Byp_Nozz	2.355	0.9831	1.0000	0.9800	2002.63	1.000	1012.1	11211.6

```
**********************************************************************************************************************************
Date:02/23/11    Time:08:10:48    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 21/ 1/ 6    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 469.18    Stator 1 exit: 477.65    Stator 2 inlet: 488.50    Stator 2 exit: 494.40
            Stator 3 inlet: 504.69    Stator 3 exit: 510.09    Stator 4 inlet: 519.59    Stator 4 exit: 524.23
            Stator 5 inlet: 532.18    Stator 5 exit: 536.27             Unblocked   Percent Blockage: 0.10

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    258.20      692.3    1.0453     723.69    9.5602    775.82    9.701      6923.4       10.0   1742.7
1647.8   1144.6


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          258.20     4.283    462.03    110.60   0.0000    836.13     2.854    411.97    2563.1   0.7800    1.40005
FS1   Inlet.Fl_O            258.20     4.283    462.03    110.60   0.0000    836.13     3.903    449.92    4162.5   0.3669    1.40005
FS12  Splitter.Fl_02        233.75     4.281    462.03    110.60   0.0000    757.33     3.839    447.87    3526.9   0.3976    1.40005
FS2   Splitter.Fl_01         24.45     4.281    462.03    110.60   0.0000     79.22     4.145    457.78     637.7   0.2154    1.40005
FS14  Fan.Fl_O              233.75     4.864    481.24    115.20   0.0000    680.26     4.058    456.95    2600.0   0.5154    1.40045
FS25  LPC.Fl_O               24.45     6.665    541.41    129.64   0.0000     55.08     6.419    535.62     412.5   0.2326    1.39974
FS3   HPC.Fl_O               23.26    41.554    988.56    238.42   0.0000     11.36    36.588    954.34      49.7   0.4328    1.38178
FS36  Bleed3.Fl_O            18.03    41.554    988.56    238.42   0.0000      8.80    38.703    969.32      49.3   0.3222    1.38178
FS4   Burner.Fl_O            18.23    40.597   1742.69    439.86   0.0111     12.10    38.343   1718.12      74.8   0.2940    1.33044
FS45  HPT.Fl_O               24.37     9.737   1148.85    280.62   0.0083     54.73     8.813   1118.49     264.7   0.3847    1.36585
FS49  LPT.Fl_O               24.65     3.293    896.35    216.92   0.0082    144.64     3.090    880.75     851.6   0.3045    1.38178
FS5   TEGV.Fl_O              24.65     3.293    896.35    216.92   0.0082    144.64     3.090    880.75     851.6   0.3045    1.38178
FS8   Core_Nozz.Fl_O         24.65     3.293    896.35    216.92   0.0082    144.64     2.854    861.44     603.2   0.4602    1.38178
FS17  FanDuctLkg.Fl_O       233.75     4.864    481.24    115.20   0.0000    680.26     4.058    456.95    2600.0   0.5154    1.40045
FS171 Bleed15.Fl_O          233.75     4.864    481.24    115.20   0.0000    680.26     3.948    453.36    2475.2   0.5544    1.40045
FS172 FanDuct.Fl_O          233.75     4.864    481.24    115.20   0.0000    680.26     3.948    453.36    2475.2   0.5544    1.40045
FS173 Byp_Nozz.Fl_O         233.75     4.864    481.24    115.20   0.0000    680.26     2.854    413.51    2002.6   0.9054    1.40045

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       757.33   1.136   0.9061   2620.833   1.0416    0.9086    -1523.9  ---.--   54.85
LPC        79.22   1.557   0.7933   2620.833   1.1718    0.8030     -658.9    7.65    4.40
HPC        55.08   6.234   0.8208   8994.347   1.8259    0.8592    -3671.9   60.09   56.89
HPT        12.10   4.169   0.8769    220.129   1.3656    0.8550     3671.9
LPT        54.73   2.957   0.8551     72.979   1.2796    0.8359     2182.7

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        879.93   1.133   0.9079   2595.838    0.0415      0.8607    1.0235    0.9980    0.9905
```

LPC	78.89	1.585	0.8407	0.692	180.0000	1.0041	0.9524	0.9437	0.0003
HPC	50.09	5.988	0.8293	8754.357	11.0423	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.102	0.8769	1.325	4.1025	12.6513	0.9790	1.0000	0.0003
LPT	0.84	2.488	0.8614	0.822	2.4879	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2563.09	6226.1

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.3045	851.64
FanDuct	0.0000	0.5544	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5602	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9189.4	2098.6	3671.9
LP_Shaft	2473.6	4634.5	2182.7

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.8998	766.96	184.03	9.737
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2861	766.96	184.03	3.293
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.55	178.59	14.341
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	882.81	212.32	28.296
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.55	178.59	14.341
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	988.56	238.42	41.554
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.55	178.59	14.341

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7918	988.56	238.42	40.597
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.4429	988.56	238.42	22.945
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.56	238.42	41.554
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.56	238.42	41.554
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.56	238.42	41.554
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1742.69	0.9995	0.0230	0.20103	0.01115

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.154	0.9800	1.0000	0.9800	603.19	0.460	645.1	494.3
Byp_Nozz	1.704	0.9800	1.0000	0.9800	2002.63	0.905	884.2	6424.1

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**********************************************************************************************************************************
Date:02/23/11    Time:08:12:29    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  3/ 16/ 1/ 1    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 462.60    Stator 1 exit: 470.64    Stator 2 inlet: 480.94    Stator 2 exit: 486.51
            Stator 3 inlet: 496.28    Stator 3 exit: 501.38    Stator 4 inlet: 509.15    Stator 4 exit: 513.55
            Stator 5 inlet: 522.30    Stator 5 exit: 526.06               Stage4   Percent Blockage: 0.10

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.730   38334.0    22.00    252.16      700.6    0.9985     699.49    9.5818    726.09    9.533      7006.2      10.0   1719.6
1625.1   1130.3


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O          252.16     4.218    455.81    109.10   0.0000    823.55     2.947    411.97    2590.3  0.7300    1.39992
FS1   Inlet.Fl_O            252.16     4.218    455.81    109.10   0.0000    823.55     3.856    444.27    4162.5  0.3604    1.39992
FS12  Splitter.Fl_02        228.33     4.216    455.81    109.10   0.0000    746.10     3.795    442.33    3526.9  0.3905    1.39992
FS2   Splitter.Fl_01         23.83     4.216    455.81    109.10   0.0000     77.87     4.087    451.77     637.7  0.2115    1.39992
FS14  Fan.Fl_O              228.33     4.772    474.06    113.48   0.0000    672.24     4.005    450.89    2600.0  0.5068    1.40030
FS25  LPC.Fl_O               23.83     6.477    531.19    127.19   0.0000     54.72     6.241    525.58     412.5  0.2309    1.39976
FS3   HPC.Fl_O               22.67    40.212    969.14    233.61   0.0000     11.33    35.439    935.77      49.7  0.4311    1.38284
FS36  Bleed3.Fl_O            17.57    40.212    969.14    233.61   0.0000      8.78    37.471    950.36      49.3  0.3211    1.38284
FS4   Burner.Fl_O            17.77    39.286   1719.63    433.45   0.0111     12.10    37.103   1695.30      74.8  0.2940    1.33158
FS45  HPT.Fl_O               23.75     9.523   1134.60    276.96   0.0083     54.20     8.639   1105.25     264.7  0.3801    1.36679
FS49  LPT.Fl_O               24.02     3.349    893.86    216.29   0.0082    138.41     3.161    879.73     851.6  0.2899    1.38195
FS5   TEGV.Fl_O              24.02     3.349    893.86    216.29   0.0082    138.41     3.161    879.73     851.6  0.2899    1.38195
FS8   Core_Nozz.Fl_O         24.02     3.349    893.86    216.29   0.0082    138.41     2.947    862.67     603.3  0.4346    1.38195
FS17  FanDuctLkg.Fl_O       228.33     4.772    474.06    113.48   0.0000    672.24     4.005    450.89    2600.0  0.5068    1.40030
FS171 Bleed15.Fl_O          228.33     4.772    474.06    113.48   0.0000    672.24     3.901    447.52    2475.2  0.5445    1.40030
FS172 FanDuct.Fl_O          228.33     4.772    474.06    113.48   0.0000    672.24     3.901    447.52    2475.2  0.5445    1.40030
FS173 Byp_Nozz.Fl_O         228.33     4.772    474.06    113.48   0.0000    672.24     2.947    413.46    2002.6  0.8565    1.40030

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan         746.10   1.132   0.9063   2573.393   1.0400    0.9087    -1414.4  ---.--   54.44
LPC          77.87   1.536   0.7998   2573.393   1.1654    0.8081     -609.6    7.69    2.60
HPC          54.72   6.208   0.8205   8982.777   1.8245    0.8590    -3501.0   59.83   56.61
HPT          12.10   4.125   0.8759    219.216   1.3629    0.8540     3501.0
LPT          54.20   2.844   0.8505     71.619   1.2670    0.8315     2024.0

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         866.88   1.129   0.9082   2548.850    0.0416      0.8607    1.0235    0.9980    0.9905
```

LPC	75.45	1.561	0.8323	0.680	180.0000	1.0321	0.9551	0.9610	0.0003
HPC	49.76	5.963	0.8290	8743.096	11.0621	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.060	0.8760	1.320	4.0595	12.6513	0.9790	1.0000	0.0003
LPT	0.83	2.402	0.8568	0.807	2.4017	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2590.32	5690.7

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2899	851.64
FanDuct	0.0000	0.5445	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5818	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9090.5	2022.7	3501.0
LP_Shaft	2412.4	4406.5	2024.0

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.8769	751.98	180.40	9.523
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2788	751.98	180.40	3.349
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	730.03	175.08	13.899
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	865.48	208.07	27.393
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	730.03	175.08	13.899
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	969.14	233.61	40.212
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	730.03	175.08	13.899

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7209	969.14	233.61	39.286
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.3808	969.14	233.61	22.262
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	969.14	233.61	40.212
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	969.14	233.61	40.212
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	969.14	233.61	40.212
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	474.06	113.48	4.772
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	474.06	113.48	4.772
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	474.06	113.48	4.772
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	474.06	113.48	4.772
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	474.06	113.48	4.772

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1719.63	0.9995	0.0230	0.19430	0.01106

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.136	0.9800	1.0000	0.9800	603.19	0.435	609.7	455.3
Byp_Nozz	1.619	0.9800	1.0000	0.9800	2002.63	0.857	836.4	5936.0

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****************************************************************************************************************************************
Date:02/23/11    Time:08:14:07    Model:                                P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  3/ 16/ 1/ 1    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 460.57    Stator 1 exit: 468.47    Stator 2 inlet: 478.58    Stator 2 exit: 484.05
            Stator 3 inlet: 493.63    Stator 3 exit: 498.63    Stator 4 inlet: 506.25    Stator 4 exit: 510.56
            Stator 5 inlet: 519.15    Stator 5 exit: 522.83               Stage4   Percent Blockage: 0.10

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.714   37357.0    22.00    259.49      730.1    0.9833     717.86    9.5853    710.17    9.474      7300.9      10.0   1712.6
1618.3   1125.9


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O          259.49     4.357    453.91    108.65   0.0000    818.82     3.088    411.97    2600.3  0.7140    1.39988
FS1   Inlet.Fl_O            259.49     4.357    453.91    108.65   0.0000    818.82     3.988    442.57    4162.5  0.3580    1.39988
FS12  Splitter.Fl_02        234.97     4.355    453.91    108.65   0.0000    741.83     3.926    440.66    3526.9  0.3878    1.39988
FS2   Splitter.Fl_01         24.51     4.355    453.91    108.65   0.0000     77.39     4.223    449.93     637.7  0.2102    1.39988
FS14  Fan.Fl_O              234.97     4.923    471.86    112.96   0.0000    669.07     4.140    449.10    2600.0  0.5035    1.40026
FS25  LPC.Fl_O               24.51     6.654    527.97    126.41   0.0000     54.63     6.412    522.42     412.5  0.2305    1.39976
FS3   HPC.Fl_O               23.33    41.277    963.12    232.12   0.0000     11.32    36.389    930.02      49.7  0.4305    1.38317
FS36  Bleed3.Fl_O            18.08    41.277    963.12    232.12   0.0000      8.77    38.469    944.49      49.3  0.3207    1.38317
FS4   Burner.Fl_O            18.28    40.326   1712.61    431.51   0.0110     12.10    38.086   1688.36      74.8  0.2940    1.33192
FS45  HPT.Fl_O               24.43     9.808   1130.24    275.84   0.0082     54.03     8.903   1101.20     264.7  0.3786    1.36708
FS49  LPT.Fl_O               24.71     3.494    893.27    216.14   0.0081    136.42     3.304    879.59     851.6  0.2853    1.38199
FS5   TEGV.Fl_O              24.71     3.494    893.27    216.14   0.0081    136.42     3.304    879.59     851.6  0.2853    1.38199
FS8   Core_Nozz.Fl_O         24.71     3.494    893.27    216.14   0.0081    136.42     3.089    863.19     603.2  0.4267    1.38199
FS17  FanDuctLkg.Fl_O       234.97     4.923    471.86    112.96   0.0000    669.07     4.140    449.10    2600.0  0.5035    1.40026
FS171 Bleed15.Fl_O          234.97     4.923    471.86    112.96   0.0000    669.07     4.035    445.80    2475.2  0.5407    1.40026
FS172 FanDuct.Fl_O          234.97     4.923    471.86    112.96   0.0000    669.07     4.035    445.80    2475.2  0.5407    1.40026
FS173 Byp_Nozz.Fl_O         234.97     4.923    471.86    112.96   0.0000    669.07     3.088    413.45    2002.6  0.8410    1.40026

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR       eff         Nc        TR    efPoly        pwr      SMN      SMW
Fan         741.83   1.130    0.9065   2556.309    1.0396    0.9088    -1432.0  ---.--    54.25
LPC          77.39   1.528    0.8004   2556.309    1.1632    0.8084     -616.2     7.70     2.49
HPC          54.63   6.204    0.8205   8980.034    1.8242    0.8590    -3577.3    59.73    56.50
HPT          12.10   4.112    0.8756    218.930    1.3621    0.8537     3577.3
LPT          54.03   2.807    0.8490     71.132    1.2629    0.8301     2048.2

TURBOMACHINERY MAP DATA
             WcMap   PRmap    effMap      NcMap     R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         861.93   1.127    0.9083   2531.929     0.0416      0.8607    1.0235    0.9980    0.9905
```

LPC	74.21	1.553	0.8292	0.675	180.0000	1.0429	0.9545	0.9652	0.0003
HPC	49.68	5.959	0.8290	8740.425	11.0697	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.046	0.8757	1.318	4.0462	12.6513	0.9790	1.0000	0.0003
LPT	0.83	2.374	0.8553	0.802	2.3739	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2600.29	5727.7

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2853	851.64
FanDuct	0.0000	0.5407	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5853	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9060.1	2073.8	3577.3
LP_Shaft	2391.4	4498.3	2048.2

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.9021	747.32	179.27	9.808
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2868	747.32	179.27	3.494
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.51	173.98	14.271
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	860.10	206.75	28.120
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.51	173.98	14.271
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	963.12	232.12	41.277
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.51	173.98	14.271

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7990	963.12	232.12	40.326
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.4492	963.12	232.12	22.870
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	963.12	232.12	41.277
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	963.12	232.12	41.277
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	963.12	232.12	41.277
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	471.86	112.96	4.923
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	471.86	112.96	4.923
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	471.86	112.96	4.923
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	471.86	112.96	4.923
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	471.86	112.96	4.923

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1712.61	0.9995	0.0230	0.19941	0.01103

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.131	0.9800	1.0000	0.9800	603.19	0.427	598.8	460.0
Byp_Nozz	1.594	0.9800	1.0000	0.9800	2002.63	0.841	821.2	5997.7

```
**********************************************************************************************************************************
Date:02/23/11    Time:08:16:14    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  3/ 16/ 1/ 1    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 462.20    Stator 1 exit: 469.78    Stator 2 inlet: 479.48    Stator 2 exit: 484.71
            Stator 3 inlet: 493.91    Stator 3 exit: 498.67    Stator 4 inlet: 505.96    Stator 4 exit: 510.05
            Stator 5 inlet: 518.32    Stator 5 exit: 521.80               Stage4   Percent Blockage: 0.10

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.669    34281.0    22.00    282.90      832.3    0.9470     788.20    9.5957    670.64    9.285      8322.3       10.0   1715.8
1620.7   1129.6


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           282.90     4.846    455.82    109.11   0.0000    804.32     3.578    418.42    2631.8   0.6690    1.39992
FS1   Inlet.Fl_O             282.90     4.846    455.82    109.11   0.0000    804.32     4.451    444.89    4162.5   0.3506    1.39992
FS12  Splitter.Fl_02         256.20     4.843    455.82    109.11   0.0000    728.78     4.385    443.06    3526.9   0.3795    1.39992
FS2   Splitter.Fl_01          26.70     4.843    455.82    109.11   0.0000     75.95     4.702    451.99     637.7   0.2060    1.39992
FS14  Fan.Fl_O               256.20     5.452    473.24    113.29   0.0000    659.67     4.615    451.25    2600.0   0.4936    1.40028
FS25  LPC.Fl_O                26.70     7.276    526.89    126.15   0.0000     54.36     7.014    521.41     412.5   0.2293    1.39976
FS3   HPC.Fl_O                25.40    44.993    960.36    231.43   0.0000     11.29    39.693    927.52      49.7   0.4292    1.38332
FS36  Bleed3.Fl_O             19.69    44.993    960.36    231.43   0.0000      8.75    41.947    941.87      49.3   0.3199    1.38332
FS4   Burner.Fl_O             19.91    43.957   1715.81    432.43   0.0111     12.11    41.513   1691.51      74.8   0.2941    1.33171
FS45  HPT.Fl_O                26.61    10.797   1133.91    276.79   0.0083     53.55     9.821   1105.39     264.7   0.3746    1.36680
FS49  LPT.Fl_O                26.92     3.998    904.67    218.98   0.0082    130.69     3.800    892.06     851.6   0.2722    1.38118
FS5   TEGV.Fl_O               26.92     3.998    904.67    218.98   0.0082    130.69     3.800    892.06     851.6   0.2722    1.38118
FS8   Core_Nozz.Fl_O          26.92     3.998    904.67    218.98   0.0082    130.69     3.578    877.23     603.1   0.4046    1.38118
FS17  FanDuctLkg.Fl_O        256.20     5.452    473.24    113.29   0.0000    659.67     4.615    451.25    2600.0   0.4936    1.40028
FS171 Bleed15.Fl_O           256.20     5.452    473.24    113.29   0.0000    659.67     4.504    448.12    2475.2   0.5295    1.40028
FS172 FanDuct.Fl_O           256.20     5.452    473.24    113.29   0.0000    659.67     4.504    448.12    2475.2   0.5295    1.40028
FS173 Byp_Nozz.Fl_O          256.20     5.452    473.24    113.29   0.0000    659.67     3.578    419.87    2002.6   0.7976    1.40028

TURBOMACHINERY PERFORMANCE DATA
               Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan        728.78   1.126   0.9067   2502.470   1.0382    0.9089    -1514.4  ---.--   53.74
LPC         75.95   1.502   0.8026   2502.470   1.1559    0.8099     -644.0    7.76    2.32
HPC         54.36   6.184   0.8203   8971.412   1.8227    0.8588    -3880.5   59.54   56.29
HPT         12.11   4.071   0.8760    218.293   1.3592    0.8543     3880.5
LPT         53.55   2.701   0.8463     69.668   1.2509    0.8280     2158.4

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        846.75   1.123   0.9085   2478.603    0.0417      0.8607    1.0235    0.9980    0.9905
```

LPC	70.29	1.527	0.8197	0.661	180.0000	1.0804	0.9535	0.9792	0.0003
HPC	49.44	5.940	0.8287	8732.034	11.0843	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.007	0.8760	1.314	4.0068	12.6513	0.9790	1.0000	0.0003
LPT	0.82	2.293	0.8526	0.785	2.2928	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2631.84	5896.7

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2722	851.64
FanDuct	0.0000	0.5295	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5957	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9042.2	2254.0	3880.5
LP_Shaft	2346.0	4832.2	2158.4

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.9825	745.37	178.79	10.797
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3124	745.37	178.79	3.998
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.65	173.53	15.573
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	857.72	206.17	30.660
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.65	173.53	15.573
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	960.36	231.43	44.993
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.65	173.53	15.573

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.0485	960.36	231.43	43.957
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.6675	960.36	231.43	24.989
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	960.36	231.43	44.993
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	960.36	231.43	44.993
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	960.36	231.43	44.993
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	473.24	113.29	5.452
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	473.24	113.29	5.452
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	473.24	113.29	5.452
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	473.24	113.29	5.452
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	473.24	113.29	5.452

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1715.81	0.9995	0.0230	0.21895	0.01112

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.117	0.9800	1.0000	0.9800	603.19	0.405	572.3	478.8
Byp_Nozz	1.524	0.9800	1.0000	0.9800	2002.63	0.798	784.9	6250.2

```
**********************************************************************************************************************************
Date:02/23/11    Time:08:18:02    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 471.61    Stator 1 exit: 478.79    Stator 2 inlet: 487.99    Stator 2 exit: 492.90
            Stator 3 inlet: 501.61    Stator 3 exit: 506.06    Stator 4 inlet: 514.11    Stator 4 exit: 517.89
            Stator 5 inlet: 524.61    Stator 5 exit: 527.91            Unblocked   Percent Blockage: 0.10

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.608   30029.0    22.00    314.03      995.1    0.9037     899.22    9.5609    620.50    9.019      9951.0       10.0   1742.1
1645.1   1149.0


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          314.03     5.599    465.62    111.46   0.0000    780.92     4.358    433.58    2686.1   0.6080    1.40012
FS1   Inlet.Fl_O            314.03     5.599    465.62    111.46   0.0000    780.92     5.172    455.17    4162.5   0.3387    1.40012
FS12  Splitter.Fl_02        284.30     5.597    465.62    111.46   0.0000    707.33     5.101    453.45    3526.9   0.3662    1.40012
FS2   Splitter.Fl_01         29.74     5.597    465.62    111.46   0.0000     73.98     5.442    461.91     637.7   0.2004    1.40012
FS14  Fan.Fl_O              284.30     6.259    482.58    115.52   0.0000    643.85     5.355    461.53    2600.0   0.4774    1.40048
FS25  LPC.Fl_O               29.74     8.179    532.86    127.59   0.0000     54.16     7.887    527.36     412.5   0.2284    1.39975
FS3   HPC.Fl_O               28.29    50.502    970.71    234.00   0.0000     11.26    44.587    937.75      49.7   0.4280    1.38276
FS36  Bleed3.Fl_O            21.93    50.502    970.71    234.00   0.0000      8.73    47.101    952.14      49.3   0.3190    1.38276
FS4   Burner.Fl_O            22.18    49.339   1742.08    439.81   0.0114     12.11    46.596   1717.48      74.8   0.2943    1.33030
FS45  HPT.Fl_O               29.64    12.253   1153.52    281.86   0.0085     53.01    11.170   1125.25     264.7   0.3704    1.36543
FS49  LPT.Fl_O               29.99     4.803    933.21    226.13   0.0084    123.08     4.593    921.82     851.6   0.2552    1.37919
FS5   TEGV.Fl_O              29.99     4.803    933.21    226.13   0.0084    123.08     4.593    921.82     851.6   0.2552    1.37919
FS8   Core_Nozz.Fl_O         29.99     4.803    933.21    226.13   0.0084    123.08     4.358    908.70     603.2   0.3769    1.37919
FS17  FanDuctLkg.Fl_O       284.30     6.259    482.58    115.52   0.0000    643.85     5.355    461.53    2600.0   0.4774    1.40048
FS171 Bleed15.Fl_O          284.30     6.259    482.58    115.52   0.0000    643.85     5.237    458.60    2475.2   0.5112    1.40048
FS172 FanDuct.Fl_O          284.30     6.259    482.58    115.52   0.0000    643.85     5.237    458.60    2475.2   0.5112    1.40048
FS173 Byp_Nozz.Fl_O         284.30     6.259    482.58    115.52   0.0000    643.85     4.358    435.01    2002.6   0.7395    1.40048

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       707.33   1.118   0.9068   2417.235   1.0364    0.9090    -1636.1  ---.--   52.80
LPC        73.98   1.461   0.8034   2417.235   1.1444    0.8103     -678.7    7.89    2.03
HPC        54.16   6.175   0.8202   8965.211   1.8217    0.8586    -4368.2   59.28   56.02
HPT        12.11   4.027   0.8777    217.715   1.3556    0.8565     4368.2
LPT        53.01   2.551   0.8434     67.433   1.2334    0.8253     2314.8

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        821.83   1.116   0.9086   2394.181    0.0420      0.8607    1.0235    0.9980    0.9905
```

LPC	64.10	1.485	0.8046	0.638	180.0000	1.1541	0.9513	0.9985	0.0003
HPC	49.25	5.931	0.8286	8725.999	11.1033	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.963	0.8777	1.311	3.9629	12.6513	0.9790	1.0000	0.0003
LPT	0.82	2.179	0.8497	0.760	2.1793	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2686.13	6056.4

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2552	851.64
FanDuct	0.0000	0.5112	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5609	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9087.0	2524.7	4368.2
LP_Shaft	2290.3	5308.4	2314.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.0943	753.61	180.79	12.253
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3479	753.61	180.79	4.803
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	867.08	208.46	34.419
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.3952	970.71	234.00	49.339
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.9709	970.71	234.00	28.126
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1742.08	0.9995	0.0230	0.24978	0.01139

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.102	0.9800	1.0000	0.9800	603.19	0.377	542.0	505.2
Byp_Nozz	1.436	0.9800	1.0000	0.9800	2002.63	0.739	740.8	6546.3

```
**********************************************************************************************************************************
Date:02/23/11    Time:08:19:57    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 32/ 2/ 3    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 482.09    Stator 1 exit: 488.87    Stator 2 inlet: 497.56    Stator 2 exit: 502.14
            Stator 3 inlet: 509.11    Stator 3 exit: 513.24    Stator 4 inlet: 522.07    Stator 4 exit: 525.49
            Stator 5 inlet: 531.82    Stator 5 exit: 534.87               Stage3   Percent Blockage: 0.10

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.552   25666.0    22.00    348.91     1194.6     0.8603    1027.74     9.4689    573.44    8.759     11946.9       10.0   1765.6
1667.1   1166.7


                                        FLOW STATION DATA
                                  W         Pt         Tt         ht      FAR        Wc         Ps         Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           348.91      6.507     476.52     114.07   0.0000    755.29      5.297     449.14    2752.5   0.5520    1.40035
FS1   Inlet.Fl_O             348.91      6.507     476.52     114.07   0.0000    755.29      6.045     466.59    4162.5   0.3259    1.40035
FS12  Splitter.Fl_02         315.58      6.504     476.52     114.07   0.0000    683.49      5.971     465.00    3526.9   0.3517    1.40035
FS2   Splitter.Fl_01          33.33      6.504     476.52     114.07   0.0000     72.18      6.333     472.91     637.7   0.1953    1.40035
FS14  Fan.Fl_O               315.58      7.231     493.16     118.06   0.0000    625.37      6.258     473.18    2600.0   0.4591    1.40071
FS25  LPC.Fl_O                33.33      9.276     539.50     129.18   0.0000     53.85      8.949     534.00     412.5   0.2271    1.39974
FS3   HPC.Fl_O                 31.71     56.998     981.35     236.64   0.0000     11.25     50.344     948.19      49.7   0.4273    1.38217
FS36  Bleed3.Fl_O              24.58     56.998     981.35     236.64   0.0000      8.72     53.172     962.66      49.3   0.3186    1.38217
FS4   Burner.Fl_O              24.86     55.685    1765.61     446.43   0.0116     12.11     52.589    1740.74      74.8   0.2944    1.32906
FS45  HPT.Fl_O                 33.22     13.955    1171.29     286.46   0.0087     52.58     12.744    1143.19     264.7   0.3670    1.36421
FS49  LPT.Fl_O                 33.61      5.768     959.93     232.84   0.0086    116.52      5.543     949.54     851.6   0.2407    1.37756
FS5   TEGV.Fl_O                33.61      5.768     959.93     232.84   0.0086    116.52      5.543     949.54     851.6   0.2407    1.37756
FS8   Core_Nozz.Fl_O           33.61      5.768     959.93     232.84   0.0086    116.52      5.297     937.80     603.3   0.3533    1.37756
FS17  FanDuctLkg.Fl_O         315.58      7.231     493.16     118.06   0.0000    625.37      6.258     473.18    2600.0   0.4591    1.40071
FS171 Bleed15.Fl_O            315.58      7.231     493.16     118.06   0.0000    625.37      6.134     470.48    2475.2   0.4906    1.40071
FS172 FanDuct.Fl_O            315.58      7.231     493.16     118.06   0.0000    625.37      6.134     470.48    2475.2   0.4906    1.40071
FS173 Byp_Nozz.Fl_O           315.58      7.231     493.16     118.06   0.0000    625.37      5.297     450.56    2002.6   0.6873    1.40071

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR       eff          Nc        TR    efPoly        pwr      SMN      SMW
Fan       683.49   1.112    0.9066    2329.829    1.0349    0.9089    -1780.8  ---.--    51.54
LPC        72.18   1.426    0.8151    2329.829    1.1322    0.8218     -712.6    8.10     1.72
HPC        53.85   6.145    0.8197    8955.318    1.8190    0.8580    -4944.1   59.28    55.99
HPT        12.11   3.990    0.8790     217.362    1.3526    0.8584     4944.1
LPT        52.58   2.420    0.8399      65.251    1.2173    0.8225     2493.3

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        794.13   1.109    0.9085   2307.609    0.0424      0.8607    1.0235    0.9980    0.9905
```

LPC	57.75	1.442	0.7891	0.615	180.0000	1.2499	0.9639	1.0330	0.0003
HPC	48.98	5.902	0.8282	8716.369	11.1069	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.927	0.8790	1.309	3.9273	12.6513	0.9790	1.0000	0.0003
LPT	0.81	2.079	0.8461	0.735	2.0791	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2752.54	6218.6

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2407	851.64
FanDuct	0.0000	0.4906	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.4689	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9133.4	2843.1	4944.1
LP_Shaft	2233.1	5864.1	2493.3

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.2265	762.33	182.91	13.955
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3899	762.33	182.91	5.768
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	740.19	177.54	19.775
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	876.82	210.85	38.864
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	740.19	177.54	19.775
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	981.35	236.64	56.998
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	740.19	177.54	19.775

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.8054	981.35	236.64	55.685
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	3.3298	981.35	236.64	31.816
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	981.35	236.64	56.998
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	981.35	236.64	56.998
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	981.35	236.64	56.998
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.231
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.231
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.231
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.231
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.231

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1765.61	0.9995	0.0230	0.28548	0.01162

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.089	0.9800	1.0000	0.9800	603.19	0.353	515.9	539.0
Byp_Nozz	1.365	0.9800	1.0000	0.9800	2002.63	0.687	700.8	6874.2

```
**********************************************************************************************************************************
Date:02/23/11    Time:08:21:54    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 34/ 2/ 5    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 496.91    Stator 1 exit: 503.30    Stator 2 inlet: 510.32    Stator 2 exit: 514.58
            Stator 3 inlet: 523.49    Stator 3 exit: 527.24    Stator 4 inlet: 534.40    Stator 4 exit: 537.62
            Stator 5 inlet: 543.58    Stator 5 exit: 546.36               Stage2   Percent Blockage: 0.10

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.490   20047.0    22.00    399.47     1508.8    0.8135    1227.39    9.3147    520.34    8.456     15087.7      10.0   1800.8
1700.2   1193.2


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           399.47     7.913    491.73    117.72   0.0000    722.38     6.740    469.18    2851.1   0.4900    1.40068
FS1   Inlet.Fl_O             399.47     7.913    491.73    117.72   0.0000    722.38     7.403    482.46    4162.5   0.3098    1.40068
FS12  Splitter.Fl_02         360.74     7.909    491.73    117.72   0.0000    652.67     7.323    481.03    3526.9   0.3333    1.40068
FS2   Splitter.Fl_01          38.73     7.909    491.73    117.72   0.0000     70.07     7.714    488.23     637.7   0.1893    1.40068
FS14  Fan.Fl_O               360.74     8.767    508.18    121.66   0.0000    598.56     7.703    489.74    2600.0   0.4337    1.40000
FS25  LPC.Fl_O                38.73    10.978    550.33    131.78   0.0000     53.40    10.598    544.82     412.5   0.2250    1.39972
FS3   HPC.Fl_O                36.85    66.914    998.39    240.87   0.0000     11.23    59.132    964.83      49.7   0.4266    1.38125
FS36  Bleed3.Fl_O             28.56    66.914    998.39    240.87   0.0000      8.70    62.438    979.47      49.3   0.3181    1.38125
FS4   Burner.Fl_O             28.90    65.373   1800.80    456.36   0.0119     12.11    61.738   1775.54      74.8   0.2946    1.32724
FS45  HPT.Fl_O                38.62    16.581   1197.89    293.38   0.0089     52.01    15.176   1169.96     264.7   0.3626    1.36240
FS49  LPT.Fl_O                39.07     7.255    995.39    241.78   0.0088    109.63     7.007    985.96     851.6   0.2257    1.37539
FS5   TEGV.Fl_O               39.07     7.255    995.39    241.78   0.0088    109.63     7.007    985.96     851.6   0.2257    1.37539
FS8   Core_Nozz.Fl_O          39.07     7.255    995.39    241.78   0.0088    109.63     6.740    975.49     603.2   0.3295    1.37539
FS17  FanDuctLkg.Fl_O         360.74     8.767    508.18    121.66   0.0000    598.56     7.703    489.74    2600.0   0.4337    1.40000
FS171 Bleed15.Fl_O            360.74     8.767    508.18    121.66   0.0000    598.56     7.571    487.32    2475.2   0.4624    1.40000
FS172 FanDuct.Fl_O            360.74     8.767    508.18    121.66   0.0000    598.56     7.571    487.32    2475.2   0.4624    1.40000
FS173 Byp_Nozz.Fl_O           360.74     8.767    508.18    121.66   0.0000    598.56     6.740    470.67    2002.6   0.6310    1.40000

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan         652.67   1.108   0.9089   2234.795   1.0334   0.9078    -2013.1  ---.--   49.22
LPC          70.07   1.388   0.8225   2234.795   1.1192   0.8302     -770.6    8.44    1.36
HPC          53.40   6.095   0.8189   8940.598   1.8142   0.8574    -5832.3   59.41   56.08
HPT          12.11   3.943   0.8807    217.020   1.3484   0.8606     5832.3
LPT          52.01   2.285   0.8363     62.871   1.2004   0.8206     2783.7

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         758.33   1.106   0.9108   2213.482    0.0433      0.8607    1.0235    0.9980    0.9905
```

LPC	50.85	1.396	0.7722	0.590	180.0000	1.3781	0.9809	1.0651	0.0003
HPC	48.57	5.855	0.8273	8702.042	11.1039	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.881	0.8807	1.306	3.8808	12.6513	0.9790	1.0000	0.0003
LPT	0.80	1.977	0.8425	0.709	1.9771	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2851.07	6460.4

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2257	851.64
FanDuct	0.0000	0.4624	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.3147	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9209.4	3326.1	5832.3
LP_Shaft	2176.0	6719.0	2783.7

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.4252	776.39	186.32	16.581
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.4531	776.39	186.32	7.255
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.93	180.87	23.284
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	892.47	214.69	45.659
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.93	180.87	23.284
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	998.39	240.87	66.914
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.93	180.87	23.284

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	4.4219	998.39	240.87	65.373
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	3.8693	998.39	240.87	37.464
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	998.39	240.87	66.914
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	998.39	240.87	66.914
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	998.39	240.87	66.914
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1800.80	0.9995	0.0230	0.34094	0.01194

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.076	0.9800	1.0000	0.9800	603.19	0.329	490.3	595.3
Byp_Nozz	1.301	0.9800	1.0000	0.9800	2002.63	0.631	657.7	7373.8

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**********************************************************************************************************************************
Date:02/23/11    Time:08:23:47    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  9/ 22/ 1/ 7    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 508.89    Stator 1 exit: 514.95    Stator 2 inlet: 523.66    Stator 2 exit: 527.63
            Stator 3 inlet: 534.93    Stator 3 exit: 538.53    Stator 4 inlet: 545.27    Stator 4 exit: 548.29
            Stator 5 inlet: 553.89    Stator 5 exit: 556.48               Stage1   Percent Blockage: 0.10

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.446    15435.0    22.00    442.52     1740.6    0.7954    1384.51    9.3041    481.90    8.018     17405.9       10.0   1821.8
1719.8   1212.4


                                        FLOW STATION DATA
                                  W         Pt         Tt         ht      FAR        Wc         Ps         Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           442.52      9.311     504.97     120.89   0.0000    689.18      8.149     485.63    2919.5   0.4460    1.40036
FS1   Inlet.Fl_O             442.52      9.311     504.97     120.89   0.0000    689.18      8.769     496.39    4162.5   0.2939    1.40036
FS12  Splitter.Fl_02         399.58      9.306     504.97     120.89   0.0000    622.61      8.684     495.08    3526.9   0.3158    1.40036
FS2   Splitter.Fl_01          42.95      9.306     504.97     120.89   0.0000     66.92      9.097     501.71     637.7   0.1804    1.40036
FS14  Fan.Fl_O               399.58     10.281     520.79     124.69   0.0000    572.31      9.159     503.86    2600.0   0.4099    1.39977
FS25  LPC.Fl_O                42.95     12.606     559.85     134.07   0.0000     52.02     12.192     554.54     412.5   0.2188    1.39970
FS3   HPC.Fl_O                40.86     74.658    1007.71     243.18   0.0000     11.21     66.003     974.00      49.7   0.4259    1.38048
FS36  Bleed3.Fl_O             31.67     74.658    1007.71     243.18   0.0000      8.69     69.680     988.70      49.3   0.3176    1.38048
FS4   Burner.Fl_O             32.05     72.939    1821.80     462.31   0.0121     12.10     68.883    1796.31      74.8   0.2947    1.32637
FS45  HPT.Fl_O                42.83     18.864    1217.21     298.41   0.0091     51.11     17.326    1190.01     264.7   0.3554    1.36099
FS49  LPT.Fl_O                43.33      8.692    1024.21     249.07   0.0090    102.95      8.431    1015.74     851.6   0.2113    1.37327
FS5   TEGV.Fl_O               43.33      8.692    1024.21     249.07   0.0090    102.95      8.431    1015.74     851.6   0.2113    1.37327
FS8   Core_Nozz.Fl_O          43.33      8.692    1024.21     249.07   0.0090    102.95      8.149    1006.46     603.2   0.3072    1.37327
FS17  FanDuctLkg.Fl_O        399.58     10.281     520.79     124.69   0.0000    572.31      9.159     503.86    2600.0   0.4099    1.39977
FS171 Bleed15.Fl_O           399.58     10.281     520.79     124.69   0.0000    572.31      9.023     501.71    2475.2   0.4360    1.39977
FS172 FanDuct.Fl_O           399.58     10.281     520.79     124.69   0.0000    572.31      9.023     501.71    2475.2   0.4360    1.39977
FS173 Byp_Nozz.Fl_O          399.58     10.281     520.79     124.69   0.0000    572.31      8.149     487.09    2002.6   0.5880    1.39977

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff          Nc       TR    efPoly        pwr     SMN     SMW
Fan       622.61   1.105   0.9099    2144.548   1.0313    0.9114    -2146.5  ---.--   46.99
LPC        66.92   1.355   0.8249    2144.548   1.1087    0.8335     -800.5    8.94    0.99
HPC        52.02   5.922   0.8158    8894.757   1.8000    0.8544    -6469.4   60.39   56.88
HPT        12.10   3.867   0.8813     216.507   1.3420    0.8615     6469.4
LPT        51.11   2.170   0.8324      60.651   1.1853    0.8171     2947.0

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       723.40   1.102   0.9118   2124.095    0.0442      0.8607    1.0235    0.9980    0.9905
```

LPC	44.29	1.351	0.7562	0.566	180.0000	1.5109	1.0088	1.0909	0.0003
HPC	47.31	5.690	0.8242	8657.425	11.0606	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.806	0.8813	1.303	3.8063	12.6513	0.9790	1.0000	0.0003
LPT	0.79	1.890	0.8386	0.684	1.8896	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2919.49	6628.1

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2113	851.64
FanDuct	0.0000	0.4360	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.3041	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9241.1	3676.9	6469.4
LP_Shaft	2116.0	7314.7	2947.0

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.5804	785.86	188.63	18.864
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.5025	785.86	188.63	8.692
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	763.41	183.17	26.257
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	901.86	217.00	51.078
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	763.41	183.17	26.257
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1007.71	243.18	74.658
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	763.41	183.17	26.257

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	4.9036	1007.71	243.18	72.939
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	4.2908	1007.71	243.18	42.008
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1007.71	243.18	74.658
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1007.71	243.18	74.658
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1007.71	243.18	74.658
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.281
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.281
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.281
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.281
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.281

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1821.80	0.9995	0.0230	0.38459	0.01214

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.067	0.9800	1.0000	0.9800	603.19	0.307	464.0	624.9
Byp_Nozz	1.262	0.9800	1.0000	0.9800	2002.63	0.588	623.5	7743.8

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****************************************************************************************************************************************
Date:02/23/11    Time:08:25:51    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 12/ 25/ 1/10    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 523.48    Stator 1 exit: 529.04    Stator 2 inlet: 536.15    Stator 2 exit: 539.83
            Stator 3 inlet: 546.53    Stator 3 exit: 549.79    Stator 4 inlet: 555.99    Stator 4 exit: 558.70
            Stator 5 inlet: 563.83    Stator 5 exit: 566.16             Unblocked   Percent Blockage: 0.10

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.406   10735.0    22.00    489.85     2003.2    0.7777    1557.96    9.2910    446.20    7.554     20032.3      10.0   1842.0
1738.8   1230.8


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           489.85    11.019    518.95    124.25   0.0000    653.50     9.822    502.39    2996.0   0.4060    1.39978
FS1   Inlet.Fl_O             489.85    11.019    518.95    124.25   0.0000    653.50    10.446    511.10    4162.5   0.2772    1.39978
FS12  Splitter.Fl_02         442.25    11.013    518.95    124.25   0.0000    590.29    10.357    509.92    3526.9   0.2976    1.39978
FS2   Splitter.Fl_01          47.60    11.013    518.95    124.25   0.0000     63.53    10.791    515.93     637.7   0.1710    1.39978
FS14  Fan.Fl_O               442.25    12.085    534.12    127.89   0.0000    545.75    10.900    518.61    2600.0   0.3868    1.39975
FS25  LPC.Fl_O                47.60    14.441    569.62    136.41   0.0000     50.76    13.990    564.49     412.5   0.2133    1.39968
FS3   HPC.Fl_O                45.29    83.232   1017.61    245.65   0.0000     11.20    73.605    983.68      49.7   0.4255    1.37981
FS36  Bleed3.Fl_O             35.10    83.232   1017.61    245.65   0.0000      8.68    77.695    998.48      49.3   0.3174    1.37981
FS4   Burner.Fl_O             35.53    81.315   1842.02    468.05   0.0123     12.10    76.796   1816.31      74.8   0.2947    1.32540
FS45  HPT.Fl_O                47.48    21.393   1235.67    303.23   0.0092     50.34    19.706   1209.07     264.7   0.3493    1.35973
FS49  LPT.Fl_O                48.03    10.389   1052.82    256.33   0.0091     96.80    10.114   1045.19     851.6   0.1982    1.37143
FS5   TEGV.Fl_O               48.03    10.389   1052.82    256.33   0.0091     96.80    10.114   1045.19     851.6   0.1982    1.37143
FS8   Core_Nozz.Fl_O          48.03    10.389   1052.82    256.33   0.0091     96.80     9.822   1036.94     603.2   0.2870    1.37143
FS17  FanDuctLkg.Fl_O         442.25    12.085    534.12    127.89   0.0000    545.75    10.900    518.61    2600.0   0.3868    1.39975
FS171 Bleed15.Fl_O            442.25    12.085    534.12    127.89   0.0000    545.75    10.760    516.69    2475.2   0.4108    1.39975
FS172 FanDuct.Fl_O            442.25    12.085    534.12    127.89   0.0000    545.75    10.760    516.69    2475.2   0.4108    1.39975
FS173 Byp_Nozz.Fl_O           442.25    12.085    534.12    127.89   0.0000    545.75     9.822    503.75    2002.6   0.5491    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       590.29   1.097   0.9093   2034.264   1.0292    0.9108    -2279.5  ---.--   45.03
LPC        63.53   1.311   0.8186   2034.264   1.0976    0.8270     -819.3    9.96    0.51
HPC        50.76   5.764   0.8128   8853.260   1.7865    0.8515    -7178.3   61.41   57.72
HPT        12.10   3.801   0.8818    216.174   1.3364    0.8624     7178.3
LPT        50.34   2.059   0.8287     57.886   1.1704    0.8140     3098.8

TURBOMACHINERY MAP DATA
           WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       685.85   1.095   0.9111   2014.862    0.0450      0.8607    1.0235    0.9980    0.9905
```

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LPC         36.28   1.298   0.7366      0.537  180.0000      1.7514    1.0460    1.1113    0.0003
HPC         46.17   5.539   0.8212   8617.034   11.0151      1.0995    1.0494    0.9898    0.9733
HPT          0.96   3.742   0.8818      1.301    3.7422     12.6513    0.9790    1.0000    0.0003
LPT          0.77   1.805   0.8348      0.652    1.8052     65.0409    0.7602    0.9926    0.0005

===INLETS====    eRam       Afs      Fram
Inlet          1.0000   2995.97    6793.5

====DUCTS====  dPnorm        MN      Aphy
TEGV           0.0000    0.1982    851.64
FanDuct        0.0000    0.4108   2475.22

==SPLITTERS==     BPR    dP/P 1    dP/P 2
Splitter       9.2910    0.0005    0.0005

===SHAFTS====   Nmech    trq in    pwr in
HP_Shaft       9277.9    4063.6    7178.3
LP_Shaft       2034.8    7998.3    3098.8

BLEEDS - interstg  Wb/Win    BldWk     BldP          W        Tt       ht        Pt
HPT_COOLC HPC.C>   0.0368   0.5000   0.2200     1.7517    795.75   191.03    21.393
LPT_COOLA HPC.C>   0.0117   0.5000   0.4500     0.5569    795.75   191.03    10.389
WB2X      HPC.B>   0.0000   0.4500   0.2200     0.0000    773.29   185.57    29.575
WB2Y      HPC.B>   0.0000   0.7600   0.6200     0.0000    911.76   219.43    57.091
WBA2X     HPC.B>   0.0000   0.4500   0.2200     0.0000    773.29   185.57    29.575
WBLKG     HPC.l>   0.0000   1.0000   1.0000     0.0000   1017.61   245.65    83.232
WBW2X     HPC.B>   0.0000   0.4500   0.2200     0.0000    773.29   185.57    29.575

BLEEDS - output    Wb/Win   hscale   Pscale          W        Tt       ht        Pt
HPT_COOLA Bleed>   0.1142   1.0000   1.0000     5.4350   1017.61   245.65    81.315
HPT_COOLB Bleed>   0.0999   1.0000   1.0000     4.7557   1017.61   245.65    47.040
WB3X      Bleed>   0.0000   1.0000   1.0000     0.0000   1017.61   245.65    83.232
WBA3X     Bleed>   0.0000   1.0000   1.0000     0.0000   1017.61   245.65    83.232
WBW3X     Bleed>   0.0000   1.0000   1.0000     0.0000   1017.61   245.65    83.232
WBFDLKG   FanDu>   0.0000   1.0000   1.0000     0.0000    534.12   127.89    12.085
WB15X     Bleed>   0.0000   1.0000   1.0000     0.0000    534.12   127.89    12.085
WB15Y     Bleed>   0.0000   1.0000   1.0000     0.0000    534.12   127.89    12.085
WB17X     Bleed>   0.0000   1.0000   1.0000     0.0000    534.12   127.89    12.085
WB17Y     Bleed>   0.0000   1.0000   1.0000     0.0000    534.12   127.89    12.085

===BURNERS===   TtOut       eff    dPnorm      Wfuel       FAR
Burner        1842.02    0.9995    0.0230    0.43277   0.01233

===NOZZLES===      PR       Cfg      CdTh       Cv        Ath      MNth     Vact       Fg
Core_Nozz       1.058    0.9800    1.0000   0.9800     603.19     0.287    439.7     656.4
Byp_Nozz        1.230    0.9800    1.0000   0.9800    2002.63     0.549    592.2    8140.3
```

15% Blockage

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**********************************************************************************************************************
Date:02/23/11    Time:08:35:58    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 34/ 2/ 5    Run by: Philip C Jorgenson      PC:   100
Temperature Stator 1 inlet: 456.56    Stator 1 exit: 475.13    Stator 2 inlet: 502.77    Stator 2 exit: 510.93
            Stator 3 inlet: 537.55    Stator 3 exit: 546.10    Stator 4 inlet: 571.37    Stator 4 exit: 579.42
            Stator 5 inlet: 599.78    Stator 5 exit: 607.62             Unblocked   Percent Blockage: 0.15

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.780   35000.0    22.00    477.01     8371.9    0.5976    5003.20    5.2999    779.49   32.229      8371.8     100.0   2874.1
2696.7   1876.6


                                        FLOW STATION DATA
                                 W        Pt        Tt       ht     FAR       Wc        Ps        Ts     Aphy      MN       gamt
FS0   Ambient.Fl_O          477.01     5.185    466.40   111.64  0.0000  1281.99     3.458    415.85   3926.2  0.7800   1.40014
FS1   Inlet.Fl_O            477.01     5.185    466.40   111.64  0.0000  1281.99     3.822    427.49   4162.5  0.6748   1.40014
FS12  Splitter.Fl_02        401.29     5.183    466.40   111.64  0.0000  1079.03     3.850    428.42   3526.9  0.6660   1.40014
FS2   Splitter.Fl_01         75.72     5.183    466.40   111.64  0.0000   203.59     3.638    421.57    637.7  0.7295   1.40014
FS14  Fan.Fl_O              401.29     8.814    550.80   131.90  0.0000   689.50     7.302    521.98   2600.0  0.5256   1.39972
FS25  LPC.Fl_O               75.72    12.470    626.53   150.09  0.0000    98.07    10.840    601.99    412.5  0.4522   1.39820
FS3   HPC.Fl_O               72.04   167.116   1392.78   341.31  0.0000    10.38   150.851   1355.71     49.7  0.3910   1.35667
FS36  Bleed3.Fl_O            55.83   167.116   1392.78   341.31  0.0000     8.05   157.663   1371.60     49.3  0.2941   1.35667
FS4   Burner.Fl_O            57.22   163.267   2874.15   782.49  0.0249    12.13   154.128   2837.81     74.8  0.3005   1.28295
FS45  HPT.Fl_O               76.22    38.400   1885.85   483.69  0.0186    55.62    34.596   1838.73    264.7  0.4000   1.31936
FS49  LPT.Fl_O               77.11     8.963   1356.88   337.80  0.0184   204.50     7.752   1307.05    851.6  0.4682   1.34611
FS5   TEGV.Fl_O              77.11     8.963   1356.88   337.80  0.0184   204.50     7.752   1307.05    851.6  0.4682   1.34611
FS8   Core_Nozz.Fl_O         77.11     8.963   1356.88   337.80  0.0184   204.50     4.796   1152.89    603.2  1.0000   1.34611
FS17  FanDuctLkg.Fl_O       401.29     8.814    550.80   131.90  0.0000   689.50     7.302    521.98   2600.0  0.5256   1.39972
FS171 Bleed15.Fl_O          401.29     8.814    550.80   131.90  0.0000   689.50     7.092    517.65   2475.2  0.5661   1.39972
FS172 FanDuct.Fl_O          401.29     8.814    550.80   131.90  0.0000   689.50     7.092    517.65   2475.2  0.5661   1.39972
FS173 Byp_Nozz.Fl_O         401.29     8.814    550.80   131.90  0.0000   689.50     4.672    458.99   2002.6  1.0000   1.39972

TURBOMACHINERY PERFORMANCE DATA
               Wc      PR      eff         Nc       TR   efPoly        pwr     SMN     SMW
Fan       1079.03   1.701   0.9114   4139.514   1.1810   0.9171   -11498.7   36.79   23.18
LPC        203.59   2.406   0.8368   4139.514   1.3433   0.8537    -4118.9    3.06    2.59
HPC         98.07  13.401   0.8581  10417.139   2.2230   0.8978   -19988.3   25.13   24.38
HPT         12.13   4.252   0.9120    213.560   1.3438   0.8973    19988.3
LPT         55.62   4.284   0.9159     90.391   1.3860   0.9002    15617.7

TURBOMACHINERY MAP DATA
```

	WcMap	PRmap	effMap	NcMap	R/Parm	s_WcDes	s_PRdes	s_effDes	s_NcDes
Fan	1253.73	1.685	0.9132	4100.034	0.0638	0.8607	1.0235	0.9980	0.9905
LPC	166.92	2.761	0.8444	1.093	180.0000	1.2197	0.7986	0.9910	0.0003
HPC	89.19	12.817	0.8670	10139.185	13.5840	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.183	0.9120	1.286	4.1834	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.497	0.9227	1.019	3.4967	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3926.21	11556.7

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4682	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.2999	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11449.2	9169.3	19988.3
LP_Shaft	3925.4	20896.4	15617.7

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.7864	1017.82	245.70	38.400
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.8859	1017.82	245.70	8.963
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	979.36	236.14	46.492
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1214.97	295.42	108.350
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	979.36	236.14	46.492
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	979.36	236.14	46.492

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	8.6453	1392.78	341.31	163.267
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	7.5649	1392.78	341.31	91.843
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2874.15	0.9995	0.0230	1.38978	0.02489

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.592	0.9805	1.0000	0.9800	603.19	1.000	1607.6	4659.7
Byp_Nozz	2.549	0.9823	1.0000	0.9800	2002.63	1.000	1029.2	15268.9

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**********************************************************************************************************************
Date:02/23/11    Time:08:37:07    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    75
Temperature Stator 1 inlet: 465.24    Stator 1 exit: 481.90    Stator 2 inlet: 491.33    Stator 2 exit: 500.31
            Stator 3 inlet: 535.89    Stator 3 exit: 543.55    Stator 4 inlet: 565.08    Stator 4 exit: 572.74
            Stator 5 inlet: 590.32    Stator 5 exit: 597.55               Stage2   Percent Blockage: 0.15

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.780   35000.0    22.00    440.14     6329.1    0.5924    3749.62    5.6469    779.49   26.817      8371.8      75.6   2616.8
2458.5   1703.1


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O          440.14     5.185    466.40    111.64   0.0000   1182.89     3.458    415.85    3622.7  0.7800    1.40014
FS1   Inlet.Fl_O            440.14     5.185    466.40    111.64   0.0000   1182.89     4.115    436.58    4162.5  0.5845    1.40014
FS12  Splitter.Fl_02        373.92     5.183    466.40    111.64   0.0000   1005.43     4.103    436.29    3526.9  0.5875    1.40014
FS2   Splitter.Fl_01         66.22     5.183    466.40    111.64   0.0000    178.05     4.163    438.11     637.7  0.5683    1.40014
FS14  Fan.Fl_O              373.92     8.108    537.14    128.61   0.0000    689.70     6.716    509.00    2600.0  0.5258    1.39974
FS25  LPC.Fl_O               66.22    11.809    612.51    146.72   0.0000     89.55    10.560    593.28     412.5  0.4030    1.39849
FS3   HPC.Fl_O               63.01   139.055   1311.71    320.26   0.0000     10.59   124.904   1274.77      49.7  0.3997    1.36155
FS36  Bleed3.Fl_O            48.83   139.055   1311.71    320.26   0.0000      8.21   130.851   1290.67      49.3  0.3000    1.36155
FS4   Burner.Fl_O            49.87   135.853   2616.84    700.09   0.0213     12.12   128.264   2582.94      74.8  0.2991    1.29281
FS45  HPT.Fl_O               66.48    31.761   1711.07    433.34   0.0159     55.88    28.586   1666.98     264.7  0.4006    1.32867
FS49  LPT.Fl_O               67.26     7.409   1224.85    302.16   0.0157    205.02     6.404   1178.71     851.6  0.4678    1.35602
FS5   TEGV.Fl_O              67.26     7.409   1224.85    302.16   0.0157    205.02     6.404   1178.71     851.6  0.4678    1.35602
FS8   Core_Nozz.Fl_O         67.26     7.409   1224.85    302.16   0.0157    205.02     3.953   1036.52     603.2  1.0000    1.35602
FS17  FanDuctLkg.Fl_O       373.92     8.108    537.14    128.61   0.0000    689.70     6.716    509.00    2600.0  0.5258    1.39974
FS171 Bleed15.Fl_O          373.92     8.108    537.14    128.61   0.0000    689.70     6.524    504.78    2475.2  0.5661    1.39974
FS172 FanDuct.Fl_O          373.92     8.108    537.14    128.61   0.0000    689.70     6.524    504.78    2475.2  0.5661    1.39974
FS173 Byp_Nozz.Fl_O         373.92     8.108    537.14    128.61   0.0000    689.70     4.300    447.61    2002.6  1.0000    1.39974

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1005.43   1.564   0.9078   3861.046   1.1517   0.9122    -8978.4   61.27   29.02
LPC        178.05   2.279   0.8524   3861.046   1.3133   0.8684    -3285.9    2.44    1.88
HPC         89.55  11.775   0.8613  10136.104   2.1415   0.8988   -15864.9   31.08   29.96
HPT         12.12   4.277   0.9091    215.324   1.3538   0.8936    15865.1
LPT         55.88   4.287   0.9119     88.512   1.3937   0.8953    12264.1

TURBOMACHINERY MAP DATA
           WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1168.20   1.551   0.9096   3824.222    0.0591      0.8607    1.0235    0.9980    0.9905
```

LPC	144.85	2.483	0.8399	1.020	180.0000	1.2292	0.8621	1.0148	0.0003
HPC	81.45	11.268	0.8702	9865.649	13.0389	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.209	0.9092	1.296	4.2085	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.499	0.9187	0.998	3.4986	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3622.74	10663.4

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4678	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.6469	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11014.9	7564.8	15865.1
LP_Shaft	3661.3	17592.8	12264.1

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.4368	968.66	233.49	31.761
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7747	968.66	233.49	7.409
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	933.57	224.81	39.803
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1148.85	278.61	90.702
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	933.57	224.81	39.803
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1311.71	320.26	139.055
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	933.57	224.81	39.803

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.5607	1311.71	320.26	135.853
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.6158	1311.71	320.26	76.312
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.71	320.26	139.055
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.71	320.26	139.055
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.71	320.26	139.055
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	537.14	128.61	8.108
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	537.14	128.61	8.108
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	537.14	128.61	8.108
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	537.14	128.61	8.108
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	537.14	128.61	8.108

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2616.84	0.9995	0.0230	1.04156	0.02133

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.142	0.9816	1.0000	0.9800	603.19	1.000	1529.3	3495.8
Byp_Nozz	2.345	0.9829	1.0000	0.9800	2002.63	1.000	1016.3	13496.8

```
****************************************************************************************************************************************
Date:02/23/11    Time:08:38:05    Model:                                P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  4/ 17/ 1/ 2    Run by: Philip C Jorgenson      PC:    72
Temperature Stator 1 inlet: 465.96    Stator 1 exit: 482.37    Stator 2 inlet: 492.17    Stator 2 exit: 501.20
            Stator 3 inlet: 535.65    Stator 3 exit: 543.33    Stator 4 inlet: 564.46    Stator 4 exit: 572.08
            Stator 5 inlet: 589.36    Stator 5 exit: 596.54               Stage2   Percent Blockage: 0.15
```

SUMMARY OUTPUT DATA

MN	alt	dTamb	W	Fn	TSFC	Wfuel	BPR	VTAS	OPR	MaxThrust	%	T4	T41	T49
0.780	35000.0	22.00	435.64	6086.4	0.5927	3607.67	5.6945	779.49	26.180	8371.8	72.7	2583.7	2427.8	1681.1

FLOW STATION DATA

		W	Pt	Tt	ht	FAR	Wc	Ps	Ts	Aphy	MN	gamt
FS0	Ambient.Fl_O	435.64	5.185	466.40	111.64	0.0000	1170.81	3.458	415.85	3585.7	0.7800	1.40014
FS1	Inlet.Fl_O	435.64	5.185	466.40	111.64	0.0000	1170.81	4.145	437.49	4162.5	0.5749	1.40014
FS12	Splitter.Fl_02	370.57	5.183	466.40	111.64	0.0000	996.42	4.130	437.10	3526.9	0.5790	1.40014
FS2	Splitter.Fl_01	65.07	5.183	466.40	111.64	0.0000	174.98	4.210	439.51	637.7	0.5531	1.40014
FS14	Fan.Fl_O	370.57	8.022	535.43	128.20	0.0000	689.72	6.645	507.39	2600.0	0.5258	1.39975
FS25	LPC.Fl_O	65.07	11.755	611.00	146.35	0.0000	88.30	10.551	592.45	412.5	0.3961	1.39853
FS3	HPC.Fl_O	61.92	135.751	1301.33	317.58	0.0000	10.62	121.852	1264.40	49.7	0.4009	1.36220
FS36	Bleed3.Fl_O	47.99	135.751	1301.33	317.58	0.0000	8.23	127.696	1280.30	49.3	0.3009	1.36220
FS4	Burner.Fl_O	48.99	132.625	2583.68	689.67	0.0209	12.12	125.220	2550.12	74.8	0.2989	1.29412
FS45	HPT.Fl_O	65.32	30.986	1688.95	427.06	0.0156	55.90	27.886	1645.25	264.7	0.4006	1.32984
FS49	LPT.Fl_O	66.08	7.227	1208.30	297.75	0.0154	205.08	6.246	1162.65	851.6	0.4678	1.35730
FS5	TEGV.Fl_O	66.08	7.227	1208.30	297.75	0.0154	205.08	6.246	1162.65	851.6	0.4678	1.35730
FS8	Core_Nozz.Fl_O	66.08	7.227	1208.30	297.75	0.0154	205.08	3.855	1022.00	603.2	1.0000	1.35730
FS17	FanDuctLkg.Fl_O	370.57	8.022	535.43	128.20	0.0000	689.72	6.645	507.39	2600.0	0.5258	1.39975
FS171	Bleed15.Fl_O	370.57	8.022	535.43	128.20	0.0000	689.72	6.455	503.18	2475.2	0.5661	1.39975
FS172	FanDuct.Fl_O	370.57	8.022	535.43	128.20	0.0000	689.72	6.455	503.18	2475.2	0.5661	1.39975
FS173	Byp_Nozz.Fl_O	370.57	8.022	535.43	128.20	0.0000	689.72	4.254	446.19	2002.6	1.0000	1.39975

TURBOMACHINERY PERFORMANCE DATA

	Wc	PR	eff	Nc	TR	efPoly	pwr	SMN	SMW
Fan	996.42	1.548	0.9072	3827.443	1.1480	0.9114	-8682.7	64.62	29.80
LPC	174.98	2.268	0.8558	3827.443	1.3101	0.8716	-3195.9	2.74	2.09
HPC	88.30	11.548	0.8614	10102.413	2.1298	0.8987	-15383.0	31.99	30.79
HPT	12.12	4.280	0.9086	215.716	1.3549	0.8929	15383.3		
LPT	55.90	4.287	0.9112	88.315	1.3946	0.8945	11878.3		

TURBOMACHINERY MAP DATA

	WcMap	PRmap	effMap	NcMap	R/Parm	s_WcDes	s_PRdes	s_effDes	s_NcDes
Fan	1157.73	1.535	0.9091	3790.939	0.0586	0.8607	1.0235	0.9980	0.9905

LPC	142.68	2.450	0.8400	1.011	180.0000	1.2264	0.8746	1.0188	0.0003
HPC	80.31	11.051	0.8703	9832.857	12.9625	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.211	0.9086	1.299	4.2112	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.499	0.9180	0.995	3.4989	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3585.74	10554.5

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4678	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.6945	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	10964.8	7368.6	15383.3
LP_Shaft	3629.4	17188.9	11878.3

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.3948	962.52	231.97	30.986
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7614	962.52	231.97	7.227
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	927.88	223.41	39.034
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1140.46	276.49	88.633
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	927.88	223.41	39.034
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1301.33	317.58	135.751
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	927.88	223.41	39.034

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.4303	1301.33	317.58	132.625
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.5016	1301.33	317.58	74.487
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.33	317.58	135.751
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.33	317.58	135.751
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.33	317.58	135.751
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	535.43	128.20	8.022
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	535.43	128.20	8.022
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	535.43	128.20	8.022
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	535.43	128.20	8.022
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	535.43	128.20	8.022

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2583.68	0.9995	0.0230	1.00213	0.02088

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.090	0.9813	1.0000	0.9800	603.19	1.000	1519.2	3359.5
Byp_Nozz	2.320	0.9829	1.0000	0.9800	2002.63	1.000	1014.7	13281.4

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**********************************************************************************************************************
Date:02/23/11    Time:08:39:04    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    69
Temperature Stator 1 inlet: 466.65    Stator 1 exit: 482.80    Stator 2 inlet: 492.92    Stator 2 exit: 501.98
            Stator 3 inlet: 535.37    Stator 3 exit: 543.07    Stator 4 inlet: 563.80    Stator 4 exit: 571.39
            Stator 5 inlet: 588.37    Stator 5 exit: 595.50               Stage2   Percent Blockage: 0.15

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.780   35000.0    22.00    431.32     5851.9    0.5932    3471.16    5.7463    779.49   25.552      8371.8      69.9   2551.4
2398.0   1659.8


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O          431.32     5.185    466.40    111.64   0.0000   1159.18     3.458    415.85    3550.1  0.7800    1.40014
FS1   Inlet.Fl_O            431.32     5.185    466.40    111.64   0.0000   1159.18     4.173    438.33    4162.5  0.5659    1.40014
FS12  Splitter.Fl_02        367.38     5.183    466.40    111.64   0.0000    987.85     4.155    437.85    3526.9  0.5711    1.40014
FS2   Splitter.Fl_01         63.93     5.183    466.40    111.64   0.0000    171.91     4.255    440.83     637.7  0.5386    1.40014
FS14  Fan.Fl_O              367.38     7.941    533.72    127.79   0.0000    689.72     6.578    505.77    2600.0  0.5257    1.39975
FS25  LPC.Fl_O               63.93    11.694    609.48    145.99   0.0000     87.10    10.533    591.56     412.5  0.3895    1.39861
FS3   HPC.Fl_O               60.83   132.493   1291.17    314.96   0.0000     10.65   118.845   1254.26      49.7  0.4021    1.36282
FS36  Bleed3.Fl_O            47.15   132.493   1291.17    314.96   0.0000      8.25   124.586   1270.17      49.3  0.3017    1.36282
FS4   Burner.Fl_O            48.11   129.441   2551.40    679.56   0.0205     12.11   122.217   2518.16      74.8  0.2987    1.29539
FS45  HPT.Fl_O               64.15    30.224   1667.47    420.98   0.0153     55.93    27.197   1624.16     264.7  0.4006    1.33113
FS49  LPT.Fl_O               64.90     7.050   1192.36    293.52   0.0151    205.10     6.093   1147.19     851.6  0.4676    1.35858
FS5   TEGV.Fl_O              64.90     7.050   1192.36    293.52   0.0151    205.10     6.093   1147.19     851.6  0.4676    1.35858
FS8   Core_Nozz.Fl_O         64.90     7.050   1192.36    293.52   0.0151    205.10     3.759   1008.01     603.2  1.0000    1.35858
FS17  FanDuctLkg.Fl_O       367.38     7.941    533.72    127.79   0.0000    689.72     6.578    505.77    2600.0  0.5257    1.39975
FS171 Bleed15.Fl_O          367.38     7.941    533.72    127.79   0.0000    689.72     6.390    501.58    2475.2  0.5660    1.39975
FS172 FanDuct.Fl_O          367.38     7.941    533.72    127.79   0.0000    689.72     6.390    501.58    2475.2  0.5660    1.39975
FS173 Byp_Nozz.Fl_O         367.38     7.941    533.72    127.79   0.0000    689.72     4.211    444.77    2002.6  1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff        Nc       TR    efPoly       pwr     SMN     SMW
Fan       987.85   1.532   0.9075  3794.286   1.1443    0.9115   -8395.0   71.05   30.55
LPC       171.91   2.256   0.8587  3794.286   1.3068    0.8743   -3106.7    3.04    2.31
HPC        87.10  11.330   0.8614 10069.087   2.1185    0.8984  -14914.5   32.86   31.60
HPT        12.11   4.283   0.9080   216.090   1.3560    0.8921   14914.3
LPT        55.93   4.287   0.9105    88.112   1.3954    0.8936   11501.8

TURBOMACHINERY MAP DATA
           WcMap   PRmap   effMap     NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan      1147.77   1.520   0.9093  3758.099    0.0580      0.8607    1.0235    0.9980    0.9905
```

LPC	140.54	2.417	0.8401	1.002	180.0000	1.2232	0.8865	1.0221	0.0003
HPC	79.21	10.843	0.8703	9800.420	12.8886	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.214	0.9080	1.301	4.2137	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.499	0.9172	0.993	3.4985	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3550.12	10449.7

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4676	851.64
FanDuct	0.0000	0.5660	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.7463	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	10915.0	7176.5	14914.3
LP_Shaft	3598.0	16789.5	11501.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.3528	956.49	230.48	30.224
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7480	956.49	230.48	7.050
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	922.28	222.03	38.270
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1132.23	274.41	86.589
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	922.28	222.03	38.270
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1291.17	314.96	132.493
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	922.28	222.03	38.270

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.3000	1291.17	314.96	129.441
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.3877	1291.17	314.96	72.689
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1291.17	314.96	132.493
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1291.17	314.96	132.493
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1291.17	314.96	132.493
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	533.72	127.79	7.941
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	533.72	127.79	7.941
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	533.72	127.79	7.941
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	533.72	127.79	7.941
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	533.72	127.79	7.941

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2551.40	0.9995	0.0230	0.96421	0.02045

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.039	0.9809	1.0000	0.9800	603.19	1.000	1509.4	3225.9
Byp_Nozz	2.296	0.9829	1.0000	0.9800	2002.63	1.000	1013.1	13075.7

```
**********************************************************************************************************************************
Date:02/23/11    Time:08:41:43    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 34/ 2/ 5    Run by: Philip C Jorgenson      PC:   100
Temperature Stator 1 inlet: 452.23    Stator 1 exit: 470.61    Stator 2 inlet: 497.98    Stator 2 exit: 506.04
            Stator 3 inlet: 532.41    Stator 3 exit: 540.85    Stator 4 inlet: 565.90    Stator 4 exit: 573.85
            Stator 5 inlet: 594.02    Stator 5 exit: 601.76             Unblocked   Percent Blockage: 0.15

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00     395.92      6923.4     0.5938    4111.10    5.2972    775.82   32.257      6923.4     100.0   2850.8
2674.6   1859.9


                                        FLOW STATION DATA
                                  W         Pt         Tt         ht      FAR        Wc         Ps         Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           395.92      4.283     462.03     110.60   0.0000   1282.11      2.854     411.97    3930.2   0.7800    1.40005
FS1   Inlet.Fl_O             395.92      4.283     462.03     110.60   0.0000   1282.11      3.157     423.48    4162.5   0.6750    1.40005
FS12  Splitter.Fl_02         333.05      4.281     462.03     110.60   0.0000   1079.05      3.180     424.41    3526.9   0.6660    1.40005
FS2   Splitter.Fl_01          62.87      4.281     462.03     110.60   0.0000    203.70      3.002     417.52     637.7   0.7305    1.40005
FS14  Fan.Fl_O               333.05      7.280     545.71     130.67   0.0000    689.60      6.031     517.14    2600.0   0.5257    1.39973
FS25  LPC.Fl_O                62.87     10.292     620.49     148.64   0.0000     98.19      8.942     596.10     412.5   0.4529    1.39833
FS3   HPC.Fl_O                59.82    138.164    1380.92     338.22   0.0000     10.38    124.716    1344.10      49.7   0.3909    1.35737
FS36  Bleed3.Fl_O             46.36    138.164    1380.92     338.22   0.0000      8.05    130.348    1359.88      49.3   0.2940    1.35737
FS4   Burner.Fl_O             47.50    134.982    2850.79     774.97   0.0246     12.13    127.427    2814.67      74.8   0.3004    1.28375
FS45  HPT.Fl_O                63.28     31.735    1869.09     478.84   0.0184     55.63     28.591    1822.29     264.7   0.3999    1.32018
FS49  LPT.Fl_O                64.01      7.404    1344.03     334.31   0.0182    204.54      6.404    1294.56     851.6   0.4682    1.34702
FS5   TEGV.Fl_O               64.01      7.404    1344.03     334.31   0.0182    204.54      6.404    1294.56     851.6   0.4682    1.34702
FS8   Core_Nozz.Fl_O          64.01      7.404    1344.03     334.31   0.0182    204.54      3.961    1141.55     603.2   1.0000    1.34702
FS17  FanDuctLkg.Fl_O        333.05      7.280     545.71     130.67   0.0000    689.60      6.031     517.14    2600.0   0.5257    1.39973
FS171 Bleed15.Fl_O           333.05      7.280     545.71     130.67   0.0000    689.60      5.857     512.85    2475.2   0.5662    1.39973
FS172 FanDuct.Fl_O           333.05      7.280     545.71     130.67   0.0000    689.60      5.857     512.85    2475.2   0.5662    1.39973
FS173 Byp_Nozz.Fl_O          333.05      7.280     545.71     130.67   0.0000    689.60      3.860     454.75    2002.6   1.0000    1.39973

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1079.05   1.701   0.9114   4139.497   1.1811   0.9169    -9460.9   36.81   23.19
LPC        203.70   2.404   0.8363   4139.497   1.3430   0.8542    -3384.1    3.06    2.59
HPC         98.19  13.424   0.8581  10422.001   2.2255   0.8979   -16455.3   25.06   24.31
HPT         12.13   4.253   0.9119    213.496   1.3446   0.8972    16455.3
LPT         55.63   4.286   0.9157     90.369   1.3868   0.8998    12845.1

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1253.75   1.685   0.9132   4100.018    0.0638      0.8607    1.0235    0.9980    0.9905
```

LPC	166.92	2.761	0.8444	1.093	180.0000	1.2204	0.7974	0.9904	0.0003
HPC	89.31	12.839	0.8669	10143.918	13.5911	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.185	0.9119	1.285	4.1851	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.498	0.9225	1.018	3.4980	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3930.20	9547.0

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4682	851.64
FanDuct	0.0000	0.5662	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.2972	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11399.2	7581.7	16455.3
LP_Shaft	3906.9	17267.7	12845.1

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.3137	1008.69	243.43	31.735
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7356	1008.69	243.43	7.404
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.52	233.95	38.424
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1204.39	292.72	89.573
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.52	233.95	38.424
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1380.92	338.22	138.164
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.52	233.95	38.424

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.1788	1380.92	338.22	134.982
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.2816	1380.92	338.22	75.925
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.92	338.22	138.164
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.92	338.22	138.164
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.92	338.22	138.164
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2850.79	0.9995	0.0230	1.14197	0.02463

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.594	0.9805	1.0000	0.9800	603.19	1.000	1600.1	3851.3
Byp_Nozz	2.551	0.9825	1.0000	0.9800	2002.63	1.000	1024.4	12619.0

```
**********************************************************************************************************************************
Date:02/23/11    Time:08:43:22    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 10/ 36/ 2/ 7    Run by: Philip C Jorgenson      PC:    84
Temperature Stator 1 inlet: 457.73    Stator 1 exit: 474.77    Stator 2 inlet: 499.37    Stator 2 exit: 507.76
            Stator 3 inlet: 531.51    Stator 3 exit: 539.93    Stator 4 inlet: 562.42    Stator 4 exit: 570.18
            Stator 5 inlet: 588.47    Stator 5 exit: 595.86             Unblocked   Percent Blockage: 0.15

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    376.28     5815.6    0.5868    3412.52    5.4802    775.82   28.782      6923.4       84.0   2672.3
2509.4   1739.6


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          376.28     4.283    462.03    110.60   0.0000   1218.50     2.854    411.97    3735.2   0.7800    1.40005
FS1   Inlet.Fl_O            376.28     4.283    462.03    110.60   0.0000   1218.50     3.321    429.63    4162.5   0.6142    1.40005
FS12  Splitter.Fl_02        318.22     4.281    462.03    110.60   0.0000   1030.99     3.323    429.78    3526.9   0.6127    1.40005
FS2   Splitter.Fl_01         58.07     4.281    462.03    110.60   0.0000    188.13     3.297    428.81     637.7   0.6226    1.40005
FS14  Fan.Fl_O              318.22     6.897    536.69    128.51   0.0000    689.71     5.713    508.59    2600.0   0.5258    1.39974
FS25  LPC.Fl_O               58.07    10.070    611.78    146.54   0.0000     92.03     8.936    591.27     412.5   0.4169    1.39851
FS3   HPC.Fl_O               55.25   123.282   1325.64    323.87   0.0000     10.53   110.897   1288.87      49.7   0.3971    1.36070
FS36  Bleed3.Fl_O            42.82   123.282   1325.64    323.87   0.0000      8.16   116.096   1304.68      49.3   0.2982    1.36070
FS4   Burner.Fl_O            43.77   120.443   2672.33    717.69   0.0221     12.12   113.709   2637.89      74.8   0.2995    1.29061
FS45  HPT.Fl_O               58.33    28.209   1747.89    443.86   0.0165     55.79    25.399   1703.20     264.7   0.4002    1.32655
FS49  LPT.Fl_O               59.01     6.577   1252.26    309.50   0.0163    204.91     5.685   1205.35     851.6   0.4679    1.35390
FS5   TEGV.Fl_O              59.01     6.577   1252.26    309.50   0.0163    204.91     5.685   1205.35     851.6   0.4679    1.35390
FS8   Core_Nozz.Fl_O         59.01     6.577   1252.26    309.50   0.0163    204.91     3.511   1060.61     603.2   1.0000    1.35390
FS17  FanDuctLkg.Fl_O        318.22     6.897    536.69    128.51   0.0000    689.71     5.713    508.59    2600.0   0.5258    1.39974
FS171 Bleed15.Fl_O           318.22     6.897    536.69    128.51   0.0000    689.71     5.550    504.37    2475.2   0.5661    1.39974
FS172 FanDuct.Fl_O           318.22     6.897    536.69    128.51   0.0000    689.71     5.550    504.37    2475.2   0.5661    1.39974
FS173 Byp_Nozz.Fl_O          318.22     6.897    536.69    128.51   0.0000    689.71     3.658    447.24    2002.6   1.0000    1.39974

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1030.99   1.611   0.9119   3951.079   1.1616   0.9164    -8064.7   54.89   26.94
LPC        188.13   2.352   0.8599   3951.079   1.3241   0.8757    -2953.1    1.70    1.34
HPC         92.03  12.242   0.8603  10205.150   2.1669   0.8985   -14214.7   29.22   28.25
HPT         12.12   4.270   0.9102    214.401   1.3516   0.8949    14214.7
LPT         55.79   4.289   0.9131     89.196   1.3924   0.8965    11017.9

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1197.89   1.597   0.9138   3913.396    0.0608      0.8607    1.0235    0.9980    0.9905
```

LPC	150.67	2.572	0.8397	1.044	180.0000	1.2486	0.8603	1.0241	0.0003
HPC	83.70	11.712	0.8692	9932.853	13.2002	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.201	0.9102	1.291	4.2009	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.500	0.9199	1.005	3.5004	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3735.22	9073.4

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4679	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.4802	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11083.4	6736.0	14214.7
LP_Shaft	3729.1	15517.7	11017.9

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.1368	975.58	235.20	28.209
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6794	975.58	235.20	6.577
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.75	226.34	34.977
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1159.49	281.31	80.261
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.75	226.34	34.977
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1325.64	323.87	123.282
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.75	226.34	34.977

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.6300	1325.64	323.87	120.443
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.8014	1325.64	323.87	67.685
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.64	323.87	123.282
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.64	323.87	123.282
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.64	323.87	123.282
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	536.69	128.51	6.897
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	536.69	128.51	6.897
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	536.69	128.51	6.897
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	536.69	128.51	6.897
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	536.69	128.51	6.897

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2672.33	0.9995	0.0230	0.94792	0.02214

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.304	0.9817	1.0000	0.9800	603.19	1.000	1546.0	3232.1
Byp_Nozz	2.417	0.9830	1.0000	0.9800	2002.63	1.000	1015.9	11656.9

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**********************************************************************************************************************
Date:02/23/11    Time:08:44:22    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    79
Temperature Stator 1 inlet: 459.04    Stator 1 exit: 475.75    Stator 2 inlet: 499.73    Stator 2 exit: 508.17
            Stator 3 inlet: 531.31    Stator 3 exit: 539.73    Stator 4 inlet: 561.62    Stator 4 exit: 569.34
            Stator 5 inlet: 587.19    Stator 5 exit: 594.51             Unblocked   Percent Blockage: 0.15

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    370.94      5524.8    0.5863    3239.07    5.5398    775.82   27.859      6923.4       79.8   2626.4
2466.9   1709.0


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          370.94     4.283    462.03    110.60   0.0000   1201.21     2.854    411.97    3682.2   0.7800    1.40005
FS1   Inlet.Fl_O            370.94     4.283    462.03    110.60   0.0000   1201.21     3.360    431.07    4162.5   0.5995    1.40005
FS12  Splitter.Fl_02        314.22     4.281    462.03    110.60   0.0000   1018.04     3.357    431.04    3526.9   0.5997    1.40005
FS2   Splitter.Fl_01         56.72     4.281    462.03    110.60   0.0000    183.77     3.361    431.20     637.7   0.5981    1.40005
FS14  Fan.Fl_O              314.22     6.795    534.32    127.94   0.0000    689.72     5.629    506.34    2600.0   0.5257    1.39975
FS25  LPC.Fl_O               56.72     9.999    609.71    146.04   0.0000     90.39     8.918    590.14     412.5   0.4077    1.39858
FS3   HPC.Fl_O               53.97   119.328   1311.33    320.17   0.0000     10.57   107.238   1274.58      49.7   0.3987    1.36157
FS36  Bleed3.Fl_O            41.83   119.328   1311.33    320.17   0.0000      8.19   112.317   1290.39      49.3   0.2994    1.36157
FS4   Burner.Fl_O            42.73   116.580   2626.38    703.15   0.0215     12.12   110.065   2592.38      74.8   0.2992    1.29240
FS45  HPT.Fl_O               56.96    27.280   1717.09    435.07   0.0161     55.83    24.558   1672.96     264.7   0.4002    1.32830
FS49  LPT.Fl_O               57.62     6.358   1228.97    303.27   0.0159    205.01     5.495   1182.71     851.6   0.4679    1.35567
FS5   TEGV.Fl_O              57.62     6.358   1228.97    303.27   0.0159    205.01     5.495   1182.71     851.6   0.4679    1.35567
FS8   Core_Nozz.Fl_O         57.62     6.358   1228.97    303.27   0.0159    205.01     3.393   1040.14     603.2   1.0000    1.35567
FS17  FanDuctLkg.Fl_O        314.22     6.795    534.32    127.94   0.0000    689.72     5.629    506.34    2600.0   0.5257    1.39975
FS171 Bleed15.Fl_O           314.22     6.795    534.32    127.94   0.0000    689.72     5.468    502.14    2475.2   0.5661    1.39975
FS172 FanDuct.Fl_O           314.22     6.795    534.32    127.94   0.0000    689.72     5.468    502.14    2475.2   0.5661    1.39975
FS173 Byp_Nozz.Fl_O          314.22     6.795    534.32    127.94   0.0000    689.72     3.604    445.27    2002.6   1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1018.04   1.587   0.9110   3904.450   1.1565   0.9153    -7710.4   58.36   27.99
LPC        183.77   2.336   0.8636   3904.450   1.3196   0.8791    -2844.8    2.07    1.61
HPC         90.39  11.934   0.8610  10159.701   2.1507   0.8987   -13634.7   30.42   29.36
HPT         12.12   4.273   0.9094    214.941   1.3532   0.8939    13634.8
LPT         55.83   4.291   0.9124     88.931   1.3939   0.8957    10555.3

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1182.85   1.574   0.9129   3867.212    0.0599      0.8607    1.0235    0.9980    0.9905
```

LPC	147.66	2.526	0.8398	1.031	180.0000	1.2446	0.8752	1.0284	0.0003
HPC	82.21	11.419	0.8699	9888.616	13.0958	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.205	0.9094	1.294	4.2047	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.501	0.9191	1.002	3.5014	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3682.21	8944.6

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4679	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.5398	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11015.3	6501.1	13634.8
LP_Shaft	3685.1	15043.7	10555.3

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.0873	967.11	233.10	27.280
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6636	967.11	233.10	6.358
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.90	224.40	34.051
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1147.92	278.38	77.783
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.90	224.40	34.051
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1311.33	320.17	119.328
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.90	224.40	34.051

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.4764	1311.33	320.17	116.580
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.6670	1311.33	320.17	65.500
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.33	320.17	119.328
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.33	320.17	119.328
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.33	320.17	119.328
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2626.38	0.9995	0.0230	0.89974	0.02151

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.228	0.9816	1.0000	0.9800	603.19	1.000	1531.8	3068.5
Byp_Nozz	2.381	0.9831	1.0000	0.9800	2002.63	1.000	1013.6	11400.9

```
**********************************************************************************************************************
Date:02/23/11    Time:08:45:24    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    76
Temperature Stator 1 inlet: 459.90    Stator 1 exit: 476.37    Stator 2 inlet: 499.93    Stator 2 exit: 508.38
            Stator 3 inlet: 531.11    Stator 3 exit: 539.50    Stator 4 inlet: 560.99    Stator 4 exit: 568.66
            Stator 5 inlet: 586.21    Stator 5 exit: 593.46             Unblocked   Percent Blockage: 0.15

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.780   39000.0    22.00    366.97     5317.1    0.5870    3120.95    5.5814    775.82   27.215      6923.4      76.8   2594.8
2437.8   1688.1


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O           366.97     4.283    462.03    110.60   0.0000   1188.36     2.854    411.97    3642.8  0.7800    1.40005
FS1   Inlet.Fl_O             366.97     4.283    462.03    110.60   0.0000   1188.36     3.387    432.08    4162.5  0.5889    1.40005
FS12  Splitter.Fl_02         311.21     4.281    462.03    110.60   0.0000   1008.30     3.382    431.95    3526.9  0.5903    1.40005
FS2   Splitter.Fl_01          55.76     4.281    462.03    110.60   0.0000    180.65     3.405    432.77     637.7  0.5816    1.40005
FS14  Fan.Fl_O               311.21     6.720    532.72    127.55   0.0000    689.73     5.567    504.82    2600.0  0.5257    1.39975
FS25  LPC.Fl_O                55.76     9.941    608.24    145.69   0.0000     89.27     8.896    589.28     412.5  0.4014    1.39875
FS3   HPC.Fl_O                 53.05   116.570   1301.48    317.62   0.0000     10.60   104.693   1264.74      49.7  0.3999    1.36219
FS36  Bleed3.Fl_O              41.12   116.570   1301.48    317.62   0.0000      8.21   109.685   1280.55      49.3  0.3001    1.36219
FS4   Burner.Fl_O              41.98   113.886   2594.81    693.21   0.0211     12.12   107.525   2561.13      74.8  0.2990    1.29364
FS45  HPT.Fl_O                 55.97    26.632   1695.98    429.07   0.0157     55.85    23.972   1652.24     264.7  0.4002    1.32939
FS49  LPT.Fl_O                 56.63     6.206   1213.08    299.04   0.0155    205.06     5.364   1167.29     851.6  0.4678    1.35689
FS5   TEGV.Fl_O                56.63     6.206   1213.08    299.04   0.0155    205.06     5.364   1167.29     851.6  0.4678    1.35689
FS8   Core_Nozz.Fl_O           56.63     6.206   1213.08    299.04   0.0155    205.06     3.311   1026.20     603.2  1.0000    1.35689
FS17  FanDuctLkg.Fl_O         311.21     6.720    532.72    127.55   0.0000    689.73     5.567    504.82    2600.0  0.5257    1.39975
FS171 Bleed15.Fl_O            311.21     6.720    532.72    127.55   0.0000    689.73     5.408    500.63    2475.2  0.5660    1.39975
FS172 FanDuct.Fl_O            311.21     6.720    532.72    127.55   0.0000    689.73     5.408    500.63    2475.2  0.5660    1.39975
FS173 Byp_Nozz.Fl_O           311.21     6.720    532.72    127.55   0.0000    689.73     3.564    443.93    2002.6  1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1008.30   1.570   0.9083   3871.412   1.1530   0.9125    -7466.6   60.55   28.78
LPC        180.65   2.322   0.8656   3871.412   1.3164   0.8810    -2768.5    2.35    1.81
HPC         89.27  11.727   0.8614  10128.412   2.1398   0.8988   -13235.1   31.26   30.13
HPT         12.12   4.276   0.9089    215.317   1.3544   0.8932    13234.9
LPT         55.85   4.291   0.9118     88.725   1.3948   0.8952    10235.8

TURBOMACHINERY MAP DATA
           WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1171.52   1.557   0.9101   3834.489    0.0593      0.8607    1.0235    0.9980    0.9905
```

LPC	145.52	2.493	0.8399	1.023	180.0000	1.2414	0.8853	1.0305	0.0003
HPC	81.19	11.221	0.8703	9858.163	13.0238	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.207	0.9089	1.296	4.2075	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.502	0.9186	1.000	3.5018	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3642.80	8848.9

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4678	851.64
FanDuct	0.0000	0.5660	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.5814	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	10968.1	6337.6	13234.9
LP_Shaft	3653.9	14712.8	10235.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.0519	961.26	231.66	26.632
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6524	961.26	231.66	6.206
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1139.95	276.36	76.051
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.570
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.3665	1301.48	317.62	113.886
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.5709	1301.48	317.62	63.976
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.570
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.570
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.570
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2594.81	0.9995	0.0230	0.86693	0.02108

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.175	0.9814	1.0000	0.9800	603.19	1.000	1522.1	2954.5
Byp_Nozz	2.355	0.9831	1.0000	0.9800	2002.63	1.000	1012.1	11211.5

```
**********************************************************************************************************************
Date:02/23/11    Time:08:46:10    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 21/ 1/ 6    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 469.18    Stator 1 exit: 477.65    Stator 2 inlet: 488.50    Stator 2 exit: 494.40
            Stator 3 inlet: 504.69    Stator 3 exit: 510.09    Stator 4 inlet: 519.59    Stator 4 exit: 524.23
            Stator 5 inlet: 532.18    Stator 5 exit: 536.27             Unblocked   Percent Blockage: 0.15

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    258.20      692.3    1.0453     723.69    9.5602    775.82    9.701      6923.4       10.0   1742.7
1647.8   1144.6


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          258.20     4.283    462.03    110.60   0.0000    836.13     2.854    411.97    2563.1   0.7800    1.40005
FS1   Inlet.Fl_O            258.20     4.283    462.03    110.60   0.0000    836.13     3.903    449.92    4162.5   0.3669    1.40005
FS12  Splitter.Fl_02        233.75     4.281    462.03    110.60   0.0000    757.33     3.839    447.87    3526.9   0.3976    1.40005
FS2   Splitter.Fl_01         24.45     4.281    462.03    110.60   0.0000     79.22     4.145    457.78     637.7   0.2154    1.40005
FS14  Fan.Fl_O              233.75     4.864    481.24    115.20   0.0000    680.26     4.058    456.95    2600.0   0.5154    1.40045
FS25  LPC.Fl_O               24.45     6.665    541.41    129.64   0.0000     55.08     6.419    535.62     412.5   0.2326    1.39974
FS3   HPC.Fl_O               23.26    41.553    988.55    238.42   0.0000     11.36    36.588    954.34      49.7   0.4328    1.38178
FS36  Bleed3.Fl_O            18.03    41.553    988.55    238.42   0.0000      8.80    38.703    969.32      49.3   0.3222    1.38178
FS4   Burner.Fl_O            18.23    40.596   1742.69    439.86   0.0111     12.10    38.343   1718.11      74.8   0.2940    1.33044
FS45  HPT.Fl_O               24.37     9.737   1148.85    280.62   0.0083     54.73     8.813   1118.49     264.7   0.3847    1.36585
FS49  LPT.Fl_O               24.65     3.293    896.35    216.92   0.0082    144.64     3.090    880.75     851.6   0.3045    1.38178
FS5   TEGV.Fl_O              24.65     3.293    896.35    216.92   0.0082    144.64     3.090    880.75     851.6   0.3045    1.38178
FS8   Core_Nozz.Fl_O         24.65     3.293    896.35    216.92   0.0082    144.64     2.854    861.44     603.2   0.4602    1.38178
FS17  FanDuctLkg.Fl_O       233.75     4.864    481.24    115.20   0.0000    680.26     4.058    456.95    2600.0   0.5154    1.40045
FS171 Bleed15.Fl_O          233.75     4.864    481.24    115.20   0.0000    680.26     3.948    453.36    2475.2   0.5544    1.40045
FS172 FanDuct.Fl_O          233.75     4.864    481.24    115.20   0.0000    680.26     3.948    453.36    2475.2   0.5544    1.40045
FS173 Byp_Nozz.Fl_O         233.75     4.864    481.24    115.20   0.0000    680.26     2.854    413.51    2002.6   0.9054    1.40045

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       757.33   1.136   0.9061   2620.827   1.0416    0.9086    -1523.8  ---.--   54.85
LPC        79.22   1.557   0.7933   2620.827   1.1718    0.8030     -658.9    7.65    4.40
HPC        55.08   6.234   0.8208   8994.341   1.8259    0.8592    -3671.9   60.09   56.89
HPT        12.10   4.169   0.8769    220.130   1.3656    0.8550     3671.9
LPT        54.73   2.957   0.8551     72.979   1.2796    0.8359     2182.7

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        879.93   1.133   0.9079   2595.832    0.0415      0.8607    1.0235    0.9980    0.9905
```

LPC	78.89	1.585	0.8407	0.692	180.0000	1.0041	0.9525	0.9437	0.0003
HPC	50.09	5.988	0.8293	8754.351	11.0423	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.102	0.8769	1.325	4.1025	12.6513	0.9790	1.0000	0.0003
LPT	0.84	2.488	0.8614	0.822	2.4879	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2563.08	6226.1

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.3045	851.64
FanDuct	0.0000	0.5544	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5602	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9189.4	2098.6	3671.9
LP_Shaft	2473.6	4634.5	2182.7

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.8998	766.96	184.03	9.737
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2861	766.96	184.03	3.293
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.54	178.59	14.341
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	882.81	212.32	28.296
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.54	178.59	14.341
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	988.55	238.42	41.553
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.54	178.59	14.341

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7918	988.55	238.42	40.596
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.4428	988.55	238.42	22.945
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.55	238.42	41.553
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.55	238.42	41.553
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.55	238.42	41.553
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1742.69	0.9995	0.0230	0.20102	0.01115

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.154	0.9800	1.0000	0.9800	603.19	0.460	645.1	494.3
Byp_Nozz	1.704	0.9800	1.0000	0.9800	2002.63	0.905	884.2	6424.1

```
**********************************************************************************************************************************
Date:02/23/11    Time:08:47:56    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  3/ 16/ 1/ 1    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 462.59    Stator 1 exit: 470.64    Stator 2 inlet: 480.94    Stator 2 exit: 486.51
            Stator 3 inlet: 496.28    Stator 3 exit: 501.38    Stator 4 inlet: 508.32    Stator 4 exit: 512.74
            Stator 5 inlet: 522.28    Stator 5 exit: 525.99               Stage4   Percent Blockage: 0.15

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.730   38334.0    22.00    252.17      700.6    0.9981     699.27    9.5800    726.09    9.533      7006.2      10.0   1719.0
1624.6   1129.9


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           252.17     4.218    455.81    109.10   0.0000    823.57     2.947    411.97    2590.4   0.7300    1.39992
FS1   Inlet.Fl_O             252.17     4.218    455.81    109.10   0.0000    823.57     3.856    444.27    4162.5   0.3604    1.39992
FS12  Splitter.Fl_02         228.34     4.216    455.81    109.10   0.0000    746.10     3.795    442.33    3526.9   0.3905    1.39992
FS2   Splitter.Fl_01          23.83     4.216    455.81    109.10   0.0000     77.88     4.087    451.77     637.7   0.2116    1.39992
FS14  Fan.Fl_O               228.34     4.772    474.06    113.48   0.0000    672.24     4.005    450.90    2600.0   0.5068    1.40030
FS25  LPC.Fl_O                23.83     6.480    531.12    127.17   0.0000     54.70     6.244    525.52     412.5   0.2309    1.39976
FS3   HPC.Fl_O                22.68    40.213    968.89    233.55   0.0000     11.33    35.440    935.53      49.7   0.4311    1.38285
FS36  Bleed3.Fl_O             17.58    40.213    968.89    233.55   0.0000      8.78    37.471    950.12      49.3   0.3211    1.38285
FS4   Burner.Fl_O             17.77    39.287   1719.04    433.29   0.0111     12.10    37.104   1694.72      74.8   0.2940    1.33161
FS45  HPT.Fl_O                23.75     9.524   1134.24    276.87   0.0082     54.19     8.639   1104.89     264.7   0.3800    1.36682
FS49  LPT.Fl_O                24.03     3.349    893.57    216.22   0.0081    138.42     3.161    879.44     851.6   0.2899    1.38197
FS5   TEGV.Fl_O               24.03     3.349    893.57    216.22   0.0081    138.42     3.161    879.44     851.6   0.2899    1.38197
FS8   Core_Nozz.Fl_O          24.03     3.349    893.57    216.22   0.0081    138.42     2.947    862.39     603.2   0.4346    1.38197
FS17  FanDuctLkg.Fl_O        228.34     4.772    474.06    113.48   0.0000    672.24     4.005    450.90    2600.0   0.5068    1.40030
FS171 Bleed15.Fl_O           228.34     4.772    474.06    113.48   0.0000    672.24     3.901    447.53    2475.2   0.5445    1.40030
FS172 FanDuct.Fl_O           228.34     4.772    474.06    113.48   0.0000    672.24     3.901    447.53    2475.2   0.5445    1.40030
FS173 Byp_Nozz.Fl_O          228.34     4.772    474.06    113.48   0.0000    672.24     2.947    413.46    2002.6   0.8565    1.40030

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       746.10   1.132   0.9063   2573.455   1.0400    0.9087    -1414.5  ---.--   54.44
LPC        77.88   1.537   0.8015   2573.455   1.1652    0.8098     -609.2    7.69    2.60
HPC        54.70   6.205   0.8205   8982.090   1.8242    0.8589    -3500.3   59.86   56.63
HPT        12.10   4.125   0.8759    219.222   1.3629    0.8539     3500.3
LPT        54.19   2.844   0.8504     71.633   1.2670    0.8314     2023.7

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        866.89   1.129   0.9082   2548.912    0.0416      0.8607    1.0235    0.9980    0.9905
```

LPC	75.45	1.562	0.8323	0.680	180.0000	1.0322	0.9564	0.9630	0.0003
HPC	49.74	5.960	0.8290	8742.427	11.0608	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.059	0.8759	1.320	4.0594	12.6513	0.9790	1.0000	0.0003
LPT	0.83	2.402	0.8567	0.807	2.4018	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2590.40	5690.8

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2899	851.64
FanDuct	0.0000	0.5445	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5800	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9089.2	2022.6	3500.3
LP_Shaft	2412.5	4405.8	2023.7

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.8771	751.82	180.36	9.524
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2789	751.82	180.36	3.349
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	729.88	175.04	13.902
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	865.28	208.02	27.395
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	729.88	175.04	13.902
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	968.89	233.55	40.213
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	729.88	175.04	13.902

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7214	968.89	233.55	39.287
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.3813	968.89	233.55	22.262
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	968.89	233.55	40.213
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	968.89	233.55	40.213
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	968.89	233.55	40.213
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	474.06	113.48	4.772
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	474.06	113.48	4.772
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	474.06	113.48	4.772
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	474.06	113.48	4.772
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	474.06	113.48	4.772

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1719.04	0.9995	0.0230	0.19424	0.01105

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.136	0.9800	1.0000	0.9800	603.19	0.435	609.6	455.3
Byp_Nozz	1.619	0.9800	1.0000	0.9800	2002.63	0.857	836.4	5936.1

```
****************************************************************************************************************************************
Date:02/23/11    Time:08:49:34    Model:                                P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  3/ 16/ 1/ 1    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 460.56    Stator 1 exit: 468.46    Stator 2 inlet: 478.58    Stator 2 exit: 484.05
            Stator 3 inlet: 493.63    Stator 3 exit: 498.63    Stator 4 inlet: 505.43    Stator 4 exit: 509.76
            Stator 5 inlet: 519.13    Stator 5 exit: 522.76               Stage4   Percent Blockage: 0.15

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.714   37357.0    22.00    259.50      730.1    0.9830     717.63    9.5837    710.17    9.474      7300.9      10.0   1712.0
1617.7   1125.6


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O          259.50     4.357    453.91    108.65   0.0000    818.84     3.088    411.97    2600.4  0.7140    1.39988
FS1   Inlet.Fl_O            259.50     4.357    453.91    108.65   0.0000    818.84     3.987    442.57    4162.5  0.3580    1.39988
FS12  Splitter.Fl_02        234.98     4.355    453.91    108.65   0.0000    741.84     3.926    440.66    3526.9  0.3878    1.39988
FS2   Splitter.Fl_01         24.52     4.355    453.91    108.65   0.0000     77.41     4.223    449.93     637.7  0.2102    1.39988
FS14  Fan.Fl_O              234.98     4.923    471.87    112.96   0.0000    669.07     4.140    449.10    2600.0  0.5035    1.40026
FS25  LPC.Fl_O               24.52     6.657    527.89    126.39   0.0000     54.61     6.415    522.34     412.5  0.2305    1.39976
FS3   HPC.Fl_O               23.33    41.277    962.88    232.06   0.0000     11.32    36.389    929.78      49.7  0.4305    1.38318
FS36  Bleed3.Fl_O            18.08    41.277    962.88    232.06   0.0000      8.77    38.469    944.25      49.3  0.3207    1.38318
FS4   Burner.Fl_O            18.28    40.327   1712.04    431.35   0.0110     12.10    38.086   1687.79      74.8  0.2940    1.33195
FS45  HPT.Fl_O               24.43     9.808   1129.89    275.75   0.0082     54.03     8.904   1100.85     264.7  0.3786    1.36710
FS49  LPT.Fl_O               24.72     3.494    892.99    216.07   0.0081    136.42     3.304    879.31     851.6  0.2853    1.38201
FS5   TEGV.Fl_O              24.72     3.494    892.99    216.07   0.0081    136.42     3.304    879.31     851.6  0.2853    1.38201
FS8   Core_Nozz.Fl_O         24.72     3.494    892.99    216.07   0.0081    136.42     3.089    862.91     603.2  0.4268    1.38201
FS17  FanDuctLkg.Fl_O       234.98     4.923    471.87    112.96   0.0000    669.07     4.140    449.10    2600.0  0.5035    1.40026
FS171 Bleed15.Fl_O          234.98     4.923    471.87    112.96   0.0000    669.07     4.035    445.80    2475.2  0.5407    1.40026
FS172 FanDuct.Fl_O          234.98     4.923    471.87    112.96   0.0000    669.07     4.035    445.80    2475.2  0.5407    1.40026
FS173 Byp_Nozz.Fl_O         234.98     4.923    471.87    112.96   0.0000    669.07     3.088    413.45    2002.6  0.8410    1.40026

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       741.84   1.130   0.9065   2556.377   1.0396    0.9088    -1432.1  ---.--   54.25
LPC        77.41   1.529   0.8021   2556.377   1.1630    0.8100     -615.6    7.70    2.49
HPC        54.61   6.201   0.8205   8979.391   1.8240    0.8590    -3576.5   59.75   56.52
HPT        12.10   4.111   0.8756    218.935   1.3621    0.8537     3576.5
LPT        54.03   2.807   0.8489     71.145   1.2629    0.8300     2047.8

TURBOMACHINERY MAP DATA
           WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       861.94   1.127   0.9083   2531.996    0.0416      0.8607    1.0235    0.9980    0.9905
```

LPC	74.21	1.553	0.8292	0.675	180.0000	1.0431	0.9557	0.9673	0.0003
HPC	49.67	5.956	0.8289	8739.800	11.0684	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.046	0.8756	1.318	4.0460	12.6513	0.9790	1.0000	0.0003
LPT	0.83	2.374	0.8552	0.802	2.3739	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2600.37	5727.8

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2853	851.64
FanDuct	0.0000	0.5407	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5837	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9058.8	2073.6	3576.5
LP_Shaft	2391.5	4497.3	2047.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.9023	747.15	179.23	9.808
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2869	747.15	179.23	3.494
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.35	173.94	14.273
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	859.89	206.70	28.122
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.35	173.94	14.273
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	962.88	232.06	41.277
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.35	173.94	14.273

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7995	962.88	232.06	40.327
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.4496	962.88	232.06	22.870
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	962.88	232.06	41.277
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	962.88	232.06	41.277
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	962.88	232.06	41.277
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1712.04	0.9995	0.0230	0.19934	0.01103

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.131	0.9800	1.0000	0.9800	603.19	0.427	598.8	460.0
Byp_Nozz	1.594	0.9800	1.0000	0.9800	2002.63	0.841	821.2	5997.9

```
****************************************************************************************************************************************
Date:02/23/11    Time:08:51:13    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  3/ 16/ 1/ 1    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 462.20    Stator 1 exit: 469.78    Stator 2 inlet: 479.48    Stator 2 exit: 484.71
            Stator 3 inlet: 493.91    Stator 3 exit: 498.67    Stator 4 inlet: 505.15    Stator 4 exit: 509.26
            Stator 5 inlet: 518.30    Stator 5 exit: 521.73               Stage4   Percent Blockage: 0.15

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.669   34281.0    22.00    282.91      832.3    0.9467     787.94    9.5948    670.64    9.285      8322.3      10.0   1715.3
1620.3   1129.2


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O          282.91     4.846    455.82    109.11   0.0000    804.34     3.578    418.42    2631.9  0.6690    1.39992
FS1   Inlet.Fl_O            282.91     4.846    455.82    109.11   0.0000    804.34     4.451    444.89    4162.5  0.3506    1.39992
FS12  Splitter.Fl_02        256.20     4.843    455.82    109.11   0.0000    728.79     4.385    443.06    3526.9  0.3796    1.39992
FS2   Splitter.Fl_01         26.70     4.843    455.82    109.11   0.0000     75.96     4.702    451.99     637.7  0.2061    1.39992
FS14  Fan.Fl_O              256.20     5.452    473.24    113.29   0.0000    659.67     4.616    451.25    2600.0  0.4936    1.40028
FS25  LPC.Fl_O               26.70     7.278    526.81    126.13   0.0000     54.34     7.017    521.33     412.5  0.2292    1.39976
FS3   HPC.Fl_O               25.41    44.991    960.12    231.37   0.0000     11.29    39.691    927.29      49.7  0.4293    1.38334
FS36  Bleed3.Fl_O            19.69    44.991    960.12    231.37   0.0000      8.75    41.945    941.63      49.3  0.3199    1.38334
FS4   Burner.Fl_O            19.91    43.955   1715.28    432.28   0.0111     12.11    41.511   1690.99      74.8  0.2941    1.33174
FS45  HPT.Fl_O               26.61    10.797   1133.58    276.71   0.0083     53.55     9.821   1105.06     264.7  0.3746    1.36682
FS49  LPT.Fl_O               26.92     3.998    904.40    218.92   0.0082    130.69     3.800    891.80     851.6  0.2722    1.38121
FS5   TEGV.Fl_O              26.92     3.998    904.40    218.92   0.0082    130.69     3.800    891.80     851.6  0.2722    1.38121
FS8   Core_Nozz.Fl_O         26.92     3.998    904.40    218.92   0.0082    130.69     3.578    876.98     603.1  0.4046    1.38121
FS17  FanDuctLkg.Fl_O       256.20     5.452    473.24    113.29   0.0000    659.67     4.616    451.25    2600.0  0.4936    1.40028
FS171 Bleed15.Fl_O          256.20     5.452    473.24    113.29   0.0000    659.67     4.504    448.12    2475.2  0.5295    1.40028
FS172 FanDuct.Fl_O          256.20     5.452    473.24    113.29   0.0000    659.67     4.504    448.12    2475.2  0.5295    1.40028
FS173 Byp_Nozz.Fl_O         256.20     5.452    473.24    113.29   0.0000    659.67     3.578    419.87    2002.6  0.7976    1.40028

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan         728.79   1.126   0.9067   2502.539   1.0382    0.9089    -1514.6  ---.--   53.74
LPC          75.96   1.503   0.8042   2502.539   1.1557    0.8115     -643.3    7.76    2.32
HPC          54.34   6.182   0.8202   8970.873   1.8225    0.8588    -3879.5   59.56   56.31
HPT          12.11   4.071   0.8760    218.297   1.3592    0.8542     3879.5
LPT          53.55   2.701   0.8462     69.680   1.2509    0.8280     2157.9

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         846.76   1.123   0.9085   2478.671    0.0417      0.8607    1.0235    0.9980    0.9905
```

LPC	70.30	1.527	0.8197	0.661	180.0000	1.0805	0.9543	0.9811	0.0003
HPC	49.42	5.938	0.8287	8731.510	11.0833	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.007	0.8760	1.314	4.0066	12.6513	0.9790	1.0000	0.0003
LPT	0.82	2.293	0.8525	0.785	2.2928	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2631.90	5896.9

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2722	851.64
FanDuct	0.0000	0.5295	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5948	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9041.0	2253.7	3879.5
LP_Shaft	2346.0	4830.9	2157.9

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.9826	745.21	178.75	10.797
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3124	745.21	178.75	3.998
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.50	173.49	15.575
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	857.52	206.12	30.660
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.50	173.49	15.575
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	960.12	231.37	44.991
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.50	173.49	15.575

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.0489	960.12	231.37	43.955
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.6678	960.12	231.37	24.988
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	960.12	231.37	44.991
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	960.12	231.37	44.991
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	960.12	231.37	44.991
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	473.24	113.29	5.452
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	473.24	113.29	5.452
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	473.24	113.29	5.452
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	473.24	113.29	5.452
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	473.24	113.29	5.452

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1715.28	0.9995	0.0230	0.21887	0.01112

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.117	0.9800	1.0000	0.9800	603.19	0.405	572.1	478.8
Byp_Nozz	1.524	0.9800	1.0000	0.9800	2002.63	0.798	784.9	6250.4

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****************************************************************************************************************************************
Date:02/23/11    Time:08:53:02    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 471.61    Stator 1 exit: 478.79    Stator 2 inlet: 487.99    Stator 2 exit: 492.90
            Stator 3 inlet: 501.61    Stator 3 exit: 506.06    Stator 4 inlet: 514.11    Stator 4 exit: 517.89
            Stator 5 inlet: 524.61    Stator 5 exit: 527.91            Unblocked   Percent Blockage: 0.15

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.608   30029.0    22.00    314.03      995.1    0.9037     899.22    9.5609    620.50    9.019      9951.0      10.0   1742.1
1645.1   1149.0


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          314.03     5.599    465.62    111.46   0.0000    780.92     4.358    433.58    2686.1   0.6080    1.40012
FS1   Inlet.Fl_O            314.03     5.599    465.62    111.46   0.0000    780.92     5.172    455.17    4162.5   0.3387    1.40012
FS12  Splitter.Fl_02        284.30     5.597    465.62    111.46   0.0000    707.33     5.101    453.45    3526.9   0.3662    1.40012
FS2   Splitter.Fl_01         29.74     5.597    465.62    111.46   0.0000     73.98     5.442    461.91     637.7   0.2004    1.40012
FS14  Fan.Fl_O              284.30     6.259    482.58    115.52   0.0000    643.85     5.355    461.53    2600.0   0.4774    1.40048
FS25  LPC.Fl_O               29.74     8.179    532.86    127.59   0.0000     54.16     7.887    527.36     412.5   0.2284    1.39975
FS3   HPC.Fl_O               28.29    50.502    970.71    234.00   0.0000     11.26    44.587    937.75      49.7   0.4280    1.38276
FS36  Bleed3.Fl_O            21.93    50.502    970.71    234.00   0.0000      8.73    47.101    952.14      49.3   0.3190    1.38276
FS4   Burner.Fl_O            22.18    49.339   1742.08    439.81   0.0114     12.11    46.596   1717.48      74.8   0.2943    1.33030
FS45  HPT.Fl_O               29.64    12.253   1153.52    281.86   0.0085     53.01    11.170   1125.25     264.7   0.3704    1.36543
FS49  LPT.Fl_O               29.99     4.803    933.21    226.13   0.0084    123.08     4.593    921.82     851.6   0.2552    1.37919
FS5   TEGV.Fl_O              29.99     4.803    933.21    226.13   0.0084    123.08     4.593    921.82     851.6   0.2552    1.37919
FS8   Core_Nozz.Fl_O         29.99     4.803    933.21    226.13   0.0084    123.08     4.358    908.70     603.2   0.3769    1.37919
FS17  FanDuctLkg.Fl_O       284.30     6.259    482.58    115.52   0.0000    643.85     5.355    461.53    2600.0   0.4774    1.40048
FS171 Bleed15.Fl_O          284.30     6.259    482.58    115.52   0.0000    643.85     5.237    458.60    2475.2   0.5112    1.40048
FS172 FanDuct.Fl_O          284.30     6.259    482.58    115.52   0.0000    643.85     5.237    458.60    2475.2   0.5112    1.40048
FS173 Byp_Nozz.Fl_O         284.30     6.259    482.58    115.52   0.0000    643.85     4.358    435.01    2002.6   0.7395    1.40048

TURBOMACHINERY PERFORMANCE DATA
               Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan        707.33   1.118   0.9068   2417.235   1.0364    0.9090    -1636.1  ---.--   52.80
LPC         73.98   1.461   0.8034   2417.235   1.1444    0.8103     -678.7    7.89    2.03
HPC         54.16   6.175   0.8202   8965.211   1.8217    0.8586    -4368.2   59.28   56.02
HPT         12.11   4.027   0.8777    217.715   1.3556    0.8565     4368.2
LPT         53.01   2.551   0.8434     67.433   1.2334    0.8253     2314.8

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        821.83   1.116   0.9086   2394.181    0.0420      0.8607    1.0235    0.9980    0.9905
```

LPC	64.10	1.485	0.8046	0.638	180.0000	1.1541	0.9513	0.9985	0.0003
HPC	49.25	5.931	0.8286	8725.999	11.1033	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.963	0.8777	1.311	3.9629	12.6513	0.9790	1.0000	0.0003
LPT	0.82	2.179	0.8497	0.760	2.1793	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2686.13	6056.4

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2552	851.64
FanDuct	0.0000	0.5112	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5609	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9087.0	2524.7	4368.2
LP_Shaft	2290.3	5308.4	2314.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.0943	753.61	180.79	12.253
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3479	753.61	180.79	4.803
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	867.08	208.46	34.419
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.3952	970.71	234.00	49.339
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.9709	970.71	234.00	28.126
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1742.08	0.9995	0.0230	0.24978	0.01139

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.102	0.9800	1.0000	0.9800	603.19	0.377	542.0	505.2
Byp_Nozz	1.436	0.9800	1.0000	0.9800	2002.63	0.739	740.8	6546.3

```
**********************************************************************************************************************************
Date:02/23/11    Time:08:54:42    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 482.09    Stator 1 exit: 488.87    Stator 2 inlet: 497.56    Stator 2 exit: 502.13
            Stator 3 inlet: 508.27    Stator 3 exit: 512.41    Stator 4 inlet: 522.05    Stator 4 exit: 525.41
            Stator 5 inlet: 531.75    Stator 5 exit: 534.79               Stage3   Percent Blockage: 0.15

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.552   25666.0    22.00    348.92     1194.7    0.8599    1027.36    9.4674    573.44    8.759     11946.9       10.0   1765.0
1666.6   1166.3


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           348.92     6.507    476.52    114.07   0.0000    755.31     5.297    449.14    2752.6   0.5520    1.40035
FS1   Inlet.Fl_O             348.92     6.507    476.52    114.07   0.0000    755.31     6.045    466.59    4162.5   0.3260    1.40035
FS12  Splitter.Fl_02         315.59     6.504    476.52    114.07   0.0000    683.49     5.971    465.00    3526.9   0.3517    1.40035
FS2   Splitter.Fl_01          33.33     6.504    476.52    114.07   0.0000     72.19     6.333    472.90     637.7   0.1953    1.40035
FS14  Fan.Fl_O               315.59     7.231    493.16    118.06   0.0000    625.37     6.258    473.18    2600.0   0.4591    1.40071
FS25  LPC.Fl_O                33.33     9.281    539.43    129.17   0.0000     53.83     8.954    533.94     412.5   0.2269    1.39974
FS3   HPC.Fl_O                31.72    56.997    981.10    236.57   0.0000     11.25    50.343    947.94      49.7   0.4273    1.38219
FS36  Bleed3.Fl_O             24.58    56.997    981.10    236.57   0.0000      8.72    53.171    962.41      49.3   0.3186    1.38219
FS4   Burner.Fl_O             24.87    55.685   1765.00    446.25   0.0116     12.11    52.588   1740.14      74.8   0.2944    1.32909
FS45  HPT.Fl_O                33.23    13.956   1170.91    286.37   0.0087     52.57    12.745   1142.82     264.7   0.3669    1.36424
FS49  LPT.Fl_O                33.62     5.768    959.62    232.76   0.0086    116.51     5.543    949.23     851.6   0.2407    1.37758
FS5   TEGV.Fl_O               33.62     5.768    959.62    232.76   0.0086    116.51     5.543    949.23     851.6   0.2407    1.37758
FS8   Core_Nozz.Fl_O          33.62     5.768    959.62    232.76   0.0086    116.51     5.297    937.49     603.2   0.3534    1.37758
FS17  FanDuctLkg.Fl_O        315.59     7.231    493.16    118.06   0.0000    625.37     6.258    473.18    2600.0   0.4591    1.40071
FS171 Bleed15.Fl_O           315.59     7.231    493.16    118.06   0.0000    625.37     6.134    470.48    2475.2   0.4906    1.40071
FS172 FanDuct.Fl_O           315.59     7.231    493.16    118.06   0.0000    625.37     6.134    470.48    2475.2   0.4906    1.40071
FS173 Byp_Nozz.Fl_O          315.59     7.231    493.16    118.06   0.0000    625.37     5.297    450.56    2002.6   0.6873    1.40071

TURBOMACHINERY PERFORMANCE DATA
               Wc      PR       eff         Nc        TR    efPoly        pwr      SMN      SMW
Fan        683.49   1.112    0.9066   2329.875    1.0349    0.9089    -1780.9  ---.--    51.54
LPC         72.19   1.427    0.8172   2329.875    1.1320    0.8238     -712.0     8.10     1.72
HPC         53.83   6.141    0.8196   8954.559    1.8188    0.8580    -4942.7    59.30    56.01
HPT         12.11   3.990    0.8789    217.368    1.3526    0.8583     4942.7
LPT         52.57   2.420    0.8398     65.263    1.2173    0.8225     2492.8

TURBOMACHINERY MAP DATA
            WcMap   PRmap    effMap      NcMap     R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        794.14   1.109    0.9085   2307.654     0.0424      0.8607    1.0235    0.9980    0.9905
```

LPC	57.75	1.442	0.7891	0.615	180.0000	1.2500	0.9655	1.0357	0.0003
HPC	48.96	5.899	0.8281	8715.631	11.1053	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.927	0.8789	1.309	3.9271	12.6513	0.9790	1.0000	0.0003
LPT	0.81	2.079	0.8461	0.736	2.0791	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2752.61	6218.8

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2407	851.64
FanDuct	0.0000	0.4906	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.4674	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9132.0	2842.7	4942.7
LP_Shaft	2233.2	5862.8	2492.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.2267	762.17	182.87	13.956
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3900	762.17	182.87	5.768
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	740.03	177.50	19.779
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	876.61	210.80	38.865
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	740.03	177.50	19.779
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	981.10	236.57	56.997
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	740.03	177.50	19.779

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.8060	981.10	236.57	55.685
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	3.3304	981.10	236.57	31.816
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	981.10	236.57	56.997
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	981.10	236.57	56.997
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	981.10	236.57	56.997
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.231
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.231
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.231
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.231
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.231

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1765.00	0.9995	0.0230	0.28538	0.01161

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.089	0.9800	1.0000	0.9800	603.19	0.353	515.9	539.1
Byp_Nozz	1.365	0.9800	1.0000	0.9800	2002.63	0.687	700.8	6874.4

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**********************************************************************************************************************************
Date:02/23/11    Time:08:55:31    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 21/ 34/ 1/19    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 481.70    Stator 1 exit: 501.37    Stator 2 inlet: 530.54    Stator 2 exit: 539.29
            Stator 3 inlet: 567.38    Stator 3 exit: 576.54    Stator 4 inlet: 603.17    Stator 4 exit: 611.78
            Stator 5 inlet: 633.25    Stator 5 exit: 641.62             Unblocked   Percent Blockage: 0.15

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.490    20047.0    22.00     708.49     15087.7     0.5185    7823.53    5.3115    520.34   32.016     15087.7     100.0   2996.4
2812.8   1964.8


                                        FLOW STATION DATA
                                  W         Pt         Tt         ht      FAR        Wc         Ps         Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           708.49      7.913     491.73     117.72   0.0000   1281.20      6.740     469.18    5056.6   0.4900    1.40068
FS1   Inlet.Fl_O             708.49      7.913     491.73     117.72   0.0000   1281.20      5.837     450.78    4162.5   0.6738    1.40068
FS12  Splitter.Fl_02         596.23      7.909     491.73     117.72   0.0000   1078.74      5.877     451.71    3526.9   0.6654    1.40068
FS2   Splitter.Fl_01         112.25      7.909     491.73     117.72   0.0000    203.09      5.574     444.93     637.7   0.7251    1.40068
FS14  Fan.Fl_O               596.23     13.462     580.15     138.94   0.0000    688.40     11.162     549.93    2600.0   0.5244    1.39966
FS25  LPC.Fl_O               112.25     19.132     659.81     158.11   0.0000     97.25     16.677     634.53     412.5   0.4476    1.39750
FS3   HPC.Fl_O               106.81    253.341    1456.06     357.89   0.0000     10.38    228.680    1417.58      49.7   0.3915    1.35302
FS36  Bleed3.Fl_O             82.78    253.341    1456.06     357.89   0.0000      8.05    239.011    1434.08      49.3   0.2944    1.35302
FS4   Burner.Fl_O             84.95    247.507    2996.41     822.18   0.0263     12.12    233.652    2958.98      74.8   0.3010    1.27865
FS45  HPT.Fl_O               113.11     58.365    1974.39     509.48   0.0196     55.57     52.594    1925.62     264.7   0.4002    1.31535
FS49  LPT.Fl_O               114.43     13.648    1424.91     356.38   0.0194    204.22     11.810    1373.24     851.6   0.4683    1.34143
FS5   TEGV.Fl_O              114.43     13.648    1424.91     356.38   0.0194    204.22     11.810    1373.24     851.6   0.4683    1.34143
FS8   Core_Nozz.Fl_O         114.43     13.648    1424.91     356.38   0.0194    204.22      7.313    1213.08     603.2   1.0000    1.34143
FS17  FanDuctLkg.Fl_O        596.23     13.462     580.15     138.94   0.0000    688.40     11.162     549.93    2600.0   0.5244    1.39966
FS171 Bleed15.Fl_O           596.23     13.462     580.15     138.94   0.0000    688.40     10.843     545.39    2475.2   0.5647    1.39966
FS172 FanDuct.Fl_O           596.23     13.462     580.15     138.94   0.0000    688.40     10.843     545.39    2475.2   0.5647    1.39966
FS173 Byp_Nozz.Fl_O          596.23     13.462     580.15     138.94   0.0000    688.40      7.123     483.44    2002.6   1.0000    1.39966

TURBOMACHINERY PERFORMANCE DATA
              Wc       PR       eff         Nc        TR    efPoly        pwr      SMN      SMW
Fan       1078.74    1.702    0.9114   4139.480    1.1798    0.9187   -17903.5    36.65    23.06
LPC        203.09    2.419    0.8396   4139.480    1.3418    0.8577    -6415.1     3.06     2.59
HPC         97.25   13.242    0.8583  10384.404    2.2068    0.8976   -30959.2    25.66    24.89
HPT         12.12    4.241    0.9124    213.966    1.3390    0.8979    30959.2
LPT         55.57    4.276    0.9173     90.709    1.3818    0.9021    24318.8

TURBOMACHINERY MAP DATA
            WcMap    PRmap    effMap      NcMap     R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1253.38    1.686    0.9132   4100.000     0.0639      0.8607    1.0235    0.9980    0.9905
```

LPC	166.92	2.761	0.8444	1.093	180.0000	1.2167	0.8059	0.9943	0.0003
HPC	88.45	12.665	0.8672	10107.324	13.5323	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.173	0.9124	1.288	4.1726	12.6513	0.9790	1.0000	0.0003
LPT	0.85	3.491	0.9241	1.022	3.4906	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	5056.62	11458.1

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4683	851.64
FanDuct	0.0000	0.5647	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.3115	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11712.4	13882.8	30959.2
LP_Shaft	4030.6	31689.1	24318.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	4.1309	1067.02	258.00	58.365
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	1.3134	1067.02	258.00	13.648
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	1027.07	248.01	70.658
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1271.66	309.94	164.342
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	1027.07	248.01	70.658
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1456.06	357.89	253.341
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	1027.07	248.01	70.658

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	12.8170	1456.06	357.89	247.507
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	11.2151	1456.06	357.89	139.317
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1456.06	357.89	253.341
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1456.06	357.89	253.341
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1456.06	357.89	253.341
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	580.15	138.94	13.462
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	580.15	138.94	13.462
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	580.15	138.94	13.462
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	580.15	138.94	13.462
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	580.15	138.94	13.462

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2996.41	0.9995	0.0230	2.17320	0.02625

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.025	0.9810	1.0000	0.9800	603.19	1.000	1646.3	6200.5
Byp_Nozz	1.997	0.9799	1.0000	0.9800	2002.63	1.000	1056.5	20345.3

```
**********************************************************************************************************************************
Date:02/23/11    Time:08:56:23    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  7/ 20/ 1/ 5    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 496.91    Stator 1 exit: 503.30    Stator 2 inlet: 509.54    Stator 2 exit: 513.79
            Stator 3 inlet: 523.47    Stator 3 exit: 527.18    Stator 4 inlet: 534.34    Stator 4 exit: 537.57
            Stator 5 inlet: 543.52    Stator 5 exit: 546.31               Stage2   Percent Blockage: 0.15

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.490    20047.0    22.00     399.48      1508.7    0.8131    1226.74    9.3126    520.34    8.456     15087.7       10.0   1799.9
1699.4   1192.6


                                        FLOW STATION DATA
                                    W         Pt         Tt         ht      FAR        Wc         Ps         Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           399.48      7.913     491.73     117.72   0.0000    722.40      6.740     469.18    2851.2   0.4900    1.40068
FS1   Inlet.Fl_O             399.48      7.913     491.73     117.72   0.0000    722.40      7.403     482.46    4162.5   0.3098    1.40068
FS12  Splitter.Fl_02         360.74      7.909     491.73     117.72   0.0000    652.68      7.323     481.03    3526.9   0.3333    1.40068
FS2   Splitter.Fl_01          38.74      7.909     491.73     117.72   0.0000     70.09      7.713     488.23     637.7   0.1893    1.40068
FS14  Fan.Fl_O               360.74      8.767     508.18     121.66   0.0000    598.57      7.703     489.74    2600.0   0.4337    1.40000
FS25  LPC.Fl_O                38.74     10.987     550.25     131.76   0.0000     53.37     10.607     544.74     412.5   0.2249    1.39972
FS3   HPC.Fl_O                36.86     66.913     998.05     240.78   0.0000     11.23     59.130     964.50      49.7   0.4266    1.38127
FS36  Bleed3.Fl_O             28.57     66.913     998.05     240.78   0.0000      8.70     62.437     979.14      49.3   0.3181    1.38127
FS4   Burner.Fl_O             28.91     65.372    1799.93     456.11   0.0119     12.11     61.737    1774.68      74.8   0.2946    1.32727
FS45  HPT.Fl_O                38.62     16.582    1197.35     293.23   0.0089     52.01     15.176    1169.42     264.7   0.3626    1.36244
FS49  LPT.Fl_O                39.08      7.255     994.93     241.66   0.0088    109.63      7.006     985.50     851.6   0.2257    1.37542
FS5   TEGV.Fl_O               39.08      7.255     994.93     241.66   0.0088    109.63      7.006     985.50     851.6   0.2257    1.37542
FS8   Core_Nozz.Fl_O          39.08      7.255     994.93     241.66   0.0088    109.63      6.740     975.04     603.2   0.3294    1.37542
FS17  FanDuctLkg.Fl_O         360.74      8.767     508.18     121.66   0.0000    598.57      7.703     489.74    2600.0   0.4337    1.40000
FS171 Bleed15.Fl_O            360.74      8.767     508.18     121.66   0.0000    598.57      7.571     487.32    2475.2   0.4624    1.40000
FS172 FanDuct.Fl_O            360.74      8.767     508.18     121.66   0.0000    598.57      7.571     487.32    2475.2   0.4624    1.40000
FS173 Byp_Nozz.Fl_O           360.74      8.767     508.18     121.66   0.0000    598.57      6.740     470.67    2002.6   0.6310    1.40000

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR       eff          Nc        TR    efPoly         pwr      SMN      SMW
Fan         652.68   1.108    0.9089    2234.867    1.0334    0.9078     -2013.3  ---.--    49.22
LPC          70.09   1.389    0.8257    2234.867    1.1190    0.8333      -769.7    8.44     1.36
HPC          53.37   6.090    0.8188    8939.484    1.8138    0.8573     -5830.1   59.45    56.11
HPT          12.11   3.942    0.8807     217.029    1.3484    0.8605      5830.1
LPT          52.01   2.286    0.8362      62.887    1.2004    0.8206      2783.0

TURBOMACHINERY MAP DATA
             WcMap   PRmap    effMap       NcMap     R/Parm      s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         758.34   1.106    0.9108    2213.553     0.0433       0.8607    1.0235    0.9980    0.9905
```

LPC	50.85	1.396	0.7722	0.590	180.0000	1.3783	0.9835	1.0693	0.0003
HPC	48.54	5.850	0.8273	8700.958	11.1017	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.881	0.8807	1.307	3.8806	12.6513	0.9790	1.0000	0.0003
LPT	0.80	1.977	0.8424	0.709	1.9772	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2851.18	6460.7

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2257	851.64
FanDuct	0.0000	0.4624	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.3126	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9207.6	3325.6	5830.1
LP_Shaft	2176.1	6717.0	2783.0

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.4255	776.18	186.27	16.582
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.4532	776.18	186.27	7.255
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.73	180.82	23.291
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	892.18	214.62	45.661
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.73	180.82	23.291
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	998.05	240.78	66.913
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.73	180.82	23.291

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	4.4230	998.05	240.78	65.372
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	3.8702	998.05	240.78	37.464
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	998.05	240.78	66.913
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	998.05	240.78	66.913
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	998.05	240.78	66.913
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1799.93	0.9995	0.0230	0.34076	0.01193

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.076	0.9800	1.0000	0.9800	603.19	0.329	490.1	595.3
Byp_Nozz	1.301	0.9800	1.0000	0.9800	2002.63	0.631	657.7	7374.1

```
**********************************************************************************************************************
Date:02/23/11    Time:08:58:30    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  9/ 35/ 2/ 6    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 508.23    Stator 1 exit: 514.29    Stator 2 inlet: 523.65    Stator 2 exit: 527.58
            Stator 3 inlet: 534.88    Stator 3 exit: 538.49    Stator 4 inlet: 545.24    Stator 4 exit: 548.26
            Stator 5 inlet: 553.86    Stator 5 exit: 556.46               Stage1   Percent Blockage: 0.15

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.446    15435.0    22.00    442.55     1740.6     0.7949    1383.64    9.2993    481.90    8.020     17405.9       10.0   1820.6
1718.7   1211.7


                                        FLOW STATION DATA
                                  W         Pt         Tt         ht      FAR        Wc         Ps         Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           442.55      9.311     504.97     120.89   0.0000    689.22      8.149     485.63    2919.7   0.4460    1.40036
FS1   Inlet.Fl_O             442.55      9.311     504.97     120.89   0.0000    689.22      8.769     496.39    4162.5   0.2939    1.40036
FS12  Splitter.Fl_02         399.58      9.306     504.97     120.89   0.0000    622.62      8.684     495.08    3526.9   0.3158    1.40036
FS2   Splitter.Fl_01          42.97      9.306     504.97     120.89   0.0000     66.95      9.097     501.70     637.7   0.1805    1.40036
FS14  Fan.Fl_O               399.58     10.281     520.79     124.69   0.0000    572.31      9.159     503.86    2600.0   0.4099    1.39977
FS25  LPC.Fl_O                42.97     12.624     559.82     134.06   0.0000     51.97     12.211     554.52     412.5   0.2186    1.39970
FS3   HPC.Fl_O                 40.89     74.673    1007.35     243.10   0.0000     11.21     66.013     973.64      49.7   0.4260    1.38051
FS36  Bleed3.Fl_O              31.69     74.673    1007.35     243.10   0.0000      8.69     69.692     988.34      49.3   0.3177    1.38051
FS4   Burner.Fl_O              32.07     72.953    1820.62     461.98   0.0121     12.10     68.897    1795.14      74.8   0.2947    1.32643
FS45  HPT.Fl_O                 42.85     18.868    1216.47     298.21   0.0091     51.11     17.329    1189.28     264.7   0.3554    1.36104
FS49  LPT.Fl_O                 43.35      8.692    1023.54     248.89   0.0089    102.97      8.431    1015.07     851.6   0.2114    1.37332
FS5   TEGV.Fl_O                43.35      8.692    1023.54     248.89   0.0089    102.97      8.431    1015.07     851.6   0.2114    1.37332
FS8   Core_Nozz.Fl_O           43.35      8.692    1023.54     248.89   0.0089    102.97      8.149    1005.79     603.2   0.3073    1.37332
FS17  FanDuctLkg.Fl_O         399.58     10.281     520.79     124.69   0.0000    572.31      9.159     503.86    2600.0   0.4099    1.39977
FS171 Bleed15.Fl_O            399.58     10.281     520.79     124.69   0.0000    572.31      9.023     501.71    2475.2   0.4360    1.39977
FS172 FanDuct.Fl_O            399.58     10.281     520.79     124.69   0.0000    572.31      9.023     501.71    2475.2   0.4360    1.39977
FS173 Byp_Nozz.Fl_O           399.58     10.281     520.79     124.69   0.0000    572.31      8.149     487.09    2002.6   0.5880    1.39977

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR       eff          Nc        TR    efPoly        pwr      SMN      SMW
Fan       622.62   1.105    0.9099    2144.594    1.0313    0.9114    -2146.6  ---.--    46.99
LPC        66.95   1.357    0.8294    2144.594    1.1086    0.8378     -800.6    8.94     0.99
HPC        51.97   5.915    0.8157    8893.131    1.7994    0.8543    -6468.0   60.46    56.94
HPT        12.10   3.867    0.8812     216.533    1.3420    0.8614     6468.0
LPT        51.11   2.171    0.8324      60.671    1.1853    0.8171     2947.2

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        723.41   1.102    0.9118   2124.140    0.0442      0.8607    1.0235    0.9980    0.9905
```

LPC	44.29	1.352	0.7562	0.566	180.0000	1.5116	1.0142	1.0968	0.0003
HPC	47.26	5.684	0.8241	8655.842	11.0569	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.806	0.8812	1.304	3.8063	12.6513	0.9790	1.0000	0.0003
LPT	0.79	1.890	0.8385	0.684	1.8899	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2919.67	6628.5

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2114	851.64
FanDuct	0.0000	0.4360	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.2993	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9239.2	3676.8	6468.0
LP_Shaft	2116.1	7315.0	2947.2

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.5813	785.66	188.58	18.868
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.5027	785.66	188.58	8.692
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	763.23	183.13	26.275
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	901.57	216.93	51.094
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	763.23	183.13	26.275
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1007.35	243.10	74.673
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	763.23	183.13	26.275

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	4.9062	1007.35	243.10	72.953
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	4.2930	1007.35	243.10	42.016
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1007.35	243.10	74.673
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1007.35	243.10	74.673
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1007.35	243.10	74.673
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.281
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.281
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.281
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.281
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.281

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1820.62	0.9995	0.0230	0.38434	0.01213

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.067	0.9800	1.0000	0.9800	603.19	0.307	463.9	625.2
Byp_Nozz	1.262	0.9800	1.0000	0.9800	2002.63	0.588	623.5	7744.0

```
**********************************************************************************************************************************
Date:02/23/11    Time:09:00:34    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 12/ 25/ 1/10    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 523.48    Stator 1 exit: 529.04    Stator 2 inlet: 536.15    Stator 2 exit: 539.83
            Stator 3 inlet: 546.53    Stator 3 exit: 549.79    Stator 4 inlet: 555.99    Stator 4 exit: 558.70
            Stator 5 inlet: 563.83    Stator 5 exit: 566.16             Unblocked   Percent Blockage: 0.15

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.406    10735.0    22.00    489.85     2003.2    0.7777    1557.96    9.2910    446.20    7.554     20032.3       10.0   1842.0
1738.8   1230.8


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           489.85    11.019    518.95    124.25   0.0000    653.50     9.822    502.39    2996.0   0.4060    1.39978
FS1   Inlet.Fl_O             489.85    11.019    518.95    124.25   0.0000    653.50    10.446    511.10    4162.5   0.2772    1.39978
FS12  Splitter.Fl_02         442.25    11.013    518.95    124.25   0.0000    590.29    10.357    509.92    3526.9   0.2976    1.39978
FS2   Splitter.Fl_01          47.60    11.013    518.95    124.25   0.0000     63.53    10.791    515.93     637.7   0.1710    1.39978
FS14  Fan.Fl_O               442.25    12.085    534.12    127.89   0.0000    545.75    10.900    518.61    2600.0   0.3868    1.39975
FS25  LPC.Fl_O                47.60    14.441    569.62    136.41   0.0000     50.76    13.990    564.49     412.5   0.2133    1.39968
FS3   HPC.Fl_O                45.29    83.232   1017.61    245.65   0.0000     11.20    73.605    983.68      49.7   0.4255    1.37981
FS36  Bleed3.Fl_O             35.10    83.232   1017.61    245.65   0.0000      8.68    77.695    998.48      49.3   0.3174    1.37981
FS4   Burner.Fl_O             35.53    81.315   1842.02    468.05   0.0123     12.10    76.796   1816.31      74.8   0.2947    1.32540
FS45  HPT.Fl_O                47.48    21.393   1235.67    303.23   0.0092     50.34    19.706   1209.07     264.7   0.3493    1.35973
FS49  LPT.Fl_O                48.03    10.389   1052.82    256.33   0.0091     96.80    10.114   1045.19     851.6   0.1982    1.37143
FS5   TEGV.Fl_O               48.03    10.389   1052.82    256.33   0.0091     96.80    10.114   1045.19     851.6   0.1982    1.37143
FS8   Core_Nozz.Fl_O          48.03    10.389   1052.82    256.33   0.0091     96.80     9.822   1036.94     603.2   0.2870    1.37143
FS17  FanDuctLkg.Fl_O        442.25    12.085    534.12    127.89   0.0000    545.75    10.900    518.61    2600.0   0.3868    1.39975
FS171 Bleed15.Fl_O           442.25    12.085    534.12    127.89   0.0000    545.75    10.760    516.69    2475.2   0.4108    1.39975
FS172 FanDuct.Fl_O           442.25    12.085    534.12    127.89   0.0000    545.75    10.760    516.69    2475.2   0.4108    1.39975
FS173 Byp_Nozz.Fl_O          442.25    12.085    534.12    127.89   0.0000    545.75     9.822    503.75    2002.6   0.5491    1.39975

TURBOMACHINERY PERFORMANCE DATA
               Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan        590.29   1.097   0.9093   2034.264   1.0292    0.9108    -2279.5  ---.--   45.03
LPC         63.53   1.311   0.8186   2034.264   1.0976    0.8270     -819.3    9.96    0.51
HPC         50.76   5.764   0.8128   8853.260   1.7865    0.8515    -7178.3   61.41   57.72
HPT         12.10   3.801   0.8818    216.174   1.3364    0.8624     7178.3
LPT         50.34   2.059   0.8287     57.886   1.1704    0.8140     3098.8

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        685.85   1.095   0.9111   2014.862    0.0450      0.8607    1.0235    0.9980    0.9905
```

LPC	36.28	1.298	0.7366	0.537	180.0000	1.7514	1.0460	1.1113	0.0003
HPC	46.17	5.539	0.8212	8617.034	11.0151	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.742	0.8818	1.301	3.7422	12.6513	0.9790	1.0000	0.0003
LPT	0.77	1.805	0.8348	0.652	1.8052	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2995.97	6793.5

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.1982	851.64
FanDuct	0.0000	0.4108	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.2910	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9277.9	4063.6	7178.3
LP_Shaft	2034.8	7998.3	3098.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.7517	795.75	191.03	21.393
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.5569	795.75	191.03	10.389
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	911.76	219.43	57.091
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	5.4350	1017.61	245.65	81.315
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	4.7557	1017.61	245.65	47.040
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1842.02	0.9995	0.0230	0.43277	0.01233

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.058	0.9800	1.0000	0.9800	603.19	0.287	439.7	656.4
Byp_Nozz	1.230	0.9800	1.0000	0.9800	2002.63	0.549	592.2	8140.3

20% Blockage

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**********************************************************************************************************************
Date:02/23/11    Time:09:35:52    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 34/ 2/ 5    Run by: Philip C Jorgenson      PC:   100
Temperature Stator 1 inlet: 456.56    Stator 1 exit: 475.13    Stator 2 inlet: 502.77    Stator 2 exit: 510.93
            Stator 3 inlet: 537.55    Stator 3 exit: 546.10    Stator 4 inlet: 571.37    Stator 4 exit: 579.42
            Stator 5 inlet: 599.78    Stator 5 exit: 607.62             Unblocked   Percent Blockage: 0.20

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.780   35000.0    22.00    477.01     8371.9    0.5976    5003.20    5.2999    779.49   32.229      8371.8     100.0   2874.1
2696.7   1876.6


                                        FLOW STATION DATA
                                 W        Pt        Tt       ht     FAR       Wc        Ps        Ts     Aphy      MN       gamt
FS0   Ambient.Fl_O          477.01     5.185    466.40   111.64  0.0000  1281.99     3.458    415.85   3926.2  0.7800   1.40014
FS1   Inlet.Fl_O            477.01     5.185    466.40   111.64  0.0000  1281.99     3.822    427.49   4162.5  0.6748   1.40014
FS12  Splitter.Fl_02        401.29     5.183    466.40   111.64  0.0000  1079.03     3.850    428.42   3526.9  0.6660   1.40014
FS2   Splitter.Fl_01         75.72     5.183    466.40   111.64  0.0000   203.59     3.638    421.57    637.7  0.7295   1.40014
FS14  Fan.Fl_O              401.29     8.814    550.80   131.90  0.0000   689.50     7.302    521.98   2600.0  0.5256   1.39972
FS25  LPC.Fl_O               75.72    12.470    626.53   150.09  0.0000    98.07    10.840    601.99    412.5  0.4522   1.39820
FS3   HPC.Fl_O               72.04   167.116   1392.78   341.31  0.0000    10.38   150.851   1355.71     49.7  0.3910   1.35667
FS36  Bleed3.Fl_O            55.83   167.116   1392.78   341.31  0.0000     8.05   157.663   1371.60     49.3  0.2941   1.35667
FS4   Burner.Fl_O            57.22   163.267   2874.15   782.49  0.0249    12.13   154.128   2837.81     74.8  0.3005   1.28295
FS45  HPT.Fl_O               76.22    38.400   1885.85   483.69  0.0186    55.62    34.596   1838.73    264.7  0.4000   1.31936
FS49  LPT.Fl_O               77.11     8.963   1356.88   337.80  0.0184   204.50     7.752   1307.05    851.6  0.4682   1.34611
FS5   TEGV.Fl_O              77.11     8.963   1356.88   337.80  0.0184   204.50     7.752   1307.05    851.6  0.4682   1.34611
FS8   Core_Nozz.Fl_O         77.11     8.963   1356.88   337.80  0.0184   204.50     4.796   1152.89    603.2  1.0000   1.34611
FS17  FanDuctLkg.Fl_O       401.29     8.814    550.80   131.90  0.0000   689.50     7.302    521.98   2600.0  0.5256   1.39972
FS171 Bleed15.Fl_O          401.29     8.814    550.80   131.90  0.0000   689.50     7.092    517.65   2475.2  0.5661   1.39972
FS172 FanDuct.Fl_O          401.29     8.814    550.80   131.90  0.0000   689.50     7.092    517.65   2475.2  0.5661   1.39972
FS173 Byp_Nozz.Fl_O         401.29     8.814    550.80   131.90  0.0000   689.50     4.672    458.99   2002.6  1.0000   1.39972

TURBOMACHINERY PERFORMANCE DATA
               Wc      PR      eff         Nc       TR   efPoly        pwr     SMN     SMW
Fan       1079.03   1.701   0.9114   4139.514   1.1810   0.9171   -11498.7   36.79   23.18
LPC        203.59   2.406   0.8368   4139.514   1.3433   0.8537    -4118.9    3.06    2.59
HPC         98.07  13.401   0.8581  10417.139   2.2230   0.8978   -19988.3   25.13   24.38
HPT         12.13   4.252   0.9120    213.560   1.3438   0.8973    19988.3
LPT         55.62   4.284   0.9159     90.391   1.3860   0.9002    15617.7

TURBOMACHINERY MAP DATA
```

	WcMap	PRmap	effMap	NcMap	R/Parm	s_WcDes	s_PRdes	s_effDes	s_NcDes
Fan	1253.73	1.685	0.9132	4100.034	0.0638	0.8607	1.0235	0.9980	0.9905
LPC	166.92	2.761	0.8444	1.093	180.0000	1.2197	0.7986	0.9910	0.0003
HPC	89.19	12.817	0.8670	10139.185	13.5840	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.183	0.9120	1.286	4.1834	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.497	0.9227	1.019	3.4967	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3926.21	11556.7

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4682	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.2999	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11449.2	9169.3	19988.3
LP_Shaft	3925.4	20896.4	15617.7

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.7864	1017.82	245.70	38.400
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.8859	1017.82	245.70	8.963
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	979.36	236.14	46.492
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1214.97	295.42	108.350
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	979.36	236.14	46.492
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	979.36	236.14	46.492

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	8.6453	1392.78	341.31	163.267
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	7.5649	1392.78	341.31	91.843
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2874.15	0.9995	0.0230	1.38978	0.02489

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.592	0.9805	1.0000	0.9800	603.19	1.000	1607.6	4659.7
Byp_Nozz	2.549	0.9823	1.0000	0.9800	2002.63	1.000	1029.2	15268.9

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**********************************************************************************************************************
Date:02/23/11    Time:09:37:03    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    75
Temperature Stator 1 inlet: 465.73    Stator 1 exit: 482.49    Stator 2 inlet: 483.37    Stator 2 exit: 492.31
            Stator 3 inlet: 535.77    Stator 3 exit: 543.00    Stator 4 inlet: 564.54    Stator 4 exit: 572.11
            Stator 5 inlet: 589.68    Stator 5 exit: 596.84               Stage2   Percent Blockage: 0.20

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.780   35000.0    22.00    439.95     6329.1    0.5941    3759.85    5.6820    779.49   26.731      8371.8      75.6   2629.3
2469.9   1711.0


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O          439.95     5.185    466.40    111.64   0.0000   1182.37     3.458    415.85    3621.1  0.7800    1.40014
FS1   Inlet.Fl_O            439.95     5.185    466.40    111.64   0.0000   1182.37     4.116    436.62    4162.5  0.5841    1.40014
FS12  Splitter.Fl_02        374.10     5.183    466.40    111.64   0.0000   1005.93     4.102    436.25    3526.9  0.5880    1.40014
FS2   Splitter.Fl_01         65.84     5.183    466.40    111.64   0.0000    177.04     4.179    438.58     637.7  0.5632    1.40014
FS14  Fan.Fl_O              374.10     8.113    537.22    128.64   0.0000    689.70     6.720    509.09    2600.0  0.5258    1.39974
FS25  LPC.Fl_O               65.84    11.647    611.99    146.59   0.0000     90.24    10.393    592.42     412.5  0.4068    1.39851
FS3   HPC.Fl_O               62.65   138.608   1314.80    321.06   0.0000     10.58   124.544   1277.90      49.7  0.3991    1.36136
FS36  Bleed3.Fl_O            48.55   138.608   1314.80    321.06   0.0000      8.20   130.453   1293.78      49.3  0.2996    1.36136
FS4   Burner.Fl_O            49.60   135.416   2629.27    704.02   0.0215     12.12   127.851   2595.25      74.8  0.2992    1.29232
FS45  HPT.Fl_O               66.11    31.648   1719.02    435.61   0.0161     55.89    28.482   1674.73     264.7  0.4008    1.32821
FS49  LPT.Fl_O               66.89     7.387   1231.14    303.84   0.0159    205.00     6.385   1184.83     851.6  0.4678    1.35554
FS5   TEGV.Fl_O              66.89     7.387   1231.14    303.84   0.0159    205.00     6.385   1184.83     851.6  0.4678    1.35554
FS8   Core_Nozz.Fl_O         66.89     7.387   1231.14    303.84   0.0159    205.00     3.942   1042.04     603.2  1.0000    1.35554
FS17  FanDuctLkg.Fl_O       374.10     8.113    537.22    128.64   0.0000    689.70     6.720    509.09    2600.0  0.5258    1.39974
FS171 Bleed15.Fl_O          374.10     8.113    537.22    128.64   0.0000    689.70     6.527    504.87    2475.2  0.5661    1.39974
FS172 FanDuct.Fl_O          374.10     8.113    537.22    128.64   0.0000    689.70     6.527    504.87    2475.2  0.5661    1.39974
FS173 Byp_Nozz.Fl_O         374.10     8.113    537.22    128.64   0.0000    689.70     4.302    447.69    2002.6  1.0000    1.39974

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1005.93   1.565   0.9079   3862.829   1.1519   0.9122    -8994.0   61.15   28.98
LPC        177.04   2.247   0.8391   3862.829   1.3122   0.8565    -3255.6    2.43    1.87
HPC         90.24  11.901   0.8611  10155.325   2.1484   0.8988   -15858.7   30.60   29.53
HPT         12.12   4.279   0.9094    215.131   1.3535   0.8939    15858.7
LPT         55.89   4.284   0.9119     88.348   1.3930   0.8952    12249.6

TURBOMACHINERY MAP DATA
           WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1168.77   1.552   0.9097   3825.988    0.0592      0.8607    1.0235    0.9980    0.9905
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LPC	144.97	2.485	0.8399	1.020	180.0000	1.2212	0.8400	0.9991	0.0003
HPC	82.07	11.387	0.8700	9884.357	13.0797	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.210	0.9094	1.295	4.2099	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.496	0.9187	0.996	3.4964	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3621.14	10658.7

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4678	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.6820	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11031.1	7550.6	15858.7
LP_Shaft	3663.0	17563.8	12249.6

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.4229	970.02	233.83	31.648
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7703	970.02	233.83	7.387
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	934.75	225.10	39.578
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1151.13	279.19	90.363
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	934.75	225.10	39.578
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1314.80	321.06	138.608
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	934.75	225.10	39.578

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.5177	1314.80	321.06	135.416
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.5782	1314.80	321.06	76.061
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1314.80	321.06	138.608
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1314.80	321.06	138.608
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1314.80	321.06	138.608
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	537.22	128.64	8.113
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	537.22	128.64	8.113
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	537.22	128.64	8.113
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	537.22	128.64	8.113
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	537.22	128.64	8.113

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2629.27	0.9995	0.0230	1.04440	0.02151

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.136	0.9816	1.0000	0.9800	603.19	1.000	1533.2	3479.4
Byp_Nozz	2.346	0.9829	1.0000	0.9800	2002.63	1.000	1016.4	13508.4

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**********************************************************************************************************************************
Date:02/23/11    Time:09:38:03    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    72
Temperature Stator 1 inlet: 466.38    Stator 1 exit: 482.86    Stator 2 inlet: 484.69    Stator 2 exit: 493.77
            Stator 3 inlet: 535.50    Stator 3 exit: 542.77    Stator 4 inlet: 563.90    Stator 4 exit: 571.45
            Stator 5 inlet: 588.72    Stator 5 exit: 595.83               Stage2   Percent Blockage: 0.20
```

SUMMARY OUTPUT DATA

MN	alt	dTamb	W	Fn	TSFC	Wfuel	BPR	VTAS	OPR	MaxThrust	%	T4	T41	T49
0.780	35000.0	22.00	435.48	6086.3	0.5941	3616.19	5.7261	779.49	26.103	8371.8	72.7	2594.4	2437.7	1687.9

FLOW STATION DATA

		W	Pt	Tt	ht	FAR	Wc	Ps	Ts	Aphy	MN	gamt
FS0	Ambient.Fl_O	435.48	5.185	466.40	111.64	0.0000	1170.37	3.458	415.85	3584.4	0.7800	1.40014
FS1	Inlet.Fl_O	435.48	5.185	466.40	111.64	0.0000	1170.37	4.146	437.52	4162.5	0.5746	1.40014
FS12	Splitter.Fl_02	370.73	5.183	466.40	111.64	0.0000	996.86	4.129	437.07	3526.9	0.5794	1.40014
FS2	Splitter.Fl_01	64.74	5.183	466.40	111.64	0.0000	174.09	4.223	439.90	637.7	0.5489	1.40014
FS14	Fan.Fl_O	370.73	8.027	535.51	128.23	0.0000	689.72	6.649	507.47	2600.0	0.5258	1.39975
FS25	LPC.Fl_O	64.74	11.604	610.46	146.22	0.0000	88.96	10.395	591.59	412.5	0.3997	1.39854
FS3	HPC.Fl_O	61.60	135.353	1303.96	318.26	0.0000	10.61	121.531	1267.07	49.7	0.4004	1.36204
FS36	Bleed3.Fl_O	47.74	135.353	1303.96	318.26	0.0000	8.22	127.341	1282.95	49.3	0.3005	1.36204
FS4	Burner.Fl_O	48.75	132.235	2594.42	693.05	0.0210	12.12	124.851	2560.75	74.8	0.2990	1.29369
FS45	HPT.Fl_O	64.99	30.886	1695.78	429.00	0.0157	55.92	27.794	1651.92	264.7	0.4008	1.32942
FS49	LPT.Fl_O	65.75	7.208	1213.68	299.18	0.0155	205.06	6.230	1167.87	851.6	0.4678	1.35687
FS5	TEGV.Fl_O	65.75	7.208	1213.68	299.18	0.0155	205.06	6.230	1167.87	851.6	0.4678	1.35687
FS8	Core_Nozz.Fl_O	65.75	7.208	1213.68	299.18	0.0155	205.06	3.845	1026.71	603.2	1.0000	1.35687
FS17	FanDuctLkg.Fl_O	370.73	8.027	535.51	128.23	0.0000	689.72	6.649	507.47	2600.0	0.5258	1.39975
FS171	Bleed15.Fl_O	370.73	8.027	535.51	128.23	0.0000	689.72	6.458	503.26	2475.2	0.5661	1.39975
FS172	FanDuct.Fl_O	370.73	8.027	535.51	128.23	0.0000	689.72	6.458	503.26	2475.2	0.5661	1.39975
FS173	Byp_Nozz.Fl_O	370.73	8.027	535.51	128.23	0.0000	689.72	4.257	446.26	2002.6	1.0000	1.39975

TURBOMACHINERY PERFORMANCE DATA

	Wc	PR	eff	Nc	TR	efPoly	pwr	SMN	SMW
Fan	996.86	1.549	0.9072	3829.072	1.1482	0.9114	-8697.5	64.33	29.76
LPC	174.09	2.239	0.8436	3829.072	1.3089	0.8607	-3167.7	2.72	2.08
HPC	88.96	11.664	0.8614	10119.725	2.1360	0.8988	-15377.0	31.54	30.39
HPT	12.12	4.281	0.9088	215.542	1.3547	0.8931	15377.0		
LPT	55.92	4.285	0.9112	88.174	1.3940	0.8944	11865.2		

TURBOMACHINERY MAP DATA

	WcMap	PRmap	effMap	NcMap	R/Parm	s_WcDes	s_PRdes	s_effDes	s_NcDes
Fan	1158.24	1.536	0.9091	3792.553	0.0586	0.8607	1.0235	0.9980	0.9905

LPC	142.79	2.452	0.8400	1.011	180.0000	1.2192	0.8536	1.0043	0.0003
HPC	80.91	11.162	0.8703	9849.708	12.9996	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.212	0.9088	1.298	4.2124	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.497	0.9180	0.994	3.4971	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3584.37	10550.5

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4678	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.7261	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	10978.7	7356.2	15377.0
LP_Shaft	3631.0	17162.7	11865.2

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.3826	963.62	232.24	30.886
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7575	963.62	232.24	7.208
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	928.83	223.64	38.829
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1142.37	276.97	88.328
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	928.83	223.64	38.829
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1303.96	318.26	135.353
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	928.83	223.64	38.829

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.3925	1303.96	318.26	132.235
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.4686	1303.96	318.26	74.264
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1303.96	318.26	135.353
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1303.96	318.26	135.353
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1303.96	318.26	135.353
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	535.51	128.23	8.027
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	535.51	128.23	8.027
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	535.51	128.23	8.027
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	535.51	128.23	8.027
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	535.51	128.23	8.027

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2594.42	0.9995	0.0230	1.00450	0.02104

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.084	0.9814	1.0000	0.9800	603.19	1.000	1522.5	3344.8
Byp_Nozz	2.321	0.9829	1.0000	0.9800	2002.63	1.000	1014.8	13292.0

```
**********************************************************************************************************************************
Date:02/23/11    Time:09:39:00    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  4/ 17/ 1/ 2    Run by: Philip C Jorgenson      PC:    69
Temperature Stator 1 inlet: 467.01    Stator 1 exit: 483.24    Stator 2 inlet: 485.95    Stator 2 exit: 495.12
            Stator 3 inlet: 535.26    Stator 3 exit: 542.58    Stator 4 inlet: 563.31    Stator 4 exit: 570.84
            Stator 5 inlet: 587.81    Stator 5 exit: 594.89               Stage2   Percent Blockage: 0.20

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    35000.0    22.00    431.17     5852.2    0.5944    3478.63    5.7761    779.49   25.484      8371.8       69.9   2561.2
2407.0   1666.0


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           431.17     5.185    466.40    111.64   0.0000   1158.79     3.458    415.85    3548.9   0.7800    1.40014
FS1   Inlet.Fl_O             431.17     5.185    466.40    111.64   0.0000   1158.79     4.174    438.36    4162.5   0.5656    1.40014
FS12  Splitter.Fl_02         367.54     5.183    466.40    111.64   0.0000    988.27     4.153    437.81    3526.9   0.5715    1.40014
FS2   Splitter.Fl_01          63.63     5.183    466.40    111.64   0.0000    171.10     4.266    441.17     637.7   0.5348    1.40014
FS14  Fan.Fl_O               367.54     7.945    533.80    127.81   0.0000    689.72     6.581    505.85    2600.0   0.5257    1.39975
FS25  LPC.Fl_O                63.63    11.560    609.02    145.88   0.0000     87.65    10.395    590.85     412.5   0.3926    1.39866
FS3   HPC.Fl_O                60.55   132.144   1293.56    315.58   0.0000     10.63   118.568   1256.69      49.7   0.4016    1.36268
FS36  Bleed3.Fl_O             46.92   132.144   1293.56    315.58   0.0000      8.24   124.277   1272.57      49.3   0.3013    1.36268
FS4   Burner.Fl_O             47.89   129.100   2561.21    682.64   0.0206     12.11   121.895   2527.88      74.8   0.2987    1.29499
FS45  HPT.Fl_O                63.85    30.136   1673.69    422.74   0.0154     55.94    27.117   1630.24     264.7   0.4007    1.33075
FS49  LPT.Fl_O                64.60     7.033   1197.20    294.80   0.0152    205.09     6.078   1151.89     851.6   0.4676    1.35821
FS5   TEGV.Fl_O               64.60     7.033   1197.20    294.80   0.0152    205.09     6.078   1151.89     851.6   0.4676    1.35821
FS8   Core_Nozz.Fl_O          64.60     7.033   1197.20    294.80   0.0152    205.09     3.750   1012.26     603.1   1.0000    1.35821
FS17  FanDuctLkg.Fl_O         367.54     7.945    533.80    127.81   0.0000    689.72     6.581    505.85    2600.0   0.5257    1.39975
FS171 Bleed15.Fl_O            367.54     7.945    533.80    127.81   0.0000    689.72     6.393    501.65    2475.2   0.5660    1.39975
FS172 FanDuct.Fl_O            367.54     7.945    533.80    127.81   0.0000    689.72     6.393    501.65    2475.2   0.5660    1.39975
FS173 Byp_Nozz.Fl_O           367.54     7.945    533.80    127.81   0.0000    689.72     4.213    444.84    2002.6   1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       988.27   1.533   0.9075   3795.991   1.1445    0.9115    -8409.2   70.70   30.51
LPC       171.10   2.231   0.8476   3795.991   1.3058    0.8643    -3082.1    3.02    2.30
HPC        87.65  11.431   0.8614  10084.806   2.1240    0.8985   -14907.4   32.46   31.23
HPT        12.11   4.284   0.9082    215.932   1.3558    0.8924    14907.8
LPT        55.94   4.285   0.9105     87.987   1.3949    0.8936    11490.6

TURBOMACHINERY MAP DATA
           WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan      1148.26   1.521   0.9093   3759.787    0.0580      0.8607    1.0235    0.9980    0.9905
```

LPC	140.65	2.419	0.8401	1.003	180.0000	1.2165	0.8673	1.0089	0.0003
HPC	79.73	10.939	0.8703	9815.720	12.9222	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.215	0.9082	1.300	4.2149	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.497	0.9172	0.992	3.4973	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3548.91	10446.1

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4676	851.64
FanDuct	0.0000	0.5660	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.7761	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	10928.0	7164.9	14907.8
LP_Shaft	3599.6	16765.6	11490.6

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.3416	957.51	230.73	30.136
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7445	957.51	230.73	7.033
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	923.16	222.24	38.089
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1133.98	274.85	86.322
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	923.16	222.24	38.089
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1293.56	315.58	132.144
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	923.16	222.24	38.089

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.2654	1293.56	315.58	129.100
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.3574	1293.56	315.58	72.493
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1293.56	315.58	132.144
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1293.56	315.58	132.144
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1293.56	315.58	132.144
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	533.80	127.81	7.945
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	533.80	127.81	7.945
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	533.80	127.81	7.945
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	533.80	127.81	7.945
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	533.80	127.81	7.945

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2561.21	0.9995	0.0230	0.96629	0.02059

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.034	0.9809	1.0000	0.9800	603.19	1.000	1512.4	3212.5
Byp_Nozz	2.297	0.9829	1.0000	0.9800	2002.63	1.000	1013.1	13085.8

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**********************************************************************************************************************************
Date:02/23/11    Time:09:41:39    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 34/ 2/ 5    Run by: Philip C Jorgenson      PC:   100
Temperature Stator 1 inlet: 452.23    Stator 1 exit: 470.61    Stator 2 inlet: 497.98    Stator 2 exit: 506.04
            Stator 3 inlet: 532.41    Stator 3 exit: 540.86    Stator 4 inlet: 565.90    Stator 4 exit: 573.85
            Stator 5 inlet: 594.02    Stator 5 exit: 601.77             Unblocked   Percent Blockage: 0.20

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    395.92      6923.3     0.5938    4111.05    5.2972    775.82   32.257      6923.3     100.0   2850.8
2674.6   1859.9


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O           395.92     4.283    462.03    110.60   0.0000   1282.11     2.854    411.97    3930.2  0.7800    1.40005
FS1   Inlet.Fl_O             395.92     4.283    462.03    110.60   0.0000   1282.11     3.157    423.48    4162.5  0.6750    1.40005
FS12  Splitter.Fl_02         333.05     4.281    462.03    110.60   0.0000   1079.05     3.180    424.41    3526.9  0.6660    1.40005
FS2   Splitter.Fl_01          62.87     4.281    462.03    110.60   0.0000    203.70     3.002    417.52     637.7  0.7305    1.40005
FS14  Fan.Fl_O               333.05     7.280    545.71    130.67   0.0000    689.60     6.031    517.14    2600.0  0.5257    1.39973
FS25  LPC.Fl_O                62.87    10.292    620.49    148.64   0.0000     98.19     8.942    596.10     412.5  0.4529    1.39833
FS3   HPC.Fl_O                59.82   138.163   1380.91    338.22   0.0000     10.38   124.715   1344.09      49.7  0.3909    1.35737
FS36  Bleed3.Fl_O             46.36   138.163   1380.91    338.22   0.0000      8.05   130.347   1359.87      49.3  0.2940    1.35737
FS4   Burner.Fl_O              47.50   134.981   2850.77    774.97   0.0246     12.13   127.426   2814.65      74.8  0.3004    1.28375
FS45  HPT.Fl_O                63.28    31.734   1869.08    478.84   0.0184     55.63    28.591   1822.28     264.7  0.3999    1.32018
FS49  LPT.Fl_O                64.01     7.404   1344.02    334.31   0.0182    204.54     6.404   1294.55     851.6  0.4682    1.34702
FS5   TEGV.Fl_O               64.01     7.404   1344.02    334.31   0.0182    204.54     6.404   1294.55     851.6  0.4682    1.34702
FS8   Core_Nozz.Fl_O          64.01     7.404   1344.02    334.31   0.0182    204.54     3.961   1141.54     603.2  1.0000    1.34702
FS17  FanDuctLkg.Fl_O        333.05     7.280    545.71    130.67   0.0000    689.60     6.031    517.14    2600.0  0.5257    1.39973
FS171 Bleed15.Fl_O           333.05     7.280    545.71    130.67   0.0000    689.60     5.857    512.85    2475.2  0.5662    1.39973
FS172 FanDuct.Fl_O           333.05     7.280    545.71    130.67   0.0000    689.60     5.857    512.85    2475.2  0.5662    1.39973
FS173 Byp_Nozz.Fl_O          333.05     7.280    545.71    130.67   0.0000    689.60     3.860    454.75    2002.6  1.0000    1.39973

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan        1079.05   1.701   0.9114   4139.491   1.1811    0.9169    -9460.9   36.81   23.19
LPC         203.70   2.404   0.8363   4139.491   1.3430    0.8542    -3384.0    3.06    2.59
HPC          98.19  13.424   0.8581  10422.002   2.2255    0.8979   -16455.1   25.06   24.31
HPT          12.13   4.253   0.9119    213.496   1.3446    0.8972    16455.1
LPT          55.63   4.286   0.9157     90.370   1.3868    0.8998    12844.9

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        1253.75   1.685   0.9132   4100.011    0.0638      0.8607    1.0235    0.9980    0.9905
```

LPC	166.92	2.761	0.8444	1.093	180.0000	1.2204	0.7974	0.9904	0.0003
HPC	89.31	12.839	0.8669	10143.919	13.5911	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.185	0.9119	1.285	4.1851	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.498	0.9225	1.018	3.4980	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3930.20	9547.0

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4682	851.64
FanDuct	0.0000	0.5662	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.2972	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11399.1	7581.6	16455.1
LP_Shaft	3906.9	17267.5	12844.9

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.3137	1008.68	243.43	31.734
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7356	1008.68	243.43	7.404
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.51	233.95	38.424
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1204.38	292.72	89.572
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.51	233.95	38.424
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1380.91	338.22	138.163
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.51	233.95	38.424

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.1788	1380.91	338.22	134.981
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.2816	1380.91	338.22	75.924
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.91	338.22	138.163
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.91	338.22	138.163
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.91	338.22	138.163
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2850.77	0.9995	0.0230	1.14196	0.02463

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.594	0.9805	1.0000	0.9800	603.19	1.000	1600.1	3851.3
Byp_Nozz	2.551	0.9825	1.0000	0.9800	2002.63	1.000	1024.4	12619.0

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**********************************************************************************************************************
Date:02/23/11    Time:09:42:47    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    84
Temperature Stator 1 inlet: 457.73    Stator 1 exit: 474.77    Stator 2 inlet: 499.37    Stator 2 exit: 507.76
            Stator 3 inlet: 531.51    Stator 3 exit: 539.93    Stator 4 inlet: 562.42    Stator 4 exit: 570.18
            Stator 5 inlet: 588.47    Stator 5 exit: 595.87             Unblocked   Percent Blockage: 0.20

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    376.28      5815.6    0.5868    3412.43    5.4803    775.82   28.782      6923.3       84.0   2672.3
2509.4   1739.6


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           376.28     4.283    462.03    110.60   0.0000   1218.51     2.854    411.97    3735.2   0.7800    1.40005
FS1   Inlet.Fl_O             376.28     4.283    462.03    110.60   0.0000   1218.51     3.321    429.63    4162.5   0.6142    1.40005
FS12  Splitter.Fl_02         318.22     4.281    462.03    110.60   0.0000   1030.99     3.323    429.78    3526.9   0.6128    1.40005
FS2   Splitter.Fl_01          58.07     4.281    462.03    110.60   0.0000    188.13     3.297    428.81     637.7   0.6226    1.40005
FS14  Fan.Fl_O               318.22     6.897    536.70    128.51   0.0000    689.71     5.713    508.59    2600.0   0.5258    1.39974
FS25  LPC.Fl_O                58.07    10.070    611.78    146.54   0.0000     92.03     8.936    591.27     412.5   0.4169    1.39851
FS3   HPC.Fl_O                 55.25   123.281   1325.63    323.86   0.0000     10.53   110.896   1288.86      49.7   0.3971    1.36070
FS36  Bleed3.Fl_O              42.82   123.281   1325.63    323.86   0.0000      8.16   116.096   1304.67      49.3   0.2982    1.36070
FS4   Burner.Fl_O              43.77   120.442   2672.29    717.67   0.0221     12.12   113.709   2637.85      74.8   0.2995    1.29062
FS45  HPT.Fl_O                 58.33    28.209   1747.86    443.85   0.0165     55.79    25.399   1703.18     264.7   0.4002    1.32655
FS49  LPT.Fl_O                 59.01     6.576   1252.23    309.49   0.0163    204.91     5.685   1205.32     851.6   0.4679    1.35391
FS5   TEGV.Fl_O                59.01     6.576   1252.23    309.49   0.0163    204.91     5.685   1205.32     851.6   0.4679    1.35391
FS8   Core_Nozz.Fl_O           59.01     6.576   1252.23    309.49   0.0163    204.91     3.511   1060.58     603.2   1.0000    1.35391
FS17  FanDuctLkg.Fl_O         318.22     6.897    536.70    128.51   0.0000    689.71     5.713    508.59    2600.0   0.5258    1.39974
FS171 Bleed15.Fl_O            318.22     6.897    536.70    128.51   0.0000    689.71     5.550    504.37    2475.2   0.5661    1.39974
FS172 FanDuct.Fl_O            318.22     6.897    536.70    128.51   0.0000    689.71     5.550    504.37    2475.2   0.5661    1.39974
FS173 Byp_Nozz.Fl_O           318.22     6.897    536.70    128.51   0.0000    689.71     3.658    447.25    2002.6   1.0000    1.39974

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan        1030.99   1.611   0.9119   3951.096   1.1616    0.9164    -8064.8   54.89   26.94
LPC         188.13   2.352   0.8599   3951.096   1.3241    0.8757    -2953.0    1.70    1.34
HPC          92.03  12.242   0.8603  10205.131   2.1669    0.8985   -14214.5   29.22   28.26
HPT          12.12   4.270   0.9102    214.402   1.3516    0.8949    14214.5
LPT          55.79   4.289   0.9131     89.198   1.3924    0.8965    11017.8

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        1197.89   1.597   0.9138   3913.413    0.0608      0.8607    1.0235    0.9980    0.9905
```

LPC	150.68	2.572	0.8397	1.044	180.0000	1.2486	0.8603	1.0241	0.0003
HPC	83.70	11.712	0.8692	9932.834	13.2001	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.201	0.9102	1.291	4.2008	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.501	0.9199	1.005	3.5005	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3735.23	9073.4

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4679	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.4803	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11083.3	6735.9	14214.5
LP_Shaft	3729.1	15517.6	11017.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.1368	975.57	235.20	28.209
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6794	975.57	235.20	6.576
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.74	226.34	34.977
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1159.48	281.31	80.261
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.74	226.34	34.977
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1325.63	323.86	123.281
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.74	226.34	34.977

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.6300	1325.63	323.86	120.442
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.8014	1325.63	323.86	67.685
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.63	323.86	123.281
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.63	323.86	123.281
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.63	323.86	123.281
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2672.29	0.9995	0.0230	0.94790	0.02214

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.304	0.9817	1.0000	0.9800	603.19	1.000	1545.9	3232.0
Byp_Nozz	2.417	0.9830	1.0000	0.9800	2002.63	1.000	1015.9	11657.0

```
**********************************************************************************************************************************
Date:02/23/11    Time:09:43:47    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    79
Temperature Stator 1 inlet: 459.04    Stator 1 exit: 475.75    Stator 2 inlet: 499.73    Stator 2 exit: 508.17
            Stator 3 inlet: 531.31    Stator 3 exit: 539.73    Stator 4 inlet: 561.62    Stator 4 exit: 569.34
            Stator 5 inlet: 587.19    Stator 5 exit: 594.51             Unblocked   Percent Blockage: 0.20

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    370.94      5524.7    0.5863    3239.05    5.5398    775.82   27.859      6923.3       79.8   2626.4
2466.9   1709.0


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           370.94     4.283    462.03    110.60   0.0000   1201.21     2.854    411.97    3682.2   0.7800    1.40005
FS1   Inlet.Fl_O             370.94     4.283    462.03    110.60   0.0000   1201.21     3.360    431.07    4162.5   0.5995    1.40005
FS12  Splitter.Fl_02         314.22     4.281    462.03    110.60   0.0000   1018.04     3.357    431.04    3526.9   0.5997    1.40005
FS2   Splitter.Fl_01          56.72     4.281    462.03    110.60   0.0000    183.77     3.361    431.20     637.7   0.5981    1.40005
FS14  Fan.Fl_O               314.22     6.795    534.32    127.94   0.0000    689.72     5.629    506.34    2600.0   0.5257    1.39975
FS25  LPC.Fl_O                56.72     9.999    609.71    146.04   0.0000     90.39     8.918    590.14     412.5   0.4077    1.39858
FS3   HPC.Fl_O                53.97   119.328   1311.33    320.17   0.0000     10.57   107.238   1274.57      49.7   0.3987    1.36157
FS36  Bleed3.Fl_O             41.83   119.328   1311.33    320.17   0.0000      8.19   112.317   1290.39      49.3   0.2994    1.36157
FS4   Burner.Fl_O             42.73   116.580   2626.37    703.14   0.0215     12.12   110.065   2592.38      74.8   0.2992    1.29240
FS45  HPT.Fl_O                56.96    27.280   1717.09    435.07   0.0161     55.83    24.558   1672.96     264.7   0.4002    1.32830
FS49  LPT.Fl_O                57.62     6.358   1228.96    303.27   0.0159    205.01     5.495   1182.71     851.6   0.4679    1.35567
FS5   TEGV.Fl_O               57.62     6.358   1228.96    303.27   0.0159    205.01     5.495   1182.71     851.6   0.4679    1.35567
FS8   Core_Nozz.Fl_O          57.62     6.358   1228.96    303.27   0.0159    205.01     3.393   1040.14     603.2   1.0000    1.35567
FS17  FanDuctLkg.Fl_O         314.22     6.795    534.32    127.94   0.0000    689.72     5.629    506.34    2600.0   0.5257    1.39975
FS171 Bleed15.Fl_O            314.22     6.795    534.32    127.94   0.0000    689.72     5.468    502.14    2475.2   0.5661    1.39975
FS172 FanDuct.Fl_O            314.22     6.795    534.32    127.94   0.0000    689.72     5.468    502.14    2475.2   0.5661    1.39975
FS173 Byp_Nozz.Fl_O           314.22     6.795    534.32    127.94   0.0000    689.72     3.604    445.27    2002.6   1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr      SMN      SMW
Fan       1018.04   1.587   0.9110   3904.444   1.1565   0.9153    -7710.4    58.36    27.99
LPC        183.77   2.336   0.8636   3904.444   1.3196   0.8791    -2844.8     2.07     1.61
HPC         90.39  11.934   0.8610  10159.695   2.1507   0.8987   -13634.6    30.42    29.36
HPT         12.12   4.274   0.9094    214.941   1.3532   0.8939    13634.8
LPT         55.83   4.291   0.9124     88.931   1.3939   0.8957    10555.2

TURBOMACHINERY MAP DATA
           WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1182.84   1.574   0.9129   3867.207    0.0599      0.8607    1.0235    0.9980    0.9905
```

LPC	147.66	2.526	0.8398	1.031	180.0000	1.2446	0.8752	1.0284	0.0003
HPC	82.21	11.419	0.8699	9888.610	13.0958	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.205	0.9094	1.294	4.2047	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.501	0.9191	1.002	3.5014	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3682.20	8944.6

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4679	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.5398	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11015.3	6501.1	13634.8
LP_Shaft	3685.1	15043.6	10555.2

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.0873	967.11	233.10	27.280
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6636	967.11	233.10	6.358
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.90	224.40	34.051
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1147.92	278.38	77.783
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.90	224.40	34.051
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1311.33	320.17	119.328
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.90	224.40	34.051

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.4764	1311.33	320.17	116.580
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.6670	1311.33	320.17	65.500
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.33	320.17	119.328
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.33	320.17	119.328
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.33	320.17	119.328
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2626.37	0.9995	0.0230	0.89974	0.02151

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.228	0.9816	1.0000	0.9800	603.19	1.000	1531.8	3068.5
Byp_Nozz	2.381	0.9831	1.0000	0.9800	2002.63	1.000	1013.6	11400.8

```
**********************************************************************************************************************
Date:02/23/11    Time:09:44:49    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    76
Temperature Stator 1 inlet: 459.90    Stator 1 exit: 476.37    Stator 2 inlet: 499.93    Stator 2 exit: 508.38
            Stator 3 inlet: 531.11    Stator 3 exit: 539.50    Stator 4 inlet: 560.99    Stator 4 exit: 568.66
            Stator 5 inlet: 586.21    Stator 5 exit: 593.46             Unblocked   Percent Blockage: 0.20

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780   39000.0    22.00    366.97     5317.1    0.5870    3120.94    5.5814    775.82   27.215      6923.3       76.8   2594.8
2437.8   1688.1


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          366.97     4.283    462.03    110.60   0.0000   1188.35     2.854    411.97    3642.8   0.7800    1.40005
FS1   Inlet.Fl_O            366.97     4.283    462.03    110.60   0.0000   1188.35     3.387    432.08    4162.5   0.5889    1.40005
FS12  Splitter.Fl_02        311.21     4.281    462.03    110.60   0.0000   1008.30     3.382    431.95    3526.9   0.5903    1.40005
FS2   Splitter.Fl_01         55.76     4.281    462.03    110.60   0.0000    180.65     3.405    432.77     637.7   0.5816    1.40005
FS14  Fan.Fl_O              311.21     6.720    532.72    127.55   0.0000    689.73     5.567    504.82    2600.0   0.5257    1.39975
FS25  LPC.Fl_O               55.76     9.941    608.24    145.69   0.0000     89.27     8.896    589.28     412.5   0.4014    1.39875
FS3   HPC.Fl_O               53.05   116.570   1301.48    317.62   0.0000     10.60   104.693   1264.74      49.7   0.3999    1.36219
FS36  Bleed3.Fl_O            41.12   116.570   1301.48    317.62   0.0000      8.21   109.684   1280.55      49.3   0.3001    1.36219
FS4   Burner.Fl_O            41.98   113.885   2594.81    693.21   0.0211     12.12   107.524   2561.13      74.8   0.2990    1.29364
FS45  HPT.Fl_O               55.97    26.631   1695.98    429.07   0.0157     55.85    23.972   1652.23     264.7   0.4002    1.32939
FS49  LPT.Fl_O               56.63     6.206   1213.08    299.04   0.0155    205.06     5.364   1167.29     851.6   0.4678    1.35689
FS5   TEGV.Fl_O              56.63     6.206   1213.08    299.04   0.0155    205.06     5.364   1167.29     851.6   0.4678    1.35689
FS8   Core_Nozz.Fl_O         56.63     6.206   1213.08    299.04   0.0155    205.06     3.311   1026.20     603.2   1.0000    1.35689
FS17  FanDuctLkg.Fl_O       311.21     6.720    532.72    127.55   0.0000    689.73     5.567    504.82    2600.0   0.5257    1.39975
FS171 Bleed15.Fl_O          311.21     6.720    532.72    127.55   0.0000    689.73     5.408    500.63    2475.2   0.5660    1.39975
FS172 FanDuct.Fl_O          311.21     6.720    532.72    127.55   0.0000    689.73     5.408    500.63    2475.2   0.5660    1.39975
FS173 Byp_Nozz.Fl_O         311.21     6.720    532.72    127.55   0.0000    689.73     3.564    443.93    2002.6   1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1008.30   1.570   0.9083   3871.407   1.1530   0.9125    -7466.5   60.55   28.78
LPC        180.65   2.322   0.8656   3871.407   1.3164   0.8810    -2768.5    2.35    1.81
HPC         89.27  11.727   0.8614  10128.406   2.1398   0.8988   -13235.1   31.26   30.13
HPT         12.12   4.276   0.9089    215.317   1.3544   0.8932    13234.9
LPT         55.85   4.291   0.9118     88.725   1.3948   0.8952    10235.7

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1171.52   1.557   0.9101   3834.484    0.0593      0.8607    1.0235    0.9980    0.9905
```

LPC	145.52	2.493	0.8399	1.023	180.0000	1.2414	0.8853	1.0305	0.0003
HPC	81.19	11.221	0.8703	9858.157	13.0238	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.207	0.9089	1.296	4.2075	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.502	0.9186	1.000	3.5018	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3642.80	8848.9

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4678	851.64
FanDuct	0.0000	0.5660	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.5814	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	10968.1	6337.6	13234.9
LP_Shaft	3653.9	14712.8	10235.7

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.0519	961.26	231.66	26.631
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6524	961.26	231.66	6.206
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1139.95	276.36	76.051
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.570
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.3665	1301.48	317.62	113.885
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.5709	1301.48	317.62	63.976
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.570
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.570
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.570
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2594.81	0.9995	0.0230	0.86693	0.02108

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.175	0.9814	1.0000	0.9800	603.19	1.000	1522.1	2954.4
Byp_Nozz	2.355	0.9831	1.0000	0.9800	2002.63	1.000	1012.1	11211.5

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**********************************************************************************************************************
Date:02/23/11    Time:09:45:31    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 469.18    Stator 1 exit: 477.65    Stator 2 inlet: 488.50    Stator 2 exit: 494.40
            Stator 3 inlet: 504.69    Stator 3 exit: 510.09    Stator 4 inlet: 519.59    Stator 4 exit: 524.22
            Stator 5 inlet: 532.18    Stator 5 exit: 536.26             Unblocked   Percent Blockage: 0.20

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780   39000.0    22.00    258.20      692.3    1.0453     723.69    9.5602    775.82    9.701      6923.3      10.0   1742.7
1647.8   1144.6


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          258.20     4.283    462.03    110.60   0.0000    836.13     2.854    411.97    2563.1   0.7800    1.40005
FS1   Inlet.Fl_O            258.20     4.283    462.03    110.60   0.0000    836.13     3.903    449.92    4162.5   0.3669    1.40005
FS12  Splitter.Fl_02        233.75     4.281    462.03    110.60   0.0000    757.33     3.839    447.87    3526.9   0.3976    1.40005
FS2   Splitter.Fl_01         24.45     4.281    462.03    110.60   0.0000     79.22     4.145    457.78     637.7   0.2154    1.40005
FS14  Fan.Fl_O              233.75     4.864    481.24    115.20   0.0000    680.26     4.058    456.95    2600.0   0.5154    1.40045
FS25  LPC.Fl_O               24.45     6.665    541.42    129.64   0.0000     55.08     6.419    535.63     412.5   0.2326    1.39974
FS3   HPC.Fl_O               23.26    41.553    988.56    238.42   0.0000     11.36    36.588    954.35      49.7   0.4328    1.38178
FS36  Bleed3.Fl_O            18.03    41.553    988.56    238.42   0.0000      8.80    38.703    969.32      49.3   0.3222    1.38178
FS4   Burner.Fl_O            18.23    40.596   1742.69    439.86   0.0111     12.10    38.342   1718.12      74.8   0.2940    1.33044
FS45  HPT.Fl_O               24.37     9.737   1148.85    280.62   0.0083     54.73     8.812   1118.49     264.7   0.3847    1.36585
FS49  LPT.Fl_O               24.65     3.293    896.35    216.92   0.0082    144.65     3.090    880.75     851.6   0.3045    1.38178
FS5   TEGV.Fl_O              24.65     3.293    896.35    216.92   0.0082    144.65     3.090    880.75     851.6   0.3045    1.38178
FS8   Core_Nozz.Fl_O         24.65     3.293    896.35    216.92   0.0082    144.65     2.854    861.44     603.2   0.4602    1.38178
FS17  FanDuctLkg.Fl_O       233.75     4.864    481.24    115.20   0.0000    680.26     4.058    456.95    2600.0   0.5154    1.40045
FS171 Bleed15.Fl_O          233.75     4.864    481.24    115.20   0.0000    680.26     3.948    453.36    2475.2   0.5544    1.40045
FS172 FanDuct.Fl_O          233.75     4.864    481.24    115.20   0.0000    680.26     3.948    453.36    2475.2   0.5544    1.40045
FS173 Byp_Nozz.Fl_O         233.75     4.864    481.24    115.20   0.0000    680.26     2.854    413.51    2002.6   0.9054    1.40045

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       757.33   1.136   0.9061   2620.820   1.0416    0.9086    -1523.8  ---.--   54.85
LPC        79.22   1.557   0.7933   2620.820   1.1718    0.8030     -658.9    7.65    4.40
HPC        55.08   6.234   0.8208   8994.320   1.8259    0.8592    -3671.9   60.09   56.89
HPT        12.10   4.169   0.8769    220.130   1.3656    0.8550     3671.9
LPT        54.73   2.957   0.8551     72.978   1.2796    0.8359     2182.7

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        879.93   1.133   0.9079   2595.825    0.0415      0.8607    1.0235    0.9980    0.9905
```

LPC	78.89	1.585	0.8407	0.692	180.0000	1.0041	0.9525	0.9436	0.0003
HPC	50.09	5.988	0.8293	8754.330	11.0422	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.102	0.8769	1.325	4.1025	12.6513	0.9790	1.0000	0.0003
LPT	0.84	2.488	0.8614	0.822	2.4879	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2563.08	6226.1

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.3045	851.64
FanDuct	0.0000	0.5544	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5602	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9189.5	2098.6	3671.9
LP_Shaft	2473.6	4634.5	2182.7

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.8998	766.96	184.03	9.737
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2861	766.96	184.03	3.293
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.55	178.59	14.341
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	882.81	212.32	28.296
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.55	178.59	14.341
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	988.56	238.42	41.553
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.55	178.59	14.341

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7918	988.56	238.42	40.596
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.4429	988.56	238.42	22.945
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.56	238.42	41.553
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.56	238.42	41.553
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.56	238.42	41.553
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1742.69	0.9995	0.0230	0.20102	0.01115

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.154	0.9800	1.0000	0.9800	603.19	0.460	645.1	494.3
Byp_Nozz	1.704	0.9800	1.0000	0.9800	2002.63	0.905	884.2	6424.1

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**********************************************************************************************************************
Date:02/23/11    Time:09:46:35    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 24/ 37/ 1/22    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 446.06    Stator 1 exit: 464.18    Stator 2 inlet: 491.18    Stator 2 exit: 499.09
            Stator 3 inlet: 525.10    Stator 3 exit: 533.40    Stator 4 inlet: 558.10    Stator 4 exit: 565.92
            Stator 5 inlet: 585.82    Stator 5 exit: 593.43             Unblocked   Percent Blockage: 0.20

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.730    38334.0    22.00     392.61      7006.3     0.5732    4016.13    5.2949    726.09   32.285      7006.3     100.0   2817.0
2642.6   1835.8


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           392.61     4.218    455.81    109.10   0.0000   1282.23     2.947    411.97    4033.0   0.7300    1.39992
FS1   Inlet.Fl_O             392.61     4.218    455.81    109.10   0.0000   1282.23     3.109    417.78    4162.5   0.6751    1.39992
FS12  Splitter.Fl_02         330.24     4.216    455.81    109.10   0.0000   1079.08     3.131    418.70    3526.9   0.6661    1.39992
FS2   Splitter.Fl_01          62.37     4.216    455.81    109.10   0.0000    203.80     2.955    411.82     637.7   0.7314    1.39992
FS14  Fan.Fl_O               330.24     7.170    538.45    128.93   0.0000    689.69     5.939    510.25    2600.0   0.5258    1.39974
FS25  LPC.Fl_O                62.37    10.121    611.81    146.55   0.0000     98.36     8.787    587.64     412.5   0.4540    1.39851
FS3   HPC.Fl_O                59.34   136.188   1363.75    333.75   0.0000     10.38   122.930   1327.31      49.7   0.3908    1.35840
FS36  Bleed3.Fl_O             45.99   136.188   1363.75    333.75   0.0000      8.05   128.483   1342.93      49.3   0.2939    1.35840
FS4   Burner.Fl_O             47.11   133.052   2816.99    764.12   0.0243     12.13   125.604   2781.18      74.8   0.3003    1.28497
FS45  HPT.Fl_O                62.76    31.263   1844.87    471.85   0.0181     55.64    28.165   1798.54     264.7   0.3998    1.32138
FS49  LPT.Fl_O                63.48     7.289   1325.40    329.27   0.0179    204.60     6.304   1276.45     851.6   0.4681    1.34834
FS5   TEGV.Fl_O               63.48     7.289   1325.40    329.27   0.0179    204.60     6.304   1276.45     851.6   0.4681    1.34834
FS8   Core_Nozz.Fl_O          63.48     7.289   1325.40    329.27   0.0179    204.60     3.898   1125.12     603.2   1.0000    1.34834
FS17  FanDuctLkg.Fl_O         330.24     7.170    538.45    128.93   0.0000    689.69     5.939    510.25    2600.0   0.5258    1.39974
FS171 Bleed15.Fl_O            330.24     7.170    538.45    128.93   0.0000    689.69     5.768    506.02    2475.2   0.5662    1.39974
FS172 FanDuct.Fl_O            330.24     7.170    538.45    128.93   0.0000    689.69     5.768    506.02    2475.2   0.5662    1.39974
FS173 Byp_Nozz.Fl_O           330.24     7.170    538.45    128.93   0.0000    689.69     3.802    448.71    2002.6   1.0000    1.39974

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1079.08   1.700   0.9114   4139.480   1.1813    0.9166    -9263.3   36.81   23.20
LPC        203.80   2.401   0.8356   4139.480   1.3422    0.8549    -3304.3    3.06    2.59
HPC         98.36  13.456   0.8580  10428.478   2.2290    0.8979   -16118.6   24.96   24.22
HPT         12.13   4.256   0.9118    213.399   1.3459    0.8970    16118.6
LPT         55.64   4.289   0.9153     90.346   1.3881    0.8994    12567.5

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1253.76   1.684   0.9132   4100.000    0.0638      0.8607    1.0235    0.9980    0.9905
```

LPC	166.92	2.761	0.8444	1.093	180.0000	1.2210	0.7955	0.9896	0.0003
HPC	89.45	12.869	0.8669	10150.222	13.6010	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.187	0.9118	1.285	4.1874	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.500	0.9221	1.018	3.5001	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	4033.02	8860.1

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4681	851.64
FanDuct	0.0000	0.5662	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.2949	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11326.2	7474.4	16118.6
LP_Shaft	3880.5	17009.5	12567.5

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.2952	995.51	240.15	31.263
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7297	995.51	240.15	7.289
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	957.76	230.79	37.856
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1189.08	288.82	88.283
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	957.76	230.79	37.856
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1363.75	333.75	136.188
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	957.76	230.79	37.856

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.1213	1363.75	333.75	133.052
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.2313	1363.75	333.75	74.829
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1363.75	333.75	136.188
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1363.75	333.75	136.188
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1363.75	333.75	136.188
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	538.45	128.93	7.170
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	538.45	128.93	7.170
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	538.45	128.93	7.170
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	538.45	128.93	7.170
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	538.45	128.93	7.170

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2816.99	0.9995	0.0230	1.11559	0.02426

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.474	0.9810	1.0000	0.9800	603.19	1.000	1589.3	3709.6
Byp_Nozz	2.433	0.9830	1.0000	0.9800	2002.63	1.000	1017.6	12156.8

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**********************************************************************************************************************************
Date:02/23/11    Time:09:47:15    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  3/ 16/ 1/ 1    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 462.60    Stator 1 exit: 470.64    Stator 2 inlet: 480.94    Stator 2 exit: 486.52
            Stator 3 inlet: 496.28    Stator 3 exit: 501.38    Stator 4 inlet: 507.30    Stator 4 exit: 511.75
            Stator 5 inlet: 522.26    Stator 5 exit: 525.90               Stage4   Percent Blockage: 0.20

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.730    38334.0    22.00    252.17      700.6    0.9979     699.11    9.5806    726.09    9.532      7006.3      10.0   1718.7
1624.3   1129.8


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           252.17     4.218    455.81    109.10   0.0000    823.58     2.947    411.97    2590.4   0.7300    1.39992
FS1   Inlet.Fl_O             252.17     4.218    455.81    109.10   0.0000    823.58     3.856    444.27    4162.5   0.3604    1.39992
FS12  Splitter.Fl_02         228.34     4.216    455.81    109.10   0.0000    746.11     3.795    442.33    3526.9   0.3905    1.39992
FS2   Splitter.Fl_01          23.83     4.216    455.81    109.10   0.0000     77.88     4.087    451.77     637.7   0.2116    1.39992
FS14  Fan.Fl_O               228.34     4.772    474.07    113.48   0.0000    672.25     4.005    450.90    2600.0   0.5068    1.40030
FS25  LPC.Fl_O                23.83     6.480    531.02    127.15   0.0000     54.69     6.244    525.43     412.5   0.2308    1.39976
FS3   HPC.Fl_O                22.68    40.208    968.70    233.50   0.0000     11.33    35.435    935.34      49.7   0.4311    1.38287
FS36  Bleed3.Fl_O             17.57    40.208    968.70    233.50   0.0000      8.78    37.466    949.93      49.3   0.3211    1.38287
FS4   Burner.Fl_O             17.77    39.282   1718.75    433.21   0.0110     12.10    37.099   1694.43      74.8   0.2940    1.33162
FS45  HPT.Fl_O                23.75     9.523   1134.05    276.82   0.0082     54.19     8.639   1104.71     264.7   0.3800    1.36683
FS49  LPT.Fl_O                24.03     3.349    893.44    216.19   0.0081    138.40     3.161    879.31     851.6   0.2899    1.38197
FS5   TEGV.Fl_O               24.03     3.349    893.44    216.19   0.0081    138.40     3.161    879.31     851.6   0.2899    1.38197
FS8   Core_Nozz.Fl_O          24.03     3.349    893.44    216.19   0.0081    138.40     2.947    862.26     603.2   0.4346    1.38197
FS17  FanDuctLkg.Fl_O        228.34     4.772    474.07    113.48   0.0000    672.25     4.005    450.90    2600.0   0.5068    1.40030
FS171 Bleed15.Fl_O           228.34     4.772    474.07    113.48   0.0000    672.25     3.901    447.53    2475.2   0.5445    1.40030
FS172 FanDuct.Fl_O           228.34     4.772    474.07    113.48   0.0000    672.25     3.901    447.53    2475.2   0.5445    1.40030
FS173 Byp_Nozz.Fl_O          228.34     4.772    474.07    113.48   0.0000    672.25     2.947    413.46    2002.6   0.8566    1.40030

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       746.11   1.132   0.9063   2573.530   1.0400    0.9087    -1414.7  ---.--   54.44
LPC        77.88   1.537   0.8024   2573.530   1.1650    0.8107     -608.4    7.69    2.60
HPC        54.69   6.205   0.8205   8981.965   1.8242    0.8589    -3499.3   59.86   56.63
HPT        12.10   4.125   0.8759    219.218   1.3629    0.8539     3499.3
LPT        54.19   2.844   0.8504     71.641   1.2670    0.8314     2023.1

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        866.90   1.129   0.9082   2548.985    0.0416      0.8607    1.0235    0.9980    0.9905
```

LPC	75.46	1.562	0.8323	0.680	180.0000	1.0321	0.9562	0.9641	0.0003
HPC	49.74	5.960	0.8290	8742.306	11.0607	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.059	0.8759	1.320	4.0592	12.6513	0.9790	1.0000	0.0003
LPT	0.83	2.402	0.8567	0.807	2.4016	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2590.42	5690.9

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2899	851.64
FanDuct	0.0000	0.5445	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5806	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9088.3	2022.2	3499.3
LP_Shaft	2412.5	4404.2	2023.1

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.8771	751.68	180.32	9.523
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2788	751.68	180.32	3.349
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	729.74	175.01	13.900
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	865.11	207.97	27.391
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	729.74	175.01	13.900
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	968.70	233.50	40.208
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	729.74	175.01	13.900

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7213	968.70	233.50	39.282
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.3812	968.70	233.50	22.260
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	968.70	233.50	40.208
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	968.70	233.50	40.208
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	968.70	233.50	40.208
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1718.75	0.9995	0.0230	0.19420	0.01105

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.136	0.9800	1.0000	0.9800	603.19	0.435	609.6	455.2
Byp_Nozz	1.619	0.9800	1.0000	0.9800	2002.63	0.857	836.4	5936.3

```
*****************************************************************************************************************************
Date:02/23/11    Time:09:48:59    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 460.57    Stator 1 exit: 468.47    Stator 2 inlet: 478.58    Stator 2 exit: 484.05
            Stator 3 inlet: 493.64    Stator 3 exit: 498.63    Stator 4 inlet: 504.42    Stator 4 exit: 508.78
            Stator 5 inlet: 519.11    Stator 5 exit: 522.67               Stage4   Percent Blockage: 0.20

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.714   37357.0    22.00    259.50      730.1    0.9827     717.45    9.5846    710.17    9.473      7300.7      10.0   1711.8
1617.5   1125.4


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O          259.50     4.357    453.91    108.65   0.0000    818.84     3.088    411.97    2600.4  0.7140    1.39988
FS1   Inlet.Fl_O            259.50     4.357    453.91    108.65   0.0000    818.84     3.987    442.57    4162.5  0.3580    1.39988
FS12  Splitter.Fl_02        234.98     4.355    453.91    108.65   0.0000    741.85     3.926    440.66    3526.9  0.3878    1.39988
FS2   Splitter.Fl_01         24.52     4.355    453.91    108.65   0.0000     77.40     4.223    449.93     637.7  0.2102    1.39988
FS14  Fan.Fl_O              234.98     4.923    471.87    112.96   0.0000    669.07     4.140    449.10    2600.0  0.5035    1.40026
FS25  LPC.Fl_O               24.52     6.656    527.80    126.37   0.0000     54.60     6.414    522.25     412.5  0.2304    1.39976
FS3   HPC.Fl_O               23.33    41.271    962.69    232.01   0.0000     11.32    36.384    929.60      49.7  0.4305    1.38319
FS36  Bleed3.Fl_O            18.08    41.271    962.69    232.01   0.0000      8.77    38.464    944.06      49.3  0.3207    1.38319
FS4   Burner.Fl_O            18.28    40.321   1711.76    431.27   0.0110     12.10    38.081   1687.51      74.8  0.2940    1.33197
FS45  HPT.Fl_O               24.43     9.807   1129.70    275.70   0.0082     54.02     8.903   1100.67     264.7  0.3785    1.36711
FS49  LPT.Fl_O               24.72     3.494    892.86    216.04   0.0081    136.41     3.304    879.19     851.6  0.2852    1.38201
FS5   TEGV.Fl_O              24.72     3.494    892.86    216.04   0.0081    136.41     3.304    879.19     851.6  0.2852    1.38201
FS8   Core_Nozz.Fl_O         24.72     3.494    892.86    216.04   0.0081    136.41     3.089    862.80     603.2  0.4267    1.38201
FS17  FanDuctLkg.Fl_O       234.98     4.923    471.87    112.96   0.0000    669.07     4.140    449.10    2600.0  0.5035    1.40026
FS171 Bleed15.Fl_O          234.98     4.923    471.87    112.96   0.0000    669.07     4.035    445.80    2475.2  0.5407    1.40026
FS172 FanDuct.Fl_O          234.98     4.923    471.87    112.96   0.0000    669.07     4.035    445.80    2475.2  0.5407    1.40026
FS173 Byp_Nozz.Fl_O         234.98     4.923    471.87    112.96   0.0000    669.07     3.088    413.45    2002.6  0.8410    1.40026

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       741.85   1.130   0.9065   2556.445   1.0396    0.9088    -1432.3  ---.--   54.25
LPC        77.40   1.529   0.8029   2556.445   1.1628    0.8108     -614.8    7.70    2.49
HPC        54.60   6.201   0.8204   8979.273   1.8240    0.8590    -3575.4   59.75   56.52
HPT        12.10   4.111   0.8756    218.931   1.3621    0.8537     3575.4
LPT        54.02   2.807   0.8489     71.153   1.2629    0.8300     2047.1

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        861.95   1.128   0.9083   2532.063    0.0416      0.8607    1.0235    0.9980    0.9905
```

LPC	74.22	1.553	0.8293	0.675	180.0000	1.0429	0.9554	0.9683	0.0003
HPC	49.66	5.956	0.8289	8739.685	11.0684	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.046	0.8756	1.318	4.0459	12.6513	0.9790	1.0000	0.0003
LPT	0.83	2.374	0.8552	0.802	2.3737	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2600.38	5727.8

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2852	851.64
FanDuct	0.0000	0.5407	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5846	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9057.9	2073.2	3575.4
LP_Shaft	2391.5	4495.7	2047.1

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.9022	747.01	179.19	9.807
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2868	747.01	179.19	3.494
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.22	173.91	14.271
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	859.73	206.66	28.117
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.22	173.91	14.271
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	962.69	232.01	41.271
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.22	173.91	14.271

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7993	962.69	232.01	40.321
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.4494	962.69	232.01	22.867
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	962.69	232.01	41.271
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	962.69	232.01	41.271
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	962.69	232.01	41.271
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1711.76	0.9995	0.0230	0.19929	0.01102

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.131	0.9800	1.0000	0.9800	603.19	0.427	598.6	459.9
Byp_Nozz	1.594	0.9800	1.0000	0.9800	2002.63	0.841	821.3	5998.0

```
**********************************************************************************************************************************
Date:02/23/11    Time:09:50:38    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  3/ 16/ 1/ 1    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 462.20    Stator 1 exit: 469.78    Stator 2 inlet: 479.49    Stator 2 exit: 484.71
            Stator 3 inlet: 493.91    Stator 3 exit: 498.68    Stator 4 inlet: 504.16    Stator 4 exit: 508.30
            Stator 5 inlet: 518.27    Stator 5 exit: 521.64               Stage4   Percent Blockage: 0.20

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.669   34281.0    22.00    282.90      832.3    0.9465     787.78    9.5960    670.64    9.283      8322.3      10.0   1715.1
1620.1   1129.1


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          282.90     4.846    455.82    109.11   0.0000    804.34     3.578    418.42    2631.9   0.6690    1.39992
FS1   Inlet.Fl_O            282.90     4.846    455.82    109.11   0.0000    804.34     4.451    444.89    4162.5   0.3506    1.39992
FS12  Splitter.Fl_02        256.21     4.843    455.82    109.11   0.0000    728.79     4.385    443.06    3526.9   0.3796    1.39992
FS2   Splitter.Fl_01         26.70     4.843    455.82    109.11   0.0000     75.95     4.702    451.99     637.7   0.2060    1.39992
FS14  Fan.Fl_O              256.21     5.452    473.24    113.29   0.0000    659.68     4.616    451.25    2600.0   0.4936    1.40029
FS25  LPC.Fl_O               26.70     7.277    526.72    126.11   0.0000     54.34     7.015    521.24     412.5   0.2292    1.39976
FS3   HPC.Fl_O               25.40    44.983    959.97    231.34   0.0000     11.29    39.684    927.14      49.7   0.4292    1.38334
FS36  Bleed3.Fl_O            19.69    44.983    959.97    231.34   0.0000      8.75    41.938    941.48      49.3   0.3199    1.38334
FS4   Burner.Fl_O            19.91    43.947   1715.09    432.23   0.0111     12.11    41.504   1690.80      74.8   0.2941    1.33175
FS45  HPT.Fl_O               26.61    10.795   1133.45    276.67   0.0083     53.54     9.819   1104.94     264.7   0.3746    1.36683
FS49  LPT.Fl_O               26.92     3.997    904.32    218.90   0.0082    130.67     3.799    891.72     851.6   0.2721    1.38121
FS5   TEGV.Fl_O              26.92     3.997    904.32    218.90   0.0082    130.67     3.799    891.72     851.6   0.2721    1.38121
FS8   Core_Nozz.Fl_O         26.92     3.997    904.32    218.90   0.0082    130.67     3.578    876.90     603.1   0.4045    1.38121
FS17  FanDuctLkg.Fl_O       256.21     5.452    473.24    113.29   0.0000    659.68     4.616    451.25    2600.0   0.4936    1.40029
FS171 Bleed15.Fl_O          256.21     5.452    473.24    113.29   0.0000    659.68     4.504    448.12    2475.2   0.5295    1.40029
FS172 FanDuct.Fl_O          256.21     5.452    473.24    113.29   0.0000    659.68     4.504    448.12    2475.2   0.5295    1.40029
FS173 Byp_Nozz.Fl_O         256.21     5.452    473.24    113.29   0.0000    659.68     3.578    419.87    2002.6   0.7976    1.40029

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       728.79   1.126   0.9067   2502.598   1.0382    0.9089    -1514.7  ---.--   53.74
LPC        75.95   1.502   0.8048   2502.598   1.1555    0.8120     -642.4    7.76    2.32
HPC        54.34   6.182   0.8202   8970.882   1.8225    0.8588    -3878.4   59.56   56.31
HPT        12.11   4.071   0.8760    218.291   1.3592    0.8542     3878.4
LPT        53.54   2.701   0.8462     69.686   1.2508    0.8280     2157.2

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        846.77   1.123   0.9085   2478.730    0.0417      0.8607    1.0235    0.9980    0.9905
```

LPC	70.30	1.527	0.8197	0.661	180.0000	1.0803	0.9537	0.9818	0.0003
HPC	49.42	5.938	0.8287	8731.518	11.0835	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.006	0.8760	1.314	4.0065	12.6513	0.9790	1.0000	0.0003
LPT	0.82	2.293	0.8525	0.785	2.2926	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2631.90	5896.9

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2721	851.64
FanDuct	0.0000	0.5295	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5960	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9040.2	2253.3	3878.4
LP_Shaft	2346.1	4829.2	2157.2

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.9825	745.09	178.72	10.795
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3124	745.09	178.72	3.997
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.38	173.46	15.572
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	857.38	206.08	30.655
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.38	173.46	15.572
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	959.97	231.34	44.983
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.38	173.46	15.572

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.0485	959.97	231.34	43.947
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.6675	959.97	231.34	24.984
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	959.97	231.34	44.983
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	959.97	231.34	44.983
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	959.97	231.34	44.983
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	473.24	113.29	5.452
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	473.24	113.29	5.452
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	473.24	113.29	5.452
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	473.24	113.29	5.452
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	473.24	113.29	5.452

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1715.09	0.9995	0.0230	0.21883	0.01111

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.117	0.9800	1.0000	0.9800	603.19	0.405	572.0	478.6
Byp_Nozz	1.524	0.9800	1.0000	0.9800	2002.63	0.798	784.9	6250.5

```
**********************************************************************************************************************************
Date:02/23/11    Time:09:52:26    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 471.61    Stator 1 exit: 478.79    Stator 2 inlet: 487.99    Stator 2 exit: 492.90
            Stator 3 inlet: 501.61    Stator 3 exit: 506.06    Stator 4 inlet: 514.11    Stator 4 exit: 517.89
            Stator 5 inlet: 524.61    Stator 5 exit: 527.91             Unblocked   Percent Blockage: 0.20

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.608    30029.0    22.00    314.03      995.1    0.9037     899.22    9.5609    620.50    9.019      9951.0       10.0   1742.1
1645.1   1149.0


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           314.03     5.599    465.62    111.46   0.0000    780.92     4.358    433.58    2686.1   0.6080    1.40012
FS1   Inlet.Fl_O             314.03     5.599    465.62    111.46   0.0000    780.92     5.172    455.17    4162.5   0.3387    1.40012
FS12  Splitter.Fl_02         284.30     5.597    465.62    111.46   0.0000    707.33     5.101    453.45    3526.9   0.3662    1.40012
FS2   Splitter.Fl_01          29.74     5.597    465.62    111.46   0.0000     73.98     5.442    461.91     637.7   0.2004    1.40012
FS14  Fan.Fl_O               284.30     6.259    482.58    115.52   0.0000    643.85     5.355    461.53    2600.0   0.4774    1.40048
FS25  LPC.Fl_O                29.74     8.179    532.86    127.59   0.0000     54.16     7.887    527.36     412.5   0.2284    1.39975
FS3   HPC.Fl_O                28.29    50.502    970.71    234.00   0.0000     11.26    44.587    937.75      49.7   0.4280    1.38276
FS36  Bleed3.Fl_O             21.93    50.502    970.71    234.00   0.0000      8.73    47.101    952.14      49.3   0.3190    1.38276
FS4   Burner.Fl_O             22.18    49.339   1742.08    439.81   0.0114     12.11    46.596   1717.48      74.8   0.2943    1.33030
FS45  HPT.Fl_O                29.64    12.253   1153.52    281.86   0.0085     53.01    11.170   1125.25     264.7   0.3704    1.36543
FS49  LPT.Fl_O                29.99     4.803    933.21    226.13   0.0084    123.08     4.593    921.82     851.6   0.2552    1.37919
FS5   TEGV.Fl_O               29.99     4.803    933.21    226.13   0.0084    123.08     4.593    921.82     851.6   0.2552    1.37919
FS8   Core_Nozz.Fl_O          29.99     4.803    933.21    226.13   0.0084    123.08     4.358    908.70     603.2   0.3769    1.37919
FS17  FanDuctLkg.Fl_O        284.30     6.259    482.58    115.52   0.0000    643.85     5.355    461.53    2600.0   0.4774    1.40048
FS171 Bleed15.Fl_O           284.30     6.259    482.58    115.52   0.0000    643.85     5.237    458.60    2475.2   0.5112    1.40048
FS172 FanDuct.Fl_O           284.30     6.259    482.58    115.52   0.0000    643.85     5.237    458.60    2475.2   0.5112    1.40048
FS173 Byp_Nozz.Fl_O          284.30     6.259    482.58    115.52   0.0000    643.85     4.358    435.01    2002.6   0.7395    1.40048

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan         707.33   1.118   0.9068   2417.235   1.0364    0.9090    -1636.1  ---.--   52.80
LPC          73.98   1.461   0.8034   2417.235   1.1444    0.8103     -678.7    7.89    2.03
HPC          54.16   6.175   0.8202   8965.211   1.8217    0.8586    -4368.2   59.28   56.02
HPT          12.11   4.027   0.8777    217.715   1.3556    0.8565     4368.2
LPT          53.01   2.551   0.8434     67.433   1.2334    0.8253     2314.8

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         821.83   1.116   0.9086   2394.181    0.0420      0.8607    1.0235    0.9980    0.9905
```

LPC	64.10	1.485	0.8046	0.638	180.0000	1.1541	0.9513	0.9985	0.0003
HPC	49.25	5.931	0.8286	8725.999	11.1033	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.963	0.8777	1.311	3.9629	12.6513	0.9790	1.0000	0.0003
LPT	0.82	2.179	0.8497	0.760	2.1793	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2686.13	6056.4

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2552	851.64
FanDuct	0.0000	0.5112	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5609	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9087.0	2524.7	4368.2
LP_Shaft	2290.3	5308.4	2314.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.0943	753.61	180.79	12.253
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3479	753.61	180.79	4.803
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	867.08	208.46	34.419
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.3952	970.71	234.00	49.339
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.9709	970.71	234.00	28.126
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1742.08	0.9995	0.0230	0.24978	0.01139

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.102	0.9800	1.0000	0.9800	603.19	0.377	542.0	505.2
Byp_Nozz	1.436	0.9800	1.0000	0.9800	2002.63	0.739	740.8	6546.3

```
****************************************************************************************************************************************
Date:02/23/11    Time:09:54:06    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 482.09    Stator 1 exit: 488.87    Stator 2 inlet: 497.56    Stator 2 exit: 502.14
            Stator 3 inlet: 507.25    Stator 3 exit: 511.40    Stator 4 inlet: 522.02    Stator 4 exit: 525.33
            Stator 5 inlet: 531.66    Stator 5 exit: 534.71               Stage3   Percent Blockage: 0.20

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.552   25666.0    22.00    348.92     1194.7    0.8597    1027.07    9.4684    573.44    8.758     11946.9       10.0   1764.7
1666.3   1166.1


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           348.92     6.507    476.52    114.07   0.0000    755.31     5.297    449.14    2752.6   0.5520    1.40035
FS1   Inlet.Fl_O             348.92     6.507    476.52    114.07   0.0000    755.31     6.045    466.59    4162.5   0.3260    1.40035
FS12  Splitter.Fl_02         315.59     6.504    476.52    114.07   0.0000    683.50     5.971    465.00    3526.9   0.3517    1.40035
FS2   Splitter.Fl_01          33.33     6.504    476.52    114.07   0.0000     72.19     6.333    472.90     637.7   0.1953    1.40035
FS14  Fan.Fl_O               315.59     7.231    493.16    118.06   0.0000    625.37     6.258    473.18    2600.0   0.4591    1.40071
FS25  LPC.Fl_O                33.33     9.280    539.34    129.14   0.0000     53.82     8.954    533.84     412.5   0.2269    1.39974
FS3   HPC.Fl_O                31.71    56.987    980.90    236.52   0.0000     11.25    50.334    947.75      49.7   0.4273    1.38220
FS36  Bleed3.Fl_O             24.58    56.987    980.90    236.52   0.0000      8.72    53.161    962.22      49.3   0.3186    1.38220
FS4   Burner.Fl_O             24.86    55.675   1764.68    446.17   0.0116     12.11    52.579   1739.83      74.8   0.2944    1.32911
FS45  HPT.Fl_O                33.23    13.954   1170.70    286.31   0.0087     52.57    12.743   1142.62     264.7   0.3669    1.36425
FS49  LPT.Fl_O                33.62     5.768    959.48    232.72   0.0086    116.50     5.543    949.09     851.6   0.2407    1.37759
FS5   TEGV.Fl_O               33.62     5.768    959.48    232.72   0.0086    116.50     5.543    949.09     851.6   0.2407    1.37759
FS8   Core_Nozz.Fl_O          33.62     5.768    959.48    232.72   0.0086    116.50     5.297    937.35     603.2   0.3533    1.37759
FS17  FanDuctLkg.Fl_O        315.59     7.231    493.16    118.06   0.0000    625.37     6.258    473.18    2600.0   0.4591    1.40071
FS171 Bleed15.Fl_O           315.59     7.231    493.16    118.06   0.0000    625.37     6.134    470.48    2475.2   0.4907    1.40071
FS172 FanDuct.Fl_O           315.59     7.231    493.16    118.06   0.0000    625.37     6.134    470.48    2475.2   0.4907    1.40071
FS173 Byp_Nozz.Fl_O          315.59     7.231    493.16    118.06   0.0000    625.37     5.297    450.56    2002.6   0.6873    1.40071

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       683.50   1.112   0.9066   2329.937   1.0349    0.9089    -1781.0  ---.--   51.54
LPC        72.19   1.427   0.8183   2329.937   1.1318    0.8249     -710.8    8.09    1.72
HPC        53.82   6.141   0.8196   8954.371   1.8187    0.8579    -4941.1   59.31   56.02
HPT        12.11   3.990   0.8789    217.363   1.3525    0.8583     4941.1
LPT        52.57   2.419   0.8398     65.270   1.2173    0.8225     2491.8

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        794.15   1.109   0.9085   2307.715    0.0424      0.8607    1.0235    0.9980    0.9905
```

LPC	57.76	1.442	0.7891	0.615	180.0000	1.2498	0.9652	1.0370	0.0003
HPC	48.95	5.898	0.8281	8715.447	11.1053	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.927	0.8789	1.309	3.9269	12.6513	0.9790	1.0000	0.0003
LPT	0.81	2.079	0.8460	0.736	2.0790	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2752.62	6218.8

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2407	851.64
FanDuct	0.0000	0.4907	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.4684	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9131.0	2842.1	4941.1
LP_Shaft	2233.2	5860.3	2491.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.2266	762.02	182.83	13.954
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3900	762.02	182.83	5.768
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	739.89	177.46	19.776
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	876.44	210.75	38.858
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	739.89	177.46	19.776
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	980.90	236.52	56.987
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	739.89	177.46	19.776

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.8057	980.90	236.52	55.675
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	3.3301	980.90	236.52	31.811
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	980.90	236.52	56.987
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	980.90	236.52	56.987
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	980.90	236.52	56.987
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.231
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.231
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.231
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.231
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.231

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1764.68	0.9995	0.0230	0.28530	0.01161

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.089	0.9800	1.0000	0.9800	603.19	0.353	515.8	538.9
Byp_Nozz	1.365	0.9800	1.0000	0.9800	2002.63	0.687	700.9	6874.6

```
**********************************************************************************************************************************
Date:02/23/11    Time:09:55:46    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  7/ 20/ 1/ 5    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 496.91    Stator 1 exit: 503.30    Stator 2 inlet: 508.58    Stator 2 exit: 512.83
            Stator 3 inlet: 523.45    Stator 3 exit: 527.09    Stator 4 inlet: 534.26    Stator 4 exit: 537.49
            Stator 5 inlet: 543.44    Stator 5 exit: 546.23               Stage2   Percent Blockage: 0.20

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.490   20047.0    22.00    399.49     1508.8    0.8127    1226.27    9.3107    520.34    8.457     15087.9      10.0   1799.3
1698.7   1192.2


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN      gamt
FS0   Ambient.Fl_O          399.49     7.913    491.73    117.72   0.0000    722.43     6.740    469.18    2851.3   0.4900   1.40068
FS1   Inlet.Fl_O            399.49     7.913    491.73    117.72   0.0000    722.43     7.403    482.46    4162.5   0.3099   1.40068
FS12  Splitter.Fl_02        360.75     7.909    491.73    117.72   0.0000    652.69     7.323    481.03    3526.9   0.3333   1.40068
FS2   Splitter.Fl_01         38.75     7.909    491.73    117.72   0.0000     70.10     7.713    488.23     637.7   0.1894   1.40068
FS14  Fan.Fl_O              360.75     8.767    508.18    121.66   0.0000    598.57     7.703    489.74    2600.0   0.4337   1.40000
FS25  LPC.Fl_O               38.75    10.994    550.19    131.75   0.0000     53.34    10.614    544.69     412.5   0.2248   1.39972
FS3   HPC.Fl_O               36.87    66.916    997.80    240.72   0.0000     11.23    59.131    964.25      49.7   0.4267   1.38128
FS36  Bleed3.Fl_O            28.57    66.916    997.80    240.72   0.0000      8.70    62.439    978.89      49.3   0.3181   1.38128
FS4   Burner.Fl_O            28.91    65.375   1799.25    455.92   0.0119     12.11    61.740   1774.02      74.8   0.2946   1.32731
FS45  HPT.Fl_O               38.63    16.583   1196.93    293.12   0.0089     52.01    15.178   1169.01     264.7   0.3626   1.36247
FS49  LPT.Fl_O               39.09     7.255    994.57    241.57   0.0088    109.63     7.007    985.15     851.6   0.2257   1.37544
FS5   TEGV.Fl_O              39.09     7.255    994.57    241.57   0.0088    109.63     7.007    985.15     851.6   0.2257   1.37544
FS8   Core_Nozz.Fl_O         39.09     7.255    994.57    241.57   0.0088    109.63     6.740    974.68     603.2   0.3295   1.37544
FS17  FanDuctLkg.Fl_O       360.75     8.767    508.18    121.66   0.0000    598.57     7.703    489.74    2600.0   0.4337   1.40000
FS171 Bleed15.Fl_O          360.75     8.767    508.18    121.66   0.0000    598.57     7.571    487.32    2475.2   0.4624   1.40000
FS172 FanDuct.Fl_O          360.75     8.767    508.18    121.66   0.0000    598.57     7.571    487.32    2475.2   0.4624   1.40000
FS173 Byp_Nozz.Fl_O         360.75     8.767    508.18    121.66   0.0000    598.57     6.740    470.67    2002.6   0.6310   1.40000

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       652.69   1.108   0.9089   2234.928   1.0334    0.9078    -2013.4  ---.--   49.22
LPC        70.10   1.390   0.8282   2234.928   1.1189    0.8357     -769.2    8.44    1.36
HPC        53.34   6.087   0.8187   8938.643   1.8135    0.8573    -5828.8   59.48   56.14
HPT        12.11   3.942   0.8806    217.039   1.3484    0.8605     5828.8
LPT        52.01   2.286   0.8362     62.900   1.2004    0.8205     2782.6

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        758.35   1.106   0.9108   2213.613    0.0433      0.8607    1.0235    0.9980    0.9905
```

LPC	50.86	1.396	0.7722	0.590	180.0000	1.3784	0.9857	1.0725	0.0003
HPC	48.51	5.847	0.8272	8700.139	11.1000	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.880	0.8806	1.307	3.8805	12.6513	0.9790	1.0000	0.0003
LPT	0.80	1.977	0.8424	0.709	1.9773	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2851.28	6460.9

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2257	851.64
FanDuct	0.0000	0.4624	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.3107	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9206.3	3325.3	5828.8
LP_Shaft	2176.1	6715.9	2782.6

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.4258	776.02	186.23	16.583
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.4533	776.02	186.23	7.255
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.58	180.79	23.297
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	891.97	214.57	45.666
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.58	180.79	23.297
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	997.80	240.72	66.916
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.58	180.79	23.297

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	4.4240	997.80	240.72	65.375
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	3.8711	997.80	240.72	37.466
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	997.80	240.72	66.916
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	997.80	240.72	66.916
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	997.80	240.72	66.916
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1799.25	0.9995	0.0230	0.34063	0.01192

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.076	0.9800	1.0000	0.9800	603.19	0.329	490.1	595.4
Byp_Nozz	1.301	0.9800	1.0000	0.9800	2002.63	0.631	657.7	7374.3

```
**********************************************************************************************************************************
Date:02/23/11    Time:09:57:38    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 21/ 1/ 6    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 507.42    Stator 1 exit: 513.49    Stator 2 inlet: 523.64    Stator 2 exit: 527.52
            Stator 3 inlet: 534.83    Stator 3 exit: 538.43    Stator 4 inlet: 545.18    Stator 4 exit: 548.21
            Stator 5 inlet: 553.81    Stator 5 exit: 556.41               Stage1   Percent Blockage: 0.20

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.446   15435.0    22.00    442.57     1740.5    0.7944    1382.69    9.2959    481.90    8.020     17405.9      10.0   1819.5
1717.6   1210.9


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN      gamt
FS0   Ambient.Fl_O           442.57     9.311    504.97    120.89   0.0000    689.26     8.149    485.63    2919.8  0.4460   1.40036
FS1   Inlet.Fl_O             442.57     9.311    504.97    120.89   0.0000    689.26     8.769    496.39    4162.5  0.2939   1.40036
FS12  Splitter.Fl_02         399.59     9.306    504.97    120.89   0.0000    622.63     8.684    495.08    3526.9  0.3158   1.40036
FS2   Splitter.Fl_01          42.99     9.306    504.97    120.89   0.0000     66.98     9.097    501.70     637.7  0.1806   1.40036
FS14  Fan.Fl_O               399.59    10.281    520.79    124.69   0.0000    572.32     9.159    503.86    2600.0  0.4099   1.39977
FS25  LPC.Fl_O                42.99    12.639    559.75    134.04   0.0000     51.92    12.226    554.47     412.5  0.2184   1.39970
FS3   HPC.Fl_O                40.90    74.677   1006.95    242.99   0.0000     11.22    66.014    973.23      49.7  0.4260   1.38055
FS36  Bleed3.Fl_O             31.70    74.677   1006.95    242.99   0.0000      8.69    69.694    987.94      49.3  0.3177   1.38055
FS4   Burner.Fl_O              32.08    72.957   1819.45    461.65   0.0121     12.10    68.900   1793.99      74.8  0.2947   1.32649
FS45  HPT.Fl_O                42.87    18.869   1215.74    298.02   0.0090     51.11    17.331   1188.57     264.7  0.3554   1.36110
FS49  LPT.Fl_O                43.37     8.692   1022.90    248.73   0.0089    102.98     8.430   1014.43     851.6  0.2114   1.37337
FS5   TEGV.Fl_O               43.37     8.692   1022.90    248.73   0.0089    102.98     8.430   1014.43     851.6  0.2114   1.37337
FS8   Core_Nozz.Fl_O          43.37     8.692   1022.90    248.73   0.0089    102.98     8.149   1005.16     603.3  0.3072   1.37337
FS17  FanDuctLkg.Fl_O        399.59    10.281    520.79    124.69   0.0000    572.32     9.159    503.86    2600.0  0.4099   1.39977
FS171 Bleed15.Fl_O           399.59    10.281    520.79    124.69   0.0000    572.32     9.023    501.71    2475.2  0.4360   1.39977
FS172 FanDuct.Fl_O           399.59    10.281    520.79    124.69   0.0000    572.32     9.023    501.71    2475.2  0.4360   1.39977
FS173 Byp_Nozz.Fl_O          399.59    10.281    520.79    124.69   0.0000    572.32     8.149    487.09    2002.6  0.5880   1.39977

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       622.63   1.105   0.9099   2144.661   1.0313    0.9114    -2146.8  ---.--   46.99
LPC        66.98   1.358   0.8338   2144.661   1.1085    0.8420     -799.9    8.94    0.99
HPC        51.92   5.909   0.8155   8891.637   1.7989    0.8542    -6465.5   60.52   57.00
HPT        12.10   3.866   0.8811    216.553   1.3420    0.8613     6465.5
LPT        51.11   2.171   0.8323     60.691   1.1854    0.8170     2946.7

TURBOMACHINERY MAP DATA
           WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       723.42   1.102   0.9118   2124.207    0.0442      0.8607    1.0235    0.9980    0.9905
```

LPC	44.30	1.352	0.7562	0.566	180.0000	1.5121	1.0187	1.1026	0.0003
HPC	47.22	5.677	0.8240	8654.387	11.0536	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.806	0.8811	1.304	3.8061	12.6513	0.9790	1.0000	0.0003
LPT	0.79	1.890	0.8385	0.684	1.8901	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2919.82	6628.9

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2114	851.64
FanDuct	0.0000	0.4360	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.2959	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9237.1	3676.2	6465.5
LP_Shaft	2116.2	7313.5	2946.7

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.5819	785.42	188.52	18.869
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.5029	785.42	188.52	8.692
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	763.00	183.07	26.287
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	901.25	216.85	51.102
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	763.00	183.07	26.287
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1006.95	242.99	74.677
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	763.00	183.07	26.287

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	4.9081	1006.95	242.99	72.957
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	4.2947	1006.95	242.99	42.019
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1006.95	242.99	74.677
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1006.95	242.99	74.677
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1006.95	242.99	74.677
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.281
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.281
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.281
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.281
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.281

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1819.45	0.9995	0.0230	0.38408	0.01212

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.067	0.9800	1.0000	0.9800	603.19	0.307	463.7	625.1
Byp_Nozz	1.262	0.9800	1.0000	0.9800	2002.63	0.588	623.6	7744.3

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****************************************************************************************************************************************
Date:02/23/11    Time:09:59:42    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 12/ 25/ 1/10    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 523.48    Stator 1 exit: 529.04    Stator 2 inlet: 536.15    Stator 2 exit: 539.83
            Stator 3 inlet: 546.53    Stator 3 exit: 549.79    Stator 4 inlet: 555.99    Stator 4 exit: 558.70
            Stator 5 inlet: 563.83    Stator 5 exit: 566.16             Unblocked   Percent Blockage: 0.20

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.406    10735.0    22.00    489.85     2003.2    0.7777    1557.96    9.2910    446.20    7.554     20032.3       10.0   1842.0
1738.8   1230.8


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           489.85    11.019    518.95    124.25   0.0000    653.50     9.822    502.39    2996.0   0.4060    1.39978
FS1   Inlet.Fl_O             489.85    11.019    518.95    124.25   0.0000    653.50    10.446    511.10    4162.5   0.2772    1.39978
FS12  Splitter.Fl_02         442.25    11.013    518.95    124.25   0.0000    590.29    10.357    509.92    3526.9   0.2976    1.39978
FS2   Splitter.Fl_01          47.60    11.013    518.95    124.25   0.0000     63.53    10.791    515.93     637.7   0.1710    1.39978
FS14  Fan.Fl_O               442.25    12.085    534.12    127.89   0.0000    545.75    10.900    518.61    2600.0   0.3868    1.39975
FS25  LPC.Fl_O                47.60    14.441    569.62    136.41   0.0000     50.76    13.990    564.49     412.5   0.2133    1.39968
FS3   HPC.Fl_O                45.29    83.232   1017.61    245.65   0.0000     11.20    73.605    983.68      49.7   0.4255    1.37981
FS36  Bleed3.Fl_O             35.10    83.232   1017.61    245.65   0.0000      8.68    77.695    998.48      49.3   0.3174    1.37981
FS4   Burner.Fl_O             35.53    81.315   1842.02    468.05   0.0123     12.10    76.796   1816.31      74.8   0.2947    1.32540
FS45  HPT.Fl_O                47.48    21.393   1235.67    303.23   0.0092     50.34    19.706   1209.07     264.7   0.3493    1.35973
FS49  LPT.Fl_O                48.03    10.389   1052.82    256.33   0.0091     96.80    10.114   1045.19     851.6   0.1982    1.37143
FS5   TEGV.Fl_O               48.03    10.389   1052.82    256.33   0.0091     96.80    10.114   1045.19     851.6   0.1982    1.37143
FS8   Core_Nozz.Fl_O          48.03    10.389   1052.82    256.33   0.0091     96.80     9.822   1036.94     603.2   0.2870    1.37143
FS17  FanDuctLkg.Fl_O         442.25    12.085    534.12    127.89   0.0000    545.75    10.900    518.61    2600.0   0.3868    1.39975
FS171 Bleed15.Fl_O            442.25    12.085    534.12    127.89   0.0000    545.75    10.760    516.69    2475.2   0.4108    1.39975
FS172 FanDuct.Fl_O            442.25    12.085    534.12    127.89   0.0000    545.75    10.760    516.69    2475.2   0.4108    1.39975
FS173 Byp_Nozz.Fl_O           442.25    12.085    534.12    127.89   0.0000    545.75     9.822    503.75    2002.6   0.5491    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       590.29   1.097   0.9093   2034.264   1.0292    0.9108    -2279.5  ---.--   45.03
LPC        63.53   1.311   0.8186   2034.264   1.0976    0.8270     -819.3    9.96    0.51
HPC        50.76   5.764   0.8128   8853.260   1.7865    0.8515    -7178.3   61.41   57.72
HPT        12.10   3.801   0.8818    216.174   1.3364    0.8624     7178.3
LPT        50.34   2.059   0.8287     57.886   1.1704    0.8140     3098.8

TURBOMACHINERY MAP DATA
           WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       685.85   1.095   0.9111   2014.862    0.0450      0.8607    1.0235    0.9980    0.9905
```

LPC	36.28	1.298	0.7366	0.537	180.0000	1.7514	1.0460	1.1113	0.0003
HPC	46.17	5.539	0.8212	8617.034	11.0151	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.742	0.8818	1.301	3.7422	12.6513	0.9790	1.0000	0.0003
LPT	0.77	1.805	0.8348	0.652	1.8052	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2995.97	6793.5

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.1982	851.64
FanDuct	0.0000	0.4108	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.2910	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9277.9	4063.6	7178.3
LP_Shaft	2034.8	7998.3	3098.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.7517	795.75	191.03	21.393
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.5569	795.75	191.03	10.389
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	911.76	219.43	57.091
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	5.4350	1017.61	245.65	81.315
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	4.7557	1017.61	245.65	47.040
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1842.02	0.9995	0.0230	0.43277	0.01233

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.058	0.9800	1.0000	0.9800	603.19	0.287	439.7	656.4
Byp_Nozz	1.230	0.9800	1.0000	0.9800	2002.63	0.549	592.2	8140.3

25% Blockage

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*****************************************************************************************************************************
Date:02/23/11    Time:10:19:18    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 34/ 2/ 5    Run by: Philip C Jorgenson      PC:   100
Temperature Stator 1 inlet: 456.56    Stator 1 exit: 475.13    Stator 2 inlet: 502.77    Stator 2 exit: 510.93
            Stator 3 inlet: 537.55    Stator 3 exit: 546.10    Stator 4 inlet: 571.37    Stator 4 exit: 579.42
            Stator 5 inlet: 599.78    Stator 5 exit: 607.62             Unblocked   Percent Blockage: 0.25

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.780   35000.0    22.00    477.01     8371.9    0.5976    5003.20    5.2999    779.49   32.229      8371.8     100.0   2874.1
2696.7   1876.6


                                        FLOW STATION DATA
                                 W        Pt        Tt       ht     FAR       Wc        Ps        Ts     Aphy      MN      gamt
FS0   Ambient.Fl_O          477.01     5.185    466.40   111.64  0.0000  1281.99     3.458    415.85   3926.2  0.7800   1.40014
FS1   Inlet.Fl_O            477.01     5.185    466.40   111.64  0.0000  1281.99     3.822    427.49   4162.5  0.6748   1.40014
FS12  Splitter.Fl_02        401.29     5.183    466.40   111.64  0.0000  1079.03     3.850    428.42   3526.9  0.6660   1.40014
FS2   Splitter.Fl_01         75.72     5.183    466.40   111.64  0.0000   203.59     3.638    421.57    637.7  0.7295   1.40014
FS14  Fan.Fl_O              401.29     8.814    550.80   131.90  0.0000   689.50     7.302    521.98   2600.0  0.5256   1.39972
FS25  LPC.Fl_O               75.72    12.470    626.53   150.09  0.0000    98.07    10.840    601.99    412.5  0.4522   1.39820
FS3   HPC.Fl_O               72.04   167.116   1392.78   341.31  0.0000    10.38   150.851   1355.71     49.7  0.3910   1.35667
FS36  Bleed3.Fl_O            55.83   167.116   1392.78   341.31  0.0000     8.05   157.663   1371.60     49.3  0.2941   1.35667
FS4   Burner.Fl_O            57.22   163.267   2874.15   782.49  0.0249    12.13   154.128   2837.81     74.8  0.3005   1.28295
FS45  HPT.Fl_O               76.22    38.400   1885.85   483.69  0.0186    55.62    34.596   1838.73    264.7  0.4000   1.31936
FS49  LPT.Fl_O               77.11     8.963   1356.88   337.80  0.0184   204.50     7.752   1307.05    851.6  0.4682   1.34611
FS5   TEGV.Fl_O              77.11     8.963   1356.88   337.80  0.0184   204.50     7.752   1307.05    851.6  0.4682   1.34611
FS8   Core_Nozz.Fl_O         77.11     8.963   1356.88   337.80  0.0184   204.50     4.796   1152.89    603.2  1.0000   1.34611
FS17  FanDuctLkg.Fl_O       401.29     8.814    550.80   131.90  0.0000   689.50     7.302    521.98   2600.0  0.5256   1.39972
FS171 Bleed15.Fl_O          401.29     8.814    550.80   131.90  0.0000   689.50     7.092    517.65   2475.2  0.5661   1.39972
FS172 FanDuct.Fl_O          401.29     8.814    550.80   131.90  0.0000   689.50     7.092    517.65   2475.2  0.5661   1.39972
FS173 Byp_Nozz.Fl_O         401.29     8.814    550.80   131.90  0.0000   689.50     4.672    458.99   2002.6  1.0000   1.39972

TURBOMACHINERY PERFORMANCE DATA
               Wc      PR      eff         Nc       TR   efPoly        pwr     SMN     SMW
Fan       1079.03   1.701   0.9114   4139.514   1.1810   0.9171   -11498.7   36.79   23.18
LPC        203.59   2.406   0.8368   4139.514   1.3433   0.8537    -4118.9    3.06    2.59
HPC         98.07  13.401   0.8581  10417.139   2.2230   0.8978   -19988.3   25.13   24.38
HPT         12.13   4.252   0.9120    213.560   1.3438   0.8973    19988.3
LPT         55.62   4.284   0.9159     90.391   1.3860   0.9002    15617.7

TURBOMACHINERY MAP DATA
```

	WcMap	PRmap	effMap	NcMap	R/Parm	s_WcDes	s_PRdes	s_effDes	s_NcDes
Fan	1253.73	1.685	0.9132	4100.034	0.0638	0.8607	1.0235	0.9980	0.9905
LPC	166.92	2.761	0.8444	1.093	180.0000	1.2197	0.7986	0.9910	0.0003
HPC	89.19	12.817	0.8670	10139.185	13.5840	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.183	0.9120	1.286	4.1834	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.497	0.9227	1.019	3.4967	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3926.21	11556.7

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4682	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.2999	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11449.2	9169.3	19988.3
LP_Shaft	3925.4	20896.4	15617.7

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.7864	1017.82	245.70	38.400
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.8859	1017.82	245.70	8.963
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	979.36	236.14	46.492
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1214.97	295.42	108.350
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	979.36	236.14	46.492
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	979.36	236.14	46.492

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	8.6453	1392.78	341.31	163.267
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	7.5649	1392.78	341.31	91.843
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2874.15	0.9995	0.0230	1.38978	0.02489

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.592	0.9805	1.0000	0.9800	603.19	1.000	1607.6	4659.7
Byp_Nozz	2.549	0.9823	1.0000	0.9800	2002.63	1.000	1029.2	15268.9

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**********************************************************************************************************************
Date:02/23/11    Time:10:20:51    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  7/ 33/ 2/ 4    Run by: Philip C Jorgenson      PC:    75
Temperature Stator 1 inlet: 466.49    Stator 1 exit: 483.38    Stator 2 inlet: 470.66    Stator 2 exit: 478.59
            Stator 3 inlet: 535.60    Stator 3 exit: 542.24    Stator 4 inlet: 563.79    Stator 4 exit: 571.22
            Stator 5 inlet: 588.77    Stator 5 exit: 595.81               Stage2   Percent Blockage: 0.25

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    35000.0    22.00     439.62      6329.1     0.5968    3776.98    5.7383    779.49   26.596      8371.8       75.6   2649.7
2488.7   1724.0


                                        FLOW STATION DATA
                                    W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O             439.62     5.185    466.40    111.64   0.0000   1181.50     3.458    415.85    3618.5   0.7800    1.40014
FS1   Inlet.Fl_O               439.62     5.185    466.40    111.64   0.0000   1181.50     4.118    436.69    4162.5   0.5834    1.40014
FS12  Splitter.Fl_02           374.38     5.183    466.40    111.64   0.0000   1006.67     4.099    436.18    3526.9   0.5887    1.40014
FS2   Splitter.Fl_01            65.24     5.183    466.40    111.64   0.0000    175.43     4.203    439.31     637.7   0.5553    1.40014
FS14  Fan.Fl_O                 374.38     8.120    537.36    128.67   0.0000    689.70     6.726    509.21    2600.0   0.5258    1.39974
FS25  LPC.Fl_O                  65.24    11.394    611.29    146.42   0.0000     91.35    10.132    591.16     412.5   0.4131    1.39852
FS3   HPC.Fl_O                  62.08   137.907   1320.04    322.42   0.0000     10.55   123.980   1283.20      49.7   0.3981    1.36104
FS36  Bleed3.Fl_O               48.11   137.907   1320.04    322.42   0.0000      8.18   129.830   1299.05      49.3   0.2990    1.36104
FS4   Burner.Fl_O               49.16   134.731   2649.75    710.51   0.0218     12.12   127.202   2615.53      74.8   0.2993    1.29151
FS45  HPT.Fl_O                  65.53    31.470   1732.17    439.36   0.0163     55.92    28.318   1687.55     264.7   0.4012    1.32745
FS49  LPT.Fl_O                  66.29     7.354   1241.58    306.63   0.0161    204.95     6.357   1194.97     851.6   0.4679    1.35473
FS5   TEGV.Fl_O                 66.29     7.354   1241.58    306.63   0.0161    204.95     6.357   1194.97     851.6   0.4679    1.35473
FS8   Core_Nozz.Fl_O            66.29     7.354   1241.58    306.63   0.0161    204.95     3.926   1051.21     603.2   1.0000    1.35473
FS17  FanDuctLkg.Fl_O          374.38     8.120    537.36    128.67   0.0000    689.70     6.726    509.21    2600.0   0.5258    1.39974
FS171 Bleed15.Fl_O             374.38     8.120    537.36    128.67   0.0000    689.70     6.533    504.99    2475.2   0.5661    1.39974
FS172 FanDuct.Fl_O             374.38     8.120    537.36    128.67   0.0000    689.70     6.533    504.99    2475.2   0.5661    1.39974
FS173 Byp_Nozz.Fl_O            374.38     8.120    537.36    128.67   0.0000    689.70     4.306    447.80    2002.6   1.0000    1.39974

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1006.67   1.567   0.9080   3865.496   1.1521    0.9124    -9017.4   60.96   28.92
LPC        175.43   2.199   0.8173   3865.496   1.3107    0.8369    -3210.5    2.40    1.85
HPC         91.35  12.103   0.8607  10185.935   2.1594    0.8987   -15851.6   29.84   28.83
HPT         12.12   4.281   0.9098    214.821   1.3530    0.8944    15851.6
LPT         55.92   4.279   0.9119     88.073   1.3918    0.8951    12227.9

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1169.63   1.554   0.9098   3828.630    0.0592      0.8607    1.0235    0.9980    0.9905
```

LPC	145.14	2.487	0.8399	1.021	180.0000	1.2087	0.8058	0.9731	0.0003
HPC	83.08	11.580	0.8696	9914.150	13.1452	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.212	0.9098	1.293	4.2122	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.493	0.9186	0.993	3.4927	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3618.48	10650.9

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4679	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.7383	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11058.1	7528.8	15851.6
LP_Shaft	3665.5	17520.7	12227.9

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.4009	972.42	234.42	31.470
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7633	972.42	234.42	7.354
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	936.85	225.62	39.227
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1155.04	280.18	89.833
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	936.85	225.62	39.227
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1320.04	322.42	137.907
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	936.85	225.62	39.227

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.4494	1320.04	322.42	134.731
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.5184	1320.04	322.42	75.666
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1320.04	322.42	137.907
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1320.04	322.42	137.907
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1320.04	322.42	137.907
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	537.36	128.67	8.120
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	537.36	128.67	8.120
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	537.36	128.67	8.120
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	537.36	128.67	8.120
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	537.36	128.67	8.120

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2649.75	0.9995	0.0230	1.04916	0.02181

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.127	0.9815	1.0000	0.9800	603.19	1.000	1539.5	3454.0
Byp_Nozz	2.348	0.9829	1.0000	0.9800	2002.63	1.000	1016.5	13526.0

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**********************************************************************************************************************
Date:02/23/11    Time:10:21:52    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    72
Temperature Stator 1 inlet: 467.02    Stator 1 exit: 483.62    Stator 2 inlet: 473.11    Stator 2 exit: 481.61
            Stator 3 inlet: 535.32    Stator 3 exit: 542.05    Stator 4 inlet: 563.18    Stator 4 exit: 570.61
            Stator 5 inlet: 587.85    Stator 5 exit: 594.86               Stage2   Percent Blockage: 0.25

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780   35000.0    22.00    435.19     6086.3    0.5966    3630.91    5.7772    779.49   25.983      8371.8      72.7   2612.5
2454.2   1699.3


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O          435.19     5.185    466.40    111.64   0.0000   1169.60     3.458    415.85    3582.0  0.7800    1.40014
FS1   Inlet.Fl_O            435.19     5.185    466.40    111.64   0.0000   1169.60     4.148    437.58    4162.5  0.5740    1.40014
FS12  Splitter.Fl_02        370.98     5.183    466.40    111.64   0.0000    997.52     4.127    437.01    3526.9  0.5800    1.40014
FS2   Splitter.Fl_01         64.21     5.183    466.40    111.64   0.0000    172.67     4.244    440.51     637.7  0.5421    1.40014
FS14  Fan.Fl_O              370.98     8.033    535.64    128.26   0.0000    689.72     6.654    507.59    2600.0  0.5258    1.39975
FS25  LPC.Fl_O               64.21    11.374    609.78    146.06   0.0000     89.96    10.158    590.42     412.5  0.4053    1.39857
FS3   HPC.Fl_O               61.10   134.731   1308.51    319.44   0.0000     10.59   121.030   1271.68      49.7  0.3995    1.36175
FS36  Bleed3.Fl_O            47.35   134.731   1308.51    319.44   0.0000      8.20   126.788   1287.53      49.3  0.2999    1.36175
FS4   Burner.Fl_O            48.36   131.628   2612.48    698.74   0.0213     12.12   124.275   2578.63      74.8  0.2991    1.29296
FS45  HPT.Fl_O               64.47    30.728   1707.31    432.28   0.0159     55.94    27.649   1663.17     264.7  0.4011    1.32883
FS49  LPT.Fl_O               65.22     7.178   1222.78    301.61   0.0157    205.03     6.204   1176.71     851.6  0.4678    1.35617
FS5   TEGV.Fl_O              65.22     7.178   1222.78    301.61   0.0157    205.03     6.204   1176.71     851.6  0.4678    1.35617
FS8   Core_Nozz.Fl_O         65.22     7.178   1222.78    301.61   0.0157    205.03     3.830   1034.70     603.2  1.0000    1.35617
FS17  FanDuctLkg.Fl_O       370.98     8.033    535.64    128.26   0.0000    689.72     6.654    507.59    2600.0  0.5258    1.39975
FS171 Bleed15.Fl_O          370.98     8.033    535.64    128.26   0.0000    689.72     6.463    503.38    2475.2  0.5661    1.39975
FS172 FanDuct.Fl_O          370.98     8.033    535.64    128.26   0.0000    689.72     6.463    503.38    2475.2  0.5661    1.39975
FS173 Byp_Nozz.Fl_O         370.98     8.033    535.64    128.26   0.0000    689.72     4.260    446.37    2002.6  1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       997.52   1.550   0.9072   3831.482   1.1485    0.9114    -8719.6   63.89   29.70
LPC       172.67   2.195   0.8238   3831.482   1.3074    0.8428    -3127.0    2.70    2.07
HPC        89.96  11.846   0.8612  10147.377   2.1459    0.8988   -15369.8   30.85   29.75
HPT        12.12   4.284   0.9091    215.263   1.3543    0.8936    15369.8
LPT        55.94   4.281   0.9112     87.931   1.3930    0.8944    11846.5

TURBOMACHINERY MAP DATA
           WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan      1159.00   1.537   0.9090   3794.940    0.0586      0.8607    1.0235    0.9980    0.9905
```

LPC	142.94	2.454	0.8400	1.012	180.0000	1.2079	0.8216	0.9807	0.0003
HPC	81.82	11.335	0.8701	9876.621	13.0584	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.215	0.9092	1.296	4.2146	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.494	0.9179	0.991	3.4939	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3582.02	10543.6

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4678	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.7772	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11002.6	7336.8	15369.8
LP_Shaft	3633.3	17124.9	11846.5

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.3631	965.67	232.75	30.728
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7513	965.67	232.75	7.178
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	930.61	224.08	38.512
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1145.75	277.83	87.855
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	930.61	224.08	38.512
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1308.51	319.44	134.731
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	930.61	224.08	38.512

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.3320	1308.51	319.44	131.628
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.4157	1308.51	319.44	73.913
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1308.51	319.44	134.731
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1308.51	319.44	134.731
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1308.51	319.44	134.731
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	535.64	128.26	8.033
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	535.64	128.26	8.033
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	535.64	128.26	8.033
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	535.64	128.26	8.033
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	535.64	128.26	8.033

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2612.48	0.9995	0.0230	1.00859	0.02130

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.076	0.9814	1.0000	0.9800	603.19	1.000	1528.1	3322.1
Byp_Nozz	2.323	0.9829	1.0000	0.9800	2002.63	1.000	1014.9	13307.8

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**********************************************************************************************************************************
Date:02/23/11    Time:10:22:52    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    69
Temperature Stator 1 inlet: 467.56    Stator 1 exit: 483.89    Stator 2 inlet: 475.33    Stator 2 exit: 484.22
            Stator 3 inlet: 535.07    Stator 3 exit: 541.88    Stator 4 inlet: 562.62    Stator 4 exit: 570.04
            Stator 5 inlet: 586.99    Stator 5 exit: 593.97               Stage2   Percent Blockage: 0.25

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.780   35000.0    22.00    430.93     5851.9    0.5966    3490.99    5.8220    779.49   25.376      8371.8      69.9   2576.9
2421.4   1675.9


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN      gamt
FS0   Ambient.Fl_O          430.93     5.185    466.40    111.64   0.0000   1158.13     3.458    415.85    3546.9  0.7800   1.40014
FS1   Inlet.Fl_O            430.93     5.185    466.40    111.64   0.0000   1158.13     4.175    438.41    4162.5  0.5651   1.40014
FS12  Splitter.Fl_02        367.76     5.183    466.40    111.64   0.0000    988.86     4.152    437.76    3526.9  0.5720   1.40014
FS2   Splitter.Fl_01         63.17     5.183    466.40    111.64   0.0000    169.85     4.283    441.68     637.7  0.5290   1.40014
FS14  Fan.Fl_O              367.76     7.950    533.92    127.84   0.0000    689.72     6.586    505.96    2600.0  0.5257   1.39975
FS25  LPC.Fl_O               63.17    11.350    608.37    145.72   0.0000     88.58    10.178    589.75     412.5  0.3976   1.39874
FS3   HPC.Fl_O               60.10   131.585   1297.50    316.59   0.0000     10.62   118.115   1260.67      49.7  0.4008   1.36244
FS36  Bleed3.Fl_O            46.58   131.585   1297.50    316.59   0.0000      8.23   123.778   1276.53      49.3  0.3008   1.36244
FS4   Burner.Fl_O            47.55   128.554   2576.90    687.56   0.0208     12.12   121.376   2543.41      74.8  0.2989   1.29437
FS45  HPT.Fl_O               63.40    29.995   1683.67    425.58   0.0155     55.96    26.986   1639.97     264.7  0.4011   1.33014
FS49  LPT.Fl_O               64.14     7.005   1205.02    296.89   0.0154    205.09     6.054   1159.47     851.6  0.4677   1.35757
FS5   TEGV.Fl_O              64.14     7.005   1205.02    296.89   0.0154    205.09     6.054   1159.47     851.6  0.4677   1.35757
FS8   Core_Nozz.Fl_O         64.14     7.005   1205.02    296.89   0.0154    205.09     3.736   1019.13     603.2  1.0000   1.35757
FS17  FanDuctLkg.Fl_O       367.76     7.950    533.92    127.84   0.0000    689.72     6.586    505.96    2600.0  0.5257   1.39975
FS171 Bleed15.Fl_O          367.76     7.950    533.92    127.84   0.0000    689.72     6.397    501.77    2475.2  0.5661   1.39975
FS172 FanDuct.Fl_O          367.76     7.950    533.92    127.84   0.0000    689.72     6.397    501.77    2475.2  0.5661   1.39975
FS173 Byp_Nozz.Fl_O         367.76     7.950    533.92    127.84   0.0000    689.72     4.216    444.94    2002.6  1.0000   1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       988.86   1.534   0.9074   3798.352   1.1448    0.9115    -8428.9   70.22   30.46
LPC       169.85   2.190   0.8295   3798.352   1.3044    0.8480    -3045.6    3.00    2.29
HPC        88.58  11.594   0.8614  10109.673   2.1327    0.8987   -14900.8   31.84   30.66
HPT        12.12   4.286   0.9085    215.689   1.3555    0.8928    14900.8
LPT        55.96   4.282   0.9105     87.780   1.3940    0.8936    11474.5

TURBOMACHINERY MAP DATA
           WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan      1148.94   1.522   0.9093   3762.126    0.0580      0.8607    1.0235    0.9980    0.9905
```

LPC	140.80	2.421	0.8401	1.003	180.0000	1.2063	0.8372	0.9873	0.0003
HPC	80.56	11.095	0.8703	9839.923	12.9743	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.217	0.9085	1.298	4.2168	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.495	0.9172	0.989	3.4948	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3546.90	10440.2

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4677	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.8220	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	10949.0	7147.7	14900.8
LP_Shaft	3601.9	16731.7	11474.5

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.3245	959.25	231.16	29.995
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7391	959.25	231.16	7.005
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	924.67	222.61	37.801
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1136.88	275.58	85.895
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	924.67	222.61	37.801
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1297.50	316.59	131.585
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	924.67	222.61	37.801

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.2124	1297.50	316.59	128.554
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.3110	1297.50	316.59	72.178
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1297.50	316.59	131.585
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1297.50	316.59	131.585
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1297.50	316.59	131.585
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	533.92	127.84	7.950
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	533.92	127.84	7.950
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	533.92	127.84	7.950
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	533.92	127.84	7.950
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	533.92	127.84	7.950

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2576.90	0.9995	0.0230	0.96972	0.02082

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.026	0.9811	1.0000	0.9800	603.19	1.000	1517.2	3192.2
Byp_Nozz	2.299	0.9829	1.0000	0.9800	2002.63	1.000	1013.2	13100.0

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**********************************************************************************************************************
Date:02/23/11    Time:10:25:34    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 34/ 2/ 5    Run by: Philip C Jorgenson      PC:   100
Temperature Stator 1 inlet: 452.23    Stator 1 exit: 470.61    Stator 2 inlet: 497.98    Stator 2 exit: 506.04
            Stator 3 inlet: 532.41    Stator 3 exit: 540.86    Stator 4 inlet: 565.90    Stator 4 exit: 573.85
            Stator 5 inlet: 594.03    Stator 5 exit: 601.77             Unblocked   Percent Blockage: 0.25

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00     395.92      6923.4     0.5938    4111.11    5.2973    775.82   32.257      6923.4     100.0   2850.8
2674.6   1859.9


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O           395.92     4.283    462.03    110.60   0.0000   1282.11     2.854    411.97    3930.2  0.7800    1.40005
FS1   Inlet.Fl_O             395.92     4.283    462.03    110.60   0.0000   1282.11     3.157    423.48    4162.5  0.6750    1.40005
FS12  Splitter.Fl_02         333.05     4.281    462.03    110.60   0.0000   1079.05     3.180    424.41    3526.9  0.6660    1.40005
FS2   Splitter.Fl_01          62.87     4.281    462.03    110.60   0.0000    203.70     3.002    417.52     637.7  0.7305    1.40005
FS14  Fan.Fl_O               333.05     7.280    545.71    130.67   0.0000    689.60     6.031    517.14    2600.0  0.5257    1.39973
FS25  LPC.Fl_O                62.87    10.292    620.49    148.64   0.0000     98.19     8.942    596.10     412.5  0.4529    1.39833
FS3   HPC.Fl_O                59.82   138.164   1380.91    338.22   0.0000     10.38   124.715   1344.10      49.7  0.3909    1.35737
FS36  Bleed3.Fl_O             46.36   138.164   1380.91    338.22   0.0000      8.05   130.348   1359.88      49.3  0.2940    1.35737
FS4   Burner.Fl_O             47.50   134.982   2850.79    774.98   0.0246     12.13   127.426   2814.67      74.8  0.3004    1.28375
FS45  HPT.Fl_O                63.28    31.734   1869.09    478.84   0.0184     55.63    28.591   1822.29     264.7  0.3999    1.32018
FS49  LPT.Fl_O                64.01     7.404   1344.03    334.31   0.0182    204.54     6.404   1294.56     851.6  0.4682    1.34702
FS5   TEGV.Fl_O               64.01     7.404   1344.03    334.31   0.0182    204.54     6.404   1294.56     851.6  0.4682    1.34702
FS8   Core_Nozz.Fl_O          64.01     7.404   1344.03    334.31   0.0182    204.54     3.961   1141.55     603.2  1.0000    1.34702
FS17  FanDuctLkg.Fl_O        333.05     7.280    545.71    130.67   0.0000    689.60     6.031    517.14    2600.0  0.5257    1.39973
FS171 Bleed15.Fl_O           333.05     7.280    545.71    130.67   0.0000    689.60     5.857    512.85    2475.2  0.5662    1.39973
FS172 FanDuct.Fl_O           333.05     7.280    545.71    130.67   0.0000    689.60     5.857    512.85    2475.2  0.5662    1.39973
FS173 Byp_Nozz.Fl_O          333.05     7.280    545.71    130.67   0.0000    689.60     3.860    454.75    2002.6  1.0000    1.39973

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan        1079.05   1.701   0.9114   4139.509   1.1811    0.9169    -9461.0   36.81   23.19
LPC         203.70   2.404   0.8363   4139.509   1.3430    0.8542    -3384.0    3.06    2.59
HPC          98.19  13.425   0.8581  10422.042   2.2255    0.8979   -16455.3   25.06   24.31
HPT          12.13   4.253   0.9119    213.496   1.3446    0.8972    16455.3
LPT          55.63   4.286   0.9157     90.370   1.3868    0.8998    12845.0

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        1253.75   1.685   0.9132   4100.029    0.0638      0.8607    1.0235    0.9980    0.9905
```

LPC	166.92	2.761	0.8444	1.093	180.0000	1.2204	0.7974	0.9904	0.0003
HPC	89.31	12.839	0.8669	10143.957	13.5911	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.185	0.9119	1.285	4.1851	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.498	0.9225	1.018	3.4980	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3930.21	9547.0

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4682	851.64
FanDuct	0.0000	0.5662	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.2973	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11399.2	7581.7	16455.3
LP_Shaft	3906.9	17267.6	12845.0

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.3137	1008.68	243.43	31.734
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7356	1008.68	243.43	7.404
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.51	233.95	38.424
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1204.38	292.72	89.573
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.51	233.95	38.424
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1380.91	338.22	138.164
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.51	233.95	38.424

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.1788	1380.91	338.22	134.982
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.2816	1380.91	338.22	75.924
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.91	338.22	138.164
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.91	338.22	138.164
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.91	338.22	138.164
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2850.79	0.9995	0.0230	1.14197	0.02463

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.594	0.9805	1.0000	0.9800	603.19	1.000	1600.1	3851.3
Byp_Nozz	2.551	0.9825	1.0000	0.9800	2002.63	1.000	1024.4	12619.1

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**********************************************************************************************************************
Date:02/23/11    Time:10:26:42    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    84
Temperature Stator 1 inlet: 457.73    Stator 1 exit: 474.77    Stator 2 inlet: 499.37    Stator 2 exit: 507.77
            Stator 3 inlet: 531.51    Stator 3 exit: 539.93    Stator 4 inlet: 562.42    Stator 4 exit: 570.18
            Stator 5 inlet: 588.48    Stator 5 exit: 595.87             Unblocked   Percent Blockage: 0.25

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    376.28      5815.7    0.5868    3412.48    5.4802    775.82   28.783      6923.4       84.0   2672.3
2509.4   1739.6


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           376.28     4.283    462.03    110.60   0.0000   1218.51     2.854    411.97    3735.2   0.7800    1.40005
FS1   Inlet.Fl_O             376.28     4.283    462.03    110.60   0.0000   1218.51     3.321    429.63    4162.5   0.6143    1.40005
FS12  Splitter.Fl_02         318.22     4.281    462.03    110.60   0.0000   1030.99     3.323    429.78    3526.9   0.6128    1.40005
FS2   Splitter.Fl_01          58.07     4.281    462.03    110.60   0.0000    188.13     3.297    428.81     637.7   0.6226    1.40005
FS14  Fan.Fl_O               318.22     6.897    536.70    128.51   0.0000    689.71     5.713    508.59    2600.0   0.5258    1.39974
FS25  LPC.Fl_O                58.07    10.071    611.78    146.54   0.0000     92.03     8.936    591.27     412.5   0.4169    1.39851
FS3   HPC.Fl_O                 55.25   123.283   1325.64    323.86   0.0000     10.53   110.898   1288.87      49.7   0.3971    1.36070
FS36  Bleed3.Fl_O              42.82   123.283   1325.64    323.86   0.0000      8.16   116.097   1304.68      49.3   0.2982    1.36070
FS4   Burner.Fl_O              43.77   120.444   2672.30    717.68   0.0221     12.12   113.710   2637.86      74.8   0.2995    1.29062
FS45  HPT.Fl_O                 58.33    28.210   1747.87    443.85   0.0165     55.79    25.399   1703.19     264.7   0.4002    1.32655
FS49  LPT.Fl_O                 59.01     6.576   1252.24    309.49   0.0163    204.91     5.685   1205.33     851.6   0.4679    1.35391
FS5   TEGV.Fl_O                59.01     6.576   1252.24    309.49   0.0163    204.91     5.685   1205.33     851.6   0.4679    1.35391
FS8   Core_Nozz.Fl_O           59.01     6.576   1252.24    309.49   0.0163    204.91     3.511   1060.59     603.2   1.0000    1.35391
FS17  FanDuctLkg.Fl_O         318.22     6.897    536.70    128.51   0.0000    689.71     5.713    508.59    2600.0   0.5258    1.39974
FS171 Bleed15.Fl_O            318.22     6.897    536.70    128.51   0.0000    689.71     5.550    504.37    2475.2   0.5661    1.39974
FS172 FanDuct.Fl_O            318.22     6.897    536.70    128.51   0.0000    689.71     5.550    504.37    2475.2   0.5661    1.39974
FS173 Byp_Nozz.Fl_O           318.22     6.897    536.70    128.51   0.0000    689.71     3.658    447.25    2002.6   1.0000    1.39974

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan        1030.99   1.611   0.9119   3951.102   1.1616    0.9164    -8064.9   54.89   26.94
LPC         188.13   2.352   0.8599   3951.102   1.3241    0.8757    -2953.1    1.70    1.34
HPC          92.03  12.242   0.8603  10205.128   2.1669    0.8985   -14214.7   29.22   28.26
HPT          12.12   4.270   0.9102    214.402   1.3516    0.8949    14214.7
LPT          55.79   4.289   0.9131     89.197   1.3924    0.8965    11018.0

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        1197.89   1.597   0.9138   3913.419    0.0608      0.8607    1.0235    0.9980    0.9905
```

LPC	150.68	2.572	0.8397	1.044	180.0000	1.2486	0.8603	1.0241	0.0003
HPC	83.70	11.712	0.8692	9932.831	13.2001	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.201	0.9102	1.291	4.2008	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.501	0.9199	1.005	3.5005	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3735.24	9073.4

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4679	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.4802	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11083.3	6736.0	14214.7
LP_Shaft	3729.1	15517.8	11018.0

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.1368	975.58	235.20	28.210
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6794	975.58	235.20	6.576
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.75	226.34	34.977
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1159.49	281.31	80.262
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.75	226.34	34.977
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1325.64	323.86	123.283
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.75	226.34	34.977

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.6300	1325.64	323.86	120.444
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.8014	1325.64	323.86	67.686
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.64	323.86	123.283
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.64	323.86	123.283
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.64	323.86	123.283
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2672.30	0.9995	0.0230	0.94791	0.02214

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.304	0.9817	1.0000	0.9800	603.19	1.000	1545.9	3232.0
Byp_Nozz	2.417	0.9830	1.0000	0.9800	2002.63	1.000	1015.9	11657.0

```
**********************************************************************************************************************************
Date:02/23/11    Time:10:27:43    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    79
Temperature Stator 1 inlet: 459.04    Stator 1 exit: 475.74    Stator 2 inlet: 499.73    Stator 2 exit: 508.17
            Stator 3 inlet: 531.31    Stator 3 exit: 539.73    Stator 4 inlet: 561.62    Stator 4 exit: 569.33
            Stator 5 inlet: 587.19    Stator 5 exit: 594.50             Unblocked   Percent Blockage: 0.25

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    370.94      5524.8     0.5863    3239.11    5.5397    775.82   27.860      6923.4       79.8   2626.4
2466.9   1709.0


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           370.94     4.283    462.03    110.60   0.0000   1201.21     2.854    411.97    3682.2   0.7800    1.40005
FS1   Inlet.Fl_O             370.94     4.283    462.03    110.60   0.0000   1201.21     3.360    431.07    4162.5   0.5995    1.40005
FS12  Splitter.Fl_02         314.22     4.281    462.03    110.60   0.0000   1018.04     3.357    431.04    3526.9   0.5997    1.40005
FS2   Splitter.Fl_01          56.72     4.281    462.03    110.60   0.0000    183.77     3.361    431.20     637.7   0.5982    1.40005
FS14  Fan.Fl_O               314.22     6.795    534.32    127.94   0.0000    689.72     5.629    506.34    2600.0   0.5257    1.39975
FS25  LPC.Fl_O                56.72     9.999    609.73    146.05   0.0000     90.39     8.918    590.15     412.5   0.4077    1.39858
FS3   HPC.Fl_O                53.97   119.331   1311.36    320.17   0.0000     10.57   107.241   1274.60      49.7   0.3987    1.36157
FS36  Bleed3.Fl_O             41.83   119.331   1311.36    320.17   0.0000      8.19   112.320   1290.42      49.3   0.2994    1.36157
FS4   Burner.Fl_O             42.73   116.583   2626.40    703.15   0.0215     12.12   110.068   2592.41      74.8   0.2992    1.29240
FS45  HPT.Fl_O                56.96    27.280   1717.11    435.08   0.0161     55.83    24.559   1672.98     264.7   0.4002    1.32830
FS49  LPT.Fl_O                57.62     6.358   1228.98    303.27   0.0159    205.01     5.496   1182.72     851.6   0.4679    1.35567
FS5   TEGV.Fl_O               57.62     6.358   1228.98    303.27   0.0159    205.01     5.496   1182.72     851.6   0.4679    1.35567
FS8   Core_Nozz.Fl_O          57.62     6.358   1228.98    303.27   0.0159    205.01     3.393   1040.16     603.2   1.0000    1.35567
FS17  FanDuctLkg.Fl_O         314.22     6.795    534.32    127.94   0.0000    689.72     5.629    506.34    2600.0   0.5257    1.39975
FS171 Bleed15.Fl_O            314.22     6.795    534.32    127.94   0.0000    689.72     5.468    502.14    2475.2   0.5661    1.39975
FS172 FanDuct.Fl_O            314.22     6.795    534.32    127.94   0.0000    689.72     5.468    502.14    2475.2   0.5661    1.39975
FS173 Byp_Nozz.Fl_O           314.22     6.795    534.32    127.94   0.0000    689.72     3.604    445.27    2002.6   1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc       PR       eff         Nc        TR    efPoly        pwr      SMN      SMW
Fan       1018.04    1.587   0.9110   3904.435    1.1565    0.9153    -7710.3    58.36    27.99
LPC        183.77    2.336   0.8636   3904.435    1.3197    0.8791    -2845.1     2.07     1.61
HPC         90.39   11.934   0.8610  10159.727    2.1507    0.8987   -13635.2    30.42    29.36
HPT         12.12    4.274   0.9094    214.943    1.3532    0.8939    13635.2
LPT         55.83    4.291   0.9124     88.930    1.3939    0.8957    10555.6

TURBOMACHINERY MAP DATA
            WcMap    PRmap    effMap      NcMap     R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1182.84    1.574   0.9129   3867.197    0.0599      0.8607    1.0235    0.9980    0.9905
```

LPC	147.66	2.526	0.8398	1.031	180.0000	1.2446	0.8753	1.0283	0.0003
HPC	82.21	11.419	0.8699	9888.642	13.0956	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.205	0.9094	1.294	4.2047	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.501	0.9191	1.002	3.5014	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3682.20	8944.6

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4679	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.5397	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11015.5	6501.2	13635.2
LP_Shaft	3685.1	15044.2	10555.6

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.0874	967.13	233.11	27.280
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6636	967.13	233.11	6.358
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.92	224.40	34.052
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1147.95	278.38	77.785
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.92	224.40	34.052
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1311.36	320.17	119.331
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.92	224.40	34.052

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.4765	1311.36	320.17	116.583
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.6671	1311.36	320.17	65.502
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.36	320.17	119.331
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.36	320.17	119.331
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.36	320.17	119.331
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2626.40	0.9995	0.0230	0.89975	0.02151

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.228	0.9816	1.0000	0.9800	603.19	1.000	1531.8	3068.6
Byp_Nozz	2.381	0.9831	1.0000	0.9800	2002.63	1.000	1013.6	11400.8

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**********************************************************************************************************************
Date:02/23/11    Time:10:28:45    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    76
Temperature Stator 1 inlet: 459.90    Stator 1 exit: 476.37    Stator 2 inlet: 499.93    Stator 2 exit: 508.38
            Stator 3 inlet: 531.11    Stator 3 exit: 539.51    Stator 4 inlet: 560.99    Stator 4 exit: 568.66
            Stator 5 inlet: 586.21    Stator 5 exit: 593.46             Unblocked   Percent Blockage: 0.25

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    366.97     5317.1    0.5870    3120.97    5.5814    775.82   27.216      6923.4       76.8   2594.8
2437.8   1688.1


                                        FLOW STATION DATA
                                    W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           366.97     4.283    462.03    110.60   0.0000   1188.36     2.854    411.97    3642.8   0.7800    1.40005
FS1   Inlet.Fl_O             366.97     4.283    462.03    110.60   0.0000   1188.36     3.387    432.08    4162.5   0.5889    1.40005
FS12  Splitter.Fl_02         311.21     4.281    462.03    110.60   0.0000   1008.30     3.382    431.95    3526.9   0.5903    1.40005
FS2   Splitter.Fl_01          55.76     4.281    462.03    110.60   0.0000    180.65     3.405    432.77     637.7   0.5816    1.40005
FS14  Fan.Fl_O               311.21     6.720    532.72    127.55   0.0000    689.73     5.567    504.82    2600.0   0.5257    1.39975
FS25  LPC.Fl_O                55.76     9.941    608.24    145.69   0.0000     89.27     8.896    589.28     412.5   0.4014    1.39875
FS3   HPC.Fl_O                53.05   116.571   1301.48    317.62   0.0000     10.60   104.693   1264.74      49.7   0.3999    1.36219
FS36  Bleed3.Fl_O             41.12   116.571   1301.48    317.62   0.0000      8.21   109.685   1280.56      49.3   0.3001    1.36219
FS4   Burner.Fl_O             41.98   113.886   2594.82    693.21   0.0211     12.12   107.525   2561.14      74.8   0.2990    1.29364
FS45  HPT.Fl_O                55.97    26.632   1695.99    429.07   0.0157     55.85    23.972   1652.24     264.7   0.4002    1.32939
FS49  LPT.Fl_O                56.63     6.206   1213.08    299.04   0.0155    205.06     5.364   1167.29     851.6   0.4678    1.35689
FS5   TEGV.Fl_O               56.63     6.206   1213.08    299.04   0.0155    205.06     5.364   1167.29     851.6   0.4678    1.35689
FS8   Core_Nozz.Fl_O          56.63     6.206   1213.08    299.04   0.0155    205.06     3.311   1026.20     603.2   1.0000    1.35689
FS17  FanDuctLkg.Fl_O        311.21     6.720    532.72    127.55   0.0000    689.73     5.567    504.82    2600.0   0.5257    1.39975
FS171 Bleed15.Fl_O           311.21     6.720    532.72    127.55   0.0000    689.73     5.408    500.63    2475.2   0.5660    1.39975
FS172 FanDuct.Fl_O           311.21     6.720    532.72    127.55   0.0000    689.73     5.408    500.63    2475.2   0.5660    1.39975
FS173 Byp_Nozz.Fl_O          311.21     6.720    532.72    127.55   0.0000    689.73     3.564    443.93    2002.6   1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1008.30   1.570   0.9083   3871.415   1.1530   0.9125    -7466.6   60.55   28.78
LPC        180.65   2.322   0.8656   3871.415   1.3164   0.8810    -2768.5    2.35    1.81
HPC         89.27  11.727   0.8614  10128.416   2.1398   0.8988   -13235.2   31.26   30.13
HPT         12.12   4.276   0.9089    215.317   1.3544   0.8932    13235.0
LPT         55.85   4.291   0.9118     88.725   1.3948   0.8952    10235.8

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1171.53   1.557   0.9101   3834.492    0.0593      0.8607    1.0235    0.9980    0.9905
```

LPC	145.52	2.493	0.8399	1.023	180.0000	1.2414	0.8853	1.0305	0.0003
HPC	81.19	11.221	0.8703	9858.167	13.0238	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.207	0.9089	1.296	4.2075	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.502	0.9186	1.000	3.5018	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3642.81	8848.9

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4678	851.64
FanDuct	0.0000	0.5660	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.5814	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	10968.1	6337.6	13235.0
LP_Shaft	3653.9	14712.8	10235.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.0519	961.26	231.66	26.632
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6524	961.26	231.66	6.206
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1139.95	276.36	76.051
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.571
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.3666	1301.48	317.62	113.886
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.5709	1301.48	317.62	63.977
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.571
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.571
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.571
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2594.82	0.9995	0.0230	0.86693	0.02108

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.175	0.9814	1.0000	0.9800	603.19	1.000	1522.1	2954.5
Byp_Nozz	2.355	0.9831	1.0000	0.9800	2002.63	1.000	1012.1	11211.5

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**********************************************************************************************************************************
Date:02/23/11    Time:10:29:30    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  7/ 20/ 1/ 5    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 469.18    Stator 1 exit: 477.65    Stator 2 inlet: 488.50    Stator 2 exit: 494.40
            Stator 3 inlet: 504.69    Stator 3 exit: 510.09    Stator 4 inlet: 519.59    Stator 4 exit: 524.23
            Stator 5 inlet: 532.18    Stator 5 exit: 536.27             Unblocked   Percent Blockage: 0.25

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780   39000.0    22.00    258.20      692.3    1.0453     723.68    9.5602    775.82    9.701      6923.4      10.0   1742.7
1647.7   1144.5


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          258.20     4.283    462.03    110.60   0.0000    836.13     2.854    411.97    2563.1   0.7800    1.40005
FS1   Inlet.Fl_O            258.20     4.283    462.03    110.60   0.0000    836.13     3.903    449.92    4162.5   0.3669    1.40005
FS12  Splitter.Fl_02        233.75     4.281    462.03    110.60   0.0000    757.33     3.839    447.87    3526.9   0.3976    1.40005
FS2   Splitter.Fl_01         24.45     4.281    462.03    110.60   0.0000     79.22     4.145    457.78     637.7   0.2154    1.40005
FS14  Fan.Fl_O              233.75     4.864    481.24    115.20   0.0000    680.26     4.058    456.95    2600.0   0.5154    1.40045
FS25  LPC.Fl_O               24.45     6.665    541.41    129.64   0.0000     55.08     6.419    535.62     412.5   0.2326    1.39974
FS3   HPC.Fl_O               23.26    41.553    988.54    238.42   0.0000     11.36    36.588    954.33      49.7   0.4328    1.38178
FS36  Bleed3.Fl_O            18.03    41.553    988.54    238.42   0.0000      8.80    38.703    969.30      49.3   0.3222    1.38178
FS4   Burner.Fl_O            18.23    40.596   1742.67    439.85   0.0111     12.10    38.342   1718.09      74.8   0.2940    1.33044
FS45  HPT.Fl_O               24.37     9.737   1148.84    280.62   0.0083     54.73     8.813   1118.48     264.7   0.3847    1.36585
FS49  LPT.Fl_O               24.65     3.293    896.34    216.92   0.0082    144.64     3.090    880.74     851.6   0.3045    1.38178
FS5   TEGV.Fl_O              24.65     3.293    896.34    216.92   0.0082    144.64     3.090    880.74     851.6   0.3045    1.38178
FS8   Core_Nozz.Fl_O         24.65     3.293    896.34    216.92   0.0082    144.64     2.854    861.43     603.2   0.4602    1.38178
FS17  FanDuctLkg.Fl_O       233.75     4.864    481.24    115.20   0.0000    680.26     4.058    456.95    2600.0   0.5154    1.40045
FS171 Bleed15.Fl_O          233.75     4.864    481.24    115.20   0.0000    680.26     3.948    453.36    2475.2   0.5544    1.40045
FS172 FanDuct.Fl_O          233.75     4.864    481.24    115.20   0.0000    680.26     3.948    453.36    2475.2   0.5544    1.40045
FS173 Byp_Nozz.Fl_O         233.75     4.864    481.24    115.20   0.0000    680.26     2.854    413.51    2002.6   0.9054    1.40045

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       757.33   1.136   0.9061   2620.834   1.0416    0.9086    -1523.9  ---.--   54.85
LPC        79.22   1.557   0.7934   2620.834   1.1718    0.8031     -658.8    7.65    4.40
HPC        55.08   6.234   0.8208   8994.328   1.8259    0.8592    -3671.8   60.09   56.89
HPT        12.10   4.169   0.8769    220.129   1.3656    0.8550     3671.8
LPT        54.73   2.957   0.8551     72.979   1.2796    0.8359     2182.7

TURBOMACHINERY MAP DATA
           WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       879.93   1.133   0.9079   2595.838    0.0415      0.8607    1.0235    0.9980    0.9905
```

LPC	78.89	1.585	0.8407	0.692	180.0000	1.0041	0.9524	0.9438	0.0003
HPC	50.09	5.988	0.8293	8754.338	11.0422	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.102	0.8769	1.325	4.1025	12.6513	0.9790	1.0000	0.0003
LPT	0.84	2.488	0.8614	0.822	2.4879	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2563.09	6226.1

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.3045	851.64
FanDuct	0.0000	0.5544	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5602	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9189.4	2098.6	3671.8
LP_Shaft	2473.6	4634.4	2182.7

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.8998	766.95	184.03	9.737
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2861	766.95	184.03	3.293
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.53	178.59	14.341
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	882.80	212.31	28.296
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.53	178.59	14.341
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	988.54	238.42	41.553
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.53	178.59	14.341

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7918	988.54	238.42	40.596
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.4428	988.54	238.42	22.945
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.54	238.42	41.553
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.54	238.42	41.553
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.54	238.42	41.553
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1742.67	0.9995	0.0230	0.20102	0.01115

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.154	0.9800	1.0000	0.9800	603.19	0.460	645.1	494.3
Byp_Nozz	1.704	0.9800	1.0000	0.9800	2002.63	0.905	884.2	6424.1

```
**********************************************************************************************************************************
Date:02/23/11    Time:10:31:11    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  3/ 16/ 1/ 1    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 462.60    Stator 1 exit: 470.65    Stator 2 inlet: 480.95    Stator 2 exit: 486.52
            Stator 3 inlet: 496.29    Stator 3 exit: 501.39    Stator 4 inlet: 506.03    Stator 4 exit: 510.51
            Stator 5 inlet: 522.23    Stator 5 exit: 525.79               Stage4   Percent Blockage: 0.25

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.730   38334.0    22.00    252.17      700.6    0.9978     699.07    9.5842    726.09    9.529      7006.3      10.0   1718.9
1624.5   1129.8


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          252.17     4.218    455.81    109.10   0.0000    823.56     2.947    411.97    2590.4   0.7300    1.39992
FS1   Inlet.Fl_O            252.17     4.218    455.81    109.10   0.0000    823.56     3.856    444.27    4162.5   0.3604    1.39992
FS12  Splitter.Fl_02        228.34     4.216    455.81    109.10   0.0000    746.12     3.795    442.33    3526.9   0.3905    1.39992
FS2   Splitter.Fl_01         23.82     4.216    455.81    109.10   0.0000     77.85     4.087    451.77     637.7   0.2115    1.39992
FS14  Fan.Fl_O              228.34     4.772    474.07    113.48   0.0000    672.25     4.005    450.90    2600.0   0.5068    1.40030
FS25  LPC.Fl_O               23.82     6.475    530.92    127.12   0.0000     54.71     6.239    525.32     412.5   0.2309    1.39976
FS3   HPC.Fl_O               22.67    40.195    968.63    233.48   0.0000     11.33    35.425    935.29      49.7   0.4310    1.38287
FS36  Bleed3.Fl_O            17.57    40.195    968.63    233.48   0.0000      8.78    37.455    949.87      49.3   0.3211    1.38287
FS4   Burner.Fl_O            17.76    39.269   1718.90    433.25   0.0111     12.10    37.088   1694.58      74.8   0.2940    1.33162
FS45  HPT.Fl_O               23.74     9.521   1134.13    276.84   0.0082     54.19     8.637   1104.79     264.7   0.3800    1.36682
FS49  LPT.Fl_O               24.02     3.348    893.54    216.21   0.0082    138.37     3.161    879.43     851.6   0.2898    1.38197
FS5   TEGV.Fl_O              24.02     3.348    893.54    216.21   0.0082    138.37     3.161    879.43     851.6   0.2898    1.38197
FS8   Core_Nozz.Fl_O         24.02     3.348    893.54    216.21   0.0082    138.37     2.947    862.38     603.2   0.4345    1.38197
FS17  FanDuctLkg.Fl_O       228.34     4.772    474.07    113.48   0.0000    672.25     4.005    450.90    2600.0   0.5068    1.40030
FS171 Bleed15.Fl_O          228.34     4.772    474.07    113.48   0.0000    672.25     3.901    447.53    2475.2   0.5445    1.40030
FS172 FanDuct.Fl_O          228.34     4.772    474.07    113.48   0.0000    672.25     3.901    447.53    2475.2   0.5445    1.40030
FS173 Byp_Nozz.Fl_O         228.34     4.772    474.07    113.48   0.0000    672.25     2.947    413.46    2002.6   0.8566    1.40030

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       746.12   1.132   0.9063   2573.591   1.0401    0.9087    -1414.8  ---.--   54.44
LPC        77.85   1.536   0.8020   2573.591   1.1648    0.8102     -607.4    7.69    2.60
HPC        54.71   6.208   0.8205   8982.573   1.8244    0.8590    -3498.3   59.83   56.60
HPT        12.10   4.125   0.8759    219.202   1.3629    0.8539     3498.3
LPT        54.19   2.843   0.8504     71.640   1.2669    0.8314     2022.2

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        866.91   1.129   0.9082   2549.046    0.0416      0.8607    1.0235    0.9980    0.9905
```

LPC	75.46	1.562	0.8323	0.680	180.0000	1.0316	0.9540	0.9636	0.0003
HPC	49.76	5.962	0.8290	8742.897	11.0624	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.059	0.8759	1.320	4.0590	12.6513	0.9790	1.0000	0.0003
LPT	0.83	2.401	0.8567	0.807	2.4012	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2590.35	5690.8

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2898	851.64
FanDuct	0.0000	0.5445	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5842	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9088.0	2021.7	3498.3
LP_Shaft	2412.6	4402.1	2022.2

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.8768	751.59	180.30	9.521
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2788	751.59	180.30	3.348
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	729.66	174.98	13.893
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	865.03	207.96	27.381
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	729.66	174.98	13.893
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	968.63	233.48	40.195
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	729.66	174.98	13.893

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7203	968.63	233.48	39.269
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.3803	968.63	233.48	22.253
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	968.63	233.48	40.195
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	968.63	233.48	40.195
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	968.63	233.48	40.195
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1718.90	0.9995	0.0230	0.19419	0.01105

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.136	0.9800	1.0000	0.9800	603.19	0.435	609.5	455.0
Byp_Nozz	1.619	0.9800	1.0000	0.9800	2002.63	0.857	836.5	5936.4

```
****************************************************************************************************************************************
Date:02/23/11    Time:10:32:49    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  3/ 16/ 1/ 1    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 460.57    Stator 1 exit: 468.47    Stator 2 inlet: 478.58    Stator 2 exit: 484.06
            Stator 3 inlet: 493.65    Stator 3 exit: 498.64    Stator 4 inlet: 503.16    Stator 4 exit: 507.55
            Stator 5 inlet: 519.08    Stator 5 exit: 522.56               Stage4   Percent Blockage: 0.25

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.714    37357.0    22.00    259.49      730.1    0.9826     717.45    9.5882    710.17    9.470      7300.9       10.0   1712.0
1617.6   1125.5


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          259.49     4.357    453.91    108.65   0.0000    818.82     3.088    411.97    2600.3   0.7140    1.39988
FS1   Inlet.Fl_O            259.49     4.357    453.91    108.65   0.0000    818.82     3.988    442.57    4162.5   0.3580    1.39988
FS12  Splitter.Fl_02        234.98     4.355    453.91    108.65   0.0000    741.86     3.926    440.66    3526.9   0.3878    1.39988
FS2   Splitter.Fl_01         24.51     4.355    453.91    108.65   0.0000     77.37     4.223    449.94     637.7   0.2101    1.39988
FS14  Fan.Fl_O              234.98     4.923    471.87    112.96   0.0000    669.08     4.140    449.10    2600.0   0.5035    1.40026
FS25  LPC.Fl_O               24.51     6.651    527.70    126.35   0.0000     54.62     6.409    522.15     412.5   0.2305    1.39976
FS3   HPC.Fl_O               23.32    41.258    962.64    232.00   0.0000     11.32    36.373    929.56      49.7   0.4305    1.38320
FS36  Bleed3.Fl_O            18.07    41.258    962.64    232.00   0.0000      8.77    38.452    944.02      49.3   0.3207    1.38320
FS4   Burner.Fl_O            18.27    40.308   1711.96    431.33   0.0110     12.10    38.069   1687.72      74.8   0.2940    1.33196
FS45  HPT.Fl_O               24.42     9.805   1129.82    275.73   0.0082     54.02     8.901   1100.79     264.7   0.3785    1.36711
FS49  LPT.Fl_O               24.71     3.494    893.00    216.07   0.0081    136.37     3.304    879.33     851.6   0.2852    1.38201
FS5   TEGV.Fl_O              24.71     3.494    893.00    216.07   0.0081    136.37     3.304    879.33     851.6   0.2852    1.38201
FS8   Core_Nozz.Fl_O         24.71     3.494    893.00    216.07   0.0081    136.37     3.089    862.94     603.1   0.4266    1.38201
FS17  FanDuctLkg.Fl_O       234.98     4.923    471.87    112.96   0.0000    669.08     4.140    449.10    2600.0   0.5035    1.40026
FS171 Bleed15.Fl_O          234.98     4.923    471.87    112.96   0.0000    669.08     4.035    445.81    2475.2   0.5407    1.40026
FS172 FanDuct.Fl_O          234.98     4.923    471.87    112.96   0.0000    669.08     4.035    445.81    2475.2   0.5407    1.40026
FS173 Byp_Nozz.Fl_O         234.98     4.923    471.87    112.96   0.0000    669.08     3.088    413.45    2002.6   0.8410    1.40026

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr      SMN      SMW
Fan       741.86   1.131   0.9065   2556.501   1.0396    0.9088    -1432.4  ---.--    54.25
LPC        77.37   1.527   0.8024   2556.501   1.1626    0.8103     -613.8     7.70     2.49
HPC        54.62   6.204   0.8205   8979.945   1.8242    0.8590    -3574.5    59.72    56.49
HPT        12.10   4.111   0.8756    218.914   1.3621    0.8537     3574.5
LPT        54.02   2.807   0.8489     71.151   1.2628    0.8300     2046.2

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        861.96   1.128   0.9083   2532.119    0.0416      0.8607    1.0235    0.9980    0.9905
```

LPC	74.22	1.553	0.8293	0.675	180.0000	1.0425	0.9531	0.9676	0.0003
HPC	49.68	5.959	0.8290	8740.339	11.0702	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.046	0.8756	1.318	4.0456	12.6513	0.9790	1.0000	0.0003
LPT	0.83	2.373	0.8552	0.802	2.3733	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2600.31	5727.7

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2852	851.64
FanDuct	0.0000	0.5407	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5882	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9057.8	2072.7	3574.5
LP_Shaft	2391.6	4493.6	2046.2

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.9019	746.94	179.17	9.805
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2867	746.94	179.17	3.494
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.14	173.89	14.264
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	859.67	206.64	28.107
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.14	173.89	14.264
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	962.64	232.00	41.258
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.14	173.89	14.264

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7983	962.64	232.00	40.308
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.4485	962.64	232.00	22.860
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	962.64	232.00	41.258
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	962.64	232.00	41.258
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	962.64	232.00	41.258
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1711.96	0.9995	0.0230	0.19929	0.01103

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.131	0.9800	1.0000	0.9800	603.19	0.427	598.6	459.7
Byp_Nozz	1.594	0.9800	1.0000	0.9800	2002.63	0.841	821.3	5998.2

```
**********************************************************************************************************************************
Date:02/23/11    Time:10:34:32    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  3/ 16/ 1/ 1    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 462.20    Stator 1 exit: 469.79    Stator 2 inlet: 479.49    Stator 2 exit: 484.72
            Stator 3 inlet: 493.92    Stator 3 exit: 498.69    Stator 4 inlet: 502.93    Stator 4 exit: 507.09
            Stator 5 inlet: 518.25    Stator 5 exit: 521.54               Stage4   Percent Blockage: 0.25

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.669   34281.0    22.00    282.90      832.3    0.9465     787.77    9.6002    670.64    9.280      8322.1      10.0   1715.4
1620.3   1129.2


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O          282.90     4.846    455.82    109.11   0.0000    804.31     3.578    418.42    2631.8  0.6690    1.39992
FS1   Inlet.Fl_O            282.90     4.846    455.82    109.11   0.0000    804.31     4.451    444.89    4162.5  0.3506    1.39992
FS12  Splitter.Fl_02        256.21     4.843    455.82    109.11   0.0000    728.80     4.385    443.06    3526.9  0.3796    1.39992
FS2   Splitter.Fl_01         26.69     4.843    455.82    109.11   0.0000     75.92     4.702    451.99     637.7  0.2060    1.39992
FS14  Fan.Fl_O              256.21     5.452    473.24    113.29   0.0000    659.68     4.616    451.25    2600.0  0.4936    1.40029
FS25  LPC.Fl_O               26.69     7.270    526.62    126.09   0.0000     54.36     7.008    521.14     412.5  0.2293    1.39976
FS3   HPC.Fl_O               25.39    44.967    959.93    231.33   0.0000     11.29    39.671    927.12      49.7  0.4292    1.38335
FS36  Bleed3.Fl_O            19.68    44.967    959.93    231.33   0.0000      8.75    41.924    941.45      49.3  0.3198    1.38335
FS4   Burner.Fl_O            19.90    43.932   1715.35    432.30   0.0111     12.11    41.489   1691.06      74.8  0.2941    1.33174
FS45  HPT.Fl_O               26.59    10.792   1133.60    276.71   0.0083     53.54     9.817   1105.09     264.7  0.3746    1.36682
FS49  LPT.Fl_O               26.91     3.997    904.49    218.94   0.0082    130.63     3.799    891.90     851.6  0.2721    1.38119
FS5   TEGV.Fl_O              26.91     3.997    904.49    218.94   0.0082    130.63     3.799    891.90     851.6  0.2721    1.38119
FS8   Core_Nozz.Fl_O         26.91     3.997    904.49    218.94   0.0082    130.63     3.578    877.09     603.1  0.4044    1.38119
FS17  FanDuctLkg.Fl_O       256.21     5.452    473.24    113.29   0.0000    659.68     4.616    451.25    2600.0  0.4936    1.40029
FS171 Bleed15.Fl_O          256.21     5.452    473.24    113.29   0.0000    659.68     4.504    448.12    2475.2  0.5295    1.40029
FS172 FanDuct.Fl_O          256.21     5.452    473.24    113.29   0.0000    659.68     4.504    448.12    2475.2  0.5295    1.40029
FS173 Byp_Nozz.Fl_O         256.21     5.452    473.24    113.29   0.0000    659.68     3.578    419.87    2002.6  0.7976    1.40029

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan         728.80   1.126   0.9067   2502.633   1.0382    0.9089    -1514.8  ---.--   53.74
LPC          75.92   1.501   0.8040   2502.633   1.1553    0.8112     -641.3    7.76    2.32
HPC          54.36   6.185   0.8203   8971.641   1.8228    0.8588    -3877.3   59.52   56.28
HPT          12.11   4.071   0.8760    218.273   1.3592    0.8543     3877.3
LPT          53.54   2.700   0.8462     69.682   1.2508    0.8280     2156.1

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         846.78   1.123   0.9085   2478.765    0.0417      0.8607    1.0235    0.9980    0.9905
```

LPC	70.31	1.527	0.8197	0.661	180.0000	1.0798	0.9510	0.9808	0.0003
HPC	49.44	5.941	0.8288	8732.257	11.0855	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.006	0.8760	1.314	4.0062	12.6513	0.9790	1.0000	0.0003
LPT	0.82	2.292	0.8525	0.785	2.2922	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2631.81	5896.7

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2721	851.64
FanDuct	0.0000	0.5295	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.6002	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9040.2	2252.6	3877.3
LP_Shaft	2346.1	4826.7	2156.1

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.9821	745.02	178.71	10.792
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3122	745.02	178.71	3.997
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.31	173.45	15.563
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	857.34	206.07	30.642
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.31	173.45	15.563
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	959.93	231.33	44.967
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.31	173.45	15.563

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.0472	959.93	231.33	43.932
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.6664	959.93	231.33	24.976
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	959.93	231.33	44.967
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	959.93	231.33	44.967
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	959.93	231.33	44.967
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	473.24	113.29	5.452
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	473.24	113.29	5.452
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	473.24	113.29	5.452
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	473.24	113.29	5.452
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	473.24	113.29	5.452

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1715.35	0.9995	0.0230	0.21883	0.01112

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.117	0.9800	1.0000	0.9800	603.19	0.404	571.9	478.3
Byp_Nozz	1.524	0.9800	1.0000	0.9800	2002.63	0.798	784.9	6250.6

```
**********************************************************************************************************************************
Date:02/23/11    Time:10:36:21    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 471.61    Stator 1 exit: 478.79    Stator 2 inlet: 487.99    Stator 2 exit: 492.90
            Stator 3 inlet: 501.61    Stator 3 exit: 506.06    Stator 4 inlet: 514.11    Stator 4 exit: 517.89
            Stator 5 inlet: 524.61    Stator 5 exit: 527.91            Unblocked   Percent Blockage: 0.25

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.608    30029.0    22.00    314.03      995.1    0.9037     899.22    9.5609    620.50    9.019      9951.0       10.0   1742.1
1645.1   1149.0


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          314.03     5.599    465.62    111.46   0.0000    780.92     4.358    433.58    2686.1   0.6080    1.40012
FS1   Inlet.Fl_O            314.03     5.599    465.62    111.46   0.0000    780.92     5.172    455.17    4162.5   0.3387    1.40012
FS12  Splitter.Fl_02        284.30     5.597    465.62    111.46   0.0000    707.33     5.101    453.45    3526.9   0.3662    1.40012
FS2   Splitter.Fl_01         29.74     5.597    465.62    111.46   0.0000     73.98     5.442    461.91     637.7   0.2004    1.40012
FS14  Fan.Fl_O              284.30     6.259    482.58    115.52   0.0000    643.85     5.355    461.53    2600.0   0.4774    1.40048
FS25  LPC.Fl_O               29.74     8.179    532.86    127.59   0.0000     54.16     7.887    527.36     412.5   0.2284    1.39975
FS3   HPC.Fl_O               28.29    50.502    970.71    234.00   0.0000     11.26    44.587    937.75      49.7   0.4280    1.38276
FS36  Bleed3.Fl_O            21.93    50.502    970.71    234.00   0.0000      8.73    47.101    952.14      49.3   0.3190    1.38276
FS4   Burner.Fl_O            22.18    49.339   1742.08    439.81   0.0114     12.11    46.596   1717.48      74.8   0.2943    1.33030
FS45  HPT.Fl_O               29.64    12.253   1153.52    281.86   0.0085     53.01    11.170   1125.25     264.7   0.3704    1.36543
FS49  LPT.Fl_O               29.99     4.803    933.21    226.13   0.0084    123.08     4.593    921.82     851.6   0.2552    1.37919
FS5   TEGV.Fl_O              29.99     4.803    933.21    226.13   0.0084    123.08     4.593    921.82     851.6   0.2552    1.37919
FS8   Core_Nozz.Fl_O         29.99     4.803    933.21    226.13   0.0084    123.08     4.358    908.70     603.2   0.3769    1.37919
FS17  FanDuctLkg.Fl_O       284.30     6.259    482.58    115.52   0.0000    643.85     5.355    461.53    2600.0   0.4774    1.40048
FS171 Bleed15.Fl_O          284.30     6.259    482.58    115.52   0.0000    643.85     5.237    458.60    2475.2   0.5112    1.40048
FS172 FanDuct.Fl_O          284.30     6.259    482.58    115.52   0.0000    643.85     5.237    458.60    2475.2   0.5112    1.40048
FS173 Byp_Nozz.Fl_O         284.30     6.259    482.58    115.52   0.0000    643.85     4.358    435.01    2002.6   0.7395    1.40048

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       707.33   1.118   0.9068   2417.235   1.0364    0.9090    -1636.1  ---.--   52.80
LPC        73.98   1.461   0.8034   2417.235   1.1444    0.8103     -678.7    7.89    2.03
HPC        54.16   6.175   0.8202   8965.211   1.8217    0.8586    -4368.2   59.28   56.02
HPT        12.11   4.027   0.8777    217.715   1.3556    0.8565     4368.2
LPT        53.01   2.551   0.8434     67.433   1.2334    0.8253     2314.8

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        821.83   1.116   0.9086   2394.181    0.0420      0.8607    1.0235    0.9980    0.9905
```

LPC	64.10	1.485	0.8046	0.638	180.0000	1.1541	0.9513	0.9985	0.0003
HPC	49.25	5.931	0.8286	8725.999	11.1033	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.963	0.8777	1.311	3.9629	12.6513	0.9790	1.0000	0.0003
LPT	0.82	2.179	0.8497	0.760	2.1793	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2686.13	6056.4

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2552	851.64
FanDuct	0.0000	0.5112	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5609	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9087.0	2524.7	4368.2
LP_Shaft	2290.3	5308.4	2314.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.0943	753.61	180.79	12.253
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3479	753.61	180.79	4.803
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	867.08	208.46	34.419
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.3952	970.71	234.00	49.339
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.9709	970.71	234.00	28.126
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1742.08	0.9995	0.0230	0.24978	0.01139

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.102	0.9800	1.0000	0.9800	603.19	0.377	542.0	505.2
Byp_Nozz	1.436	0.9800	1.0000	0.9800	2002.63	0.739	740.8	6546.3

```
**********************************************************************************************************************************
Date:02/23/11    Time:10:38:01    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 482.09    Stator 1 exit: 488.88    Stator 2 inlet: 497.57    Stator 2 exit: 502.15
            Stator 3 inlet: 505.96    Stator 3 exit: 510.12    Stator 4 inlet: 521.99    Stator 4 exit: 525.22
            Stator 5 inlet: 531.55    Stator 5 exit: 534.60               Stage3   Percent Blockage: 0.25

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.552   25666.0    22.00    348.91      1194.6    0.8597    1026.96    9.4717    573.44    8.755      11946.9      10.0   1764.8
1666.3   1166.2


                                        FLOW STATION DATA
                                    W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN      gamt
FS0   Ambient.Fl_O           348.91     6.507    476.52    114.07   0.0000    755.30     5.297    449.14    2752.6   0.5520   1.40035
FS1   Inlet.Fl_O             348.91     6.507    476.52    114.07   0.0000    755.30     6.045    466.59    4162.5   0.3259   1.40035
FS12  Splitter.Fl_02         315.59     6.504    476.52    114.07   0.0000    683.51     5.971    465.00    3526.9   0.3517   1.40035
FS2   Splitter.Fl_01          33.32     6.504    476.52    114.07   0.0000     72.16     6.333    472.91     637.7   0.1952   1.40035
FS14  Fan.Fl_O               315.59     7.232    493.16    118.06   0.0000    625.38     6.258    473.18    2600.0   0.4592   1.40071
FS25  LPC.Fl_O                33.32     9.274    539.23    129.12   0.0000     53.84     8.947    533.74     412.5   0.2270   1.39974
FS3   HPC.Fl_O                31.70    56.968    980.81    236.50   0.0000     11.25    50.318    947.66      49.7   0.4273   1.38220
FS36  Bleed3.Fl_O             24.57    56.968    980.81    236.50   0.0000      8.72    53.144    962.13      49.3   0.3186   1.38220
FS4   Burner.Fl_O             24.86    55.656   1764.77    446.19   0.0116     12.11    52.561   1739.91      74.8   0.2944   1.32910
FS45  HPT.Fl_O                33.22    13.951   1170.74    286.32   0.0087     52.57    12.740   1142.66     264.7   0.3669   1.36425
FS49  LPT.Fl_O                33.60     5.767    959.56    232.74   0.0086    116.47     5.543    949.18     851.6   0.2406   1.37758
FS5   TEGV.Fl_O               33.60     5.767    959.56    232.74   0.0086    116.47     5.543    949.18     851.6   0.2406   1.37758
FS8   Core_Nozz.Fl_O          33.60     5.767    959.56    232.74   0.0086    116.47     5.297    937.45     603.3   0.3532   1.37758
FS17  FanDuctLkg.Fl_O        315.59     7.232    493.16    118.06   0.0000    625.38     6.258    473.18    2600.0   0.4592   1.40071
FS171 Bleed15.Fl_O           315.59     7.232    493.16    118.06   0.0000    625.38     6.134    470.48    2475.2   0.4907   1.40071
FS172 FanDuct.Fl_O           315.59     7.232    493.16    118.06   0.0000    625.38     6.134    470.48    2475.2   0.4907   1.40071
FS173 Byp_Nozz.Fl_O          315.59     7.232    493.16    118.06   0.0000    625.38     5.297    450.56    2002.6   0.6873   1.40071

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       683.51   1.112   0.9066   2329.991   1.0349    0.9089    -1781.2  ---.--   51.54
LPC        72.16   1.426   0.8180   2329.991   1.1316    0.8246     -709.4    8.09    1.72
HPC        53.84   6.143   0.8197   8954.833   1.8189    0.8580    -4939.5   59.28   55.99
HPT        12.11   3.990   0.8789    217.348   1.3525    0.8583     4939.6
LPT        52.57   2.419   0.8398     65.270   1.2172    0.8225     2490.5

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        794.16   1.109   0.9085   2307.769    0.0424      0.8607    1.0235    0.9980    0.9905
```

LPC	57.76	1.442	0.7891	0.615	180.0000	1.2493	0.9629	1.0366	0.0003
HPC	48.96	5.901	0.8281	8715.898	11.1066	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.927	0.8789	1.308	3.9267	12.6513	0.9790	1.0000	0.0003
LPT	0.81	2.079	0.8460	0.736	2.0786	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2752.57	6218.7

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2406	851.64
FanDuct	0.0000	0.4907	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.4717	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9130.6	2841.3	4939.6
LP_Shaft	2233.3	5857.0	2490.5

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.2262	761.92	182.81	13.951
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3898	761.92	182.81	5.767
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	739.79	177.44	19.767
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	876.34	210.73	38.844
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	739.79	177.44	19.767
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	980.81	236.50	56.968
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	739.79	177.44	19.767

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.8044	980.81	236.50	55.656
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	3.3290	980.81	236.50	31.801
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	980.81	236.50	56.968
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	980.81	236.50	56.968
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	980.81	236.50	56.968
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1764.77	0.9995	0.0230	0.28527	0.01161

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.089	0.9800	1.0000	0.9800	603.19	0.353	515.6	538.5
Byp_Nozz	1.365	0.9800	1.0000	0.9800	2002.63	0.687	700.9	6874.8

```
**********************************************************************************************************************************
Date:02/23/11    Time:10:40:03    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  7/ 20/ 1/ 5    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 496.91    Stator 1 exit: 503.30    Stator 2 inlet: 507.38    Stator 2 exit: 511.62
            Stator 3 inlet: 523.42    Stator 3 exit: 526.99    Stator 4 inlet: 534.15    Stator 4 exit: 537.38
            Stator 5 inlet: 543.34    Stator 5 exit: 546.13               Stage2   Percent Blockage: 0.25

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.490    20047.0    22.00     399.49      1508.8    0.8125    1225.89    9.3123    520.34    8.455     15087.8       10.0   1798.9
1698.4   1192.0


                                        FLOW STATION DATA
                                    W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O            399.49     7.913    491.73    117.72   0.0000    722.43     6.740    469.18    2851.3   0.4900    1.40068
FS1   Inlet.Fl_O              399.49     7.913    491.73    117.72   0.0000    722.43     7.403    482.46    4162.5   0.3099    1.40068
FS12  Splitter.Fl_02          360.75     7.909    491.73    117.72   0.0000    652.70     7.323    481.03    3526.9   0.3333    1.40068
FS2   Splitter.Fl_01           38.74     7.909    491.73    117.72   0.0000     70.09     7.713    488.23     637.7   0.1894    1.40068
FS14  Fan.Fl_O                360.75     8.767    508.18    121.66   0.0000    598.58     7.703    489.74    2600.0   0.4337    1.40000
FS25  LPC.Fl_O                 38.74    10.992    550.08    131.72   0.0000     53.34    10.613    544.58     412.5   0.2247    1.39972
FS3   HPC.Fl_O                 36.86    66.900    997.58    240.66   0.0000     11.23    59.117    964.04      49.7   0.4266    1.38129
FS36  Bleed3.Fl_O              28.57    66.900    997.58    240.66   0.0000      8.70    62.424    978.67      49.3   0.3181    1.38129
FS4   Burner.Fl_O              28.91    65.359   1798.94    455.84   0.0119     12.11    61.725   1773.71      74.8   0.2946    1.32732
FS45  HPT.Fl_O                 38.63    16.580   1196.73    293.07   0.0089     52.01    15.175   1168.82     264.7   0.3625    1.36248
FS49  LPT.Fl_O                 39.08     7.255    994.44    241.53   0.0088    109.61     7.007    985.02     851.6   0.2257    1.37545
FS5   TEGV.Fl_O                39.08     7.255    994.44    241.53   0.0088    109.61     7.007    985.02     851.6   0.2257    1.37545
FS8   Core_Nozz.Fl_O           39.08     7.255    994.44    241.53   0.0088    109.61     6.740    974.56     603.2   0.3294    1.37545
FS17  FanDuctLkg.Fl_O         360.75     8.767    508.18    121.66   0.0000    598.58     7.703    489.74    2600.0   0.4337    1.40000
FS171 Bleed15.Fl_O            360.75     8.767    508.18    121.66   0.0000    598.58     7.571    487.32    2475.2   0.4624    1.40000
FS172 FanDuct.Fl_O            360.75     8.767    508.18    121.66   0.0000    598.58     7.571    487.32    2475.2   0.4624    1.40000
FS173 Byp_Nozz.Fl_O           360.75     8.767    508.18    121.66   0.0000    598.58     6.740    470.67    2002.6   0.6310    1.40000

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan         652.70   1.109   0.9089   2235.000   1.0335   0.9078    -2013.6  ---.--   49.22
LPC          70.09   1.390   0.8294   2235.000   1.1187   0.8368     -767.6    8.44    1.36
HPC          53.34   6.086   0.8187   8938.458   1.8135   0.8572    -5826.4   59.48   56.14
HPT          12.11   3.942   0.8806    217.031   1.3484   0.8604     5826.4
LPT          52.01   2.285   0.8361     62.907   1.2004   0.8205     2781.2

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         758.36   1.106   0.9108   2213.684    0.0433      0.8607    1.0235    0.9980    0.9905
```

LPC	50.86	1.396	0.7722	0.590	180.0000	1.3781	0.9851	1.0740	0.0003
HPC	48.51	5.846	0.8272	8699.960	11.1001	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.880	0.8806	1.307	3.8801	12.6513	0.9790	1.0000	0.0003
LPT	0.80	1.977	0.8423	0.709	1.9771	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2851.27	6460.9

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2257	851.64
FanDuct	0.0000	0.4624	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.3123	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9205.1	3324.3	5826.4
LP_Shaft	2176.2	6712.3	2781.2

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.4256	775.85	186.19	16.580
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.4533	775.85	186.19	7.255
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.42	180.75	23.292
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	891.78	214.52	45.655
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.42	180.75	23.292
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	997.58	240.66	66.900
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.42	180.75	23.292

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	4.4233	997.58	240.66	65.359
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	3.8705	997.58	240.66	37.457
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	997.58	240.66	66.900
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	997.58	240.66	66.900
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	997.58	240.66	66.900
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1798.94	0.9995	0.0230	0.34052	0.01192

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.076	0.9800	1.0000	0.9800	603.19	0.329	489.9	595.1
Byp_Nozz	1.301	0.9800	1.0000	0.9800	2002.63	0.631	657.7	7374.5

```
**********************************************************************************************************************************
Date:02/23/11    Time:10:41:56    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  9/ 22/ 1/ 7    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 506.40    Stator 1 exit: 512.49    Stator 2 inlet: 523.62    Stator 2 exit: 527.44
            Stator 3 inlet: 534.74    Stator 3 exit: 538.36    Stator 4 inlet: 545.11    Stator 4 exit: 548.13
            Stator 5 inlet: 553.74    Stator 5 exit: 556.34               Stage1   Percent Blockage: 0.25

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.446   15435.0    22.00    442.59     1740.5    0.7940    1381.96    9.2930    481.90    8.021     17405.9      10.0   1818.5
1716.8   1210.4


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN      gamt
FS0   Ambient.Fl_O          442.59     9.311    504.97    120.89   0.0000    689.29     8.149    485.63    2919.9   0.4460   1.40036
FS1   Inlet.Fl_O            442.59     9.311    504.97    120.89   0.0000    689.29     8.769    496.39    4162.5   0.2939   1.40036
FS12  Splitter.Fl_02        399.59     9.306    504.97    120.89   0.0000    622.64     8.684    495.08    3526.9   0.3158   1.40036
FS2   Splitter.Fl_01         43.00     9.306    504.97    120.89   0.0000     67.00     9.097    501.70     637.7   0.1807   1.40036
FS14  Fan.Fl_O              399.59    10.282    520.79    124.69   0.0000    572.32     9.159    503.86    2600.0   0.4099   1.39977
FS25  LPC.Fl_O               43.00    12.651    559.70    134.03   0.0000     51.89    12.238    554.42     412.5   0.2183   1.39970
FS3   HPC.Fl_O               40.91    74.682   1006.63    242.92   0.0000     11.22    66.017    972.92      49.7   0.4261   1.38057
FS36  Bleed3.Fl_O            31.71    74.682   1006.63    242.92   0.0000      8.69    69.698    987.63      49.3   0.3178   1.38057
FS4   Burner.Fl_O            32.09    72.962   1818.54    461.39   0.0121     12.10    68.905   1793.09      74.8   0.2947   1.32653
FS45  HPT.Fl_O               42.88    18.871   1215.17    297.87   0.0090     51.11    17.333   1188.01     264.7   0.3554   1.36114
FS49  LPT.Fl_O               43.38     8.692   1022.40    248.60   0.0089    102.98     8.431   1013.93     851.6   0.2114   1.37340
FS5   TEGV.Fl_O              43.38     8.692   1022.40    248.60   0.0089    102.98     8.431   1013.93     851.6   0.2114   1.37340
FS8   Core_Nozz.Fl_O         43.38     8.692   1022.40    248.60   0.0089    102.98     8.149   1004.66     603.2   0.3073   1.37340
FS17  FanDuctLkg.Fl_O        399.59    10.282    520.79    124.69   0.0000    572.32     9.159    503.86    2600.0   0.4099   1.39977
FS171 Bleed15.Fl_O           399.59    10.282    520.79    124.69   0.0000    572.32     9.023    501.71    2475.2   0.4360   1.39977
FS172 FanDuct.Fl_O           399.59    10.282    520.79    124.69   0.0000    572.32     9.023    501.71    2475.2   0.4360   1.39977
FS173 Byp_Nozz.Fl_O          399.59    10.282    520.79    124.69   0.0000    572.32     8.149    487.09    2002.6   0.5880   1.39977

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       622.64   1.105   0.9099   2144.713   1.0313    0.9114    -2147.0  ---.--   46.99
LPC        67.00   1.359   0.8373   2144.713   1.1084    0.8454     -799.4    8.94    0.99
HPC        51.89   5.903   0.8154   8890.460   1.7985    0.8541    -6463.7   60.57   57.04
HPT        12.10   3.866   0.8811    216.568   1.3420    0.8612     6463.7
LPT        51.11   2.171   0.8323     60.707   1.1854    0.8170     2946.4

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        723.43   1.102   0.9118   2124.258    0.0442      0.8607    1.0235    0.9980    0.9905
```

LPC	44.30	1.352	0.7562	0.566	180.0000	1.5124	1.0222	1.1072	0.0003
HPC	47.19	5.672	0.8239	8653.242	11.0511	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.806	0.8811	1.304	3.8060	12.6513	0.9790	1.0000	0.0003
LPT	0.79	1.890	0.8384	0.684	1.8902	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2919.95	6629.2

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2114	851.64
FanDuct	0.0000	0.4360	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.2930	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9235.4	3675.8	6463.7
LP_Shaft	2116.2	7312.4	2946.4

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.5824	785.24	188.47	18.871
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.5031	785.24	188.47	8.692
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	762.83	183.03	26.298
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	901.00	216.78	51.110
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	762.83	183.03	26.298
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1006.63	242.92	74.682
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	762.83	183.03	26.298

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	4.9097	1006.63	242.92	72.962
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	4.2961	1006.63	242.92	42.022
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1006.63	242.92	74.682
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1006.63	242.92	74.682
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1006.63	242.92	74.682
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1818.54	0.9995	0.0230	0.38388	0.01211

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.067	0.9800	1.0000	0.9800	603.19	0.307	463.7	625.2
Byp_Nozz	1.262	0.9800	1.0000	0.9800	2002.63	0.588	623.6	7744.5

```
**********************************************************************************************************************************
Date:02/23/11    Time:10:44:00    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 12/ 25/ 1/10    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 523.48    Stator 1 exit: 529.04    Stator 2 inlet: 536.15    Stator 2 exit: 539.83
            Stator 3 inlet: 546.53    Stator 3 exit: 549.79    Stator 4 inlet: 555.99    Stator 4 exit: 558.70
            Stator 5 inlet: 563.83    Stator 5 exit: 566.16             Unblocked   Percent Blockage: 0.25

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.406    10735.0    22.00    489.85     2003.2    0.7777    1557.96    9.2910    446.20    7.554     20032.3       10.0   1842.0
1738.8   1230.8


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           489.85    11.019    518.95    124.25   0.0000    653.50     9.822    502.39    2996.0   0.4060    1.39978
FS1   Inlet.Fl_O             489.85    11.019    518.95    124.25   0.0000    653.50    10.446    511.10    4162.5   0.2772    1.39978
FS12  Splitter.Fl_02         442.25    11.013    518.95    124.25   0.0000    590.29    10.357    509.92    3526.9   0.2976    1.39978
FS2   Splitter.Fl_01          47.60    11.013    518.95    124.25   0.0000     63.53    10.791    515.93     637.7   0.1710    1.39978
FS14  Fan.Fl_O               442.25    12.085    534.12    127.89   0.0000    545.75    10.900    518.61    2600.0   0.3868    1.39975
FS25  LPC.Fl_O                47.60    14.441    569.62    136.41   0.0000     50.76    13.990    564.49     412.5   0.2133    1.39968
FS3   HPC.Fl_O                45.29    83.232   1017.61    245.65   0.0000     11.20    73.605    983.68      49.7   0.4255    1.37981
FS36  Bleed3.Fl_O             35.10    83.232   1017.61    245.65   0.0000      8.68    77.695    998.48      49.3   0.3174    1.37981
FS4   Burner.Fl_O             35.53    81.315   1842.02    468.05   0.0123     12.10    76.796   1816.31      74.8   0.2947    1.32540
FS45  HPT.Fl_O                47.48    21.393   1235.67    303.23   0.0092     50.34    19.706   1209.07     264.7   0.3493    1.35973
FS49  LPT.Fl_O                48.03    10.389   1052.82    256.33   0.0091     96.80    10.114   1045.19     851.6   0.1982    1.37143
FS5   TEGV.Fl_O               48.03    10.389   1052.82    256.33   0.0091     96.80    10.114   1045.19     851.6   0.1982    1.37143
FS8   Core_Nozz.Fl_O          48.03    10.389   1052.82    256.33   0.0091     96.80     9.822   1036.94     603.2   0.2870    1.37143
FS17  FanDuctLkg.Fl_O        442.25    12.085    534.12    127.89   0.0000    545.75    10.900    518.61    2600.0   0.3868    1.39975
FS171 Bleed15.Fl_O           442.25    12.085    534.12    127.89   0.0000    545.75    10.760    516.69    2475.2   0.4108    1.39975
FS172 FanDuct.Fl_O           442.25    12.085    534.12    127.89   0.0000    545.75    10.760    516.69    2475.2   0.4108    1.39975
FS173 Byp_Nozz.Fl_O          442.25    12.085    534.12    127.89   0.0000    545.75     9.822    503.75    2002.6   0.5491    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       590.29   1.097   0.9093   2034.264   1.0292    0.9108    -2279.5  ---.--   45.03
LPC        63.53   1.311   0.8186   2034.264   1.0976    0.8270     -819.3    9.96    0.51
HPC        50.76   5.764   0.8128   8853.260   1.7865    0.8515    -7178.3   61.41   57.72
HPT        12.10   3.801   0.8818    216.174   1.3364    0.8624     7178.3
LPT        50.34   2.059   0.8287     57.886   1.1704    0.8140     3098.8

TURBOMACHINERY MAP DATA
           WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       685.85   1.095   0.9111   2014.862    0.0450      0.8607    1.0235    0.9980    0.9905
```

LPC	36.28	1.298	0.7366	0.537	180.0000	1.7514	1.0460	1.1113	0.0003
HPC	46.17	5.539	0.8212	8617.034	11.0151	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.742	0.8818	1.301	3.7422	12.6513	0.9790	1.0000	0.0003
LPT	0.77	1.805	0.8348	0.652	1.8052	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2995.97	6793.5

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.1982	851.64
FanDuct	0.0000	0.4108	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.2910	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9277.9	4063.6	7178.3
LP_Shaft	2034.8	7998.3	3098.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.7517	795.75	191.03	21.393
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.5569	795.75	191.03	10.389
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	911.76	219.43	57.091
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	5.4350	1017.61	245.65	81.315
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	4.7557	1017.61	245.65	47.040
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1842.02	0.9995	0.0230	0.43277	0.01233

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.058	0.9800	1.0000	0.9800	603.19	0.287	439.7	656.4
Byp_Nozz	1.230	0.9800	1.0000	0.9800	2002.63	0.549	592.2	8140.3

27% Blockage

```
**********************************************************************************************************************
Date:02/23/11    Time:14:52:58    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 34/ 2/ 5    Run by: Philip C Jorgenson      PC:   100
Temperature Stator 1 inlet: 456.56    Stator 1 exit: 475.13    Stator 2 inlet: 502.77    Stator 2 exit: 510.93
            Stator 3 inlet: 537.55    Stator 3 exit: 546.10    Stator 4 inlet: 571.37    Stator 4 exit: 579.42
            Stator 5 inlet: 599.78    Stator 5 exit: 607.62             Unblocked   Percent Blockage: 0.27

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.780   35000.0    22.00    477.01     8371.9    0.5976    5003.20    5.2999    779.49   32.229      8371.8     100.0   2874.1
2696.7   1876.6


                                        FLOW STATION DATA
                                 W        Pt        Tt       ht     FAR       Wc        Ps        Ts     Aphy      MN      gamt
FS0   Ambient.Fl_O          477.01     5.185    466.40   111.64  0.0000  1281.99     3.458    415.85   3926.2  0.7800   1.40014
FS1   Inlet.Fl_O            477.01     5.185    466.40   111.64  0.0000  1281.99     3.822    427.49   4162.5  0.6748   1.40014
FS12  Splitter.Fl_02        401.29     5.183    466.40   111.64  0.0000  1079.03     3.850    428.42   3526.9  0.6660   1.40014
FS2   Splitter.Fl_01         75.72     5.183    466.40   111.64  0.0000   203.59     3.638    421.57    637.7  0.7295   1.40014
FS14  Fan.Fl_O              401.29     8.814    550.80   131.90  0.0000   689.50     7.302    521.98   2600.0  0.5256   1.39972
FS25  LPC.Fl_O               75.72    12.470    626.53   150.09  0.0000    98.07    10.840    601.99    412.5  0.4522   1.39820
FS3   HPC.Fl_O               72.04   167.116   1392.78   341.31  0.0000    10.38   150.851   1355.71     49.7  0.3910   1.35667
FS36  Bleed3.Fl_O            55.83   167.116   1392.78   341.31  0.0000     8.05   157.663   1371.60     49.3  0.2941   1.35667
FS4   Burner.Fl_O            57.22   163.267   2874.15   782.49  0.0249    12.13   154.128   2837.81     74.8  0.3005   1.28295
FS45  HPT.Fl_O               76.22    38.400   1885.85   483.69  0.0186    55.62    34.596   1838.73    264.7  0.4000   1.31936
FS49  LPT.Fl_O               77.11     8.963   1356.88   337.80  0.0184   204.50     7.752   1307.05    851.6  0.4682   1.34611
FS5   TEGV.Fl_O              77.11     8.963   1356.88   337.80  0.0184   204.50     7.752   1307.05    851.6  0.4682   1.34611
FS8   Core_Nozz.Fl_O         77.11     8.963   1356.88   337.80  0.0184   204.50     4.796   1152.89    603.2  1.0000   1.34611
FS17  FanDuctLkg.Fl_O       401.29     8.814    550.80   131.90  0.0000   689.50     7.302    521.98   2600.0  0.5256   1.39972
FS171 Bleed15.Fl_O          401.29     8.814    550.80   131.90  0.0000   689.50     7.092    517.65   2475.2  0.5661   1.39972
FS172 FanDuct.Fl_O          401.29     8.814    550.80   131.90  0.0000   689.50     7.092    517.65   2475.2  0.5661   1.39972
FS173 Byp_Nozz.Fl_O         401.29     8.814    550.80   131.90  0.0000   689.50     4.672    458.99   2002.6  1.0000   1.39972

TURBOMACHINERY PERFORMANCE DATA
               Wc      PR      eff         Nc       TR   efPoly        pwr     SMN     SMW
Fan       1079.03   1.701   0.9114   4139.514   1.1810   0.9171   -11498.7   36.79   23.18
LPC        203.59   2.406   0.8368   4139.514   1.3433   0.8537    -4118.9    3.06    2.59
HPC         98.07  13.401   0.8581  10417.139   2.2230   0.8978   -19988.3   25.13   24.38
HPT         12.13   4.252   0.9120    213.560   1.3438   0.8973    19988.3
LPT         55.62   4.284   0.9159     90.391   1.3860   0.9002    15617.7

TURBOMACHINERY MAP DATA
```

	WcMap	PRmap	effMap	NcMap	R/Parm	s_WcDes	s_PRdes	s_effDes	s_NcDes
Fan	1253.73	1.685	0.9132	4100.034	0.0638	0.8607	1.0235	0.9980	0.9905
LPC	166.92	2.761	0.8444	1.093	180.0000	1.2197	0.7986	0.9910	0.0003
HPC	89.19	12.817	0.8670	10139.185	13.5840	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.183	0.9120	1.286	4.1834	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.497	0.9227	1.019	3.4967	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3926.21	11556.7

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4682	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.2999	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11449.2	9169.3	19988.3
LP_Shaft	3925.4	20896.4	15617.7

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.7864	1017.82	245.70	38.400
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.8859	1017.82	245.70	8.963
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	979.36	236.14	46.492
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1214.97	295.42	108.350
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	979.36	236.14	46.492
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	979.36	236.14	46.492

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	8.6453	1392.78	341.31	163.267
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	7.5649	1392.78	341.31	91.843
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2874.15	0.9995	0.0230	1.38978	0.02489

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.592	0.9805	1.0000	0.9800	603.19	1.000	1607.6	4659.7
Byp_Nozz	2.549	0.9823	1.0000	0.9800	2002.63	1.000	1029.2	15268.9

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**********************************************************************************************************************
Date:02/23/11    Time:14:54:16    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 11/ 24/ 1/ 9    Run by: Philip C Jorgenson      PC:    75
Temperature Stator 1 inlet: 466.93    Stator 1 exit: 483.90    Stator 2 inlet: 462.59    Stator 2 exit: 468.78
            Stator 3 inlet: 535.51    Stator 3 exit: 541.84    Stator 4 inlet: 563.39    Stator 4 exit: 570.73
            Stator 5 inlet: 588.26    Stator 5 exit: 595.23               Stage2   Percent Blockage: 0.27

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.780   35000.0    22.00    439.43     6329.1    0.5984    3787.46    5.7725    779.49   26.516      8371.8      75.6   2662.3
2500.2   1732.0


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O           439.43     5.185    466.40    111.64   0.0000   1180.98     3.458    415.85    3616.9  0.7800    1.40014
FS1   Inlet.Fl_O             439.43     5.185    466.40    111.64   0.0000   1180.98     4.119    436.73    4162.5  0.5829    1.40014
FS12  Splitter.Fl_02         374.54     5.183    466.40    111.64   0.0000   1007.10     4.098    436.14    3526.9  0.5891    1.40014
FS2   Splitter.Fl_01          64.88     5.183    466.40    111.64   0.0000    174.47     4.218    439.74     637.7  0.5507    1.40014
FS14  Fan.Fl_O               374.54     8.124    537.43    128.69   0.0000    689.70     6.729    509.29    2600.0  0.5258    1.39974
FS25  LPC.Fl_O                64.88    11.246    610.92    146.34   0.0000     92.02     9.979    590.44     412.5  0.4169    1.39853
FS3   HPC.Fl_O                61.74   137.491   1323.31    323.26   0.0000     10.54   123.645   1286.51      49.7  0.3976    1.36084
FS36  Bleed3.Fl_O             47.85   137.491   1323.31    323.26   0.0000      8.17   129.459   1302.33      49.3  0.2986    1.36084
FS4   Burner.Fl_O             48.90   134.325   2662.30    714.49   0.0220     12.12   126.817   2627.95      74.8  0.2994    1.29102
FS45  HPT.Fl_O                65.18    31.365   1740.24    441.68   0.0164     55.94    28.220   1695.42     264.7  0.4014    1.32698
FS49  LPT.Fl_O                65.94     7.335   1247.98    308.35   0.0162    204.93     6.341   1201.19     851.6  0.4679    1.35424
FS5   TEGV.Fl_O               65.94     7.335   1247.98    308.35   0.0162    204.93     6.341   1201.19     851.6  0.4679    1.35424
FS8   Core_Nozz.Fl_O          65.94     7.335   1247.98    308.35   0.0162    204.93     3.916   1056.84     603.2  1.0000    1.35424
FS17  FanDuctLkg.Fl_O        374.54     8.124    537.43    128.69   0.0000    689.70     6.729    509.29    2600.0  0.5258    1.39974
FS171 Bleed15.Fl_O           374.54     8.124    537.43    128.69   0.0000    689.70     6.536    505.06    2475.2  0.5661    1.39974
FS172 FanDuct.Fl_O           374.54     8.124    537.43    128.69   0.0000    689.70     6.536    505.06    2475.2  0.5661    1.39974
FS173 Byp_Nozz.Fl_O          374.54     8.124    537.43    128.69   0.0000    689.70     4.308    447.86    2002.6  1.0000    1.39974

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan        1007.10   1.567   0.9081   3867.056   1.1523    0.9125    -9031.1   60.86   28.89
LPC         174.47   2.170   0.8040   3867.056   1.3099    0.8248    -3184.8    2.39    1.84
HPC          92.02  12.226   0.8604  10204.282   2.1661    0.8986   -15848.3   29.39   28.41
HPT          12.12   4.283   0.9100    214.636   1.3528    0.8946    15848.3
LPT          55.94   4.276   0.9118     87.904   1.3910    0.8951    12216.0

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        1170.13   1.554   0.9099   3830.175    0.0593      0.8607    1.0235    0.9980    0.9905
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LPC	145.24	2.489	0.8399	1.021	180.0000	1.2012	0.7857	0.9573	0.0003
HPC	83.69	11.697	0.8693	9932.008	13.1846	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.214	0.9101	1.292	4.2136	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.490	0.9186	0.991	3.4904	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3616.86	10646.1

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4679	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.7725	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11074.7	7516.0	15848.3
LP_Shaft	3667.0	17496.5	12216.0

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.3877	973.95	234.80	31.365
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7591	973.95	234.80	7.335
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	938.19	225.95	39.020
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1157.49	280.80	89.518
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	938.19	225.95	39.020
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1323.31	323.26	137.491
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	938.19	225.95	39.020

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.4085	1323.31	323.26	134.325
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.4826	1323.31	323.26	75.432
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1323.31	323.26	137.491
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1323.31	323.26	137.491
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1323.31	323.26	137.491
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	537.43	128.69	8.124
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	537.43	128.69	8.124
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	537.43	128.69	8.124
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	537.43	128.69	8.124
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	537.43	128.69	8.124

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2662.30	0.9995	0.0230	1.05207	0.02199

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.121	0.9815	1.0000	0.9800	603.19	1.000	1543.4	3439.0
Byp_Nozz	2.349	0.9829	1.0000	0.9800	2002.63	1.000	1016.6	13536.3

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**********************************************************************************************************************************
Date:02/23/11    Time:14:55:17    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  7/ 20/ 1/ 5    Run by: Philip C Jorgenson      PC:    72
Temperature Stator 1 inlet: 467.38    Stator 1 exit: 484.05    Stator 2 inlet: 466.03    Stator 2 exit: 473.51
            Stator 3 inlet: 535.22    Stator 3 exit: 541.66    Stator 4 inlet: 562.80    Stator 4 exit: 570.15
            Stator 5 inlet: 587.38    Stator 5 exit: 594.33               Stage2   Percent Blockage: 0.27

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    35000.0    22.00    435.02      6086.3    0.5980    3639.89    5.8071    779.49   25.915      8371.8       72.7   2623.3
2464.2   1706.2


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O           435.02     5.185    466.40    111.64   0.0000   1169.13     3.458    415.85    3580.6  0.7800    1.40014
FS1   Inlet.Fl_O             435.02     5.185    466.40    111.64   0.0000   1169.13     4.149    437.61    4162.5  0.5736    1.40014
FS12  Splitter.Fl_02         371.11     5.183    466.40    111.64   0.0000    997.88     4.126    436.98    3526.9  0.5803    1.40014
FS2   Splitter.Fl_01          63.91     5.183    466.40    111.64   0.0000    171.84     4.256    440.86     637.7  0.5382    1.40014
FS14  Fan.Fl_O               371.11     8.036    535.71    128.27   0.0000    689.71     6.657    507.66    2600.0  0.5258    1.39975
FS25  LPC.Fl_O                63.91    11.243    609.45    145.98   0.0000     90.55    10.023    589.80     412.5  0.4085    1.39861
FS3   HPC.Fl_O                60.81   134.376   1311.32    320.16   0.0000     10.57   120.745   1274.51      49.7  0.3990    1.36157
FS36  Bleed3.Fl_O             47.13   134.376   1311.32    320.16   0.0000      8.19   126.472   1290.35      49.3  0.2996    1.36157
FS4   Burner.Fl_O             48.14   131.281   2623.30    702.16   0.0215     12.12   123.947   2589.34      74.8  0.2992    1.29254
FS45  HPT.Fl_O                64.17    30.638   1714.25    434.26   0.0160     55.96    27.566   1669.94     264.7  0.4013    1.32846
FS49  LPT.Fl_O                64.92     7.161   1228.27    303.08   0.0158    205.01     6.190   1182.04     851.6  0.4678    1.35574
FS5   TEGV.Fl_O               64.92     7.161   1228.27    303.08   0.0158    205.01     6.190   1182.04     851.6  0.4678    1.35574
FS8   Core_Nozz.Fl_O          64.92     7.161   1228.27    303.08   0.0158    205.01     3.822   1039.53     603.2  1.0000    1.35574
FS17  FanDuctLkg.Fl_O        371.11     8.036    535.71    128.27   0.0000    689.71     6.657    507.66    2600.0  0.5258    1.39975
FS171 Bleed15.Fl_O           371.11     8.036    535.71    128.27   0.0000    689.71     6.466    503.45    2475.2  0.5661    1.39975
FS172 FanDuct.Fl_O           371.11     8.036    535.71    128.27   0.0000    689.71     6.466    503.45    2475.2  0.5661    1.39975
FS173 Byp_Nozz.Fl_O          371.11     8.036    535.71    128.27   0.0000    689.71     4.262    446.43    2002.6  1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan         997.88   1.551   0.9072   3832.794   1.1486    0.9114    -8731.6   63.65   29.67
LPC         171.84   2.169   0.8121   3832.794   1.3067    0.8322    -3104.7    2.69    2.06
HPC          90.55  11.952   0.8610  10163.547   2.1516    0.8988   -15367.3   30.44   29.38
HPT          12.12   4.285   0.9094    215.102   1.3541    0.8938    15367.3
LPT          55.96   4.278   0.9111     87.783   1.3923    0.8944    11836.4

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        1159.42   1.538   0.9090   3796.239    0.0586      0.8607    1.0235    0.9980    0.9905
```

LPC	143.03	2.455	0.8400	1.012	180.0000	1.2014	0.8036	0.9668	0.0003
HPC	82.35	11.436	0.8699	9892.360	13.0928	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.216	0.9094	1.295	4.2158	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.492	0.9179	0.989	3.4920	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3580.59	10539.4

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4678	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.8071	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11017.1	7325.9	15367.3
LP_Shaft	3634.5	17104.3	11836.4

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.3518	966.97	233.07	30.638
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7477	966.97	233.07	7.161
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.75	224.36	38.333
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1147.85	278.36	87.586
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.75	224.36	38.333
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1311.32	320.16	134.376
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.75	224.36	38.333

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.2969	1311.32	320.16	131.281
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.3849	1311.32	320.16	73.713
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.32	320.16	134.376
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.32	320.16	134.376
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.32	320.16	134.376
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	535.71	128.27	8.036
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	535.71	128.27	8.036
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	535.71	128.27	8.036
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	535.71	128.27	8.036
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	535.71	128.27	8.036

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2623.30	0.9995	0.0230	1.01108	0.02145

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.071	0.9813	1.0000	0.9800	603.19	1.000	1531.4	3309.3
Byp_Nozz	2.324	0.9829	1.0000	0.9800	2002.63	1.000	1015.0	13316.4

```
**********************************************************************************************************************
Date:02/23/11    Time:14:56:18    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    69
Temperature Stator 1 inlet: 467.86    Stator 1 exit: 484.25    Stator 2 inlet: 469.05    Stator 2 exit: 477.35
            Stator 3 inlet: 534.96    Stator 3 exit: 541.52    Stator 4 inlet: 562.26    Stator 4 exit: 569.62
            Stator 5 inlet: 586.56    Stator 5 exit: 593.49               Stage2   Percent Blockage: 0.27

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.780   35000.0    22.00    430.78     5851.9    0.5978    3498.18    5.8482    779.49   25.318      8371.8      69.9   2586.0
2429.7   1681.6


                                        FLOW STATION DATA
                                    W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN      gamt
FS0   Ambient.Fl_O           430.78     5.185    466.40    111.64   0.0000   1157.75     3.458    415.85    3545.7  0.7800   1.40014
FS1   Inlet.Fl_O             430.78     5.185    466.40    111.64   0.0000   1157.75     4.176    438.43    4162.5  0.5648   1.40014
FS12  Splitter.Fl_02         367.88     5.183    466.40    111.64   0.0000    989.19     4.151    437.74    3526.9  0.5723   1.40014
FS2   Splitter.Fl_01          62.90     5.183    466.40    111.64   0.0000    169.14     4.293    441.96     637.7  0.5258   1.40014
FS14  Fan.Fl_O               367.88     7.953    533.99    127.86   0.0000    689.72     6.588    506.02    2600.0  0.5257   1.39975
FS25  LPC.Fl_O                62.90    11.233    608.04    145.64   0.0000     89.11    10.057    589.17     412.5  0.4006   1.39877
FS3   HPC.Fl_O                59.85   131.279   1299.81    317.19   0.0000     10.61   117.869   1263.01      49.7  0.4004   1.36230
FS36  Bleed3.Fl_O              46.39   131.279   1299.81    317.19   0.0000      8.22   123.507   1278.85      49.3  0.3005   1.36230
FS4   Burner.Fl_O              47.36   128.256   2585.96    690.41   0.0209     12.12   121.094   2552.37      74.8  0.2989   1.29401
FS45  HPT.Fl_O                 63.14    29.918   1689.45    427.22   0.0156     55.98    26.915   1645.61     264.7  0.4012   1.32978
FS49  LPT.Fl_O                 63.88     6.990   1209.56    298.09   0.0154    205.08     6.042   1163.87     851.6  0.4678   1.35718
FS5   TEGV.Fl_O                63.88     6.990   1209.56    298.09   0.0154    205.08     6.042   1163.87     851.6  0.4678   1.35718
FS8   Core_Nozz.Fl_O           63.88     6.990   1209.56    298.09   0.0154    205.08     3.729   1023.11     603.2  1.0000   1.35718
FS17  FanDuctLkg.Fl_O         367.88     7.953    533.99    127.86   0.0000    689.72     6.588    506.02    2600.0  0.5257   1.39975
FS171 Bleed15.Fl_O            367.88     7.953    533.99    127.86   0.0000    689.72     6.400    501.83    2475.2  0.5661   1.39975
FS172 FanDuct.Fl_O            367.88     7.953    533.99    127.86   0.0000    689.72     6.400    501.83    2475.2  0.5661   1.39975
FS173 Byp_Nozz.Fl_O           367.88     7.953    533.99    127.86   0.0000    689.72     4.218    444.99    2002.6  1.0000   1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff        Nc       TR    efPoly       pwr     SMN     SMW
Fan       989.19   1.535   0.9074  3799.644   1.1449    0.9115   -8439.8   69.96   30.43
LPC       169.14   2.167   0.8190  3799.644   1.3037    0.8385   -3025.9    2.99    2.28
HPC        89.11  11.687   0.8614 10123.614   2.1377    0.8988  -14897.7   31.49   30.34
HPT        12.12   4.287   0.9087   215.549   1.3553    0.8930   14897.7
LPT        55.98   4.280   0.9105    87.660   1.3935    0.8936   11465.7

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap     NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1149.32   1.522   0.9093  3763.406    0.0581      0.8607    1.0235    0.9980    0.9905
```

LPC	140.88	2.422	0.8401	1.004	180.0000	1.2006	0.8206	0.9749	0.0003
HPC	81.04	11.184	0.8703	9853.492	13.0040	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.218	0.9087	1.298	4.2179	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.493	0.9172	0.988	3.4932	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3545.73	10436.8

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4678	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.8482	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	10961.2	7138.3	14897.7
LP_Shaft	3603.1	16713.2	11465.7

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.3149	960.29	231.42	29.918
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7360	960.29	231.42	6.990
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	925.58	222.84	37.643
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1138.60	276.02	85.662
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	925.58	222.84	37.643
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1299.81	317.19	131.279
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	925.58	222.84	37.643

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.1825	1299.81	317.19	128.256
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.2848	1299.81	317.19	72.006
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1299.81	317.19	131.279
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1299.81	317.19	131.279
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1299.81	317.19	131.279
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	533.99	127.86	7.953
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	533.99	127.86	7.953
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	533.99	127.86	7.953
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	533.99	127.86	7.953
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	533.99	127.86	7.953

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2585.96	0.9995	0.0230	0.97172	0.02095

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.021	0.9811	1.0000	0.9800	603.19	1.000	1520.0	3180.9
Byp_Nozz	2.300	0.9829	1.0000	0.9800	2002.63	1.000	1013.3	13107.7

```
**********************************************************************************************************************************
Date:02/23/11    Time:14:58:57    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 34/ 2/ 5    Run by: Philip C Jorgenson      PC:   100
Temperature Stator 1 inlet: 452.23    Stator 1 exit: 470.61    Stator 2 inlet: 497.98    Stator 2 exit: 506.04
            Stator 3 inlet: 532.41    Stator 3 exit: 540.85    Stator 4 inlet: 565.90    Stator 4 exit: 573.85
            Stator 5 inlet: 594.02    Stator 5 exit: 601.76             Unblocked   Percent Blockage: 0.27

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    395.92     6923.4    0.5938    4111.10    5.2972    775.82   32.257      6923.3     100.0   2850.8
2674.6   1859.9


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          395.92     4.283    462.03    110.60   0.0000   1282.11     2.854    411.97    3930.2   0.7800    1.40005
FS1   Inlet.Fl_O            395.92     4.283    462.03    110.60   0.0000   1282.11     3.157    423.48    4162.5   0.6750    1.40005
FS12  Splitter.Fl_02        333.05     4.281    462.03    110.60   0.0000   1079.05     3.180    424.41    3526.9   0.6660    1.40005
FS2   Splitter.Fl_01         62.87     4.281    462.03    110.60   0.0000    203.70     3.002    417.52     637.7   0.7305    1.40005
FS14  Fan.Fl_O              333.05     7.280    545.71    130.67   0.0000    689.60     6.031    517.14    2600.0   0.5257    1.39973
FS25  LPC.Fl_O               62.87    10.292    620.49    148.64   0.0000     98.19     8.942    596.10     412.5   0.4529    1.39833
FS3   HPC.Fl_O               59.82   138.164   1380.92    338.22   0.0000     10.38   124.716   1344.10      49.7   0.3909    1.35737
FS36  Bleed3.Fl_O            46.36   138.164   1380.92    338.22   0.0000      8.05   130.348   1359.88      49.3   0.2940    1.35737
FS4   Burner.Fl_O            47.50   134.982   2850.79    774.97   0.0246     12.13   127.427   2814.67      74.8   0.3004    1.28375
FS45  HPT.Fl_O               63.28    31.734   1869.09    478.84   0.0184     55.63    28.591   1822.29     264.7   0.3999    1.32018
FS49  LPT.Fl_O               64.01     7.404   1344.03    334.31   0.0182    204.54     6.404   1294.56     851.6   0.4682    1.34702
FS5   TEGV.Fl_O              64.01     7.404   1344.03    334.31   0.0182    204.54     6.404   1294.56     851.6   0.4682    1.34702
FS8   Core_Nozz.Fl_O         64.01     7.404   1344.03    334.31   0.0182    204.54     3.961   1141.55     603.2   1.0000    1.34702
FS17  FanDuctLkg.Fl_O       333.05     7.280    545.71    130.67   0.0000    689.60     6.031    517.14    2600.0   0.5257    1.39973
FS171 Bleed15.Fl_O          333.05     7.280    545.71    130.67   0.0000    689.60     5.857    512.85    2475.2   0.5662    1.39973
FS172 FanDuct.Fl_O          333.05     7.280    545.71    130.67   0.0000    689.60     5.857    512.85    2475.2   0.5662    1.39973
FS173 Byp_Nozz.Fl_O         333.05     7.280    545.71    130.67   0.0000    689.60     3.860    454.75    2002.6   1.0000    1.39973

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1079.05   1.701   0.9114   4139.497   1.1811    0.9169    -9460.9   36.81   23.19
LPC        203.70   2.404   0.8363   4139.497   1.3430    0.8542    -3384.1    3.06    2.59
HPC         98.19  13.424   0.8581  10422.001   2.2255    0.8979   -16455.3   25.06   24.31
HPT         12.13   4.253   0.9119    213.496   1.3446    0.8972    16455.3
LPT         55.63   4.286   0.9157     90.369   1.3868    0.8998    12845.1

TURBOMACHINERY MAP DATA
           WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1253.75   1.685   0.9132   4100.017    0.0638      0.8607    1.0235    0.9980    0.9905
```

LPC	166.92	2.761	0.8444	1.093	180.0000	1.2204	0.7974	0.9904	0.0003
HPC	89.31	12.839	0.8669	10143.918	13.5911	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.185	0.9119	1.285	4.1851	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.498	0.9225	1.018	3.4980	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3930.20	9547.0

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4682	851.64
FanDuct	0.0000	0.5662	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.2972	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11399.2	7581.7	16455.3
LP_Shaft	3906.9	17267.7	12845.1

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.3137	1008.69	243.43	31.734
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7356	1008.69	243.43	7.404
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.52	233.95	38.424
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1204.39	292.72	89.573
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.52	233.95	38.424
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1380.92	338.22	138.164
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.52	233.95	38.424

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.1788	1380.92	338.22	134.982
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.2816	1380.92	338.22	75.925
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.92	338.22	138.164
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.92	338.22	138.164
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.92	338.22	138.164
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2850.79	0.9995	0.0230	1.14197	0.02463

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.594	0.9805	1.0000	0.9800	603.19	1.000	1600.1	3851.3
Byp_Nozz	2.551	0.9825	1.0000	0.9800	2002.63	1.000	1024.4	12619.0

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**********************************************************************************************************************
Date:02/23/11    Time:15:00:05    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    84
Temperature Stator 1 inlet: 457.73    Stator 1 exit: 474.77    Stator 2 inlet: 499.37    Stator 2 exit: 507.77
            Stator 3 inlet: 531.51    Stator 3 exit: 539.93    Stator 4 inlet: 562.42    Stator 4 exit: 570.18
            Stator 5 inlet: 588.48    Stator 5 exit: 595.87             Unblocked   Percent Blockage: 0.27

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    376.28      5815.7    0.5868    3412.48    5.4803    775.82   28.783      6923.3       84.0   2672.3
2509.4   1739.6


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          376.28     4.283    462.03    110.60   0.0000   1218.51     2.854    411.97    3735.2   0.7800    1.40005
FS1   Inlet.Fl_O            376.28     4.283    462.03    110.60   0.0000   1218.51     3.321    429.63    4162.5   0.6142    1.40005
FS12  Splitter.Fl_02        318.22     4.281    462.03    110.60   0.0000   1030.99     3.323    429.78    3526.9   0.6128    1.40005
FS2   Splitter.Fl_01         58.07     4.281    462.03    110.60   0.0000    188.13     3.297    428.81     637.7   0.6226    1.40005
FS14  Fan.Fl_O              318.22     6.897    536.70    128.51   0.0000    689.71     5.713    508.59    2600.0   0.5258    1.39974
FS25  LPC.Fl_O               58.07    10.070    611.78    146.54   0.0000     92.03     8.936    591.27     412.5   0.4169    1.39851
FS3   HPC.Fl_O               55.25   123.284   1325.65    323.87   0.0000     10.53   110.899   1288.88      49.7   0.3971    1.36070
FS36  Bleed3.Fl_O            42.82   123.284   1325.65    323.87   0.0000      8.16   116.099   1304.68      49.3   0.2982    1.36070
FS4   Burner.Fl_O            43.77   120.445   2672.32    717.68   0.0221     12.12   113.711   2637.88      74.8   0.2995    1.29062
FS45  HPT.Fl_O               58.33    28.210   1747.89    443.86   0.0165     55.79    25.399   1703.20     264.7   0.4002    1.32655
FS49  LPT.Fl_O               59.01     6.577   1252.25    309.50   0.0163    204.90     5.685   1205.34     851.6   0.4679    1.35390
FS5   TEGV.Fl_O              59.01     6.577   1252.25    309.50   0.0163    204.90     5.685   1205.34     851.6   0.4679    1.35390
FS8   Core_Nozz.Fl_O         59.01     6.577   1252.25    309.50   0.0163    204.90     3.511   1060.60     603.2   1.0000    1.35390
FS17  FanDuctLkg.Fl_O        318.22     6.897    536.70    128.51   0.0000    689.71     5.713    508.59    2600.0   0.5258    1.39974
FS171 Bleed15.Fl_O           318.22     6.897    536.70    128.51   0.0000    689.71     5.550    504.37    2475.2   0.5661    1.39974
FS172 FanDuct.Fl_O           318.22     6.897    536.70    128.51   0.0000    689.71     5.550    504.37    2475.2   0.5661    1.39974
FS173 Byp_Nozz.Fl_O          318.22     6.897    536.70    128.51   0.0000    689.71     3.658    447.25    2002.6   1.0000    1.39974

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1030.99   1.611   0.9119   3951.097   1.1616   0.9164    -8064.9   54.89   26.94
LPC        188.13   2.352   0.8599   3951.097   1.3241   0.8757    -2953.1    1.70    1.34
HPC         92.03  12.242   0.8603  10205.147   2.1669   0.8985   -14214.7   29.22   28.25
HPT         12.12   4.270   0.9102    214.401   1.3516   0.8949    14214.7
LPT         55.79   4.289   0.9131     89.197   1.3924   0.8965    11018.0

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1197.89   1.597   0.9138   3913.414    0.0608      0.8607    1.0235    0.9980    0.9905
```

LPC	150.68	2.572	0.8397	1.044	180.0000	1.2486	0.8603	1.0241	0.0003
HPC	83.70	11.712	0.8692	9932.851	13.2002	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.201	0.9102	1.291	4.2008	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.501	0.9199	1.005	3.5005	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3735.23	9073.4

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4679	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.4803	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11083.4	6735.9	14214.7
LP_Shaft	3729.1	15517.7	11018.0

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.1368	975.58	235.20	28.210
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6794	975.58	235.20	6.577
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.75	226.34	34.977
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1159.49	281.31	80.263
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.75	226.34	34.977
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1325.65	323.87	123.284
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.75	226.34	34.977

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.6299	1325.65	323.87	120.445
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.8014	1325.65	323.87	67.686
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.65	323.87	123.284
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.65	323.87	123.284
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.65	323.87	123.284
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2672.32	0.9995	0.0230	0.94791	0.02214

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.304	0.9817	1.0000	0.9800	603.19	1.000	1545.9	3232.1
Byp_Nozz	2.417	0.9830	1.0000	0.9800	2002.63	1.000	1015.9	11657.0

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**********************************************************************************************************************
Date:02/23/11    Time:15:01:05    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    79
Temperature Stator 1 inlet: 459.04    Stator 1 exit: 475.75    Stator 2 inlet: 499.73    Stator 2 exit: 508.17
            Stator 3 inlet: 531.31    Stator 3 exit: 539.73    Stator 4 inlet: 561.62    Stator 4 exit: 569.34
            Stator 5 inlet: 587.19    Stator 5 exit: 594.51             Unblocked   Percent Blockage: 0.27

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    370.94      5524.8    0.5863    3239.08    5.5397    775.82   27.860      6923.3       79.8   2626.4
2466.9   1709.0


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           370.94     4.283    462.03    110.60   0.0000   1201.21     2.854    411.97    3682.2   0.7800    1.40005
FS1   Inlet.Fl_O             370.94     4.283    462.03    110.60   0.0000   1201.21     3.360    431.07    4162.5   0.5995    1.40005
FS12  Splitter.Fl_02         314.22     4.281    462.03    110.60   0.0000   1018.04     3.357    431.04    3526.9   0.5997    1.40005
FS2   Splitter.Fl_01          56.72     4.281    462.03    110.60   0.0000    183.77     3.361    431.20     637.7   0.5981    1.40005
FS14  Fan.Fl_O               314.22     6.795    534.32    127.94   0.0000    689.72     5.629    506.34    2600.0   0.5257    1.39975
FS25  LPC.Fl_O                56.72     9.999    609.72    146.05   0.0000     90.39     8.918    590.14     412.5   0.4077    1.39858
FS3   HPC.Fl_O                53.97   119.329   1311.34    320.17   0.0000     10.57   107.239   1274.58      49.7   0.3987    1.36157
FS36  Bleed3.Fl_O             41.83   119.329   1311.34    320.17   0.0000      8.19   112.318   1290.40      49.3   0.2994    1.36157
FS4   Burner.Fl_O             42.73   116.581   2626.38    703.14   0.0215     12.12   110.066   2592.38      74.8   0.2992    1.29240
FS45  HPT.Fl_O                56.96    27.280   1717.09    435.07   0.0161     55.83    24.558   1672.96     264.7   0.4002    1.32830
FS49  LPT.Fl_O                57.62     6.358   1228.97    303.27   0.0159    205.01     5.496   1182.71     851.6   0.4679    1.35567
FS5   TEGV.Fl_O               57.62     6.358   1228.97    303.27   0.0159    205.01     5.496   1182.71     851.6   0.4679    1.35567
FS8   Core_Nozz.Fl_O          57.62     6.358   1228.97    303.27   0.0159    205.01     3.393   1040.14     603.2   1.0000    1.35567
FS17  FanDuctLkg.Fl_O         314.22     6.795    534.32    127.94   0.0000    689.72     5.629    506.34    2600.0   0.5257    1.39975
FS171 Bleed15.Fl_O            314.22     6.795    534.32    127.94   0.0000    689.72     5.468    502.14    2475.2   0.5661    1.39975
FS172 FanDuct.Fl_O            314.22     6.795    534.32    127.94   0.0000    689.72     5.468    502.14    2475.2   0.5661    1.39975
FS173 Byp_Nozz.Fl_O           314.22     6.795    534.32    127.94   0.0000    689.72     3.604    445.27    2002.6   1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
                Wc       PR       eff         Nc        TR    efPoly        pwr      SMN      SMW
Fan       1018.04    1.587    0.9110   3904.445    1.1565    0.9153    -7710.4    58.36    27.99
LPC        183.77    2.336    0.8636   3904.445    1.3197    0.8791    -2844.9     2.07     1.61
HPC         90.39   11.934    0.8610  10159.676    2.1507    0.8987   -13634.7    30.42    29.36
HPT         12.12    4.274    0.9094    214.941    1.3532    0.8939    13634.9
LPT         55.83    4.291    0.9124     88.931    1.3939    0.8957    10555.3

TURBOMACHINERY MAP DATA
             WcMap    PRmap    effMap      NcMap     R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1182.84    1.574    0.9129   3867.207    0.0599      0.8607    1.0235    0.9980    0.9905
```

LPC	147.66	2.526	0.8398	1.031	180.0000	1.2446	0.8753	1.0284	0.0003
HPC	82.20	11.419	0.8699	9888.593	13.0958	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.205	0.9094	1.294	4.2047	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.501	0.9191	1.002	3.5014	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3682.21	8944.6

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4679	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.5397	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11015.4	6501.1	13634.9
LP_Shaft	3685.1	15043.8	10555.3

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.0873	967.11	233.11	27.280
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6636	967.11	233.11	6.358
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.90	224.40	34.052
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1147.92	278.38	77.784
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.90	224.40	34.052
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1311.34	320.17	119.329
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.90	224.40	34.052

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.4764	1311.34	320.17	116.581
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.6670	1311.34	320.17	65.501
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.34	320.17	119.329
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.34	320.17	119.329
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.34	320.17	119.329
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2626.38	0.9995	0.0230	0.89974	0.02151

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.228	0.9816	1.0000	0.9800	603.19	1.000	1531.8	3068.5
Byp_Nozz	2.381	0.9831	1.0000	0.9800	2002.63	1.000	1013.6	11400.8

```
**********************************************************************************************************************************
Date:02/23/11    Time:15:02:07    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    76
Temperature Stator 1 inlet: 459.90    Stator 1 exit: 476.37    Stator 2 inlet: 499.93    Stator 2 exit: 508.39
            Stator 3 inlet: 531.11    Stator 3 exit: 539.51    Stator 4 inlet: 560.99    Stator 4 exit: 568.66
            Stator 5 inlet: 586.21    Stator 5 exit: 593.47             Unblocked   Percent Blockage: 0.27

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.780   39000.0    22.00    366.97     5317.1    0.5870    3120.95    5.5814    775.82   27.215      6923.3      76.8   2594.8
2437.8   1688.1


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O          366.97     4.283    462.03    110.60   0.0000   1188.36     2.854    411.97    3642.8  0.7800    1.40005
FS1   Inlet.Fl_O            366.97     4.283    462.03    110.60   0.0000   1188.36     3.387    432.08    4162.5  0.5889    1.40005
FS12  Splitter.Fl_02        311.21     4.281    462.03    110.60   0.0000   1008.30     3.382    431.95    3526.9  0.5903    1.40005
FS2   Splitter.Fl_01         55.76     4.281    462.03    110.60   0.0000    180.65     3.405    432.77     637.7  0.5816    1.40005
FS14  Fan.Fl_O              311.21     6.720    532.72    127.55   0.0000    689.73     5.567    504.82    2600.0  0.5257    1.39975
FS25  LPC.Fl_O               55.76     9.941    608.23    145.69   0.0000     89.27     8.896    589.28     412.5  0.4014    1.39875
FS3   HPC.Fl_O               53.05   116.570   1301.48    317.62   0.0000     10.60   104.692   1264.74      49.7  0.3999    1.36219
FS36  Bleed3.Fl_O            41.12   116.570   1301.48    317.62   0.0000      8.21   109.684   1280.55      49.3  0.3002    1.36219
FS4   Burner.Fl_O            41.98   113.885   2594.81    693.21   0.0211     12.12   107.524   2561.13      74.8  0.2990    1.29364
FS45  HPT.Fl_O               55.97    26.631   1695.98    429.07   0.0157     55.85    23.972   1652.24     264.7  0.4002    1.32939
FS49  LPT.Fl_O               56.63     6.206   1213.08    299.04   0.0155    205.06     5.364   1167.29     851.6  0.4678    1.35689
FS5   TEGV.Fl_O              56.63     6.206   1213.08    299.04   0.0155    205.06     5.364   1167.29     851.6  0.4678    1.35689
FS8   Core_Nozz.Fl_O         56.63     6.206   1213.08    299.04   0.0155    205.06     3.311   1026.20     603.2  1.0000    1.35689
FS17  FanDuctLkg.Fl_O       311.21     6.720    532.72    127.55   0.0000    689.73     5.567    504.82    2600.0  0.5257    1.39975
FS171 Bleed15.Fl_O          311.21     6.720    532.72    127.55   0.0000    689.73     5.408    500.63    2475.2  0.5660    1.39975
FS172 FanDuct.Fl_O          311.21     6.720    532.72    127.55   0.0000    689.73     5.408    500.63    2475.2  0.5660    1.39975
FS173 Byp_Nozz.Fl_O         311.21     6.720    532.72    127.55   0.0000    689.73     3.564    443.93    2002.6  1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1008.30   1.570   0.9083   3871.415   1.1530    0.9125    -7466.6   60.55   28.78
LPC        180.65   2.322   0.8656   3871.415   1.3164    0.8810    -2768.4    2.35    1.81
HPC         89.27  11.727   0.8614  10128.420   2.1398    0.8988   -13235.1   31.26   30.13
HPT         12.12   4.276   0.9089    215.317   1.3544    0.8932    13234.9
LPT         55.85   4.291   0.9118     88.725   1.3948    0.8952    10235.7

TURBOMACHINERY MAP DATA
           WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1171.53   1.557   0.9101   3834.492    0.0593      0.8607    1.0235    0.9980    0.9905
```

LPC	145.52	2.493	0.8399	1.023	180.0000	1.2414	0.8853	1.0305	0.0003
HPC	81.19	11.221	0.8703	9858.170	13.0238	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.207	0.9089	1.296	4.2075	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.502	0.9186	1.000	3.5018	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3642.81	8848.9

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4678	851.64
FanDuct	0.0000	0.5660	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.5814	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	10968.1	6337.6	13234.9
LP_Shaft	3653.9	14712.7	10235.7

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.0519	961.26	231.66	26.631
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6524	961.26	231.66	6.206
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1139.95	276.36	76.051
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.570
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.3665	1301.48	317.62	113.885
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.5708	1301.48	317.62	63.976
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.570
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.570
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.570
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2594.81	0.9995	0.0230	0.86693	0.02108

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.175	0.9814	1.0000	0.9800	603.19	1.000	1522.1	2954.4
Byp_Nozz	2.355	0.9831	1.0000	0.9800	2002.63	1.000	1012.1	11211.5

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****************************************************************************************************************************************
Date:02/23/11    Time:15:02:07    Model:          P&W2040 Turbofan Engine - Original LPC Map, COMDES OFF    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 19/ 29/ 1/17    Run by: Philip C Jorgenson      PC:    50
Temperature Stator 1 inlet:   0.00    Stator 1 exit:   0.00    Stator 2 inlet:   0.00    Stator 2 exit:   0.00
            Stator 3 inlet:   0.00    Stator 3 exit:   0.00    Stator 4 inlet:   0.00    Stator 4 exit:   0.00
            Stator 5 inlet:   0.00    Stator 5 exit:   0.00             Unblocked   Percent Blockage: 0.27

                                                SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    331.26      3461.7     0.6023    2085.06    6.2395    775.82   20.920      6923.3       50.0   2288.9
2154.7   1486.4


                                                FLOW STATION DATA
                                    W         Pt         Tt         ht      FAR        Wc         Ps         Ts      Aphy       MN       gamt
FS0    Ambient.Fl_O             331.26      4.283     462.03     110.60   0.0000   1072.71      2.854     411.97    3288.3   0.7800    1.40005
FS1    Inlet.Fl_O               331.26      4.283     462.03     110.60   0.0000   1072.71      3.600     439.66    4162.5   0.5045    1.40005
FS12   Splitter.Fl_02           285.50      4.281     462.03     110.60   0.0000    925.00      3.567     438.57    3526.9   0.5173    1.40005
FS2    Splitter.Fl_01            45.76      4.281     462.03     110.60   0.0000    148.25      3.750     444.86     637.7   0.4393    1.40005
FS14   Fan.Fl_O                 285.50      6.070     516.31     123.61   0.0000    689.63      5.028     489.25    2600.0   0.5256    1.39978
FS25   LPC.Fl_O                  45.76      9.109     588.80     141.02   0.0000     78.66      8.388     575.11     412.5   0.3451    1.39965
FS3    HPC.Fl_O                  43.54     89.605    1200.04     291.61   0.0000     10.86     79.945    1163.66      49.7   0.4112    1.36855
FS36   Bleed3.Fl_O               33.74     89.605    1200.04     291.61   0.0000      8.42     84.023    1179.41      49.3   0.3079    1.36855
FS4    Burner.Fl_O               34.32     87.541    2288.89     599.00   0.0172     12.10     82.668    2258.34      74.8   0.2971    1.30596
FS45   HPT.Fl_O                  45.80     20.350    1492.91     372.39   0.0128     56.11     18.299    1452.95     264.7   0.4004    1.34187
FS49   LPT.Fl_O                  46.34      4.791    1065.66     260.33   0.0127    203.71      4.153    1025.30     851.6   0.4615    1.36826
FS5    TEGV.Fl_O                 46.34      4.791    1065.66     260.33   0.0127    203.71      4.153    1025.30     851.6   0.4615    1.36826
FS8    Core_Nozz.Fl_O            46.34      4.791    1065.66     260.33   0.0127    203.71      2.854     925.90     603.2   0.8990    1.36826
FS17   FanDuctLkg.Fl_O          285.50      6.070     516.31     123.61   0.0000    689.63      5.028     489.25    2600.0   0.5256    1.39978
FS171  Bleed15.Fl_O             285.50      6.070     516.31     123.61   0.0000    689.63      4.883     485.18    2475.2   0.5661    1.39978
FS172  FanDuct.Fl_O             285.50      6.070     516.31     123.61   0.0000    689.63      4.883     485.18    2475.2   0.5661    1.39978
FS173  Byp_Nozz.Fl_O            285.50      6.070     516.31     123.61   0.0000    689.63      3.219     430.27    2002.6   1.0000    1.39978

TURBOMACHINERY PERFORMANCE DATA
              Wc       PR       eff          Nc        TR     efPoly        pwr      SMN      SMW
Fan         925.00    1.418   0.9085    3530.666    1.1175   0.9107    -5258.3   122.22    36.45
LPC         148.25    2.128   0.8822    3530.666    1.2744   0.8950    -1969.6    28.09    20.21
HPC          78.66    9.837   0.8618    9815.620    2.0381   0.8972    -9512.8    39.56    37.83
HPT          12.10    4.302   0.9025     218.597    1.3649   0.8853     9512.6
LPT          56.11    4.247   0.9036      86.244    1.3984   0.8849     7228.0

TURBOMACHINERY MAP DATA
            WcMap    PRmap    effMap      NcMap     R/Parm     s_WcDes    s_PRdes   s_effDes    s_NcDes
Fan       1074.74    1.408    0.9104    3496.993     0.0536      0.8607     1.0235     0.9980     0.9905
```

LPC	146.25	2.120	0.8792	0.933	716.3440	1.0136	1.0072	1.0034	0.0003
HPC	71.54	9.421	0.8707	9553.717	12.3549	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.232	0.9025	1.316	4.2323	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.468	0.9103	0.972	3.4684	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3288.30	7987.7

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4615	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	6.2395	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	10458.2	4777.2	9512.6
LP_Shaft	3332.3	11392.2	7228.0

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.6839	899.09	216.32	20.350
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.5354	899.09	216.32	4.791
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	868.42	208.79	26.818
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1056.92	255.47	59.016
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	868.42	208.79	26.818
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1200.04	291.61	89.605
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	868.42	208.79	26.818

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	5.2245	1200.04	291.61	87.541
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	4.5716	1200.04	291.61	49.108
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1200.04	291.61	89.605
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1200.04	291.61	89.605
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1200.04	291.61	89.605
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	516.31	123.61	6.070
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	516.31	123.61	6.070
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	516.31	123.61	6.070
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	516.31	123.61	6.070
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	516.31	123.61	6.070

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2288.89	0.9995	0.0230	0.57918	0.01717

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.679	0.9800	1.0000	0.9800	603.19	0.899	1303.6	1877.3
Byp_Nozz	2.127	0.9825	1.0000	0.9800	2002.63	1.000	996.3	9572.1

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**********************************************************************************************************************************
Date:02/23/11    Time:15:02:53    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 21/ 1/ 6    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 469.18    Stator 1 exit: 477.65    Stator 2 inlet: 488.50    Stator 2 exit: 494.40
            Stator 3 inlet: 504.69    Stator 3 exit: 510.09    Stator 4 inlet: 519.59    Stator 4 exit: 524.23
            Stator 5 inlet: 532.18    Stator 5 exit: 536.27             Unblocked   Percent Blockage: 0.27

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    258.20      692.3    1.0453     723.69    9.5602    775.82    9.701      6923.3      10.0   1742.7
1647.8   1144.6


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          258.20     4.283    462.03    110.60   0.0000    836.13     2.854    411.97    2563.1   0.7800    1.40005
FS1   Inlet.Fl_O            258.20     4.283    462.03    110.60   0.0000    836.13     3.903    449.92    4162.5   0.3669    1.40005
FS12  Splitter.Fl_02        233.75     4.281    462.03    110.60   0.0000    757.33     3.839    447.87    3526.9   0.3976    1.40005
FS2   Splitter.Fl_01         24.45     4.281    462.03    110.60   0.0000     79.22     4.145    457.78     637.7   0.2154    1.40005
FS14  Fan.Fl_O              233.75     4.864    481.24    115.20   0.0000    680.26     4.058    456.95    2600.0   0.5154    1.40045
FS25  LPC.Fl_O               24.45     6.665    541.41    129.64   0.0000     55.08     6.419    535.62     412.5   0.2326    1.39974
FS3   HPC.Fl_O               23.26    41.553    988.55    238.42   0.0000     11.36    36.588    954.34      49.7   0.4328    1.38178
FS36  Bleed3.Fl_O            18.03    41.553    988.55    238.42   0.0000      8.80    38.703    969.32      49.3   0.3222    1.38178
FS4   Burner.Fl_O            18.23    40.596   1742.69    439.86   0.0111     12.10    38.343   1718.11      74.8   0.2940    1.33044
FS45  HPT.Fl_O               24.37     9.737   1148.85    280.62   0.0083     54.73     8.813   1118.49     264.7   0.3847    1.36585
FS49  LPT.Fl_O               24.65     3.293    896.35    216.92   0.0082    144.64     3.090    880.75     851.6   0.3045    1.38178
FS5   TEGV.Fl_O              24.65     3.293    896.35    216.92   0.0082    144.64     3.090    880.75     851.6   0.3045    1.38178
FS8   Core_Nozz.Fl_O         24.65     3.293    896.35    216.92   0.0082    144.64     2.854    861.44     603.2   0.4602    1.38178
FS17  FanDuctLkg.Fl_O       233.75     4.864    481.24    115.20   0.0000    680.26     4.058    456.95    2600.0   0.5154    1.40045
FS171 Bleed15.Fl_O          233.75     4.864    481.24    115.20   0.0000    680.26     3.948    453.36    2475.2   0.5544    1.40045
FS172 FanDuct.Fl_O          233.75     4.864    481.24    115.20   0.0000    680.26     3.948    453.36    2475.2   0.5544    1.40045
FS173 Byp_Nozz.Fl_O         233.75     4.864    481.24    115.20   0.0000    680.26     2.854    413.51    2002.6   0.9054    1.40045

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       757.33   1.136   0.9061   2620.827   1.0416    0.9086    -1523.8  ---.--   54.85
LPC        79.22   1.557   0.7933   2620.827   1.1718    0.8030     -658.9    7.65    4.40
HPC        55.08   6.234   0.8208   8994.341   1.8259    0.8592    -3671.9   60.09   56.89
HPT        12.10   4.169   0.8769    220.130   1.3656    0.8550     3671.9
LPT        54.73   2.957   0.8551     72.979   1.2796    0.8359     2182.7

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        879.93   1.133   0.9079   2595.832    0.0415      0.8607    1.0235    0.9980    0.9905
```

LPC	78.89	1.585	0.8407	0.692	180.0000	1.0041	0.9525	0.9437	0.0003
HPC	50.09	5.988	0.8293	8754.351	11.0423	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.102	0.8769	1.325	4.1025	12.6513	0.9790	1.0000	0.0003
LPT	0.84	2.488	0.8614	0.822	2.4879	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2563.08	6226.1

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.3045	851.64
FanDuct	0.0000	0.5544	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5602	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9189.4	2098.6	3671.9
LP_Shaft	2473.6	4634.5	2182.7

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.8998	766.96	184.03	9.737
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2861	766.96	184.03	3.293
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.54	178.59	14.341
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	882.81	212.32	28.296
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.54	178.59	14.341
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	988.55	238.42	41.553
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.54	178.59	14.341

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7918	988.55	238.42	40.596
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.4428	988.55	238.42	22.945
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.55	238.42	41.553
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.55	238.42	41.553
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.55	238.42	41.553
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1742.69	0.9995	0.0230	0.20102	0.01115

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.154	0.9800	1.0000	0.9800	603.19	0.460	645.1	494.3
Byp_Nozz	1.704	0.9800	1.0000	0.9800	2002.63	0.905	884.2	6424.1

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**********************************************************************************************************************************
Date:02/23/11    Time:15:04:39    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  3/ 16/ 1/ 1    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 462.60    Stator 1 exit: 470.65    Stator 2 inlet: 480.95    Stator 2 exit: 486.53
            Stator 3 inlet: 496.30    Stator 3 exit: 501.40    Stator 4 inlet: 505.43    Stator 4 exit: 509.92
            Stator 5 inlet: 522.22    Stator 5 exit: 525.74               Stage4   Percent Blockage: 0.27

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.730   38334.0    22.00    252.16      700.6    0.9978     699.09    9.5870    726.09    9.527      7006.2      10.0   1719.1
1624.7   1130.0


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht       FAR        Wc        Ps        Ts      Aphy       MN      gamt
FS0   Ambient.Fl_O          252.16     4.218    455.81    109.10    0.0000    823.54     2.947    411.97    2590.3   0.7300   1.39992
FS1   Inlet.Fl_O            252.16     4.218    455.81    109.10    0.0000    823.54     3.856    444.27    4162.5   0.3604   1.39992
FS12  Splitter.Fl_02        228.34     4.216    455.81    109.10    0.0000    746.12     3.795    442.33    3526.9   0.3905   1.39992
FS2   Splitter.Fl_01         23.82     4.216    455.81    109.10    0.0000     77.83     4.087    451.77     637.7   0.2114   1.39992
FS14  Fan.Fl_O              228.34     4.772    474.07    113.48    0.0000    672.25     4.005    450.90    2600.0   0.5068   1.40030
FS25  LPC.Fl_O               23.82     6.471    530.87    127.11    0.0000     54.73     6.235    525.27     412.5   0.2310   1.39976
FS3   HPC.Fl_O               22.66    40.186    968.64    233.49    0.0000     11.33    35.418    935.30      49.7   0.4310   1.38287
FS36  Bleed3.Fl_O            17.56    40.186    968.64    233.49    0.0000      8.78    37.447    949.88      49.3   0.3210   1.38287
FS4   Burner.Fl_O            17.76    39.260   1719.14    433.32    0.0111     12.10    37.079   1694.81      74.8   0.2940   1.33160
FS45  HPT.Fl_O               23.73     9.519   1134.27    276.87    0.0082     54.19     8.635   1104.93     264.7   0.3800   1.36681
FS49  LPT.Fl_O               24.01     3.348    893.68    216.25    0.0082    138.35     3.161    879.57     851.6   0.2897   1.38196
FS5   TEGV.Fl_O              24.01     3.348    893.68    216.25    0.0082    138.35     3.161    879.57     851.6   0.2897   1.38196
FS8   Core_Nozz.Fl_O         24.01     3.348    893.68    216.25    0.0082    138.35     2.947    862.53     603.2   0.4344   1.38196
FS17  FanDuctLkg.Fl_O       228.34     4.772    474.07    113.48    0.0000    672.25     4.005    450.90    2600.0   0.5068   1.40030
FS171 Bleed15.Fl_O          228.34     4.772    474.07    113.48    0.0000    672.25     3.901    447.53    2475.2   0.5445   1.40030
FS172 FanDuct.Fl_O          228.34     4.772    474.07    113.48    0.0000    672.25     3.901    447.53    2475.2   0.5445   1.40030
FS173 Byp_Nozz.Fl_O         228.34     4.772    474.07    113.48    0.0000    672.25     2.947    413.46    2002.6   0.8566   1.40030

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR       eff         Nc        TR    efPoly        pwr      SMN      SMW
Fan         746.12   1.132    0.9063   2573.611    1.0401    0.9087    -1414.8  ---.--    54.44
LPC          77.83   1.535    0.8013   2573.611    1.1647    0.8095     -606.8     7.69     2.60
HPC          54.73   6.210    0.8206   8983.138    1.8246    0.8590    -3497.8    59.80    56.58
HPT          12.10   4.125    0.8759    219.190    1.3629    0.8540     3497.8
LPT          54.19   2.843    0.8504     71.636    1.2669    0.8314     2021.6

TURBOMACHINERY MAP DATA
             WcMap   PRmap    effMap      NcMap     R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         866.91   1.129    0.9082   2549.065     0.0416      0.8607    1.0235    0.9980    0.9905
```

LPC	75.46	1.562	0.8323	0.680	180.0000	1.0313	0.9522	0.9627	0.0003
HPC	49.77	5.965	0.8291	8743.447	11.0637	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.059	0.8760	1.320	4.0589	12.6513	0.9790	1.0000	0.0003
LPT	0.83	2.401	0.8567	0.807	2.4009	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2590.29	5690.6

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2897	851.64
FanDuct	0.0000	0.5445	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5870	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9088.2	2021.4	3497.8
LP_Shaft	2412.6	4400.9	2021.6

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.8765	751.57	180.30	9.519
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2787	751.57	180.30	3.348
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	729.63	174.98	13.888
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	865.03	207.96	27.374
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	729.63	174.98	13.888
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	968.64	233.49	40.186
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	729.63	174.98	13.888

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7195	968.64	233.49	39.260
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.3796	968.64	233.49	22.248
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	968.64	233.49	40.186
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	968.64	233.49	40.186
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	968.64	233.49	40.186
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1719.14	0.9995	0.0230	0.19419	0.01106

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.136	0.9800	1.0000	0.9800	603.19	0.434	609.4	454.8
Byp_Nozz	1.619	0.9800	1.0000	0.9800	2002.63	0.857	836.5	5936.4

```
****************************************************************************************************************************************
Date:02/23/11    Time:15:06:17    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  3/ 16/ 1/ 1    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 460.57    Stator 1 exit: 468.48    Stator 2 inlet: 478.59    Stator 2 exit: 484.06
            Stator 3 inlet: 493.65    Stator 3 exit: 498.65    Stator 4 inlet: 502.57    Stator 4 exit: 506.97
            Stator 5 inlet: 519.07    Stator 5 exit: 522.51               Stage4   Percent Blockage: 0.27

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.714   37357.0    22.00    259.48      730.1    0.9827     717.47    9.5911    710.17    9.468      7300.9      10.0   1712.2
1617.8   1125.7


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O          259.48     4.357    453.91    108.65   0.0000    818.80     3.088    411.97    2600.3  0.7140    1.39988
FS1   Inlet.Fl_O            259.48     4.357    453.91    108.65   0.0000    818.80     3.988    442.57    4162.5  0.3580    1.39988
FS12  Splitter.Fl_02        234.98     4.355    453.91    108.65   0.0000    741.86     3.926    440.66    3526.9  0.3878    1.39988
FS2   Splitter.Fl_01         24.50     4.355    453.91    108.65   0.0000     77.35     4.223    449.94     637.7  0.2101    1.39988
FS14  Fan.Fl_O              234.98     4.923    471.87    112.96   0.0000    669.08     4.140    449.10    2600.0  0.5035    1.40026
FS25  LPC.Fl_O               24.50     6.646    527.64    126.34   0.0000     54.64     6.405    522.10     412.5  0.2306    1.39976
FS3   HPC.Fl_O               23.31    41.249    962.65    232.00   0.0000     11.31    36.366    929.57      49.7  0.4304    1.38320
FS36  Bleed3.Fl_O            18.07    41.249    962.65    232.00   0.0000      8.77    38.444    944.03      49.3  0.3206    1.38320
FS4   Burner.Fl_O            18.27    40.299   1712.20    431.39   0.0110     12.10    38.060   1687.95      74.8  0.2940    1.33194
FS45  HPT.Fl_O               24.41     9.803   1129.95    275.77   0.0082     54.02     8.899   1100.93     264.7  0.3785    1.36710
FS49  LPT.Fl_O               24.70     3.493    893.14    216.11   0.0081    136.35     3.304    879.47     851.6  0.2851    1.38200
FS5   TEGV.Fl_O              24.70     3.493    893.14    216.11   0.0081    136.35     3.304    879.47     851.6  0.2851    1.38200
FS8   Core_Nozz.Fl_O         24.70     3.493    893.14    216.11   0.0081    136.35     3.089    863.09     603.1  0.4265    1.38200
FS17  FanDuctLkg.Fl_O        234.98     4.923    471.87    112.96   0.0000    669.08     4.140    449.10    2600.0  0.5035    1.40026
FS171 Bleed15.Fl_O           234.98     4.923    471.87    112.96   0.0000    669.08     4.035    445.81    2475.2  0.5407    1.40026
FS172 FanDuct.Fl_O           234.98     4.923    471.87    112.96   0.0000    669.08     4.035    445.81    2475.2  0.5407    1.40026
FS173 Byp_Nozz.Fl_O          234.98     4.923    471.87    112.96   0.0000    669.08     3.088    413.45    2002.6  0.8410    1.40026

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       741.86   1.131   0.9065   2556.525   1.0396    0.9088    -1432.5  ---.--   54.25
LPC        77.35   1.526   0.8017   2556.525   1.1624    0.8096     -613.1    7.70    2.49
HPC        54.64   6.206   0.8205   8980.516   1.8244    0.8591    -3574.0   59.69   56.47
HPT        12.10   4.111   0.8756    218.902   1.3621    0.8537     3574.0
LPT        54.02   2.806   0.8489     71.147   1.2628    0.8300     2045.6

TURBOMACHINERY MAP DATA
           WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       861.96   1.128   0.9083   2532.143    0.0416      0.8607    1.0235    0.9980    0.9905
```

LPC	74.22	1.553	0.8293	0.675	180.0000	1.0421	0.9512	0.9667	0.0003
HPC	49.70	5.961	0.8290	8740.895	11.0716	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.045	0.8757	1.318	4.0455	12.6513	0.9790	1.0000	0.0003
LPT	0.83	2.373	0.8552	0.802	2.3730	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2600.25	5727.6

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2851	851.64
FanDuct	0.0000	0.5407	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5911	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9057.9	2072.3	3574.0
LP_Shaft	2391.6	4492.3	2045.6

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.9016	746.92	179.17	9.803
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2867	746.92	179.17	3.493
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.12	173.88	14.259
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	859.66	206.64	28.100
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.12	173.88	14.259
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	962.65	232.00	41.249
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.12	173.88	14.259

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7974	962.65	232.00	40.299
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.4478	962.65	232.00	22.855
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	962.65	232.00	41.249
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	962.65	232.00	41.249
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	962.65	232.00	41.249
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1712.20	0.9995	0.0230	0.19930	0.01103

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.131	0.9800	1.0000	0.9800	603.19	0.427	598.5	459.5
Byp_Nozz	1.594	0.9800	1.0000	0.9800	2002.63	0.841	821.3	5998.2

```
**********************************************************************************************************************************
Date:02/23/11    Time:15:07:58    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  3/ 16/ 1/ 1    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 462.21    Stator 1 exit: 469.79    Stator 2 inlet: 479.50    Stator 2 exit: 484.73
            Stator 3 inlet: 493.93    Stator 3 exit: 498.70    Stator 4 inlet: 502.35    Stator 4 exit: 506.53
            Stator 5 inlet: 518.23    Stator 5 exit: 521.49               Stage4   Percent Blockage: 0.27

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.669   34281.0    22.00    282.89      832.3    0.9466     787.83    9.6030    670.64    9.278      8322.3      10.0   1715.6
1620.5   1129.4


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          282.89     4.846    455.82    109.11   0.0000    804.30     3.578    418.42    2631.8   0.6690    1.39992
FS1   Inlet.Fl_O            282.89     4.846    455.82    109.11   0.0000    804.30     4.451    444.89    4162.5   0.3505    1.39992
FS12  Splitter.Fl_02        256.21     4.843    455.82    109.11   0.0000    728.80     4.385    443.06    3526.9   0.3796    1.39992
FS2   Splitter.Fl_01         26.68     4.843    455.82    109.11   0.0000     75.89     4.702    451.99     637.7   0.2059    1.39992
FS14  Fan.Fl_O              256.21     5.452    473.25    113.29   0.0000    659.68     4.616    451.25    2600.0   0.4936    1.40029
FS25  LPC.Fl_O               26.68     7.265    526.57    126.08   0.0000     54.38     7.004    521.09     412.5   0.2294    1.39976
FS3   HPC.Fl_O               25.39    44.958    959.96    231.33   0.0000     11.29    39.664    927.14      49.7   0.4292    1.38334
FS36  Bleed3.Fl_O            19.67    44.958    959.96    231.33   0.0000      8.75    41.915    941.48      49.3   0.3198    1.38334
FS4   Burner.Fl_O            19.89    43.922   1715.63    432.38   0.0111     12.11    41.481   1691.33      74.8   0.2941    1.33172
FS45  HPT.Fl_O               26.59    10.790   1133.76    276.76   0.0083     53.54     9.815   1105.25     264.7   0.3745    1.36681
FS49  LPT.Fl_O               26.90     3.997    904.65    218.98   0.0082    130.61     3.799    892.06     851.6   0.2720    1.38118
FS5   TEGV.Fl_O              26.90     3.997    904.65    218.98   0.0082    130.61     3.799    892.06     851.6   0.2720    1.38118
FS8   Core_Nozz.Fl_O         26.90     3.997    904.65    218.98   0.0082    130.61     3.578    877.25     603.1   0.4044    1.38118
FS17  FanDuctLkg.Fl_O       256.21     5.452    473.25    113.29   0.0000    659.68     4.616    451.25    2600.0   0.4936    1.40029
FS171 Bleed15.Fl_O          256.21     5.452    473.25    113.29   0.0000    659.68     4.504    448.12    2475.2   0.5295    1.40029
FS172 FanDuct.Fl_O          256.21     5.452    473.25    113.29   0.0000    659.68     4.504    448.12    2475.2   0.5295    1.40029
FS173 Byp_Nozz.Fl_O         256.21     5.452    473.25    113.29   0.0000    659.68     3.578    419.87    2002.6   0.7976    1.40029

TURBOMACHINERY PERFORMANCE DATA
               Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan        728.80   1.126   0.9067   2502.666   1.0382    0.9089    -1514.9  ---.--   53.74
LPC         75.89   1.500   0.8032   2502.666   1.1552    0.8104     -640.6    7.76    2.32
HPC         54.38   6.188   0.8203   8972.244   1.8230    0.8589    -3876.9   59.50   56.25
HPT         12.11   4.071   0.8760    218.260   1.3592    0.8543     3876.9
LPT         53.54   2.699   0.8462     69.678   1.2507    0.8280     2155.5

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        846.79   1.123   0.9085   2478.797    0.0417      0.8607    1.0235    0.9980    0.9905
```

LPC	70.31	1.527	0.8197	0.661	180.0000	1.0794	0.9491	0.9798	0.0003
HPC	49.46	5.944	0.8288	8732.844	11.0869	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.006	0.8760	1.314	4.0061	12.6513	0.9790	1.0000	0.0003
LPT	0.82	2.292	0.8525	0.785	2.2919	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2631.75	5896.5

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2720	851.64
FanDuct	0.0000	0.5295	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.6030	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9040.3	2252.3	3876.9
LP_Shaft	2346.1	4825.3	2155.5

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.9818	745.01	178.71	10.790
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3122	745.01	178.71	3.997
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.29	173.44	15.557
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	857.34	206.07	30.634
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.29	173.44	15.557
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	959.96	231.33	44.958
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.29	173.44	15.557

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.0463	959.96	231.33	43.922
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.6656	959.96	231.33	24.971
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	959.96	231.33	44.958
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	959.96	231.33	44.958
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	959.96	231.33	44.958
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	473.25	113.29	5.452
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	473.25	113.29	5.452
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	473.25	113.29	5.452
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	473.25	113.29	5.452
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	473.25	113.29	5.452

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1715.63	0.9995	0.0230	0.21884	0.01112

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.117	0.9800	1.0000	0.9800	603.19	0.404	571.9	478.1
Byp_Nozz	1.524	0.9800	1.0000	0.9800	2002.63	0.798	784.9	6250.7

```
**********************************************************************************************************************************
Date:02/23/11    Time:15:09:47    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 471.61    Stator 1 exit: 478.79    Stator 2 inlet: 487.99    Stator 2 exit: 492.90
            Stator 3 inlet: 501.61    Stator 3 exit: 506.06    Stator 4 inlet: 514.11    Stator 4 exit: 517.89
            Stator 5 inlet: 524.61    Stator 5 exit: 527.91            Unblocked   Percent Blockage: 0.27

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.608   30029.0    22.00    314.03      995.1    0.9037     899.22    9.5609    620.50    9.019      9951.0      10.0   1742.1
1645.1   1149.0


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           314.03     5.599    465.62    111.46   0.0000    780.92     4.358    433.58    2686.1   0.6080    1.40012
FS1   Inlet.Fl_O             314.03     5.599    465.62    111.46   0.0000    780.92     5.172    455.17    4162.5   0.3387    1.40012
FS12  Splitter.Fl_02         284.30     5.597    465.62    111.46   0.0000    707.33     5.101    453.45    3526.9   0.3662    1.40012
FS2   Splitter.Fl_01          29.74     5.597    465.62    111.46   0.0000     73.98     5.442    461.91     637.7   0.2004    1.40012
FS14  Fan.Fl_O               284.30     6.259    482.58    115.52   0.0000    643.85     5.355    461.53    2600.0   0.4774    1.40048
FS25  LPC.Fl_O                29.74     8.179    532.86    127.59   0.0000     54.16     7.887    527.36     412.5   0.2284    1.39975
FS3   HPC.Fl_O                28.29    50.502    970.71    234.00   0.0000     11.26    44.587    937.75      49.7   0.4280    1.38276
FS36  Bleed3.Fl_O             21.93    50.502    970.71    234.00   0.0000      8.73    47.101    952.14      49.3   0.3190    1.38276
FS4   Burner.Fl_O             22.18    49.339   1742.08    439.81   0.0114     12.11    46.596   1717.48      74.8   0.2943    1.33030
FS45  HPT.Fl_O                29.64    12.253   1153.52    281.86   0.0085     53.01    11.170   1125.25     264.7   0.3704    1.36543
FS49  LPT.Fl_O                29.99     4.803    933.21    226.13   0.0084    123.08     4.593    921.82     851.6   0.2552    1.37919
FS5   TEGV.Fl_O               29.99     4.803    933.21    226.13   0.0084    123.08     4.593    921.82     851.6   0.2552    1.37919
FS8   Core_Nozz.Fl_O          29.99     4.803    933.21    226.13   0.0084    123.08     4.358    908.70     603.2   0.3769    1.37919
FS17  FanDuctLkg.Fl_O        284.30     6.259    482.58    115.52   0.0000    643.85     5.355    461.53    2600.0   0.4774    1.40048
FS171 Bleed15.Fl_O           284.30     6.259    482.58    115.52   0.0000    643.85     5.237    458.60    2475.2   0.5112    1.40048
FS172 FanDuct.Fl_O           284.30     6.259    482.58    115.52   0.0000    643.85     5.237    458.60    2475.2   0.5112    1.40048
FS173 Byp_Nozz.Fl_O          284.30     6.259    482.58    115.52   0.0000    643.85     4.358    435.01    2002.6   0.7395    1.40048

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       707.33   1.118   0.9068   2417.235   1.0364    0.9090    -1636.1  ---.--   52.80
LPC        73.98   1.461   0.8034   2417.235   1.1444    0.8103     -678.7    7.89    2.03
HPC        54.16   6.175   0.8202   8965.211   1.8217    0.8586    -4368.2   59.28   56.02
HPT        12.11   4.027   0.8777    217.715   1.3556    0.8565     4368.2
LPT        53.01   2.551   0.8434     67.433   1.2334    0.8253     2314.8

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        821.83   1.116   0.9086   2394.181    0.0420      0.8607    1.0235    0.9980    0.9905
```

LPC	64.10	1.485	0.8046	0.638	180.0000	1.1541	0.9513	0.9985	0.0003
HPC	49.25	5.931	0.8286	8725.999	11.1033	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.963	0.8777	1.311	3.9629	12.6513	0.9790	1.0000	0.0003
LPT	0.82	2.179	0.8497	0.760	2.1793	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2686.13	6056.4

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2552	851.64
FanDuct	0.0000	0.5112	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5609	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9087.0	2524.7	4368.2
LP_Shaft	2290.3	5308.4	2314.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.0943	753.61	180.79	12.253
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3479	753.61	180.79	4.803
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	867.08	208.46	34.419
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.3952	970.71	234.00	49.339
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.9709	970.71	234.00	28.126
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1742.08	0.9995	0.0230	0.24978	0.01139

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.102	0.9800	1.0000	0.9800	603.19	0.377	542.0	505.2
Byp_Nozz	1.436	0.9800	1.0000	0.9800	2002.63	0.739	740.8	6546.3

```
**********************************************************************************************************************************
Date:02/23/11    Time:15:11:28    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  7/ 20/ 1/ 5    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 482.10    Stator 1 exit: 488.88    Stator 2 inlet: 497.57    Stator 2 exit: 502.15
            Stator 3 inlet: 505.36    Stator 3 exit: 509.51    Stator 4 inlet: 521.97    Stator 4 exit: 525.16
            Stator 5 inlet: 531.50    Stator 5 exit: 534.54               Stage3   Percent Blockage: 0.27

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.552   25666.0    22.00    348.91     1194.7    0.8597    1027.01    9.4740    573.44    8.753     11946.9       10.0   1765.0
1666.5   1166.3


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          348.91     6.507    476.52    114.07   0.0000    755.28     5.297    449.14    2752.5   0.5520    1.40035
FS1   Inlet.Fl_O            348.91     6.507    476.52    114.07   0.0000    755.28     6.045    466.59    4162.5   0.3259    1.40035
FS12  Splitter.Fl_02        315.60     6.504    476.52    114.07   0.0000    683.52     5.971    465.00    3526.9   0.3517    1.40035
FS2   Splitter.Fl_01         33.31     6.504    476.52    114.07   0.0000     72.15     6.333    472.91     637.7   0.1952    1.40035
FS14  Fan.Fl_O              315.60     7.232    493.16    118.06   0.0000    625.38     6.258    473.18    2600.0   0.4592    1.40071
FS25  LPC.Fl_O               33.31     9.269    539.19    129.11   0.0000     53.85     8.942    533.69     412.5   0.2271    1.39974
FS3   HPC.Fl_O               31.70    56.959    980.82    236.50   0.0000     11.25    50.311    947.68      49.7   0.4273    1.38220
FS36  Bleed3.Fl_O            24.56    56.959    980.82    236.50   0.0000      8.72    53.136    962.14      49.3   0.3185    1.38220
FS4   Burner.Fl_O            24.85    55.647   1764.99    446.25   0.0116     12.11    52.553   1740.13      74.8   0.2944    1.32909
FS45  HPT.Fl_O               33.21    13.949   1170.87    286.36   0.0087     52.57    12.738   1142.79     264.7   0.3669    1.36424
FS49  LPT.Fl_O               33.60     5.767    959.69    232.78   0.0086    116.45     5.543    949.32     851.6   0.2406    1.37757
FS5   TEGV.Fl_O              33.60     5.767    959.69    232.78   0.0086    116.45     5.543    949.32     851.6   0.2406    1.37757
FS8   Core_Nozz.Fl_O         33.60     5.767    959.69    232.78   0.0086    116.45     5.297    937.59     603.2   0.3531    1.37757
FS17  FanDuctLkg.Fl_O       315.60     7.232    493.16    118.06   0.0000    625.38     6.258    473.18    2600.0   0.4592    1.40071
FS171 Bleed15.Fl_O          315.60     7.232    493.16    118.06   0.0000    625.38     6.134    470.48    2475.2   0.4907    1.40071
FS172 FanDuct.Fl_O          315.60     7.232    493.16    118.06   0.0000    625.38     6.134    470.48    2475.2   0.4907    1.40071
FS173 Byp_Nozz.Fl_O         315.60     7.232    493.16    118.06   0.0000    625.38     5.297    450.56    2002.6   0.6873    1.40071

TURBOMACHINERY PERFORMANCE DATA
               Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan        683.52   1.112   0.9066   2330.009   1.0349    0.9089    -1781.2  ---.--   51.54
LPC         72.15   1.425   0.8173   2330.009   1.1315    0.8239     -708.7    8.09    1.72
HPC         53.85   6.145   0.8197   8955.364   1.8191    0.8580    -4939.0   59.26   55.97
HPT         12.11   3.989   0.8789    217.338   1.3525    0.8584     4939.0
LPT         52.57   2.419   0.8398     65.267   1.2172    0.8225     2489.9

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        794.17   1.109   0.9085   2307.787    0.0424      0.8607    1.0235    0.9980    0.9905
```

LPC	57.76	1.442	0.7891	0.615	180.0000	1.2490	0.9611	1.0357	0.0003
HPC	48.98	5.903	0.8282	8716.414	11.1079	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.927	0.8790	1.308	3.9266	12.6513	0.9790	1.0000	0.0003
LPT	0.81	2.078	0.8460	0.736	2.0784	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2752.51	6218.6

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2406	851.64
FanDuct	0.0000	0.4907	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.4740	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9130.8	2841.0	4939.0
LP_Shaft	2233.3	5855.5	2489.9

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.2259	761.91	182.81	13.949
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3897	761.91	182.81	5.767
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	739.77	177.44	19.761
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	876.34	210.73	38.837
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	739.77	177.44	19.761
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	980.82	236.50	56.959
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	739.77	177.44	19.761

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.8035	980.82	236.50	55.647
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	3.3282	980.82	236.50	31.796
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	980.82	236.50	56.959
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	980.82	236.50	56.959
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	980.82	236.50	56.959
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1764.99	0.9995	0.0230	0.28528	0.01161

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.089	0.9800	1.0000	0.9800	603.19	0.353	515.6	538.4
Byp_Nozz	1.365	0.9800	1.0000	0.9800	2002.63	0.687	700.9	6874.8

```
****************************************************************************************************************************************
Date:02/23/11    Time:15:13:10    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  7/ 20/ 1/ 5    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 496.91    Stator 1 exit: 503.30    Stator 2 inlet: 506.81    Stator 2 exit: 511.05
            Stator 3 inlet: 523.40    Stator 3 exit: 526.94    Stator 4 inlet: 534.11    Stator 4 exit: 537.33
            Stator 5 inlet: 543.29    Stator 5 exit: 546.08               Stage2   Percent Blockage: 0.27

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.490   20047.0    22.00    399.49     1508.8    0.8125    1225.83    9.3138    520.34    8.453     15087.8      10.0   1799.0
1698.4   1192.0


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O          399.49     7.913    491.73    117.72   0.0000    722.42     6.740    469.18    2851.3  0.4900    1.40068
FS1   Inlet.Fl_O            399.49     7.913    491.73    117.72   0.0000    722.42     7.403    482.46    4162.5  0.3099    1.40068
FS12  Splitter.Fl_02        360.76     7.909    491.73    117.72   0.0000    652.70     7.323    481.03    3526.9  0.3334    1.40068
FS2   Splitter.Fl_01         38.73     7.909    491.73    117.72   0.0000     70.08     7.713    488.23     637.7  0.1893    1.40068
FS14  Fan.Fl_O              360.76     8.767    508.18    121.66   0.0000    598.58     7.703    489.74    2600.0  0.4337    1.40000
FS25  LPC.Fl_O               38.73    10.989    550.03    131.71   0.0000     53.34    10.610    544.54     412.5  0.2248    1.39972
FS3   HPC.Fl_O               36.86    66.890    997.53    240.65   0.0000     11.23    59.109    964.00      49.7  0.4266    1.38130
FS36  Bleed3.Fl_O            28.56    66.890    997.53    240.65   0.0000      8.70    62.415    978.63      49.3  0.3181    1.38130
FS4   Burner.Fl_O            28.90    65.349   1798.98    455.85   0.0119     12.11    61.716   1773.74      74.8  0.2946    1.32732
FS45  HPT.Fl_O               38.62    16.578   1196.75    293.08   0.0089     52.00    15.174   1168.84     264.7  0.3625    1.36248
FS49  LPT.Fl_O               39.07     7.255    994.47    241.54   0.0088    109.60     7.006    985.05     851.6  0.2257    1.37545
FS5   TEGV.Fl_O              39.07     7.255    994.47    241.54   0.0088    109.60     7.006    985.05     851.6  0.2257    1.37545
FS8   Core_Nozz.Fl_O         39.07     7.255    994.47    241.54   0.0088    109.60     6.740    974.60     603.2  0.3293    1.37545
FS17  FanDuctLkg.Fl_O       360.76     8.767    508.18    121.66   0.0000    598.58     7.703    489.74    2600.0  0.4337    1.40000
FS171 Bleed15.Fl_O          360.76     8.767    508.18    121.66   0.0000    598.58     7.571    487.32    2475.2  0.4624    1.40000
FS172 FanDuct.Fl_O          360.76     8.767    508.18    121.66   0.0000    598.58     7.571    487.32    2475.2  0.4624    1.40000
FS173 Byp_Nozz.Fl_O         360.76     8.767    508.18    121.66   0.0000    598.58     6.740    470.67    2002.6  0.6310    1.40000

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       652.70   1.109   0.9089   2235.030   1.0335    0.9079    -2013.7  ---.--   49.21
LPC        70.08   1.389   0.8293   2235.030   1.1186    0.8367     -766.9    8.44    1.36
HPC        53.34   6.087   0.8187   8938.609   1.8136    0.8573    -5825.5   59.47   56.13
HPT        12.11   3.942   0.8806    217.024   1.3484    0.8604     5825.5
LPT        52.00   2.285   0.8361     62.907   1.2004    0.8205     2780.6

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        758.37   1.106   0.9108   2213.713    0.0433      0.8607    1.0235    0.9980    0.9905
```

LPC	50.86	1.396	0.7722	0.590	180.0000	1.3778	0.9841	1.0739	0.0003
HPC	48.51	5.847	0.8272	8700.106	11.1006	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.880	0.8806	1.306	3.8800	12.6513	0.9790	1.0000	0.0003
LPT	0.80	1.977	0.8423	0.709	1.9769	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2851.25	6460.8

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2257	851.64
FanDuct	0.0000	0.4624	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.3138	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9204.9	3323.9	5825.5
LP_Shaft	2176.2	6710.7	2780.6

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.4254	775.81	186.18	16.578
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.4532	775.81	186.18	7.255
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.37	180.73	23.287
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	891.73	214.51	45.648
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.37	180.73	23.287
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	997.53	240.65	66.890
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.37	180.73	23.287

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	4.4226	997.53	240.65	65.349
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	3.8699	997.53	240.65	37.452
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	997.53	240.65	66.890
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	997.53	240.65	66.890
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	997.53	240.65	66.890
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1798.98	0.9995	0.0230	0.34051	0.01192

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.076	0.9800	1.0000	0.9800	603.19	0.329	489.9	594.9
Byp_Nozz	1.301	0.9800	1.0000	0.9800	2002.63	0.631	657.7	7374.6

```
**********************************************************************************************************************************
Date:02/23/11    Time:15:15:18    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  9/ 35/ 2/ 6    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 505.92    Stator 1 exit: 512.02    Stator 2 inlet: 523.61    Stator 2 exit: 527.40
            Stator 3 inlet: 534.70    Stator 3 exit: 538.32    Stator 4 inlet: 545.07    Stator 4 exit: 548.10
            Stator 5 inlet: 553.70    Stator 5 exit: 556.31               Stage1   Percent Blockage: 0.27

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.446   15435.0    22.00    442.60     1740.6    0.7938    1381.74    9.2927    481.90    8.021     17405.9      10.0   1818.3
1716.5   1210.2


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O          442.60     9.311    504.97    120.89   0.0000    689.30     8.149    485.63    2920.0  0.4460    1.40036
FS1   Inlet.Fl_O            442.60     9.311    504.97    120.89   0.0000    689.30     8.769    496.39    4162.5  0.2939    1.40036
FS12  Splitter.Fl_02        399.60     9.306    504.97    120.89   0.0000    622.64     8.684    495.08    3526.9  0.3158    1.40036
FS2   Splitter.Fl_01         43.00     9.306    504.97    120.89   0.0000     67.00     9.097    501.70     637.7  0.1807    1.40036
FS14  Fan.Fl_O              399.60    10.282    520.79    124.69   0.0000    572.33     9.159    503.86    2600.0  0.4099    1.39977
FS25  LPC.Fl_O               43.00    12.653    559.67    134.02   0.0000     51.88    12.240    554.39     412.5  0.2182    1.39970
FS3   HPC.Fl_O               40.92    74.680   1006.53    242.89   0.0000     11.22    66.015    972.82      49.7  0.4261    1.38058
FS36  Bleed3.Fl_O            31.71    74.680   1006.53    242.89   0.0000      8.69    69.696    987.52      49.3  0.3178    1.38058
FS4   Burner.Fl_O            32.09    72.960   1818.30    461.32   0.0121     12.10    68.903   1792.85      74.8  0.2947    1.32654
FS45  HPT.Fl_O               42.88    18.871   1215.02    297.83   0.0090     51.11    17.333   1187.86     264.7  0.3554    1.36115
FS49  LPT.Fl_O               43.38     8.692   1022.27    248.57   0.0089    102.98     8.431   1013.81     851.6  0.2114    1.37341
FS5   TEGV.Fl_O              43.38     8.692   1022.27    248.57   0.0089    102.98     8.431   1013.81     851.6  0.2114    1.37341
FS8   Core_Nozz.Fl_O         43.38     8.692   1022.27    248.57   0.0089    102.98     8.149   1004.54     603.2  0.3073    1.37341
FS17  FanDuctLkg.Fl_O        399.60    10.282    520.79    124.69   0.0000    572.33     9.159    503.86    2600.0  0.4099    1.39977
FS171 Bleed15.Fl_O           399.60    10.282    520.79    124.69   0.0000    572.33     9.023    501.71    2475.2  0.4360    1.39977
FS172 FanDuct.Fl_O           399.60    10.282    520.79    124.69   0.0000    572.33     9.023    501.71    2475.2  0.4360    1.39977
FS173 Byp_Nozz.Fl_O          399.60    10.282    520.79    124.69   0.0000    572.33     8.149    487.09    2002.6  0.5880    1.39977

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan         622.64   1.105   0.9099   2144.741   1.0313    0.9114    -2147.1  ---.--   46.99
LPC          67.00   1.360   0.8383   2144.741   1.1083    0.8463     -798.9    8.94    0.99
HPC          51.88   5.902   0.8154   8890.191   1.7984    0.8541    -6462.8   60.58   57.05
HPT          12.10   3.866   0.8810    216.570   1.3420    0.8612     6462.8
LPT          51.11   2.171   0.8322     60.712   1.1854    0.8170     2946.0

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         723.43   1.102   0.9118   2124.286    0.0442      0.8607    1.0235    0.9980    0.9905
```

LPC	44.30	1.352	0.7562	0.566	180.0000	1.5124	1.0228	1.1085	0.0003
HPC	47.19	5.671	0.8239	8652.980	11.0506	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.806	0.8811	1.304	3.8059	12.6513	0.9790	1.0000	0.0003
LPT	0.79	1.890	0.8384	0.684	1.8902	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2919.97	6629.2

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2114	851.64
FanDuct	0.0000	0.4360	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.2927	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9234.9	3675.6	6462.8
LP_Shaft	2116.2	7311.4	2946.0

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.5824	785.17	188.46	18.871
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.5031	785.17	188.46	8.692
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	762.76	183.01	26.299
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	900.91	216.76	51.109
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	762.76	183.01	26.299
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1006.53	242.89	74.680
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	762.76	183.01	26.299

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	4.9098	1006.53	242.89	72.960
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	4.2962	1006.53	242.89	42.021
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1006.53	242.89	74.680
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1006.53	242.89	74.680
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1006.53	242.89	74.680
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1818.30	0.9995	0.0230	0.38382	0.01210

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.067	0.9800	1.0000	0.9800	603.19	0.307	463.7	625.3
Byp_Nozz	1.262	0.9800	1.0000	0.9800	2002.63	0.588	623.6	7744.6

```
**********************************************************************************************************************************
Date:02/23/11    Time:15:17:22    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 12/ 25/ 1/10    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 523.48    Stator 1 exit: 529.04    Stator 2 inlet: 536.15    Stator 2 exit: 539.83
            Stator 3 inlet: 546.53    Stator 3 exit: 549.79    Stator 4 inlet: 555.99    Stator 4 exit: 558.70
            Stator 5 inlet: 563.83    Stator 5 exit: 566.16             Unblocked   Percent Blockage: 0.27

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.406    10735.0    22.00     489.85      2003.2     0.7777    1557.96    9.2910    446.20    7.554      20032.3       10.0   1842.0
1738.8   1230.8


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           489.85    11.019    518.95    124.25   0.0000    653.50     9.822    502.39    2996.0   0.4060    1.39978
FS1   Inlet.Fl_O             489.85    11.019    518.95    124.25   0.0000    653.50    10.446    511.10    4162.5   0.2772    1.39978
FS12  Splitter.Fl_02         442.25    11.013    518.95    124.25   0.0000    590.29    10.357    509.92    3526.9   0.2976    1.39978
FS2   Splitter.Fl_01          47.60    11.013    518.95    124.25   0.0000     63.53    10.791    515.93     637.7   0.1710    1.39978
FS14  Fan.Fl_O               442.25    12.085    534.12    127.89   0.0000    545.75    10.900    518.61    2600.0   0.3868    1.39975
FS25  LPC.Fl_O                47.60    14.441    569.62    136.41   0.0000     50.76    13.990    564.49     412.5   0.2133    1.39968
FS3   HPC.Fl_O                45.29    83.232   1017.61    245.65   0.0000     11.20    73.605    983.68      49.7   0.4255    1.37981
FS36  Bleed3.Fl_O             35.10    83.232   1017.61    245.65   0.0000      8.68    77.695    998.48      49.3   0.3174    1.37981
FS4   Burner.Fl_O             35.53    81.315   1842.02    468.05   0.0123     12.10    76.796   1816.31      74.8   0.2947    1.32540
FS45  HPT.Fl_O                47.48    21.393   1235.67    303.23   0.0092     50.34    19.706   1209.07     264.7   0.3493    1.35973
FS49  LPT.Fl_O                48.03    10.389   1052.82    256.33   0.0091     96.80    10.114   1045.19     851.6   0.1982    1.37143
FS5   TEGV.Fl_O               48.03    10.389   1052.82    256.33   0.0091     96.80    10.114   1045.19     851.6   0.1982    1.37143
FS8   Core_Nozz.Fl_O          48.03    10.389   1052.82    256.33   0.0091     96.80     9.822   1036.94     603.2   0.2870    1.37143
FS17  FanDuctLkg.Fl_O        442.25    12.085    534.12    127.89   0.0000    545.75    10.900    518.61    2600.0   0.3868    1.39975
FS171 Bleed15.Fl_O           442.25    12.085    534.12    127.89   0.0000    545.75    10.760    516.69    2475.2   0.4108    1.39975
FS172 FanDuct.Fl_O           442.25    12.085    534.12    127.89   0.0000    545.75    10.760    516.69    2475.2   0.4108    1.39975
FS173 Byp_Nozz.Fl_O          442.25    12.085    534.12    127.89   0.0000    545.75     9.822    503.75    2002.6   0.5491    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       590.29   1.097   0.9093   2034.264   1.0292    0.9108    -2279.5  ---.--   45.03
LPC        63.53   1.311   0.8186   2034.264   1.0976    0.8270     -819.3    9.96    0.51
HPC        50.76   5.764   0.8128   8853.260   1.7865    0.8515    -7178.3   61.41   57.72
HPT        12.10   3.801   0.8818    216.174   1.3364    0.8624     7178.3
LPT        50.34   2.059   0.8287     57.886   1.1704    0.8140     3098.8

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        685.85   1.095   0.9111   2014.862    0.0450      0.8607    1.0235    0.9980    0.9905
```

LPC	36.28	1.298	0.7366	0.537	180.0000	1.7514	1.0460	1.1113	0.0003
HPC	46.17	5.539	0.8212	8617.034	11.0151	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.742	0.8818	1.301	3.7422	12.6513	0.9790	1.0000	0.0003
LPT	0.77	1.805	0.8348	0.652	1.8052	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2995.97	6793.5

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.1982	851.64
FanDuct	0.0000	0.4108	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.2910	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9277.9	4063.6	7178.3
LP_Shaft	2034.8	7998.3	3098.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.7517	795.75	191.03	21.393
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.5569	795.75	191.03	10.389
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	911.76	219.43	57.091
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	5.4350	1017.61	245.65	81.315
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	4.7557	1017.61	245.65	47.040
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1842.02	0.9995	0.0230	0.43277	0.01233

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.058	0.9800	1.0000	0.9800	603.19	0.287	439.7	656.4
Byp_Nozz	1.230	0.9800	1.0000	0.9800	2002.63	0.549	592.2	8140.3

30% Blockage

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**********BIG NOTE!!  at 35000 feet in Cruise the LPC STALLS/SURGES at reduced thrust so no output available after 100% thust
****************************************************************************************************************************
Date:02/22/11    Time:15:27:41    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 34/ 2/ 5    Run by: Philip C Jorgenson      PC:   100
Temperature Stator 1 inlet: 456.56    Stator 1 exit: 475.13    Stator 2 inlet: 502.77    Stator 2 exit: 510.93
            Stator 3 inlet: 537.55    Stator 3 exit: 546.10    Stator 4 inlet: 571.37    Stator 4 exit: 579.42
            Stator 5 inlet: 599.78    Stator 5 exit: 607.62             Unblocked   Percent Blockage: 0.30

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.780   35000.0    22.00    477.01     8371.9    0.5976    5003.20    5.2999    779.49   32.229      8371.8     100.0   2874.1
2696.7   1876.6


                                        FLOW STATION DATA
                                 W        Pt        Tt       ht     FAR       Wc        Ps        Ts     Aphy      MN       gamt
FS0   Ambient.Fl_O          477.01     5.185    466.40   111.64  0.0000  1281.99     3.458    415.85   3926.2  0.7800   1.40014
FS1   Inlet.Fl_O            477.01     5.185    466.40   111.64  0.0000  1281.99     3.822    427.49   4162.5  0.6748   1.40014
FS12  Splitter.Fl_02        401.29     5.183    466.40   111.64  0.0000  1079.03     3.850    428.42   3526.9  0.6660   1.40014
FS2   Splitter.Fl_01         75.72     5.183    466.40   111.64  0.0000   203.59     3.638    421.57    637.7  0.7295   1.40014
FS14  Fan.Fl_O              401.29     8.814    550.80   131.90  0.0000   689.50     7.302    521.98   2600.0  0.5256   1.39972
FS25  LPC.Fl_O               75.72    12.470    626.53   150.09  0.0000    98.07    10.840    601.99    412.5  0.4522   1.39820
FS3   HPC.Fl_O               72.04   167.116   1392.78   341.31  0.0000    10.38   150.851   1355.71     49.7  0.3910   1.35667
FS36  Bleed3.Fl_O            55.83   167.116   1392.78   341.31  0.0000     8.05   157.663   1371.60     49.3  0.2941   1.35667
FS4   Burner.Fl_O            57.22   163.267   2874.15   782.49  0.0249    12.13   154.128   2837.81     74.8  0.3005   1.28295
FS45  HPT.Fl_O               76.22    38.400   1885.85   483.69  0.0186    55.62    34.596   1838.73    264.7  0.4000   1.31936
FS49  LPT.Fl_O               77.11     8.963   1356.88   337.80  0.0184   204.50     7.752   1307.05    851.6  0.4682   1.34611
FS5   TEGV.Fl_O              77.11     8.963   1356.88   337.80  0.0184   204.50     7.752   1307.05    851.6  0.4682   1.34611
FS8   Core_Nozz.Fl_O         77.11     8.963   1356.88   337.80  0.0184   204.50     4.796   1152.89    603.2  1.0000   1.34611
FS17  FanDuctLkg.Fl_O       401.29     8.814    550.80   131.90  0.0000   689.50     7.302    521.98   2600.0  0.5256   1.39972
FS171 Bleed15.Fl_O          401.29     8.814    550.80   131.90  0.0000   689.50     7.092    517.65   2475.2  0.5661   1.39972
FS172 FanDuct.Fl_O          401.29     8.814    550.80   131.90  0.0000   689.50     7.092    517.65   2475.2  0.5661   1.39972
FS173 Byp_Nozz.Fl_O         401.29     8.814    550.80   131.90  0.0000   689.50     4.672    458.99   2002.6  1.0000   1.39972

TURBOMACHINERY PERFORMANCE DATA
               Wc      PR      eff         Nc       TR   efPoly        pwr     SMN     SMW
Fan       1079.03   1.701   0.9114   4139.514   1.1810   0.9171   -11498.7   36.79   23.18
LPC        203.59   2.406   0.8368   4139.514   1.3433   0.8537    -4118.9    3.06    2.59
HPC         98.07  13.401   0.8581  10417.139   2.2230   0.8978   -19988.3   25.13   24.38
HPT         12.13   4.252   0.9120    213.560   1.3438   0.8973    19988.3
LPT         55.62   4.284   0.9159     90.391   1.3860   0.9002    15617.7
```

TURBOMACHINERY MAP DATA

	WcMap	PRmap	effMap	NcMap	R/Parm	s_WcDes	s_PRdes	s_effDes	s_NcDes
Fan	1253.73	1.685	0.9132	4100.034	0.0638	0.8607	1.0235	0.9980	0.9905
LPC	166.92	2.761	0.8444	1.093	180.0000	1.2197	0.7986	0.9910	0.0003
HPC	89.19	12.817	0.8670	10139.185	13.5840	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.183	0.9120	1.286	4.1834	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.497	0.9227	1.019	3.4967	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3926.21	11556.7

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4682	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.2999	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11449.2	9169.3	19988.3
LP_Shaft	3925.4	20896.4	15617.7

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.7864	1017.82	245.70	38.400
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.8859	1017.82	245.70	8.963
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	979.36	236.14	46.492
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1214.97	295.42	108.350
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	979.36	236.14	46.492
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	979.36	236.14	46.492

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	8.6453	1392.78	341.31	163.267
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	7.5649	1392.78	341.31	91.843
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1392.78	341.31	167.116
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	550.80	131.90	8.814

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2874.15	0.9995	0.0230	1.38978	0.02489

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.592	0.9805	1.0000	0.9800	603.19	1.000	1607.6	4659.7
Byp_Nozz	2.549	0.9823	1.0000	0.9800	2002.63	1.000	1029.2	15268.9

```
**********************************************************************************************************************
Date:02/22/11    Time:15:30:20    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 34/ 2/ 5    Run by: Philip C Jorgenson      PC:   100
Temperature Stator 1 inlet: 452.22    Stator 1 exit: 470.61    Stator 2 inlet: 497.98    Stator 2 exit: 506.03
            Stator 3 inlet: 532.41    Stator 3 exit: 540.85    Stator 4 inlet: 565.89    Stator 4 exit: 573.85
            Stator 5 inlet: 594.02    Stator 5 exit: 601.76             Unblocked   Percent Blockage: 0.30

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    395.92      6923.4     0.5938    4111.11    5.2972    775.82   32.257      6923.4     100.0   2850.8
2674.6   1859.9


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          395.92     4.283    462.03    110.60   0.0000   1282.11     2.854    411.97    3930.2   0.7800    1.40005
FS1   Inlet.Fl_O            395.92     4.283    462.03    110.60   0.0000   1282.11     3.157    423.48    4162.5   0.6750    1.40005
FS12  Splitter.Fl_02        333.05     4.281    462.03    110.60   0.0000   1079.05     3.180    424.41    3526.9   0.6660    1.40005
FS2   Splitter.Fl_01         62.87     4.281    462.03    110.60   0.0000    203.70     3.002    417.52     637.7   0.7305    1.40005
FS14  Fan.Fl_O              333.05     7.280    545.71    130.67   0.0000    689.60     6.031    517.14    2600.0   0.5257    1.39973
FS25  LPC.Fl_O               62.87    10.292    620.49    148.64   0.0000     98.19     8.942    596.10     412.5   0.4529    1.39833
FS3   HPC.Fl_O               59.82   138.165   1380.92    338.22   0.0000     10.38   124.716   1344.10      49.7   0.3909    1.35737
FS36  Bleed3.Fl_O            46.36   138.165   1380.92    338.22   0.0000      8.05   130.349   1359.88      49.3   0.2940    1.35737
FS4   Burner.Fl_O            47.51   134.983   2850.79    774.97   0.0246     12.13   127.427   2814.67      74.8   0.3004    1.28375
FS45  HPT.Fl_O               63.28    31.735   1869.09    478.84   0.0184     55.63    28.591   1822.29     264.7   0.3999    1.32018
FS49  LPT.Fl_O               64.01     7.404   1344.03    334.31   0.0182    204.54     6.404   1294.56     851.6   0.4682    1.34702
FS5   TEGV.Fl_O              64.01     7.404   1344.03    334.31   0.0182    204.54     6.404   1294.56     851.6   0.4682    1.34702
FS8   Core_Nozz.Fl_O         64.01     7.404   1344.03    334.31   0.0182    204.54     3.961   1141.55     603.2   1.0000    1.34702
FS17  FanDuctLkg.Fl_O        333.05     7.280    545.71    130.67   0.0000    689.60     6.031    517.14    2600.0   0.5257    1.39973
FS171 Bleed15.Fl_O           333.05     7.280    545.71    130.67   0.0000    689.60     5.857    512.85    2475.2   0.5662    1.39973
FS172 FanDuct.Fl_O           333.05     7.280    545.71    130.67   0.0000    689.60     5.857    512.85    2475.2   0.5662    1.39973
FS173 Byp_Nozz.Fl_O          333.05     7.280    545.71    130.67   0.0000    689.60     3.860    454.75    2002.6   1.0000    1.39973

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1079.05   1.701   0.9114   4139.500   1.1811   0.9169    -9461.0   36.81   23.19
LPC        203.70   2.404   0.8363   4139.500   1.3430   0.8542    -3384.1    3.06    2.59
HPC         98.19  13.424   0.8581  10422.016   2.2255   0.8979   -16455.4   25.06   24.31
HPT         12.13   4.253   0.9119    213.497   1.3446   0.8972    16455.4
LPT         55.63   4.286   0.9157     90.370   1.3868   0.8998    12845.1

TURBOMACHINERY MAP DATA
           WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1253.75   1.685   0.9132   4100.021    0.0638      0.8607    1.0235    0.9980    0.9905
```

LPC	166.92	2.761	0.8444	1.093	180.0000	1.2204	0.7974	0.9904	0.0003
HPC	89.31	12.839	0.8669	10143.932	13.5911	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.185	0.9119	1.285	4.1851	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.498	0.9225	1.018	3.4980	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3930.21	9547.0

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4682	851.64
FanDuct	0.0000	0.5662	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.2972	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11399.2	7581.7	16455.4
LP_Shaft	3906.9	17267.7	12845.1

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.3137	1008.69	243.43	31.735
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7356	1008.69	243.43	7.404
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.52	233.95	38.424
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1204.39	292.72	89.573
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.52	233.95	38.424
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1380.92	338.22	138.165
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.52	233.95	38.424

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.1788	1380.92	338.22	134.983
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.2816	1380.92	338.22	75.925
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.92	338.22	138.165
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.92	338.22	138.165
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.92	338.22	138.165
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2850.79	0.9995	0.0230	1.14198	0.02463

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.594	0.9805	1.0000	0.9800	603.19	1.000	1600.1	3851.4
Byp_Nozz	2.551	0.9825	1.0000	0.9800	2002.63	1.000	1024.4	12619.1

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**********************************************************************************************************************
Date:02/22/11    Time:15:31:27    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    84
Temperature Stator 1 inlet: 457.73    Stator 1 exit: 474.77    Stator 2 inlet: 499.38    Stator 2 exit: 507.77
            Stator 3 inlet: 531.51    Stator 3 exit: 539.94    Stator 4 inlet: 562.42    Stator 4 exit: 570.18
            Stator 5 inlet: 588.48    Stator 5 exit: 595.87             Unblocked   Percent Blockage: 0.30

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    376.28      5815.7    0.5868    3412.49    5.4803    775.82   28.783      6923.4       84.0   2672.3
2509.4   1739.6


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           376.28     4.283    462.03    110.60   0.0000   1218.51     2.854    411.97    3735.2   0.7800    1.40005
FS1   Inlet.Fl_O             376.28     4.283    462.03    110.60   0.0000   1218.51     3.321    429.63    4162.5   0.6143    1.40005
FS12  Splitter.Fl_02         318.22     4.281    462.03    110.60   0.0000   1030.99     3.323    429.78    3526.9   0.6128    1.40005
FS2   Splitter.Fl_01          58.07     4.281    462.03    110.60   0.0000    188.13     3.297    428.81     637.7   0.6226    1.40005
FS14  Fan.Fl_O               318.22     6.897    536.70    128.51   0.0000    689.71     5.713    508.59    2600.0   0.5258    1.39974
FS25  LPC.Fl_O                58.07    10.070    611.78    146.54   0.0000     92.03     8.936    591.27     412.5   0.4169    1.39851
FS3   HPC.Fl_O                 55.25   123.283   1325.64    323.87   0.0000     10.53   110.898   1288.87      49.7   0.3971    1.36070
FS36  Bleed3.Fl_O              42.82   123.283   1325.64    323.87   0.0000      8.16   116.098   1304.68      49.3   0.2982    1.36070
FS4   Burner.Fl_O              43.77   120.444   2672.32    717.68   0.0221     12.12   113.711   2637.88      74.8   0.2995    1.29062
FS45  HPT.Fl_O                 58.33    28.210   1747.88    443.86   0.0165     55.79    25.399   1703.20     264.7   0.4002    1.32655
FS49  LPT.Fl_O                 59.01     6.577   1252.24    309.50   0.0163    204.91     5.685   1205.33     851.6   0.4679    1.35390
FS5   TEGV.Fl_O                59.01     6.577   1252.24    309.50   0.0163    204.91     5.685   1205.33     851.6   0.4679    1.35390
FS8   Core_Nozz.Fl_O           59.01     6.577   1252.24    309.50   0.0163    204.91     3.511   1060.60     603.2   1.0000    1.35390
FS17  FanDuctLkg.Fl_O         318.22     6.897    536.70    128.51   0.0000    689.71     5.713    508.59    2600.0   0.5258    1.39974
FS171 Bleed15.Fl_O            318.22     6.897    536.70    128.51   0.0000    689.71     5.550    504.37    2475.2   0.5661    1.39974
FS172 FanDuct.Fl_O            318.22     6.897    536.70    128.51   0.0000    689.71     5.550    504.37    2475.2   0.5661    1.39974
FS173 Byp_Nozz.Fl_O           318.22     6.897    536.70    128.51   0.0000    689.71     3.658    447.25    2002.6   1.0000    1.39974

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan        1030.99   1.611   0.9119   3951.105   1.1616    0.9164    -8064.9   54.89   26.94
LPC         188.13   2.352   0.8599   3951.105   1.3241    0.8757    -2953.1    1.70    1.34
HPC          92.03  12.242   0.8603  10205.136   2.1669    0.8985   -14214.7   29.22   28.26
HPT          12.12   4.270   0.9102    214.401   1.3516    0.8949    14214.7
LPT          55.79   4.289   0.9131     89.197   1.3924    0.8965    11018.0

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        1197.89   1.597   0.9138   3913.422    0.0608      0.8607    1.0235    0.9980    0.9905
```

LPC	150.68	2.572	0.8397	1.044	180.0000	1.2486	0.8603	1.0241	0.0003
HPC	83.70	11.712	0.8692	9932.839	13.2002	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.201	0.9102	1.291	4.2008	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.501	0.9199	1.005	3.5005	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3735.24	9073.4

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4679	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.4803	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11083.4	6736.0	14214.7
LP_Shaft	3729.1	15517.8	11018.0

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.1368	975.58	235.20	28.210
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6794	975.58	235.20	6.577
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.75	226.34	34.977
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1159.49	281.31	80.262
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.75	226.34	34.977
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1325.64	323.87	123.283
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.75	226.34	34.977

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.6300	1325.64	323.87	120.444
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.8014	1325.64	323.87	67.686
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.64	323.87	123.283
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.64	323.87	123.283
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.64	323.87	123.283
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2672.32	0.9995	0.0230	0.94791	0.02214

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.304	0.9817	1.0000	0.9800	603.19	1.000	1545.9	3232.1
Byp_Nozz	2.417	0.9830	1.0000	0.9800	2002.63	1.000	1015.9	11657.0

```
**********************************************************************************************************************************
Date:02/22/11    Time:15:32:27    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    79
Temperature Stator 1 inlet: 459.04    Stator 1 exit: 475.75    Stator 2 inlet: 499.73    Stator 2 exit: 508.17
            Stator 3 inlet: 531.31    Stator 3 exit: 539.73    Stator 4 inlet: 561.62    Stator 4 exit: 569.34
            Stator 5 inlet: 587.19    Stator 5 exit: 594.51             Unblocked   Percent Blockage: 0.30

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780   39000.0    22.00    370.94     5524.8    0.5863    3239.09    5.5398    775.82   27.859      6923.4      79.8   2626.4
2466.9   1709.0


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O          370.94     4.283    462.03    110.60   0.0000   1201.21     2.854    411.97    3682.2  0.7800    1.40005
FS1   Inlet.Fl_O            370.94     4.283    462.03    110.60   0.0000   1201.21     3.360    431.07    4162.5  0.5995    1.40005
FS12  Splitter.Fl_02        314.22     4.281    462.03    110.60   0.0000   1018.04     3.357    431.04    3526.9  0.5997    1.40005
FS2   Splitter.Fl_01         56.72     4.281    462.03    110.60   0.0000    183.77     3.361    431.20     637.7  0.5981    1.40005
FS14  Fan.Fl_O              314.22     6.795    534.32    127.94   0.0000    689.72     5.629    506.34    2600.0  0.5257    1.39975
FS25  LPC.Fl_O               56.72     9.999    609.71    146.04   0.0000     90.39     8.918    590.14     412.5  0.4077    1.39858
FS3   HPC.Fl_O               53.97   119.329   1311.34    320.17   0.0000     10.57   107.239   1274.58      49.7  0.3987    1.36157
FS36  Bleed3.Fl_O            41.83   119.329   1311.34    320.17   0.0000      8.19   112.318   1290.39      49.3  0.2994    1.36157
FS4   Burner.Fl_O            42.73   116.581   2626.38    703.15   0.0215     12.12   110.066   2592.39      74.8  0.2992    1.29240
FS45  HPT.Fl_O               56.96    27.280   1717.09    435.07   0.0161     55.83    24.558   1672.96     264.7  0.4002    1.32830
FS49  LPT.Fl_O               57.62     6.358   1228.97    303.27   0.0159    205.01     5.495   1182.71     851.6  0.4679    1.35567
FS5   TEGV.Fl_O              57.62     6.358   1228.97    303.27   0.0159    205.01     5.495   1182.71     851.6  0.4679    1.35567
FS8   Core_Nozz.Fl_O         57.62     6.358   1228.97    303.27   0.0159    205.01     3.393   1040.15     603.2  1.0000    1.35567
FS17  FanDuctLkg.Fl_O        314.22     6.795    534.32    127.94   0.0000    689.72     5.629    506.34    2600.0  0.5257    1.39975
FS171 Bleed15.Fl_O           314.22     6.795    534.32    127.94   0.0000    689.72     5.468    502.14    2475.2  0.5661    1.39975
FS172 FanDuct.Fl_O           314.22     6.795    534.32    127.94   0.0000    689.72     5.468    502.14    2475.2  0.5661    1.39975
FS173 Byp_Nozz.Fl_O          314.22     6.795    534.32    127.94   0.0000    689.72     3.604    445.27    2002.6  1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1018.04   1.587   0.9110   3904.454   1.1565   0.9153    -7710.5   58.36   27.99
LPC        183.77   2.336   0.8636   3904.454   1.3196   0.8791    -2844.8    2.07    1.61
HPC         90.39  11.934   0.8610  10159.703   2.1507   0.8987   -13634.7   30.42   29.36
HPT         12.12   4.273   0.9094    214.941   1.3532   0.8939    13634.9
LPT         55.83   4.291   0.9124     88.931   1.3939   0.8957    10555.3

TURBOMACHINERY MAP DATA
           WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1182.85   1.574   0.9129   3867.216    0.0599      0.8607    1.0235    0.9980    0.9905
```

LPC	147.66	2.526	0.8398	1.031	180.0000	1.2446	0.8752	1.0284	0.0003
HPC	82.21	11.419	0.8699	9888.619	13.0958	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.205	0.9094	1.294	4.2047	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.501	0.9191	1.002	3.5014	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3682.21	8944.6

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4679	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.5398	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11015.4	6501.1	13634.9
LP_Shaft	3685.1	15043.8	10555.3

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.0873	967.11	233.11	27.280
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6636	967.11	233.11	6.358
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.90	224.40	34.051
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1147.92	278.38	77.783
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.90	224.40	34.051
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1311.34	320.17	119.329
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.90	224.40	34.051

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.4764	1311.34	320.17	116.581
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.6670	1311.34	320.17	65.501
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.34	320.17	119.329
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.34	320.17	119.329
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.34	320.17	119.329
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2626.38	0.9995	0.0230	0.89975	0.02151

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.228	0.9816	1.0000	0.9800	603.19	1.000	1531.8	3068.5
Byp_Nozz	2.381	0.9831	1.0000	0.9800	2002.63	1.000	1013.6	11400.9

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**********************************************************************************************************************
Date:02/22/11    Time:15:33:29    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    76
Temperature Stator 1 inlet: 459.90    Stator 1 exit: 476.37    Stator 2 inlet: 499.93    Stator 2 exit: 508.38
            Stator 3 inlet: 531.11    Stator 3 exit: 539.51    Stator 4 inlet: 560.99    Stator 4 exit: 568.66
            Stator 5 inlet: 586.21    Stator 5 exit: 593.46             Unblocked   Percent Blockage: 0.30

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00     366.97      5317.1     0.5870    3120.97    5.5814    775.82   27.216      6923.4       76.8   2594.8
2437.8   1688.1


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           366.97     4.283    462.03    110.60   0.0000   1188.36     2.854    411.97    3642.8   0.7800    1.40005
FS1   Inlet.Fl_O             366.97     4.283    462.03    110.60   0.0000   1188.36     3.387    432.08    4162.5   0.5889    1.40005
FS12  Splitter.Fl_02         311.21     4.281    462.03    110.60   0.0000   1008.30     3.382    431.95    3526.9   0.5903    1.40005
FS2   Splitter.Fl_01          55.76     4.281    462.03    110.60   0.0000    180.65     3.405    432.77     637.7   0.5816    1.40005
FS14  Fan.Fl_O               311.21     6.720    532.72    127.55   0.0000    689.73     5.567    504.82    2600.0   0.5257    1.39975
FS25  LPC.Fl_O                55.76     9.941    608.24    145.69   0.0000     89.27     8.896    589.28     412.5   0.4014    1.39875
FS3   HPC.Fl_O                53.05   116.571   1301.48    317.62   0.0000     10.60   104.693   1264.74      49.7   0.3999    1.36219
FS36  Bleed3.Fl_O             41.12   116.571   1301.48    317.62   0.0000      8.21   109.685   1280.56      49.3   0.3001    1.36219
FS4   Burner.Fl_O             41.98   113.886   2594.82    693.21   0.0211     12.12   107.525   2561.14      74.8   0.2990    1.29364
FS45  HPT.Fl_O                55.97    26.632   1695.99    429.07   0.0157     55.85    23.972   1652.24     264.7   0.4002    1.32939
FS49  LPT.Fl_O                56.63     6.206   1213.08    299.04   0.0155    205.06     5.364   1167.29     851.6   0.4678    1.35689
FS5   TEGV.Fl_O               56.63     6.206   1213.08    299.04   0.0155    205.06     5.364   1167.29     851.6   0.4678    1.35689
FS8   Core_Nozz.Fl_O          56.63     6.206   1213.08    299.04   0.0155    205.06     3.311   1026.20     603.2   1.0000    1.35689
FS17  FanDuctLkg.Fl_O        311.21     6.720    532.72    127.55   0.0000    689.73     5.567    504.82    2600.0   0.5257    1.39975
FS171 Bleed15.Fl_O           311.21     6.720    532.72    127.55   0.0000    689.73     5.408    500.63    2475.2   0.5660    1.39975
FS172 FanDuct.Fl_O           311.21     6.720    532.72    127.55   0.0000    689.73     5.408    500.63    2475.2   0.5660    1.39975
FS173 Byp_Nozz.Fl_O          311.21     6.720    532.72    127.55   0.0000    689.73     3.564    443.93    2002.6   1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
                Wc       PR       eff         Nc        TR    efPoly        pwr      SMN      SMW
Fan        1008.30    1.570    0.9083   3871.417    1.1530    0.9125    -7466.6    60.55    28.78
LPC         180.65    2.322    0.8656   3871.417    1.3164    0.8810    -2768.5     2.35     1.81
HPC          89.27   11.727    0.8614  10128.418    2.1398    0.8988   -13235.2    31.26    30.13
HPT          12.12    4.276    0.9089    215.317    1.3544    0.8932    13235.0
LPT          55.85    4.291    0.9118     88.725    1.3948    0.8952    10235.8

TURBOMACHINERY MAP DATA
             WcMap    PRmap    effMap      NcMap     R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        1171.53    1.557    0.9101   3834.494     0.0593      0.8607    1.0235    0.9980    0.9905
```

LPC	145.52	2.493	0.8399	1.023	180.0000	1.2414	0.8853	1.0305	0.0003
HPC	81.19	11.221	0.8703	9858.168	13.0238	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.207	0.9089	1.296	4.2075	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.502	0.9186	1.000	3.5018	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3642.81	8848.9

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4678	851.64
FanDuct	0.0000	0.5660	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.5814	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	10968.1	6337.6	13235.0
LP_Shaft	3653.9	14712.9	10235.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.0519	961.26	231.66	26.632
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6524	961.26	231.66	6.206
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1139.95	276.36	76.051
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.571
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.3666	1301.48	317.62	113.886
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.5709	1301.48	317.62	63.977
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.571
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.571
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.571
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2594.82	0.9995	0.0230	0.86694	0.02108

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.175	0.9814	1.0000	0.9800	603.19	1.000	1522.1	2954.5
Byp_Nozz	2.355	0.9831	1.0000	0.9800	2002.63	1.000	1012.1	11211.5

```
**********************************************************************************************************************************
Date:02/22/11    Time:15:34:10    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 469.18    Stator 1 exit: 477.65    Stator 2 inlet: 488.50    Stator 2 exit: 494.40
            Stator 3 inlet: 504.69    Stator 3 exit: 510.09    Stator 4 inlet: 519.59    Stator 4 exit: 524.23
            Stator 5 inlet: 532.18    Stator 5 exit: 536.27             Unblocked   Percent Blockage: 0.30

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780   39000.0    22.00    258.20      692.4    1.0453     723.70    9.5602    775.82    9.701      6923.4      10.0   1742.7
1647.8   1144.6


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          258.20     4.283    462.03    110.60   0.0000    836.13     2.854    411.97    2563.1   0.7800    1.40005
FS1   Inlet.Fl_O            258.20     4.283    462.03    110.60   0.0000    836.13     3.903    449.92    4162.5   0.3669    1.40005
FS12  Splitter.Fl_02        233.75     4.281    462.03    110.60   0.0000    757.33     3.839    447.87    3526.9   0.3976    1.40005
FS2   Splitter.Fl_01         24.45     4.281    462.03    110.60   0.0000     79.22     4.145    457.78     637.7   0.2154    1.40005
FS14  Fan.Fl_O              233.75     4.864    481.24    115.20   0.0000    680.26     4.058    456.95    2600.0   0.5154    1.40045
FS25  LPC.Fl_O               24.45     6.665    541.42    129.64   0.0000     55.08     6.419    535.63     412.5   0.2326    1.39974
FS3   HPC.Fl_O               23.26    41.554    988.56    238.42   0.0000     11.36    36.589    954.35      49.7   0.4328    1.38178
FS36  Bleed3.Fl_O            18.03    41.554    988.56    238.42   0.0000      8.80    38.704    969.32      49.3   0.3222    1.38178
FS4   Burner.Fl_O            18.23    40.597   1742.70    439.86   0.0111     12.10    38.343   1718.13      74.8   0.2940    1.33044
FS45  HPT.Fl_O               24.37     9.738   1148.86    280.62   0.0083     54.73     8.813   1118.50     264.7   0.3847    1.36585
FS49  LPT.Fl_O               24.65     3.293    896.35    216.92   0.0082    144.64     3.090    880.75     851.6   0.3045    1.38178
FS5   TEGV.Fl_O              24.65     3.293    896.35    216.92   0.0082    144.64     3.090    880.75     851.6   0.3045    1.38178
FS8   Core_Nozz.Fl_O         24.65     3.293    896.35    216.92   0.0082    144.64     2.854    861.44     603.2   0.4602    1.38178
FS17  FanDuctLkg.Fl_O       233.75     4.864    481.24    115.20   0.0000    680.26     4.058    456.95    2600.0   0.5154    1.40045
FS171 Bleed15.Fl_O          233.75     4.864    481.24    115.20   0.0000    680.26     3.948    453.36    2475.2   0.5544    1.40045
FS172 FanDuct.Fl_O          233.75     4.864    481.24    115.20   0.0000    680.26     3.948    453.36    2475.2   0.5544    1.40045
FS173 Byp_Nozz.Fl_O         233.75     4.864    481.24    115.20   0.0000    680.26     2.854    413.51    2002.6   0.9054    1.40045

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       757.33   1.136   0.9061   2620.828   1.0416    0.9086    -1523.8  ---.--   54.85
LPC        79.22   1.557   0.7933   2620.828   1.1718    0.8030     -658.9    7.65    4.40
HPC        55.08   6.234   0.8208   8994.352   1.8259    0.8592    -3671.9   60.09   56.89
HPT        12.10   4.169   0.8769    220.129   1.3656    0.8550     3671.9
LPT        54.73   2.957   0.8551     72.978   1.2796    0.8359     2182.7

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        879.93   1.133   0.9079   2595.833    0.0415      0.8607    1.0235    0.9980    0.9905
```

LPC	78.89	1.585	0.8407	0.692	180.0000	1.0041	0.9525	0.9437	0.0003
HPC	50.09	5.988	0.8293	8754.362	11.0423	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.102	0.8769	1.325	4.1025	12.6513	0.9790	1.0000	0.0003
LPT	0.84	2.488	0.8614	0.822	2.4879	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2563.08	6226.1

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.3045	851.64
FanDuct	0.0000	0.5544	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5602	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9189.5	2098.7	3671.9
LP_Shaft	2473.6	4634.5	2182.7

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.8998	766.96	184.03	9.738
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2861	766.96	184.03	3.293
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.55	178.59	14.341
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	882.81	212.32	28.296
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.55	178.59	14.341
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	988.56	238.42	41.554
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.55	178.59	14.341

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7918	988.56	238.42	40.597
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.4429	988.56	238.42	22.945
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.56	238.42	41.554
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.56	238.42	41.554
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.56	238.42	41.554
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1742.70	0.9995	0.0230	0.20103	0.01115

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.154	0.9800	1.0000	0.9800	603.19	0.460	645.2	494.3
Byp_Nozz	1.704	0.9800	1.0000	0.9800	2002.63	0.905	884.2	6424.1

```
****************************************************************************************************************************************
Date:02/22/11    Time:15:36:12    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  3/ 16/ 1/ 1    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 462.61    Stator 1 exit: 470.66    Stator 2 inlet: 480.96    Stator 2 exit: 486.54
            Stator 3 inlet: 496.31    Stator 3 exit: 501.42    Stator 4 inlet: 504.39    Stator 4 exit: 508.92
            Stator 5 inlet: 522.20    Stator 5 exit: 525.65               Stage4   Percent Blockage: 0.30

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.730   38334.0    22.00    252.15      700.6    0.9980     699.21    9.5923    726.09    9.523      7006.3      10.0   1719.7
1625.2   1130.3


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          252.15     4.218    455.81    109.10   0.0000    823.50     2.947    411.97    2590.2   0.7300    1.39992
FS1   Inlet.Fl_O            252.15     4.218    455.81    109.10   0.0000    823.50     3.856    444.28    4162.5   0.3604    1.39992
FS12  Splitter.Fl_02        228.34     4.216    455.81    109.10   0.0000    746.13     3.795    442.33    3526.9   0.3905    1.39992
FS2   Splitter.Fl_01         23.80     4.216    455.81    109.10   0.0000     77.78     4.087    451.78     637.7   0.2113    1.39992
FS14  Fan.Fl_O              228.34     4.772    474.07    113.48   0.0000    672.25     4.005    450.90    2600.0   0.5068    1.40030
FS25  LPC.Fl_O               23.80     6.463    530.80    127.09   0.0000     54.76     6.227    525.19     412.5   0.2311    1.39976
FS3   HPC.Fl_O               22.65    40.171    968.74    233.51   0.0000     11.32    35.406    935.40      49.7   0.4309    1.38286
FS36  Bleed3.Fl_O            17.55    40.171    968.74    233.51   0.0000      8.78    37.434    949.98      49.3   0.3210    1.38286
FS4   Burner.Fl_O            17.75    39.246   1719.72    433.48   0.0111     12.10    37.065   1695.39      74.8   0.2940    1.33157
FS45  HPT.Fl_O               23.72     9.516   1134.61    276.96   0.0083     54.18     8.632   1105.28     264.7   0.3799    1.36678
FS49  LPT.Fl_O               24.00     3.348    894.00    216.33   0.0082    138.31     3.161    879.89     851.6   0.2897    1.38194
FS5   TEGV.Fl_O              24.00     3.348    894.00    216.33   0.0082    138.31     3.161    879.89     851.6   0.2897    1.38194
FS8   Core_Nozz.Fl_O         24.00     3.348    894.00    216.33   0.0082    138.31     2.947    862.86     603.2   0.4343    1.38194
FS17  FanDuctLkg.Fl_O       228.34     4.772    474.07    113.48   0.0000    672.25     4.005    450.90    2600.0   0.5068    1.40030
FS171 Bleed15.Fl_O          228.34     4.772    474.07    113.48   0.0000    672.25     3.901    447.53    2475.2   0.5445    1.40030
FS172 FanDuct.Fl_O          228.34     4.772    474.07    113.48   0.0000    672.25     3.901    447.53    2475.2   0.5445    1.40030
FS173 Byp_Nozz.Fl_O         228.34     4.772    474.07    113.48   0.0000    672.25     2.947    413.46    2002.6   0.8566    1.40030

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       746.13   1.132   0.9063   2573.633   1.0401    0.9087    -1414.9  ---.--   54.44
LPC        77.78   1.533   0.7996   2573.633   1.1645    0.8079     -605.9    7.69    2.60
HPC        54.76   6.216   0.8207   8984.302   1.8250    0.8591    -3497.2   59.75   56.54
HPT        12.10   4.124   0.8760    219.168   1.3629    0.8540     3497.2
LPT        54.18   2.842   0.8504     71.626   1.2668    0.8314     2020.8

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        866.91   1.129   0.9082   2549.088    0.0416      0.8607    1.0235    0.9980    0.9905
```

LPC	75.47	1.562	0.8323	0.680	180.0000	1.0307	0.9488	0.9607	0.0003
HPC	49.80	5.970	0.8292	8744.580	11.0665	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.059	0.8760	1.319	4.0587	12.6513	0.9790	1.0000	0.0003
LPT	0.83	2.400	0.8567	0.807	2.4004	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2590.17	5690.3

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2897	851.64
FanDuct	0.0000	0.5445	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5923	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9088.8	2020.9	3497.2
LP_Shaft	2412.6	4399.1	2020.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.8760	751.59	180.30	9.516
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2785	751.59	180.30	3.348
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	729.64	174.98	13.879
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	865.08	207.97	27.362
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	729.64	174.98	13.879
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	968.74	233.51	40.171
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	729.64	174.98	13.879

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7180	968.74	233.51	39.246
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.3783	968.74	233.51	22.240
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	968.74	233.51	40.171
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	968.74	233.51	40.171
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	968.74	233.51	40.171
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1719.72	0.9995	0.0230	0.19422	0.01106

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.136	0.9800	1.0000	0.9800	603.19	0.434	609.3	454.5
Byp_Nozz	1.619	0.9800	1.0000	0.9800	2002.63	0.857	836.5	5936.5

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*****************************************************************************************************************************
Date:02/22/11    Time:15:37:50    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  3/ 16/ 1/ 1    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 460.58    Stator 1 exit: 468.48    Stator 2 inlet: 478.60    Stator 2 exit: 484.07
            Stator 3 inlet: 493.67    Stator 3 exit: 498.67    Stator 4 inlet: 501.55    Stator 4 exit: 505.98
            Stator 5 inlet: 519.05    Stator 5 exit: 522.43               Stage4   Percent Blockage: 0.30

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.714   37357.0    22.00    259.47      730.1    0.9828     717.58    9.5964    710.17    9.464      7300.9      10.0   1712.8
1618.4   1126.0


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O          259.47     4.357    453.91    108.65   0.0000    818.76     3.088    411.97    2600.1  0.7140    1.39988
FS1   Inlet.Fl_O            259.47     4.357    453.91    108.65   0.0000    818.76     3.988    442.57    4162.5  0.3580    1.39988
FS12  Splitter.Fl_02        234.98     4.355    453.91    108.65   0.0000    741.87     3.926    440.66    3526.9  0.3878    1.39988
FS2   Splitter.Fl_01         24.49     4.355    453.91    108.65   0.0000     77.31     4.223    449.94     637.7  0.2099    1.39988
FS14  Fan.Fl_O              234.98     4.923    471.87    112.96   0.0000    669.08     4.140    449.10    2600.0  0.5035    1.40026
FS25  LPC.Fl_O               24.49     6.638    527.58    126.32   0.0000     54.68     6.396    522.02     412.5  0.2308    1.39976
FS3   HPC.Fl_O               23.30    41.233    962.74    232.02   0.0000     11.31    36.353    929.67      49.7  0.4304    1.38319
FS36  Bleed3.Fl_O            18.06    41.233    962.74    232.02   0.0000      8.77    38.430    944.12      49.3  0.3206    1.38319
FS4   Burner.Fl_O            18.26    40.283   1712.77    431.55   0.0110     12.10    38.045   1688.52      74.8  0.2940    1.33191
FS45  HPT.Fl_O               24.40     9.800   1130.30    275.86   0.0082     54.02     8.896   1101.27     264.7  0.3785    1.36707
FS49  LPT.Fl_O               24.69     3.493    893.46    216.19   0.0081    136.31     3.304    879.80     851.6  0.2850    1.38198
FS5   TEGV.Fl_O              24.69     3.493    893.46    216.19   0.0081    136.31     3.304    879.80     851.6  0.2850    1.38198
FS8   Core_Nozz.Fl_O         24.69     3.493    893.46    216.19   0.0081    136.31     3.089    863.42     603.1  0.4264    1.38198
FS17  FanDuctLkg.Fl_O       234.98     4.923    471.87    112.96   0.0000    669.08     4.140    449.10    2600.0  0.5035    1.40026
FS171 Bleed15.Fl_O          234.98     4.923    471.87    112.96   0.0000    669.08     4.035    445.81    2475.2  0.5407    1.40026
FS172 FanDuct.Fl_O          234.98     4.923    471.87    112.96   0.0000    669.08     4.035    445.81    2475.2  0.5407    1.40026
FS173 Byp_Nozz.Fl_O         234.98     4.923    471.87    112.96   0.0000    669.08     3.088    413.45    2002.6  0.8410    1.40026

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       741.87   1.131   0.9065   2556.547   1.0396    0.9088    -1432.5  ---.--   54.25
LPC        77.31   1.524   0.8000   2556.547   1.1623    0.8079     -612.2    7.70    2.49
HPC        54.68   6.212   0.8206   8981.678   1.8248    0.8591    -3573.3   59.64   56.42
HPT        12.10   4.111   0.8757    218.879   1.3621    0.8538     3573.3
LPT        54.02   2.806   0.8489     71.137   1.2627    0.8300     2044.7

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        861.96   1.128   0.9083   2532.164    0.0416      0.8607    1.0235    0.9980    0.9905
```

LPC	74.22	1.553	0.8293	0.675	180.0000	1.0415	0.9478	0.9647	0.0003
HPC	49.73	5.966	0.8291	8742.026	11.0743	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.045	0.8757	1.318	4.0453	12.6513	0.9790	1.0000	0.0003
LPT	0.83	2.372	0.8552	0.802	2.3725	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2600.13	5727.3

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2850	851.64
FanDuct	0.0000	0.5407	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5964	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9058.5	2071.8	3573.3
LP_Shaft	2391.6	4490.3	2044.7

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.9011	746.93	179.17	9.800
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2865	746.93	179.17	3.493
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.12	173.89	14.249
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	859.71	206.65	28.087
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.12	173.89	14.249
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	962.74	232.02	41.233
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.12	173.89	14.249

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7959	962.74	232.02	40.283
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.4465	962.74	232.02	22.847
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	962.74	232.02	41.233
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	962.74	232.02	41.233
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	962.74	232.02	41.233
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1712.77	0.9995	0.0230	0.19933	0.01104

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.131	0.9800	1.0000	0.9800	603.19	0.426	598.4	459.2
Byp_Nozz	1.594	0.9800	1.0000	0.9800	2002.63	0.841	821.3	5998.3

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**********************************************************************************************************************
Date:02/22/11    Time:15:39:29    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  3/ 16/ 1/ 1    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 462.21    Stator 1 exit: 469.80    Stator 2 inlet: 479.51    Stator 2 exit: 484.74
            Stator 3 inlet: 493.94    Stator 3 exit: 498.71    Stator 4 inlet: 501.36    Stator 4 exit: 505.56
            Stator 5 inlet: 518.21    Stator 5 exit: 521.41               Stage4   Percent Blockage: 0.30

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.669   34281.0    22.00    282.87      832.3    0.9467     787.98    9.6086    670.64    9.274      8322.3      10.0   1716.3
1621.1   1129.8


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O          282.87     4.846    455.82    109.11   0.0000    804.25     3.578    418.42    2631.6  0.6690    1.39992
FS1   Inlet.Fl_O            282.87     4.846    455.82    109.11   0.0000    804.25     4.451    444.90    4162.5  0.3505    1.39992
FS12  Splitter.Fl_02        256.21     4.843    455.82    109.11   0.0000    728.81     4.385    443.06    3526.9  0.3796    1.39992
FS2   Splitter.Fl_01         26.66     4.843    455.82    109.11   0.0000     75.85     4.702    452.00     637.7  0.2058    1.39992
FS14  Fan.Fl_O              256.21     5.452    473.25    113.29   0.0000    659.68     4.616    451.25    2600.0  0.4936    1.40029
FS25  LPC.Fl_O               26.66     7.255    526.50    126.06   0.0000     54.42     6.994    521.01     412.5  0.2296    1.39976
FS3   HPC.Fl_O               25.37    44.940    960.06    231.36   0.0000     11.29    39.650    927.25      49.7  0.4291    1.38334
FS36  Bleed3.Fl_O            19.66    44.940    960.06    231.36   0.0000      8.75    41.900    941.58      49.3  0.3198    1.38334
FS4   Burner.Fl_O            19.88    43.905   1716.26    432.56   0.0111     12.11    41.464   1691.95      74.8  0.2941    1.33168
FS45  HPT.Fl_O               26.57    10.786   1134.14    276.85   0.0083     53.53     9.812   1105.63     264.7  0.3745    1.36678
FS49  LPT.Fl_O               26.88     3.997    905.01    219.07   0.0082    130.57     3.799    892.43     851.6  0.2719    1.38114
FS5   TEGV.Fl_O              26.88     3.997    905.01    219.07   0.0082    130.57     3.799    892.43     851.6  0.2719    1.38114
FS8   Core_Nozz.Fl_O         26.88     3.997    905.01    219.07   0.0082    130.57     3.578    877.62     603.1  0.4042    1.38114
FS17  FanDuctLkg.Fl_O       256.21     5.452    473.25    113.29   0.0000    659.68     4.616    451.25    2600.0  0.4936    1.40029
FS171 Bleed15.Fl_O          256.21     5.452    473.25    113.29   0.0000    659.68     4.504    448.12    2475.2  0.5295    1.40029
FS172 FanDuct.Fl_O          256.21     5.452    473.25    113.29   0.0000    659.68     4.504    448.12    2475.2  0.5295    1.40029
FS173 Byp_Nozz.Fl_O         256.21     5.452    473.25    113.29   0.0000    659.68     3.578    419.87    2002.6  0.7976    1.40029

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan         728.81   1.126   0.9067   2502.680   1.0382    0.9089    -1514.9  ---.--   53.74
LPC          75.85   1.498   0.8013   2502.680   1.1551    0.8085     -639.6    7.76    2.32
HPC          54.42   6.194   0.8204   8973.492   1.8235    0.8590    -3876.2   59.44   56.20
HPT          12.11   4.070   0.8761    218.235   1.3592    0.8544     3876.2
LPT          53.53   2.699   0.8462     69.667   1.2506    0.8280     2154.5

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         846.79   1.123   0.9085   2478.811    0.0417      0.8607    1.0235    0.9980    0.9905
```

LPC	70.31	1.527	0.8197	0.661	180.0000	1.0788	0.9453	0.9775	0.0003
HPC	49.49	5.949	0.8289	8734.059	11.0899	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.006	0.8761	1.314	4.0059	12.6513	0.9790	1.0000	0.0003
LPT	0.82	2.291	0.8525	0.785	2.2913	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2631.62	5896.2

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2719	851.64
FanDuct	0.0000	0.5295	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.6086	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9041.0	2251.8	3876.2
LP_Shaft	2346.2	4823.1	2154.5

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.9813	745.03	178.71	10.786
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3120	745.03	178.71	3.997
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.30	173.45	15.546
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	857.40	206.09	30.620
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.30	173.45	15.546
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	960.06	231.36	44.940
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.30	173.45	15.546

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.0446	960.06	231.36	43.905
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.6641	960.06	231.36	24.961
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	960.06	231.36	44.940
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	960.06	231.36	44.940
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	960.06	231.36	44.940
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	473.25	113.29	5.452
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	473.25	113.29	5.452
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	473.25	113.29	5.452
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	473.25	113.29	5.452
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	473.25	113.29	5.452

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1716.26	0.9995	0.0230	0.21888	0.01113

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.117	0.9800	1.0000	0.9800	603.19	0.404	571.8	477.8
Byp_Nozz	1.524	0.9800	1.0000	0.9800	2002.63	0.798	784.9	6250.7

```
**********************************************************************************************************************************
Date:02/22/11    Time:15:41:17    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 471.61    Stator 1 exit: 478.79    Stator 2 inlet: 487.99    Stator 2 exit: 492.90
            Stator 3 inlet: 501.61    Stator 3 exit: 506.06    Stator 4 inlet: 514.11    Stator 4 exit: 517.89
            Stator 5 inlet: 524.61    Stator 5 exit: 527.91            Unblocked   Percent Blockage: 0.30

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.608   30029.0    22.00    314.03      995.1    0.9037     899.22    9.5609    620.50    9.019      9951.0       10.0   1742.1
1645.1   1149.0


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           314.03     5.599    465.62    111.46   0.0000    780.92     4.358    433.58    2686.1   0.6080    1.40012
FS1   Inlet.Fl_O             314.03     5.599    465.62    111.46   0.0000    780.92     5.172    455.17    4162.5   0.3387    1.40012
FS12  Splitter.Fl_02         284.30     5.597    465.62    111.46   0.0000    707.33     5.101    453.45    3526.9   0.3662    1.40012
FS2   Splitter.Fl_01          29.74     5.597    465.62    111.46   0.0000     73.98     5.442    461.91     637.7   0.2004    1.40012
FS14  Fan.Fl_O               284.30     6.259    482.58    115.52   0.0000    643.85     5.355    461.53    2600.0   0.4774    1.40048
FS25  LPC.Fl_O                29.74     8.179    532.86    127.59   0.0000     54.16     7.887    527.36     412.5   0.2284    1.39975
FS3   HPC.Fl_O                28.29    50.502    970.71    234.00   0.0000     11.26    44.587    937.75      49.7   0.4280    1.38276
FS36  Bleed3.Fl_O             21.93    50.502    970.71    234.00   0.0000      8.73    47.101    952.14      49.3   0.3190    1.38276
FS4   Burner.Fl_O             22.18    49.339   1742.08    439.81   0.0114     12.11    46.596   1717.48      74.8   0.2943    1.33030
FS45  HPT.Fl_O                29.64    12.253   1153.52    281.86   0.0085     53.01    11.170   1125.25     264.7   0.3704    1.36543
FS49  LPT.Fl_O                29.99     4.803    933.21    226.13   0.0084    123.08     4.593    921.82     851.6   0.2552    1.37919
FS5   TEGV.Fl_O               29.99     4.803    933.21    226.13   0.0084    123.08     4.593    921.82     851.6   0.2552    1.37919
FS8   Core_Nozz.Fl_O          29.99     4.803    933.21    226.13   0.0084    123.08     4.358    908.70     603.2   0.3769    1.37919
FS17  FanDuctLkg.Fl_O        284.30     6.259    482.58    115.52   0.0000    643.85     5.355    461.53    2600.0   0.4774    1.40048
FS171 Bleed15.Fl_O           284.30     6.259    482.58    115.52   0.0000    643.85     5.237    458.60    2475.2   0.5112    1.40048
FS172 FanDuct.Fl_O           284.30     6.259    482.58    115.52   0.0000    643.85     5.237    458.60    2475.2   0.5112    1.40048
FS173 Byp_Nozz.Fl_O          284.30     6.259    482.58    115.52   0.0000    643.85     4.358    435.01    2002.6   0.7395    1.40048

TURBOMACHINERY PERFORMANCE DATA
               Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan        707.33   1.118   0.9068   2417.235   1.0364    0.9090    -1636.1  ---.--   52.80
LPC         73.98   1.461   0.8034   2417.235   1.1444    0.8103     -678.7    7.89    2.03
HPC         54.16   6.175   0.8202   8965.211   1.8217    0.8586    -4368.2   59.28   56.02
HPT         12.11   4.027   0.8777    217.715   1.3556    0.8565     4368.2
LPT         53.01   2.551   0.8434     67.433   1.2334    0.8253     2314.8

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        821.83   1.116   0.9086   2394.181    0.0420      0.8607    1.0235    0.9980    0.9905
```

LPC	64.10	1.485	0.8046	0.638	180.0000	1.1541	0.9513	0.9985	0.0003
HPC	49.25	5.931	0.8286	8725.999	11.1033	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.963	0.8777	1.311	3.9629	12.6513	0.9790	1.0000	0.0003
LPT	0.82	2.179	0.8497	0.760	2.1793	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2686.13	6056.4

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2552	851.64
FanDuct	0.0000	0.5112	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5609	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9087.0	2524.7	4368.2
LP_Shaft	2290.3	5308.4	2314.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.0943	753.61	180.79	12.253
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3479	753.61	180.79	4.803
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	867.08	208.46	34.419
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.3952	970.71	234.00	49.339
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.9709	970.71	234.00	28.126
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1742.08	0.9995	0.0230	0.24978	0.01139

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.102	0.9800	1.0000	0.9800	603.19	0.377	542.0	505.2
Byp_Nozz	1.436	0.9800	1.0000	0.9800	2002.63	0.739	740.8	6546.3

```
**********************************************************************************************************************************
Date:02/22/11    Time:15:42:56    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 482.10    Stator 1 exit: 488.88    Stator 2 inlet: 497.58    Stator 2 exit: 502.16
            Stator 3 inlet: 504.32    Stator 3 exit: 508.48    Stator 4 inlet: 521.94    Stator 4 exit: 525.08
            Stator 5 inlet: 531.41    Stator 5 exit: 534.45               Stage3   Percent Blockage: 0.30

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.552   25666.0    22.00    348.89      1194.7    0.8598    1027.18    9.4788    573.44    8.750      11946.9      10.0   1765.5
1667.0   1166.6


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht       FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           348.89     6.507    476.52    114.07    0.0000    755.25     5.297    449.14    2752.4   0.5520    1.40035
FS1   Inlet.Fl_O             348.89     6.507    476.52    114.07    0.0000    755.25     6.045    466.60    4162.5   0.3259    1.40035
FS12  Splitter.Fl_02         315.60     6.504    476.52    114.07    0.0000    683.52     5.971    465.00    3526.9   0.3517    1.40035
FS2   Splitter.Fl_01          33.29     6.504    476.52    114.07    0.0000     72.11     6.333    472.91     637.7   0.1951    1.40035
FS14  Fan.Fl_O               315.60     7.232    493.16    118.06    0.0000    625.38     6.258    473.18    2600.0   0.4592    1.40071
FS25  LPC.Fl_O                33.29     9.258    539.11    129.09    0.0000     53.89     8.931    533.61     412.5   0.2272    1.39974
FS3   HPC.Fl_O                31.68    56.939    980.90    236.52    0.0000     11.24    50.296    947.77      49.7   0.4272    1.38220
FS36  Bleed3.Fl_O             24.55    56.939    980.90    236.52    0.0000      8.71    53.119    962.23      49.3   0.3185    1.38220
FS4   Burner.Fl_O             24.84    55.628   1765.54    446.41    0.0116     12.11    52.535   1740.68      74.8   0.2944    1.32906
FS45  HPT.Fl_O                33.19    13.944   1171.20    286.44    0.0087     52.56    12.734   1143.12     264.7   0.3669    1.36421
FS49  LPT.Fl_O                33.58     5.767    960.02    232.86    0.0086    116.42     5.543    949.65     851.6   0.2405    1.37755
FS5   TEGV.Fl_O               33.58     5.767    960.02    232.86    0.0086    116.42     5.543    949.65     851.6   0.2405    1.37755
FS8   Core_Nozz.Fl_O          33.58     5.767    960.02    232.86    0.0086    116.42     5.297    937.92     603.2   0.3530    1.37755
FS17  FanDuctLkg.Fl_O        315.60     7.232    493.16    118.06    0.0000    625.38     6.258    473.18    2600.0   0.4592    1.40071
FS171 Bleed15.Fl_O           315.60     7.232    493.16    118.06    0.0000    625.38     6.134    470.48    2475.2   0.4907    1.40071
FS172 FanDuct.Fl_O           315.60     7.232    493.16    118.06    0.0000    625.38     6.134    470.48    2475.2   0.4907    1.40071
FS173 Byp_Nozz.Fl_O          315.60     7.232    493.16    118.06    0.0000    625.38     5.297    450.56    2002.6   0.6873    1.40071

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR       eff         Nc        TR    efPoly        pwr     SMN      SMW
Fan         683.52   1.112    0.9066   2330.031    1.0349    0.9089    -1781.3  ---.--    51.54
LPC          72.11   1.423    0.8154   2330.031    1.1314    0.8220     -707.5    8.09     1.72
HPC          53.89   6.151    0.8198   8956.505    1.8195    0.8581    -4938.3   59.21    55.93
HPT          12.11   3.989    0.8790    217.317    1.3525    0.8584     4938.3
LPT          52.56   2.418    0.8398     65.259    1.2171    0.8225     2488.8

TURBOMACHINERY MAP DATA
             WcMap   PRmap    effMap      NcMap     R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         794.17   1.109    0.9085   2307.809     0.0424      0.8607    1.0235    0.9980    0.9905
```

LPC	57.77	1.442	0.7891	0.615	180.0000	1.2483	0.9572	1.0333	0.0003
HPC	49.01	5.908	0.8283	8717.525	11.1106	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.926	0.8790	1.308	3.9265	12.6513	0.9790	1.0000	0.0003
LPT	0.81	2.078	0.8460	0.735	2.0779	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2752.40	6218.3

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2405	851.64
FanDuct	0.0000	0.4907	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.4788	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9131.3	2840.4	4938.3
LP_Shaft	2233.3	5852.8	2488.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.2253	761.91	182.81	13.944
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3896	761.91	182.81	5.767
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	739.77	177.43	19.748
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	876.39	210.74	38.820
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	739.77	177.43	19.748
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	980.90	236.52	56.939
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	739.77	177.43	19.748

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.8016	980.90	236.52	55.628
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	3.3265	980.90	236.52	31.785
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	980.90	236.52	56.939
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	980.90	236.52	56.939
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	980.90	236.52	56.939
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1765.54	0.9995	0.0230	0.28533	0.01162

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.089	0.9800	1.0000	0.9800	603.19	0.353	515.5	538.1
Byp_Nozz	1.365	0.9800	1.0000	0.9800	2002.63	0.687	700.9	6874.9

```
**********************************************************************************************************************************
Date:02/22/11    Time:15:44:48    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  7/ 33/ 2/ 4    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 496.92    Stator 1 exit: 503.31    Stator 2 inlet: 505.84    Stator 2 exit: 510.08
            Stator 3 inlet: 523.38    Stator 3 exit: 526.85    Stator 4 inlet: 534.02    Stator 4 exit: 537.25
            Stator 5 inlet: 543.20    Stator 5 exit: 545.99               Stage2   Percent Blockage: 0.30

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.490   20047.0    22.00    399.48     1508.8    0.8124    1225.84    9.3173    520.34    8.451     15087.8      10.0   1799.2
1698.7   1192.2


                                        FLOW STATION DATA
                                  W         Pt         Tt         ht      FAR        Wc         Ps         Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           399.48      7.913     491.73     117.72   0.0000    722.40      6.740     469.18    2851.2   0.4900    1.40068
FS1   Inlet.Fl_O             399.48      7.913     491.73     117.72   0.0000    722.40      7.403     482.46    4162.5   0.3098    1.40068
FS12  Splitter.Fl_02         360.76      7.909     491.73     117.72   0.0000    652.71      7.323     481.03    3526.9   0.3334    1.40068
FS2   Splitter.Fl_01          38.72      7.909     491.73     117.72   0.0000     70.05      7.714     488.23     637.7   0.1893    1.40068
FS14  Fan.Fl_O               360.76      8.767     508.18     121.66   0.0000    598.58      7.703     489.74    2600.0   0.4337    1.40000
FS25  LPC.Fl_O                38.72     10.981     549.96     131.69   0.0000     53.36     10.601     544.45     412.5   0.2248    1.39972
FS3   HPC.Fl_O                 36.84     66.870     997.51     240.65   0.0000     11.23     59.093     963.98      49.7   0.4266    1.38130
FS36  Bleed3.Fl_O              28.55     66.870     997.51     240.65   0.0000      8.70     62.397     978.61      49.3   0.3181    1.38130
FS4   Burner.Fl_O              28.89     65.330    1799.25     455.92   0.0119     12.11     61.697    1774.01      74.8   0.2946    1.32731
FS45  HPT.Fl_O                 38.61     16.575    1196.91     293.12   0.0089     52.00     15.171    1169.01     264.7   0.3625    1.36247
FS49  LPT.Fl_O                 39.06      7.255     994.66     241.59   0.0088    109.57      7.006     985.24     851.6   0.2256    1.37544
FS5   TEGV.Fl_O                39.06      7.255     994.66     241.59   0.0088    109.57      7.006     985.24     851.6   0.2256    1.37544
FS8   Core_Nozz.Fl_O           39.06      7.255     994.66     241.59   0.0088    109.57      6.740     974.79     603.1   0.3293    1.37544
FS17  FanDuctLkg.Fl_O         360.76      8.767     508.18     121.66   0.0000    598.58      7.703     489.74    2600.0   0.4337    1.40000
FS171 Bleed15.Fl_O            360.76      8.767     508.18     121.66   0.0000    598.58      7.571     487.32    2475.2   0.4624    1.40000
FS172 FanDuct.Fl_O            360.76      8.767     508.18     121.66   0.0000    598.58      7.571     487.32    2475.2   0.4624    1.40000
FS173 Byp_Nozz.Fl_O           360.76      8.767     508.18     121.66   0.0000    598.58      6.740     470.67    2002.6   0.6310    1.40000

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan         652.71   1.109   0.9089   2235.049   1.0335    0.9079    -2013.8  ---.--   49.21
LPC          70.05   1.388   0.8284   2235.049   1.1184    0.8359     -765.5    8.44    1.36
HPC          53.36   6.090   0.8188   8939.200   1.8138    0.8573    -5824.0   59.45   56.11
HPT          12.11   3.941   0.8806    217.006   1.3483    0.8605     5824.0
LPT          52.00   2.285   0.8361     62.904   1.2003    0.8205     2779.3

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         758.37   1.106   0.9108   2213.733    0.0433      0.8607    1.0235    0.9980    0.9905
```

LPC	50.86	1.396	0.7722	0.590	180.0000	1.3772	0.9814	1.0728	0.0003
HPC	48.53	5.850	0.8272	8700.682	11.1022	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.880	0.8807	1.306	3.8796	12.6513	0.9790	1.0000	0.0003
LPT	0.80	1.977	0.8423	0.709	1.9766	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2851.16	6460.6

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2256	851.64
FanDuct	0.0000	0.4624	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.3173	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9204.9	3323.0	5824.0
LP_Shaft	2176.2	6707.5	2779.3

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.4249	775.76	186.17	16.575
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.4530	775.76	186.17	7.255
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.32	180.72	23.277
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	891.70	214.50	45.632
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.32	180.72	23.277
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	997.51	240.65	66.870
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.32	180.72	23.277

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	4.4209	997.51	240.65	65.330
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	3.8684	997.51	240.65	37.442
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	997.51	240.65	66.870
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	997.51	240.65	66.870
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	997.51	240.65	66.870
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	508.18	121.66	8.767

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1799.25	0.9995	0.0230	0.34051	0.01193

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.076	0.9800	1.0000	0.9800	603.19	0.329	489.9	594.7
Byp_Nozz	1.301	0.9800	1.0000	0.9800	2002.63	0.631	657.7	7374.7

```
**********************************************************************************************************************************
Date:02/22/11    Time:15:46:39    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 21/ 1/ 6    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 505.11    Stator 1 exit: 511.23    Stator 2 inlet: 523.59    Stator 2 exit: 527.33
            Stator 3 inlet: 534.64    Stator 3 exit: 538.25    Stator 4 inlet: 545.00    Stator 4 exit: 548.03
            Stator 5 inlet: 553.64    Stator 5 exit: 556.25               Stage1   Percent Blockage: 0.30

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.446   15435.0    22.00    442.60     1740.5    0.7937    1381.38    9.2940    481.90    8.019     17405.9      10.0   1818.0
1716.3   1210.1


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O          442.60     9.311    504.97    120.89   0.0000    689.30     8.149    485.63    2920.0  0.4460    1.40036
FS1   Inlet.Fl_O            442.60     9.311    504.97    120.89   0.0000    689.30     8.769    496.39    4162.5  0.2939    1.40036
FS12  Splitter.Fl_02        399.60     9.306    504.97    120.89   0.0000    622.65     8.684    495.08    3526.9  0.3158    1.40036
FS2   Splitter.Fl_01         43.00     9.306    504.97    120.89   0.0000     66.99     9.097    501.70     637.7  0.1806    1.40036
FS14  Fan.Fl_O              399.60    10.282    520.79    124.69   0.0000    572.33     9.159    503.86    2600.0  0.4099    1.39977
FS25  LPC.Fl_O               43.00    12.652    559.58    134.00   0.0000     51.88    12.239    554.31     412.5  0.2182    1.39970
FS3   HPC.Fl_O               40.91    74.665   1006.35    242.85   0.0000     11.22    66.002    972.65      49.7  0.4261    1.38060
FS36  Bleed3.Fl_O            31.71    74.665   1006.35    242.85   0.0000      8.69    69.682    987.35      49.3  0.3178    1.38060
FS4   Burner.Fl_O            32.09    72.945   1818.04    461.25   0.0121     12.10    68.890   1792.60      74.8  0.2947    1.32655
FS45  HPT.Fl_O               42.88    18.869   1214.86    297.79   0.0090     51.11    17.331   1187.70     264.7  0.3554    1.36116
FS49  LPT.Fl_O               43.38     8.692   1022.16    248.54   0.0089    102.96     8.430   1013.70     851.6  0.2114    1.37342
FS5   TEGV.Fl_O              43.38     8.692   1022.16    248.54   0.0089    102.96     8.430   1013.70     851.6  0.2114    1.37342
FS8   Core_Nozz.Fl_O         43.38     8.692   1022.16    248.54   0.0089    102.96     8.149   1004.44     603.3  0.3072    1.37342
FS17  FanDuctLkg.Fl_O        399.60    10.282    520.79    124.69   0.0000    572.33     9.159    503.86    2600.0  0.4099    1.39977
FS171 Bleed15.Fl_O           399.60    10.282    520.79    124.69   0.0000    572.33     9.023    501.71    2475.2  0.4361    1.39977
FS172 FanDuct.Fl_O           399.60    10.282    520.79    124.69   0.0000    572.33     9.023    501.71    2475.2  0.4361    1.39977
FS173 Byp_Nozz.Fl_O          399.60    10.282    520.79    124.69   0.0000    572.33     8.149    487.09    2002.6  0.5880    1.39977

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan         622.65   1.105   0.9099   2144.795   1.0313    0.9114    -2147.2  ---.--   46.99
LPC          66.99   1.359   0.8393   2144.795   1.1081    0.8473     -797.6    8.94    0.99
HPC          51.88   5.902   0.8154   8890.017   1.7984    0.8541    -6460.7   60.58   57.05
HPT          12.10   3.866   0.8810    216.564   1.3420    0.8612     6460.7
LPT          51.11   2.171   0.8322     60.717   1.1854    0.8169     2944.8

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         723.44   1.102   0.9118   2124.340    0.0442      0.8607    1.0235    0.9980    0.9905
```

LPC	44.31	1.352	0.7562	0.566	180.0000	1.5121	1.0224	1.1098	0.0003
HPC	47.18	5.671	0.8238	8652.811	11.0506	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.806	0.8810	1.304	3.8057	12.6513	0.9790	1.0000	0.0003
LPT	0.79	1.890	0.8384	0.684	1.8900	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2919.98	6629.2

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2114	851.64
FanDuct	0.0000	0.4361	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.2940	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9234.0	3674.7	6460.7
LP_Shaft	2116.3	7308.3	2944.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.5822	785.04	188.43	18.869
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.5030	785.04	188.43	8.692
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	762.64	182.98	26.294
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	900.76	216.72	51.100
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	762.64	182.98	26.294
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1006.35	242.85	74.665
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	762.64	182.98	26.294

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	4.9092	1006.35	242.85	72.945
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	4.2957	1006.35	242.85	42.013
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1006.35	242.85	74.665
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1006.35	242.85	74.665
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1006.35	242.85	74.665
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1818.04	0.9995	0.0230	0.38372	0.01210

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.067	0.9800	1.0000	0.9800	603.19	0.307	463.5	625.0
Byp_Nozz	1.262	0.9800	1.0000	0.9800	2002.63	0.588	623.6	7744.8

```
**********************************************************************************************************************************
Date:02/22/11    Time:15:48:41    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 12/ 25/ 1/10    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 523.48    Stator 1 exit: 529.04    Stator 2 inlet: 536.15    Stator 2 exit: 539.83
            Stator 3 inlet: 546.53    Stator 3 exit: 549.79    Stator 4 inlet: 555.99    Stator 4 exit: 558.70
            Stator 5 inlet: 563.83    Stator 5 exit: 566.16             Unblocked   Percent Blockage: 0.30

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.406    10735.0    22.00     489.85      2003.2     0.7777    1557.96    9.2910    446.20    7.554      20032.3       10.0   1842.0
1738.8   1230.8


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           489.85    11.019    518.95    124.25   0.0000    653.50     9.822    502.39    2996.0   0.4060    1.39978
FS1   Inlet.Fl_O             489.85    11.019    518.95    124.25   0.0000    653.50    10.446    511.10    4162.5   0.2772    1.39978
FS12  Splitter.Fl_02         442.25    11.013    518.95    124.25   0.0000    590.29    10.357    509.92    3526.9   0.2976    1.39978
FS2   Splitter.Fl_01          47.60    11.013    518.95    124.25   0.0000     63.53    10.791    515.93     637.7   0.1710    1.39978
FS14  Fan.Fl_O               442.25    12.085    534.12    127.89   0.0000    545.75    10.900    518.61    2600.0   0.3868    1.39975
FS25  LPC.Fl_O                47.60    14.441    569.62    136.41   0.0000     50.76    13.990    564.49     412.5   0.2133    1.39968
FS3   HPC.Fl_O                45.29    83.232   1017.61    245.65   0.0000     11.20    73.605    983.68      49.7   0.4255    1.37981
FS36  Bleed3.Fl_O             35.10    83.232   1017.61    245.65   0.0000      8.68    77.695    998.48      49.3   0.3174    1.37981
FS4   Burner.Fl_O             35.53    81.315   1842.02    468.05   0.0123     12.10    76.796   1816.31      74.8   0.2947    1.32540
FS45  HPT.Fl_O                47.48    21.393   1235.67    303.23   0.0092     50.34    19.706   1209.07     264.7   0.3493    1.35973
FS49  LPT.Fl_O                48.03    10.389   1052.82    256.33   0.0091     96.80    10.114   1045.19     851.6   0.1982    1.37143
FS5   TEGV.Fl_O               48.03    10.389   1052.82    256.33   0.0091     96.80    10.114   1045.19     851.6   0.1982    1.37143
FS8   Core_Nozz.Fl_O          48.03    10.389   1052.82    256.33   0.0091     96.80     9.822   1036.94     603.2   0.2870    1.37143
FS17  FanDuctLkg.Fl_O        442.25    12.085    534.12    127.89   0.0000    545.75    10.900    518.61    2600.0   0.3868    1.39975
FS171 Bleed15.Fl_O           442.25    12.085    534.12    127.89   0.0000    545.75    10.760    516.69    2475.2   0.4108    1.39975
FS172 FanDuct.Fl_O           442.25    12.085    534.12    127.89   0.0000    545.75    10.760    516.69    2475.2   0.4108    1.39975
FS173 Byp_Nozz.Fl_O          442.25    12.085    534.12    127.89   0.0000    545.75     9.822    503.75    2002.6   0.5491    1.39975

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR       eff         Nc        TR    efPoly        pwr      SMN      SMW
Fan         590.29   1.097    0.9093   2034.264    1.0292    0.9108    -2279.5  ---.--    45.03
LPC          63.53   1.311    0.8186   2034.264    1.0976    0.8270     -819.3     9.96     0.51
HPC          50.76   5.764    0.8128   8853.260    1.7865    0.8515    -7178.3    61.41    57.72
HPT          12.10   3.801    0.8818    216.174    1.3364    0.8624     7178.3
LPT          50.34   2.059    0.8287     57.886    1.1704    0.8140     3098.8

TURBOMACHINERY MAP DATA
             WcMap   PRmap    effMap      NcMap     R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         685.85   1.095    0.9111   2014.862     0.0450      0.8607    1.0235    0.9980    0.9905
```

LPC	36.28	1.298	0.7366	0.537	180.0000	1.7514	1.0460	1.1113	0.0003
HPC	46.17	5.539	0.8212	8617.034	11.0151	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.742	0.8818	1.301	3.7422	12.6513	0.9790	1.0000	0.0003
LPT	0.77	1.805	0.8348	0.652	1.8052	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2995.97	6793.5

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.1982	851.64
FanDuct	0.0000	0.4108	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.2910	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9277.9	4063.6	7178.3
LP_Shaft	2034.8	7998.3	3098.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.7517	795.75	191.03	21.393
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.5569	795.75	191.03	10.389
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	911.76	219.43	57.091
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	5.4350	1017.61	245.65	81.315
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	4.7557	1017.61	245.65	47.040
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1842.02	0.9995	0.0230	0.43277	0.01233

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.058	0.9800	1.0000	0.9800	603.19	0.287	439.7	656.4
Byp_Nozz	1.230	0.9800	1.0000	0.9800	2002.63	0.549	592.2	8140.3

35% Blockage

```
BIG NOTE!!  at 35000 Cruise the LPC STALLS/SURGES at reduced thrust so no output available after 100% thrust
*****************************************************************************************************************
Date:02/22/11    Time:14:53:30    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 34/ 2/ 5    Run by: Philip C Jorgenson      PC:   100
Temperature Stator 1 inlet: 456.56    Stator 1 exit: 475.13    Stator 2 inlet: 502.77    Stator 2 exit: 510.93
            Stator 3 inlet: 537.55    Stator 3 exit: 546.10    Stator 4 inlet: 571.37    Stator 4 exit: 579.42
            Stator 5 inlet: 599.78    Stator 5 exit: 607.62             Unblocked   Percent Blockage: 0.35

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.780   35000.0    22.00    477.01     8371.9    0.5976    5003.20    5.2999    779.49   32.229      8371.8     100.0   2874.1
2696.7   1876.6


                                        FLOW STATION DATA
                                 W        Pt        Tt       ht     FAR       Wc        Ps        Ts     Aphy      MN      gamt
FS0   Ambient.Fl_O          477.01     5.185    466.40   111.64  0.0000  1281.99     3.458    415.85   3926.2  0.7800   1.40014
FS1   Inlet.Fl_O            477.01     5.185    466.40   111.64  0.0000  1281.99     3.822    427.49   4162.5  0.6748   1.40014
FS12  Splitter.Fl_02        401.29     5.183    466.40   111.64  0.0000  1079.03     3.850    428.42   3526.9  0.6660   1.40014
FS2   Splitter.Fl_01         75.72     5.183    466.40   111.64  0.0000   203.59     3.638    421.57    637.7  0.7295   1.40014
FS14  Fan.Fl_O              401.29     8.814    550.80   131.90  0.0000   689.50     7.302    521.98   2600.0  0.5256   1.39972
FS25  LPC.Fl_O               75.72    12.470    626.53   150.09  0.0000    98.07    10.840    601.99    412.5  0.4522   1.39820
FS3   HPC.Fl_O               72.04   167.116   1392.78   341.31  0.0000    10.38   150.851   1355.71     49.7  0.3910   1.35667
FS36  Bleed3.Fl_O            55.83   167.116   1392.78   341.31  0.0000     8.05   157.663   1371.60     49.3  0.2941   1.35667
FS4   Burner.Fl_O            57.22   163.267   2874.15   782.49  0.0249    12.13   154.128   2837.81     74.8  0.3005   1.28295
FS45  HPT.Fl_O               76.22    38.400   1885.85   483.69  0.0186    55.62    34.596   1838.73    264.7  0.4000   1.31936
FS49  LPT.Fl_O               77.11     8.963   1356.88   337.80  0.0184   204.50     7.752   1307.05    851.6  0.4682   1.34611
FS5   TEGV.Fl_O              77.11     8.963   1356.88   337.80  0.0184   204.50     7.752   1307.05    851.6  0.4682   1.34611
FS8   Core_Nozz.Fl_O         77.11     8.963   1356.88   337.80  0.0184   204.50     4.796   1152.89    603.2  1.0000   1.34611
FS17  FanDuctLkg.Fl_O       401.29     8.814    550.80   131.90  0.0000   689.50     7.302    521.98   2600.0  0.5256   1.39972
FS171 Bleed15.Fl_O          401.29     8.814    550.80   131.90  0.0000   689.50     7.092    517.65   2475.2  0.5661   1.39972
FS172 FanDuct.Fl_O          401.29     8.814    550.80   131.90  0.0000   689.50     7.092    517.65   2475.2  0.5661   1.39972
FS173 Byp_Nozz.Fl_O         401.29     8.814    550.80   131.90  0.0000   689.50     4.672    458.99   2002.6  1.0000   1.39972

TURBOMACHINERY PERFORMANCE DATA
               Wc      PR      eff         Nc       TR   efPoly        pwr     SMN     SMW
Fan       1079.03   1.701   0.9114   4139.514   1.1810   0.9171   -11498.7   36.79   23.18
LPC        203.59   2.406   0.8368   4139.514   1.3433   0.8537    -4118.9    3.06    2.59
HPC         98.07  13.401   0.8581  10417.139   2.2230   0.8978   -19988.3   25.13   24.38
HPT         12.13   4.252   0.9120    213.560   1.3438   0.8973    19988.3
```

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LPT         55.62   4.284   0.9159     90.391   1.3860   0.9002    15617.7

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1253.73   1.685   0.9132   4100.034    0.0638      0.8607    1.0235    0.9980    0.9905
LPC        166.92   2.761   0.8444      1.093  180.0000      1.2197    0.7986    0.9910    0.0003
HPC         89.19  12.817   0.8670  10139.185   13.5840      1.0995    1.0494    0.9898    0.9733
HPT          0.96   4.183   0.9120      1.286    4.1834     12.6513    0.9790    1.0000    0.0003
LPT          0.86   3.497   0.9227      1.019    3.4967     65.0409    0.7602    0.9926    0.0005

===INLETS====    eRam       Afs      Fram
Inlet          1.0000   3926.21   11556.7

====DUCTS====  dPnorm        MN      Aphy
TEGV           0.0000    0.4682    851.64
FanDuct        0.0000    0.5661   2475.22

==SPLITTERS==     BPR    dP/P 1    dP/P 2
Splitter       5.2999    0.0005    0.0005

===SHAFTS====   Nmech    trq in    pwr in
HP_Shaft      11449.2    9169.3   19988.3
LP_Shaft       3925.4   20896.4   15617.7

BLEEDS - interstg  Wb/Win    BldWk     BldP          W         Tt        ht         Pt
HPT_COOLC HPC.C>   0.0368    0.5000    0.2200     2.7864   1017.82    245.70    38.400
LPT_COOLA HPC.C>   0.0117    0.5000    0.4500     0.8859   1017.82    245.70     8.963
WB2X      HPC.B>   0.0000    0.4500    0.2200     0.0000    979.36    236.14    46.492
WB2Y      HPC.B>   0.0000    0.7600    0.6200     0.0000   1214.97    295.42   108.350
WBA2X     HPC.B>   0.0000    0.4500    0.2200     0.0000    979.36    236.14    46.492
WBLKG     HPC.l>   0.0000    1.0000    1.0000     0.0000   1392.78    341.31   167.116
WBW2X     HPC.B>   0.0000    0.4500    0.2200     0.0000    979.36    236.14    46.492

BLEEDS - output    Wb/Win    hscale    Pscale          W         Tt        ht         Pt
HPT_COOLA Bleed>   0.1142    1.0000    1.0000     8.6453   1392.78    341.31   163.267
HPT_COOLB Bleed>   0.0999    1.0000    1.0000     7.5649   1392.78    341.31    91.843
WB3X      Bleed>   0.0000    1.0000    1.0000     0.0000   1392.78    341.31   167.116
WBA3X     Bleed>   0.0000    1.0000    1.0000     0.0000   1392.78    341.31   167.116
WBW3X     Bleed>   0.0000    1.0000    1.0000     0.0000   1392.78    341.31   167.116
WBFDLKG   FanDu>   0.0000    1.0000    1.0000     0.0000    550.80    131.90     8.814
WB15X     Bleed>   0.0000    1.0000    1.0000     0.0000    550.80    131.90     8.814
WB15Y     Bleed>   0.0000    1.0000    1.0000     0.0000    550.80    131.90     8.814
WB17X     Bleed>   0.0000    1.0000    1.0000     0.0000    550.80    131.90     8.814
WB17Y     Bleed>   0.0000    1.0000    1.0000     0.0000    550.80    131.90     8.814

===BURNERS===    TtOut       eff     dPnorm      Wfuel       FAR
Burner         2874.15    0.9995    0.0230    1.38978   0.02489


===NOZZLES===       PR       Cfg      CdTh        Cv        Ath      MNth     Vact        Fg
Core_Nozz        2.592    0.9805    1.0000    0.9800     603.19     1.000   1607.6     4659.7
Byp_Nozz         2.549    0.9823    1.0000    0.9800    2002.63     1.000   1029.2    15268.9
```

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**********************************************************************************************************************************
Date:02/22/11    Time:14:56:11    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 34/ 2/ 5    Run by: Philip C Jorgenson      PC:   100
Temperature Stator 1 inlet: 452.22    Stator 1 exit: 470.61    Stator 2 inlet: 497.98    Stator 2 exit: 506.03
            Stator 3 inlet: 532.41    Stator 3 exit: 540.85    Stator 4 inlet: 565.89    Stator 4 exit: 573.85
            Stator 5 inlet: 594.02    Stator 5 exit: 601.76             Unblocked   Percent Blockage: 0.35

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    395.92     6923.4    0.5938    4111.11    5.2972    775.82   32.257      6923.4     100.0   2850.8
2674.6   1859.9


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          395.92     4.283    462.03    110.60   0.0000   1282.11     2.854    411.97    3930.2   0.7800    1.40005
FS1   Inlet.Fl_O            395.92     4.283    462.03    110.60   0.0000   1282.11     3.157    423.48    4162.5   0.6750    1.40005
FS12  Splitter.Fl_02        333.05     4.281    462.03    110.60   0.0000   1079.05     3.180    424.41    3526.9   0.6660    1.40005
FS2   Splitter.Fl_01         62.87     4.281    462.03    110.60   0.0000    203.70     3.002    417.52     637.7   0.7305    1.40005
FS14  Fan.Fl_O              333.05     7.280    545.71    130.67   0.0000    689.60     6.031    517.14    2600.0   0.5257    1.39973
FS25  LPC.Fl_O               62.87    10.292    620.49    148.64   0.0000     98.19     8.942    596.10     412.5   0.4529    1.39833
FS3   HPC.Fl_O               59.82   138.165   1380.92    338.22   0.0000     10.38   124.716   1344.10      49.7   0.3909    1.35737
FS36  Bleed3.Fl_O            46.36   138.165   1380.92    338.22   0.0000      8.05   130.349   1359.88      49.3   0.2940    1.35737
FS4   Burner.Fl_O            47.51   134.983   2850.79    774.97   0.0246     12.13   127.427   2814.67      74.8   0.3004    1.28375
FS45  HPT.Fl_O               63.28    31.735   1869.09    478.84   0.0184     55.63    28.591   1822.29     264.7   0.3999    1.32018
FS49  LPT.Fl_O               64.01     7.404   1344.03    334.31   0.0182    204.54     6.404   1294.56     851.6   0.4682    1.34702
FS5   TEGV.Fl_O              64.01     7.404   1344.03    334.31   0.0182    204.54     6.404   1294.56     851.6   0.4682    1.34702
FS8   Core_Nozz.Fl_O         64.01     7.404   1344.03    334.31   0.0182    204.54     3.961   1141.55     603.2   1.0000    1.34702
FS17  FanDuctLkg.Fl_O       333.05     7.280    545.71    130.67   0.0000    689.60     6.031    517.14    2600.0   0.5257    1.39973
FS171 Bleed15.Fl_O          333.05     7.280    545.71    130.67   0.0000    689.60     5.857    512.85    2475.2   0.5662    1.39973
FS172 FanDuct.Fl_O          333.05     7.280    545.71    130.67   0.0000    689.60     5.857    512.85    2475.2   0.5662    1.39973
FS173 Byp_Nozz.Fl_O         333.05     7.280    545.71    130.67   0.0000    689.60     3.860    454.75    2002.6   1.0000    1.39973

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan        1079.05   1.701   0.9114   4139.500   1.1811    0.9169    -9461.0   36.81   23.19
LPC         203.70   2.404   0.8363   4139.500   1.3430    0.8542    -3384.1    3.06    2.59
HPC          98.19  13.424   0.8581  10422.016   2.2255    0.8979   -16455.4   25.06   24.31
HPT          12.13   4.253   0.9119    213.497   1.3446    0.8972    16455.4
LPT          55.63   4.286   0.9157     90.370   1.3868    0.8998    12845.1

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        1253.75   1.685   0.9132   4100.021    0.0638      0.8607    1.0235    0.9980    0.9905
```

LPC	166.92	2.761	0.8444	1.093	180.0000	1.2204	0.7974	0.9904	0.0003
HPC	89.31	12.839	0.8669	10143.932	13.5911	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.185	0.9119	1.285	4.1851	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.498	0.9225	1.018	3.4980	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3930.21	9547.0

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4682	851.64
FanDuct	0.0000	0.5662	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.2972	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11399.2	7581.7	16455.4
LP_Shaft	3906.9	17267.7	12845.1

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.3137	1008.69	243.43	31.735
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7356	1008.69	243.43	7.404
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.52	233.95	38.424
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1204.39	292.72	89.573
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.52	233.95	38.424
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1380.92	338.22	138.165
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.52	233.95	38.424

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.1788	1380.92	338.22	134.983
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.2816	1380.92	338.22	75.925
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.92	338.22	138.165
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.92	338.22	138.165
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.92	338.22	138.165
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2850.79	0.9995	0.0230	1.14198	0.02463

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.594	0.9805	1.0000	0.9800	603.19	1.000	1600.1	3851.4
Byp_Nozz	2.551	0.9825	1.0000	0.9800	2002.63	1.000	1024.4	12619.1

```
**********************************************************************************************************************
Date:02/22/11    Time:14:57:19    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    84
Temperature Stator 1 inlet: 457.73    Stator 1 exit: 474.77    Stator 2 inlet: 499.38    Stator 2 exit: 507.77
            Stator 3 inlet: 531.51    Stator 3 exit: 539.94    Stator 4 inlet: 562.42    Stator 4 exit: 570.18
            Stator 5 inlet: 588.48    Stator 5 exit: 595.87             Unblocked   Percent Blockage: 0.35

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    376.28      5815.7     0.5868    3412.49    5.4803    775.82   28.783      6923.4       84.0   2672.3
2509.4   1739.6


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           376.28     4.283    462.03    110.60   0.0000   1218.51     2.854    411.97    3735.2   0.7800    1.40005
FS1   Inlet.Fl_O             376.28     4.283    462.03    110.60   0.0000   1218.51     3.321    429.63    4162.5   0.6143    1.40005
FS12  Splitter.Fl_02         318.22     4.281    462.03    110.60   0.0000   1030.99     3.323    429.78    3526.9   0.6128    1.40005
FS2   Splitter.Fl_01          58.07     4.281    462.03    110.60   0.0000    188.13     3.297    428.81     637.7   0.6226    1.40005
FS14  Fan.Fl_O               318.22     6.897    536.70    128.51   0.0000    689.71     5.713    508.59    2600.0   0.5258    1.39974
FS25  LPC.Fl_O                58.07    10.070    611.78    146.54   0.0000     92.03     8.936    591.27     412.5   0.4169    1.39851
FS3   HPC.Fl_O                 55.25   123.283   1325.64    323.87   0.0000     10.53   110.898   1288.87      49.7   0.3971    1.36070
FS36  Bleed3.Fl_O              42.82   123.283   1325.64    323.87   0.0000      8.16   116.098   1304.68      49.3   0.2982    1.36070
FS4   Burner.Fl_O              43.77   120.444   2672.32    717.68   0.0221     12.12   113.711   2637.88      74.8   0.2995    1.29062
FS45  HPT.Fl_O                 58.33    28.210   1747.88    443.86   0.0165     55.79    25.399   1703.20     264.7   0.4002    1.32655
FS49  LPT.Fl_O                 59.01     6.577   1252.24    309.50   0.0163    204.91     5.685   1205.33     851.6   0.4679    1.35390
FS5   TEGV.Fl_O                59.01     6.577   1252.24    309.50   0.0163    204.91     5.685   1205.33     851.6   0.4679    1.35390
FS8   Core_Nozz.Fl_O           59.01     6.577   1252.24    309.50   0.0163    204.91     3.511   1060.60     603.2   1.0000    1.35390
FS17  FanDuctLkg.Fl_O         318.22     6.897    536.70    128.51   0.0000    689.71     5.713    508.59    2600.0   0.5258    1.39974
FS171 Bleed15.Fl_O            318.22     6.897    536.70    128.51   0.0000    689.71     5.550    504.37    2475.2   0.5661    1.39974
FS172 FanDuct.Fl_O            318.22     6.897    536.70    128.51   0.0000    689.71     5.550    504.37    2475.2   0.5661    1.39974
FS173 Byp_Nozz.Fl_O           318.22     6.897    536.70    128.51   0.0000    689.71     3.658    447.25    2002.6   1.0000    1.39974

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1030.99   1.611   0.9119   3951.105   1.1616   0.9164    -8064.9   54.89   26.94
LPC        188.13   2.352   0.8599   3951.105   1.3241   0.8757    -2953.1    1.70    1.34
HPC         92.03  12.242   0.8603  10205.136   2.1669   0.8985   -14214.7   29.22   28.26
HPT         12.12   4.270   0.9102    214.401   1.3516   0.8949    14214.7
LPT         55.79   4.289   0.9131     89.197   1.3924   0.8965    11018.0

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1197.89   1.597   0.9138   3913.422    0.0608      0.8607    1.0235    0.9980    0.9905
```

LPC	150.68	2.572	0.8397	1.044	180.0000	1.2486	0.8603	1.0241	0.0003
HPC	83.70	11.712	0.8692	9932.839	13.2002	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.201	0.9102	1.291	4.2008	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.501	0.9199	1.005	3.5005	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3735.24	9073.4

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4679	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.4803	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11083.4	6736.0	14214.7
LP_Shaft	3729.1	15517.8	11018.0

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.1368	975.58	235.20	28.210
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6794	975.58	235.20	6.577
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.75	226.34	34.977
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1159.49	281.31	80.262
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.75	226.34	34.977
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1325.64	323.87	123.283
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.75	226.34	34.977

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.6300	1325.64	323.87	120.444
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.8014	1325.64	323.87	67.686
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.64	323.87	123.283
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.64	323.87	123.283
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.64	323.87	123.283
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2672.32	0.9995	0.0230	0.94791	0.02214

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.304	0.9817	1.0000	0.9800	603.19	1.000	1545.9	3232.1
Byp_Nozz	2.417	0.9830	1.0000	0.9800	2002.63	1.000	1015.9	11657.0

```
**********************************************************************************************************************************
Date:02/22/11    Time:14:58:19    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    79
Temperature Stator 1 inlet: 459.04    Stator 1 exit: 475.75    Stator 2 inlet: 499.73    Stator 2 exit: 508.17
            Stator 3 inlet: 531.31    Stator 3 exit: 539.73    Stator 4 inlet: 561.62    Stator 4 exit: 569.34
            Stator 5 inlet: 587.19    Stator 5 exit: 594.51             Unblocked   Percent Blockage: 0.35

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    370.94      5524.8    0.5863    3239.09    5.5398    775.82   27.859      6923.4       79.8   2626.4
2466.9   1709.0


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           370.94     4.283    462.03    110.60   0.0000   1201.21     2.854    411.97    3682.2   0.7800    1.40005
FS1   Inlet.Fl_O             370.94     4.283    462.03    110.60   0.0000   1201.21     3.360    431.07    4162.5   0.5995    1.40005
FS12  Splitter.Fl_02         314.22     4.281    462.03    110.60   0.0000   1018.04     3.357    431.04    3526.9   0.5997    1.40005
FS2   Splitter.Fl_01          56.72     4.281    462.03    110.60   0.0000    183.77     3.361    431.20     637.7   0.5981    1.40005
FS14  Fan.Fl_O               314.22     6.795    534.32    127.94   0.0000    689.72     5.629    506.34    2600.0   0.5257    1.39975
FS25  LPC.Fl_O                56.72     9.999    609.71    146.04   0.0000     90.39     8.918    590.14     412.5   0.4077    1.39858
FS3   HPC.Fl_O                53.97   119.329   1311.34    320.17   0.0000     10.57   107.239   1274.58      49.7   0.3987    1.36157
FS36  Bleed3.Fl_O             41.83   119.329   1311.34    320.17   0.0000      8.19   112.318   1290.39      49.3   0.2994    1.36157
FS4   Burner.Fl_O             42.73   116.581   2626.38    703.15   0.0215     12.12   110.066   2592.39      74.8   0.2992    1.29240
FS45  HPT.Fl_O                56.96    27.280   1717.09    435.07   0.0161     55.83    24.558   1672.96     264.7   0.4002    1.32830
FS49  LPT.Fl_O                57.62     6.358   1228.97    303.27   0.0159    205.01     5.495   1182.71     851.6   0.4679    1.35567
FS5   TEGV.Fl_O               57.62     6.358   1228.97    303.27   0.0159    205.01     5.495   1182.71     851.6   0.4679    1.35567
FS8   Core_Nozz.Fl_O          57.62     6.358   1228.97    303.27   0.0159    205.01     3.393   1040.15     603.2   1.0000    1.35567
FS17  FanDuctLkg.Fl_O         314.22     6.795    534.32    127.94   0.0000    689.72     5.629    506.34    2600.0   0.5257    1.39975
FS171 Bleed15.Fl_O            314.22     6.795    534.32    127.94   0.0000    689.72     5.468    502.14    2475.2   0.5661    1.39975
FS172 FanDuct.Fl_O            314.22     6.795    534.32    127.94   0.0000    689.72     5.468    502.14    2475.2   0.5661    1.39975
FS173 Byp_Nozz.Fl_O           314.22     6.795    534.32    127.94   0.0000    689.72     3.604    445.27    2002.6   1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
                Wc       PR       eff         Nc        TR    efPoly        pwr      SMN      SMW
Fan       1018.04    1.587    0.9110   3904.454    1.1565    0.9153    -7710.5    58.36    27.99
LPC        183.77    2.336    0.8636   3904.454    1.3196    0.8791    -2844.8     2.07     1.61
HPC         90.39   11.934    0.8610  10159.703    2.1507    0.8987   -13634.7    30.42    29.36
HPT         12.12    4.273    0.9094    214.941    1.3532    0.8939    13634.9
LPT         55.83    4.291    0.9124     88.931    1.3939    0.8957    10555.3

TURBOMACHINERY MAP DATA
             WcMap    PRmap    effMap      NcMap     R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1182.85    1.574    0.9129   3867.216     0.0599      0.8607    1.0235    0.9980    0.9905
```

LPC	147.66	2.526	0.8398	1.031	180.0000	1.2446	0.8752	1.0284	0.0003
HPC	82.21	11.419	0.8699	9888.619	13.0958	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.205	0.9094	1.294	4.2047	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.501	0.9191	1.002	3.5014	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3682.21	8944.6

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4679	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.5398	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11015.4	6501.1	13634.9
LP_Shaft	3685.1	15043.8	10555.3

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.0873	967.11	233.11	27.280
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6636	967.11	233.11	6.358
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.90	224.40	34.051
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1147.92	278.38	77.783
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.90	224.40	34.051
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1311.34	320.17	119.329
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.90	224.40	34.051

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.4764	1311.34	320.17	116.581
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.6670	1311.34	320.17	65.501
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.34	320.17	119.329
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.34	320.17	119.329
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.34	320.17	119.329
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2626.38	0.9995	0.0230	0.89975	0.02151

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.228	0.9816	1.0000	0.9800	603.19	1.000	1531.8	3068.5
Byp_Nozz	2.381	0.9831	1.0000	0.9800	2002.63	1.000	1013.6	11400.9

```
**********************************************************************************************************************************
Date:02/22/11    Time:14:59:20    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    76
Temperature Stator 1 inlet: 459.90    Stator 1 exit: 476.37    Stator 2 inlet: 499.93    Stator 2 exit: 508.38
            Stator 3 inlet: 531.11    Stator 3 exit: 539.51    Stator 4 inlet: 560.99    Stator 4 exit: 568.66
            Stator 5 inlet: 586.21    Stator 5 exit: 593.46             Unblocked   Percent Blockage: 0.35

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    366.97      5317.1     0.5870    3120.97    5.5814    775.82   27.216      6923.4       76.8   2594.8
2437.8   1688.1


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           366.97     4.283    462.03    110.60   0.0000   1188.36     2.854    411.97    3642.8   0.7800    1.40005
FS1   Inlet.Fl_O             366.97     4.283    462.03    110.60   0.0000   1188.36     3.387    432.08    4162.5   0.5889    1.40005
FS12  Splitter.Fl_02         311.21     4.281    462.03    110.60   0.0000   1008.30     3.382    431.95    3526.9   0.5903    1.40005
FS2   Splitter.Fl_01          55.76     4.281    462.03    110.60   0.0000    180.65     3.405    432.77     637.7   0.5816    1.40005
FS14  Fan.Fl_O               311.21     6.720    532.72    127.55   0.0000    689.73     5.567    504.82    2600.0   0.5257    1.39975
FS25  LPC.Fl_O                55.76     9.941    608.24    145.69   0.0000     89.27     8.896    589.28     412.5   0.4014    1.39875
FS3   HPC.Fl_O                53.05   116.571   1301.48    317.62   0.0000     10.60   104.693   1264.74      49.7   0.3999    1.36219
FS36  Bleed3.Fl_O             41.12   116.571   1301.48    317.62   0.0000      8.21   109.685   1280.56      49.3   0.3001    1.36219
FS4   Burner.Fl_O             41.98   113.886   2594.82    693.21   0.0211     12.12   107.525   2561.14      74.8   0.2990    1.29364
FS45  HPT.Fl_O                55.97    26.632   1695.99    429.07   0.0157     55.85    23.972   1652.24     264.7   0.4002    1.32939
FS49  LPT.Fl_O                56.63     6.206   1213.08    299.04   0.0155    205.06     5.364   1167.29     851.6   0.4678    1.35689
FS5   TEGV.Fl_O               56.63     6.206   1213.08    299.04   0.0155    205.06     5.364   1167.29     851.6   0.4678    1.35689
FS8   Core_Nozz.Fl_O          56.63     6.206   1213.08    299.04   0.0155    205.06     3.311   1026.20     603.2   1.0000    1.35689
FS17  FanDuctLkg.Fl_O        311.21     6.720    532.72    127.55   0.0000    689.73     5.567    504.82    2600.0   0.5257    1.39975
FS171 Bleed15.Fl_O           311.21     6.720    532.72    127.55   0.0000    689.73     5.408    500.63    2475.2   0.5660    1.39975
FS172 FanDuct.Fl_O           311.21     6.720    532.72    127.55   0.0000    689.73     5.408    500.63    2475.2   0.5660    1.39975
FS173 Byp_Nozz.Fl_O          311.21     6.720    532.72    127.55   0.0000    689.73     3.564    443.93    2002.6   1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1008.30   1.570   0.9083   3871.417   1.1530    0.9125    -7466.6   60.55   28.78
LPC        180.65   2.322   0.8656   3871.417   1.3164    0.8810    -2768.5    2.35    1.81
HPC         89.27  11.727   0.8614  10128.418   2.1398    0.8988   -13235.2   31.26   30.13
HPT         12.12   4.276   0.9089    215.317   1.3544    0.8932    13235.0
LPT         55.85   4.291   0.9118     88.725   1.3948    0.8952    10235.8

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1171.53   1.557   0.9101   3834.494    0.0593      0.8607    1.0235    0.9980    0.9905
```

LPC	145.52	2.493	0.8399	1.023	180.0000	1.2414	0.8853	1.0305	0.0003
HPC	81.19	11.221	0.8703	9858.168	13.0238	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.207	0.9089	1.296	4.2075	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.502	0.9186	1.000	3.5018	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3642.81	8848.9

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4678	851.64
FanDuct	0.0000	0.5660	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.5814	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	10968.1	6337.6	13235.0
LP_Shaft	3653.9	14712.9	10235.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.0519	961.26	231.66	26.632
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6524	961.26	231.66	6.206
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1139.95	276.36	76.051
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.571
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.3666	1301.48	317.62	113.886
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.5709	1301.48	317.62	63.977
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.571
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.571
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.571
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2594.82	0.9995	0.0230	0.86694	0.02108

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.175	0.9814	1.0000	0.9800	603.19	1.000	1522.1	2954.5
Byp_Nozz	2.355	0.9831	1.0000	0.9800	2002.63	1.000	1012.1	11211.5

```
**********************************************************************************************************************************
Date:02/22/11    Time:15:00:02    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 469.18    Stator 1 exit: 477.65    Stator 2 inlet: 488.50    Stator 2 exit: 494.40
            Stator 3 inlet: 504.69    Stator 3 exit: 510.09    Stator 4 inlet: 519.59    Stator 4 exit: 524.23
            Stator 5 inlet: 532.18    Stator 5 exit: 536.27             Unblocked   Percent Blockage: 0.35

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    258.20      692.4    1.0453     723.70    9.5602    775.82    9.701      6923.4       10.0   1742.7
1647.8   1144.6


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          258.20     4.283    462.03    110.60   0.0000    836.13     2.854    411.97    2563.1   0.7800    1.40005
FS1   Inlet.Fl_O            258.20     4.283    462.03    110.60   0.0000    836.13     3.903    449.92    4162.5   0.3669    1.40005
FS12  Splitter.Fl_02        233.75     4.281    462.03    110.60   0.0000    757.33     3.839    447.87    3526.9   0.3976    1.40005
FS2   Splitter.Fl_01         24.45     4.281    462.03    110.60   0.0000     79.22     4.145    457.78     637.7   0.2154    1.40005
FS14  Fan.Fl_O              233.75     4.864    481.24    115.20   0.0000    680.26     4.058    456.95    2600.0   0.5154    1.40045
FS25  LPC.Fl_O               24.45     6.665    541.42    129.64   0.0000     55.08     6.419    535.63     412.5   0.2326    1.39974
FS3   HPC.Fl_O               23.26    41.554    988.56    238.42   0.0000     11.36    36.589    954.35      49.7   0.4328    1.38178
FS36  Bleed3.Fl_O            18.03    41.554    988.56    238.42   0.0000      8.80    38.704    969.32      49.3   0.3222    1.38178
FS4   Burner.Fl_O            18.23    40.597   1742.70    439.86   0.0111     12.10    38.343   1718.13      74.8   0.2940    1.33044
FS45  HPT.Fl_O               24.37     9.738   1148.86    280.62   0.0083     54.73     8.813   1118.50     264.7   0.3847    1.36585
FS49  LPT.Fl_O               24.65     3.293    896.35    216.92   0.0082    144.64     3.090    880.75     851.6   0.3045    1.38178
FS5   TEGV.Fl_O              24.65     3.293    896.35    216.92   0.0082    144.64     3.090    880.75     851.6   0.3045    1.38178
FS8   Core_Nozz.Fl_O         24.65     3.293    896.35    216.92   0.0082    144.64     2.854    861.44     603.2   0.4602    1.38178
FS17  FanDuctLkg.Fl_O       233.75     4.864    481.24    115.20   0.0000    680.26     4.058    456.95    2600.0   0.5154    1.40045
FS171 Bleed15.Fl_O          233.75     4.864    481.24    115.20   0.0000    680.26     3.948    453.36    2475.2   0.5544    1.40045
FS172 FanDuct.Fl_O          233.75     4.864    481.24    115.20   0.0000    680.26     3.948    453.36    2475.2   0.5544    1.40045
FS173 Byp_Nozz.Fl_O         233.75     4.864    481.24    115.20   0.0000    680.26     2.854    413.51    2002.6   0.9054    1.40045

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       757.33   1.136   0.9061   2620.828   1.0416    0.9086    -1523.8  ---.--   54.85
LPC        79.22   1.557   0.7933   2620.828   1.1718    0.8030     -658.9    7.65    4.40
HPC        55.08   6.234   0.8208   8994.352   1.8259    0.8592    -3671.9   60.09   56.89
HPT        12.10   4.169   0.8769    220.129   1.3656    0.8550     3671.9
LPT        54.73   2.957   0.8551     72.978   1.2796    0.8359     2182.7

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        879.93   1.133   0.9079   2595.833    0.0415      0.8607    1.0235    0.9980    0.9905
```

LPC	78.89	1.585	0.8407	0.692	180.0000	1.0041	0.9525	0.9437	0.0003
HPC	50.09	5.988	0.8293	8754.362	11.0423	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.102	0.8769	1.325	4.1025	12.6513	0.9790	1.0000	0.0003
LPT	0.84	2.488	0.8614	0.822	2.4879	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2563.08	6226.1

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.3045	851.64
FanDuct	0.0000	0.5544	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5602	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9189.5	2098.7	3671.9
LP_Shaft	2473.6	4634.5	2182.7

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.8998	766.96	184.03	9.738
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2861	766.96	184.03	3.293
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.55	178.59	14.341
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	882.81	212.32	28.296
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.55	178.59	14.341
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	988.56	238.42	41.554
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.55	178.59	14.341

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7918	988.56	238.42	40.597
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.4429	988.56	238.42	22.945
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.56	238.42	41.554
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.56	238.42	41.554
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.56	238.42	41.554
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1742.70	0.9995	0.0230	0.20103	0.01115

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.154	0.9800	1.0000	0.9800	603.19	0.460	645.2	494.3
Byp_Nozz	1.704	0.9800	1.0000	0.9800	2002.63	0.905	884.2	6424.1

```
**********************************************************************************************************************************
Date:02/22/11    Time:15:02:04    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  3/ 16/ 1/ 1    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 462.62    Stator 1 exit: 470.68    Stator 2 inlet: 480.98    Stator 2 exit: 486.57
            Stator 3 inlet: 496.34    Stator 3 exit: 501.46    Stator 4 inlet: 502.26    Stator 4 exit: 506.83
            Stator 5 inlet: 522.15    Stator 5 exit: 525.49               Stage4   Percent Blockage: 0.35

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.730   38334.0    22.00    252.11      700.6    0.9985     699.54    9.6059    726.09    9.514      7006.3      10.0   1721.3
1626.6   1131.3


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht       FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          252.11     4.218    455.81    109.10    0.0000    823.39     2.947    411.97    2589.8   0.7300    1.39992
FS1   Inlet.Fl_O            252.11     4.218    455.81    109.10    0.0000    823.39     3.856    444.28    4162.5   0.3603    1.39992
FS12  Splitter.Fl_02        228.34     4.216    455.81    109.10    0.0000    746.13     3.795    442.33    3526.9   0.3905    1.39992
FS2   Splitter.Fl_01         23.77     4.216    455.81    109.10    0.0000     77.67     4.087    451.79     637.7   0.2110    1.39992
FS14  Fan.Fl_O              228.34     4.772    474.07    113.48    0.0000    672.25     4.005    450.90    2600.0   0.5068    1.40030
FS25  LPC.Fl_O               23.77     6.442    530.66    127.06    0.0000     54.85     6.206    525.03     412.5   0.2315    1.39976
FS3   HPC.Fl_O               22.62    40.132    969.04    233.58    0.0000     11.32    35.375    935.72      49.7   0.4308    1.38285
FS36  Bleed3.Fl_O            17.53    40.132    969.04    233.58    0.0000      8.77    37.400    950.29      49.3   0.3209    1.38285
FS4   Burner.Fl_O            17.72    39.208   1721.31    433.93    0.0111     12.10    37.030   1696.96      74.8   0.2940    1.33148
FS45  HPT.Fl_O               23.69     9.507   1135.57    277.21    0.0083     54.18     8.625   1106.22     264.7   0.3799    1.36671
FS49  LPT.Fl_O               23.97     3.347    894.88    216.55    0.0082    138.22     3.160    880.77     851.6   0.2895    1.38188
FS5   TEGV.Fl_O              23.97     3.347    894.88    216.55    0.0082    138.22     3.160    880.77     851.6   0.2895    1.38188
FS8   Core_Nozz.Fl_O         23.97     3.347    894.88    216.55    0.0082    138.22     2.947    863.76     603.2   0.4339    1.38188
FS17  FanDuctLkg.Fl_O       228.34     4.772    474.07    113.48    0.0000    672.25     4.005    450.90    2600.0   0.5068    1.40030
FS171 Bleed15.Fl_O          228.34     4.772    474.07    113.48    0.0000    672.25     3.901    447.53    2475.2   0.5445    1.40030
FS172 FanDuct.Fl_O          228.34     4.772    474.07    113.48    0.0000    672.25     3.901    447.53    2475.2   0.5445    1.40030
FS173 Byp_Nozz.Fl_O         228.34     4.772    474.07    113.48    0.0000    672.25     2.947    413.46    2002.6   0.8566    1.40030

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR       eff         Nc        TR    efPoly        pwr      SMN      SMW
Fan         746.13   1.132    0.9063   2573.659    1.0401    0.9087    -1414.9  ---.--    54.44
LPC          77.67   1.528    0.7949   2573.659    1.1642    0.8033     -603.9     7.69     2.61
HPC          54.85   6.230    0.8209   8987.361    1.8261    0.8593    -3495.8    59.62    56.42
HPT          12.10   4.124    0.8762    219.112    1.3629    0.8542     3495.8
LPT          54.18   2.841    0.8505     71.596    1.2666    0.8316     2018.9

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         866.92   1.129   0.9082   2549.113    0.0416      0.8607    1.0235    0.9980    0.9905
```

LPC	75.47	1.562	0.8323	0.680	180.0000	1.0292	0.9401	0.9550	0.0003
HPC	49.89	5.983	0.8294	8747.557	11.0735	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.058	0.8762	1.319	4.0583	12.6513	0.9790	1.0000	0.0003
LPT	0.83	2.399	0.8568	0.807	2.3991	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2589.83	5689.6

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2895	851.64
FanDuct	0.0000	0.5445	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.6059	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9090.7	2019.7	3495.8
LP_Shaft	2412.7	4394.8	2018.9

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.8748	751.67	180.32	9.507
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2781	751.67	180.32	3.347
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	729.70	175.00	13.854
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	865.28	208.02	27.330
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	729.70	175.00	13.854
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	969.04	233.58	40.132
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	729.70	175.00	13.854

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7142	969.04	233.58	39.208
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.3750	969.04	233.58	22.219
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	969.04	233.58	40.132
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	969.04	233.58	40.132
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	969.04	233.58	40.132
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1721.31	0.9995	0.0230	0.19432	0.01109

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.136	0.9800	1.0000	0.9800	603.19	0.434	609.0	453.7
Byp_Nozz	1.619	0.9800	1.0000	0.9800	2002.63	0.857	836.5	5936.5

```
**********************************************************************************************************************************
Date:02/22/11    Time:15:03:44    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 460.59    Stator 1 exit: 468.50    Stator 2 inlet: 478.62    Stator 2 exit: 484.10
            Stator 3 inlet: 493.69    Stator 3 exit: 498.71    Stator 4 inlet: 499.44    Stator 4 exit: 503.92
            Stator 5 inlet: 519.01    Stator 5 exit: 522.27               Stage4   Percent Blockage: 0.35

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.714   37357.0    22.00    259.44      730.1    0.9834     717.95    9.6100    710.17    9.455      7300.9      10.0   1714.4
1619.8   1127.0


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht       FAR        Wc        Ps        Ts      Aphy       MN      gamt
FS0   Ambient.Fl_O          259.44     4.357    453.91    108.65    0.0000    818.66     3.088    411.97    2599.8   0.7140   1.39988
FS1   Inlet.Fl_O            259.44     4.357    453.91    108.65    0.0000    818.66     3.988    442.58    4162.5   0.3579   1.39988
FS12  Splitter.Fl_02        234.99     4.355    453.91    108.65    0.0000    741.87     3.926    440.66    3526.9   0.3878   1.39988
FS2   Splitter.Fl_01         24.45     4.355    453.91    108.65    0.0000     77.20     4.223    449.96     637.7   0.2096   1.39988
FS14  Fan.Fl_O              234.99     4.923    471.87    112.96    0.0000    669.08     4.140    449.10    2600.0   0.5035   1.40026
FS25  LPC.Fl_O               24.45     6.617    527.45    126.29    0.0000     54.77     6.375    521.88     412.5   0.2312   1.39976
FS3   HPC.Fl_O               23.27    41.195    963.07    232.10    0.0000     11.31    36.323    930.01      49.7   0.4302   1.38317
FS36  Bleed3.Fl_O            18.03    41.195    963.07    232.10    0.0000      8.77    38.396    944.46      49.3   0.3205   1.38317
FS4   Burner.Fl_O            18.23    40.246   1714.41    432.01    0.0111     12.10    38.010   1690.13      74.8   0.2940   1.33182
FS45  HPT.Fl_O               24.37     9.791   1131.28    276.11    0.0083     54.01     8.889   1102.24     264.7   0.3784   1.36700
FS49  LPT.Fl_O               24.65     3.492    894.35    216.41    0.0082    136.23     3.303    880.70     851.6   0.2848   1.38192
FS5   TEGV.Fl_O              24.65     3.492    894.35    216.41    0.0082    136.23     3.303    880.70     851.6   0.2848   1.38192
FS8   Core_Nozz.Fl_O         24.65     3.492    894.35    216.41    0.0082    136.23     3.089    864.34     603.2   0.4260   1.38192
FS17  FanDuctLkg.Fl_O       234.99     4.923    471.87    112.96    0.0000    669.08     4.140    449.10    2600.0   0.5035   1.40026
FS171 Bleed15.Fl_O          234.99     4.923    471.87    112.96    0.0000    669.08     4.035    445.81    2475.2   0.5407   1.40026
FS172 FanDuct.Fl_O          234.99     4.923    471.87    112.96    0.0000    669.08     4.035    445.81    2475.2   0.5407   1.40026
FS173 Byp_Nozz.Fl_O         234.99     4.923    471.87    112.96    0.0000    669.08     3.088    413.45    2002.6   0.8410   1.40026

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       741.87   1.131   0.9065   2556.568   1.0396    0.9088    -1432.5  ---.--   54.25
LPC        77.20   1.520   0.7951   2556.568   1.1620    0.8031     -610.3    7.70    2.49
HPC        54.77   6.226   0.8209   8984.751   1.8259    0.8594    -3572.0   59.51   56.30
HPT        12.10   4.110   0.8759    218.824   1.3621    0.8540     3572.0
LPT        54.01   2.804   0.8490     71.107   1.2625    0.8302     2042.9

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        861.97   1.128   0.9083   2532.186    0.0416      0.8607    1.0235    0.9980    0.9905
```

LPC	74.23	1.553	0.8293	0.675	180.0000	1.0400	0.9390	0.9588	0.0003
HPC	49.81	5.980	0.8294	8745.017	11.0814	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.045	0.8759	1.317	4.0450	12.6513	0.9790	1.0000	0.0003
LPT	0.83	2.371	0.8553	0.801	2.3712	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2599.79	5726.5

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2848	851.64
FanDuct	0.0000	0.5407	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.6100	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9060.5	2070.6	3572.0
LP_Shaft	2391.6	4486.2	2042.9

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.8998	747.03	179.20	9.791
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2861	747.03	179.20	3.492
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.20	173.91	14.224
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	859.94	206.71	28.055
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.20	173.91	14.224
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	963.07	232.10	41.195
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.20	173.91	14.224

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7920	963.07	232.10	40.246
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.4430	963.07	232.10	22.826
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	963.07	232.10	41.195
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	963.07	232.10	41.195
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	963.07	232.10	41.195
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1714.41	0.9995	0.0230	0.19943	0.01106

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.131	0.9800	1.0000	0.9800	603.19	0.426	598.2	458.3
Byp_Nozz	1.594	0.9800	1.0000	0.9800	2002.63	0.841	821.3	5998.3

```
**********************************************************************************************************************************
Date:02/22/11    Time:15:05:24    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  4/ 17/ 1/ 2    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 462.22    Stator 1 exit: 469.82    Stator 2 inlet: 479.53    Stator 2 exit: 484.77
            Stator 3 inlet: 493.97    Stator 3 exit: 498.75    Stator 4 inlet: 499.29    Stator 4 exit: 503.53
            Stator 5 inlet: 518.17    Stator 5 exit: 521.25               Stage4   Percent Blockage: 0.35

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.669   34281.0    22.00    282.84      832.2    0.9474     788.42    9.6220    670.64    9.266      8322.3      10.0   1717.9
1622.6   1130.8


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht       FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          282.84     4.846    455.82    109.11    0.0000    804.15     3.578    418.42    2631.3   0.6690    1.39992
FS1   Inlet.Fl_O            282.84     4.846    455.82    109.11    0.0000    804.15     4.451    444.90    4162.5   0.3505    1.39992
FS12  Splitter.Fl_02        256.21     4.843    455.82    109.11    0.0000    728.81     4.385    443.06    3526.9   0.3796    1.39992
FS2   Splitter.Fl_01         26.63     4.843    455.82    109.11    0.0000     75.74     4.703    452.01     637.7   0.2055    1.39992
FS14  Fan.Fl_O              256.21     5.452    473.25    113.29    0.0000    659.68     4.616    451.25    2600.0   0.4936    1.40029
FS25  LPC.Fl_O               26.63     7.232    526.36    126.03    0.0000     54.51     6.970    520.86     412.5   0.2300    1.39976
FS3   HPC.Fl_O               25.34    44.899    960.38    231.44    0.0000     11.28    39.618    927.59      49.7   0.4289    1.38332
FS36  Bleed3.Fl_O            19.64    44.899    960.38    231.44    0.0000      8.75    41.864    941.92      49.3   0.3196    1.38332
FS4   Burner.Fl_O            19.85    43.865   1717.92    433.03    0.0112     12.11    41.426   1693.60      74.8   0.2941    1.33159
FS45  HPT.Fl_O               26.53    10.778   1135.15    277.11    0.0083     53.53     9.804   1106.62     264.7   0.3745    1.36671
FS49  LPT.Fl_O               26.85     3.996    905.94    219.31    0.0082    130.48     3.799    893.37     851.6   0.2717    1.38104
FS5   TEGV.Fl_O              26.85     3.996    905.94    219.31    0.0082    130.48     3.799    893.37     851.6   0.2717    1.38104
FS8   Core_Nozz.Fl_O         26.85     3.996    905.94    219.31    0.0082    130.48     3.578    878.58     603.2   0.4038    1.38104
FS17  FanDuctLkg.Fl_O       256.21     5.452    473.25    113.29    0.0000    659.68     4.616    451.25    2600.0   0.4936    1.40029
FS171 Bleed15.Fl_O          256.21     5.452    473.25    113.29    0.0000    659.68     4.504    448.12    2475.2   0.5295    1.40029
FS172 FanDuct.Fl_O          256.21     5.452    473.25    113.29    0.0000    659.68     4.504    448.12    2475.2   0.5295    1.40029
FS173 Byp_Nozz.Fl_O         256.21     5.452    473.25    113.29    0.0000    659.68     3.578    419.87    2002.6   0.7976    1.40029

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR       eff         Nc        TR    efPoly        pwr      SMN      SMW
Fan         728.81   1.126    0.9067   2502.692    1.0382    0.9089    -1514.9  ---.--    53.74
LPC          75.74   1.493    0.7962   2502.692    1.1548    0.8036     -637.5     7.76     2.32
HPC          54.51   6.209    0.8207   8976.663    1.8246    0.8592    -3874.9    59.31    56.08
HPT          12.11   4.070    0.8763    218.178    1.3591    0.8546     3874.9
LPT          53.53   2.697    0.8463     69.636    1.2504    0.8280     2152.4

TURBOMACHINERY MAP DATA
             WcMap   PRmap    effMap      NcMap     R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         846.79   1.123    0.9085   2478.823     0.0417      0.8607    1.0235    0.9980    0.9905
```

LPC	70.31	1.527	0.8197	0.661	180.0000	1.0773	0.9361	0.9713	0.0003
HPC	49.58	5.963	0.8292	8737.145	11.0973	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.006	0.8763	1.313	4.0055	12.6513	0.9790	1.0000	0.0003
LPT	0.82	2.290	0.8526	0.785	2.2900	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2631.28	5895.5

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2717	851.64
FanDuct	0.0000	0.5295	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.6220	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9043.0	2250.5	3874.9
LP_Shaft	2346.2	4818.4	2152.4

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.9799	745.12	178.73	10.778
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3115	745.12	178.73	3.996
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.38	173.46	15.519
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	857.62	206.14	30.586
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.38	173.46	15.519
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	960.38	231.44	44.899
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.38	173.46	15.519

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.0403	960.38	231.44	43.865
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.6604	960.38	231.44	24.939
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	960.38	231.44	44.899
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	960.38	231.44	44.899
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	960.38	231.44	44.899
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	473.25	113.29	5.452
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	473.25	113.29	5.452
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	473.25	113.29	5.452
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	473.25	113.29	5.452
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	473.25	113.29	5.452

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1717.92	0.9995	0.0230	0.21901	0.01115

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.117	0.9800	1.0000	0.9800	603.19	0.404	571.5	476.9
Byp_Nozz	1.524	0.9800	1.0000	0.9800	2002.63	0.798	784.9	6250.8

```
**********************************************************************************************************************************
Date:02/22/11    Time:15:07:13    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 471.61    Stator 1 exit: 478.79    Stator 2 inlet: 487.99    Stator 2 exit: 492.90
            Stator 3 inlet: 501.61    Stator 3 exit: 506.06    Stator 4 inlet: 514.11    Stator 4 exit: 517.89
            Stator 5 inlet: 524.61    Stator 5 exit: 527.91            Unblocked   Percent Blockage: 0.35

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.608   30029.0    22.00    314.03      995.1    0.9037     899.22    9.5609    620.50    9.019      9951.0      10.0   1742.1
1645.1   1149.0


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           314.03     5.599    465.62    111.46   0.0000    780.92     4.358    433.58    2686.1   0.6080    1.40012
FS1   Inlet.Fl_O             314.03     5.599    465.62    111.46   0.0000    780.92     5.172    455.17    4162.5   0.3387    1.40012
FS12  Splitter.Fl_02         284.30     5.597    465.62    111.46   0.0000    707.33     5.101    453.45    3526.9   0.3662    1.40012
FS2   Splitter.Fl_01          29.74     5.597    465.62    111.46   0.0000     73.98     5.442    461.91     637.7   0.2004    1.40012
FS14  Fan.Fl_O               284.30     6.259    482.58    115.52   0.0000    643.85     5.355    461.53    2600.0   0.4774    1.40048
FS25  LPC.Fl_O                29.74     8.179    532.86    127.59   0.0000     54.16     7.887    527.36     412.5   0.2284    1.39975
FS3   HPC.Fl_O                28.29    50.502    970.71    234.00   0.0000     11.26    44.587    937.75      49.7   0.4280    1.38276
FS36  Bleed3.Fl_O             21.93    50.502    970.71    234.00   0.0000      8.73    47.101    952.14      49.3   0.3190    1.38276
FS4   Burner.Fl_O             22.18    49.339   1742.08    439.81   0.0114     12.11    46.596   1717.48      74.8   0.2943    1.33030
FS45  HPT.Fl_O                29.64    12.253   1153.52    281.86   0.0085     53.01    11.170   1125.25     264.7   0.3704    1.36543
FS49  LPT.Fl_O                29.99     4.803    933.21    226.13   0.0084    123.08     4.593    921.82     851.6   0.2552    1.37919
FS5   TEGV.Fl_O               29.99     4.803    933.21    226.13   0.0084    123.08     4.593    921.82     851.6   0.2552    1.37919
FS8   Core_Nozz.Fl_O          29.99     4.803    933.21    226.13   0.0084    123.08     4.358    908.70     603.2   0.3769    1.37919
FS17  FanDuctLkg.Fl_O        284.30     6.259    482.58    115.52   0.0000    643.85     5.355    461.53    2600.0   0.4774    1.40048
FS171 Bleed15.Fl_O           284.30     6.259    482.58    115.52   0.0000    643.85     5.237    458.60    2475.2   0.5112    1.40048
FS172 FanDuct.Fl_O           284.30     6.259    482.58    115.52   0.0000    643.85     5.237    458.60    2475.2   0.5112    1.40048
FS173 Byp_Nozz.Fl_O          284.30     6.259    482.58    115.52   0.0000    643.85     4.358    435.01    2002.6   0.7395    1.40048

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       707.33   1.118   0.9068   2417.235   1.0364    0.9090    -1636.1  ---.--   52.80
LPC        73.98   1.461   0.8034   2417.235   1.1444    0.8103     -678.7    7.89    2.03
HPC        54.16   6.175   0.8202   8965.211   1.8217    0.8586    -4368.2   59.28   56.02
HPT        12.11   4.027   0.8777    217.715   1.3556    0.8565     4368.2
LPT        53.01   2.551   0.8434     67.433   1.2334    0.8253     2314.8

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        821.83   1.116   0.9086   2394.181    0.0420      0.8607    1.0235    0.9980    0.9905
```

LPC	64.10	1.485	0.8046	0.638	180.0000	1.1541	0.9513	0.9985	0.0003
HPC	49.25	5.931	0.8286	8725.999	11.1033	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.963	0.8777	1.311	3.9629	12.6513	0.9790	1.0000	0.0003
LPT	0.82	2.179	0.8497	0.760	2.1793	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2686.13	6056.4

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2552	851.64
FanDuct	0.0000	0.5112	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5609	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9087.0	2524.7	4368.2
LP_Shaft	2290.3	5308.4	2314.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.0943	753.61	180.79	12.253
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3479	753.61	180.79	4.803
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	867.08	208.46	34.419
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.3952	970.71	234.00	49.339
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.9709	970.71	234.00	28.126
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1742.08	0.9995	0.0230	0.24978	0.01139

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.102	0.9800	1.0000	0.9800	603.19	0.377	542.0	505.2
Byp_Nozz	1.436	0.9800	1.0000	0.9800	2002.63	0.739	740.8	6546.3

```
****************************************************************************************************************************************
Date:02/22/11    Time:15:08:53    Model:                                P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 482.11    Stator 1 exit: 488.90    Stator 2 inlet: 497.60    Stator 2 exit: 502.19
            Stator 3 inlet: 502.16    Stator 3 exit: 506.32    Stator 4 inlet: 521.89    Stator 4 exit: 524.91
            Stator 5 inlet: 531.24    Stator 5 exit: 534.28               Stage3   Percent Blockage: 0.35

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.552   25666.0    22.00    348.85     1194.7    0.8602    1027.68    9.4911    573.44    8.743     11946.9       10.0   1767.1
1668.4   1167.5


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           348.85     6.507    476.52    114.07   0.0000    755.17     5.297    449.14    2752.1   0.5520    1.40035
FS1   Inlet.Fl_O             348.85     6.507    476.52    114.07   0.0000    755.17     6.046    466.60    4162.5   0.3259    1.40035
FS12  Splitter.Fl_02         315.60     6.504    476.52    114.07   0.0000    683.53     5.971    465.00    3526.9   0.3517    1.40035
FS2   Splitter.Fl_01          33.25     6.504    476.52    114.07   0.0000     72.02     6.334    472.92     637.7   0.1948    1.40035
FS14  Fan.Fl_O               315.60     7.232    493.16    118.06   0.0000    625.38     6.258    473.18    2600.0   0.4592    1.40071
FS25  LPC.Fl_O                33.25     9.229    538.94    129.05   0.0000     53.97     8.902    533.42     412.5   0.2276    1.39974
FS3   HPC.Fl_O                31.64    56.891    981.16    236.59   0.0000     11.24    50.258    948.04      49.7   0.4270    1.38219
FS36  Bleed3.Fl_O             24.52    56.891    981.16    236.59   0.0000      8.71    53.076    962.49      49.3   0.3184    1.38219
FS4   Burner.Fl_O             24.81    55.581   1767.06    446.84   0.0116     12.11    52.490   1742.18      74.8   0.2944    1.32898
FS45  HPT.Fl_O                33.15    13.933   1172.11    286.68   0.0087     52.56    12.725   1144.02     264.7   0.3668    1.36415
FS49  LPT.Fl_O                33.54     5.766    960.91    233.08   0.0086    116.34     5.542    950.54     851.6   0.2403    1.37749
FS5   TEGV.Fl_O               33.54     5.766    960.91    233.08   0.0086    116.34     5.542    950.54     851.6   0.2403    1.37749
FS8   Core_Nozz.Fl_O          33.54     5.766    960.91    233.08   0.0086    116.34     5.297    938.82     603.2   0.3528    1.37749
FS17  FanDuctLkg.Fl_O        315.60     7.232    493.16    118.06   0.0000    625.38     6.258    473.18    2600.0   0.4592    1.40071
FS171 Bleed15.Fl_O           315.60     7.232    493.16    118.06   0.0000    625.38     6.134    470.48    2475.2   0.4907    1.40071
FS172 FanDuct.Fl_O           315.60     7.232    493.16    118.06   0.0000    625.38     6.134    470.48    2475.2   0.4907    1.40071
FS173 Byp_Nozz.Fl_O          315.60     7.232    493.16    118.06   0.0000    625.38     5.297    450.56    2002.6   0.6873    1.40071

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       683.53   1.112   0.9066   2330.075   1.0349    0.9089    -1781.4  ---.--   51.54
LPC        72.02   1.419   0.8102   2330.075   1.1310    0.8169     -704.7    8.09    1.72
HPC        53.97   6.164   0.8200   8959.534   1.8205    0.8583    -4936.7   59.08   55.81
HPT        12.11   3.989   0.8792    217.263   1.3525    0.8586     4936.7
LPT        52.56   2.416   0.8398     65.235   1.2169    0.8225     2486.1

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        794.18   1.109   0.9085   2307.852    0.0424      0.8607    1.0235    0.9980    0.9905
```

LPC	57.77	1.442	0.7891	0.615	180.0000	1.2467	0.9472	1.0267	0.0003
HPC	49.09	5.921	0.8285	8720.473	11.1177	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.926	0.8792	1.308	3.9262	12.6513	0.9790	1.0000	0.0003
LPT	0.81	2.077	0.8460	0.735	2.0767	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2752.08	6217.6

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2403	851.64
FanDuct	0.0000	0.4907	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.4911	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9133.0	2839.0	4936.7
LP_Shaft	2233.4	5846.4	2486.1

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.2237	761.96	182.82	13.933
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3891	761.96	182.82	5.766
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	739.79	177.44	19.715
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	876.54	210.78	38.779
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	739.79	177.44	19.715
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	981.16	236.59	56.891
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	739.79	177.44	19.715

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.7967	981.16	236.59	55.581
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	3.3222	981.16	236.59	31.759
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	981.16	236.59	56.891
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	981.16	236.59	56.891
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	981.16	236.59	56.891
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1767.06	0.9995	0.0230	0.28547	0.01164

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.089	0.9800	1.0000	0.9800	603.19	0.353	515.4	537.2
Byp_Nozz	1.365	0.9800	1.0000	0.9800	2002.63	0.687	700.9	6875.0

```
**********************************************************************************************************************************
Date:02/22/11    Time:15:10:47    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  7/ 33/ 2/ 4    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 496.93    Stator 1 exit: 503.32    Stator 2 inlet: 503.83    Stator 2 exit: 508.06
            Stator 3 inlet: 523.32    Stator 3 exit: 526.68    Stator 4 inlet: 533.85    Stator 4 exit: 537.07
            Stator 5 inlet: 543.03    Stator 5 exit: 545.82               Stage2   Percent Blockage: 0.35

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.490   20047.0    22.00    399.44     1508.8    0.8126    1226.15    9.3278    520.34    8.444     15087.8      10.0   1800.3
1699.7   1192.9


                                        FLOW STATION DATA
                                  W         Pt         Tt         ht      FAR        Wc         Ps         Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           399.44      7.913     491.73     117.72   0.0000    722.34      6.740     469.18    2850.9   0.4900    1.40068
FS1   Inlet.Fl_O             399.44      7.913     491.73     117.72   0.0000    722.34      7.403     482.46    4162.5   0.3098    1.40068
FS12  Splitter.Fl_02         360.77      7.909     491.73     117.72   0.0000    652.72      7.323     481.03    3526.9   0.3334    1.40068
FS2   Splitter.Fl_01          38.68      7.909     491.73     117.72   0.0000     69.98      7.714     488.24     637.7   0.1890    1.40068
FS14  Fan.Fl_O               360.77      8.767     508.19     121.66   0.0000    598.59      7.704     489.74    2600.0   0.4337    1.40000
FS25  LPC.Fl_O                38.68     10.955     549.78     131.65   0.0000     53.42     10.575     544.27     412.5   0.2251    1.39972
FS3   HPC.Fl_O                36.80     66.817     997.60     240.67   0.0000     11.23     59.051     964.09      49.7   0.4264    1.38129
FS36  Bleed3.Fl_O             28.52     66.817     997.60     240.67   0.0000      8.70     62.350     978.71      49.3   0.3180    1.38129
FS4   Burner.Fl_O             28.86     65.278    1800.34     456.23   0.0119     12.11     61.648    1775.09      74.8   0.2946    1.32725
FS45  HPT.Fl_O                38.56     16.565    1197.59     293.30   0.0089     51.99     15.162    1169.68     264.7   0.3624    1.36242
FS49  LPT.Fl_O                39.02      7.254     995.33     241.76   0.0088    109.50      7.006     985.92     851.6   0.2254    1.37539
FS5   TEGV.Fl_O               39.02      7.254     995.33     241.76   0.0088    109.50      7.006     985.92     851.6   0.2254    1.37539
FS8   Core_Nozz.Fl_O          39.02      7.254     995.33     241.76   0.0088    109.50      6.740     975.48     603.1   0.3291    1.37539
FS17  FanDuctLkg.Fl_O         360.77      8.767     508.19     121.66   0.0000    598.59      7.704     489.74    2600.0   0.4337    1.40000
FS171 Bleed15.Fl_O            360.77      8.767     508.19     121.66   0.0000    598.59      7.571     487.32    2475.2   0.4624    1.40000
FS172 FanDuct.Fl_O            360.77      8.767     508.19     121.66   0.0000    598.59      7.571     487.32    2475.2   0.4624    1.40000
FS173 Byp_Nozz.Fl_O           360.77      8.767     508.19     121.66   0.0000    598.59      6.740     470.67    2002.6   0.6310    1.40000

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR       eff          Nc       TR    efPoly        pwr     SMN      SMW
Fan         652.72   1.109    0.9089    2235.139   1.0335    0.9079    -2014.0  ---.--    49.21
LPC          69.98   1.385    0.8246    2235.139   1.1180    0.8321     -762.4    8.44     1.36
HPC          53.42   6.099    0.8189    8941.237   1.8145    0.8575    -5821.0   59.35    56.02
HPT          12.11   3.941    0.8807     216.955   1.3483    0.8606     5821.0
LPT          51.99   2.284    0.8361      62.888   1.2002    0.8205     2776.4

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         758.39   1.106   0.9108   2213.822    0.0433      0.8607    1.0235    0.9980    0.9905
```

LPC	50.87	1.396	0.7723	0.590	180.0000	1.3755	0.9730	1.0678	0.0003
HPC	48.58	5.859	0.8274	8702.664	11.1076	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.879	0.8808	1.306	3.8789	12.6513	0.9790	1.0000	0.0003
LPT	0.80	1.976	0.8423	0.709	1.9757	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2850.91	6460.0

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2254	851.64
FanDuct	0.0000	0.4624	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.3278	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9205.5	3321.1	5821.0
LP_Shaft	2176.3	6700.3	2776.4

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.4233	775.72	186.16	16.565
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.4525	775.72	186.16	7.254
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.27	180.71	23.245
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	891.73	214.51	45.589
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.27	180.71	23.245
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	997.60	240.67	66.817
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.27	180.71	23.245

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	4.4161	997.60	240.67	65.278
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	3.8642	997.60	240.67	37.414
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	997.60	240.67	66.817
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	997.60	240.67	66.817
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	997.60	240.67	66.817
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	508.19	121.66	8.767
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	508.19	121.66	8.767
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	508.19	121.66	8.767
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	508.19	121.66	8.767
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	508.19	121.66	8.767

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1800.34	0.9995	0.0230	0.34060	0.01194

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.076	0.9800	1.0000	0.9800	603.19	0.329	489.7	593.9
Byp_Nozz	1.301	0.9800	1.0000	0.9800	2002.63	0.631	657.7	7375.0

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**********************************************************************************************************************************
Date:02/22/11    Time:15:12:54    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  9/ 35/ 2/ 6    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 503.43    Stator 1 exit: 509.58    Stator 2 inlet: 523.54    Stator 2 exit: 527.19
            Stator 3 inlet: 534.49    Stator 3 exit: 538.11    Stator 4 inlet: 544.86    Stator 4 exit: 547.89
            Stator 5 inlet: 553.49    Stator 5 exit: 556.10               Stage1   Percent Blockage: 0.35

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.446   15435.0    22.00    442.59     1740.6    0.7936    1381.25    9.2981    481.90    8.016     17405.9      10.0   1818.2
1716.4   1210.1


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht     FAR        Wc        Ps        Ts     Aphy      MN      gamt
FS0   Ambient.Fl_O          442.59     9.311    504.97    120.89  0.0000    689.28     8.149    485.63   2919.9  0.4460   1.40036
FS1   Inlet.Fl_O            442.59     9.311    504.97    120.89  0.0000    689.28     8.769    496.39   4162.5  0.2939   1.40036
FS12  Splitter.Fl_02        399.61     9.306    504.97    120.89  0.0000    622.66     8.684    495.08   3526.9  0.3159   1.40036
FS2   Splitter.Fl_01         42.98     9.306    504.97    120.89  0.0000     66.97     9.097    501.70    637.7  0.1806   1.40036
FS14  Fan.Fl_O              399.61    10.282    520.79    124.69  0.0000    572.34     9.159    503.86   2600.0  0.4099   1.39977
FS25  LPC.Fl_O               42.98    12.642    559.46    133.97  0.0000     51.89    12.229    554.18    412.5  0.2183   1.39970
FS3   HPC.Fl_O               40.89    74.637   1006.25    242.82  0.0000     11.22    65.979    972.56     49.7  0.4260   1.38061
FS36  Bleed3.Fl_O            31.69    74.637   1006.25    242.82  0.0000      8.69    69.657    987.26     49.3  0.3177   1.38061
FS4   Burner.Fl_O            32.08    72.918   1818.20    461.29  0.0121     12.10    68.864   1792.75     74.8  0.2947   1.32655
FS45  HPT.Fl_O               42.86    18.864   1214.95    297.81  0.0090     51.10    17.326   1187.80    264.7  0.3553   1.36115
FS49  LPT.Fl_O               43.36     8.692   1022.29    248.58  0.0089    102.93     8.430   1013.84    851.6  0.2113   1.37341
FS5   TEGV.Fl_O              43.36     8.692   1022.29    248.58  0.0089    102.93     8.430   1013.84    851.6  0.2113   1.37341
FS8   Core_Nozz.Fl_O         43.36     8.692   1022.29    248.58  0.0089    102.93     8.149   1004.58    603.2  0.3071   1.37341
FS17  FanDuctLkg.Fl_O       399.61    10.282    520.79    124.69  0.0000    572.34     9.159    503.86   2600.0  0.4099   1.39977
FS171 Bleed15.Fl_O          399.61    10.282    520.79    124.69  0.0000    572.34     9.023    501.71   2475.2  0.4361   1.39977
FS172 FanDuct.Fl_O          399.61    10.282    520.79    124.69  0.0000    572.34     9.023    501.71   2475.2  0.4361   1.39977
FS173 Byp_Nozz.Fl_O         399.61    10.282    520.79    124.69  0.0000    572.34     8.149    487.09   2002.6  0.5880   1.39977

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan         622.66   1.105   0.9099   2144.863   1.0313    0.9114    -2147.5  ---.--   46.98
LPC          66.97   1.358   0.8389   2144.863   1.1079    0.8469     -795.5    8.94    0.99
HPC          51.89   5.904   0.8155   8890.493   1.7986    0.8541    -6458.2   60.55   57.02
HPT          12.10   3.865   0.8811    216.543   1.3420    0.8612     6458.2
LPT          51.10   2.170   0.8322     60.717   1.1853    0.8169     2942.9

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         723.46   1.102   0.9118   2124.407    0.0442      0.8607    1.0235    0.9980    0.9905
```

LPC	44.31	1.352	0.7562	0.567	180.0000	1.5113	1.0192	1.1093	0.0003
HPC	47.19	5.673	0.8239	8653.274	11.0522	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.805	0.8811	1.304	3.8052	12.6513	0.9790	1.0000	0.0003
LPT	0.79	1.890	0.8384	0.684	1.8896	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2919.90	6629.1

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2113	851.64
FanDuct	0.0000	0.4361	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.2981	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9233.5	3673.5	6458.2
LP_Shaft	2116.3	7303.4	2942.9

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.5816	784.92	188.40	18.864
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.5028	784.92	188.40	8.692
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	762.52	182.96	26.281
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	900.65	216.70	51.079
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	762.52	182.96	26.281
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1006.25	242.82	74.637
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	762.52	182.96	26.281

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	4.9072	1006.25	242.82	72.918
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	4.2939	1006.25	242.82	41.999
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1006.25	242.82	74.637
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1006.25	242.82	74.637
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1006.25	242.82	74.637
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1818.20	0.9995	0.0230	0.38368	0.01211

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.067	0.9800	1.0000	0.9800	603.19	0.307	463.5	624.6
Byp_Nozz	1.262	0.9800	1.0000	0.9800	2002.63	0.588	623.6	7745.1

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**********************************************************************************************************************************
Date:02/22/11    Time:15:14:58    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 12/ 25/ 1/10    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 523.48    Stator 1 exit: 529.04    Stator 2 inlet: 536.15    Stator 2 exit: 539.83
            Stator 3 inlet: 546.53    Stator 3 exit: 549.79    Stator 4 inlet: 555.99    Stator 4 exit: 558.70
            Stator 5 inlet: 563.83    Stator 5 exit: 566.16             Unblocked   Percent Blockage: 0.35

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.406    10735.0    22.00    489.85     2003.2    0.7777    1557.96    9.2910    446.20    7.554     20032.3       10.0   1842.0
1738.8   1230.8


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           489.85    11.019    518.95    124.25   0.0000    653.50     9.822    502.39    2996.0   0.4060    1.39978
FS1   Inlet.Fl_O             489.85    11.019    518.95    124.25   0.0000    653.50    10.446    511.10    4162.5   0.2772    1.39978
FS12  Splitter.Fl_02         442.25    11.013    518.95    124.25   0.0000    590.29    10.357    509.92    3526.9   0.2976    1.39978
FS2   Splitter.Fl_01          47.60    11.013    518.95    124.25   0.0000     63.53    10.791    515.93     637.7   0.1710    1.39978
FS14  Fan.Fl_O               442.25    12.085    534.12    127.89   0.0000    545.75    10.900    518.61    2600.0   0.3868    1.39975
FS25  LPC.Fl_O                47.60    14.441    569.62    136.41   0.0000     50.76    13.990    564.49     412.5   0.2133    1.39968
FS3   HPC.Fl_O                45.29    83.232   1017.61    245.65   0.0000     11.20    73.605    983.68      49.7   0.4255    1.37981
FS36  Bleed3.Fl_O             35.10    83.232   1017.61    245.65   0.0000      8.68    77.695    998.48      49.3   0.3174    1.37981
FS4   Burner.Fl_O             35.53    81.315   1842.02    468.05   0.0123     12.10    76.796   1816.31      74.8   0.2947    1.32540
FS45  HPT.Fl_O                47.48    21.393   1235.67    303.23   0.0092     50.34    19.706   1209.07     264.7   0.3493    1.35973
FS49  LPT.Fl_O                48.03    10.389   1052.82    256.33   0.0091     96.80    10.114   1045.19     851.6   0.1982    1.37143
FS5   TEGV.Fl_O               48.03    10.389   1052.82    256.33   0.0091     96.80    10.114   1045.19     851.6   0.1982    1.37143
FS8   Core_Nozz.Fl_O          48.03    10.389   1052.82    256.33   0.0091     96.80     9.822   1036.94     603.2   0.2870    1.37143
FS17  FanDuctLkg.Fl_O        442.25    12.085    534.12    127.89   0.0000    545.75    10.900    518.61    2600.0   0.3868    1.39975
FS171 Bleed15.Fl_O           442.25    12.085    534.12    127.89   0.0000    545.75    10.760    516.69    2475.2   0.4108    1.39975
FS172 FanDuct.Fl_O           442.25    12.085    534.12    127.89   0.0000    545.75    10.760    516.69    2475.2   0.4108    1.39975
FS173 Byp_Nozz.Fl_O          442.25    12.085    534.12    127.89   0.0000    545.75     9.822    503.75    2002.6   0.5491    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       590.29   1.097   0.9093   2034.264   1.0292    0.9108    -2279.5  ---.--   45.03
LPC        63.53   1.311   0.8186   2034.264   1.0976    0.8270     -819.3    9.96    0.51
HPC        50.76   5.764   0.8128   8853.260   1.7865    0.8515    -7178.3   61.41   57.72
HPT        12.10   3.801   0.8818    216.174   1.3364    0.8624     7178.3
LPT        50.34   2.059   0.8287     57.886   1.1704    0.8140     3098.8

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        685.85   1.095   0.9111   2014.862    0.0450      0.8607    1.0235    0.9980    0.9905
```

LPC	36.28	1.298	0.7366	0.537	180.0000	1.7514	1.0460	1.1113	0.0003
HPC	46.17	5.539	0.8212	8617.034	11.0151	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.742	0.8818	1.301	3.7422	12.6513	0.9790	1.0000	0.0003
LPT	0.77	1.805	0.8348	0.652	1.8052	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2995.97	6793.5

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.1982	851.64
FanDuct	0.0000	0.4108	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.2910	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9277.9	4063.6	7178.3
LP_Shaft	2034.8	7998.3	3098.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.7517	795.75	191.03	21.393
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.5569	795.75	191.03	10.389
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	911.76	219.43	57.091
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	5.4350	1017.61	245.65	81.315
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	4.7557	1017.61	245.65	47.040
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1842.02	0.9995	0.0230	0.43277	0.01233

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.058	0.9800	1.0000	0.9800	603.19	0.287	439.7	656.4
Byp_Nozz	1.230	0.9800	1.0000	0.9800	2002.63	0.549	592.2	8140.3

40% Blockage

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BIG NOTE!!  at 35000 Cruise the LPC STALLS/SURGES at reduced thrust so no output available after 100% thrust
****************************************************************************************************************************
Date:02/22/11    Time:13:38:37    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 34/ 2/ 5    Run by: Philip C Jorgenson      PC:   100
Temperature Stator 1 inlet: 456.56    Stator 1 exit: 475.13    Stator 2 inlet: 502.77    Stator 2 exit: 510.93
            Stator 3 inlet: 537.55    Stator 3 exit: 546.10    Stator 4 inlet: 571.37    Stator 4 exit: 579.42
            Stator 5 inlet: 599.78    Stator 5 exit: 607.62             Unblocked   Percent Blockage: 0.40

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.780   35000.0    22.00    477.01     8371.9    0.5976    5003.20    5.2999    779.49   32.229      8371.8     100.0   2874.1
2696.7   1876.6


                                        FLOW STATION DATA
                                 W        Pt        Tt       ht     FAR       Wc        Ps        Ts     Aphy      MN      gamt
FS0   Ambient.Fl_O          477.01     5.185    466.40   111.64  0.0000  1281.99     3.458    415.85   3926.2  0.7800   1.40014
FS1   Inlet.Fl_O            477.01     5.185    466.40   111.64  0.0000  1281.99     3.822    427.49   4162.5  0.6748   1.40014
FS12  Splitter.Fl_02        401.29     5.183    466.40   111.64  0.0000  1079.03     3.850    428.42   3526.9  0.6660   1.40014
FS2   Splitter.Fl_01         75.72     5.183    466.40   111.64  0.0000   203.59     3.638    421.57    637.7  0.7295   1.40014
FS14  Fan.Fl_O              401.29     8.814    550.80   131.90  0.0000   689.50     7.302    521.98   2600.0  0.5256   1.39972
FS25  LPC.Fl_O               75.72    12.470    626.53   150.09  0.0000    98.07    10.840    601.99    412.5  0.4522   1.39820
FS3   HPC.Fl_O               72.04   167.116   1392.78   341.31  0.0000    10.38   150.851   1355.71     49.7  0.3910   1.35667
FS36  Bleed3.Fl_O            55.83   167.116   1392.78   341.31  0.0000     8.05   157.663   1371.60     49.3  0.2941   1.35667
FS4   Burner.Fl_O            57.22   163.267   2874.15   782.49  0.0249    12.13   154.128   2837.81     74.8  0.3005   1.28295
FS45  HPT.Fl_O               76.22    38.400   1885.85   483.69  0.0186    55.62    34.596   1838.73    264.7  0.4000   1.31936
FS49  LPT.Fl_O               77.11     8.963   1356.88   337.80  0.0184   204.50     7.752   1307.05    851.6  0.4682   1.34611
FS5   TEGV.Fl_O              77.11     8.963   1356.88   337.80  0.0184   204.50     7.752   1307.05    851.6  0.4682   1.34611
FS8   Core_Nozz.Fl_O         77.11     8.963   1356.88   337.80  0.0184   204.50     4.796   1152.89    603.2  1.0000   1.34611
FS17  FanDuctLkg.Fl_O       401.29     8.814    550.80   131.90  0.0000   689.50     7.302    521.98   2600.0  0.5256   1.39972
FS171 Bleed15.Fl_O          401.29     8.814    550.80   131.90  0.0000   689.50     7.092    517.65   2475.2  0.5661   1.39972
FS172 FanDuct.Fl_O          401.29     8.814    550.80   131.90  0.0000   689.50     7.092    517.65   2475.2  0.5661   1.39972
FS173 Byp_Nozz.Fl_O         401.29     8.814    550.80   131.90  0.0000   689.50     4.672    458.99   2002.6  1.0000   1.39972

TURBOMACHINERY PERFORMANCE DATA
               Wc      PR      eff         Nc       TR   efPoly        pwr     SMN     SMW
Fan       1079.03   1.701   0.9114   4139.514   1.1810   0.9171   -11498.7   36.79   23.18
LPC        203.59   2.406   0.8368   4139.514   1.3433   0.8537    -4118.9    3.06    2.59
HPC         98.07  13.401   0.8581  10417.139   2.2230   0.8978   -19988.3   25.13   24.38
HPT         12.13   4.252   0.9120    213.560   1.3438   0.8973    19988.3
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LPT         55.62   4.284   0.9159     90.391   1.3860   0.9002    15617.7

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1253.73   1.685   0.9132   4100.034    0.0638      0.8607    1.0235    0.9980    0.9905
LPC        166.92   2.761   0.8444      1.093  180.0000      1.2197    0.7986    0.9910    0.0003
HPC         89.19  12.817   0.8670  10139.185   13.5840      1.0995    1.0494    0.9898    0.9733
HPT          0.96   4.183   0.9120      1.286    4.1834     12.6513    0.9790    1.0000    0.0003
LPT          0.86   3.497   0.9227      1.019    3.4967     65.0409    0.7602    0.9926    0.0005

===INLETS====    eRam       Afs      Fram
Inlet          1.0000   3926.21   11556.7

====DUCTS====  dPnorm        MN      Aphy
TEGV           0.0000    0.4682    851.64
FanDuct        0.0000    0.5661   2475.22

==SPLITTERS==     BPR    dP/P 1    dP/P 2
Splitter       5.2999    0.0005    0.0005

===SHAFTS====   Nmech    trq in    pwr in
HP_Shaft      11449.2    9169.3   19988.3
LP_Shaft       3925.4   20896.4   15617.7

BLEEDS - interstg  Wb/Win    BldWk     BldP          W         Tt        ht         Pt
HPT_COOLC HPC.C>   0.0368    0.5000    0.2200     2.7864   1017.82    245.70    38.400
LPT_COOLA HPC.C>   0.0117    0.5000    0.4500     0.8859   1017.82    245.70     8.963
WB2X      HPC.B>   0.0000    0.4500    0.2200     0.0000    979.36    236.14    46.492
WB2Y      HPC.B>   0.0000    0.7600    0.6200     0.0000   1214.97    295.42   108.350
WBA2X     HPC.B>   0.0000    0.4500    0.2200     0.0000    979.36    236.14    46.492
WBLKG     HPC.l>   0.0000    1.0000    1.0000     0.0000   1392.78    341.31   167.116
WBW2X     HPC.B>   0.0000    0.4500    0.2200     0.0000    979.36    236.14    46.492

BLEEDS - output    Wb/Win    hscale    Pscale          W         Tt        ht         Pt
HPT_COOLA Bleed>   0.1142    1.0000    1.0000     8.6453   1392.78    341.31   163.267
HPT_COOLB Bleed>   0.0999    1.0000    1.0000     7.5649   1392.78    341.31    91.843
WB3X      Bleed>   0.0000    1.0000    1.0000     0.0000   1392.78    341.31   167.116
WBA3X     Bleed>   0.0000    1.0000    1.0000     0.0000   1392.78    341.31   167.116
WBW3X     Bleed>   0.0000    1.0000    1.0000     0.0000   1392.78    341.31   167.116
WBFDLKG   FanDu>   0.0000    1.0000    1.0000     0.0000    550.80    131.90     8.814
WB15X     Bleed>   0.0000    1.0000    1.0000     0.0000    550.80    131.90     8.814
WB15Y     Bleed>   0.0000    1.0000    1.0000     0.0000    550.80    131.90     8.814
WB17X     Bleed>   0.0000    1.0000    1.0000     0.0000    550.80    131.90     8.814
WB17Y     Bleed>   0.0000    1.0000    1.0000     0.0000    550.80    131.90     8.814

===BURNERS===    TtOut       eff     dPnorm      Wfuel       FAR
Burner         2874.15    0.9995    0.0230    1.38978   0.02489


===NOZZLES===       PR       Cfg      CdTh        Cv        Ath      MNth      Vact        Fg
Core_Nozz        2.592    0.9805    1.0000    0.9800     603.19     1.000    1607.6     4659.7
Byp_Nozz         2.549    0.9823    1.0000    0.9800    2002.63     1.000    1029.2    15268.9
```

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**********************************************************************************************************************************
Date:02/22/11    Time:13:41:19    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 34/ 2/ 5    Run by: Philip C Jorgenson      PC:   100
Temperature Stator 1 inlet: 452.22    Stator 1 exit: 470.61    Stator 2 inlet: 497.98    Stator 2 exit: 506.03
            Stator 3 inlet: 532.41    Stator 3 exit: 540.85    Stator 4 inlet: 565.89    Stator 4 exit: 573.85
            Stator 5 inlet: 594.02    Stator 5 exit: 601.76             Unblocked   Percent Blockage: 0.40

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    395.92      6923.4     0.5938    4111.11    5.2972    775.82   32.257      6923.4     100.0   2850.8
2674.6   1859.9


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O           395.92     4.283    462.03    110.60   0.0000   1282.11     2.854    411.97    3930.2  0.7800    1.40005
FS1   Inlet.Fl_O             395.92     4.283    462.03    110.60   0.0000   1282.11     3.157    423.48    4162.5  0.6750    1.40005
FS12  Splitter.Fl_02         333.05     4.281    462.03    110.60   0.0000   1079.05     3.180    424.41    3526.9  0.6660    1.40005
FS2   Splitter.Fl_01          62.87     4.281    462.03    110.60   0.0000    203.70     3.002    417.52     637.7  0.7305    1.40005
FS14  Fan.Fl_O               333.05     7.280    545.71    130.67   0.0000    689.60     6.031    517.14    2600.0  0.5257    1.39973
FS25  LPC.Fl_O                62.87    10.292    620.49    148.64   0.0000     98.19     8.942    596.10     412.5  0.4529    1.39833
FS3   HPC.Fl_O                59.82   138.165   1380.92    338.22   0.0000     10.38   124.716   1344.10      49.7  0.3909    1.35737
FS36  Bleed3.Fl_O             46.36   138.165   1380.92    338.22   0.0000      8.05   130.349   1359.88      49.3  0.2940    1.35737
FS4   Burner.Fl_O              47.51   134.983   2850.79    774.97   0.0246     12.13   127.427   2814.67      74.8  0.3004    1.28375
FS45  HPT.Fl_O                63.28    31.735   1869.09    478.84   0.0184     55.63    28.591   1822.29     264.7  0.3999    1.32018
FS49  LPT.Fl_O                64.01     7.404   1344.03    334.31   0.0182    204.54     6.404   1294.56     851.6  0.4682    1.34702
FS5   TEGV.Fl_O               64.01     7.404   1344.03    334.31   0.0182    204.54     6.404   1294.56     851.6  0.4682    1.34702
FS8   Core_Nozz.Fl_O          64.01     7.404   1344.03    334.31   0.0182    204.54     3.961   1141.55     603.2  1.0000    1.34702
FS17  FanDuctLkg.Fl_O        333.05     7.280    545.71    130.67   0.0000    689.60     6.031    517.14    2600.0  0.5257    1.39973
FS171 Bleed15.Fl_O           333.05     7.280    545.71    130.67   0.0000    689.60     5.857    512.85    2475.2  0.5662    1.39973
FS172 FanDuct.Fl_O           333.05     7.280    545.71    130.67   0.0000    689.60     5.857    512.85    2475.2  0.5662    1.39973
FS173 Byp_Nozz.Fl_O          333.05     7.280    545.71    130.67   0.0000    689.60     3.860    454.75    2002.6  1.0000    1.39973

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan        1079.05   1.701   0.9114   4139.500   1.1811    0.9169    -9461.0   36.81   23.19
LPC         203.70   2.404   0.8363   4139.500   1.3430    0.8542    -3384.1    3.06    2.59
HPC          98.19  13.424   0.8581  10422.016   2.2255    0.8979   -16455.4   25.06   24.31
HPT          12.13   4.253   0.9119    213.497   1.3446    0.8972    16455.4
LPT          55.63   4.286   0.9157     90.370   1.3868    0.8998    12845.1

TURBOMACHINERY MAP DATA
             WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        1253.75   1.685   0.9132   4100.021    0.0638      0.8607    1.0235    0.9980    0.9905
```

LPC	166.92	2.761	0.8444	1.093	180.0000	1.2204	0.7974	0.9904	0.0003
HPC	89.31	12.839	0.8669	10143.932	13.5911	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.185	0.9119	1.285	4.1851	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.498	0.9225	1.018	3.4980	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3930.21	9547.0

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4682	851.64
FanDuct	0.0000	0.5662	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.2972	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11399.2	7581.7	16455.4
LP_Shaft	3906.9	17267.7	12845.1

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.3137	1008.69	243.43	31.735
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.7356	1008.69	243.43	7.404
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.52	233.95	38.424
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1204.39	292.72	89.573
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.52	233.95	38.424
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1380.92	338.22	138.165
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	970.52	233.95	38.424

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	7.1788	1380.92	338.22	134.983
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	6.2816	1380.92	338.22	75.925
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.92	338.22	138.165
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.92	338.22	138.165
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1380.92	338.22	138.165
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	545.71	130.67	7.280

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2850.79	0.9995	0.0230	1.14198	0.02463

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.594	0.9805	1.0000	0.9800	603.19	1.000	1600.1	3851.4
Byp_Nozz	2.551	0.9825	1.0000	0.9800	2002.63	1.000	1024.4	12619.1

```
**********************************************************************************************************************
Date:02/22/11    Time:13:42:28    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    84
Temperature Stator 1 inlet: 457.73    Stator 1 exit: 474.77    Stator 2 inlet: 499.38    Stator 2 exit: 507.77
            Stator 3 inlet: 531.51    Stator 3 exit: 539.94    Stator 4 inlet: 562.42    Stator 4 exit: 570.18
            Stator 5 inlet: 588.48    Stator 5 exit: 595.87             Unblocked   Percent Blockage: 0.40

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    376.28      5815.7    0.5868    3412.49    5.4803    775.82   28.783      6923.4       84.0   2672.3
2509.4   1739.6


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          376.28     4.283    462.03    110.60   0.0000   1218.51     2.854    411.97    3735.2   0.7800    1.40005
FS1   Inlet.Fl_O            376.28     4.283    462.03    110.60   0.0000   1218.51     3.321    429.63    4162.5   0.6143    1.40005
FS12  Splitter.Fl_02        318.22     4.281    462.03    110.60   0.0000   1030.99     3.323    429.78    3526.9   0.6128    1.40005
FS2   Splitter.Fl_01         58.07     4.281    462.03    110.60   0.0000    188.13     3.297    428.81     637.7   0.6226    1.40005
FS14  Fan.Fl_O              318.22     6.897    536.70    128.51   0.0000    689.71     5.713    508.59    2600.0   0.5258    1.39974
FS25  LPC.Fl_O               58.07    10.070    611.78    146.54   0.0000     92.03     8.936    591.27     412.5   0.4169    1.39851
FS3   HPC.Fl_O               55.25   123.283   1325.64    323.87   0.0000     10.53   110.898   1288.87      49.7   0.3971    1.36070
FS36  Bleed3.Fl_O            42.82   123.283   1325.64    323.87   0.0000      8.16   116.098   1304.68      49.3   0.2982    1.36070
FS4   Burner.Fl_O            43.77   120.444   2672.32    717.68   0.0221     12.12   113.711   2637.88      74.8   0.2995    1.29062
FS45  HPT.Fl_O               58.33    28.210   1747.88    443.86   0.0165     55.79    25.399   1703.20     264.7   0.4002    1.32655
FS49  LPT.Fl_O               59.01     6.577   1252.24    309.50   0.0163    204.91     5.685   1205.33     851.6   0.4679    1.35390
FS5   TEGV.Fl_O              59.01     6.577   1252.24    309.50   0.0163    204.91     5.685   1205.33     851.6   0.4679    1.35390
FS8   Core_Nozz.Fl_O         59.01     6.577   1252.24    309.50   0.0163    204.91     3.511   1060.60     603.2   1.0000    1.35390
FS17  FanDuctLkg.Fl_O        318.22     6.897    536.70    128.51   0.0000    689.71     5.713    508.59    2600.0   0.5258    1.39974
FS171 Bleed15.Fl_O           318.22     6.897    536.70    128.51   0.0000    689.71     5.550    504.37    2475.2   0.5661    1.39974
FS172 FanDuct.Fl_O           318.22     6.897    536.70    128.51   0.0000    689.71     5.550    504.37    2475.2   0.5661    1.39974
FS173 Byp_Nozz.Fl_O          318.22     6.897    536.70    128.51   0.0000    689.71     3.658    447.25    2002.6   1.0000    1.39974

TURBOMACHINERY PERFORMANCE DATA
                Wc       PR       eff         Nc        TR     efPoly        pwr      SMN      SMW
Fan        1030.99    1.611    0.9119   3951.105    1.1616    0.9164    -8064.9    54.89    26.94
LPC         188.13    2.352    0.8599   3951.105    1.3241    0.8757    -2953.1     1.70     1.34
HPC          92.03   12.242    0.8603  10205.136    2.1669    0.8985   -14214.7    29.22    28.26
HPT          12.12    4.270    0.9102    214.401    1.3516    0.8949    14214.7
LPT          55.79    4.289    0.9131     89.197    1.3924    0.8965    11018.0

TURBOMACHINERY MAP DATA
             WcMap    PRmap    effMap      NcMap     R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        1197.89    1.597    0.9138   3913.422     0.0608      0.8607    1.0235    0.9980    0.9905
```

LPC	150.68	2.572	0.8397	1.044	180.0000	1.2486	0.8603	1.0241	0.0003
HPC	83.70	11.712	0.8692	9932.839	13.2002	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.201	0.9102	1.291	4.2008	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.501	0.9199	1.005	3.5005	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3735.24	9073.4

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4679	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.4803	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11083.4	6736.0	14214.7
LP_Shaft	3729.1	15517.8	11018.0

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.1368	975.58	235.20	28.210
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6794	975.58	235.20	6.577
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.75	226.34	34.977
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1159.49	281.31	80.262
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.75	226.34	34.977
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1325.64	323.87	123.283
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	939.75	226.34	34.977

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.6300	1325.64	323.87	120.444
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.8014	1325.64	323.87	67.686
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.64	323.87	123.283
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.64	323.87	123.283
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1325.64	323.87	123.283
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	536.70	128.51	6.897

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2672.32	0.9995	0.0230	0.94791	0.02214

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.304	0.9817	1.0000	0.9800	603.19	1.000	1545.9	3232.1
Byp_Nozz	2.417	0.9830	1.0000	0.9800	2002.63	1.000	1015.9	11657.0

```
**********************************************************************************************************************************
Date:02/22/11    Time:13:43:29    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    79
Temperature Stator 1 inlet: 459.04    Stator 1 exit: 475.75    Stator 2 inlet: 499.73    Stator 2 exit: 508.17
            Stator 3 inlet: 531.31    Stator 3 exit: 539.73    Stator 4 inlet: 561.62    Stator 4 exit: 569.34
            Stator 5 inlet: 587.19    Stator 5 exit: 594.51             Unblocked   Percent Blockage: 0.40

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    370.94      5524.8    0.5863    3239.09    5.5398    775.82   27.859      6923.4       79.8   2626.4
2466.9   1709.0


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           370.94     4.283    462.03    110.60   0.0000   1201.21     2.854    411.97    3682.2   0.7800    1.40005
FS1   Inlet.Fl_O             370.94     4.283    462.03    110.60   0.0000   1201.21     3.360    431.07    4162.5   0.5995    1.40005
FS12  Splitter.Fl_02         314.22     4.281    462.03    110.60   0.0000   1018.04     3.357    431.04    3526.9   0.5997    1.40005
FS2   Splitter.Fl_01          56.72     4.281    462.03    110.60   0.0000    183.77     3.361    431.20     637.7   0.5981    1.40005
FS14  Fan.Fl_O               314.22     6.795    534.32    127.94   0.0000    689.72     5.629    506.34    2600.0   0.5257    1.39975
FS25  LPC.Fl_O                56.72     9.999    609.71    146.04   0.0000     90.39     8.918    590.14     412.5   0.4077    1.39858
FS3   HPC.Fl_O                53.97   119.329   1311.34    320.17   0.0000     10.57   107.239   1274.58      49.7   0.3987    1.36157
FS36  Bleed3.Fl_O             41.83   119.329   1311.34    320.17   0.0000      8.19   112.318   1290.39      49.3   0.2994    1.36157
FS4   Burner.Fl_O             42.73   116.581   2626.38    703.15   0.0215     12.12   110.066   2592.39      74.8   0.2992    1.29240
FS45  HPT.Fl_O                56.96    27.280   1717.09    435.07   0.0161     55.83    24.558   1672.96     264.7   0.4002    1.32830
FS49  LPT.Fl_O                57.62     6.358   1228.97    303.27   0.0159    205.01     5.495   1182.71     851.6   0.4679    1.35567
FS5   TEGV.Fl_O               57.62     6.358   1228.97    303.27   0.0159    205.01     5.495   1182.71     851.6   0.4679    1.35567
FS8   Core_Nozz.Fl_O          57.62     6.358   1228.97    303.27   0.0159    205.01     3.393   1040.15     603.2   1.0000    1.35567
FS17  FanDuctLkg.Fl_O         314.22     6.795    534.32    127.94   0.0000    689.72     5.629    506.34    2600.0   0.5257    1.39975
FS171 Bleed15.Fl_O            314.22     6.795    534.32    127.94   0.0000    689.72     5.468    502.14    2475.2   0.5661    1.39975
FS172 FanDuct.Fl_O            314.22     6.795    534.32    127.94   0.0000    689.72     5.468    502.14    2475.2   0.5661    1.39975
FS173 Byp_Nozz.Fl_O           314.22     6.795    534.32    127.94   0.0000    689.72     3.604    445.27    2002.6   1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1018.04   1.587   0.9110   3904.454   1.1565   0.9153    -7710.5   58.36   27.99
LPC        183.77   2.336   0.8636   3904.454   1.3196   0.8791    -2844.8    2.07    1.61
HPC         90.39  11.934   0.8610  10159.703   2.1507   0.8987   -13634.7   30.42   29.36
HPT         12.12   4.273   0.9094    214.941   1.3532   0.8939    13634.9
LPT         55.83   4.291   0.9124     88.931   1.3939   0.8957    10555.3

TURBOMACHINERY MAP DATA
           WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1182.85   1.574   0.9129   3867.216    0.0599      0.8607    1.0235    0.9980    0.9905
```

LPC	147.66	2.526	0.8398	1.031	180.0000	1.2446	0.8752	1.0284	0.0003
HPC	82.21	11.419	0.8699	9888.619	13.0958	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.205	0.9094	1.294	4.2047	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.501	0.9191	1.002	3.5014	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3682.21	8944.6

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4679	851.64
FanDuct	0.0000	0.5661	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.5398	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	11015.4	6501.1	13634.9
LP_Shaft	3685.1	15043.8	10555.3

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.0873	967.11	233.11	27.280
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6636	967.11	233.11	6.358
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.90	224.40	34.051
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1147.92	278.38	77.783
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.90	224.40	34.051
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1311.34	320.17	119.329
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	931.90	224.40	34.051

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.4764	1311.34	320.17	116.581
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.6670	1311.34	320.17	65.501
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.34	320.17	119.329
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.34	320.17	119.329
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1311.34	320.17	119.329
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.32	127.94	6.795

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2626.38	0.9995	0.0230	0.89975	0.02151

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.228	0.9816	1.0000	0.9800	603.19	1.000	1531.8	3068.5
Byp_Nozz	2.381	0.9831	1.0000	0.9800	2002.63	1.000	1013.6	11400.9

```
**********************************************************************************************************************
Date:02/22/11    Time:13:44:31    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    76
Temperature Stator 1 inlet: 459.90    Stator 1 exit: 476.37    Stator 2 inlet: 499.93    Stator 2 exit: 508.38
            Stator 3 inlet: 531.11    Stator 3 exit: 539.51    Stator 4 inlet: 560.99    Stator 4 exit: 568.66
            Stator 5 inlet: 586.21    Stator 5 exit: 593.46             Unblocked   Percent Blockage: 0.40

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W          Fn       TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780    39000.0    22.00    366.97      5317.1     0.5870    3120.97    5.5814    775.82   27.216      6923.4       76.8   2594.8
2437.8   1688.1


                                        FLOW STATION DATA
                                  W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O           366.97     4.283    462.03    110.60   0.0000   1188.36     2.854    411.97    3642.8   0.7800    1.40005
FS1   Inlet.Fl_O             366.97     4.283    462.03    110.60   0.0000   1188.36     3.387    432.08    4162.5   0.5889    1.40005
FS12  Splitter.Fl_02         311.21     4.281    462.03    110.60   0.0000   1008.30     3.382    431.95    3526.9   0.5903    1.40005
FS2   Splitter.Fl_01          55.76     4.281    462.03    110.60   0.0000    180.65     3.405    432.77     637.7   0.5816    1.40005
FS14  Fan.Fl_O               311.21     6.720    532.72    127.55   0.0000    689.73     5.567    504.82    2600.0   0.5257    1.39975
FS25  LPC.Fl_O                55.76     9.941    608.24    145.69   0.0000     89.27     8.896    589.28     412.5   0.4014    1.39875
FS3   HPC.Fl_O                53.05   116.571   1301.48    317.62   0.0000     10.60   104.693   1264.74      49.7   0.3999    1.36219
FS36  Bleed3.Fl_O             41.12   116.571   1301.48    317.62   0.0000      8.21   109.685   1280.56      49.3   0.3001    1.36219
FS4   Burner.Fl_O             41.98   113.886   2594.82    693.21   0.0211     12.12   107.525   2561.14      74.8   0.2990    1.29364
FS45  HPT.Fl_O                55.97    26.632   1695.99    429.07   0.0157     55.85    23.972   1652.24     264.7   0.4002    1.32939
FS49  LPT.Fl_O                56.63     6.206   1213.08    299.04   0.0155    205.06     5.364   1167.29     851.6   0.4678    1.35689
FS5   TEGV.Fl_O               56.63     6.206   1213.08    299.04   0.0155    205.06     5.364   1167.29     851.6   0.4678    1.35689
FS8   Core_Nozz.Fl_O          56.63     6.206   1213.08    299.04   0.0155    205.06     3.311   1026.20     603.2   1.0000    1.35689
FS17  FanDuctLkg.Fl_O        311.21     6.720    532.72    127.55   0.0000    689.73     5.567    504.82    2600.0   0.5257    1.39975
FS171 Bleed15.Fl_O           311.21     6.720    532.72    127.55   0.0000    689.73     5.408    500.63    2475.2   0.5660    1.39975
FS172 FanDuct.Fl_O           311.21     6.720    532.72    127.55   0.0000    689.73     5.408    500.63    2475.2   0.5660    1.39975
FS173 Byp_Nozz.Fl_O          311.21     6.720    532.72    127.55   0.0000    689.73     3.564    443.93    2002.6   1.0000    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       1008.30   1.570   0.9083   3871.417   1.1530    0.9125    -7466.6   60.55   28.78
LPC        180.65   2.322   0.8656   3871.417   1.3164    0.8810    -2768.5    2.35    1.81
HPC         89.27  11.727   0.8614  10128.418   2.1398    0.8988   -13235.2   31.26   30.13
HPT         12.12   4.276   0.9089    215.317   1.3544    0.8932    13235.0
LPT         55.85   4.291   0.9118     88.725   1.3948    0.8952    10235.8

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       1171.53   1.557   0.9101   3834.494    0.0593      0.8607    1.0235    0.9980    0.9905
```

LPC	145.52	2.493	0.8399	1.023	180.0000	1.2414	0.8853	1.0305	0.0003
HPC	81.19	11.221	0.8703	9858.168	13.0238	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.207	0.9089	1.296	4.2075	12.6513	0.9790	1.0000	0.0003
LPT	0.86	3.502	0.9186	1.000	3.5018	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	3642.81	8848.9

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.4678	851.64
FanDuct	0.0000	0.5660	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	5.5814	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	10968.1	6337.6	13235.0
LP_Shaft	3653.9	14712.9	10235.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	2.0519	961.26	231.66	26.632
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.6524	961.26	231.66	6.206
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	1139.95	276.36	76.051
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.571
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	926.47	223.06	33.399

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	6.3666	1301.48	317.62	113.886
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	5.5709	1301.48	317.62	63.977
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.571
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.571
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1301.48	317.62	116.571
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	532.72	127.55	6.720

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	2594.82	0.9995	0.0230	0.86694	0.02108

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	2.175	0.9814	1.0000	0.9800	603.19	1.000	1522.1	2954.5
Byp_Nozz	2.355	0.9831	1.0000	0.9800	2002.63	1.000	1012.1	11211.5

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**********************************************************************************************************************
Date:02/22/11    Time:13:44:31    Model:          P&W2040 Turbofan Engine - Original LPC Map, COMDES OFF    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 13/ 23/ 1/11    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet:   0.00    Stator 1 exit:   0.00    Stator 2 inlet:   0.00    Stator 2 exit:   0.00
            Stator 3 inlet:   0.00    Stator 3 exit:   0.00    Stator 4 inlet:   0.00    Stator 4 exit:   0.00
            Stator 5 inlet:   0.00    Stator 5 exit:   0.00             Unblocked   Percent Blockage: 0.40

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust     %       T4
T41      T49
 0.780   39000.0    22.00    258.47      692.3    1.0370     717.93    9.4788    775.82    9.738      6923.4      10.0   1725.6
1632.0   1134.1


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          258.47     4.283    462.03    110.60   0.0000    837.00     2.854    411.97    2565.7   0.7800    1.40005
FS1   Inlet.Fl_O            258.47     4.283    462.03    110.60   0.0000    837.00     3.902    449.89    4162.5   0.3674    1.40005
FS12  Splitter.Fl_02        233.80     4.281    462.03    110.60   0.0000    757.50     3.839    447.86    3526.9   0.3978    1.40005
FS2   Splitter.Fl_01         24.67     4.281    462.03    110.60   0.0000     79.92     4.142    457.70     637.7   0.2174    1.40005
FS14  Fan.Fl_O              233.80     4.865    481.27    115.21   0.0000    680.29     4.059    456.98    2600.0   0.5155    1.40046
FS25  LPC.Fl_O               24.67     6.805    540.38    129.39   0.0000     54.37     6.560    534.76     412.5   0.2294    1.39974
FS3   HPC.Fl_O               23.47    41.710    982.46    236.91   0.0000     11.38    36.704    948.28      49.7   0.4338    1.38211
FS36  Bleed3.Fl_O            18.19    41.710    982.46    236.91   0.0000      8.82    38.837    963.25      49.3   0.3229    1.38211
FS4   Burner.Fl_O            18.39    40.749   1725.59    435.05   0.0110     12.10    38.488   1701.21      74.8   0.2939    1.33136
FS45  HPT.Fl_O               24.58     9.777   1138.28    277.88   0.0082     54.73     8.848   1108.16     264.7   0.3846    1.36661
FS49  LPT.Fl_O               24.87     3.297    887.65    214.74   0.0081    145.00     3.093    872.10     851.6   0.3053    1.38230
FS5   TEGV.Fl_O              24.87     3.297    887.65    214.74   0.0081    145.00     3.093    872.10     851.6   0.3053    1.38230
FS8   Core_Nozz.Fl_O         24.87     3.297    887.65    214.74   0.0081    145.00     2.854    852.81     603.2   0.4618    1.38230
FS17  FanDuctLkg.Fl_O       233.80     4.865    481.27    115.21   0.0000    680.29     4.059    456.98    2600.0   0.5155    1.40046
FS171 Bleed15.Fl_O          233.80     4.865    481.27    115.21   0.0000    680.29     3.948    453.39    2475.2   0.5544    1.40046
FS172 FanDuct.Fl_O          233.80     4.865    481.27    115.21   0.0000    680.29     3.948    453.39    2475.2   0.5544    1.40046
FS173 Byp_Nozz.Fl_O         233.80     4.865    481.27    115.21   0.0000    680.29     2.854    413.51    2002.6   0.9056    1.40046

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       757.50   1.136   0.9061   2622.108   1.0417    0.9087    -1526.7  ---.--   54.83
LPC        79.92   1.590   0.8432   2622.108   1.1696    0.8511     -656.0    7.46    4.31
HPC        54.37   6.129   0.8191   8970.487   1.8181    0.8575    -3661.2   61.02   57.72
HPT        12.10   4.168   0.8755    220.421   1.3655    0.8533     3661.2
LPT        54.73   2.965   0.8539     73.352   1.2803    0.8343     2182.8

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        880.13   1.133   0.9080   2597.100    0.0415      0.8607    1.0235    0.9980    0.9905
```

LPC	78.84	1.585	0.8403	0.693	177.9331	1.0136	1.0072	1.0034	0.0003
HPC	49.45	5.888	0.8276	8731.134	10.9932	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.101	0.8755	1.327	4.1015	12.6513	0.9790	1.0000	0.0003
LPT	0.84	2.494	0.8603	0.827	2.4941	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2565.74	6232.5

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.3053	851.64
FanDuct	0.0000	0.5544	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.4788	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9156.3	2100.1	3661.2
LP_Shaft	2474.8	4632.4	2182.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.9077	763.33	183.15	9.777
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2886	763.33	183.15	3.297
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	741.18	177.78	14.484
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	877.88	211.11	28.446
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	741.18	177.78	14.484
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	982.46	236.91	41.710
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	741.18	177.78	14.484

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.8164	982.46	236.91	40.749
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.4644	982.46	236.91	23.033
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	982.46	236.91	41.710
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	982.46	236.91	41.710
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	982.46	236.91	41.710
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	481.27	115.21	4.865
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	481.27	115.21	4.865
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	481.27	115.21	4.865
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	481.27	115.21	4.865
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	481.27	115.21	4.865

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1725.59	0.9995	0.0230	0.19943	0.01096

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.155	0.9800	1.0000	0.9800	603.19	0.462	644.2	497.9
Byp_Nozz	1.705	0.9800	1.0000	0.9800	2002.63	0.906	884.4	6427.0

```
**********************************************************************************************************************************
Date:02/22/11    Time:13:45:13    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 469.18    Stator 1 exit: 477.65    Stator 2 inlet: 488.50    Stator 2 exit: 494.40
            Stator 3 inlet: 504.69    Stator 3 exit: 510.09    Stator 4 inlet: 519.59    Stator 4 exit: 524.23
            Stator 5 inlet: 532.18    Stator 5 exit: 536.27             Unblocked   Percent Blockage: 0.40

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.780   39000.0    22.00    258.20      692.4    1.0453     723.70    9.5602    775.82    9.701      6923.4      10.0   1742.7
1647.8   1144.6


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          258.20     4.283    462.03    110.60   0.0000    836.13     2.854    411.97    2563.1   0.7800    1.40005
FS1   Inlet.Fl_O            258.20     4.283    462.03    110.60   0.0000    836.13     3.903    449.92    4162.5   0.3669    1.40005
FS12  Splitter.Fl_02        233.75     4.281    462.03    110.60   0.0000    757.33     3.839    447.87    3526.9   0.3976    1.40005
FS2   Splitter.Fl_01         24.45     4.281    462.03    110.60   0.0000     79.22     4.145    457.78     637.7   0.2154    1.40005
FS14  Fan.Fl_O              233.75     4.864    481.24    115.20   0.0000    680.26     4.058    456.95    2600.0   0.5154    1.40045
FS25  LPC.Fl_O               24.45     6.665    541.42    129.64   0.0000     55.08     6.419    535.63     412.5   0.2326    1.39974
FS3   HPC.Fl_O               23.26    41.554    988.56    238.42   0.0000     11.36    36.589    954.35      49.7   0.4328    1.38178
FS36  Bleed3.Fl_O            18.03    41.554    988.56    238.42   0.0000      8.80    38.704    969.32      49.3   0.3222    1.38178
FS4   Burner.Fl_O            18.23    40.597   1742.70    439.86   0.0111     12.10    38.343   1718.13      74.8   0.2940    1.33044
FS45  HPT.Fl_O               24.37     9.738   1148.86    280.62   0.0083     54.73     8.813   1118.50     264.7   0.3847    1.36585
FS49  LPT.Fl_O               24.65     3.293    896.35    216.92   0.0082    144.64     3.090    880.75     851.6   0.3045    1.38178
FS5   TEGV.Fl_O              24.65     3.293    896.35    216.92   0.0082    144.64     3.090    880.75     851.6   0.3045    1.38178
FS8   Core_Nozz.Fl_O         24.65     3.293    896.35    216.92   0.0082    144.64     2.854    861.44     603.2   0.4602    1.38178
FS17  FanDuctLkg.Fl_O       233.75     4.864    481.24    115.20   0.0000    680.26     4.058    456.95    2600.0   0.5154    1.40045
FS171 Bleed15.Fl_O          233.75     4.864    481.24    115.20   0.0000    680.26     3.948    453.36    2475.2   0.5544    1.40045
FS172 FanDuct.Fl_O          233.75     4.864    481.24    115.20   0.0000    680.26     3.948    453.36    2475.2   0.5544    1.40045
FS173 Byp_Nozz.Fl_O         233.75     4.864    481.24    115.20   0.0000    680.26     2.854    413.51    2002.6   0.9054    1.40045

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       757.33   1.136   0.9061   2620.828   1.0416    0.9086    -1523.8  ---.--   54.85
LPC        79.22   1.557   0.7933   2620.828   1.1718    0.8030     -658.9    7.65    4.40
HPC        55.08   6.234   0.8208   8994.352   1.8259    0.8592    -3671.9   60.09   56.89
HPT        12.10   4.169   0.8769    220.129   1.3656    0.8550     3671.9
LPT        54.73   2.957   0.8551     72.978   1.2796    0.8359     2182.7

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        879.93   1.133   0.9079   2595.833    0.0415      0.8607    1.0235    0.9980    0.9905
```

LPC	78.89	1.585	0.8407	0.692	180.0000	1.0041	0.9525	0.9437	0.0003
HPC	50.09	5.988	0.8293	8754.362	11.0423	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.102	0.8769	1.325	4.1025	12.6513	0.9790	1.0000	0.0003
LPT	0.84	2.488	0.8614	0.822	2.4879	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2563.08	6226.1

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.3045	851.64
FanDuct	0.0000	0.5544	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5602	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9189.5	2098.7	3671.9
LP_Shaft	2473.6	4634.5	2182.7

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.8998	766.96	184.03	9.738
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2861	766.96	184.03	3.293
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.55	178.59	14.341
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	882.81	212.32	28.296
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.55	178.59	14.341
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	988.56	238.42	41.554
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	744.55	178.59	14.341

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7918	988.56	238.42	40.597
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.4429	988.56	238.42	22.945
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.56	238.42	41.554
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.56	238.42	41.554
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	988.56	238.42	41.554
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	481.24	115.20	4.864

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1742.70	0.9995	0.0230	0.20103	0.01115

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.154	0.9800	1.0000	0.9800	603.19	0.460	645.2	494.3
Byp_Nozz	1.704	0.9800	1.0000	0.9800	2002.63	0.905	884.2	6424.1

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**********************************************************************************************************************************
Date:02/22/11    Time:13:47:22    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 462.64    Stator 1 exit: 470.70    Stator 2 inlet: 481.01    Stator 2 exit: 486.61
            Stator 3 inlet: 496.39    Stator 3 exit: 501.51    Stator 4 inlet: 499.34    Stator 4 exit: 503.99
            Stator 5 inlet: 522.10    Stator 5 exit: 525.30               Stage4   Percent Blockage: 0.40

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.730   38334.0    22.00    252.07      700.6    0.9993     700.13    9.6256    726.09    9.502      7006.3      10.0   1723.8
1628.9   1132.8


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht       FAR        Wc        Ps        Ts      Aphy       MN      gamt
FS0   Ambient.Fl_O          252.07     4.218    455.81    109.10    0.0000    823.24     2.947    411.97    2589.3   0.7300   1.39992
FS1   Inlet.Fl_O            252.07     4.218    455.81    109.10    0.0000    823.24     3.856    444.28    4162.5   0.3603   1.39992
FS12  Splitter.Fl_02        228.34     4.216    455.81    109.10    0.0000    746.13     3.795    442.33    3526.9   0.3905   1.39992
FS2   Splitter.Fl_01         23.72     4.216    455.81    109.10    0.0000     77.52     4.088    451.81     637.7   0.2105   1.39992
FS14  Fan.Fl_O              228.34     4.772    474.07    113.48    0.0000    672.25     4.005    450.90    2600.0   0.5068   1.40030
FS25  LPC.Fl_O               23.72     6.412    530.51    127.02    0.0000     54.98     6.176    524.85     412.5   0.2322   1.39976
FS3   HPC.Fl_O               22.57    40.080    969.60    233.72    0.0000     11.32    35.334    936.30      49.7   0.4305   1.38282
FS36  Bleed3.Fl_O            17.49    40.080    969.60    233.72    0.0000      8.77    37.354    950.85      49.3   0.3207   1.38282
FS4   Burner.Fl_O            17.69    39.157   1723.83    434.64    0.0111     12.10    36.982   1699.45      74.8   0.2941   1.33134
FS45  HPT.Fl_O               23.64     9.496   1137.09    277.61    0.0083     54.17     8.615   1107.72     264.7   0.3798   1.36660
FS49  LPT.Fl_O               23.92     3.346    896.25    216.89    0.0082    138.09     3.159    882.15     851.6   0.2892   1.38180
FS5   TEGV.Fl_O              23.92     3.346    896.25    216.89    0.0082    138.09     3.159    882.15     851.6   0.2892   1.38180
FS8   Core_Nozz.Fl_O         23.92     3.346    896.25    216.89    0.0082    138.09     2.947    865.16     603.2   0.4334   1.38180
FS17  FanDuctLkg.Fl_O       228.34     4.772    474.07    113.48    0.0000    672.25     4.005    450.90    2600.0   0.5068   1.40030
FS171 Bleed15.Fl_O          228.34     4.772    474.07    113.48    0.0000    672.25     3.901    447.53    2475.2   0.5445   1.40030
FS172 FanDuct.Fl_O          228.34     4.772    474.07    113.48    0.0000    672.25     3.901    447.53    2475.2   0.5445   1.40030
FS173 Byp_Nozz.Fl_O         228.34     4.772    474.07    113.48    0.0000    672.25     2.947    413.46    2002.6   0.8566   1.40030

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff        Nc       TR    efPoly       pwr     SMN     SMW
Fan       746.13   1.132   0.9064  2573.669   1.0401    0.9087   -1414.9  ---.--   54.44
LPC        77.52   1.521   0.7875  2573.669   1.1639    0.7960    -601.4    7.69    2.61
HPC        54.98   6.250   0.8212  8991.920   1.8277    0.8596   -3494.4   59.43   56.24
HPT        12.10   4.123   0.8764   219.031   1.3629    0.8545    3494.4
LPT        54.17   2.838   0.8506    71.549   1.2664    0.8318    2016.4

TURBOMACHINERY MAP DATA
           WcMap   PRmap   effMap     NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       866.92   1.129   0.9082  2549.123    0.0416      0.8607    1.0235    0.9980    0.9905
```

LPC	75.47	1.562	0.8323	0.680	180.0000	1.0271	0.9275	0.9462	0.0003
HPC	50.01	6.003	0.8297	8751.995	11.0840	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.058	0.8764	1.319	4.0578	12.6513	0.9790	1.0000	0.0003
LPT	0.83	2.397	0.8569	0.806	2.3973	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2589.34	5688.5

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2892	851.64
FanDuct	0.0000	0.5445	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.6256	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9094.0	2018.1	3494.4
LP_Shaft	2412.7	4389.4	2016.4

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.8730	751.88	180.37	9.496
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2776	751.88	180.37	3.346
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	729.87	175.04	13.819
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	865.68	208.11	27.287
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	729.87	175.04	13.819
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	969.60	233.72	40.080
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	729.87	175.04	13.819

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7086	969.60	233.72	39.157
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.3701	969.60	233.72	22.191
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	969.60	233.72	40.080
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	969.60	233.72	40.080
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	969.60	233.72	40.080
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	474.07	113.48	4.772

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1723.83	0.9995	0.0230	0.19448	0.01112

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.135	0.9800	1.0000	0.9800	603.19	0.433	608.8	452.6
Byp_Nozz	1.620	0.9800	1.0000	0.9800	2002.63	0.857	836.5	5936.6

```
**********************************************************************************************************************************
Date:02/22/11    Time:13:49:03    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  4/ 17/ 1/ 2    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 460.61    Stator 1 exit: 468.52    Stator 2 inlet: 478.65    Stator 2 exit: 484.14
            Stator 3 inlet: 493.74    Stator 3 exit: 498.76    Stator 4 inlet: 496.56    Stator 4 exit: 501.11
            Stator 5 inlet: 518.96    Stator 5 exit: 522.08               Stage4   Percent Blockage: 0.40

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.714   37357.0    22.00    259.39      730.1    0.9842     718.54    9.6296    710.17    9.443      7300.9      10.0   1716.9
1622.1   1128.4


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O          259.39     4.357    453.91    108.65   0.0000    818.50     3.088    411.97    2599.3  0.7140    1.39988
FS1   Inlet.Fl_O            259.39     4.357    453.91    108.65   0.0000    818.50     3.988    442.58    4162.5  0.3578    1.39988
FS12  Splitter.Fl_02        234.99     4.355    453.91    108.65   0.0000    741.87     3.926    440.66    3526.9  0.3878    1.39988
FS2   Splitter.Fl_01         24.40     4.355    453.91    108.65   0.0000     77.04     4.224    449.97     637.7  0.2092    1.39988
FS14  Fan.Fl_O              234.99     4.923    471.87    112.96   0.0000    669.08     4.140    449.10    2600.0  0.5035    1.40026
FS25  LPC.Fl_O               24.40     6.586    527.29    126.25   0.0000     54.90     6.345    521.69     412.5  0.2318    1.39976
FS3   HPC.Fl_O               23.22    41.141    963.59    232.23   0.0000     11.30    36.280    930.55      49.7  0.4299    1.38315
FS36  Bleed3.Fl_O            17.99    41.141    963.59    232.23   0.0000      8.76    38.348    944.99      49.3  0.3203    1.38315
FS4   Burner.Fl_O            18.19    40.193   1716.87    432.71   0.0111     12.10    37.960   1692.57      74.8  0.2940    1.33168
FS45  HPT.Fl_O               24.32     9.780   1132.78    276.50   0.0083     54.00     8.879   1103.71     264.7  0.3784    1.36689
FS49  LPT.Fl_O               24.60     3.491    895.71    216.75   0.0082    136.10     3.302    882.06     851.6  0.2846    1.38184
FS5   TEGV.Fl_O              24.60     3.491    895.71    216.75   0.0082    136.10     3.302    882.06     851.6  0.2846    1.38184
FS8   Core_Nozz.Fl_O         24.60     3.491    895.71    216.75   0.0082    136.10     3.089    865.73     603.2  0.4255    1.38184
FS17  FanDuctLkg.Fl_O        234.99     4.923    471.87    112.96   0.0000    669.08     4.140    449.10    2600.0  0.5035    1.40026
FS171 Bleed15.Fl_O           234.99     4.923    471.87    112.96   0.0000    669.08     4.035    445.81    2475.2  0.5407    1.40026
FS172 FanDuct.Fl_O           234.99     4.923    471.87    112.96   0.0000    669.08     4.035    445.81    2475.2  0.5407    1.40026
FS173 Byp_Nozz.Fl_O          234.99     4.923    471.87    112.96   0.0000    669.08     3.088    413.45    2002.6  0.8410    1.40026

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       741.87   1.131   0.9065   2556.578   1.0396    0.9088    -1432.6  ---.--   54.25
LPC        77.04   1.513   0.7878   2556.578   1.1617    0.7959     -607.7    7.70    2.49
HPC        54.90   6.246   0.8212   8989.234   1.8274    0.8597    -3570.4   59.32   56.13
HPT        12.10   4.110   0.8761    218.742   1.3620    0.8542     3570.4
LPT        54.00   2.801   0.8491     71.060   1.2623    0.8304     2040.3

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        861.97   1.128   0.9083   2532.195    0.0416      0.8607    1.0235    0.9980    0.9905
```

LPC	74.23	1.553	0.8293	0.675	180.0000	1.0379	0.9264	0.9500	0.0003
HPC	49.93	5.999	0.8297	8749.381	11.0919	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.044	0.8761	1.317	4.0444	12.6513	0.9790	1.0000	0.0003
LPT	0.83	2.369	0.8554	0.801	2.3694	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2599.30	5725.5

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2846	851.64
FanDuct	0.0000	0.5407	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.6296	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9063.6	2069.0	3570.4
LP_Shaft	2391.7	4480.5	2040.3

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.8980	747.22	179.24	9.780
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.2855	747.22	179.24	3.491
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.35	173.94	14.188
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	860.30	206.80	28.010
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.35	173.94	14.188
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	963.59	232.23	41.141
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	725.35	173.94	14.188

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	2.7863	963.59	232.23	40.193
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.4381	963.59	232.23	22.797
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	963.59	232.23	41.141
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	963.59	232.23	41.141
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	963.59	232.23	41.141
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	471.87	112.96	4.923

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1716.87	0.9995	0.0230	0.19959	0.01109

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.130	0.9800	1.0000	0.9800	603.19	0.425	597.9	457.2
Byp_Nozz	1.594	0.9800	1.0000	0.9800	2002.63	0.841	821.3	5998.3

```
**********************************************************************************************************************************
Date:02/22/11    Time:13:50:46    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  4/ 17/ 1/ 2    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 462.24    Stator 1 exit: 469.84    Stator 2 inlet: 479.55    Stator 2 exit: 484.80
            Stator 3 inlet: 494.01    Stator 3 exit: 498.79    Stator 4 inlet: 496.46    Stator 4 exit: 500.76
            Stator 5 inlet: 518.11    Stator 5 exit: 521.06               Stage4   Percent Blockage: 0.40

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.669   34281.0    22.00    282.79      832.2    0.9483     789.17    9.6404    670.64    9.255      8322.3      10.0   1720.4
1624.9   1132.3


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht       FAR        Wc        Ps        Ts      Aphy       MN      gamt
FS0   Ambient.Fl_O          282.79     4.846    455.82    109.11    0.0000    804.00     3.578    418.42    2630.8   0.6690   1.39992
FS1   Inlet.Fl_O            282.79     4.846    455.82    109.11    0.0000    804.00     4.451    444.90    4162.5   0.3504   1.39992
FS12  Splitter.Fl_02        256.21     4.843    455.82    109.11    0.0000    728.80     4.385    443.06    3526.9   0.3796   1.39992
FS2   Splitter.Fl_01         26.58     4.843    455.82    109.11    0.0000     75.60     4.703    452.02     637.7   0.2050   1.39992
FS14  Fan.Fl_O              256.21     5.452    473.25    113.29    0.0000    659.68     4.616    451.25    2600.0   0.4936   1.40029
FS25  LPC.Fl_O               26.58     7.200    526.23    126.00    0.0000     54.64     6.938    520.69     412.5   0.2306   1.39976
FS3   HPC.Fl_O               25.29    44.846    960.94    231.58    0.0000     11.28    39.576    928.17      49.7   0.4287   1.38329
FS36  Bleed3.Fl_O            19.60    44.846    960.94    231.58    0.0000      8.74    41.817    942.48      49.3   0.3195   1.38329
FS4   Burner.Fl_O            19.82    43.814   1720.44    433.74    0.0112     12.11    41.377   1696.08      74.8   0.2942   1.33145
FS45  HPT.Fl_O               26.48    10.766   1136.67    277.51    0.0083     53.52     9.794   1108.13     264.7   0.3744   1.36659
FS49  LPT.Fl_O               26.80     3.995    907.35    219.66    0.0082    130.36     3.798    894.78     851.6   0.2715   1.38089
FS5   TEGV.Fl_O              26.80     3.995    907.35    219.66    0.0082    130.36     3.798    894.78     851.6   0.2715   1.38089
FS8   Core_Nozz.Fl_O         26.80     3.995    907.35    219.66    0.0082    130.36     3.578    880.01     603.2   0.4034   1.38089
FS17  FanDuctLkg.Fl_O       256.21     5.452    473.25    113.29    0.0000    659.68     4.616    451.25    2600.0   0.4936   1.40029
FS171 Bleed15.Fl_O          256.21     5.452    473.25    113.29    0.0000    659.68     4.504    448.12    2475.2   0.5295   1.40029
FS172 FanDuct.Fl_O          256.21     5.452    473.25    113.29    0.0000    659.68     4.504    448.12    2475.2   0.5295   1.40029
FS173 Byp_Nozz.Fl_O         256.21     5.452    473.25    113.29    0.0000    659.68     3.578    419.87    2002.6   0.7976   1.40029

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       728.80   1.126   0.9067   2502.670   1.0382    0.9089    -1514.9  ---.--   53.74
LPC        75.60   1.487   0.7886   2502.670   1.1544    0.7961     -635.0    7.76    2.32
HPC        54.64   6.229   0.8210   8981.163   1.8261    0.8595    -3873.9   59.11   55.91
HPT        12.11   4.070   0.8765    218.099   1.3591    0.8548     3873.9
LPT        53.52   2.695   0.8464     69.589   1.2502    0.8281     2149.9

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        846.79   1.123   0.9085   2478.801    0.0417      0.8607    1.0235    0.9980    0.9905
```

LPC	70.31	1.527	0.8197	0.661	180.0000	1.0752	0.9235	0.9620	0.0003
HPC	49.70	5.983	0.8295	8741.525	11.1077	1.0995	1.0494	0.9898	0.9733
HPT	0.96	4.005	0.8765	1.313	4.0050	12.6513	0.9790	1.0000	0.0003
LPT	0.82	2.288	0.8527	0.784	2.2882	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2630.79	5894.4

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2715	851.64
FanDuct	0.0000	0.5295	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.6404	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9046.3	2249.1	3873.9
LP_Shaft	2346.2	4812.8	2149.9

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	0.9780	745.34	178.79	10.766
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3109	745.34	178.79	3.995
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.56	173.51	15.482
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	858.02	206.24	30.541
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.56	173.51	15.482
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	960.94	231.58	44.846
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	723.56	173.51	15.482

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.0345	960.94	231.58	43.814
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.6553	960.94	231.58	24.910
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	960.94	231.58	44.846
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	960.94	231.58	44.846
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	960.94	231.58	44.846
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	473.25	113.29	5.452
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	473.25	113.29	5.452
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	473.25	113.29	5.452
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	473.25	113.29	5.452
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	473.25	113.29	5.452

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1720.44	0.9995	0.0230	0.21921	0.01119

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.117	0.9800	1.0000	0.9800	603.19	0.403	571.4	475.9
Byp_Nozz	1.524	0.9800	1.0000	0.9800	2002.63	0.798	784.9	6250.7

```
****************************************************************************************************************************************
Date:02/22/11    Time:13:52:37    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  5/ 18/ 1/ 3    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 471.61    Stator 1 exit: 478.79    Stator 2 inlet: 487.99    Stator 2 exit: 492.90
            Stator 3 inlet: 501.61    Stator 3 exit: 506.06    Stator 4 inlet: 514.11    Stator 4 exit: 517.89
            Stator 5 inlet: 524.61    Stator 5 exit: 527.91            Unblocked   Percent Blockage: 0.40

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.608    30029.0    22.00    314.03      995.1    0.9037     899.22    9.5609    620.50    9.019      9951.0       10.0   1742.1
1645.1   1149.0


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          314.03     5.599    465.62    111.46   0.0000    780.92     4.358    433.58    2686.1   0.6080    1.40012
FS1   Inlet.Fl_O            314.03     5.599    465.62    111.46   0.0000    780.92     5.172    455.17    4162.5   0.3387    1.40012
FS12  Splitter.Fl_02        284.30     5.597    465.62    111.46   0.0000    707.33     5.101    453.45    3526.9   0.3662    1.40012
FS2   Splitter.Fl_01         29.74     5.597    465.62    111.46   0.0000     73.98     5.442    461.91     637.7   0.2004    1.40012
FS14  Fan.Fl_O              284.30     6.259    482.58    115.52   0.0000    643.85     5.355    461.53    2600.0   0.4774    1.40048
FS25  LPC.Fl_O               29.74     8.179    532.86    127.59   0.0000     54.16     7.887    527.36     412.5   0.2284    1.39975
FS3   HPC.Fl_O               28.29    50.502    970.71    234.00   0.0000     11.26    44.587    937.75      49.7   0.4280    1.38276
FS36  Bleed3.Fl_O            21.93    50.502    970.71    234.00   0.0000      8.73    47.101    952.14      49.3   0.3190    1.38276
FS4   Burner.Fl_O            22.18    49.339   1742.08    439.81   0.0114     12.11    46.596   1717.48      74.8   0.2943    1.33030
FS45  HPT.Fl_O               29.64    12.253   1153.52    281.86   0.0085     53.01    11.170   1125.25     264.7   0.3704    1.36543
FS49  LPT.Fl_O               29.99     4.803    933.21    226.13   0.0084    123.08     4.593    921.82     851.6   0.2552    1.37919
FS5   TEGV.Fl_O              29.99     4.803    933.21    226.13   0.0084    123.08     4.593    921.82     851.6   0.2552    1.37919
FS8   Core_Nozz.Fl_O         29.99     4.803    933.21    226.13   0.0084    123.08     4.358    908.70     603.2   0.3769    1.37919
FS17  FanDuctLkg.Fl_O       284.30     6.259    482.58    115.52   0.0000    643.85     5.355    461.53    2600.0   0.4774    1.40048
FS171 Bleed15.Fl_O          284.30     6.259    482.58    115.52   0.0000    643.85     5.237    458.60    2475.2   0.5112    1.40048
FS172 FanDuct.Fl_O          284.30     6.259    482.58    115.52   0.0000    643.85     5.237    458.60    2475.2   0.5112    1.40048
FS173 Byp_Nozz.Fl_O         284.30     6.259    482.58    115.52   0.0000    643.85     4.358    435.01    2002.6   0.7395    1.40048

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       707.33   1.118   0.9068   2417.235   1.0364    0.9090    -1636.1  ---.--   52.80
LPC        73.98   1.461   0.8034   2417.235   1.1444    0.8103     -678.7    7.89    2.03
HPC        54.16   6.175   0.8202   8965.211   1.8217    0.8586    -4368.2   59.28   56.02
HPT        12.11   4.027   0.8777    217.715   1.3556    0.8565     4368.2
LPT        53.01   2.551   0.8434     67.433   1.2334    0.8253     2314.8

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        821.83   1.116   0.9086   2394.181    0.0420      0.8607    1.0235    0.9980    0.9905
```

LPC	64.10	1.485	0.8046	0.638	180.0000	1.1541	0.9513	0.9985	0.0003
HPC	49.25	5.931	0.8286	8725.999	11.1033	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.963	0.8777	1.311	3.9629	12.6513	0.9790	1.0000	0.0003
LPT	0.82	2.179	0.8497	0.760	2.1793	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2686.13	6056.4

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2552	851.64
FanDuct	0.0000	0.5112	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5609	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9087.0	2524.7	4368.2
LP_Shaft	2290.3	5308.4	2314.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.0943	753.61	180.79	12.253
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3479	753.61	180.79	4.803
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	867.08	208.46	34.419
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	731.67	175.47	17.490

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.3952	970.71	234.00	49.339
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	2.9709	970.71	234.00	28.126
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	970.71	234.00	50.502
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	482.58	115.52	6.259

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1742.08	0.9995	0.0230	0.24978	0.01139

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.102	0.9800	1.0000	0.9800	603.19	0.377	542.0	505.2
Byp_Nozz	1.436	0.9800	1.0000	0.9800	2002.63	0.739	740.8	6546.3

```
**********************************************************************************************************************************
Date:02/22/11    Time:13:54:19    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  6/ 19/ 1/ 4    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 482.13    Stator 1 exit: 488.92    Stator 2 inlet: 497.62    Stator 2 exit: 502.22
            Stator 3 inlet: 499.22    Stator 3 exit: 503.38    Stator 4 inlet: 521.81    Stator 4 exit: 524.70
            Stator 5 inlet: 531.02    Stator 5 exit: 534.05               Stage3   Percent Blockage: 0.40

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.552   25666.0    22.00    348.79     1194.7    0.8610    1028.58    9.5084    573.44    8.733     11946.9       10.0   1769.5
1670.6   1168.9


                                        FLOW STATION DATA
                                    W        Pt        Tt        ht       FAR        Wc        Ps        Ts      Aphy       MN      gamt
FS0   Ambient.Fl_O           348.79     6.507    476.52    114.07    0.0000    755.04     5.297    449.14    2751.6   0.5520   1.40035
FS1   Inlet.Fl_O             348.79     6.507    476.52    114.07    0.0000    755.04     6.046    466.60    4162.5   0.3258   1.40035
FS12  Splitter.Fl_02         315.60     6.504    476.52    114.07    0.0000    683.53     5.971    465.00    3526.9   0.3517   1.40035
FS2   Splitter.Fl_01          33.19     6.504    476.52    114.07    0.0000     71.89     6.335    472.94     637.7   0.1945   1.40035
FS14  Fan.Fl_O               315.60     7.232    493.16    118.06    0.0000    625.39     6.258    473.18    2600.0   0.4592   1.40071
FS25  LPC.Fl_O                33.19     9.188    538.75    129.00    0.0000     54.11     8.861    533.20     412.5   0.2282   1.39974
FS3   HPC.Fl_O                31.58    56.827    981.65    236.71    0.0000     11.24    50.208    948.55      49.7   0.4268   1.38216
FS36  Bleed3.Fl_O             24.48    56.827    981.65    236.71    0.0000      8.71    53.020    962.99      49.3   0.3182   1.38216
FS4   Burner.Fl_O             24.76    55.518   1769.45    447.52    0.0117     12.11    52.430   1744.54      74.8   0.2945   1.32884
FS45  HPT.Fl_O                33.09    13.919   1173.55    287.06    0.0087     52.55    12.712   1145.43     264.7   0.3668   1.36404
FS49  LPT.Fl_O                33.48     5.765    962.28    233.43    0.0086    116.24     5.542    951.92     851.6   0.2401   1.37739
FS5   TEGV.Fl_O               33.48     5.765    962.28    233.43    0.0086    116.24     5.542    951.92     851.6   0.2401   1.37739
FS8   Core_Nozz.Fl_O          33.48     5.765    962.28    233.43    0.0086    116.24     5.297    940.21     603.2   0.3524   1.37739
FS17  FanDuctLkg.Fl_O        315.60     7.232    493.16    118.06    0.0000    625.39     6.258    473.18    2600.0   0.4592   1.40071
FS171 Bleed15.Fl_O           315.60     7.232    493.16    118.06    0.0000    625.39     6.134    470.48    2475.2   0.4907   1.40071
FS172 FanDuct.Fl_O           315.60     7.232    493.16    118.06    0.0000    625.39     6.134    470.48    2475.2   0.4907   1.40071
FS173 Byp_Nozz.Fl_O          315.60     7.232    493.16    118.06    0.0000    625.39     5.297    450.56    2002.6   0.6874   1.40071

TURBOMACHINERY PERFORMANCE DATA
                Wc      PR       eff         Nc        TR    efPoly        pwr      SMN      SMW
Fan         683.53   1.112    0.9066   2330.102    1.0349    0.9089    -1781.5  ---.--    51.54
LPC          71.89   1.413    0.8020   2330.102    1.1306    0.8088     -701.3     8.09     1.72
HPC          54.11   6.185    0.8204   8964.039    1.8221    0.8587    -4935.4    58.89    55.64
HPT          12.11   3.989    0.8794    217.187    1.3525    0.8589     4935.4
LPT          52.55   2.414    0.8399     65.195    1.2166    0.8226     2482.8

TURBOMACHINERY MAP DATA
             WcMap   PRmap    effMap      NcMap     R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan         794.18   1.109    0.9085   2307.879     0.0424      0.8607    1.0235    0.9980    0.9905
```

LPC	57.77	1.442	0.7891	0.615	180.0000	1.2444	0.9330	1.0163	0.0003
HPC	49.21	5.941	0.8289	8724.857	11.1280	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.926	0.8794	1.307	3.9259	12.6513	0.9790	1.0000	0.0003
LPT	0.81	2.075	0.8461	0.735	2.0751	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2751.63	6216.6

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2401	851.64
FanDuct	0.0000	0.4907	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.5084	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9136.0	2837.3	4935.4
LP_Shaft	2233.4	5838.5	2482.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.2215	762.11	182.86	13.919
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.3883	762.11	182.86	5.765
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	739.92	177.47	19.669
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	876.87	210.86	38.724
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	739.92	177.47	19.669
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	981.65	236.71	56.827
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	739.92	177.47	19.669

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	3.7899	981.65	236.71	55.518
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	3.3162	981.65	236.71	31.723
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	981.65	236.71	56.827
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	981.65	236.71	56.827
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	981.65	236.71	56.827
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	493.16	118.06	7.232

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1769.45	0.9995	0.0230	0.28572	0.01167

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.088	0.9800	1.0000	0.9800	603.19	0.352	515.2	536.1
Byp_Nozz	1.365	0.9800	1.0000	0.9800	2002.63	0.687	700.9	6875.1

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**********************************************************************************************************************************
Date:02/22/11    Time:13:56:16    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  8/ 34/ 2/ 5    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 496.94    Stator 1 exit: 503.34    Stator 2 inlet: 501.11    Stator 2 exit: 505.31
            Stator 3 inlet: 523.25    Stator 3 exit: 526.47    Stator 4 inlet: 533.64    Stator 4 exit: 536.85
            Stator 5 inlet: 542.81    Stator 5 exit: 545.59               Stage2   Percent Blockage: 0.40

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.490   20047.0    22.00    399.39     1508.8    0.8132    1226.94    9.3440    520.34    8.434     15087.9       10.0   1802.4
1701.5   1194.1


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          399.39     7.913    491.73    117.72   0.0000    722.23     6.740    469.18    2850.5   0.4900    1.40068
FS1   Inlet.Fl_O            399.39     7.913    491.73    117.72   0.0000    722.23     7.403    482.46    4162.5   0.3098    1.40068
FS12  Splitter.Fl_02        360.78     7.909    491.73    117.72   0.0000    652.74     7.323    481.03    3526.9   0.3334    1.40068
FS2   Splitter.Fl_01         38.61     7.909    491.73    117.72   0.0000     69.86     7.715    488.25     637.7   0.1887    1.40068
FS14  Fan.Fl_O              360.78     8.767    508.19    121.66   0.0000    598.60     7.704    489.74    2600.0   0.4337    1.40000
FS25  LPC.Fl_O               38.61    10.913    549.58    131.60   0.0000     53.52    10.533    544.05     412.5   0.2256    1.39972
FS3   HPC.Fl_O               36.74    66.740    997.93    240.75   0.0000     11.22    58.990    964.44      49.7   0.4262    1.38127
FS36  Bleed3.Fl_O            28.47    66.740    997.93    240.75   0.0000      8.70    62.282    979.05      49.3   0.3179    1.38127
FS4   Burner.Fl_O            28.81    65.203   1802.37    456.82   0.0120     12.11    61.577   1777.09      74.8   0.2946    1.32718
FS45  HPT.Fl_O               38.50    16.550   1198.84    293.63   0.0089     51.98    15.149   1170.93     264.7   0.3623    1.36233
FS49  LPT.Fl_O               38.95     7.252    996.54    242.07   0.0088    109.40     7.005    987.14     851.6   0.2252    1.37531
FS5   TEGV.Fl_O              38.95     7.252    996.54    242.07   0.0088    109.40     7.005    987.14     851.6   0.2252    1.37531
FS8   Core_Nozz.Fl_O         38.95     7.252    996.54    242.07   0.0088    109.40     6.740    976.71     603.2   0.3287    1.37531
FS17  FanDuctLkg.Fl_O       360.78     8.767    508.19    121.66   0.0000    598.60     7.704    489.74    2600.0   0.4337    1.40000
FS171 Bleed15.Fl_O          360.78     8.767    508.19    121.66   0.0000    598.60     7.571    487.32    2475.2   0.4624    1.40000
FS172 FanDuct.Fl_O          360.78     8.767    508.19    121.66   0.0000    598.60     7.571    487.32    2475.2   0.4624    1.40000
FS173 Byp_Nozz.Fl_O         360.78     8.767    508.19    121.66   0.0000    598.60     6.740    470.67    2002.6   0.6310    1.40000

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       652.74   1.109   0.9089   2235.262   1.0335    0.9079    -2014.4  ---.--   49.21
LPC        69.86   1.380   0.8173   2235.262   1.1176    0.8250     -758.4    8.44    1.36
HPC        53.52   6.116   0.8192   8944.784   1.8158    0.8577    -5818.0   59.18   55.87
HPT        12.11   3.940   0.8809    216.879   1.3482    0.8608     5818.0
LPT        51.98   2.282   0.8362     62.859   1.2000    0.8206     2772.8

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        758.41   1.106   0.9108   2213.944    0.0433      0.8607    1.0235    0.9980    0.9905
```

LPC	50.88	1.396	0.7723	0.590	180.0000	1.3730	0.9593	1.0583	0.0003
HPC	48.68	5.875	0.8277	8706.116	11.1166	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.878	0.8810	1.306	3.8781	12.6513	0.9790	1.0000	0.0003
LPT	0.80	1.974	0.8424	0.708	1.9745	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2850.51	6459.1

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2252	851.64
FanDuct	0.0000	0.4624	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.3440	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9207.5	3318.7	5818.0
LP_Shaft	2176.4	6691.3	2772.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.4209	775.78	186.18	16.550
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.4517	775.78	186.18	7.252
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.31	180.72	23.195
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	891.93	214.56	45.526
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.31	180.72	23.195
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	997.93	240.75	66.740
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	753.31	180.72	23.195

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	4.4085	997.93	240.75	65.203
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	3.8576	997.93	240.75	37.373
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	997.93	240.75	66.740
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	997.93	240.75	66.740
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	997.93	240.75	66.740
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	508.19	121.66	8.767
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	508.19	121.66	8.767
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	508.19	121.66	8.767
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	508.19	121.66	8.767
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	508.19	121.66	8.767

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1802.37	0.9995	0.0230	0.34082	0.01197

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.076	0.9800	1.0000	0.9800	603.19	0.329	489.4	592.5
Byp_Nozz	1.301	0.9800	1.0000	0.9800	2002.63	0.631	657.7	7375.4

```
**********************************************************************************************************************************
Date:02/22/11    Time:13:58:27    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy=  9/ 35/ 2/ 6    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 501.19    Stator 1 exit: 507.38    Stator 2 inlet: 523.48    Stator 2 exit: 527.00
            Stator 3 inlet: 534.30    Stator 3 exit: 537.91    Stator 4 inlet: 544.66    Stator 4 exit: 547.69
            Stator 5 inlet: 553.29    Stator 5 exit: 555.90               Stage1   Percent Blockage: 0.40

                                        SUMMARY OUTPUT DATA
    MN       alt    dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.446   15435.0    22.00    442.54     1740.6    0.7938    1381.62    9.3091    481.90    8.009     17405.9      10.0   1819.3
1717.4   1210.8


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy      MN       gamt
FS0   Ambient.Fl_O          442.54     9.311    504.97    120.89   0.0000    689.22     8.149    485.63    2919.6  0.4460    1.40036
FS1   Inlet.Fl_O            442.54     9.311    504.97    120.89   0.0000    689.22     8.769    496.39    4162.5  0.2939    1.40036
FS12  Splitter.Fl_02        399.62     9.306    504.97    120.89   0.0000    622.67     8.684    495.08    3526.9  0.3159    1.40036
FS2   Splitter.Fl_01         42.93     9.306    504.97    120.89   0.0000     66.89     9.098    501.71     637.7  0.1803    1.40036
FS14  Fan.Fl_O              399.62    10.282    520.79    124.69   0.0000    572.35     9.159    503.86    2600.0  0.4099    1.39977
FS25  LPC.Fl_O               42.93    12.610    559.26    133.93   0.0000     51.95    12.197    553.97     412.5  0.2185    1.39970
FS3   HPC.Fl_O               40.85    74.573   1006.32    242.84   0.0000     11.21    65.928    972.65      49.7  0.4259    1.38060
FS36  Bleed3.Fl_O            31.66    74.573   1006.32    242.84   0.0000      8.69    69.601    987.33      49.3  0.3176    1.38060
FS4   Burner.Fl_O            32.04    72.856   1819.33    461.62   0.0121     12.10    68.805   1793.87      74.8  0.2947    1.32649
FS45  HPT.Fl_O               42.81    18.852   1215.65    298.00   0.0090     51.09    17.316   1188.50     264.7  0.3552    1.36110
FS49  LPT.Fl_O               43.31     8.691   1023.02    248.76   0.0089    102.86     8.430   1014.57     851.6  0.2111    1.37335
FS5   TEGV.Fl_O              43.31     8.691   1023.02    248.76   0.0089    102.86     8.430   1014.57     851.6  0.2111    1.37335
FS8   Core_Nozz.Fl_O         43.31     8.691   1023.02    248.76   0.0089    102.86     8.149   1005.32     603.2  0.3069    1.37335
FS17  FanDuctLkg.Fl_O        399.62    10.282    520.79    124.69   0.0000    572.35     9.159    503.86    2600.0  0.4099    1.39977
FS171 Bleed15.Fl_O           399.62    10.282    520.79    124.69   0.0000    572.35     9.023    501.71    2475.2  0.4361    1.39977
FS172 FanDuct.Fl_O           399.62    10.282    520.79    124.69   0.0000    572.35     9.023    501.71    2475.2  0.4361    1.39977
FS173 Byp_Nozz.Fl_O          399.62    10.282    520.79    124.69   0.0000    572.35     8.149    487.09    2002.6  0.5880    1.39977

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr     SMN     SMW
Fan       622.67   1.105   0.9099   2144.953   1.0313    0.9114    -2147.7  ---.--   46.98
LPC        66.89   1.355   0.8348   2144.953   1.1075    0.8429     -791.6    8.94    0.99
HPC        51.95   5.914   0.8156   8892.543   1.7994    0.8543    -6454.5   60.45   56.93
HPT        12.10   3.865   0.8812    216.486   1.3419    0.8614     6454.5
LPT        51.09   2.169   0.8322     60.702   1.1851    0.8169     2939.3

TURBOMACHINERY MAP DATA
           WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan       723.47   1.102   0.9118   2124.496    0.0442      0.8607    1.0235    0.9980    0.9905
```

LPC	44.32	1.352	0.7563	0.567	180.0000	1.5093	1.0095	1.1038	0.0003
HPC	47.25	5.682	0.8241	8655.269	11.0580	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.804	0.8812	1.303	3.8045	12.6513	0.9790	1.0000	0.0003
LPT	0.79	1.889	0.8384	0.684	1.8887	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2919.63	6628.5

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.2111	851.64
FanDuct	0.0000	0.4361	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.3091	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9233.9	3671.2	6454.5
LP_Shaft	2116.4	7294.2	2939.3

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.5797	784.86	188.38	18.852
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.5023	784.86	188.38	8.691
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	762.44	182.94	26.242
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	900.65	216.70	51.027
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	762.44	182.94	26.242
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1006.32	242.84	74.573
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	762.44	182.94	26.242

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	4.9015	1006.32	242.84	72.856
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	4.2889	1006.32	242.84	41.965
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1006.32	242.84	74.573
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1006.32	242.84	74.573
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1006.32	242.84	74.573
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	520.79	124.69	10.282

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1819.33	0.9995	0.0230	0.38378	0.01212

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.066	0.9800	1.0000	0.9800	603.19	0.307	463.3	623.6
Byp_Nozz	1.262	0.9800	1.0000	0.9800	2002.63	0.588	623.6	7745.4

```
****************************************************************************************************************************************
Date:02/22/11    Time:14:00:34    Model:                              P&W2040 Turbofan Engine -  COMDES ON    converge = 1   CASE:   0
Version:NPSS_1.6.5 - Rev: ->    Gas Package:GasTbl    iter/pass/Jacb/Broy= 12/ 25/ 1/10    Run by: Philip C Jorgenson      PC:    10
Temperature Stator 1 inlet: 523.48    Stator 1 exit: 529.04    Stator 2 inlet: 536.15    Stator 2 exit: 539.83
            Stator 3 inlet: 546.53    Stator 3 exit: 549.79    Stator 4 inlet: 555.99    Stator 4 exit: 558.70
            Stator 5 inlet: 563.83    Stator 5 exit: 566.16             Unblocked   Percent Blockage: 0.40

                                        SUMMARY OUTPUT DATA
    MN       alt     dTamb         W         Fn      TSFC      Wfuel       BPR      VTAS      OPR       MaxThrust      %       T4
T41      T49
 0.406    10735.0    22.00    489.85     2003.2    0.7777    1557.96    9.2910    446.20    7.554     20032.3       10.0   1842.0
1738.8   1230.8


                                        FLOW STATION DATA
                                 W        Pt        Tt        ht      FAR        Wc        Ps        Ts      Aphy       MN       gamt
FS0   Ambient.Fl_O          489.85    11.019    518.95    124.25   0.0000    653.50     9.822    502.39    2996.0   0.4060    1.39978
FS1   Inlet.Fl_O            489.85    11.019    518.95    124.25   0.0000    653.50    10.446    511.10    4162.5   0.2772    1.39978
FS12  Splitter.Fl_02        442.25    11.013    518.95    124.25   0.0000    590.29    10.357    509.92    3526.9   0.2976    1.39978
FS2   Splitter.Fl_01         47.60    11.013    518.95    124.25   0.0000     63.53    10.791    515.93     637.7   0.1710    1.39978
FS14  Fan.Fl_O              442.25    12.085    534.12    127.89   0.0000    545.75    10.900    518.61    2600.0   0.3868    1.39975
FS25  LPC.Fl_O               47.60    14.441    569.62    136.41   0.0000     50.76    13.990    564.49     412.5   0.2133    1.39968
FS3   HPC.Fl_O               45.29    83.232   1017.61    245.65   0.0000     11.20    73.605    983.68      49.7   0.4255    1.37981
FS36  Bleed3.Fl_O            35.10    83.232   1017.61    245.65   0.0000      8.68    77.695    998.48      49.3   0.3174    1.37981
FS4   Burner.Fl_O            35.53    81.315   1842.02    468.05   0.0123     12.10    76.796   1816.31      74.8   0.2947    1.32540
FS45  HPT.Fl_O               47.48    21.393   1235.67    303.23   0.0092     50.34    19.706   1209.07     264.7   0.3493    1.35973
FS49  LPT.Fl_O               48.03    10.389   1052.82    256.33   0.0091     96.80    10.114   1045.19     851.6   0.1982    1.37143
FS5   TEGV.Fl_O              48.03    10.389   1052.82    256.33   0.0091     96.80    10.114   1045.19     851.6   0.1982    1.37143
FS8   Core_Nozz.Fl_O         48.03    10.389   1052.82    256.33   0.0091     96.80     9.822   1036.94     603.2   0.2870    1.37143
FS17  FanDuctLkg.Fl_O        442.25    12.085    534.12    127.89   0.0000    545.75    10.900    518.61    2600.0   0.3868    1.39975
FS171 Bleed15.Fl_O           442.25    12.085    534.12    127.89   0.0000    545.75    10.760    516.69    2475.2   0.4108    1.39975
FS172 FanDuct.Fl_O           442.25    12.085    534.12    127.89   0.0000    545.75    10.760    516.69    2475.2   0.4108    1.39975
FS173 Byp_Nozz.Fl_O          442.25    12.085    534.12    127.89   0.0000    545.75     9.822    503.75    2002.6   0.5491    1.39975

TURBOMACHINERY PERFORMANCE DATA
              Wc      PR      eff         Nc       TR    efPoly        pwr      SMN      SMW
Fan       590.29   1.097   0.9093   2034.264   1.0292    0.9108    -2279.5  ---.--    45.03
LPC        63.53   1.311   0.8186   2034.264   1.0976    0.8270     -819.3    9.96     0.51
HPC        50.76   5.764   0.8128   8853.260   1.7865    0.8515    -7178.3   61.41    57.72
HPT        12.10   3.801   0.8818    216.174   1.3364    0.8624     7178.3
LPT        50.34   2.059   0.8287     57.886   1.1704    0.8140     3098.8

TURBOMACHINERY MAP DATA
            WcMap   PRmap   effMap      NcMap    R/Parm     s_WcDes   s_PRdes  s_effDes   s_NcDes
Fan        685.85   1.095   0.9111   2014.862    0.0450      0.8607    1.0235    0.9980    0.9905
```

LPC	36.28	1.298	0.7366	0.537	180.0000	1.7514	1.0460	1.1113	0.0003
HPC	46.17	5.539	0.8212	8617.034	11.0151	1.0995	1.0494	0.9898	0.9733
HPT	0.96	3.742	0.8818	1.301	3.7422	12.6513	0.9790	1.0000	0.0003
LPT	0.77	1.805	0.8348	0.652	1.8052	65.0409	0.7602	0.9926	0.0005

===INLETS====	eRam	Afs	Fram
Inlet	1.0000	2995.97	6793.5

====DUCTS====	dPnorm	MN	Aphy
TEGV	0.0000	0.1982	851.64
FanDuct	0.0000	0.4108	2475.22

==SPLITTERS==	BPR	dP/P 1	dP/P 2
Splitter	9.2910	0.0005	0.0005

===SHAFTS====	Nmech	trq in	pwr in
HP_Shaft	9277.9	4063.6	7178.3
LP_Shaft	2034.8	7998.3	3098.8

BLEEDS - interstg	Wb/Win	BldWk	BldP	W	Tt	ht	Pt
HPT_COOLC HPC.C>	0.0368	0.5000	0.2200	1.7517	795.75	191.03	21.393
LPT_COOLA HPC.C>	0.0117	0.5000	0.4500	0.5569	795.75	191.03	10.389
WB2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575
WB2Y HPC.B>	0.0000	0.7600	0.6200	0.0000	911.76	219.43	57.091
WBA2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575
WBLKG HPC.l>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBW2X HPC.B>	0.0000	0.4500	0.2200	0.0000	773.29	185.57	29.575

BLEEDS - output	Wb/Win	hscale	Pscale	W	Tt	ht	Pt
HPT_COOLA Bleed>	0.1142	1.0000	1.0000	5.4350	1017.61	245.65	81.315
HPT_COOLB Bleed>	0.0999	1.0000	1.0000	4.7557	1017.61	245.65	47.040
WB3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBA3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBW3X Bleed>	0.0000	1.0000	1.0000	0.0000	1017.61	245.65	83.232
WBFDLKG FanDu>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB15X Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB15Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB17X Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085
WB17Y Bleed>	0.0000	1.0000	1.0000	0.0000	534.12	127.89	12.085

===BURNERS===	TtOut	eff	dPnorm	Wfuel	FAR
Burner	1842.02	0.9995	0.0230	0.43277	0.01233

===NOZZLES===	PR	Cfg	CdTh	Cv	Ath	MNth	Vact	Fg
Core_Nozz	1.058	0.9800	1.0000	0.9800	603.19	0.287	439.7	656.4
Byp_Nozz	1.230	0.9800	1.0000	0.9800	2002.63	0.549	592.2	8140.3

Appendix I.—Compressor Flow Analysis Along Vehicle Flight Trajectory; Parametrically Varying Blockages

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********************************************************************************
CRUISE 1  Operating Point #1
NPSS:  Inlet Mach number .78,  Altitude 35000ft, dT 22R, Thrust 75.6%
                Stage 2 stator Blocked @ 10%

****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
****************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 5.530   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     66.457    3660.150       5.183     466.396       1.000       1.000       0.980
 W Kg/sec =  30.2079525

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    178.741    3859.932       1.401       0.248      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 132943.031   52146.965       1.597     831.557     520.642     619.754       1.190

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   414.77    -0.14   414.77     0.40   694.89
  MEAN    17.06     0.00    -0.02   414.77    -0.14   414.77     0.40
  HUB     12.51     0.00    -0.02   414.77    -0.14   414.77     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.82    50.47     7.35   658.94   778.73     4.65   452.05     0.75
  MEAN    52.73    47.20     5.53   544.92   684.93     4.65   452.05     0.66
  HUB     43.94    38.62     5.32   399.58   576.04     4.65   452.05     0.55

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   651.89   365.27   539.94  1063.04     0.61
  MEAN    18.04   687.24   406.76   553.94  1057.47     0.65
  HUB     15.00   792.79   537.27   582.97  1047.12     0.76

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    658.94   614.63   293.67     0.58  7538.45
  MEAN   576.09   579.24   169.32     0.55  7338.83     1.31
  HUB    479.11   585.87    58.16     0.56  8060.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      6.69     1.29     5.19   505.13     1.08   469.70     0.92     0.91
  MEAN     6.65     1.28     5.00   504.10     1.08   464.73     0.92     0.91
  HUB      6.81     1.31     4.65   507.81     1.09   455.45     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     34.08    28.54    24.20     4.34     0.93     0.29     2.90
  MEAN    36.29    17.00    12.70     4.30     0.92     0.24     3.51     0.91
  HUB     42.66    -5.70    -9.30     3.60     0.92     0.09     4.78

    blockage3   Cor/Incid
       0.950       0.998
```

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     699.119     405.973     569.169    1057.421       0.661      -0.006

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.697       4.993     464.919      24.000      35.499      35.400      -0.099

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     588.756     405.973     715.156    1070.816       0.550       0.272

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.669       5.430     476.772     528.796       0.026       0.424

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     18.083     538.204       0.000     538.204    1076.139       0.500       0.342

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.596     481.524       0.000       0.060       0.042       0.367

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873       6.640       1.281     505.681      39.285     220.252       1.707

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 244252.078       0.563     917.307  730913.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc = 5.530   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     66.457    3660.150       6.640     505.681       1.000       1.000       0.980
W Kg/sec =  30.2079525

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    145.270    3706.967       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 132943.031   52146.965       1.395     590.487     423.151     474.134       1.120

     ROTOR LEADING EDGE CONDITIONS, STAGE   2
        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   510.11    -0.18   510.11     0.47   664.76
 MEAN    18.08     0.00    -0.02   510.11    -0.18   510.11     0.47
 HUB     15.21     0.00    -0.02   510.11    -0.18   510.11     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.15    46.36     5.79   656.38   831.43     5.70   483.98     0.77
 MEAN    48.55    42.30     6.25   577.43   770.61     5.70   483.98     0.71
 HUB     43.61    37.84     5.77   485.82   704.56     5.70   483.98     0.65

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   582.45   295.76   501.77  1105.84     0.53
 MEAN    18.01   597.40   310.15   510.58  1101.71     0.54
 HUB     15.22   650.56   390.33   520.45  1097.71     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.23   615.50   356.47     0.56  6043.06
 MEAN   575.25   575.30   265.10     0.52  5589.01     1.45
 HUB    486.24   529.21    95.91     0.48  5944.67

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      8.04     1.21     6.65   536.72     1.06   508.44     0.92     0.91
 MEAN     7.92     1.19     6.49   534.39     1.06   504.63     0.92     0.91
 HUB      8.01     1.21     6.32   536.22     1.06   500.93     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.52    35.39    31.50     3.89     0.93     0.32     2.90
 MEAN    31.28    27.44    23.50     3.94     0.93     0.31     3.30     0.91
 HUB     36.87    10.44     6.50     3.94     0.93     0.32     3.92


   blockage3   Cor/Incid
      0.850       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     17.960     681.796     311.023     606.721    1093.278       0.624       -0.234

     Pt3         Ps3         Ts3        Vane No.     Alpha3     Vane A3      Incid3
      7.976       6.135     497.014      46.000      27.141      30.600       3.459

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     17.960     607.470     311.023     682.463    1102.031       0.551       -0.013

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850       7.950       6.466     505.005     455.853       0.027       0.274

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     17.823     598.861       0.000     598.861    1102.977       0.543       0.229

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850       6.480     505.871       0.000       0.060       0.047      -0.003

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.869       7.920        1.193     535.775      30.095     251.316       1.948

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 187162.562       0.440     702.903  657221.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc = 5.530   EfDer =  0.979

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     66.457    3660.150        7.920     535.775        1.000        1.000        0.880
W Kg/sec =  30.2079525

   W cor       RPM cor         GAMMA         Cp          R            Blades        THK
    125.370    3601.353        1.401        0.249      53.349       56.000        0.050

   CFM        SCFM             A1/A*       Area1       A*        AthrRotor   ChokeMargin
 132943.031   52146.965        1.341     489.818     365.197     384.470        1.053

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1       Stator    Alfa      C1       CU1        Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   553.01    -0.19   553.01      0.50   630.74
 MEAN    17.74      0.00    -0.02   553.01    -0.19   553.01      0.50
 HUB     15.05      0.00    -0.02   553.01    -0.19   553.01      0.50

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     49.23    46.36     2.87   641.05   846.77      6.68   510.28      0.76
 MEAN    45.70    43.40     2.30   566.58   791.87      6.68   510.28      0.71
 HUB     41.01    38.84     2.17   480.71   732.86      6.68   510.28      0.66

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   557.63   281.11   481.59  1137.95      0.49
 MEAN    17.51   571.49   297.06   488.21  1134.57      0.50
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 HUB     14.85   621.93   375.37   495.88  1131.30     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    632.75   596.31   351.64     0.52  5572.61
 MEAN   559.17   554.13   262.11     0.49  5203.86     1.53
 HUB    474.32   505.66    98.95     0.45  5577.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     9.32     1.18     7.91   564.39     1.05   538.47     0.92     0.90
 MEAN    9.23     1.17     7.76   562.50     1.05   535.27     0.92     0.90
 HUB     9.33     1.18     7.59   564.41     1.05   532.17     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    30.27    36.14    31.50     4.64     0.93     0.35     2.90
 MEAN   31.32    28.23    23.50     4.73     0.91     0.36     3.28     0.90
 HUB    37.12    11.29     6.50     4.79     0.91     0.38     3.87


  blockage3   Cor/Incid
     0.950       0.979

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     577.314     299.008     493.848    1135.276       0.509       0.011

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     9.277       7.775     535.981      46.000      31.193      31.500       0.307

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     502.831     299.008     585.017    1142.357       0.440       0.229

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       9.262       8.107     542.688     471.992       0.020       0.330

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4        cp 3-4
    17.121     487.138       0.000     487.138    1143.720       0.426       0.245

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       8.152     543.983       0.000       0.060       0.037       0.259

   STAGE EXIT CONDITIONS, STAGE   3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.861       9.236       1.166     563.767      27.991     251.572       1.950

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 174137.516       0.435     653.986  722200.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc = 5.530   EfDer =  1.000

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    66.457    3660.150       9.236     563.767       1.000       1.000       0.980
W Kg/sec =  30.2079525

  W cor      RPM cor        GAMMA        Cp         R           Blades       THK
   110.272    3510.810       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 132943.031   52146.965       1.598     513.330     321.229     401.059       1.249

    ROTOR LEADING EDGE CONDITIONS, STAGE   4

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   455.70    -0.16   455.70     0.40   590.06
 MEAN    16.97     0.00    -0.02   455.70    -0.16   455.70     0.40
 HUB     14.32     0.00    -0.02   455.70    -0.16   455.70     0.40
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.48    46.36     7.12   615.18   765.70     8.28   546.46     0.67
MEAN    49.96    43.80     6.16   542.06   708.28     8.28   546.46     0.62
HUB     45.12    37.84     7.28   457.39   645.76     8.28   546.46     0.56

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   533.30   279.11   454.43  1167.75     0.46
MEAN    16.57   544.01   289.22   460.75  1164.24     0.47
HUB     13.89   588.38   356.82   467.84  1160.78     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    603.04   558.07   323.93     0.48  5272.59
MEAN   529.38   519.59   240.16     0.45  4796.21     1.48
HUB    443.66   475.83    86.84     0.41  4958.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     10.73     1.16     9.30   590.83     1.05   567.13     0.92     0.91
MEAN    10.59     1.15     9.12   588.38     1.04   563.72     0.92     0.91
HUB     10.64     1.15     8.93   589.22     1.05   560.37     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.56    35.48    31.50     3.98     0.93     0.33     2.90
MEAN    32.12    27.53    23.50     4.03     0.93     0.33     3.29     0.91
HUB     37.33    10.52     6.50     4.02     0.93     0.33     3.90


  blockage3   Cor/Incid
     0.950       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    16.481     536.247     290.850     450.519    1166.061       0.460       0.054

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
    10.639       9.202     565.512      46.000      32.846      32.400      -0.446

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    16.481     465.554     290.850     548.939    1172.130       0.397       0.270

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950      10.626       9.531     571.414     456.573       0.018       0.359

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    16.096     441.670       0.000     441.670    1173.981       0.376       0.266

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       9.611     573.220       0.000       0.060       0.037       0.322

   STAGE EXIT CONDITIONS, STAGE   4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.880      10.598       1.147     589.478      25.711     249.093       1.931

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 160015.656       0.440     600.951  625021.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc = 5.530   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     66.457    3660.150      10.598     589.478       1.000       1.000       0.980
W Kg/sec =  30.2079525

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     98.270    3433.392       1.401       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
132943.031	52146.965	1.780	509.668	286.281	390.276	1.363

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	410.99	-0.14	410.99	0.35	548.89
MEAN	15.91	0.00	-0.02	410.99	-0.14	410.99	0.35	
HUB	13.07	0.00	-0.02	410.99	-0.14	410.99	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.92	47.36	7.56	585.16	715.18	9.74	575.41	0.61
MEAN	51.05	44.80	6.25	508.27	653.76	9.74	575.41	0.56
HUB	45.46	38.84	6.62	417.47	585.93	9.74	575.41	0.50

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	497.17	277.05	412.82	1195.39	0.42
MEAN	15.50	501.63	275.74	419.04	1191.42	0.42
HUB	12.59	534.66	323.34	425.80	1187.49	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	573.02	507.96	295.97	0.42	4972.82	
MEAN	495.01	472.94	219.26	0.40	4275.63	1.52
HUB	402.14	433.03	78.79	0.36	4072.71	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	12.14	1.15	10.78	614.99	1.04	594.40	0.92	0.91
MEAN	11.91	1.12	10.55	611.41	1.04	590.45	0.92	0.91
HUB	11.85	1.12	10.31	610.37	1.04	586.56	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.87	35.64	31.50	4.14	0.93	0.36	2.90	
MEAN	33.35	27.62	23.50	4.12	0.93	0.34	3.34	0.91
HUB	37.21	10.48	6.50	3.98	0.93	0.33	4.06	

blockage3	Cor/Incid
0.950	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	507.421	280.801	422.643	1191.770	0.426	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
11.938	10.539	590.808	46.000	33.600	33.000	-0.600

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	441.861	280.801	523.536	1196.988	0.369	0.214

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	11.919	10.848	595.993	440.827	0.034	0.374

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	412.453	0.000	412.453	1199.088	0.344	0.308

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	10.978	598.086	0.000	0.060	0.037	0.305

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.881	11.915	1.124	612.259	22.781	258.013	2.000

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 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  141847.734       0.432     532.720  636072.812

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     907415.50   3407.8655    178.7411      2.2989      0.8605      5.5298      1.3127


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NPSS: Inlet Mach number .78, Altitude 35000ft, dT 22R, Thrust 75.6%
Stage 2 stator Blocked @ 15%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 5.657   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      66.218    3661.312       5.183     466.396       1.000       1.000       0.980
 W Kg/sec =  30.0989075

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     178.096    3861.157       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  132463.141   51958.723       1.603     831.557     518.762     619.754       1.195

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   413.00    -0.14   413.00     0.40   695.11
  MEAN    17.06     0.00    -0.02   413.00    -0.14   413.00     0.40
  HUB     12.51     0.00    -0.02   413.00    -0.14   413.00     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.94    50.47     7.47   659.15   777.97     4.65   452.17     0.75
  MEAN    52.86    47.20     5.66   545.09   683.99     4.65   452.17     0.66
  HUB     44.07    38.62     5.45   399.71   574.84     4.65   452.17     0.55

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   650.48   367.05   537.02  1063.43     0.61
  MEAN    18.04   685.56   407.83   551.06  1057.81     0.65
  HUB     15.00   790.42   537.12   579.89  1047.46     0.75

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    659.15   611.32   292.09     0.57  7575.25
  MEAN   576.27   576.23   168.44     0.54  7358.07     1.32
  HUB    479.26   582.77    57.86     0.56  8058.61

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      6.70     1.29     5.20   505.33     1.08   470.05     0.92     0.91
  MEAN     6.65     1.28     5.02   504.21     1.08   465.04     0.92     0.91
  HUB      6.81     1.31     4.67   507.81     1.09   455.76     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     34.35    28.54    24.20     4.34     0.93     0.30     2.90
  MEAN    36.50    17.00    12.70     4.30     0.92     0.24     3.51     0.91
  HUB     42.81    -5.70    -9.30     3.60     0.92     0.09     4.78
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   blockage3   Cor/Incid
      0.950       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     697.269     407.039     566.130    1057.785       0.659      -0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.702       5.006     465.239      24.000      35.716      35.400      -0.316

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     585.216     407.039     712.852    1071.323       0.546       0.277

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.674       5.448     477.224     528.796       0.026       0.427

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     18.083     535.116       0.000     535.116    1076.564       0.497       0.345

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.613     481.905       0.000       0.060       0.042       0.371

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874       6.646       1.282     505.786      39.390     219.411       1.701

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 244903.078       0.564     916.431  727782.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc = 5.657   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     66.218    3661.312       6.646     505.786       1.000       1.000       0.980
W Kg/sec =  30.0989075

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    144.632    3707.760       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 132463.141   51958.723       1.402     590.487     421.292     474.134       1.125

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   507.28    -0.17   507.28     0.47   664.90
 MEAN    18.08     0.00    -0.02   507.28    -0.17   507.28     0.47
 HUB     15.21     0.00    -0.02   507.28    -0.17   507.28     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.32    46.36     5.96   656.59   829.87     5.71   484.33     0.77
 MEAN    48.72    42.30     6.42   577.62   768.88     5.71   484.33     0.71
 HUB     43.78    37.84     5.94   485.97   702.62     5.71   484.33     0.65

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   581.05   298.19   498.70  1106.39     0.53
 MEAN    18.01   595.78   311.93   507.60  1102.19     0.54
 HUB     15.22   648.67   391.06   517.53  1098.11     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.44   611.72   354.25     0.55  6092.54
 MEAN   575.44   571.92   263.51     0.52  5620.91     1.46
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 HUB    486.39   526.24    95.33     0.48  5955.75

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     8.06     1.21     6.67   537.09     1.06   508.94     0.92     0.91
 MEAN    7.94     1.19     6.51   534.67     1.06   505.07     0.92     0.91
 HUB     8.02     1.21     6.33   536.39     1.06   501.31     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    30.88    35.39    31.50     3.89     0.93     0.32     2.90
 MEAN   31.57    27.44    23.50     3.94     0.93     0.32     3.30     0.91
 HUB    37.08    10.44     6.50     3.94     0.93     0.32     3.92


  blockage3   Cor/Incid
     0.800       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3         Ao3          Mach3        cp 2-3
    17.960     732.342     312.801     662.179    1087.005       0.674      -0.409

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     7.991       5.894     491.326      46.000      25.285      30.600       5.315

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.960     663.374     312.801     733.423    1095.848       0.605      -0.197

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.800       7.956       6.210     499.353     428.205       0.033       0.249

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4         Ao4           Mach4       cp 3-4
    17.823     654.703       0.000     654.703    1096.898       0.597       0.215

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.800       6.217     500.306       0.000       0.060       0.062      -0.192

   STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.856       7.912       1.191     536.048      30.262     249.654       1.935

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188206.828       0.442     704.273  653924.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc = 5.657   EfDer =  0.952

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     66.218    3661.312       7.912     536.048       1.000       1.000       0.830
W Kg/sec =  30.0989075

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    125.065    3601.579       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 132463.141   51958.723       1.268     461.987     364.307     361.823       0.993

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   597.33    -0.21   597.33     0.54   630.78
 MEAN    17.74     0.00    -0.02   597.33    -0.21   597.33     0.54
 HUB     15.05     0.00    -0.02   597.33    -0.21   597.33     0.54

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.04    46.36     0.68   641.26   876.52     6.48   506.30     0.79
 MEAN    43.51    43.40     0.11   566.76   823.57     6.48   506.30     0.75
 HUB     38.85    38.84     0.01   480.86   766.96     6.48   506.30     0.70
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      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   555.98   274.20   483.66  1137.67     0.49
MEAN    17.51   569.93   291.38   489.82  1134.49     0.50
HUB     14.85   620.43   370.98   497.29  1131.41     0.55

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    632.95   602.19   358.75     0.53  5436.02
MEAN   559.35   558.33   267.97     0.49  5104.66     1.58
HUB    474.47   507.95   103.49     0.45  5512.22

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      9.24     1.17     7.85   563.97     1.05   538.20     0.92     0.87
MEAN     9.15     1.16     7.70   562.27     1.05   535.19     0.92     0.87
HUB      9.26     1.17     7.55   564.36     1.05   532.28     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     29.55    36.57    31.50     5.07     0.93     0.37     2.90
MEAN    30.75    28.68    23.50     5.18     0.90     0.38     3.28     0.87
HUB     36.72    11.76     6.50     5.26     0.90     0.40     3.87


   blockage3   Cor/Incid
      0.950       0.952

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     575.879     293.289     495.599    1135.174       0.507       0.010

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      9.202       7.718     535.886      46.000      30.616      31.500       0.884

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     505.445     293.289     584.374    1141.879       0.443       0.218

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       9.186       8.029     542.235     471.992       0.020       0.321

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.121     489.638       0.000     489.638    1143.259       0.428       0.235

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       8.075     543.547       0.000       0.060       0.037       0.248

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.835       9.161       1.158     563.533      27.485     257.501       1.996

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 170990.344       0.427     639.849  778675.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc = 5.657   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     66.218    3661.312       9.161     563.533       1.000       1.000       0.980
W Kg/sec =  30.0989075

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    110.753    3512.652       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 132463.141   51958.723       1.591     513.330     322.632     401.059       1.243

     ROTOR LEADING EDGE CONDITIONS, STAGE   4
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       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   457.97    -0.16   457.97     0.40   590.37
MEAN    16.97     0.00    -0.02   457.97    -0.16   457.97     0.40
HUB     14.32     0.00    -0.02   457.97    -0.16   457.97     0.40

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.35    46.36     6.99   615.38   767.21     8.21   546.05     0.67
MEAN    49.82    43.80     6.02   542.23   709.87     8.21   546.05     0.62
HUB     44.98    37.84     7.14   457.54   647.47     8.21   546.05     0.57

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   534.52   277.58   456.79  1167.25     0.46
MEAN    16.57   545.42   288.15   463.09  1163.78     0.47
HUB     13.89   590.03   356.50   470.16  1160.35     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    603.23   560.99   325.65     0.48  5243.79
MEAN   529.55   522.24   241.41     0.45  4778.37     1.47
HUB    443.80   478.20    87.30     0.41  4954.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     10.64     1.16     9.21   590.46     1.05   566.65     0.92     0.91
MEAN    10.50     1.15     9.03   588.07     1.04   563.28     0.92     0.91
HUB     10.55     1.15     8.84   588.97     1.05   559.96     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.29    35.49    31.50     3.99     0.93     0.33     2.90
MEAN    31.89    27.53    23.50     4.03     0.93     0.33     3.29     0.91
HUB     37.17    10.52     6.50     4.02     0.93     0.33     3.90


  blockage3   Cor/Incid
     0.950       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    16.481     537.565     289.766     452.782    1165.615       0.461       0.054

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
    10.548       9.116     565.082      46.000      32.618      32.400      -0.218

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    16.481     468.042     289.766     550.479    1171.609       0.399       0.266

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950      10.536       9.438     570.908     456.573       0.018       0.355

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    16.096     443.985       0.000     443.985    1173.484       0.378       0.262

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       9.518     572.737       0.000       0.060       0.037       0.319

   STAGE EXIT CONDITIONS, STAGE   4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.880      10.507       1.147     589.165      25.632     250.372       1.941

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 159521.391       0.438     596.932  623470.312


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc = 5.657   EfDer =  0.999
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   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     66.218    3661.312      10.507     589.165       1.000       1.000       0.980
W Kg/sec =  30.0989075

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     98.734    3435.392       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 132463.141   51958.723       1.772     509.668     287.634     390.276       1.357

    ROTOR LEADING EDGE CONDITIONS, STAGE   5

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   413.10    -0.14   413.10     0.35   549.21
 MEAN    15.91     0.00    -0.02   413.10    -0.14   413.10     0.35
 HUB     13.07     0.00    -0.02   413.10    -0.14   413.10     0.35

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.79    47.36     7.43   585.34   716.55     9.65   574.95     0.61
 MEAN    50.91    44.80     6.11   508.44   655.21     9.65   574.95     0.56
 HUB     45.32    38.84     6.48   417.60   587.50     9.65   574.95     0.50

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   498.19   275.62   415.00  1194.87     0.42
 MEAN    15.50   502.89   274.73   421.22  1190.92     0.42
 HUB     12.59   536.22   323.05   427.98  1187.02     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    573.20   510.67   297.58     0.43  4947.29
 MEAN   495.16   475.41   220.43     0.40  4259.91     1.51
 HUB    402.26   435.25    79.21     0.37  4069.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     12.03     1.14    10.67   614.56     1.04   593.88     0.92     0.91
 MEAN    11.81     1.12    10.44   611.03     1.04   589.96     0.92     0.91
 HUB     11.75     1.12    10.21   610.05     1.04   586.09     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.59    35.64    31.50     4.14     0.93     0.35     2.90
 MEAN    33.11    27.62    23.50     4.12     0.93     0.34     3.34     0.91
 HUB     37.05    10.49     6.50     3.99     0.93     0.33     4.06


  blockage3   Cor/Incid
     0.950       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    15.219     508.686     279.767     424.843    1191.275       0.427      -0.005

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
    11.832      10.438     590.320      46.000      33.366      33.000      -0.366

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    15.219     444.293     279.767     525.039    1196.422       0.371       0.210

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950      11.813      10.740     595.432     440.827       0.034       0.371

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    14.701     414.669       0.000     414.669    1198.550       0.346       0.305

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      10.870     597.552       0.000       0.060       0.037       0.302
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    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      11.809       1.124     611.877      22.712     259.348       2.010

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  141414.672       0.430     529.176  634445.250

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     905036.31   3386.6606    178.0959      2.2785      0.8524      5.6570      1.3119


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NPSS: Inlet Mach number .78, Altitude 35000ft, dT 22R, Thrust 75.6%
Stage 2 stator Blocked @ 20%

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*********************************************************************
**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
****************   Stator Vane, Gasplus Properties  *****************
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         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 5.856   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      65.841    3663.003       5.183     466.396       1.000       1.000       0.980
 W Kg/sec =  29.9276352

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     177.082    3862.941       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  131709.375   51663.059       1.612     831.557     515.810     619.754       1.202

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   410.22    -0.14   410.22     0.39   695.43
  MEAN    17.06     0.00    -0.02   410.22    -0.14   410.22     0.39
  HUB     12.51     0.00    -0.02   410.22    -0.14   410.22     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.12    50.47     7.65   659.45   776.75     4.66   452.36     0.74
  MEAN    53.06    47.20     5.86   545.34   682.52     4.66   452.36     0.65
  HUB     44.28    38.62     5.66   399.89   572.98     4.66   452.36     0.55

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   648.32   369.81   532.50  1064.04     0.61
  MEAN    18.04   682.96   409.46   546.61  1058.32     0.65
  HUB     15.00   786.74   536.87   575.09  1047.99     0.75

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    659.45   606.17   289.64     0.57  7632.16
  MEAN   576.53   571.57   167.07     0.54  7387.44     1.33
  HUB    479.49   577.95    57.38     0.55  8054.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      6.71     1.30     5.22   505.64     1.08   470.60     0.92     0.91
  MEAN     6.66     1.29     5.03   504.38     1.08   465.50     0.92     0.91
  HUB      6.81     1.31     4.68   507.81     1.09   456.24     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.78    28.54    24.20     4.34     0.93     0.30     2.90
 MEAN    36.84    17.00    12.70     4.30     0.92     0.25     3.51     0.91
 HUB     43.03    -5.70    -9.30     3.60     0.92     0.10     4.78


   blockage3   Cor/Incid
      0.950       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     694.402     408.665     561.416    1058.344       0.656      -0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.710       5.024     465.731      24.000      36.052      35.400      -0.652

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     579.759     408.665     709.315    1072.097       0.541       0.284

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.682       5.476     477.913     528.796       0.026       0.433

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     18.083     530.352       0.000     530.352    1077.215       0.492       0.351

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.638     482.487       0.000       0.060       0.041       0.377

    STAGE EXIT CONDITIONS, STAGE   1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.875       6.655       1.284     505.945      39.549     218.110       1.691

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 245894.469       0.565     914.905  722879.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc = 5.856   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     65.841    3663.003       6.655     505.945       1.000       1.000       0.980
W Kg/sec =  29.9276352

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    143.641    3708.888       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 131709.375   51663.059       1.411     590.487     418.406     474.134       1.133

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   502.92    -0.17   502.92     0.47   665.10
 MEAN    18.08     0.00    -0.02   502.92    -0.17   502.92     0.47
 HUB     15.21     0.00    -0.02   502.92    -0.17   502.92     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.57    46.36     6.21   656.90   827.45     5.73   484.85     0.77
 MEAN    48.98    42.30     6.68   577.88   766.21     5.73   484.85     0.71
 HUB     44.04    37.84     6.20   486.20   699.63     5.73   484.85     0.65

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   578.94   301.88   494.01  1107.21     0.52
 MEAN    18.01   593.31   314.65   503.01  1102.91     0.54
 HUB     15.22   645.78   392.20   513.05  1098.73     0.59
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.74   605.92   350.86     0.55  6168.01
 MEAN   575.70   566.72   261.05     0.51  5669.89     1.47
 HUB    486.61   521.66    94.42     0.47  5973.03

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     8.09     1.22     6.71   537.65     1.06   509.71     0.92     0.91
 MEAN    7.96     1.20     6.54   535.09     1.06   505.74     0.92     0.91
 HUB     8.04     1.21     6.36   536.65     1.06   501.88     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    31.43    35.38    31.50     3.88     0.93     0.33     2.90
 MEAN   32.03    27.43    23.50     3.93     0.93     0.32     3.30     0.91
 HUB    37.40    10.43     6.50     3.93     0.93     0.33     3.92


  blockage3   Cor/Incid
     0.750       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.960     797.996     315.529     732.966    1078.163       0.740      -0.650

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     8.013       5.568     483.365      46.000      23.291      30.600       7.309

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.960     735.151     315.529     800.004    1087.086       0.676      -0.452

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.750       7.964       5.862     491.399     400.556       0.043       0.220

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    17.823     727.733       0.000     727.733    1088.118       0.669       0.189

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750       5.849     492.306       0.000       0.060       0.088      -0.460

   STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.832       7.897       1.187     536.464      30.519     247.121       1.916

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 189804.297       0.445     706.209  648799.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc = 5.856   EfDer =  0.907

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     65.841    3663.003       7.897     536.464       1.000       1.000       0.780
W Kg/sec =  29.9276352

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    124.649    3601.845       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 131709.375   51663.059       1.196     434.156     363.096     339.175       0.934

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   651.69    -0.22   651.69     0.59   630.82
 MEAN    17.74     0.00    -0.02   651.69    -0.22   651.69     0.59
 HUB     15.05     0.00    -0.02   651.69    -0.22   651.69     0.59

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.56    46.36    -1.80   641.55   914.65     6.22   501.06     0.83
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 MEAN    41.04    43.40    -2.36   567.02   863.99     6.22   501.06     0.79
 HUB     36.45    38.84    -2.39   481.08   810.16     6.22   501.06     0.74

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   554.48   265.24   486.92  1137.30     0.49
 MEAN    17.51   568.54   284.07   492.48  1134.38     0.50
 HUB     14.85   619.20   365.48   499.83  1131.56     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    633.24   610.34   368.00     0.54  5258.97
 MEAN   559.61   564.32   275.54     0.50  4977.09     1.63
 HUB    474.69   511.62   109.21     0.45  5430.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      9.11     1.15     7.74   563.49     1.05   537.86     0.92     0.83
 MEAN     9.04     1.15     7.62   562.04     1.05   535.10     0.92     0.83
 HUB      9.15     1.16     7.47   564.37     1.05   532.41     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.58    37.08    31.50     5.58     0.93     0.38     2.90
 MEAN    29.98    29.23    23.50     5.73     0.89     0.40     3.28     0.83
 HUB     36.18    12.32     6.50     5.82     0.89     0.43     3.87


   blockage3   Cor/Incid
      0.950       0.907

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     574.677     285.935     498.493    1135.048       0.506       0.008

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      9.088       7.628     535.769      46.000      29.839      31.500       1.661

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     509.489     285.935     584.241    1141.272       0.446       0.203

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       9.073       7.912     541.661     471.992       0.020       0.308

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.121     493.521       0.000     493.521    1142.677       0.432       0.221

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       7.958     542.996       0.000       0.060       0.038       0.233

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.793       9.047       1.146     563.301      26.837     265.569       2.059

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 166955.797       0.416     621.196  846700.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc = 5.856   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     65.841    3663.003       9.047     563.301       1.000       1.000       0.980
W Kg/sec =  29.9276352

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    111.487    3514.999       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
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131709.375   51663.059       1.581     513.330     324.771     401.059       1.235

    ROTOR LEADING EDGE CONDITIONS, STAGE   4

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   461.49    -0.16   461.49     0.40   590.77
MEAN    16.97     0.00    -0.02   461.49    -0.16   461.49     0.40
HUB     14.32     0.00    -0.02   461.49    -0.16   461.49     0.40

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.15    46.36     6.79   615.66   769.55     8.09   545.55     0.67
MEAN    49.62    43.80     5.82   542.48   712.34     8.09   545.55     0.62
HUB     44.78    37.84     6.94   457.75   650.12     8.09   545.55     0.57

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   536.43   275.16   460.49  1166.60     0.46
MEAN    16.57   547.63   286.43   466.75  1163.19     0.47
HUB     13.89   592.61   355.97   473.78  1159.82     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    603.51   565.57   328.36     0.48  5198.01
MEAN   529.80   526.38   243.37     0.45  4749.93     1.47
HUB    444.00   481.89    88.04     0.42  4946.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     10.49     1.16     9.08   590.00     1.05   566.02     0.92     0.91
MEAN    10.36     1.15     8.90   587.70     1.04   562.71     0.92     0.91
HUB     10.42     1.15     8.72   588.71     1.05   559.45     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.86    35.49    31.50     3.99     0.93     0.33     2.90
MEAN    31.54    27.54    23.50     4.04     0.92     0.32     3.29     0.91
HUB     36.92    10.53     6.50     4.03     0.92     0.33     3.90


  blockage3   Cor/Incid
     0.950       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    16.481     539.620     288.040     456.315    1165.050       0.463       0.055

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
    10.410       8.985     564.538      46.000      32.261      32.400       0.139

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    16.481     471.942     288.040     552.898    1170.922       0.403       0.260

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950      10.397       9.296     570.243     456.573       0.018       0.350

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    16.096     447.614       0.000     447.614    1172.835       0.382       0.257

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       9.377     572.108       0.000       0.060       0.037       0.313

   STAGE EXIT CONDITIONS, STAGE   4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.879      10.369       1.146     588.805      25.504     252.394       1.957

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 158726.094       0.436     590.576  620900.500
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc = 5.856   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     65.841    3663.003      10.369     588.805       1.000       1.000       0.980
W Kg/sec =  29.9276352

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     99.450    3438.029       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 131709.375   51663.059       1.759     509.668     289.721     390.276       1.347

    ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   416.39    -0.14   416.39     0.35   549.63
 MEAN    15.91     0.00    -0.02   416.39    -0.14   416.39     0.35
 HUB     13.07     0.00    -0.02   416.39    -0.14   416.39     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.59    47.36     7.23   585.61   718.68     9.51   574.36     0.61
 MEAN    50.70    44.80     5.90   508.67   657.48     9.51   574.36     0.56
 HUB     45.11    38.84     6.27   417.79   589.96     9.51   574.36     0.50

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   499.82   273.36   418.44  1194.17     0.42
 MEAN    15.50   504.88   273.09   424.65  1190.26     0.42
 HUB     12.59   538.65   322.54   431.41  1186.41     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    573.47   514.94   300.11     0.43  4906.67
 MEAN   495.39   479.32   222.30     0.40  4234.59     1.50
 HUB    402.45   438.75    79.90     0.37  4062.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     11.86     1.14    10.51   614.00     1.04   593.19     0.92     0.91
 MEAN    11.65     1.12    10.29   610.55     1.04   589.31     0.92     0.91
 HUB     11.59     1.12    10.06   609.67     1.04   585.49     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.16    35.65    31.50     4.15     0.93     0.35     2.90
 MEAN    32.75    27.63    23.50     4.13     0.92     0.33     3.34     0.91
 HUB     36.78    10.49     6.50     3.99     0.92     0.32     4.06


  blockage3   Cor/Incid
     0.950       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
    15.219     510.673     278.102     428.306    1190.624       0.429       -0.004

    Pt3         Ps3         Ts3        Vane No.     Alpha3     Vane A3      Incid3
    11.670      10.283     589.679      46.000      32.996      33.000       0.004

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth      Aoth          Machth      cp 2-Th
    15.219     448.136     278.102     527.415    1195.657       0.375       0.203

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      11.651      10.574     594.674     440.827       0.034       0.365

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4          Mach4        cp 3-4
    14.701     418.169       0.000     418.169    1197.829       0.349       0.299
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   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.705     596.837       0.000       0.060       0.037       0.296

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      11.647       1.123     611.405      22.599     261.480       2.027

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 140709.609       0.428     523.542  631771.875

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    902090.25   3356.4282    177.0825      2.2472      0.8391      5.8559      1.3109


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NPSS: Inlet Mach number .78, Altitude 35000ft, dT 22R, Thrust 75.6%
Stage 2 stator Blocked @ 25%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
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         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 6.171   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      65.242    3665.532       5.183     466.396       1.000       1.000       0.980
 W Kg/sec =  29.655592

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     175.473    3865.608       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  130512.133   51193.441       1.627     831.557     511.121     619.754       1.213

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   405.82    -0.14   405.82     0.39   695.91
  MEAN    17.06     0.00    -0.02   405.82    -0.14   405.82     0.39
  HUB     12.51     0.00    -0.02   405.82    -0.14   405.82     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.42    50.47     7.95   659.91   774.82     4.67   452.66     0.74
  MEAN    53.37    47.20     6.17   545.72   680.18     4.67   452.66     0.65
  HUB     44.61    38.62     5.99   400.17   570.03     4.67   452.66     0.55

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   645.01   374.09   525.45  1064.97     0.61
  MEAN    18.04   678.93   412.00   539.64  1059.12     0.64
  HUB     15.00   780.99   536.45   567.61  1048.80     0.74

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    659.91   598.15   285.81     0.56  7720.46
  MEAN   576.93   564.28   164.94     0.53  7433.17     1.34
  HUB    479.82   570.42    56.63     0.54  8048.43

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      6.74     1.30     5.26   506.12     1.09   471.43     0.92     0.91
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 MEAN     6.67     1.29     5.06   504.64     1.08   466.22     0.92     0.91
 HUB      6.81     1.31     4.71   507.81     1.09   456.98     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.45    28.54    24.20     4.34     0.93     0.31     2.90
 MEAN    37.36    17.00    12.70     4.30     0.93     0.26     3.51     0.91
 HUB     43.38    -5.70    -9.30     3.60     0.93     0.11     4.78


   blockage3   Cor/Incid
      0.950       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     689.982     411.197     554.068    1059.204       0.651      -0.004

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.721       5.053     466.488      24.000      36.581      35.400      -1.181

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     571.317     411.197     703.908    1073.281       0.532       0.295

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.693       5.518     478.970     528.796       0.026       0.441

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     18.083     522.978       0.000     522.978    1078.213       0.485       0.360

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.676     483.382       0.000       0.060       0.041       0.386

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877       6.668       1.287     506.191      39.796     216.079       1.675

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 247426.250       0.568     912.236  715128.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc = 6.171   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     65.242    3665.532       6.668     506.191       1.000       1.000       0.980
W Kg/sec =  29.655592

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    142.092    3710.545       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 130512.133   51193.441       1.427     590.487     413.894     474.134       1.146

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   496.15    -0.17   496.15     0.46   665.40
 MEAN    18.08     0.00    -0.02   496.15    -0.17   496.15     0.46
 HUB     15.21     0.00    -0.02   496.15    -0.17   496.15     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.96    46.36     6.60   657.35   823.71     5.77   485.66     0.76
 MEAN    49.38    42.30     7.08   578.28   762.09     5.77   485.66     0.71
 HUB     44.45    37.84     6.61   486.53   695.02     5.77   485.66     0.64

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     20.42   575.81   307.56   486.79  1108.47     0.52
 MEAN    18.01   589.58   318.82   495.94  1104.02     0.53
 HUB     15.22   641.34   393.90   506.12  1099.68     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.19   597.02   345.63     0.54  6283.82
 MEAN   576.10   558.70   257.28     0.51  5745.06     1.48
 HUB    486.95   514.60    93.05     0.47  5998.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     8.13     1.22     6.76   538.52     1.06   510.87     0.92     0.91
 MEAN    8.00     1.20     6.58   535.74     1.06   506.76     0.92     0.91
 HUB     8.06     1.21     6.40   537.05     1.06   502.76     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    32.28    35.38    31.50     3.88     0.93     0.34     2.90
 MEAN   32.74    27.42    23.50     3.92     0.93     0.33     3.30     0.91
 HUB    37.89    10.42     6.50     3.92     0.93     0.33     3.92


  blockage3   Cor/Incid
     0.700       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
    17.960     892.686     319.717     833.468    1063.932       0.839       -1.022

    Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
     8.047       5.073     470.659      46.000      20.987      30.600       9.613

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
    17.960     838.642     319.717     897.519    1072.706       0.782       -0.851

  BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
     0.700       7.974       5.324     478.460     372.907       0.060       0.181

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4         Ao4          Mach4       cp 3-4
    17.823     837.911       0.000     837.911    1073.094       0.781       0.120

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.700       5.250     478.589       0.000       0.060       0.139      -0.901

   STAGE EXIT CONDITIONS, STAGE   2
     Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
     0.787       7.856        1.178     537.104      30.912     243.276       1.886

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 192248.188       0.451     708.800  640775.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc = 6.171   EfDer =  0.844

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     65.242    3665.532       7.856     537.104       1.000       1.000       0.730
W Kg/sec =  29.655592

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    124.230    3602.186       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 130512.133   51193.441       1.123     406.326     361.877     316.528       0.875

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   723.51    -0.25   723.51     0.66   630.88
 MEAN    17.74     0.00    -0.02   723.51    -0.25   723.51     0.66
 HUB     15.05     0.00    -0.02   723.51    -0.25   723.51     0.66
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     41.59    46.36    -4.77   642.00   967.44     5.84   493.47     0.89
MEAN    38.12    43.40    -5.28   567.42   919.62     5.84   493.47     0.84
HUB     33.65    38.84    -5.19   481.42   869.18     5.84   493.47     0.80

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   553.29   252.99   492.06  1136.80     0.49
MEAN    17.51   567.47   274.11   496.88  1134.24     0.50
HUB     14.85   618.46   358.16   504.19  1131.74     0.55

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    633.68   622.14   380.69     0.55  5016.67
MEAN   560.00   573.25   285.89     0.51  4803.16     1.69
HUB    475.02   517.56   116.86     0.46  5322.41

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      8.92     1.14     7.59   562.90     1.05   537.38     0.92     0.77
MEAN     8.87     1.13     7.48   561.80     1.05   534.96     0.92     0.77
HUB      8.99     1.14     7.34   564.47     1.05   532.59     0.92     0.77

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     27.21    37.73    31.50     6.23     0.93     0.40     2.90
MEAN    28.88    29.91    23.50     6.41     0.88     0.42     3.28     0.77
HUB     35.39    13.05     6.50     6.55     0.88     0.46     3.87


   blockage3   Cor/Incid
      0.950       0.844

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     573.917     275.910     503.244    1134.865       0.506       0.004

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      8.914       7.485     535.601      46.000      28.734      31.500       2.766

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     515.883     275.910     585.031    1140.437       0.452       0.181

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       8.898       7.732     540.873     471.992       0.021       0.291

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.121     499.690       0.000     499.690    1141.881       0.438       0.200

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       7.777     542.244       0.000       0.060       0.039       0.212

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.733       8.871       1.129     563.059      25.956     277.755       2.153

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 161476.250       0.402     595.347  933223.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc = 6.171   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     65.242    3665.532       8.871     563.059       1.000       1.000       0.980
W Kg/sec =  29.655592

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
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   112.635    3518.180       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
130512.133   51193.441       1.564     513.330     328.117     401.059       1.222

    ROTOR LEADING EDGE CONDITIONS, STAGE   4

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   467.09    -0.16   467.09     0.41   591.30
MEAN    16.97     0.00    -0.02   467.09    -0.16   467.09     0.41
HUB     14.32     0.00    -0.02   467.09    -0.16   467.09     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     52.84    46.36     6.48   616.09   773.26     7.91   544.88     0.68
MEAN    49.30    43.80     5.50   542.86   716.27     7.91   544.88     0.63
HUB     44.45    37.84     6.61   458.07   654.33     7.91   544.88     0.57

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   539.55   271.26   466.40  1165.69     0.46
MEAN    16.57   551.17   283.64   472.58  1162.37     0.47
HUB     13.89   596.72   355.11   479.55  1159.10     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    603.93   572.88   332.67     0.49  5124.52
MEAN   530.16   533.01   246.52     0.46  4703.82     1.46
HUB    444.31   487.78    89.20     0.42  4934.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     10.27     1.16     8.87   589.40     1.05   565.14     0.92     0.91
MEAN    10.15     1.14     8.70   587.24     1.04   561.92     0.92     0.91
HUB     10.21     1.15     8.52   588.43     1.05   558.76     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.18    35.50    31.50     4.00     0.93     0.32     2.90
MEAN    30.97    27.55    23.50     4.05     0.92     0.32     3.29     0.91
HUB     36.52    10.54     6.50     4.04     0.92     0.32     3.90


  blockage3   Cor/Incid
     0.950       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     542.918     285.240     461.950    1164.274       0.466       0.055

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     10.196       8.784     563.792      46.000      31.694      32.400       0.706

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     16.481     478.190     285.240     556.801    1169.947       0.409       0.250

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950      10.183       9.076     569.300     456.573       0.018       0.342

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     16.096     453.433       0.000     453.433    1171.920       0.387       0.248

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       9.158     571.222       0.000       0.060       0.037       0.305

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      10.155       1.145     588.357      25.297     255.658       1.982

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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157433.797       0.432     580.443  616697.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
RESET =  0.000BLEED =  0.000 DPInc = 6.171   EfDer =  0.999

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    65.242    3665.532      10.155     588.357       1.000       1.000       0.980
W Kg/sec =  29.655592

  W cor      RPM cor        GAMMA        Cp         R           Blades       THK
   100.583    3441.715       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
130512.133   51193.441       1.739     509.668     293.023     390.276       1.332

    ROTOR LEADING EDGE CONDITIONS, STAGE   5

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   421.68    -0.15   421.68     0.36   550.22
MEAN    15.91     0.00    -0.02   421.68    -0.15   421.68     0.36
HUB     13.07     0.00    -0.02   421.68    -0.15   421.68     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.27    47.36     6.91   586.02   722.08     9.29   573.54     0.61
MEAN    50.37    44.80     5.57   509.02   661.11     9.29   573.54     0.56
HUB     44.76    38.84     5.92   418.08   593.91     9.29   573.54     0.51

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   502.48   269.68   423.99  1193.17     0.42
MEAN    15.50   508.13   270.46   430.17  1189.33     0.43
HUB     12.59   542.58   321.71   436.92  1185.55     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    573.86   521.82   304.18     0.44  4840.69
MEAN   495.73   485.58   225.27     0.41  4193.87     1.49
HUB    402.73   444.37    81.02     0.37  4052.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     11.59     1.14    10.26   613.23     1.04   592.20     0.92     0.91
MEAN    11.39     1.12    10.05   609.91     1.04   588.40     0.92     0.91
HUB     11.35     1.12     9.83   609.18     1.04   584.65     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.46    35.66    31.50     4.16     0.93     0.34     2.90
MEAN    32.16    27.64    23.50     4.14     0.92     0.33     3.34     0.91
HUB     36.36    10.51     6.50     4.01     0.92     0.32     4.06


  blockage3   Cor/Incid
     0.950       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    15.219     513.917     275.424     433.881    1189.699       0.432      -0.004

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
    11.418      10.043     588.769      46.000      32.407      33.000       0.593

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    15.219     454.347     275.424     531.309    1194.544       0.380       0.191

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950      11.399      10.315     593.574     440.827       0.034       0.356

   VANED DIFFUSER EXIT:
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   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     14.701     423.823       0.000     423.823    1196.789       0.354       0.289

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.448     595.807       0.000       0.060       0.037       0.286

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      11.395       1.122     610.771      22.415     264.944       2.054

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 139556.547       0.424     514.531  627422.125

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    898141.06   3311.3574    175.4728      2.1986      0.8174      6.1710      1.3096


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NPSS: Inlet Mach number .78, Altitude 35000ft, dT 22R, Thrust 75.6%
Stage 2 stator Blocked @ 27%

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*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*****************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 6.359   EfDer =  1.000

    W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
      64.884    3667.012       5.183     466.396       1.000       1.000       0.980
 W Kg/sec =  29.4928627

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     174.510    3867.168       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  129795.977   50912.527       1.636     831.557     508.317     619.754       1.219

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   403.20    -0.14   403.20     0.39   696.19
  MEAN    17.06     0.00    -0.02   403.20    -0.14   403.20     0.39
  HUB     12.51     0.00    -0.02   403.20    -0.14   403.20     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.59    50.47     8.12   660.17   773.68     4.68   452.84     0.74
  MEAN    53.56    47.20     6.36   545.94   678.80     4.68   452.84     0.65
  HUB     44.81    38.62     6.19   400.33   568.28     4.68   452.84     0.54

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   643.11   376.60   521.30  1065.51     0.60
  MEAN    18.04   676.59   413.50   535.53  1059.58     0.64
  HUB     15.00   777.62   536.19   563.20  1049.28     0.74

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    660.17   593.44   283.57     0.56  7772.16
  MEAN   577.17   559.98   163.66     0.53  7460.30     1.35
  HUB    480.01   565.99    56.18     0.54  8044.64
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     6.75     1.30     5.27   506.40     1.09   471.92     0.92     0.91
 MEAN    6.68     1.29     5.08   504.80     1.08   466.64     0.92     0.91
 HUB     6.81     1.31     4.73   507.81     1.09   457.42     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    35.85    28.54    24.20     4.34     0.93     0.32     2.90
 MEAN   37.67    16.99    12.70     4.29     0.93     0.26     3.51     0.91
 HUB    43.59    -5.70    -9.30     3.60     0.93     0.11     4.78


   blockage3   Cor/Incid
      0.950       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     687.420     412.699     549.751    1059.702       0.649      -0.004

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.728       5.069     466.927      24.000      36.896      35.400      -1.496

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     566.386     412.699     700.795    1073.968       0.527       0.301

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.700       5.543     479.583     528.796       0.026       0.446

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     18.083     518.667       0.000     518.667    1078.792       0.481       0.366

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.698     483.901       0.000       0.060       0.041       0.391

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877       6.675       1.288     506.336      39.940     214.881       1.666

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 248326.578       0.570     910.532  710512.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc = 6.359   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     64.884    3667.012       6.675     506.336       1.000       1.000       0.980
W Kg/sec =  29.4928627

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    141.177    3711.512       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 129795.977   50912.527       1.436     590.487     411.230     474.134       1.153

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   492.19    -0.17   492.19     0.46   665.58
 MEAN    18.08     0.00    -0.02   492.19    -0.17   492.19     0.46
 HUB     15.21     0.00    -0.02   492.19    -0.17   492.19     0.46

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.19    46.36     6.83   657.61   821.54     5.79   486.14     0.76
 MEAN    49.62    42.30     7.32   578.52   759.69     5.79   486.14     0.70
 HUB     44.69    37.84     6.85   486.73   692.33     5.79   486.14     0.64

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
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     0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   574.05   310.85   482.60  1109.20     0.52
 MEAN    18.01   587.45   321.26   491.83  1104.66     0.53
 HUB     15.22   638.78   394.91   502.08  1100.23     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.45   591.85   342.61     0.53  6350.98
 MEAN   576.33   554.04   255.07     0.50  5788.88     1.49
 HUB    487.15   510.48    92.24     0.46  6014.28

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      8.16     1.22     6.79   539.02     1.06   511.54     0.92     0.91
 MEAN     8.02     1.20     6.61   536.13     1.06   507.35     0.92     0.91
 HUB      8.07     1.21     6.42   537.29     1.06   503.27     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.79    35.37    31.50     3.87     0.93     0.34     2.90
 MEAN    33.15    27.41    23.50     3.91     0.93     0.33     3.30     0.91
 HUB     38.19    10.41     6.50     3.91     0.93     0.34     3.92


   blockage3   Cor/Incid
      0.680       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     947.799     322.158     891.369    1054.891       0.898      -1.247

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      8.067       4.776     462.592      46.000      19.871      30.600      10.729

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     900.340     322.158     956.242    1063.183       0.847      -1.100

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.680       7.978       4.989     469.902     361.848       0.070       0.155

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     908.337       0.000     908.337    1062.585       0.855       0.050

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680       4.850     468.783       0.000       0.060       0.178      -1.195

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.754       7.820       1.171     537.477      31.141     241.061       1.869

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 193673.453       0.454     710.137  636036.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc = 6.359   EfDer =  0.814

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     64.884    3667.012       7.820     537.477       1.000       1.000       0.710
W Kg/sec =  29.4928627

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    124.164    3602.386       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 129795.977   50912.527       1.093     395.194     361.686     307.469       0.850

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
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 TIP     20.07     0.00    -0.02   761.71    -0.26   761.71     0.70   630.92
 MEAN    17.74     0.00    -0.02   761.71    -0.26   761.71     0.70
 HUB     15.05     0.00    -0.02   761.71    -0.26   761.71     0.70

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     40.15    46.36    -6.21   642.25   996.51     5.62   489.11     0.92
 MEAN    36.71    43.40    -6.69   567.64   950.11     5.62   489.11     0.88
 HUB     32.32    38.84    -6.52   481.61   901.33     5.62   489.11     0.83

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   553.04   246.39   495.12  1136.52     0.49
 MEAN    17.51   567.29   268.75   499.60  1134.15     0.50
 HUB     14.85   618.46   354.30   506.92  1131.84     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    633.93   628.76   387.55     0.55  4886.23
 MEAN   560.22   578.41   291.48     0.51  4709.47     1.73
 HUB    475.21   521.14   120.91     0.46  5265.30

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      8.81     1.13     7.49   562.61     1.05   537.12     0.92     0.74
 MEAN     8.78     1.12     7.40   561.71     1.05   534.88     0.92     0.74
 HUB      8.89     1.14     7.26   564.56     1.05   532.68     0.92     0.74

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.46    38.05    31.50     6.55     0.93     0.41     2.90
 MEAN    28.28    30.26    23.50     6.76     0.87     0.43     3.28     0.74
 HUB     34.95    13.42     6.50     6.92     0.87     0.47     3.87


   blockage3   Cor/Incid
      0.950       0.814

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     573.895     270.509     506.142    1134.760       0.506       0.003

      Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      8.813       7.400     535.506      46.000      28.122      31.500       3.378

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     519.707     270.509     585.893    1139.983       0.456       0.168

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       8.796       7.627     540.446     471.992       0.022       0.281

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.121     503.391       0.000     503.391    1141.449       0.441       0.188

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       7.672     541.837       0.000       0.060       0.041       0.200

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.703       8.769       1.121     562.962      25.484     285.070       2.210

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 158541.312       0.395     581.319  976775.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc = 6.359   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     64.884    3667.012       8.769     562.962       1.000       1.000       0.980
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W Kg/sec =  29.4928627

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    113.316    3519.906       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 129795.977   50912.527       1.555     513.330     330.101     401.059       1.215

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   470.44    -0.16   470.44     0.41   591.59
 MEAN    16.97     0.00    -0.02   470.44    -0.16   470.44     0.41
 HUB     14.32     0.00    -0.02   470.44    -0.16   470.44     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.65    46.36     6.29   616.33   775.49     7.81   544.52     0.68
 MEAN    49.11    43.80     5.31   543.07   718.62     7.81   544.52     0.63
 HUB     44.26    37.84     6.42   458.25   656.85     7.81   544.52     0.57

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   541.46   268.90   469.96  1165.19     0.46
 MEAN    16.57   553.33   281.97   476.09  1161.93     0.48
 HUB     13.89   599.20   354.58   483.02  1158.72     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    604.17   577.30   335.27     0.50  5079.99
 MEAN   530.38   537.00   248.40     0.46  4676.14     1.45
 HUB    444.49   491.32    89.91     0.42  4927.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     10.14     1.16     8.74   589.09     1.05   564.66     0.92     0.91
 MEAN    10.02     1.14     8.58   587.01     1.04   561.50     0.92     0.91
 HUB     10.09     1.15     8.41   588.30     1.05   558.38     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.78    35.50    31.50     4.00     0.93     0.31     2.90
 MEAN    30.64    27.55    23.50     4.05     0.92     0.31     3.29     0.91
 HUB     36.28    10.54     6.50     4.04     0.92     0.32     3.90


  blockage3   Cor/Incid
     0.950       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    16.481     544.933     283.559     465.345    1163.850       0.468       0.056

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
    10.070       8.665     563.386      46.000      31.356      32.400       1.044

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    16.481     481.965     283.559     559.193    1169.403       0.412       0.245

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950      10.058       8.947     568.775     456.573       0.019       0.337

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    16.096     456.951       0.000     456.951    1171.413       0.390       0.242

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       9.030     570.732       0.000       0.060       0.037       0.300

   STAGE EXIT CONDITIONS, STAGE   4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
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      0.876      10.030       1.144     588.133      25.171     257.642       1.997

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 156648.078       0.429     574.377  614139.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc = 6.359   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     64.884    3667.012      10.030     588.133       1.000       1.000       0.980
W Kg/sec =  29.4928627

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    101.262    3443.759       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 129795.977   50912.527       1.728     509.668     295.001     390.276       1.323

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   424.87    -0.15   424.87     0.36   550.54
 MEAN    15.91     0.00    -0.02   424.87    -0.15   424.87     0.36
 HUB     13.07     0.00    -0.02   424.87    -0.15   424.87     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.08    47.36     6.72   586.25   724.14     9.16   573.10     0.62
 MEAN    50.17    44.80     5.37   509.23   663.30     9.16   573.10     0.57
 HUB     44.56    38.84     5.72   418.25   596.29     9.16   573.10     0.51

      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   504.14   267.44   427.35  1192.60     0.42
 MEAN    15.50   510.11   268.84   433.52  1188.81     0.43
 HUB     12.59   544.97   321.21   440.25  1185.08     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    574.09   525.99   306.65     0.44  4800.59
 MEAN   495.93   489.40   227.10     0.41  4168.68     1.48
 HUB    402.89   447.77    81.68     0.38  4045.90

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     11.44     1.14    10.12   612.81     1.04   591.64     0.92     0.91
 MEAN    11.25     1.12     9.91   609.56     1.04   587.89     0.92     0.91
 HUB     11.21     1.12     9.70   608.93     1.04   584.19     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.04    35.66    31.50     4.16     0.93     0.34     2.90
 MEAN    31.80    27.65    23.50     4.15     0.92     0.32     3.34     0.91
 HUB     36.11    10.51     6.50     4.01     0.92     0.31     4.06


  blockage3   Cor/Incid
     0.950       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     515.893     273.768     437.260    1189.184       0.434      -0.004

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     11.270       9.903     588.263      46.000      32.051      33.000       0.949

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     458.130     273.768     533.697    1193.912       0.384       0.184

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
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      0.950      11.250      10.163     592.950     440.827       0.034       0.351

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     14.701     427.263       0.000     427.263    1196.202       0.357       0.283

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.297     595.227       0.000       0.060       0.037       0.281

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      11.247       1.121     610.434      22.301     267.068       2.070

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 138849.297       0.421     509.115  624784.688

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    896038.75   3285.4790    174.5099      2.1700      0.8041      6.3595      1.3088


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CRUISE 1 Operating Point #2

NPSS: Inlet Mach number .78, Altitude 35000ft, dT 22R, Thrust 72.7%
Stage 2 stator Blocked @ 10%

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**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
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         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 5.869   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      65.287    3628.360       5.183     466.396       1.000       1.000       0.980
 W Kg/sec =  29.6760006

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     175.594    3826.406       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  130601.953   51228.672       1.626     831.557     511.473     619.754       1.212

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   406.15    -0.14   406.15     0.39   688.85
  MEAN    17.06     0.00    -0.02   406.15    -0.14   406.15     0.39
  HUB     12.51     0.00    -0.02   406.15    -0.14   406.15     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.13    50.47     7.66   653.22   769.30     4.67   452.64     0.74
  MEAN    53.07    47.20     5.87   540.18   675.95     4.67   452.64     0.65
  HUB     44.29    38.62     5.67   396.11   567.42     4.67   452.64     0.54

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   642.67   365.97   528.29  1063.83     0.60
  MEAN    18.04   676.84   405.51   541.92  1058.27     0.64
  HUB     15.00   779.14   531.77   569.46  1048.19     0.74
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.22   601.33   287.25     0.57  7552.79
 MEAN   571.08   566.65   165.57     0.54  7316.19     1.33
 HUB    474.95   572.29    56.82     0.55  7978.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     6.68     1.29     5.22   504.86     1.08   470.43     0.92     0.91
 MEAN    6.63     1.28     5.03   503.66     1.08   465.47     0.92     0.91
 HUB     6.77     1.31     4.69   507.03     1.09   456.45     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    34.71    28.53    24.20     4.33     0.93     0.30     2.90
 MEAN   36.81    16.99    12.70     4.29     0.92     0.25     3.51     0.91
 HUB    43.04    -5.70    -9.30     3.60     0.92     0.10     4.78


  blockage3   Cor/Incid
     0.950       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    18.071     688.152     404.723     556.555    1058.300       0.650      -0.005

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     6.678       5.025     465.692      24.000      36.024      35.400      -0.624

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    18.071     575.635     404.723     703.674    1071.690       0.537       0.282

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       6.651       5.464     477.551     528.796       0.026       0.431

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    18.083     526.720       0.000     526.720    1076.724       0.489       0.350

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       5.624     482.048       0.000       0.060       0.041       0.375

   STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875       6.624       1.278     505.185      38.790     218.122       1.691

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 241171.812       0.565     889.789  715708.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc = 5.869   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     65.287    3628.360       6.624     505.185       1.000       1.000       0.980
W Kg/sec =  29.6760006

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    142.975    3676.572       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 130601.953   51228.672       1.418     590.487     416.466     474.134       1.138

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   499.57    -0.17   499.57     0.46   659.31
 MEAN    18.08     0.00    -0.02   499.57    -0.17   499.57     0.46
 HUB     15.21     0.00    -0.02   499.57    -0.17   499.57     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.49    46.36     6.13   650.68   820.48     5.72   484.37     0.76
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 MEAN    48.90    42.30     6.60   572.42   759.89     5.72   484.37     0.70
 HUB     43.96    37.84     6.12   481.60   694.03     5.72   484.37     0.64

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   574.87   297.16   492.11  1105.95     0.52
 MEAN    18.01   589.19   310.43   500.78  1101.80     0.53
 HUB     15.22   641.25   388.10   510.47  1097.76     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    646.57   603.54   349.41     0.55  6071.56
 MEAN   570.26   564.17   259.83     0.51  5593.88     1.46
 HUB    482.01   519.04    93.91     0.47  5910.62

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      8.01     1.21     6.66   536.10     1.06   508.55     0.92     0.91
 MEAN     7.90     1.19     6.50   533.67     1.06   504.73     0.92     0.91
 HUB      7.97     1.20     6.33   535.28     1.06   501.00     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.13    35.38    31.50     3.88     0.93     0.33     2.90
 MEAN    31.79    27.42    23.50     3.92     0.93     0.32     3.30     0.91
 HUB     37.24    10.42     6.50     3.92     0.93     0.32     3.92


   blockage3   Cor/Incid
      0.850       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     670.343     311.298     593.678    1093.865       0.613      -0.227

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.947       6.166     497.547      46.000      27.670      30.600       2.930

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     594.119     311.298     670.734    1102.665       0.539       0.003

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.850       7.923       6.502     505.584     455.853       0.026       0.282

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     585.519       0.000     585.519    1103.588       0.531       0.240

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850       6.518     506.430       0.000       0.060       0.044       0.014

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873       7.896       1.192     535.018      29.832     248.172       1.924

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 185529.812       0.444     684.501  643245.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc = 5.869   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     65.287    3628.360       7.896     535.018       1.000       1.000       0.880
W Kg/sec =  29.6760006

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    123.438    3572.600       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
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130601.953   51228.672       1.362     489.818     359.566     384.470       1.069

    ROTOR LEADING EDGE CONDITIONS, STAGE   3

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   541.38    -0.19   541.38     0.49   625.70
MEAN    17.74     0.00    -0.02   541.38    -0.19   541.38     0.49
HUB     15.05     0.00    -0.02   541.38    -0.19   541.38     0.49

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     49.58    46.36     3.22   635.48   834.97     6.71   510.58     0.75
MEAN    46.06    43.40     2.66   561.66   780.23     6.71   510.58     0.70
HUB     41.37    38.84     2.53   476.53   721.36     6.71   510.58     0.65

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   550.44   282.69   472.30  1137.75     0.48
MEAN    17.51   563.74   297.48   478.87  1134.33     0.50
HUB     14.85   613.19   373.37   486.40  1131.02     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    627.25   584.63   344.57     0.51  5603.76
MEAN   554.32   543.40   256.84     0.48  5211.11     1.54
HUB    470.20   495.95    96.83     0.44  5547.39

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      9.30     1.18     7.92   563.54     1.05   538.29     0.92     0.90
MEAN     9.20     1.16     7.77   561.54     1.05   535.05     0.92     0.90
HUB      9.28     1.18     7.60   563.26     1.05   531.91     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.90    36.11    31.50     4.61     0.93     0.36     2.90
MEAN    31.85    28.21    23.50     4.71     0.91     0.36     3.28     0.90
HUB     37.51    11.26     6.50     4.76     0.91     0.38     3.87


  blockage3   Cor/Incid
     0.950       0.983

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     569.451     299.429     484.372    1135.030       0.502       0.011

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     9.245       7.784     535.747      46.000      31.724      31.500      -0.224

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     492.986     299.429     576.796    1142.182       0.432       0.239

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       9.231       8.121     542.519     471.992       0.020       0.338

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    17.121     477.719       0.000     477.719    1143.482       0.418       0.253

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       8.163     543.755       0.000       0.060       0.037       0.267

   STAGE EXIT CONDITIONS, STAGE   3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.865       9.206       1.166     562.781      27.763     248.270       1.925

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 172717.141       0.439     637.229  706677.500
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc = 5.869   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     65.287    3628.360       9.206     562.781       1.000       1.000       0.980
W Kg/sec =  29.6760006

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    108.594    3483.364       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 130601.953   51228.672       1.623     513.330     316.342     401.059       1.268

    ROTOR LEADING EDGE CONDITIONS, STAGE   4

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   447.11    -0.15   447.11     0.39   585.45
 MEAN    16.97     0.00    -0.02   447.11    -0.15   447.11     0.39
 HUB     14.32     0.00    -0.02   447.11    -0.15   447.11     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.76    46.36     7.40   609.84   756.31     8.29   546.12     0.66
 MEAN    50.25    43.80     6.45   537.35   699.16     8.29   546.12     0.61
 HUB     45.41    37.84     7.57   453.42   636.90     8.29   546.12     0.56

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   526.74   279.83   446.26  1167.16     0.45
 MEAN    16.57   536.94   289.08   452.48  1163.64     0.46
 HUB     13.89   580.38   354.64   459.42  1160.17     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    597.81   547.96   317.97     0.47  5286.22
 MEAN   524.79   510.19   235.70     0.44  4793.82     1.49
 HUB    439.80   467.25    85.16     0.40  4928.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     10.69     1.16     9.30   589.68     1.05   566.56     0.92     0.91
 MEAN    10.55     1.15     9.11   587.17     1.04   563.15     0.92     0.91
 HUB     10.59     1.15     8.92   587.86     1.04   559.79     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.09    35.47    31.50     3.97     0.93     0.34     2.90
 MEAN    32.57    27.52    23.50     4.02     0.93     0.33     3.29     0.91
 HUB     37.67    10.50     6.50     4.00     0.93     0.34     3.90


  blockage3   Cor/Incid
     0.950       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    16.481     529.466     290.707     442.519    1165.405       0.454       0.054

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
    10.592       9.193     564.872      46.000      33.302      32.400      -0.902

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    16.481     457.169     290.707     541.770    1171.521       0.390       0.277

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950      10.580       9.525     570.817     456.573       0.018       0.365

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    16.096     433.845       0.000     433.845    1173.297       0.370       0.272
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   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       9.601     572.549       0.000       0.060       0.037       0.328

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      10.552       1.146     588.236      25.456     246.432       1.910

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 158424.109       0.443     584.496  613083.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc = 5.869   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     65.287    3628.360      10.552     588.236       1.000       1.000       0.980
W Kg/sec =  29.6760006

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     96.857    3407.160       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 130601.953   51228.672       1.806     509.668     282.165     390.276       1.383

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   403.86    -0.14   403.86     0.34   544.69
 MEAN    15.91     0.00    -0.02   403.86    -0.14   403.86     0.34
 HUB     13.07     0.00    -0.02   403.86    -0.14   403.86     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.16    47.36     7.80   580.07   706.93     9.72   574.65     0.60
 MEAN    51.29    44.80     6.49   503.86   645.85     9.72   574.65     0.55
 HUB     45.71    38.84     6.87   413.84   578.34     9.72   574.65     0.49

      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   491.53   277.09   405.98  1194.40     0.41
 MEAN    15.50   495.50   275.19   412.06  1190.45     0.42
 HUB     12.59   527.70   321.24   418.66  1186.54     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    568.04   499.47   290.95     0.42  4973.50
 MEAN   490.71   465.01   215.51     0.39  4267.03     1.53
 HUB    398.64   425.75    77.40     0.36  4046.26

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     12.08     1.14    10.75   613.53     1.04   593.40     0.92     0.91
 MEAN    11.85     1.12    10.52   609.94     1.04   589.48     0.92     0.91
 HUB     11.78     1.12    10.28   608.82     1.03   585.62     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.31    35.63    31.50     4.13     0.93     0.36     2.90
 MEAN    33.74    27.61    23.50     4.11     0.93     0.34     3.34     0.91
 HUB     37.50    10.47     6.50     3.97     0.93     0.33     4.06


  blockage3   Cor/Incid
     0.950       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     501.248     280.238     415.591    1190.788       0.421      -0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     11.875      10.511     589.830      46.000      33.992      33.000      -0.992
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     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth         Cmth       Aoth          Machth       cp 2-Th
      15.219     434.402     280.238     516.951    1196.036        0.363        0.221

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      11.856      10.823     595.041     440.827        0.033        0.380

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4         Ao4           Mach4        cp 3-4
      14.701     405.636       0.000     405.636    1198.058        0.339        0.314

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
       0.950      10.947     597.054       0.000        0.060        0.037        0.311

     STAGE EXIT CONDITIONS, STAGE   5
       Eff4        Pt4          PR4        Texit        Del T        Ns         Ns nondim
       0.882       11.851        1.123     610.762      22.526     255.701        1.982

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  140253.094       0.435     517.455  624611.688

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency       Rotor1Inc    TR
     898096.00   3313.4702     175.5936      2.2867       0.8632       5.8688       1.3095


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NPSS: Inlet Mach number .78, Altitude 35000ft, dT 22R, Thrust 72.7%
Stage 2 stator Blocked @ 15%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
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          Fan Hub + 4 Stage LPC 100%  12-20-2010

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 5.982   EfDer =  0.999

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
      65.075     3629.447        5.183     466.396        1.000        1.000        0.980
 W Kg/sec =  29.5794983

    W cor       RPM cor         GAMMA         Cp          R            Blades       THK
     175.023     3827.553        1.401        0.248       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*        AthrRotor   ChokeMargin
  130177.258    51062.086        1.631     831.557     509.810      619.754        1.216

      ROTOR LEADING EDGE CONDITIONS, STAGE   1

         R1       Stator    Alfa      C1       CU1        Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02    404.59    -0.14    404.59      0.39    689.06
  MEAN    17.06      0.00    -0.02    404.59    -0.14    404.59      0.39
  HUB     12.51      0.00    -0.02    404.59    -0.14    404.59      0.39

        BetaFlo    BetaBlade Incid    U1        W1        Ps1       Ts1      Rel Mach
  TIP     58.24     50.47      7.77    653.41    768.65      4.67    452.74      0.74
  MEAN    53.18     47.20      5.98    540.34    675.14      4.67    452.74      0.65
  HUB     44.41     38.62      5.79    396.23    566.39      4.67    452.74      0.54

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
     B2 axial     THK         AeroBl      Blades2
       0.700        0.050        0.950       32.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	641.50	367.52	525.78	1064.17	0.60
MEAN	18.04	675.42	406.44	539.44	1058.56	0.64
HUB	15.00	777.12	531.65	566.81	1048.48	0.74

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	653.41	598.48	285.89	0.56	7584.91	
MEAN	571.25	564.05	164.81	0.53	7332.97	1.33
HUB	475.09	569.62	56.55	0.54	7976.44	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.69	1.29	5.23	505.04	1.08	470.73	0.92	0.91
MEAN	6.63	1.28	5.04	503.76	1.08	465.73	0.92	0.91
HUB	6.77	1.31	4.70	507.03	1.09	456.71	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.95	28.53	24.20	4.33	0.93	0.30	2.90	
MEAN	37.00	16.99	12.70	4.29	0.92	0.25	3.51	0.91
HUB	43.17	-5.70	-9.30	3.60	0.92	0.10	4.78	

blockage3	Cor/Incid
0.950	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	686.589	405.652	553.941	1058.608	0.649	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
6.682	5.035	465.963	24.000	36.215	35.400	-0.815

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	572.615	405.652	701.742	1072.117	0.534	0.286

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	6.655	5.480	477.932	528.796	0.026	0.434

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	524.079	0.000	524.079	1077.085	0.487	0.353

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.638	482.371	0.000	0.060	0.041	0.378

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.876	6.629	1.279	505.277	38.881	217.385	1.685

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
241740.844	0.566	888.988	712968.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 5.982 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
65.075	3629.447	6.629	505.277	1.000	1.000	0.980

W Kg/sec = 29.5794983

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
142.419	3677.341	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
130177.258	51062.086	1.423	590.487	414.846	474.134	1.143

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	497.15	-0.17	497.15	0.46	659.45
MEAN	18.08	0.00	-0.02	497.15	-0.17	497.15	0.46	

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 HUB     15.21     0.00    -0.02   497.15    -0.17   497.15     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.63    46.36     6.27   650.88   819.16     5.73   484.67     0.76
 MEAN    49.04    42.30     6.74   572.59   758.43     5.73   484.67     0.70
 HUB     44.11    37.84     6.27   481.74   692.39     5.73   484.67     0.64

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   573.72   299.25   489.49  1106.42     0.52
 MEAN    18.01   587.84   311.97   498.22  1102.21     0.53
 HUB     15.22   639.65   388.75   507.97  1098.11     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    646.76   600.31   347.51     0.54  6114.17
 MEAN   570.43   561.27   258.46     0.51  5621.67     1.46
 HUB    482.16   516.49    93.41     0.47  5920.48

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      8.03     1.21     6.68   536.42     1.06   508.98     0.92     0.91
 MEAN     7.91     1.19     6.52   533.91     1.06   505.10     0.92     0.91
 HUB      7.98     1.20     6.34   535.43     1.06   501.32     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.44    35.37    31.50     3.87     0.93     0.33     2.90
 MEAN    32.05    27.42    23.50     3.92     0.93     0.32     3.30     0.91
 HUB     37.43    10.42     6.50     3.92     0.93     0.33     3.92


   blockage3   Cor/Incid
      0.800       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     718.849     312.846     647.203    1087.933       0.661      -0.397

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.959       5.937     492.165      46.000      25.798      30.600       4.802

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     647.956     312.846     719.527    1096.827       0.591      -0.175

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.800       7.928       6.259     500.245     428.205       0.031       0.257

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.823     639.083       0.000     639.083    1097.874       0.582       0.229

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.800       6.271     501.197       0.000       0.060       0.058      -0.167

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.861       7.890       1.190     535.254      29.977     246.743       1.913

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 186432.828       0.446     685.596  640390.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc = 5.982   EfDer =  0.957

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      65.075    3629.447       7.890     535.254       1.000       1.000       0.830
W Kg/sec =  29.5794983
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
123.168	3572.881	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
130177.258	51062.086	1.288	461.987	358.782	361.823	1.008

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	584.24	-0.20	584.24	0.53	625.75
MEAN	17.74	0.00	-0.02	584.24	-0.20	584.24	0.53	
HUB	15.05	0.00	-0.02	584.24	-0.20	584.24	0.53	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.42	46.36	1.06	635.68	863.53	6.52	506.80	0.78
MEAN	43.89	43.40	0.49	561.83	810.69	6.52	506.80	0.73
HUB	39.22	38.84	0.38	476.68	754.16	6.52	506.80	0.68

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	548.71	276.10	474.18	1137.48	0.48
MEAN	17.51	562.14	292.04	480.32	1134.24	0.50
HUB	14.85	611.63	369.15	487.66	1131.11	0.54

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	627.44	590.16	351.34	0.52	5473.52	
MEAN	554.48	547.35	262.44	0.48	5116.21	1.58
HUB	470.34	498.05	101.19	0.44	5484.90	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	9.22	1.17	7.86	563.12	1.05	538.03	0.92	0.88
MEAN	9.13	1.16	7.72	561.31	1.05	534.96	0.92	0.88
HUB	9.22	1.17	7.56	563.18	1.05	532.00	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.21	36.54	31.50	5.04	0.93	0.37	2.90	
MEAN	31.30	28.65	23.50	5.15	0.90	0.38	3.28	0.88
HUB	37.12	11.72	6.50	5.22	0.90	0.40	3.87	

blockage3	Cor/Incid
0.950	0.957

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	567.945	293.958	485.953	1134.922	0.500	0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
9.176	7.732	535.646	46.000	31.170	31.500	0.330

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	495.355	293.958	576.010	1141.719	0.434	0.228

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	9.162	8.049	542.081	471.992	0.020	0.329

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	479.978	0.000	479.978	1143.035	0.420	0.243

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	8.092	543.332	0.000	0.060	0.037	0.257

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.841	9.136	1.158	562.537	27.283	253.850	1.968

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
169732.062	0.431	624.180	761393.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 5.982 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
65.075	3629.447	9.136	562.537	1.000	1.000	0.980

W Kg/sec = 29.5794983

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
109.037	3485.161	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
130177.258	51062.086	1.616	513.330	317.632	401.059	1.263

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	449.17	-0.15	449.17	0.39	585.75
MEAN	16.97	0.00	-0.02	449.17	-0.15	449.17	0.39	
HUB	14.32	0.00	-0.02	449.17	-0.15	449.17	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.64	46.36	7.28	610.02	757.67	8.22	545.72	0.66
MEAN	50.12	43.80	6.32	537.51	700.60	8.22	545.72	0.61
HUB	45.29	37.84	7.45	453.56	638.44	8.22	545.72	0.56

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	527.82	278.46	448.39	1166.68	0.45
MEAN	16.57	538.19	288.09	454.59	1163.20	0.46
HUB	13.89	581.85	354.33	461.52	1159.76	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	597.98	550.59	319.53	0.47	5260.23	
MEAN	524.94	512.59	236.85	0.44	4777.38	1.48
HUB	439.94	469.39	85.60	0.40	4923.91	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	10.60	1.16	9.21	589.31	1.05	566.09	0.92	0.91
MEAN	10.46	1.15	9.03	586.85	1.04	562.72	0.92	0.91
HUB	10.51	1.15	8.85	587.60	1.04	559.39	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.84	35.47	31.50	3.97	0.93	0.34	2.90	
MEAN	32.36	27.52	23.50	4.02	0.93	0.33	3.29	0.91
HUB	37.52	10.51	6.50	4.01	0.93	0.33	3.90	

blockage3	Cor/Incid
0.950	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	530.628	289.710	444.561	1164.973	0.455	0.054

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
10.509	9.114	564.455	46.000	33.091	32.400	-0.691

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	459.409	289.710	543.129	1171.021	0.392	0.274

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	10.497	9.440	570.332	456.573	0.018	0.362

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	435.929	0.000	435.929	1172.818	0.372	0.269

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	9.516	572.084	0.000	0.060	0.037	0.325

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.880	10.469	1.146	587.922	25.384	247.595	1.919

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
157978.578	0.442	580.957	611735.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 5.982 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
65.075	3629.447	10.469	587.922	1.000	1.000	0.980

W Kg/sec = 29.5794983

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
97.281	3409.093	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
130177.258	51062.086	1.798	509.668	283.399	390.276	1.377

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	405.76	-0.14	405.76	0.35	545.00
MEAN	15.91	0.00	-0.02	405.76	-0.14	405.76	0.35	
HUB	13.07	0.00	-0.02	405.76	-0.14	405.76	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.04	47.36	7.68	580.25	708.16	9.64	574.21	0.60
MEAN	51.17	44.80	6.37	504.01	647.15	9.64	574.21	0.55
HUB	45.58	38.84	6.74	413.96	579.76	9.64	574.21	0.49

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	492.43	275.81	407.94	1193.89	0.41
MEAN	15.50	496.63	274.29	414.02	1189.97	0.42
HUB	12.59	529.11	320.99	420.62	1186.08	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	568.21	501.91	292.41	0.42	4950.51	
MEAN	490.85	467.24	216.57	0.39	4253.01	1.52
HUB	398.76	427.75	77.77	0.36	4043.06	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	11.97	1.14	10.65	613.11	1.04	592.91	0.92	0.91
MEAN	11.75	1.12	10.43	609.56	1.04	589.01	0.92	0.91
HUB	11.69	1.12	10.20	608.49	1.03	585.17	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.06	35.63	31.50	4.13	0.93	0.36	2.90	
MEAN	33.52	27.61	23.50	4.11	0.93	0.34	3.34	0.91
HUB	37.35	10.48	6.50	3.98	0.93	0.33	4.06	

blockage3	Cor/Incid
0.950	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	502.376	279.316	417.569	1190.312	0.422	-0.005

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     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     11.778      10.419     589.360      46.000      33.779      33.000      -0.779

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     436.581     279.316     518.286    1195.498       0.365       0.217

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      11.760      10.724     594.507     440.827       0.033       0.376

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     14.701     407.623       0.000     407.623    1197.544       0.340       0.311

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.849     596.544       0.000       0.060       0.037       0.307

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.882      11.755       1.123     610.386      22.465     256.903       1.991

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 139870.688       0.433     514.366  623194.688

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    895755.00   3294.0867    175.0226      2.2681      0.8558      5.9825      1.3087
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NPSS: Inlet Mach number .78, Altitude 35000ft, dT 22R, Thrust 72.7%
Stage 2 stator Blocked @ 20%

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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
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         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 6.159   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     64.744    3630.992       5.183     466.396       1.000       1.000       0.980
 W Kg/sec =  29.4292717

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     174.134    3829.183       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  129516.117   50802.754       1.639     831.557     507.221     619.754       1.222

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   402.18    -0.14   402.18     0.39   689.35
  MEAN    17.06     0.00    -0.02   402.18    -0.14   402.18     0.39
  HUB     12.51     0.00    -0.02   402.18    -0.14   402.18     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.40    50.47     7.93   653.69   767.62     4.68   452.91     0.74
  MEAN    53.36    47.20     6.16   540.57   673.88     4.68   452.91     0.65
  HUB     44.60    38.62     5.98   396.40   564.79     4.68   452.91     0.54

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.700      0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   639.70   369.90   521.91  1064.68     0.60
MEAN    18.04   673.22   407.85   535.62  1058.99     0.64
HUB     15.00   774.01   531.45   562.72  1048.92     0.74

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    653.69   594.08   283.79     0.56  7633.84
MEAN   571.50   560.06   163.65     0.53  7358.35     1.34
HUB    475.30   565.51    56.15     0.54  7973.49

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      6.70     1.29     5.25   505.31     1.08   471.19     0.92     0.91
MEAN     6.64     1.28     5.06   503.90     1.08   466.12     0.92     0.91
HUB      6.77     1.31     4.72   507.04     1.09   457.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.33    28.54    24.20     4.34     0.93     0.31     2.90
MEAN    37.29    16.99    12.70     4.29     0.93     0.26     3.51     0.91
HUB     43.36    -5.70    -9.30     3.60     0.93     0.11     4.78


  blockage3   Cor/Incid
     0.950       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    18.071     684.182     407.057     549.917    1059.077       0.646      -0.004

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     6.688       5.051     466.376      24.000      36.509      35.400      -1.109

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    18.071     567.989     407.057     698.790    1072.765       0.529       0.292

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       6.662       5.503     478.510     528.796       0.026       0.438

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    18.083     520.034       0.000     520.034    1077.632       0.483       0.358

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       5.658     482.861       0.000       0.060       0.040       0.383

   STAGE EXIT CONDITIONS, STAGE   1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.877       6.636       1.281     505.415      39.019     216.253       1.676

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 242597.531       0.568     887.607  708712.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc = 6.159   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    64.744    3630.992       6.636     505.415       1.000       1.000       0.980
W Kg/sec =  29.4292717

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    141.562    3678.404       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 129516.117   50802.754       1.432     590.487     412.350     474.134       1.150

    ROTOR LEADING EDGE CONDITIONS, STAGE   2
```

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	493.43	-0.17	493.43	0.46	659.64
MEAN	18.08	0.00	-0.02	493.43	-0.17	493.43	0.46	
HUB	15.21	0.00	-0.02	493.43	-0.17	493.43	0.46	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.85	46.36	6.49	651.16	817.13	5.75	485.11	0.76
MEAN	49.27	42.30	6.97	572.83	756.18	5.75	485.11	0.70
HUB	44.34	37.84	6.50	481.95	689.87	5.75	485.11	0.64

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	571.99	302.41	485.51	1107.11	0.52
MEAN	18.01	585.77	314.28	494.32	1102.82	0.53
HUB	15.22	637.21	389.71	504.15	1098.64	0.58

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	647.04	595.39	344.63	0.54	6178.61	
MEAN	570.67	556.86	256.39	0.50	5663.32	1.47
HUB	482.36	512.59	92.65	0.47	5935.16	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	8.05	1.21	6.71	536.90	1.06	509.62	0.92	0.91
MEAN	7.93	1.19	6.54	534.27	1.06	505.66	0.92	0.91
HUB	7.99	1.20	6.36	535.66	1.06	501.81	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.92	35.37	31.50	3.87	0.93	0.34	2.90	
MEAN	32.45	27.41	23.50	3.91	0.93	0.33	3.30	0.91
HUB	37.70	10.41	6.50	3.91	0.93	0.33	3.92	

blockage3	Cor/Incid
0.750	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	781.434	315.167	715.059	1079.642	0.724	-0.629

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
7.978	5.628	484.692	46.000	23.786	30.600	6.814

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	716.576	315.167	782.823	1088.627	0.658	-0.419

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	7.934	5.930	492.793	400.556	0.040	0.228

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	708.383	0.000	708.383	1089.722	0.650	0.206

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	5.927	493.768	0.000	0.060	0.081	-0.422

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.840	7.875	1.187	535.610	30.195	244.591	1.896

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
187788.031	0.449	687.072	635985.062

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 6.159 EfDer = 0.916

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl

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     64.744    3630.992       7.875     535.610       1.000       1.000       0.780
W Kg/sec =  29.4292717

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    122.813    3573.215       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 129516.117   50802.754       1.214     434.156     357.749     339.175       0.948

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   636.61    -0.22   636.61     0.58   625.81
 MEAN    17.74     0.00    -0.02   636.61    -0.22   636.61     0.58
 HUB     15.05     0.00    -0.02   636.61    -0.22   636.61     0.58

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.98    46.36    -1.38   635.95   899.99     6.27   501.82     0.82
 MEAN    41.45    43.40    -1.95   562.07   849.37     6.27   501.82     0.77
 HUB     36.85    38.84    -1.99   476.88   795.55     6.27   501.82     0.72

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   547.14   267.48   477.31  1137.10     0.48
 MEAN    17.51   560.72   285.00   482.88  1134.10     0.49
 HUB     14.85   610.36   363.83   490.07  1131.21     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    627.71   597.99   360.23     0.53  5303.09
 MEAN   554.72   553.10   269.72     0.49  4993.33     1.63
 HUB    470.54   501.56   106.71     0.44  5406.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      9.10     1.16     7.77   562.62     1.05   537.67     0.92     0.84
 MEAN     9.02     1.15     7.64   561.05     1.05   534.84     0.92     0.84
 HUB      9.13     1.16     7.48   563.15     1.05   532.09     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.27    37.04    31.50     5.54     0.93     0.39     2.90
 MEAN    30.55    29.19    23.50     5.69     0.89     0.40     3.28     0.84
 HUB     36.59    12.28     6.50     5.78     0.89     0.43     3.87


   blockage3   Cor/Incid
      0.950       0.916

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     566.698     286.874     488.723    1134.765       0.499       0.008

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      9.069       7.647     535.500      46.000      30.412      31.500       1.088

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     499.183     286.874     575.743    1141.104       0.437       0.213

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       9.054       7.938     541.500     471.992       0.020       0.317

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.121     483.644       0.000     483.644    1142.445       0.423       0.230

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       7.982     542.773       0.000       0.060       0.037       0.243

    STAGE EXIT CONDITIONS, STAGE   3
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     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.802       9.029       1.147     562.273      26.663     261.456       2.027

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 165874.031       0.421     606.894  827123.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc = 6.159   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     64.744    3630.992       9.029     562.273       1.000       1.000       0.980
W Kg/sec =  29.4292717

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    109.742    3487.465       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 129516.117   50802.754       1.606     513.330     319.688     401.059       1.255

    ROTOR LEADING EDGE CONDITIONS, STAGE   4

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   452.50    -0.16   452.50     0.40   586.14
 MEAN    16.97     0.00    -0.02   452.50    -0.16   452.50     0.40
 HUB     14.32     0.00    -0.02   452.50    -0.16   452.50     0.40

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.45    46.36     7.09   610.28   759.86     8.11   545.21     0.66
 MEAN    49.93    43.80     6.13   537.74   702.92     8.11   545.21     0.61
 HUB     45.09    37.84     7.25   453.75   640.93     8.11   545.21     0.56

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   529.58   276.17   451.87  1166.03     0.45
 MEAN    16.57   540.24   286.47   458.03  1162.60     0.46
 HUB     13.89   584.27   353.84   464.94  1159.22     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    598.24   554.90   322.07     0.48  5217.11
 MEAN   525.17   516.50   238.70     0.44  4750.57     1.48
 HUB    440.12   472.88    86.28     0.41  4917.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     10.47     1.16     9.09   588.84     1.05   565.47     0.92     0.91
 MEAN    10.33     1.14     8.91   586.46     1.04   562.14     0.92     0.91
 HUB     10.38     1.15     8.73   587.31     1.04   558.86     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.43    35.48    31.50     3.98     0.93     0.33     2.90
 MEAN    32.02    27.53    23.50     4.03     0.93     0.33     3.29     0.91
 HUB     37.27    10.51     6.50     4.01     0.93     0.33     3.90


  blockage3   Cor/Incid
     0.950       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    16.481     532.542     288.082     447.895    1164.399       0.457       0.054

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
    10.379       8.992     563.903      46.000      32.749      32.400      -0.349

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    16.481     463.075     288.082     545.371    1170.335       0.396       0.268
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BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	10.368	9.307	569.667	456.573	0.018	0.357

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	439.341	0.000	439.341	1172.167	0.375	0.264

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	9.384	571.452	0.000	0.060	0.037	0.320

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.880	10.340	1.145	587.538	25.265	249.499	1.934

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
157235.422	0.439	575.287	609563.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 6.159 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
64.744	3630.992	10.340	587.538	1.000	1.000	0.980

W Kg/sec = 29.4292717

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
97.963	3411.657	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
129516.117	50802.754	1.786	509.668	285.388	390.276	1.368

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	408.86	-0.14	408.86	0.35	545.41
MEAN	15.91	0.00	-0.02	408.86	-0.14	408.86	0.35	
HUB	13.07	0.00	-0.02	408.86	-0.14	408.86	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.85	47.36	7.49	580.49	710.14	9.51	573.61	0.60
MEAN	50.97	44.80	6.17	504.23	649.27	9.51	573.61	0.55
HUB	45.38	38.84	6.54	414.14	582.06	9.51	573.61	0.50

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	493.92	273.68	411.17	1193.20	0.41
MEAN	15.50	498.48	272.76	417.24	1189.31	0.42
HUB	12.59	531.38	320.50	423.84	1185.47	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	568.45	505.92	294.78	0.42	4912.34	
MEAN	491.06	470.90	218.30	0.40	4229.36	1.51
HUB	398.93	431.04	78.43	0.36	4036.91	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	11.82	1.14	10.50	612.54	1.04	592.22	0.92	0.91
MEAN	11.60	1.12	10.28	609.07	1.04	588.36	0.92	0.91
HUB	11.54	1.12	10.06	608.09	1.03	584.56	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.65	35.64	31.50	4.14	0.93	0.35	2.90	
MEAN	33.17	27.62	23.50	4.12	0.93	0.34	3.34	0.91
HUB	37.10	10.48	6.50	3.98	0.93	0.33	4.06	

blockage3	Cor/Incid
0.950	1.000

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     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
      15.219      504.225     277.761      420.823     1189.658        0.424       -0.005

      Pt3          Ps3         Ts3        Vane No.     Alpha3     Vane A3      Incid3
      11.627       10.275      588.716       46.000      33.426      33.000       -0.426

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG          Cth         Cuth         Cmth        Aoth         Machth      cp 2-Th
      15.219      440.177     277.761      520.487     1194.739        0.368        0.211

    BlockageThr  PtTh         PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950       11.608       10.569      593.755      440.827        0.033        0.371

     VANED DIFFUSER EXIT:
    R4           C4          Cu4         Cm4         Ao4          Mach4        cp 3-4
      14.701      410.903       0.000      410.903     1196.826        0.343        0.305

    Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
       0.950       10.695      595.831        0.000        0.060        0.037        0.302

     STAGE EXIT CONDITIONS, STAGE   5
       Eff4        Pt4           PR4         Texit         Del T        Ns         Ns nondim
       0.881       11.604        1.122      609.898       22.359      258.908        2.007

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  139212.062       0.431     509.344  620924.312

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency       Rotor1Inc    TR
     892707.12   3266.2051     174.1337       2.2390       0.8436       6.1585       1.3077


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NPSS: Inlet Mach number .78, Altitude 35000ft, dT 22R, Thrust 72.7%
Stage 2 stator Blocked @ 25%

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*********************************************************************
**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

          Fan Hub + 4 Stage LPC 100%  12-20-2010

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 6.440   EfDer =  1.000

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
      64.214     3633.277        5.183      466.396        1.000        1.000        0.980
 W Kg/sec =  29.1883183

    W cor       RPM cor         GAMMA         Cp          R            Blades       THK
     172.708     3831.592        1.401        0.248       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*        AthrRotor   ChokeMargin
  128455.703    50386.805        1.653      831.557      503.068      619.754        1.232

      ROTOR LEADING EDGE CONDITIONS, STAGE   1

         R1       Stator     Alfa      C1       CU1        Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00     -0.02   398.32     -0.14    398.32      0.38    689.78
  MEAN    17.06      0.00     -0.02   398.32     -0.14    398.32      0.38
  HUB     12.51      0.00     -0.02   398.32     -0.14    398.32      0.38

        BetaFlo    BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
  TIP     58.67     50.47      8.20   654.10    765.95      4.69    453.16      0.73
  MEAN    53.64     47.20      6.44   540.91    671.86      4.69    453.16      0.64
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HUB     44.89    38.62     6.27   396.65   562.22     4.69   453.16     0.54

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   636.91   373.63   515.81  1065.47     0.60
MEAN    18.04   669.79   410.07   529.58  1059.67     0.63
HUB     15.00   769.07   531.10   556.25  1049.61     0.73

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    654.10   587.13   280.47     0.55  7710.81
MEAN   571.86   553.74   161.78     0.52  7398.45     1.35
HUB    475.59   559.01    55.50     0.53  7968.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      6.72     1.30     5.28   505.72     1.08   471.90     0.92     0.91
MEAN     6.65     1.28     5.08   504.13     1.08   466.73     0.92     0.91
HUB      6.77     1.31     4.74   507.04     1.09   457.74     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.92    28.54    24.20     4.34     0.93     0.32     2.90
MEAN    37.75    16.99    12.70     4.29     0.93     0.27     3.51     0.91
HUB     43.68    -5.70    -9.30     3.60     0.93     0.11     4.78


  blockage3   Cor/Incid
     0.950       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     680.424     409.278     543.570    1059.806       0.642      -0.003

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.698       5.075     467.018      24.000      36.978      35.400      -1.578

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     560.734     409.278     694.212    1073.771       0.522       0.301

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.671       5.539     479.407     528.796       0.026       0.446

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     18.083     513.684       0.000     513.684    1078.482       0.476       0.366

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.690     483.623       0.000       0.060       0.040       0.391

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878       6.647       1.283     505.629      39.233     214.465       1.663

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 243931.797       0.570     885.182  701914.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc = 6.440   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     64.214    3633.277       6.647     505.629       1.000       1.000       0.980
W Kg/sec =  29.1883183

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    140.206    3679.938       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 128455.703   50386.805       1.446     590.487     408.400     474.134       1.161
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ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	487.59	-0.17	487.59	0.45	659.91
MEAN	18.08	0.00	-0.02	487.59	-0.17	487.59	0.45	
HUB	15.21	0.00	-0.02	487.59	-0.17	487.59	0.45	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.20	46.36	6.84	651.56	813.94	5.78	485.80	0.75
MEAN	49.62	42.30	7.32	573.20	752.65	5.78	485.81	0.70
HUB	44.69	37.84	6.85	482.25	685.91	5.78	485.80	0.63

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	569.35	307.30	479.30	1108.19	0.51
MEAN	18.01	582.60	317.89	488.23	1103.76	0.53
HUB	15.22	633.42	391.21	498.17	1099.45	0.58

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	647.44	587.73	340.14	0.53	6278.55	
MEAN	571.03	549.95	253.14	0.50	5728.28	1.49
HUB	482.67	506.50	91.46	0.46	5957.88	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	8.09	1.22	6.76	537.64	1.06	510.61	0.92	0.91
MEAN	7.96	1.20	6.58	534.84	1.06	506.54	0.92	0.91
HUB	8.01	1.21	6.40	536.01	1.06	502.56	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.67	35.36	31.50	3.86	0.93	0.34	2.90	
MEAN	33.07	27.41	23.50	3.91	0.93	0.33	3.30	0.91
HUB	38.14	10.40	6.50	3.90	0.93	0.33	3.92	

blockage3	Cor/Incid
0.700	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	869.590	318.785	809.050	1066.682	0.815	-0.977

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
8.006	5.171	473.109	46.000	21.506	30.600	9.094

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	812.715	318.785	873.001	1075.633	0.756	-0.791

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.700	7.941	5.438	481.087	372.907	0.055	0.192

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	808.986	0.000	808.986	1076.364	0.752	0.151

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.700	5.389	481.607	0.000	0.060	0.125	-0.825

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.801	7.840	1.179	536.162	30.533	241.270	1.870

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
189889.453	0.453	689.072	629004.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

```
 RESET =  0.000BLEED =  0.000 DPInc = 6.440   EfDer =  0.855

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     64.214    3633.277       7.840     536.162       1.000       1.000       0.730
W Kg/sec =  29.1883183

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    122.416    3573.621       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 128455.703   50386.805       1.139     406.326     356.591     316.528       0.888

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   704.49    -0.24   704.48     0.65   625.88
 MEAN    17.74     0.00    -0.02   704.49    -0.24   704.48     0.65
 HUB     15.05     0.00    -0.02   704.49    -0.24   704.48     0.65

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.10    46.36    -4.26   636.35   949.50     5.92   494.79     0.87
 MEAN    38.61    43.40    -4.79   562.42   901.60     5.92   494.79     0.83
 HUB     34.13    38.84    -4.71   477.18   851.02     5.92   494.79     0.78

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   545.77   255.93   482.05  1136.60     0.48
 MEAN    17.51   559.51   275.61   486.92  1133.94     0.49
 HUB     14.85   609.48   356.91   494.04  1131.36     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    628.10   609.00   372.18     0.54  5074.76
 MEAN   555.07   561.41   279.46     0.50  4829.31     1.70
 HUB    470.84   507.01   113.93     0.45  5303.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      8.92     1.14     7.62   562.03     1.05   537.20     0.92     0.78
 MEAN     8.87     1.13     7.51   560.78     1.05   534.68     0.92     0.78
 HUB      8.97     1.14     7.37   563.20     1.05   532.23     0.92     0.78

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.96    37.67    31.50     6.17     0.93     0.40     2.90
 MEAN    29.51    29.85    23.50     6.35     0.88     0.42     3.28     0.78
 HUB     35.85    12.99     6.50     6.49     0.88     0.46     3.87


  blockage3   Cor/Incid
     0.950       0.855

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     565.759     277.420     493.073    1134.568       0.499       0.005

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     8.908       7.515     535.318      46.000      29.364      31.500       2.136

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     505.007     277.420     576.189    1140.300       0.443       0.192

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       8.893       7.772     540.741     471.992       0.020       0.300

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    17.121     489.249       0.000     489.249    1141.677       0.429       0.211

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950       7.815     542.047       0.000       0.060       0.038       0.223

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4        Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.745       8.868       1.131     562.002      25.839     272.589       2.113

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 160748.797       0.407     583.327  909604.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc = 6.440   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     64.214    3633.277       8.868     562.002       1.000       1.000       0.980
W Kg/sec =  29.1883183

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    110.804    3490.502       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 128455.703   50386.805       1.590     513.330     322.782     401.059       1.243

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   457.60    -0.16   457.60     0.40   586.65
 MEAN    16.97     0.00    -0.02   457.60    -0.16   457.60     0.40
 HUB     14.32     0.00    -0.02   457.60    -0.16   457.60     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.16    46.36     6.80   610.66   763.21     7.94   544.55     0.67
 MEAN    49.63    43.80     5.83   538.08   706.46     7.94   544.55     0.62
 HUB     44.79    37.84     6.95   454.03   644.74     7.94   544.55     0.56

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   532.35   272.65   457.23  1165.16     0.46
 MEAN    16.57   543.41   283.94   463.33  1161.82     0.47
 HUB     13.89   587.98   353.06   470.19  1158.52     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    598.62   561.52   325.96     0.48  5150.69
 MEAN   525.50   522.51   241.55     0.45  4708.73     1.47
 HUB    440.40   478.23    87.34     0.41  4906.26

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     10.26     1.16     8.89   588.25     1.05   564.63     0.92     0.91
 MEAN    10.14     1.14     8.73   585.99     1.04   561.39     0.92     0.91
 HUB     10.19     1.15     8.55   587.00     1.04   558.19     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.81    35.49    31.50     3.99     0.93     0.33     2.90
 MEAN    31.50    27.53    23.50     4.03     0.92     0.32     3.29     0.91
 HUB     36.90    10.52     6.50     4.02     0.92     0.33     3.90


  blockage3   Cor/Incid
     0.950       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     535.493     285.541     453.011    1163.650       0.460       0.055

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     10.183       8.806     563.183      46.000      32.224      32.400       0.176

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    16.481     468.724     285.541     548.850    1169.408       0.401       0.259

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      10.171       9.105     568.771     456.573       0.018       0.349

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     16.096     444.602       0.000     444.602    1171.294       0.380       0.256

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       9.183     570.607       0.000       0.060       0.037       0.312

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      10.144       1.144     587.081      25.079     252.456       1.957

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 156075.109       0.436     566.367  605885.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc = 6.440   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     64.214    3633.277      10.144     587.081       1.000       1.000       0.980
W Kg/sec =  29.1883183

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     99.002    3415.134       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 128455.703   50386.805       1.767     509.668     288.414     390.276       1.353

    ROTOR LEADING EDGE CONDITIONS, STAGE   5

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   413.64    -0.14   413.64     0.35   545.97
 MEAN    15.91     0.00    -0.02   413.64    -0.14   413.64     0.35
 HUB     13.07     0.00    -0.02   413.64    -0.14   413.64     0.35

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.55    47.36     7.19   580.86   713.21     9.31   572.83     0.61
 MEAN    50.66    44.80     5.86   504.54   652.54     9.31   572.83     0.56
 HUB     45.06    38.84     6.22   414.40   585.62     9.31   572.83     0.50

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   496.28   270.37   416.17  1192.25     0.42
 MEAN    15.50   501.37   270.37   422.22  1188.42     0.42
 HUB     12.59   534.92   319.76   428.82  1184.64     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    568.81   512.12   298.44     0.43  4853.00
 MEAN   491.37   476.57   221.00     0.40  4192.31     1.50
 HUB    399.18   436.11    79.42     0.37  4027.67

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     11.58     1.14    10.27   611.80     1.04   591.28     0.92     0.91
 MEAN    11.37     1.12    10.06   608.43     1.04   587.49     0.92     0.91
 HUB     11.32     1.12     9.84   607.59     1.03   583.76     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.01    35.65    31.50     4.15     0.93     0.35     2.90
 MEAN    32.63    27.63    23.50     4.13     0.92     0.33     3.34     0.91
 HUB     36.71    10.49     6.50     3.99     0.92     0.32     4.06
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   blockage3   Cor/Incid
      0.950       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     507.106     275.325     425.855    1188.779       0.427      -0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     11.396      10.056     587.852      46.000      32.884      33.000       0.116

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     445.761     275.325     523.934    1193.693       0.373       0.200

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      11.378      10.333     592.721     440.827       0.033       0.363

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     14.701     415.993       0.000     415.993    1195.843       0.348       0.297

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.460     594.859       0.000       0.060       0.037       0.293

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      11.374       1.121     609.275      22.195     262.036       2.031

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  138183.172       0.427     501.440  617108.812

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    888828.38   3225.3877    172.7079      2.1946      0.8238      6.4397      1.3063


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NPSS: Inlet Mach number .78, Altitude 35000ft, dT 22R, Thrust 72.7%
Stage 2 stator Blocked @ 27%

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
**********************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 6.602   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      63.907    3634.521       5.183     466.396       1.000       1.000       0.980
 W Kg/sec =  29.0486355

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     171.881    3832.905       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  127840.969   50145.676       1.661     831.557     500.660     619.754       1.238

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

         R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   396.09    -0.14   396.09     0.38   690.02
  MEAN    17.06     0.00    -0.02   396.09    -0.14   396.09     0.38
  HUB     12.51     0.00    -0.02   396.09    -0.14   396.09     0.38
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.82    50.47     8.35   654.33   764.99     4.69   453.31     0.73
MEAN    53.80    47.20     6.60   541.10   670.69     4.69   453.31     0.64
HUB     45.06    38.62     6.44   396.78   560.74     4.69   453.31     0.54

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   635.34   375.74   512.33  1065.92     0.60
MEAN    18.04   667.83   411.33   526.12  1060.05     0.63
HUB     15.00   766.27   530.90   552.55  1050.00     0.73

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    654.33   583.17   278.58     0.55  7754.38
MEAN   572.05   550.12   160.72     0.52  7421.15     1.36
HUB    475.76   555.29    55.14     0.53  7965.25

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      6.73     1.30     5.29   505.96     1.08   472.30     0.92     0.91
MEAN     6.66     1.28     5.09   504.26     1.08   467.08     0.92     0.91
HUB      6.77     1.31     4.75   507.03     1.09   458.10     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     36.26    28.54    24.20     4.34     0.93     0.32     2.90
MEAN    38.02    16.99    12.70     4.29     0.93     0.27     3.51     0.91
HUB     43.86    -5.70    -9.30     3.60     0.93     0.12     4.78


   blockage3   Cor/Incid
      0.950       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     678.290     410.535     539.943    1060.217       0.640      -0.003

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.703       5.088     467.381      24.000      37.247      35.400      -1.847

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     556.614     410.535     691.634    1074.336       0.518       0.307

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.676       5.559     479.912     528.796       0.026       0.450

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     18.083     510.075       0.000     510.075    1078.960       0.473       0.370

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.708     484.052       0.000       0.060       0.040       0.396

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878       6.653       1.284     505.751      39.355     213.444       1.655

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 244684.875       0.572     883.665  697988.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc = 6.602   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     63.907    3634.521       6.653     505.751       1.000       1.000       0.980
W Kg/sec =  29.0486355

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    139.429    3680.758       1.401       0.248      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
127840.969	50145.676	1.454	590.487	406.138	474.134	1.167

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	484.26	-0.17	484.26	0.45	660.06
MEAN	18.08	0.00	-0.02	484.26	-0.17	484.26	0.45	
HUB	15.21	0.00	-0.02	484.26	-0.17	484.26	0.45	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.40	46.36	7.04	651.79	812.13	5.80	486.20	0.75
MEAN	49.83	42.30	7.53	573.39	750.65	5.80	486.20	0.69
HUB	44.90	37.84	7.06	482.42	683.67	5.80	486.20	0.63

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	567.91	310.06	475.80	1108.79	0.51
MEAN	18.01	580.84	319.93	484.78	1104.29	0.53
HUB	15.22	631.26	392.03	494.78	1099.91	0.57

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	647.66	583.40	337.61	0.53	6334.82	
MEAN	571.22	546.04	251.30	0.49	5764.93	1.49
HUB	482.83	503.04	90.80	0.46	5970.45	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	8.11	1.22	6.78	538.06	1.06	511.17	0.92	0.91
MEAN	7.97	1.20	6.60	535.15	1.06	507.03	0.92	0.91
HUB	8.02	1.21	6.42	536.20	1.06	502.98	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.09	35.36	31.50	3.86	0.93	0.35	2.90	
MEAN	33.42	27.40	23.50	3.90	0.93	0.34	3.30	0.91
HUB	38.39	10.40	6.50	3.90	0.93	0.34	3.92	

blockage3	Cor/Incid
0.680	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	919.195	320.827	861.388	1058.726	0.868	-1.182

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
8.022	4.906	466.029	46.000	20.428	30.600	10.172

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	867.465	320.827	924.892	1067.431	0.813	-1.014

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	7.943	5.144	473.734	361.848	0.065	0.171

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	869.310	0.000	869.310	1067.579	0.814	0.100

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	5.050	473.513	0.000	0.060	0.157	-1.080

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.773	7.810	1.174	536.473	30.723	239.413	1.856

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
191069.828	0.456	690.038	625002.000

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc = 6.602   EfDer =  0.825

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     63.907    3634.521       7.810     536.473       1.000       1.000       0.710
W Kg/sec =  29.0486355

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    122.323    3573.809       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 127840.969   50145.676       1.109     395.194     356.322     307.469       0.863

    ROTOR LEADING EDGE CONDITIONS, STAGE   3

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   739.51    -0.25   739.51     0.68   625.91
 MEAN    17.74     0.00    -0.02   739.51    -0.25   739.51     0.68
 HUB     15.05     0.00    -0.02   739.51    -0.25   739.51     0.68

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     40.73    46.36    -5.63   636.56   975.92     5.73   490.88     0.90
 MEAN    37.28    43.40    -6.12   562.61   929.36     5.73   490.88     0.86
 HUB     32.86    38.84    -5.98   477.34   880.33     5.73   490.88     0.81

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   545.37   249.88   484.76  1136.33     0.48
 MEAN    17.51   559.19   270.69   489.31  1133.84     0.49
 HUB     14.85   609.35   353.36   496.43  1131.43     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    628.32   614.98   378.44     0.54  4955.28
 MEAN   555.26   566.04   284.56     0.50  4743.43     1.73
 HUB    471.00   510.18   117.64     0.45  5251.22

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      8.83     1.13     7.54   561.74     1.05   536.95     0.92     0.76
 MEAN     8.78     1.12     7.43   560.66     1.05   534.59     0.92     0.76
 HUB      8.89     1.14     7.30   563.25     1.05   532.30     0.92     0.76

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.27    37.98    31.50     6.48     0.93     0.41     2.90
 MEAN    28.95    30.18    23.50     6.68     0.87     0.44     3.28     0.76
 HUB     35.44    13.33     6.50     6.83     0.87     0.47     3.87


  blockage3   Cor/Incid
     0.950       0.825

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     565.581     272.470     495.622    1134.458       0.499       0.004

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     8.817       7.439     535.217      46.000      28.800      31.500       2.700

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     508.358     272.470     576.773    1139.874       0.446       0.181

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       8.802       7.678     540.340     471.992       0.021       0.291

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
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     17.121     492.486       0.000     492.486    1141.270       0.432       0.200

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       7.721     541.664       0.000       0.060       0.039       0.212

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.716       8.776       1.124     561.883      25.410     279.011       2.163

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 158077.047       0.400     570.886  950299.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc = 6.602   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     63.907    3634.521       8.776     561.883       1.000       1.000       0.980
W Kg/sec =  29.0486355

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    111.411    3492.066       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 127840.969   50145.676       1.582     513.330     324.550     401.059       1.236

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   460.54    -0.16   460.54     0.40   586.91
 MEAN    16.97     0.00    -0.02   460.54    -0.16   460.54     0.40
 HUB     14.32     0.00    -0.02   460.54    -0.16   460.54     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.99    46.36     6.63   610.87   765.15     7.85   544.21     0.67
 MEAN    49.46    43.80     5.66   538.26   708.51     7.85   544.21     0.62
 HUB     44.61    37.84     6.77   454.19   646.94     7.85   544.21     0.57

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   533.97   270.58   460.34  1164.70     0.46
 MEAN    16.57   545.27   282.49   466.39  1161.40     0.47
 HUB     13.89   590.14   352.61   473.22  1158.15     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    598.82   565.38   328.24     0.49  5111.66
 MEAN   525.68   525.99   243.19     0.45  4684.58     1.46
 HUB    440.55   481.32    87.95     0.42  4899.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     10.15     1.16     8.78   587.94     1.05   564.18     0.92     0.91
 MEAN    10.03     1.14     8.62   585.76     1.04   560.98     0.92     0.91
 HUB     10.09     1.15     8.45   586.86     1.04   557.84     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.45    35.49    31.50     3.99     0.93     0.32     2.90
 MEAN    31.20    27.54    23.50     4.04     0.92     0.32     3.29     0.91
 HUB     36.69    10.53     6.50     4.03     0.92     0.32     3.90


   blockage3   Cor/Incid
      0.950       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     537.228     284.074     455.978    1163.251       0.462       0.055

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
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    10.072       8.701     562.801      46.000      31.923      32.400       0.477

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    16.481     472.008     284.074     550.899    1168.906       0.404       0.254

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      10.060       8.991     568.286     456.573       0.018       0.345

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     16.096     447.661       0.000     447.661    1170.824       0.382       0.251

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       9.070     570.152       0.000       0.060       0.037       0.308

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      10.033       1.143     586.853      24.970     254.185       1.970

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 155394.000       0.433     561.197  603713.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc = 6.602   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     63.907    3634.521      10.033     586.853       1.000       1.000       0.980
W Kg/sec =  29.0486355

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     99.600    3416.966       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 127840.969   50145.676       1.757     509.668     290.158     390.276       1.345

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   416.42    -0.14   416.42     0.35   546.26
 MEAN    15.91      0.00    -0.02   416.42    -0.14   416.42     0.35
 HUB     13.07      0.00    -0.02   416.42    -0.14   416.42     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.38    47.36     7.02   581.06   714.98     9.20   572.41     0.61
 MEAN    50.48    44.80     5.68   504.72   654.44     9.20   572.41     0.56
 HUB     44.88    38.84     6.04   414.54   587.68     9.20   572.41     0.50

      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   497.68   268.42   419.09  1191.73     0.42
 MEAN    15.50   503.07   268.96   425.13  1187.94     0.42
 HUB     12.59   536.99   319.33   431.72  1184.20     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    569.01   515.74   300.59     0.43  4818.02
 MEAN   491.54   479.87   222.58     0.40  4170.52     1.50
 HUB    399.32   439.07    79.99     0.37  4022.25

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     11.44     1.14    10.14   611.40     1.04   590.77     0.92     0.91
 MEAN    11.24     1.12     9.94   608.10     1.04   587.02     0.92     0.91
 HUB     11.20     1.12     9.72   607.35     1.03   583.32     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.64    35.65    31.50     4.15     0.93     0.34     2.90
 MEAN    32.32    27.63    23.50     4.13     0.92     0.33     3.34     0.91
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  HUB     36.49    10.50     6.50     4.00     0.92     0.32     4.06


    blockage3   Cor/Incid
       0.950       0.999

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
      15.219     508.800     273.892     428.790    1188.302       0.428       -0.004

      Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      11.266       9.931     587.383      46.000      32.569      33.000       0.431

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
      15.219     449.031     273.892     525.971    1193.116       0.376       0.194

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      11.247      10.199     592.152     440.827       0.034       0.358

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
      14.701     418.972       0.000     418.972    1195.304       0.351       0.292

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      10.327     594.326       0.000       0.060       0.037       0.288

     STAGE EXIT CONDITIONS, STAGE   5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.879      11.243       1.121     608.950      22.097     263.879       2.046

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  137573.016       0.425     496.837  614863.625

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     886798.75   3202.6230    171.8814      2.1693      0.8121      6.6023      1.3057


*******************************************************************************
CRUISE 1  Operating Point #3

NPSS:  Inlet Mach number .78,  Altitude 35000ft, dT 22R, Thrust 69.9%
                Stage 2 stator Blocked @ 10%

*********************************************************************
**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

          Fan Hub + 4 Stage LPC 100%  12-20-2010

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 6.210   EfDer =  1.000

    W act       RPM act        Pt          Tt           POTS        POTH       AeroBl
      64.123     3596.943       5.183     466.396       1.000       1.000       0.980
 W Kg/sec =  29.1469536

    W cor       RPM cor        GAMMA        Cp          R           Blades       THK
     172.463    3793.275       1.401       0.248      53.349      32.000       0.050

    CFM        SCFM           A1/A*       Area1       A*        AthrRotor   ChokeMargin
  128273.656   50315.398       1.655     831.557     502.355     619.754       1.234

      ROTOR LEADING EDGE CONDITIONS, STAGE   1
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       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   397.66    -0.14   397.66     0.38   682.89
MEAN    17.06     0.00    -0.02   397.66    -0.14   397.66     0.38
HUB     12.51     0.00    -0.02   397.66    -0.14   397.66     0.38

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.45    50.47     7.98   647.56   760.03     4.69   453.21     0.73
MEAN    53.41    47.20     6.21   535.51   667.12     4.69   453.21     0.64
HUB     44.65    38.62     6.03   392.68   558.96     4.69   453.21     0.54

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   633.72   366.58   516.93  1064.58     0.60
MEAN    18.04   666.70   404.22   530.19  1059.03     0.63
HUB     15.00   765.88   526.36   556.34  1049.20     0.73

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    647.56   588.36   280.98     0.55  7565.44
MEAN   566.14   554.36   161.92     0.52  7292.77     1.34
HUB    470.84   559.10    55.52     0.53  7897.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      6.67     1.29     5.25   504.60     1.08   471.11     0.92     0.91
MEAN     6.61     1.28     5.06   503.22     1.08   466.16     0.92     0.91
HUB      6.74     1.30     4.73   506.27     1.09   457.39     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.34    28.53    24.20     4.33     0.93     0.31     2.90
MEAN    37.32    16.98    12.70     4.28     0.93     0.26     3.51     0.91
HUB     43.41    -5.70    -9.30     3.60     0.93     0.11     4.78


   blockage3   Cor/Incid
      0.950       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     18.071     677.495     403.430     544.283    1059.121       0.640       -0.004

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.658       5.055     466.415      24.000      36.546      35.400       -1.146

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     562.930     403.430     692.565    1072.493       0.525       0.291

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       6.632       5.496     478.267     528.796       0.025       0.438

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     18.083     515.573       0.000     515.573    1077.259       0.479       0.357

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.649     482.526       0.000       0.060       0.040       0.383

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.877       6.608        1.275     504.695      38.299     216.014       1.675

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 238121.922       0.568     862.874  700751.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
  RESET =  0.000BLEED =  0.000 DPInc = 6.210   EfDer =  1.000

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
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     64.123    3596.943       6.608     504.695       1.000       1.000       0.980
W Kg/sec =  29.1469536

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    140.705    3646.509       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 128273.656   50315.398       1.441     590.487     409.852     474.134       1.157

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   489.32    -0.17   489.32     0.45   653.92
 MEAN    18.08     0.00    -0.02   489.32    -0.17   489.32     0.45
 HUB     15.21     0.00    -0.02   489.32    -0.17   489.32     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.82    46.36     6.46   645.05   809.78     5.74   484.73     0.75
 MEAN    49.24    42.30     6.94   567.46   749.42     5.74   484.73     0.69
 HUB     44.31    37.84     6.47   477.43   683.76     5.74   484.73     0.63

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   567.51   298.44   482.71  1106.02     0.51
 MEAN    18.01   581.19   310.62   491.22  1101.86     0.53
 HUB     15.22   632.15   385.86   500.73  1097.79     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    640.97   591.89   342.53     0.54  6097.51
 MEAN   565.32   553.32   254.69     0.50  5597.37     1.47
 HUB    477.84   509.11    91.98     0.46  5876.45

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      7.99     1.21     6.67   535.47     1.06   508.62     0.92     0.91
 MEAN     7.87     1.19     6.51   532.95     1.06   504.79     0.92     0.91
 HUB      7.93     1.20     6.34   534.36     1.06   501.04     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.73    35.36    31.50     3.86     0.93     0.33     2.90
 MEAN    32.31    27.41    23.50     3.91     0.93     0.32     3.30     0.91
 HUB     37.62    10.41     6.50     3.91     0.93     0.33     3.92


   blockage3   Cor/Incid
      0.850       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     659.326     311.496     581.103    1094.377       0.602      -0.222

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.916       6.193     498.012      46.000      28.193      30.600       2.407

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     581.307     311.496     659.505    1103.210       0.527       0.019

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.850       7.895       6.533     506.083     455.853       0.025       0.289

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     572.761       0.000     572.761    1104.106       0.519       0.251

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850       6.551     506.906       0.000       0.060       0.042       0.031

    STAGE EXIT CONDITIONS, STAGE   2
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      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876       7.871       1.191     534.261      29.566     245.127       1.900

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 183874.078       0.448     666.298  629556.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc = 6.210   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     64.123    3596.943       7.871     534.261       1.000       1.000       0.880
W Kg/sec =  29.1469536

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    121.545    3544.174       1.401       0.248      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 128273.656   50315.398       1.383     489.818     354.052     384.470       1.086

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   530.19    -0.18   530.19     0.48   620.72
 MEAN    17.74     0.00    -0.02   530.19    -0.18   530.19     0.48
 HUB     15.05     0.00    -0.02   530.19    -0.18   530.19     0.48

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.92    46.36     3.56   629.98   823.54     6.73   510.83     0.74
 MEAN    46.41    43.40     3.01   556.80   768.98     6.73   510.83     0.69
 HUB     41.71    38.84     2.87   472.41   710.25     6.73   510.83     0.64

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   543.50   284.07   463.36  1137.50     0.48
 MEAN    17.51   556.27   297.77   469.86  1134.05     0.49
 HUB     14.85   604.71   371.34   477.27  1130.70     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    621.82   573.40   337.76     0.50  5631.00
 MEAN   549.52   533.05   251.75     0.47  5216.17     1.55
 HUB    466.13   486.59    94.79     0.43  5517.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      9.27     1.18     7.93   562.68     1.05   538.05     0.92     0.90
 MEAN     9.16     1.16     7.77   560.58     1.05   534.79     0.92     0.90
 HUB      9.24     1.17     7.60   562.10     1.05   531.62     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.51    36.09    31.50     4.59     0.93     0.36     2.90
 MEAN    32.36    28.18    23.50     4.68     0.91     0.37     3.28     0.90
 HUB     37.88    11.23     6.50     4.73     0.91     0.38     3.87


  blockage3   Cor/Incid
     0.950       0.986

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     561.866     299.724     475.246    1134.737       0.495       0.012

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     9.210       7.788     535.468      46.000      32.238      31.500      -0.738

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     483.541     299.724     568.900    1141.947       0.423       0.247
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BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	9.196	8.129	542.295	471.992	0.020	0.345

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	468.680	0.000	468.680	1143.189	0.410	0.261

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	8.168	543.474	0.000	0.060	0.037	0.275

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.868	9.171	1.165	561.787	27.526	245.136	1.900

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
171242.812	0.443	620.527	691541.188

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.210 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
64.123	3596.943	9.171	561.787	1.000	1.000	0.980

W Kg/sec = 29.1469536

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
106.967	3456.255	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
128273.656	50315.398	1.647	513.330	311.601	401.059	1.287

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	438.86	-0.15	438.86	0.38	580.89
MEAN	16.97	0.00	-0.02	438.86	-0.15	438.86	0.38	
HUB	14.32	0.00	-0.02	438.86	-0.15	438.86	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.03	46.36	7.67	604.56	747.17	8.29	545.74	0.65
MEAN	50.53	43.80	6.73	532.70	690.31	8.29	545.74	0.60
HUB	45.70	37.84	7.86	449.49	628.31	8.29	545.74	0.55

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	520.41	280.37	438.43	1166.52	0.45
MEAN	16.57	530.10	288.79	444.53	1163.00	0.46
HUB	13.89	572.63	352.43	451.33	1159.53	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	592.63	538.26	312.26	0.46	5296.32	
MEAN	520.24	501.17	231.46	0.43	4788.87	1.50
HUB	436.00	459.00	83.57	0.40	4897.39	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	10.64	1.16	9.28	588.50	1.05	565.93	0.92	0.91
MEAN	10.49	1.14	9.10	585.94	1.04	562.53	0.92	0.91
HUB	10.53	1.15	8.91	586.49	1.04	559.16	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.60	35.46	31.50	3.96	0.93	0.34	2.90	
MEAN	33.01	27.51	23.50	4.01	0.93	0.34	3.29	0.91
HUB	37.99	10.49	6.50	3.99	0.93	0.34	3.90	

blockage3	Cor/Incid
0.950	1.000

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     522.891     290.410     434.830    1164.707       0.449       0.053

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     10.540       9.178     564.192      46.000      33.738      32.400      -1.338

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     16.481     449.138     290.410     534.848    1170.858       0.384       0.284

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      10.529       9.512     570.167     456.573       0.018       0.372

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     16.096     426.346       0.000     426.346    1172.564       0.364       0.278

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       9.583     571.830       0.000       0.060       0.037       0.333

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      10.500       1.145     586.980      25.192     243.930       1.891

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 156783.969       0.446     568.133  601343.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc = 6.210   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     64.123    3596.943      10.500     586.980       1.000       1.000       0.980
W Kg/sec =  29.1469536

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     95.495    3381.272       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 128273.656   50315.398       1.832     509.668     278.195     390.276       1.403

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   397.01    -0.14   397.01     0.34   540.56
 MEAN    15.91      0.00    -0.02   397.01    -0.14   397.01     0.34
 HUB     13.07      0.00    -0.02   397.01    -0.14   397.01     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.39    47.36     8.03   575.05   698.90     9.70   573.85     0.60
 MEAN    51.53    44.80     6.73   499.50   638.16     9.70   573.85     0.54
 HUB     45.95    38.84     7.11   410.26   571.00     9.70   573.85     0.49

      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   486.06   276.96   399.43  1193.35     0.41
 MEAN    15.50   489.57   274.53   405.36  1189.43     0.41
 HUB     12.59   520.99   319.14   411.80  1185.55     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    563.12   491.35   286.16     0.41  4971.25
 MEAN   486.46   457.42   211.93     0.38  4256.67     1.53
 HUB    395.19   418.76    76.05     0.35  4019.80

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     12.01     1.14    10.71   612.05     1.04   592.36     0.92     0.91
 MEAN    11.78     1.12    10.48   608.44     1.04   588.47     0.92     0.91
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  HUB     11.71     1.11    10.25   607.25     1.03   584.63     0.92     0.91

          Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     34.74    35.62    31.50     4.12     0.93     0.36     2.90
  MEAN    34.11    27.60    23.50     4.10     0.93     0.35     3.34     0.91
  HUB     37.78    10.46     6.50     3.96     0.93     0.33     4.06


    blockage3   Cor/Incid
       0.950       1.000

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
      15.219     495.273     279.560     408.830    1189.762       0.416       -0.005

      Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      11.804      10.477     588.809      46.000      34.364      33.000      -1.364

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
      15.219     427.272     279.560     510.602    1195.031       0.358       0.228

    BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
       0.950      11.786      10.789     594.035     440.827       0.033       0.385

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
      14.701     399.111       0.000     399.111    1196.979       0.333       0.319

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      10.908     595.974       0.000       0.060       0.037       0.316

     STAGE EXIT CONDITIONS, STAGE   5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.882      11.781       1.122     609.245      22.266     253.533       1.965

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  138629.953       0.437     502.349  613305.438

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     888652.69   3220.1807    172.4632      2.2731      0.8653      6.2100      1.3063


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NPSS: Inlet Mach number .78, Altitude 35000ft, dT 22R, Thrust 69.9%
Stage 2 stator Blocked @ 15%

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*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*****************************************************************

          Fan Hub + 4 Stage LPC 100%  12-20-2010

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 6.313   EfDer =  1.000

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
      63.934     3598.006        5.183     466.396        1.000        1.000        0.980
 W Kg/sec =  29.060955

    W cor       RPM cor         GAMMA         Cp          R           Blades       THK
     171.954     3794.396        1.401        0.248       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1       A*        AthrRotor   ChokeMargin
  127895.180    50166.941        1.660     831.557     500.873     619.754        1.237
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ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	396.29	-0.14	396.29	0.38	683.09
MEAN	17.06	0.00	-0.02	396.29	-0.14	396.29	0.38	
HUB	12.51	0.00	-0.02	396.29	-0.14	396.29	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.55	50.47	8.08	647.75	759.48	4.69	453.30	0.73
MEAN	53.51	47.20	6.31	535.66	666.43	4.69	453.30	0.64
HUB	44.76	38.62	6.14	392.80	558.07	4.69	453.30	0.53

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	632.74	367.96	514.75	1064.87	0.59
MEAN	18.04	665.49	405.05	528.03	1059.27	0.63
HUB	15.00	764.15	526.27	554.03	1049.45	0.73

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	647.75	585.88	279.80	0.55	7593.73	
MEAN	566.30	552.10	161.26	0.52	7307.75	1.34
HUB	470.98	556.79	55.30	0.53	7895.82	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.68	1.29	5.26	504.75	1.08	471.37	0.92	0.91
MEAN	6.62	1.28	5.07	503.31	1.08	466.38	0.92	0.91
HUB	6.74	1.30	4.74	506.28	1.09	457.61	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.56	28.53	24.20	4.33	0.93	0.31	2.90	
MEAN	37.49	16.98	12.70	4.28	0.93	0.26	3.51	0.91
HUB	43.53	-5.70	-9.30	3.60	0.93	0.11	4.78	

blockage3	Cor/Incid
0.950	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	676.170	404.259	542.015	1059.384	0.638	-0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
6.662	5.063	466.647	24.000	36.717	35.400	-1.317

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	560.324	404.259	690.933	1072.859	0.522	0.295

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	6.636	5.509	478.593	528.796	0.025	0.440

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	513.290	0.000	513.290	1077.569	0.476	0.360

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.660	482.804	0.000	0.060	0.040	0.386

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	6.612	1.276	504.777	38.381	215.360	1.669

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
238631.188	0.569	862.168	698334.688

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

```
 RESET =  0.000BLEED =  0.000 DPInc = 6.313   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     63.934    3598.006       6.612     504.777       1.000       1.000       0.980
W Kg/sec =  29.060955

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    140.214    3647.290       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 127895.180   50166.941       1.446     590.487     408.424     474.134       1.161

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   487.21    -0.17   487.21     0.45   654.06
 MEAN    18.08     0.00    -0.02   487.21    -0.17   487.21     0.45
 HUB     15.21     0.00    -0.02   487.21    -0.17   487.21     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.95    46.36     6.59   645.24   808.66     5.75   484.98     0.75
 MEAN    49.37    42.30     7.07   567.63   748.18     5.75   484.98     0.69
 HUB     44.44    37.84     6.60   477.57   682.36     5.75   484.98     0.63

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   566.55   300.25   480.45  1106.42     0.51
 MEAN    18.01   580.05   311.97   489.01  1102.21     0.53
 HUB     15.22   630.79   386.43   498.56  1098.10     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    641.16   589.11   340.91     0.53  6134.58
 MEAN   565.49   550.82   253.51     0.50  5621.61     1.47
 HUB    477.98   506.90    91.55     0.46  5885.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      8.00     1.21     6.69   535.75     1.06   508.99     0.92     0.91
 MEAN     7.88     1.19     6.52   533.16     1.06   505.11     0.92     0.91
 HUB      7.94     1.20     6.35   534.49     1.06   501.32     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.00    35.36    31.50     3.86     0.93     0.34     2.90
 MEAN    32.54    27.40    23.50     3.90     0.93     0.33     3.30     0.91
 HUB     37.78    10.41     6.50     3.91     0.93     0.33     3.92


  blockage3   Cor/Incid
     0.800       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.960     705.889     312.846     632.777    1088.768       0.648      -0.386

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     7.927       5.975     492.920      46.000      26.308      30.600       4.292

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.960     633.183     312.846     706.253    1097.697       0.577      -0.153

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.800       7.899       6.303     501.038     428.205       0.030       0.264

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    17.823     624.208       0.000     624.208    1098.729       0.568       0.241

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.800       6.317     501.979       0.000       0.060       0.054      -0.143

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4        Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866       7.865       1.189     534.469      29.693     243.889       1.891

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 184661.094       0.449     667.176  627060.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc = 6.313   EfDer =  0.962

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     63.934    3598.006       7.865     534.469       1.000       1.000       0.830
W Kg/sec =  29.060955

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    121.301    3544.529       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 127895.180   50166.941       1.307     461.987     353.342     361.823       1.024

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   571.66    -0.20   571.66     0.52   620.78
 MEAN    17.74     0.00    -0.02   571.66    -0.20   571.66     0.52
 HUB     15.05     0.00    -0.02   571.66    -0.20   571.66     0.52

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.80    46.36     1.44   630.17   850.97     6.55   507.23     0.77
 MEAN    44.26    43.40     0.86   556.96   798.26     6.55   507.23     0.72
 HUB     39.59    38.84     0.75   472.55   741.81     6.55   507.23     0.67

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   541.69   277.80   465.03  1137.24     0.48
 MEAN    17.51   554.59   292.57   471.14  1133.96     0.49
 HUB     14.85   603.09   367.29   478.35  1130.78     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.00   578.56   344.20     0.51  5507.17
 MEAN   549.68   536.73   257.11     0.47  5125.46     1.59
 HUB    466.27   488.48    98.98     0.43  5457.22

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      9.20     1.17     7.87   562.27     1.05   537.81     0.92     0.88
 MEAN     9.10     1.16     7.73   560.34     1.05   534.70     0.92     0.88
 HUB      9.18     1.17     7.57   562.02     1.05   531.70     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.85    36.51    31.50     5.01     0.93     0.38     2.90
 MEAN    31.84    28.62    23.50     5.12     0.91     0.38     3.28     0.88
 HUB     37.52    11.69     6.50     5.19     0.91     0.41     3.87


  blockage3   Cor/Incid
     0.950       0.962

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     560.273     294.494     476.633    1134.634       0.494       0.011

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      9.146       7.741     535.372      46.000      31.710      31.500      -0.210

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	485.647	294.494	567.961	1141.509	0.425	0.237

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	9.133	8.063	541.880	471.992	0.019	0.336

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	470.682	0.000	470.682	1142.765	0.412	0.252

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	8.103	543.073	0.000	0.060	0.037	0.265

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.847	9.108	1.158	561.542	27.073	250.378	1.941

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
168420.625	0.435	608.499	744556.812

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.313 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
63.934	3598.006	9.108	561.542	1.000	1.000	0.980

W Kg/sec = 29.060955

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
107.366	3458.031	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
127895.180	50166.941	1.641	513.330	312.764	401.059	1.282

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	440.68	-0.15	440.68	0.38	581.19
MEAN	16.97	0.00	-0.02	440.68	-0.15	440.68	0.38	
HUB	14.32	0.00	-0.02	440.68	-0.15	440.68	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.93	46.36	7.57	604.74	748.39	8.22	545.36	0.65
MEAN	50.42	43.80	6.62	532.86	691.59	8.22	545.36	0.60
HUB	45.59	37.84	7.75	449.63	629.68	8.22	545.36	0.55

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	521.36	279.18	440.31	1166.07	0.45
MEAN	16.57	531.20	287.94	446.39	1162.58	0.46
HUB	13.89	573.95	352.19	453.19	1159.14	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	592.80	540.58	313.62	0.46	5273.90	
MEAN	520.40	503.29	232.45	0.43	4774.87	1.49
HUB	436.13	460.90	83.94	0.40	4894.09	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	10.56	1.16	9.21	588.15	1.05	565.50	0.92	0.91
MEAN	10.42	1.14	9.03	585.64	1.04	562.12	0.92	0.91
HUB	10.45	1.15	8.84	586.24	1.04	558.78	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.38	35.46	31.50	3.96	0.93	0.34	2.90	
MEAN	32.82	27.51	23.50	4.01	0.93	0.33	3.29	0.91
HUB	37.85	10.49	6.50	3.99	0.93	0.34	3.90	

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   blockage3   Cor/Incid
      0.950       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     523.923     289.560     436.635    1164.298       0.450       0.053

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     10.465       9.107     563.798      46.000      33.551      32.400      -1.151

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     16.481     451.109     289.560     536.045    1170.392       0.385       0.281

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      10.453       9.435     569.715     456.573       0.018       0.369

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     16.096     428.180       0.000     428.180    1172.116       0.365       0.275

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       9.507     571.395       0.000       0.060       0.037       0.331

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      10.426       1.145     586.675      25.133     244.941       1.899

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 156414.500       0.445     565.122  600150.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc = 6.313   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     63.934    3598.006      10.426     586.675       1.000       1.000       0.980
W Kg/sec =  29.060955

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     95.872    3383.149       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 127895.180   50166.941       1.825     509.668     279.295     390.276       1.397

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   398.68    -0.14   398.68     0.34   540.86
 MEAN    15.91     0.00    -0.02   398.68    -0.14   398.68     0.34
 HUB     13.07     0.00    -0.02   398.68    -0.14   398.68     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.28    47.36     7.92   575.22   699.99     9.63   573.43     0.60
 MEAN    51.42    44.80     6.62   499.64   639.32     9.63   573.43     0.54
 HUB     45.84    38.84     7.00   410.38   572.25     9.63   573.43     0.49

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   486.85   275.87   401.15  1192.89     0.41
 MEAN    15.50   490.56   273.74   407.08  1188.98     0.41
 HUB     12.59   522.21   318.91   413.53  1185.12     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    563.29   493.49   287.42     0.41  4951.61
 MEAN   486.60   459.38   212.87     0.39  4244.45     1.53
 HUB    395.31   420.52    76.40     0.35  4016.81
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    11.92     1.14    10.62   611.65     1.04   591.90     0.92     0.91
 MEAN   11.69     1.12    10.40   608.08     1.04   588.03     0.92     0.91
 HUB    11.62     1.11    10.17   606.93     1.03   584.22     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    34.52    35.62    31.50     4.12     0.93     0.36     2.90
 MEAN   33.92    27.61    23.50     4.11     0.93     0.34     3.34     0.91
 HUB    37.64    10.47     6.50     3.97     0.93     0.33     4.06


   blockage3   Cor/Incid
      0.950       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     15.219      496.257     278.756     410.567     1189.319       0.417       -0.005

     Pt3         Ps3         Ts3        Vane No.     Alpha3     Vane A3      Incid3
     11.717      10.394      588.371      46.000      34.175      33.000      -1.175

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth        Aoth         Machth      cp 2-Th
     15.219      429.179     278.756     511.761     1194.534       0.359       0.224

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      11.700      10.701      593.543     440.827       0.033       0.382

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4          Mach4       cp 3-4
     14.701      400.853       0.000     400.853     1196.504       0.335       0.316

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.820      595.502       0.000       0.060       0.037       0.313

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.882      11.694       1.122     608.889      22.214     254.587       1.974

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 138306.203       0.436     499.697  612045.000

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    886433.56   3202.6616     171.9543      2.2564      0.8587      6.3127      1.3055


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NPSS: Inlet Mach number .78, Altitude 35000ft, dT 22R, Thrust 69.9%
Stage 2 stator Blocked @ 20%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS *******************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 6.477   EfDer =  1.000

    W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
      63.631    3599.622       5.183     466.396       1.000       1.000       0.980
 W Kg/sec =  28.9232712

    W cor      RPM cor        GAMMA        Cp         R          Blades      THK
     171.140    3796.100       1.401       0.248      53.349      32.000      0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
127289.250	49929.262	1.668	831.557	498.500	619.754	1.243

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	394.10	-0.14	394.10	0.38	683.39
MEAN	17.06	0.00	-0.02	394.10	-0.14	394.10	0.38	
HUB	12.51	0.00	-0.02	394.10	-0.14	394.10	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.70	50.47	8.23	648.04	758.58	4.70	453.44	0.73
MEAN	53.68	47.20	6.48	535.90	665.32	4.70	453.44	0.64
HUB	44.93	38.62	6.31	392.97	556.64	4.70	453.44	0.53

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	631.19	370.13	511.28	1065.32	0.59
MEAN	18.04	663.58	406.36	524.60	1059.66	0.63
HUB	15.00	761.39	526.12	550.37	1049.84	0.73

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	648.04	581.93	277.91	0.55	7638.57	
MEAN	566.56	548.51	160.20	0.52	7331.47	1.35
HUB	471.19	553.11	54.93	0.53	7893.45	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.69	1.29	5.27	504.99	1.08	471.78	0.92	0.91
MEAN	6.62	1.28	5.08	503.44	1.08	466.73	0.92	0.91
HUB	6.74	1.30	4.75	506.28	1.09	457.97	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.90	28.53	24.20	4.33	0.93	0.32	2.90	
MEAN	37.76	16.98	12.70	4.28	0.93	0.27	3.51	0.91
HUB	43.71	-5.70	-9.30	3.60	0.93	0.11	4.78	

blockage3	Cor/Incid
0.950	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	674.079	405.573	538.418	1059.797	0.636	-0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
6.667	5.077	467.011	24.000	36.990	35.400	-1.590

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	556.204	405.573	688.369	1073.433	0.518	0.300

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	6.642	5.530	479.105	528.796	0.026	0.445

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	509.680	0.000	509.680	1078.056	0.473	0.365

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.678	483.241	0.000	0.060	0.040	0.390

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	6.618	1.277	504.906	38.510	214.322	1.661

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
239431.516	0.570	860.961	694474.625

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc = 6.477   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     63.631    3599.622       6.618     504.906       1.000       1.000       0.980
W Kg/sec =  28.9232712

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    139.436    3648.463       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 127289.250   49929.262       1.454     590.487     406.157     474.134       1.167

    ROTOR LEADING EDGE CONDITIONS, STAGE   2

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   483.89    -0.17   483.89     0.45   654.27
 MEAN    18.08     0.00    -0.02   483.89    -0.17   483.89     0.45
 HUB     15.21     0.00    -0.02   483.89    -0.17   483.89     0.45

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.15    46.36     6.79   645.53   806.89     5.77   485.38     0.75
 MEAN    49.57    42.30     7.27   567.89   746.21     5.77   485.38     0.69
 HUB     44.65    37.84     6.81   477.79   680.14     5.77   485.38     0.63

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   565.07   303.11   476.89  1107.05     0.51
 MEAN    18.01   578.26   314.08   485.52  1102.76     0.52
 HUB     15.22   628.64   387.32   495.15  1098.57     0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    641.45   584.72   338.34     0.53  6192.90
 MEAN   565.74   546.87   251.66     0.50  5659.59     1.48
 HUB    478.19   503.42    90.87     0.46  5898.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      8.02     1.21     6.72   536.19     1.06   509.57     0.92     0.91
 MEAN     7.90     1.19     6.55   533.50     1.06   505.62     0.92     0.91
 HUB      7.95     1.20     6.37   534.70     1.06   501.76     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.44    35.35    31.50     3.85     0.93     0.34     2.90
 MEAN    32.90    27.40    23.50     3.90     0.93     0.33     3.30     0.91
 HUB     38.03    10.40     6.50     3.90     0.93     0.33     3.92


  blockage3   Cor/Incid
     0.750       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.960     765.388     314.962     697.579    1081.040       0.708      -0.609

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     7.943       5.684     485.947      46.000      24.300      30.600       6.300

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.960     698.512     314.962     766.238    1090.082       0.641      -0.388

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.750       7.904       5.995     494.111     400.556       0.038       0.237

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
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     17.823     689.772       0.000     689.772    1091.211       0.632       0.223

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750       5.999     495.124       0.000       0.060       0.074      -0.385

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.847       7.853       1.186     534.796      29.891     241.954       1.876

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 185894.406       0.452     668.450  623091.188


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc = 6.477   EfDer =  0.924

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     63.631    3599.622       7.853     534.796       1.000       1.000       0.780
W Kg/sec =  28.9232712

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    120.952    3545.037       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 127289.250   49929.262       1.232     434.156     352.328     339.175       0.963

    ROTOR LEADING EDGE CONDITIONS, STAGE   3

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   621.84    -0.21   621.84     0.57   620.87
 MEAN    17.74     0.00    -0.02   621.84    -0.21   621.84     0.57
 HUB     15.05     0.00    -0.02   621.84    -0.21   621.84     0.57

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.40    46.36    -0.96   630.45   885.67     6.32   502.56     0.81
 MEAN    41.87    43.40    -1.53   557.21   835.11     6.32   502.56     0.76
 HUB     37.26    38.84    -1.58   472.76   781.27     6.32   502.56     0.71

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   539.95   269.74   467.75  1136.91     0.47
 MEAN    17.51   553.01   285.97   473.33  1133.85     0.49
 HUB     14.85   601.66   362.26   480.37  1130.90     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.28   585.73   352.55     0.52  5347.78
 MEAN   549.93   541.95   263.95     0.48  5010.18     1.64
 HUB    466.48   491.55   104.22     0.43  5382.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      9.09     1.16     7.79   561.80     1.05   537.50     0.92     0.85
 MEAN     9.01     1.15     7.65   560.10     1.05   534.60     0.92     0.85
 HUB      9.10     1.16     7.50   561.98     1.05   531.80     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.97    37.01    31.50     5.51     0.93     0.39     2.90
 MEAN    31.14    29.15    23.50     5.65     0.89     0.40     3.28     0.85
 HUB     37.02    12.24     6.50     5.74     0.89     0.43     3.87


  blockage3   Cor/Incid
     0.950       0.924

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     558.841     287.849     479.006    1134.510       0.493       0.009

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
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      9.049       7.665     535.258      46.000      31.003      31.500       0.497

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     488.965     287.849     567.400    1140.961       0.429       0.224

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       9.035       7.963     541.362     471.992       0.019       0.325

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.121     473.851       0.000     473.851    1142.239       0.415       0.239

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       8.004     542.575       0.000       0.060       0.037       0.252

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.811       9.011       1.147     561.293      26.497     257.376       1.995

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 164840.188       0.426     592.742  807781.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc = 6.477   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     63.631    3599.622       9.011     561.293       1.000       1.000       0.980
W Kg/sec =  28.9232712

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    107.985    3460.350       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 127289.250   49929.262       1.632     513.330     314.567     401.059       1.275

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   443.57    -0.15   443.57     0.39   581.58
 MEAN    16.97     0.00    -0.02   443.57    -0.15   443.57     0.39
 HUB     14.32     0.00    -0.02   443.57    -0.15   443.57     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.76    46.36     7.40   605.01   750.31     8.12   544.90     0.66
 MEAN    50.25    43.80     6.45   533.09   693.62     8.12   544.90     0.61
 HUB     45.41    37.84     7.57   449.83   631.85     8.12   544.90     0.55

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   522.87   277.27   443.30  1165.50     0.45
 MEAN    16.57   532.97   286.58   449.36  1162.05     0.46
 HUB     13.89   576.04   351.79   456.14  1158.65     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    593.07   544.29   315.80     0.47  5237.71
 MEAN   520.63   506.66   234.04     0.44  4752.40     1.49
 HUB    436.32   463.91    84.53     0.40  4888.60

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     10.44     1.16     9.09   587.73     1.05   564.95     0.92     0.91
 MEAN    10.30     1.14     8.92   585.28     1.04   561.61     0.92     0.91
 HUB     10.34     1.15     8.73   585.97     1.04   558.32     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.02    35.47    31.50     3.97     0.93     0.34     2.90
 MEAN    32.53    27.51    23.50     4.01     0.93     0.33     3.29     0.91
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 HUB     37.64    10.50     6.50     4.00     0.93     0.34     3.90


   blockage3   Cor/Incid
      0.950       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     16.481     525.572     288.196     439.510    1163.790       0.452        0.054

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
     10.348       8.996     563.309      46.000      33.254      32.400       -0.854

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     16.481     454.255     288.196     537.963    1169.790       0.388        0.276

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      10.337       9.315     569.133     456.573        0.018        0.364

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4        cp 3-4
     16.096     431.108       0.000     431.108    1171.544       0.368        0.271

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       9.388     570.841       0.000       0.060        0.037        0.327

    STAGE EXIT CONDITIONS, STAGE   4
       Eff4        Pt4          PR4        Texit         Del T        Ns         Ns nondim
       0.880      10.309        1.144     586.330       25.037     246.564        1.911

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 155813.234       0.443     560.282  598106.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc = 6.477   EfDer =  1.000

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     63.631     3599.622       10.309     586.330       1.000        1.000        0.980
W Kg/sec =  28.9232712

   W cor       RPM cor         GAMMA         Cp          R            Blades       THK
     96.464     3385.664        1.401        0.249      53.349       56.000        0.050

   CFM        SCFM             A1/A*       Area1        A*        AthrRotor   ChokeMargin
 127289.250   49929.262        1.814     509.668     281.020     390.276        1.389

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1       Stator    Alfa     C1       CU1        Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   401.35    -0.14   401.35      0.34   541.26
 MEAN    15.91      0.00    -0.02   401.35    -0.14   401.35      0.34
 HUB     13.07      0.00    -0.02   401.35    -0.14   401.35      0.34

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     55.11     47.36     7.75   575.48   701.73      9.51   572.91      0.60
 MEAN    51.25     44.80     6.45   499.87   641.16      9.51   572.91      0.55
 HUB     45.66     38.84     6.82   410.56   574.25      9.51   572.91      0.49

      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050        0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   488.13    274.10    403.91  1192.28      0.41
 MEAN    15.50   492.16    272.49    409.84  1188.41      0.41
 HUB     12.59   524.17    318.53    416.29  1184.58      0.44

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    563.54    496.91    289.45     0.42  4919.82
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  MEAN   486.82   462.50   214.33     0.39  4225.08     1.52
  HUB    395.49   423.34    76.95     0.36  4012.11

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     11.77     1.14    10.49   611.16     1.04   591.31     0.92     0.91
  MEAN    11.56     1.12    10.27   607.65     1.04   587.47     0.92     0.91
  HUB     11.49     1.11    10.05   606.58     1.03   583.68     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     34.16    35.63    31.50     4.13     0.93     0.36     2.90
  MEAN    33.62    27.61    23.50     4.11     0.93     0.34     3.34     0.91
  HUB     37.42    10.47     6.50     3.97     0.93     0.33     4.06


    blockage3   Cor/Incid
       0.950       1.000

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
      15.219     497.853     277.482     413.353    1188.749       0.419      -0.005

      Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      11.582      10.265     587.811      46.000      33.873      33.000      -0.873

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
      15.219     432.242     277.482     513.644    1193.879       0.362       0.219

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      11.565      10.563     592.895     440.827       0.033       0.377

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
      14.701     403.650       0.000     403.650    1195.882       0.338       0.312

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      10.683     594.886       0.000       0.060       0.037       0.308

     STAGE EXIT CONDITIONS, STAGE   5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.882      11.560       1.121     608.461      22.130     256.279       1.987

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  137783.156       0.434     495.448  609905.188

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     883762.50   3177.8833    171.1396      2.2304      0.8476      6.4766      1.3046


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NPSS: Inlet Mach number .78, Altitude 35000ft, dT 22R, Thrust 69.9%
Stage 2 stator Blocked @ 25%

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*********************************************************************
**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

          Fan Hub + 4 Stage LPC 100%  12-20-2010

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 6.727   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      63.167    3601.861       5.183     466.396       1.000       1.000       0.980
 W Kg/sec =  28.7121353
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
169.890	3798.462	1.401	0.248	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
126360.055	49564.785	1.680	831.557	494.861	619.754	1.252

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	390.75	-0.13	390.75	0.37	683.82
MEAN	17.06	0.00	-0.02	390.75	-0.13	390.75	0.37	
HUB	12.51	0.00	-0.02	390.75	-0.13	390.75	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.93	50.47	8.46	648.45	757.19	4.71	453.66	0.72
MEAN	53.93	47.20	6.73	536.24	663.61	4.71	453.66	0.64
HUB	45.19	38.62	6.57	393.22	554.45	4.71	453.66	0.53

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	628.88	373.37	506.05	1065.99	0.59
MEAN	18.04	660.68	408.31	519.41	1060.24	0.62
HUB	15.00	757.21	525.86	544.84	1050.43	0.72

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	648.45	575.97	275.07	0.54	7705.45	
MEAN	566.91	543.08	158.60	0.51	7366.58	1.36
HUB	471.48	547.54	54.38	0.52	7889.58	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.70	1.29	5.30	505.36	1.08	472.38	0.92	0.91
MEAN	6.63	1.28	5.10	503.64	1.08	467.25	0.92	0.91
HUB	6.74	1.30	4.77	506.29	1.09	458.50	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.42	28.53	24.20	4.33	0.93	0.32	2.90	
MEAN	38.17	16.98	12.70	4.28	0.93	0.27	3.51	0.91
HUB	43.98	-5.70	-9.30	3.60	0.93	0.12	4.78	

blockage3	Cor/Incid
0.950	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	670.922	407.517	532.979	1060.414	0.633	-0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
6.675	5.097	467.555	24.000	37.402	35.400	-2.002

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	550.016	407.517	684.534	1074.284	0.512	0.308

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	6.650	5.560	479.866	528.796	0.026	0.451

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	504.252	0.000	504.252	1078.779	0.467	0.372

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.705	483.889	0.000	0.060	0.039	0.397

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	6.627	1.279	505.095	38.699	212.758	1.649

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 240608.672       0.572     858.878  688575.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc = 6.727   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     63.167    3601.861       6.627     505.095       1.000       1.000       0.980
W Kg/sec =  28.7121353

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    138.258    3650.048       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 126360.055   49564.785       1.466     590.487     402.724     474.134       1.177

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   478.88    -0.16   478.88     0.44   654.55
 MEAN    18.08     0.00    -0.02   478.88    -0.16   478.88     0.44
 HUB     15.21     0.00    -0.02   478.88    -0.16   478.88     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.45    46.36     7.09   645.93   804.22     5.79   485.97     0.74
 MEAN    49.89    42.30     7.59   568.24   743.24     5.79   485.97     0.69
 HUB     44.96    37.84     7.12   478.08   676.79     5.79   485.97     0.63

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   562.90   307.35   471.59  1107.97     0.51
 MEAN    18.01   575.60   317.21   480.31  1103.57     0.52
 HUB     15.22   625.43   388.64   490.02  1099.27     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    641.84   578.17   334.50     0.52  6279.43
 MEAN   566.09   540.96   248.88     0.49  5715.89     1.49
 HUB    478.49   498.19    89.85     0.45  5918.78

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      8.06     1.22     6.75   536.84     1.06   510.42     0.92     0.91
 MEAN     7.92     1.19     6.58   533.99     1.06   506.36     0.92     0.91
 HUB      7.97     1.20     6.40   535.01     1.06   502.40     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.09    35.35    31.50     3.85     0.93     0.35     2.90
 MEAN    33.44    27.39    23.50     3.89     0.93     0.34     3.30     0.91
 HUB     38.42    10.39     6.50     3.89     0.93     0.34     3.92


  blockage3   Cor/Incid
     0.700       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     847.900     318.099     785.970    1069.174       0.793      -0.937

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.967       5.261     475.331      46.000      22.034      30.600       8.566

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     788.445     318.099     850.196    1078.257       0.731      -0.737

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.700       7.909       5.541     483.443     372.907       0.051       0.203
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    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.823     782.596       0.000     782.596    1079.214       0.725       0.178

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.700       5.511     484.218       0.000       0.060       0.113      -0.758

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.813       7.822       1.180     535.279      30.184     239.093       1.853

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 187717.172       0.456     670.077  617071.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc = 6.727   EfDer =  0.866

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     63.167    3601.861       7.822     535.279       1.000       1.000       0.730
W Kg/sec =  28.7121353

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    120.588    3545.644       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 126360.055   49564.785       1.157     406.326     351.266     316.528       0.901

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   686.30    -0.24   686.30     0.63   620.98
 MEAN    17.74     0.00    -0.02   686.30    -0.24   686.30     0.63
 HUB     15.05     0.00    -0.02   686.30    -0.24   686.30     0.63

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.60    46.36    -3.76   630.84   932.35     5.99   496.01     0.85
 MEAN    39.10    43.40    -4.30   557.56   884.39     5.99   496.01     0.81
 HUB     34.59    38.84    -4.25   473.05   833.68     5.99   496.01     0.76

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   538.45   258.82   472.17  1136.43     0.47
 MEAN    17.51   551.72   277.10   477.08  1133.68     0.49
 HUB     14.85   600.67   355.69   484.03  1131.01     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.67   596.10   363.85     0.52  5131.92
 MEAN   550.27   549.75   273.17     0.48  4855.27     1.70
 HUB    466.77   496.61   111.08     0.44  5285.57

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      8.92     1.14     7.65   561.21     1.05   537.04     0.92     0.79
 MEAN     8.86     1.13     7.53   559.81     1.05   534.44     0.92     0.79
 HUB      8.96     1.15     7.39   561.99     1.05   531.91     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.73    37.62    31.50     6.12     0.93     0.41     2.90
 MEAN    30.15    29.79    23.50     6.29     0.88     0.43     3.28     0.79
 HUB     36.31    12.92     6.50     6.42     0.88     0.46     3.87


  blockage3   Cor/Incid
     0.950       0.866

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
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     17.392     557.786     278.919     483.041    1134.305       0.492       0.006

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      8.899       7.543     535.067      46.000      30.003      31.500       1.497

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     494.326     278.919     567.586    1140.190       0.434       0.204

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       8.886       7.809     540.633     471.992       0.020       0.309

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.121     478.997       0.000     478.997    1141.500       0.420       0.221

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       7.850     541.877       0.000       0.060       0.037       0.234

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.756       8.861       1.133     561.004      25.725     267.608       2.074

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 160039.266       0.413     571.277  886699.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc = 6.727   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     63.167    3601.861       8.861     561.004       1.000       1.000       0.980
W Kg/sec =  28.7121353

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    108.976    3463.396       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 126360.055   49564.785       1.617     513.330     317.454     401.059       1.263

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   448.26    -0.15   448.26     0.39   582.09
 MEAN    16.97     0.00    -0.02   448.26    -0.15   448.26     0.39
 HUB     14.32     0.00    -0.02   448.26    -0.15   448.26     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.49    46.36     7.13   605.38   753.40     7.97   544.26     0.66
 MEAN    49.97    43.80     6.17   533.43   696.88     7.97   544.26     0.61
 HUB     45.13    37.84     7.29   450.11   635.35     7.97   544.26     0.56

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   525.35   274.06   448.20  1164.68     0.45
 MEAN    16.57   535.85   284.30   454.21  1161.30     0.46
 HUB     13.89   579.43   351.09   460.96  1157.97     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    593.44   550.35   319.38     0.47  5177.19
 MEAN   520.95   512.17   236.65     0.44  4714.59     1.48
 HUB    436.59   468.82    85.50     0.40  4878.83

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     10.25     1.16     8.92   587.16     1.05   564.16     0.92     0.91
 MEAN    10.12     1.14     8.75   584.82     1.04   560.89     0.92     0.91
 HUB     10.17     1.15     8.57   585.65     1.04   557.67     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.44    35.47    31.50     3.97     0.93     0.33     2.90
 MEAN    32.04    27.52    23.50     4.02     0.93     0.33     3.29     0.91
 HUB     37.29    10.51     6.50     4.01     0.93     0.33     3.90


   blockage3   Cor/Incid
      0.950       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     16.481     528.256     285.900     444.203    1163.071       0.454       0.054

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
     10.168       8.826     562.619      46.000      32.766      32.400      -0.366

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     16.481     459.413     285.900     541.109    1168.913       0.393       0.268

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      10.156       9.130     568.285     456.573       0.018       0.357

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     16.096     435.911       0.000     435.911    1170.716       0.372       0.264

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       9.204     570.039       0.000       0.060       0.037       0.320

    STAGE EXIT CONDITIONS, STAGE   4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.880      10.129       1.143     585.875      24.871     249.262       1.932

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 154777.312       0.439     552.494  594941.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc = 6.727   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     63.167    3601.861      10.129     585.875       1.000       1.000       0.980
W Kg/sec =  28.7121353

   W cor      RPM cor        GAMMA        Cp          R           Blades       THK
     97.424    3389.086       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 126360.055   49564.785       1.796     509.668     283.815     390.276       1.375

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   405.72    -0.14   405.72     0.35   541.80
 MEAN    15.91     0.00    -0.02   405.72    -0.14   405.72     0.35
 HUB     13.07     0.00    -0.02   405.72    -0.14   405.72     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.84    47.36     7.48   575.84   704.53     9.32   572.16     0.60
 MEAN    50.96    44.80     6.16   500.18   644.15     9.32   572.16     0.55
 HUB     45.37    38.84     6.53   410.82   577.49     9.32   572.16     0.49

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   490.24   271.10   408.46  1191.39     0.41
 MEAN    15.50   494.77   270.34   414.38  1187.57     0.42
 HUB     12.59   527.39   317.87   420.83  1183.80     0.45
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       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    563.89   502.56   292.79     0.42  4866.18
 MEAN   487.12   467.67   216.79     0.39  4191.77     1.51
 HUB    395.73   427.98    77.86     0.36  4003.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     11.55     1.14    10.28   610.45     1.04   590.42     0.92     0.91
 MEAN    11.35     1.12    10.07   607.04     1.04   586.65     0.92     0.91
 HUB     11.29     1.11     9.85   606.09     1.03   582.92     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.57    35.63    31.50     4.13     0.93     0.35     2.90
 MEAN    33.12    27.62    23.50     4.12     0.93     0.34     3.34     0.91
 HUB     37.07    10.48     6.50     3.98     0.93     0.33     4.06


   blockage3   Cor/Incid
      0.950       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     500.460     275.292     417.940    1187.917       0.421      -0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     11.372      10.064     586.993      46.000      33.372      33.000      -0.372

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     437.311     275.292     516.746    1192.899       0.367       0.210

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      11.354      10.347     591.927     440.827       0.033       0.370

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     14.701     408.276       0.000     408.276    1194.958       0.342       0.304

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.469     593.972       0.000       0.060       0.037       0.301

    STAGE EXIT CONDITIONS, STAGE   5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.881      11.350       1.120     607.859      21.984     259.119       2.009

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  136871.141       0.430     488.576  606609.562

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    880013.56   3141.3027    169.8903      2.1899      0.8295      6.7265      1.3033


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NPSS: Inlet Mach number .78, Altitude 35000ft, dT 22R, Thrust 69.9%
Stage 2 stator Blocked @ 27%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc = 6.867   EfDer =  1.000
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
62.905	3603.087	5.183	466.396	1.000	1.000	0.980

W Kg/sec = 28.5930901

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
169.186	3799.754	1.401	0.248	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
125836.148	49359.281	1.687	831.557	492.809	619.754	1.258

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	388.87	-0.13	388.87	0.37	684.05
MEAN	17.06	0.00	-0.02	388.87	-0.13	388.87	0.37	
HUB	12.51	0.00	-0.02	388.87	-0.13	388.87	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.06	50.47	8.59	648.67	756.41	4.71	453.78	0.72
MEAN	54.07	47.20	6.87	536.42	662.65	4.71	453.78	0.63
HUB	45.34	38.62	6.72	393.35	553.22	4.71	453.78	0.53

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	627.61	375.18	503.13	1066.37	0.59
MEAN	18.04	659.08	409.39	516.51	1060.55	0.62
HUB	15.00	754.90	525.73	541.75	1050.75	0.72

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	648.67	572.66	273.49	0.54	7742.66	
MEAN	567.10	540.05	157.72	0.51	7386.04	1.37
HUB	471.64	544.44	54.08	0.52	7887.55	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.71	1.29	5.31	505.56	1.08	472.71	0.92	0.91
MEAN	6.63	1.28	5.11	503.75	1.08	467.54	0.92	0.91
HUB	6.74	1.30	4.78	506.29	1.09	458.79	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.71	28.53	24.20	4.33	0.93	0.33	2.90	
MEAN	38.40	16.98	12.70	4.28	0.93	0.28	3.51	0.91
HUB	44.14	-5.70	-9.30	3.60	0.93	0.12	4.78	

blockage3	Cor/Incid
0.950	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	669.173	408.594	529.946	1060.755	0.631	-0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
6.680	5.108	467.855	24.000	37.633	35.400	-2.233

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	546.583	408.594	682.424	1074.753	0.509	0.313

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	6.654	5.577	480.285	528.796	0.026	0.455

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	501.239	0.000	501.239	1079.178	0.464	0.375

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.720	484.247	0.000	0.060	0.039	0.401

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    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879       6.632       1.280     505.200      38.804     211.885       1.643

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 241263.266       0.573     857.644  685259.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc = 6.867   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     62.905    3603.087       6.632     505.200       1.000       1.000       0.980
W Kg/sec =  28.5930901

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    137.599    3650.910       1.401       0.248      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 125836.148   49359.281       1.473     590.487     400.806     474.134       1.183

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   476.10    -0.16   476.10     0.44   654.71
 MEAN    18.08      0.00    -0.02   476.10    -0.16   476.10     0.44
 HUB     15.21      0.00    -0.02   476.10    -0.16   476.10     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.62    46.36     7.26   646.15   802.74     5.81   486.30     0.74
 MEAN    50.06    42.30     7.76   568.43   741.60     5.81   486.30     0.69
 HUB     45.14    37.84     7.30   478.25   674.94     5.81   486.30     0.62

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   561.73   309.68   468.65  1108.47     0.51
 MEAN    18.01   574.15   318.94   477.42  1104.01     0.52
 HUB     15.22   623.66   389.37   487.18  1099.65     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    642.06   574.56   332.39     0.52  6326.99
 MEAN   566.28   537.69   247.34     0.49  5747.10     1.50
 HUB    478.65   495.29    89.29     0.45  5929.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      8.07     1.22     6.77   537.19     1.06   510.88     0.92     0.91
 MEAN     7.93     1.20     6.60   534.26     1.06   506.77     0.92     0.91
 HUB      7.98     1.20     6.41   535.18     1.06   502.76     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.46    35.35    31.50     3.85     0.93     0.35     2.90
 MEAN    33.75    27.39    23.50     3.89     0.93     0.34     3.30     0.91
 HUB     38.63    10.39     6.50     3.89     0.93     0.34     3.92


  blockage3   Cor/Incid
     0.680       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     893.048     319.837     833.810    1062.112       0.841      -1.124

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.980       5.022     469.047      46.000      20.986      30.600       9.614

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     837.863     319.837     896.834    1071.082       0.782      -0.939
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BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	7.910	5.279	477.011	361.848	0.060	0.184

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	835.646	0.000	835.646	1071.697	0.780	0.140

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	5.217	477.346	0.000	0.060	0.140	-0.983

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.790	7.798	1.176	535.546	30.346	237.524	1.841

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
188722.891	0.458	670.874	613707.312

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 6.867 EfDer = 0.837

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
62.905	3603.087	7.798	535.546	1.000	1.000	0.710

W Kg/sec = 28.5930901

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
120.487	3545.966	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
125836.148	49359.281	1.126	395.194	350.975	307.469	0.876

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	718.85	-0.25	718.85	0.66	621.04
MEAN	17.74	0.00	-0.02	718.85	-0.25	718.85	0.66	
HUB	15.05	0.00	-0.02	718.85	-0.25	718.85	0.66	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	41.29	46.36	-5.07	631.06	956.71	5.82	492.47	0.88
MEAN	37.82	43.40	-5.58	557.75	910.00	5.82	492.47	0.84
HUB	33.37	38.84	-5.47	473.22	860.76	5.82	492.47	0.79

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	537.97	253.23	474.64	1136.17	0.47
MEAN	17.51	551.33	272.55	479.25	1133.58	0.49
HUB	14.85	600.45	352.37	486.18	1131.06	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	622.88	601.60	369.65	0.53	5021.44	
MEAN	550.46	553.99	277.91	0.49	4775.82	1.73
HUB	466.93	499.50	114.56	0.44	5236.42	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	8.83	1.13	7.58	560.93	1.05	536.80	0.92	0.77
MEAN	8.78	1.13	7.47	559.69	1.05	534.35	0.92	0.77
HUB	8.88	1.14	7.33	562.02	1.05	531.96	0.92	0.77

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.08	37.91	31.50	6.41	0.93	0.42	2.90	
MEAN	29.63	30.11	23.50	6.61	0.87	0.44	3.28	0.77
HUB	35.93	13.26	6.50	6.76	0.87	0.47	3.87	

blockage3	Cor/Incid
0.950	0.837

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     557.524     274.339     485.356    1134.194       0.492       0.004

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      8.817       7.474     534.964      46.000      29.477      31.500       2.023

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     497.345     274.339     567.992    1139.790       0.436       0.194

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       8.804       7.724     540.256     471.992       0.020       0.301

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.121     481.907       0.000     481.907    1141.119       0.422       0.212

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       7.765     541.517       0.000       0.060       0.038       0.224

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.729       8.779       1.126     560.877      25.331     273.341       2.119

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 157587.422       0.406     560.193  925097.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc = 6.867   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     62.905    3603.087       8.779     560.877       1.000       1.000       0.980
W Kg/sec =  28.5930901

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    109.530    3464.967       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 125836.148   49359.281       1.609     513.330     319.070     401.059       1.257

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   450.90    -0.16   450.90     0.39   582.36
 MEAN    16.97     0.00    -0.02   450.90    -0.16   450.90     0.39
 HUB     14.32     0.00    -0.02   450.90    -0.16   450.90     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.34    46.36     6.98   605.59   755.14     7.89   543.93     0.66
 MEAN    49.81    43.80     6.01   533.61   698.73     7.89   543.93     0.61
 HUB     44.97    37.84     7.13   450.26   637.33     7.89   543.93     0.56

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   526.78   272.24   450.98  1164.24     0.45
 MEAN    16.57   537.50   283.00   456.96  1160.91     0.46
 HUB     13.89   581.37   350.70   463.68  1157.63     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    593.64   553.79   321.41     0.48  5142.80
 MEAN   521.13   515.29   238.13     0.44  4693.07     1.47
 HUB    436.74   471.60    86.05     0.41  4873.38

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     10.15     1.16     8.82   586.86     1.05   563.74     0.92     0.91
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 MEAN    10.02     1.14     8.65   584.59     1.04   560.52     0.92     0.91
 HUB     10.07     1.15     8.48   585.50     1.04   557.34     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.12    35.48    31.50     3.98     0.93     0.33     2.90
 MEAN    31.77    27.52    23.50     4.02     0.93     0.32     3.29     0.91
 HUB     37.10    10.51     6.50     4.01     0.93     0.33     3.90


   blockage3   Cor/Incid
      0.950       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     529.792     284.593     446.863    1162.699       0.456       0.054

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     10.068       8.731     562.262      46.000      32.492      32.400      -0.092

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     16.481     462.345     284.593     542.914    1168.451       0.396       0.263

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      10.057       9.027     567.838     456.573       0.018       0.353

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     16.096     438.642       0.000     438.642    1170.281       0.375       0.259

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       9.102     569.618       0.000       0.060       0.037       0.316

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      10.030       1.142     585.653      24.776     250.800       1.944

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 154186.750       0.438     548.104  593125.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc = 6.867   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     62.905    3603.087      10.030     585.653       1.000       1.000       0.980
W Kg/sec =  28.5930901

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     97.964    3390.881       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 125836.148   49359.281       1.786     509.668     285.392     390.276       1.368

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   408.21    -0.14   408.21     0.35   542.09
 MEAN    15.91     0.00    -0.02   408.21    -0.14   408.21     0.35
 HUB     13.07     0.00    -0.02   408.21    -0.14   408.21     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.68    47.36     7.32   576.03   706.12     9.22   571.77     0.60
 MEAN    50.80    44.80     6.00   500.35   645.85     9.22   571.77     0.55
 HUB     45.20    38.84     6.36   410.96   579.34     9.22   571.77     0.49

      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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  TIP     17.94   491.47   269.39   411.06  1190.91     0.41
  MEAN    15.50   496.27   269.10   416.98  1187.13     0.42
  HUB     12.59   529.23   317.48   423.42  1183.39     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    564.09   505.78   294.70     0.42  4835.40
  MEAN   487.29   470.61   218.18     0.40  4172.72     1.51
  HUB    395.87   430.62    78.38     0.36  3998.93

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     11.43     1.14    10.17   610.08     1.04   589.95     0.92     0.91
  MEAN    11.23     1.12     9.96   606.73     1.04   586.21     0.92     0.91
  HUB     11.18     1.11     9.75   605.85     1.03   582.52     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     33.24    35.64    31.50     4.14     0.93     0.35     2.90
  MEAN    32.84    27.62    23.50     4.12     0.92     0.33     3.34     0.91
  HUB     36.86    10.49     6.50     3.99     0.92     0.32     4.06


    blockage3   Cor/Incid
       0.950       0.999

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
      15.219     501.962     274.039     420.557    1187.477       0.423       -0.005

      Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      11.255       9.953     586.562      46.000      33.089      33.000       -0.089

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth        Aoth         Machth      cp 2-Th
      15.219     440.210     274.039     518.539    1192.374       0.369       0.204

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      11.238      10.228     591.409     440.827       0.033       0.366

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4         Ao4          Mach4       cp 3-4
      14.701     410.921       0.000     410.921    1194.465       0.344       0.300

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      10.350     593.485       0.000       0.060       0.037       0.296

     STAGE EXIT CONDITIONS, STAGE   5
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.881       11.233       1.120     607.553      21.900     260.754       2.021

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  136343.625       0.428     484.675  604723.500

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     878103.94   3121.4905    169.1859      2.1674      0.8191      6.8673      1.3027


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DESCENT   Operating Point #1

NPSS:  Inlet Mach number .73,  Altitude 38334ft, dT 22R, Thrust 10%
                Stage 4 stator Blocked @ 10%

*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
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        Fan Hub + 4 Stage LPC 100%  12-20-2010

    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
 RESET =  0.000BLEED =  0.000 DPInc =17.812   EfDer =  0.932

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    23.830    2412.422       4.216     455.811       1.000       1.000       0.980
W Kg/sec =  10.8316822

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    77.884    2573.468       1.401       0.248      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 57267.148   18698.365       3.665     831.557     226.869     619.754       2.732

    ROTOR LEADING EDGE CONDITIONS, STAGE   1

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   167.41    -0.06   167.41     0.16   463.29
MEAN    17.06     0.00    -0.02   167.41    -0.06   167.41     0.16
HUB     12.51     0.00    -0.02   167.41    -0.06   167.41     0.16

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     68.92    50.47    18.45   434.31   465.51     4.14   453.47     0.45
MEAN    65.01    47.20    17.81   359.16   396.31     4.14   453.47     0.38
HUB     57.56    38.62    18.94   263.36   312.12     4.14   453.47     0.30

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   384.35   311.46   225.19  1057.77     0.36
MEAN    18.04   384.38   309.45   228.01  1054.51     0.36
HUB     15.00   409.83   337.94   231.84  1050.61     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    434.31   256.52   122.85     0.24  6426.70
MEAN   379.70   238.58    70.25     0.23  5582.28     1.92
HUB    315.79   232.90    22.16     0.22  5069.90

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      4.85     1.15     4.42   477.58     1.05   465.26     0.92     0.85
MEAN     4.76     1.13     4.34   474.72     1.04   462.40     0.92     0.85
HUB      4.71     1.12     4.24   472.98     1.04   458.98     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     54.13    28.61    24.20     4.41     0.93     0.56     2.90
MEAN    53.62    17.12    12.70     4.42     0.95     0.51     3.51     0.85
HUB     55.55    -5.46    -9.30     3.84     0.95     0.38     4.78


  blockage3   Cor/Incid
     0.950       0.932

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    18.071     387.155     308.852     233.451    1054.738       0.367       0.002

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     4.767       4.344     462.595      24.000      52.916      35.400     -17.516

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    18.071     246.908     308.852     395.415    1063.157       0.232       0.553

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       4.752       4.576     470.010     528.796       0.046       0.669

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
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     18.083     231.091       0.000     231.091    1063.870       0.217       0.514

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       4.568     470.640       0.000       0.060       0.117       0.533

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.777       4.721       1.120     475.093      19.282     157.297       1.219

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 119865.539       0.635     161.415  249905.891


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.812   EfDer =  0.935

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.830    2412.422       4.721     475.093       1.000       1.000       0.980
W Kg/sec =  10.8316822

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     71.016    2520.704       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57267.148   18698.365       2.854     590.487     206.862     474.134       2.292

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   221.39    -0.08   221.39     0.21   452.03
 MEAN    18.08     0.00    -0.02   221.39    -0.08   221.39     0.21
 HUB     15.21     0.00    -0.02   221.39    -0.08   221.39     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.90    46.36    16.54   432.63   486.05     4.58   471.01     0.46
 MEAN    59.82    42.30    17.52   380.59   440.37     4.58   471.01     0.41
 HUB     55.35    37.84    17.51   320.21   389.35     4.58   471.01     0.37

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   352.95   266.36   231.58  1077.88     0.33
 MEAN    18.01   348.55   258.46   233.85  1075.20     0.32
 HUB     15.22   364.50   277.39   236.45  1072.50     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    429.89   283.49   163.53     0.26  5440.69
 MEAN   379.15   263.16   120.69     0.24  4656.20     1.85
 HUB    320.48   240.35    43.09     0.22  4223.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      5.29     1.12     4.91   493.52     1.04   483.13     0.92     0.86
 MEAN     5.21     1.10     4.84   490.86     1.03   480.73     0.92     0.86
 HUB      5.16     1.09     4.76   489.40     1.03   478.32     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.00    35.23    31.50     3.73     0.93     0.51     2.90
 MEAN    47.86    27.30    23.50     3.80     0.95     0.49     3.30     0.86
 HUB     49.56    10.33     6.50     3.83     0.95     0.47     3.92


  blockage3   Cor/Incid
     0.950       0.935

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     351.822     259.184     237.913    1075.434       0.327       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
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      5.215       4.842     480.939      46.000      47.450      30.600     -16.850

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     240.659     259.184     353.685    1081.557       0.223       0.496

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.204       5.027     486.431     511.151       0.040       0.569

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     17.823     238.557       0.000     238.557    1081.650       0.221       0.424

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.003     486.515       0.000       0.060       0.113       0.434

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4        Pt4           PR4       Texit        Del T       Ns        Ns nondim
      0.784       5.176       1.096     491.260      16.167     173.954       1.348

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 100508.547       0.544     135.349  226226.969


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.812   EfDer =  0.955

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     23.830    2412.422       5.176     491.260       1.000       1.000       0.980
W Kg/sec =  10.8316822

   W cor      RPM cor        GAMMA        Cp          R           Blades       THK
     65.866    2478.881       1.401       0.248      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1       A*        AthrRotor   ChokeMargin
  57267.148   18698.365       2.843     545.479     191.862     429.765       2.240

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   226.07    -0.08   226.07     0.21   434.15
 MEAN    17.74     0.00    -0.02   226.07    -0.08   226.07     0.21
 HUB     15.05     0.00    -0.02   226.07    -0.08   226.07     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.86    46.36    15.50   422.52   479.27     5.02   487.00     0.44
 MEAN    58.82    43.40    15.42   373.44   436.60     5.02   487.00     0.40
 HUB     54.50    38.84    15.66   316.84   389.29     5.02   487.00     0.36

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
   B2 axial    THK         AeroBl     Blades2
     0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   344.02   250.27   236.03  1094.53     0.31
 MEAN    17.51   342.02   245.52   238.11  1092.20     0.31
 HUB     14.85   360.52   268.61   240.46  1089.85     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    417.05   289.01   166.78     0.26  4959.45
 MEAN   368.55   268.01   123.03     0.25  4299.66     1.79
 HUB    312.63   244.46    44.02     0.22  3990.01

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      5.74     1.11     5.36   508.05     1.03   498.19     0.92     0.87
 MEAN     5.66     1.09     5.29   505.82     1.03   496.07     0.92     0.87
 HUB      5.62     1.09     5.21   504.77     1.03   493.94     0.92     0.87

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.68    35.24    31.50     3.74     0.93     0.49     2.90
 MEAN    45.88    27.33    23.50     3.83     0.95     0.47     3.28     0.87
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HUB     48.16    10.37     6.50     3.87     0.95     0.46     3.87


   blockage3   Cor/Incid
      0.950       0.955

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     17.392     345.188     247.135     240.997    1092.436       0.316        0.007

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.669       5.290     496.281      46.000      45.720      31.500     -14.220

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     17.392     247.018     247.135     349.419    1097.758       0.225        0.461

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       5.661       5.464     501.128     471.992       0.032        0.543

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4          Mach4        cp 3-4
     17.121     240.808       0.000     240.808    1098.034       0.219        0.414

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       5.450     501.381       0.000       0.060       0.095        0.425

    STAGE EXIT CONDITIONS, STAGE   3
       Eff4        Pt4          PR4        Texit         Del T        Ns         Ns nondim
       0.811       5.636        1.089     506.215      14.955     179.100        1.388

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  92986.922       0.535     125.220  224520.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.812   EfDer =  0.968

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     23.830     2412.422        5.636     506.215       1.000        1.000        0.980
W Kg/sec =  10.8316822

   W cor       RPM cor         GAMMA         Cp          R            Blades       THK
     61.399     2441.989        1.401        0.248      53.349       56.000        0.050

   CFM        SCFM             A1/A*       Area1        A*        AthrRotor   ChokeMargin
  57267.148   18698.365        2.870     513.330     178.854     401.059        2.242

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1       Stator    Alfa     C1       CU1        Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00     -0.02   227.22     -0.08   227.22      0.21   410.43
 MEAN    16.97      0.00     -0.02   227.22     -0.08   227.22      0.21
 HUB     14.32      0.00     -0.02   227.22     -0.08   227.22      0.21

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     60.74     46.36     14.38   405.47    464.86      5.47   501.91      0.42
 MEAN    57.55     43.80     13.75   357.27    423.48      5.47   501.91      0.39
 HUB     53.00     37.84     15.16   301.47    377.57      5.47   501.91      0.34

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050        0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88    330.02    230.55    236.14   1109.45      0.30
 MEAN    16.57    328.22    225.98    238.04   1107.33      0.30
 HUB     13.89    345.72    248.69    240.17   1105.19      0.31

       U2        W2        Wu2      MachRel2   DelRCu      Ws1/W2
 TIP    397.47    289.17    166.92      0.26   4354.32
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 MEAN   348.92   267.91   122.94     0.24  3746.69     1.74
 HUB    292.42   244.12    43.73     0.22  3455.36

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     6.16     1.09     5.79   520.96     1.03   511.88     0.92     0.89
 MEAN    6.09     1.08     5.73   518.90     1.03   509.92     0.92     0.89
 HUB     6.05     1.07     5.65   517.91     1.02   507.95     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    44.31    35.26    31.50     3.76     0.93     0.46     2.90
 MEAN   43.51    27.31    23.50     3.81     0.94     0.45     3.29     0.89
 HUB    46.00    10.32     6.50     3.82     0.94     0.44     3.90


  blockage3   Cor/Incid
     0.850       0.968

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    16.481     348.169     227.251     263.777    1106.492       0.315      -0.093

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     6.095       5.690     509.153      46.000      40.746      32.400      -8.346

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    16.481     274.464     227.251     356.333    1110.641       0.247       0.303

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.850       6.091       5.838     512.979     407.025       0.020       0.468

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    16.096     261.608       0.000     261.608    1111.263       0.235       0.416

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.850       5.846     513.553       0.000       0.060       0.059       0.327

   STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.845       6.077       1.078     519.258      13.043     192.990       1.496

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  81106.781       0.513     109.221  229460.031


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.812   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.830    2412.422       6.077     519.258       1.000       1.000       0.880
W Kg/sec =  10.8316822

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     57.679    2411.124       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57267.148   18698.365       2.724     457.661     168.018     348.945       2.077

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   243.09    -0.08   243.09     0.22   385.46
 MEAN    15.91     0.00    -0.02   243.09    -0.08   243.09     0.22
 HUB     13.07     0.00    -0.02   243.09    -0.08   243.09     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.78    47.36    10.42   385.68   455.96     5.88   514.33     0.41
 MEAN    54.04    44.80     9.24   335.01   413.98     5.88   514.33     0.37
 HUB     48.55    38.84     9.71   275.15   367.21     5.88   514.33     0.33
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      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   311.32   214.44   225.69  1122.71     0.28
MEAN    15.50   306.82   205.81   227.56  1120.57     0.27
HUB     12.59   318.89   221.35   229.56  1118.43     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    377.68   278.54   163.24     0.25  3848.55
MEAN   326.26   257.47   120.45     0.23  3190.88     1.78
HUB    265.05   233.68    43.70     0.21  2787.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      6.58     1.08     6.23   532.29     1.03   524.21     0.92     0.91
MEAN     6.49     1.07     6.16   530.06     1.02   522.21     0.92     0.91
HUB      6.44     1.06     6.08   528.70     1.02   520.22     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.54    35.88    31.50     4.38     0.93     0.47     2.90
MEAN    42.13    27.89    23.50     4.39     0.93     0.45     3.34     0.91
HUB     43.96    10.78     6.50     4.28     0.93     0.44     4.06


   blockage3   Cor/Incid
      0.950       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     310.725     209.583     229.401    1120.666       0.277      -0.011

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.493       6.155     522.300      46.000      42.415      33.000      -9.415

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     241.268     209.583     319.586    1124.089       0.215       0.361

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.486       6.281     525.496     440.827       0.039       0.498

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     14.701     226.811       0.000     226.811    1124.692       0.202       0.413

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.296     526.060       0.000       0.060       0.065       0.405

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864       6.477       1.066     530.349      11.090     212.839       1.650

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  68971.297       0.484      92.879  269041.594

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    463439.06    624.0847     77.8842      1.5363      0.7997     17.8118      1.1635


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NPSS:  Inlet Mach number .73,  Altitude 38334ft, dT 22R, Thrust 10%
               Stage 4 stator Blocked @ 15%

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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
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********** Stator Vane, Gasplus Properties **********

Fan Hub + 4 Stage LPC 100% 12-20-2010

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
RESET = 0.000BLEED = 0.000 DPInc =17.808 EfDer = 0.932

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
23.835	2412.480	4.216	455.811	1.000	1.000	0.980

W Kg/sec = 10.833909

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
77.900	2573.530	1.401	0.248	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
57278.922	18702.209	3.665	831.557	226.915	619.754	2.731

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	167.45	-0.06	167.45	0.16	463.30
MEAN	17.06	0.00	-0.02	167.45	-0.06	167.45	0.16	
HUB	12.51	0.00	-0.02	167.45	-0.06	167.45	0.16	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	68.92	50.47	18.45	434.32	465.54	4.14	453.47	0.45
MEAN	65.01	47.20	17.81	359.16	396.33	4.14	453.47	0.38
HUB	57.56	38.62	18.94	263.37	312.14	4.14	453.47	0.30

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	384.36	311.44	225.24	1057.77	0.36
MEAN	18.04	384.39	309.43	228.05	1054.51	0.36
HUB	15.00	409.86	337.95	231.89	1050.60	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	434.32	256.58	122.88	0.24	6426.23	
MEAN	379.71	238.64	70.28	0.23	5581.88	1.92
HUB	315.79	232.95	22.15	0.22	5069.94	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	4.85	1.15	4.42	477.58	1.05	465.26	0.92	0.85
MEAN	4.76	1.13	4.34	474.72	1.04	462.40	0.92	0.85
HUB	4.71	1.12	4.24	472.98	1.04	458.98	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	54.12	28.61	24.20	4.41	0.93	0.56	2.90	
MEAN	53.61	17.13	12.70	4.43	0.95	0.51	3.51	0.85
HUB	55.54	-5.46	-9.30	3.84	0.95	0.38	4.78	

blockage3	Cor/Incid
0.950	0.932

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	387.166	308.829	233.499	1054.736	0.367	0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
4.767	4.344	462.594	24.000	52.908	35.400	-17.508

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	246.960	308.829	395.430	1063.154	0.232	0.552

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	4.752	4.576	470.007	528.796	0.046	0.669

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	231.139	0.000	231.139	1063.867	0.217	0.514

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	4.568	470.638	0.000	0.060	0.117	0.533

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.777	4.721	1.120	475.093	19.281	157.321	1.220

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
119862.695	0.635	161.445	249958.656

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =17.808 EfDer = 0.935

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
23.835	2412.480	4.721	475.093	1.000	1.000	0.980

W Kg/sec = 10.833909

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
71.030	2520.767	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
57278.922	18702.209	2.854	590.487	206.904	474.134	2.292

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	221.44	-0.08	221.44	0.21	452.04
MEAN	18.08	0.00	-0.02	221.44	-0.08	221.44	0.21	
HUB	15.21	0.00	-0.02	221.44	-0.08	221.44	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.90	46.36	16.54	432.64	486.08	4.58	471.00	0.46
MEAN	59.81	42.30	17.51	380.60	440.40	4.58	471.00	0.41
HUB	55.34	37.84	17.50	320.21	389.39	4.58	471.00	0.37

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	352.97	266.34	231.62	1077.88	0.33
MEAN	18.01	348.58	258.46	233.90	1075.20	0.32
HUB	15.22	364.53	277.40	236.50	1072.50	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	429.90	283.55	163.56	0.26	5440.27	
MEAN	379.16	263.20	120.70	0.24	4656.29	1.85
HUB	320.49	240.40	43.09	0.22	4224.03	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	5.29	1.12	4.91	493.52	1.04	483.13	0.92	0.86
MEAN	5.21	1.10	4.84	490.86	1.03	480.73	0.92	0.86
HUB	5.16	1.09	4.76	489.40	1.03	478.32	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	48.99	35.23	31.50	3.73	0.93	0.51	2.90	
MEAN	47.86	27.29	23.50	3.79	0.95	0.49	3.30	0.86
HUB	49.55	10.33	6.50	3.83	0.95	0.47	3.92	

blockage3	Cor/Incid
0.950	0.935

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

```
     17.960     351.859     259.189     237.962    1075.432       0.327       0.005

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.215       4.842     480.937      46.000      47.445      30.600     -16.845

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     240.708     259.189     353.721    1081.554       0.223       0.496

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.204       5.027     486.429     511.151       0.040       0.568

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     17.823     238.605       0.000     238.605    1081.648       0.221       0.424

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.003     486.513       0.000       0.060       0.113       0.434

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4        Pt4           PR4       Texit        Del T       Ns        Ns nondim
      0.784       5.176       1.096     491.260      16.167     173.976       1.349

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 100509.305       0.544     135.377  226275.672


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.808   EfDer =  0.955

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     23.835     2412.480       5.176     491.260       1.000       1.000       0.980
W Kg/sec =  10.833909

   W cor       RPM cor         GAMMA         Cp          R           Blades       THK
     65.878     2478.942       1.401       0.248      53.349      56.000       0.050

   CFM        SCFM             A1/A*       Area1       A*        AthrRotor   ChokeMargin
  57278.922   18702.209        2.843     545.479     191.898     429.765       2.240

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1       Stator    Alfa      C1       CU1        Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00     -0.02   226.12     -0.08   226.12      0.21   434.16
 MEAN    17.74      0.00     -0.02   226.12     -0.08   226.12      0.21
 HUB     15.05      0.00     -0.02   226.12     -0.08   226.12      0.21

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     61.85     46.36     15.49   422.53    479.30      5.02   487.00      0.44
 MEAN    58.81     43.40     15.41   373.45    436.63      5.02   487.00      0.40
 HUB     54.49     38.84     15.65   316.85    389.32      5.02   487.00      0.36

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP      19.81   344.04    250.26    236.08   1094.53      0.31
 MEAN     17.51   342.04    245.51    238.15   1092.20      0.31
 HUB      14.85   360.54    268.59    240.51   1089.85      0.33

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP     417.06    289.06    166.80      0.26   4959.13
 MEAN    368.56    268.07    123.05      0.25   4299.38      1.79
 HUB     312.63    244.51     44.04      0.22   3989.75

         Pt2        PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP       5.74      1.11      5.36    508.05      1.03    498.19      0.92      0.87
 MEAN      5.66      1.09      5.29    505.82      1.03    496.07      0.92      0.87
 HUB       5.62      1.09      5.21    504.77      1.03    493.93      0.92      0.87
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	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	46.67	35.24	31.50	3.74	0.93	0.49	2.90	
MEAN	45.87	27.33	23.50	3.83	0.95	0.47	3.28	0.87
HUB	48.16	10.38	6.50	3.88	0.95	0.46	3.87	

blockage3	Cor/Incid
0.950	0.955

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	345.210	247.119	241.044	1092.433	0.316	0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
5.669	5.290	496.279	46.000	45.713	31.500	-14.213

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	247.067	247.119	349.442	1097.754	0.225	0.461

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	5.661	5.464	501.125	471.992	0.032	0.543

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	240.855	0.000	240.855	1098.031	0.219	0.414

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.450	501.378	0.000	0.060	0.095	0.425

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.811	5.636	1.089	506.214	14.955	179.127	1.389

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
92983.133	0.535	125.240	224568.328

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =17.808 EfDer = 0.968

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
23.835	2412.480	5.636	506.214	1.000	1.000	0.980

W Kg/sec = 10.833909

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
61.411	2442.051	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
57278.922	18702.209	2.870	513.330	178.888	401.059	2.242

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	227.27	-0.08	227.27	0.21	410.44
MEAN	16.97	0.00	-0.02	227.27	-0.08	227.27	0.21	
HUB	14.32	0.00	-0.02	227.27	-0.08	227.27	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.73	46.36	14.37	405.48	464.89	5.47	501.91	0.42
MEAN	57.54	43.80	13.74	357.28	423.51	5.47	501.91	0.39
HUB	53.00	37.84	15.16	301.48	377.61	5.47	501.91	0.34

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	330.05	230.54	236.18	1109.45	0.30
MEAN	16.57	328.25	225.97	238.08	1107.32	0.30
HUB	13.89	345.75	248.67	240.22	1105.18	0.31

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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    397.48   289.22   166.94     0.26  4354.07
MEAN   348.93   267.96   122.96     0.24  3746.48     1.74
HUB    292.42   244.17    43.75     0.22  3455.17

       Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     6.16     1.09     5.79   520.96     1.03   511.88     0.92     0.89
MEAN    6.09     1.08     5.73   518.90     1.03   509.92     0.92     0.89
HUB     6.05     1.07     5.65   517.91     1.02   507.95     0.92     0.89

       Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP    44.31    35.25    31.50     3.75     0.93     0.46     2.90
MEAN   43.50    27.31    23.50     3.81     0.94     0.45     3.29     0.89
HUB    45.99    10.32     6.50     3.82     0.94     0.44     3.90


  blockage3   Cor/Incid
     0.800       0.968

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    16.481     362.190     227.238     282.037    1105.588       0.328      -0.180

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     6.095       5.658     508.321      46.000      38.858      32.400      -6.458

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    16.481     293.555     227.238     371.230    1109.661       0.265       0.210

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.800       6.092       5.803     512.073     382.250       0.018       0.439

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    16.096     279.542       0.000     279.542    1110.386       0.252       0.425

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.800       5.818     512.743       0.000       0.060       0.051       0.249

   STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.851       6.080       1.079     519.257      13.043     193.018       1.496

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  81104.117       0.513     109.240  229509.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.808   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.835    2412.480       6.080     519.257       1.000       1.000       0.830
W Kg/sec =  10.833909

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     57.658    2411.186       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57278.922   18702.209       2.570     431.657     167.958     328.280       1.955

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   258.44    -0.09   258.44     0.23   385.47
 MEAN    15.91     0.00    -0.02   258.44    -0.09   258.44     0.23
 HUB     13.07     0.00    -0.02   258.44    -0.09   258.44     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.18    47.36     8.82   385.69   464.35     5.86   513.69     0.42
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MEAN    52.36    44.80     7.56   335.01   423.19     5.86   513.69     0.38
HUB     46.80    38.84     7.96   275.16   377.56     5.86   513.69     0.34

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   310.05   212.72   225.56  1122.67     0.28
MEAN    15.50   305.73   204.33   227.42  1120.55     0.27
HUB     12.59   317.93   220.12   229.41  1118.43     0.28

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    377.69   279.45   164.97     0.25  3817.87
MEAN   326.27   258.05   121.93     0.23  3168.11     1.81
HUB    265.06   233.77    44.94     0.21  2772.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      6.58     1.08     6.24   532.18     1.02   524.17     0.92     0.91
MEAN     6.49     1.07     6.16   529.98     1.02   522.19     0.92     0.91
HUB      6.44     1.06     6.09   528.64     1.02   520.22     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.32    36.18    31.50     4.68     0.93     0.48     2.90
MEAN    41.94    28.20    23.50     4.70     0.93     0.46     3.34     0.91
HUB     43.82    11.08     6.50     4.58     0.93     0.45     4.06


   blockage3   Cor/Incid
      0.950       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     309.610     208.081     229.260    1120.643       0.276      -0.011

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.495       6.160     522.279      46.000      42.228      33.000      -9.228

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     241.170     208.081     318.529    1124.009       0.215       0.358

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.489       6.284     525.421     440.827       0.038       0.495

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     14.701     226.714       0.000     226.714    1124.612       0.202       0.411

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.299     525.985       0.000       0.060       0.064       0.402

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869       6.480       1.066     530.270      11.013     214.261       1.661

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  68489.633       0.480      92.250  286198.406

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    462948.88    623.5527     77.9002      1.5370      0.8015     17.8078      1.1634


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NPSS: Inlet Mach number .73, Altitude 38334ft, dT 22R, Thrust 10%
Stage 4 stator Blocked @ 20%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.810   EfDer =  0.932

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.833    2412.550       4.216     455.811       1.000       1.000       0.980
 W Kg/sec =  10.8333178

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     77.896    2573.604       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57275.797   18701.189       3.665     831.557     226.903     619.754       2.731

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   167.44    -0.06   167.44     0.16   463.31
  MEAN    17.06     0.00    -0.02   167.44    -0.06   167.44     0.16
  HUB     12.51     0.00    -0.02   167.44    -0.06   167.44     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.92    50.47    18.45   434.33   465.54     4.14   453.47     0.45
  MEAN    65.01    47.20    17.81   359.18   396.34     4.14   453.47     0.38
  HUB     57.56    38.62    18.94   263.38   312.15     4.14   453.47     0.30

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   384.36   311.46   225.23  1057.77     0.36
  MEAN    18.04   384.40   309.45   228.04  1054.51     0.36
  HUB     15.00   409.87   337.97   231.88  1050.61     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    434.33   256.57   122.87     0.24  6426.58
  MEAN   379.72   238.62    70.27     0.23  5582.28     1.92
  HUB    315.80   232.94    22.17     0.22  5070.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      4.85     1.15     4.42   477.58     1.05   465.26     0.92     0.85
  MEAN     4.76     1.13     4.34   474.72     1.04   462.40     0.92     0.85
  HUB      4.71     1.12     4.24   472.99     1.04   458.98     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     54.13    28.61    24.20     4.41     0.93     0.56     2.90
  MEAN    53.61    17.13    12.70     4.43     0.95     0.51     3.51     0.85
  HUB     55.55    -5.46    -9.30     3.84     0.95     0.38     4.78


   blockage3   Cor/Incid
      0.950       0.932

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     387.176     308.851     233.486    1054.738       0.367       0.002

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      4.768       4.344     462.595      24.000      52.911      35.400     -17.511

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     246.945     308.851     395.438    1063.157       0.232       0.553
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BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	4.752	4.576	470.010	528.796	0.046	0.669

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	231.125	0.000	231.125	1063.870	0.217	0.514

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	4.568	470.640	0.000	0.060	0.117	0.533

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.777	4.721	1.120	475.095	19.283	157.310	1.219

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
119873.883	0.635	161.451	249944.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =17.810 EfDer = 0.935

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
23.833	2412.550	4.721	475.095	1.000	1.000	0.980

W Kg/sec = 10.8333178

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
71.026	2520.834	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
57275.797	18701.189	2.854	590.487	206.891	474.134	2.292

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	221.43	-0.08	221.43	0.21	452.05
MEAN	18.08	0.00	-0.02	221.43	-0.08	221.43	0.21	
HUB	15.21	0.00	-0.02	221.43	-0.08	221.43	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.90	46.36	16.54	432.65	486.09	4.58	471.01	0.46
MEAN	59.82	42.30	17.52	380.61	440.40	4.58	471.01	0.41
HUB	55.34	37.84	17.50	320.22	389.39	4.58	471.01	0.37

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	352.98	266.36	231.61	1077.88	0.33
MEAN	18.01	348.58	258.46	233.88	1075.20	0.32
HUB	15.22	364.52	277.40	236.49	1072.50	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	429.91	283.53	163.55	0.26	5440.70	
MEAN	379.17	263.20	120.71	0.24	4656.29	1.85
HUB	320.50	240.38	43.10	0.22	4224.03	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	5.29	1.12	4.91	493.52	1.04	483.13	0.92	0.86
MEAN	5.21	1.10	4.84	490.86	1.03	480.73	0.92	0.86
HUB	5.16	1.09	4.76	489.40	1.03	478.32	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	48.99	35.23	31.50	3.73	0.93	0.51	2.90	
MEAN	47.86	27.30	23.50	3.80	0.95	0.49	3.30	0.86
HUB	49.55	10.33	6.50	3.83	0.95	0.47	3.92	

blockage3	Cor/Incid
0.950	0.935

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     351.849     259.189     237.947    1075.435       0.327       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.215       4.842     480.940      46.000      47.447      30.600     -16.847

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     240.693     259.189     353.711    1081.558       0.223       0.496

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.204       5.027     486.432     511.151       0.040       0.568

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.823     238.591       0.000     238.591    1081.651       0.221       0.424

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.003     486.516       0.000       0.060       0.113       0.434

    STAGE EXIT CONDITIONS, STAGE   2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.784       5.176       1.096     491.262      16.168     173.968       1.349

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 100515.375       0.544     135.378  226262.047


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.810   EfDer =  0.955

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.833    2412.550       5.176     491.262       1.000       1.000       0.980
W Kg/sec =  10.8333178

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     65.874    2479.006       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57275.797   18701.189       2.843     545.479     191.887     429.765       2.240

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   226.10    -0.08   226.10     0.21   434.17
 MEAN    17.74     0.00    -0.02   226.10    -0.08   226.10     0.21
 HUB     15.05     0.00    -0.02   226.10    -0.08   226.10     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.85    46.36    15.49   422.54   479.30     5.02   487.00     0.44
 MEAN    58.81    43.40    15.41   373.46   436.63     5.02   487.00     0.40
 HUB     54.50    38.84    15.66   316.85   389.32     5.02   487.00     0.36

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   344.04   250.28   236.07  1094.53     0.31
 MEAN    17.51   342.05   245.53   238.14  1092.20     0.31
 HUB     14.85   360.55   268.62   240.50  1089.85     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    417.07   289.04   166.79     0.26  4959.55
 MEAN   368.57   268.05   123.04     0.25  4299.81     1.79
 HUB    312.64   244.49    44.02     0.22  3990.19

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      5.74     1.11     5.36   508.06     1.03   498.19     0.92     0.87
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 MEAN     5.66     1.09     5.29   505.82     1.03   496.07     0.92     0.87
 HUB      5.62     1.09     5.21   504.78     1.03   493.94     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.67    35.24    31.50     3.74     0.93     0.49     2.90
 MEAN    45.88    27.32    23.50     3.82     0.95     0.47     3.28     0.87
 HUB     48.16    10.37     6.50     3.87     0.95     0.46     3.87


   blockage3   Cor/Incid
      0.950       0.955

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     345.217     247.143     241.029    1092.438       0.316       0.007

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.669       5.290     496.283      46.000      45.718      31.500     -14.218

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     247.051     247.143     349.448    1097.760       0.225       0.461

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.661       5.464     501.131     471.992       0.032       0.543

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.121     240.840       0.000     240.840    1098.037       0.219       0.414

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.450     501.383       0.000       0.060       0.095       0.425

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.811       5.636       1.089     506.219      14.957     179.110       1.388

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  92994.891       0.535     125.249  224554.531


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.810   EfDer =  0.968

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.833    2412.550       5.636     506.219       1.000       1.000       0.980
W Kg/sec =  10.8333178

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     61.407    2442.110       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57275.797   18701.189       2.870     513.330     178.876     401.059       2.242

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   227.25    -0.08   227.25     0.21   410.45
 MEAN    16.97     0.00    -0.02   227.25    -0.08   227.25     0.21
 HUB     14.32     0.00    -0.02   227.25    -0.08   227.25     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.74    46.36    14.38   405.49   464.90     5.47   501.91     0.42
 MEAN    57.55    43.80    13.75   357.29   423.51     5.47   501.91     0.39
 HUB     53.00    37.84    15.16   301.49   377.61     5.47   501.91     0.34

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     18.88   330.05   230.56   236.17  1109.45     0.30
 MEAN    16.57   328.23   225.97   238.07  1107.33     0.30
 HUB     13.89   345.74   248.67   240.20  1105.19     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    397.49   289.21   166.93     0.26  4354.49
 MEAN   348.94   267.95   122.97     0.24  3746.47     1.74
 HUB    292.43   244.15    43.76     0.22  3455.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     6.16     1.09     5.79   520.96     1.03   511.88     0.92     0.89
 MEAN    6.09     1.08     5.73   518.91     1.03   509.92     0.92     0.89
 HUB     6.05     1.07     5.65   517.92     1.02   507.95     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    44.31    35.25    31.50     3.75     0.93     0.46     2.90
 MEAN   43.51    27.32    23.50     3.82     0.94     0.45     3.29     0.89
 HUB    45.99    10.33     6.50     3.83     0.94     0.44     3.90


  blockage3   Cor/Incid
     0.750       0.968

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
    16.481     378.777     227.237     303.043    1104.479       0.343       -0.286

    Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
     6.095       5.619     507.302      46.000      36.864      32.400       -4.464

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
    16.481     315.559     227.237     388.863    1108.455       0.285       0.094

  BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
     0.750       6.093       5.759     510.961     357.476       0.016       0.409

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4         Ao4          Mach4       cp 3-4
    16.096     300.196       0.000     300.196    1109.310       0.271       0.433

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750       5.781     511.750       0.000       0.060       0.043       0.151

   STAGE EXIT CONDITIONS, STAGE   4
     Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
     0.856       6.083        1.079     519.263      13.043     193.008       1.496

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  81109.242       0.513     109.241  229494.672


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.810   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.833    2412.550       6.083     519.263       1.000       1.000       0.780
W Kg/sec =  10.8333178

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     57.629    2411.243       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57275.797   18701.189       2.416     405.654     167.873     307.615       1.832

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   275.91    -0.10   275.91     0.25   385.48
 MEAN    15.91     0.00    -0.02   275.91    -0.10   275.91     0.25
 HUB     13.07     0.00    -0.02   275.91    -0.10   275.91     0.25
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       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.43    47.36     7.07   385.70   474.30     5.83   512.92     0.43
 MEAN    50.53    44.80     5.73   335.02   434.09     5.83   512.92     0.39
 HUB     44.93    38.84     6.09   275.17   389.74     5.83   512.92     0.35

      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   308.53   210.59   225.49  1122.62     0.27
 MEAN    15.50   304.45   202.51   227.33  1120.52     0.27
 HUB     12.59   316.79   218.59   229.29  1118.43     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    377.70   280.66   167.11     0.25  3779.70
 MEAN   326.28   258.84   123.76     0.23  3139.99     1.84
 HUB    265.06   233.96    46.48     0.21  2753.25

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.58     1.08     6.24   532.06     1.02   524.12     0.92     0.91
 MEAN     6.49     1.07     6.17   529.89     1.02   522.17     0.92     0.91
 HUB      6.44     1.06     6.09   528.58     1.02   520.22     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.04    36.54    31.50     5.04     0.93     0.48     2.90
 MEAN    41.70    28.56    23.50     5.06     0.92     0.47     3.34     0.91
 HUB     43.63    11.46     6.50     4.96     0.92     0.47     4.06


    blockage3   Cor/Incid
       0.950       0.999

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
      15.219     308.296     206.227     229.166    1120.619       0.275      -0.010

      Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
       6.494       6.162     522.256      46.000      41.984      33.000      -8.984

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
      15.219     241.133     206.227     317.292    1123.914       0.215       0.354

    BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
       0.950       6.489       6.284     525.332     440.827       0.037       0.491

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
      14.701     226.672       0.000     226.672    1124.517       0.202       0.408

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       6.299     525.896       0.000       0.060       0.063       0.399

     STAGE EXIT CONDITIONS, STAGE   5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.869       6.480       1.065     530.179      10.917     216.035       1.675

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   67891.805       0.476      91.439  305679.062

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     462385.19    622.7595     77.8959      1.5370      0.8024     17.8096      1.1632

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NPSS: Inlet Mach number .73, Altitude 38334ft, dT 22R, Thrust 10%
Stage 4 stator Blocked @ 25%

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
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         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.818   EfDer =  0.932

    W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     23.825    2412.607       4.216     455.811       1.000       1.000       0.980
 W Kg/sec =  10.8294544

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     77.868    2573.666       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57255.371   18694.520       3.666     831.557     226.822     619.754       2.732

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   167.38    -0.06   167.38     0.16   463.33
  MEAN    17.06     0.00    -0.02   167.38    -0.06   167.38     0.16
  HUB     12.51     0.00    -0.02   167.38    -0.06   167.38     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.93    50.47    18.46   434.34   465.53     4.14   453.48     0.45
  MEAN    65.02    47.20    17.82   359.18   396.32     4.14   453.48     0.38
  HUB     57.57    38.62    18.95   263.39   312.12     4.14   453.48     0.30

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   384.37   311.52   225.15  1057.78     0.36
  MEAN    18.04   384.37   309.48   227.96  1054.52     0.36
  HUB     15.00   409.82   337.97   231.79  1050.61     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    434.34   256.47   122.82     0.24  6427.91
  MEAN   379.73   238.54    70.25     0.23  5582.71     1.92
  HUB    315.81   232.85    22.16     0.22  5070.30

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      4.85     1.15     4.42   477.58     1.05   465.27     0.92     0.85
  MEAN     4.76     1.13     4.34   474.72     1.04   462.40     0.92     0.85
  HUB      4.71     1.12     4.24   472.99     1.04   458.98     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     54.14    28.61    24.20     4.41     0.93     0.56     2.90
  MEAN    53.63    17.13    12.70     4.43     0.95     0.51     3.51     0.85
  HUB     55.56    -5.46    -9.30     3.84     0.95     0.38     4.78


    blockage3   Cor/Incid
       0.950       0.932

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
      18.071     387.143     308.876     233.400    1054.743       0.367       0.002

      Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
       4.768       4.344     462.600      24.000      52.924      35.400     -17.524
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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth          Machth      cp 2-Th
     18.071     246.853     308.876     395.399    1063.164       0.232       0.553

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       4.752       4.577     470.016     528.796       0.046       0.669

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     18.083     231.040       0.000     231.040    1063.876       0.217       0.514

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       4.568     470.646       0.000       0.060       0.117       0.533

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4        Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.777       4.721       1.120     475.097      19.286     157.270       1.219

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 119889.062       0.635     161.414  249853.141


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.818   EfDer =  0.935

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     23.825     2412.607       4.721     475.097       1.000       1.000       0.980
W Kg/sec =  10.8294544

   W cor       RPM cor         GAMMA         Cp          R           Blades       THK
     71.001     2520.888       1.401       0.248      53.349      56.000       0.050

   CFM        SCFM            A1/A*       Area1       A*        AthrRotor   ChokeMargin
  57255.371   18694.520       2.855     590.487     206.819     474.134       2.293

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

         R1       Stator    Alfa      C1       CU1        Cm1      Abs MACH  U1 corrected
 TIP      20.55      0.00     -0.02    221.34     -0.08    221.34      0.21    452.06
 MEAN     18.08      0.00     -0.02    221.34     -0.08    221.34      0.21
 HUB      15.21      0.00     -0.02    221.34     -0.08    221.34      0.21

       BetaFlo    BetaBlade Incid    U1        W1        Ps1       Ts1      Rel Mach
 TIP      62.91     46.36     16.55    432.66    486.06      4.58    471.01      0.46
 MEAN     59.83     42.30     17.53    380.62    440.37      4.58    471.01      0.41
 HUB      55.35     37.84     17.51    320.23    389.35      4.58    471.01      0.37

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP      20.42    352.97    266.43    231.53   1077.89      0.33
 MEAN     18.01    348.55    258.51    233.80   1075.21      0.32
 HUB      15.22    364.49    277.43    236.40   1072.51      0.34

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP     429.92    283.43    163.49      0.26   5442.06
 MEAN    379.18    263.10    120.67      0.24   4657.15      1.85
 HUB     320.50    240.30     43.08      0.22   4224.43

         Pt2        PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP       5.29      1.12      4.91    493.53      1.04    483.14      0.92      0.86
 MEAN      5.21      1.10      4.84    490.87      1.03    480.74      0.92      0.86
 HUB       5.16      1.09      4.76    489.40      1.03    478.33      0.92      0.86

         Alfa2   Beta FLO Beta BLADE Deviat    Slip F. Diff Fct Solidity  AvgRotEff
 TIP      49.01     35.23     31.50      3.73      0.93      0.51      2.90
 MEAN     47.87     27.30     23.50      3.80      0.95      0.49      3.30      0.86
 HUB      49.56     10.33      6.50      3.83      0.95      0.47      3.92
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   blockage3   Cor/Incid
      0.950       0.935

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     351.826     259.237     237.862    1075.443       0.327       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.215       4.842     480.947      46.000      47.462      30.600     -16.862

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     240.604     259.237     353.686    1081.568       0.222       0.497

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.204       5.027     486.441     511.151       0.040       0.569

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     238.504       0.000     238.504    1081.662       0.220       0.424

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.003     486.525       0.000       0.060       0.113       0.434

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.784       5.176       1.096     491.268      16.171     173.913       1.348

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 100536.055       0.544     135.358  226176.953


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.818   EfDer =  0.955

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.825    2412.607       5.176     491.268       1.000       1.000       0.980
W Kg/sec =  10.8294544

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     65.851    2479.051       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57255.371   18694.520       2.844     545.479     191.819     429.765       2.240

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   226.02    -0.08   226.02     0.21   434.18
 MEAN    17.74     0.00    -0.02   226.02    -0.08   226.02     0.21
 HUB     15.05     0.00    -0.02   226.02    -0.08   226.02     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.86    46.36    15.50   422.55   479.27     5.02   487.01     0.44
 MEAN    58.82    43.40    15.42   373.47   436.60     5.02   487.01     0.40
 HUB     54.51    38.84    15.67   316.86   389.28     5.02   487.01     0.36

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   344.03   250.34   235.98  1094.55     0.31
 MEAN    17.51   342.02   245.58   238.05  1092.21     0.31
 HUB     14.85   360.51   268.64   240.41  1089.86     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    417.08   288.94   166.74     0.26  4960.82
 MEAN   368.58   267.96   123.01     0.25  4300.58     1.79
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 HUB    312.65   244.41    44.01     0.22  3990.49

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      5.74     1.11     5.36   508.07     1.03   498.20     0.92     0.87
 MEAN     5.66     1.09     5.29   505.83     1.03   496.08     0.92     0.87
 HUB      5.62     1.09     5.21   504.78     1.03   493.95     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.69    35.24    31.50     3.74     0.93     0.49     2.90
 MEAN    45.89    27.33    23.50     3.83     0.95     0.47     3.28     0.87
 HUB     48.17    10.37     6.50     3.87     0.95     0.46     3.87


   blockage3   Cor/Incid
      0.950       0.955

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     345.189     247.188     240.943    1092.449       0.316       0.007

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.669       5.290     496.294      46.000      45.733      31.500     -14.233

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     246.961     247.188     349.416    1097.774       0.225       0.461

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.661       5.465     501.143     471.992       0.032       0.543

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.121     240.753       0.000     240.753    1098.050       0.219       0.414

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.451     501.395       0.000       0.060       0.095       0.425

    STAGE EXIT CONDITIONS, STAGE   3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.811       5.636       1.089     506.228      14.960     179.055       1.388

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93013.492       0.535     125.230  224468.844


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.818   EfDer =  0.968

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.825    2412.607       5.636     506.228       1.000       1.000       0.980
W Kg/sec =  10.8294544

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     61.385    2442.146       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57255.371   18694.520       2.871     513.330     178.813     401.059       2.243

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   227.17    -0.08   227.17     0.21   410.45
 MEAN    16.97     0.00    -0.02   227.17    -0.08   227.17     0.21
 HUB     14.32     0.00    -0.02   227.17    -0.08   227.17     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.75    46.36    14.39   405.50   464.87     5.47   501.93     0.42
 MEAN    57.56    43.80    13.76   357.30   423.47     5.47   501.93     0.39
 HUB     53.01    37.84    15.17   301.49   377.56     5.47   501.93     0.34

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   330.03   230.63   236.08  1109.47     0.30
MEAN    16.57   328.22   226.04   237.98  1107.34     0.30
HUB     13.89   345.71   248.72   240.12  1105.20     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    397.50   289.10   166.87     0.26  4355.71
MEAN   348.95   267.85   122.91     0.24  3747.67     1.74
HUB    292.44   244.06    43.72     0.22  3455.85

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      6.16     1.09     5.79   520.98     1.03   511.90     0.92     0.89
MEAN     6.09     1.08     5.73   518.92     1.03   509.94     0.92     0.89
HUB      6.05     1.07     5.65   517.93     1.02   507.97     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.33    35.25    31.50     3.75     0.93     0.46     2.90
MEAN    43.53    27.31    23.50     3.81     0.94     0.45     3.29     0.89
HUB     46.01    10.32     6.50     3.82     0.94     0.44     3.90


  blockage3   Cor/Incid
     0.700       0.968

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    16.481     398.667     227.310     327.514    1103.089       0.361      -0.418

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     6.095       5.569     506.026      46.000      34.762      32.400      -2.362

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    16.481     341.255     227.310     410.030    1106.942       0.308      -0.053

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.700       6.093       5.705     509.567     332.702       0.015       0.378

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    16.096     324.290       0.000     324.290    1107.964       0.293       0.438

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.700       5.733     510.508       0.000       0.060       0.039       0.024

   STAGE EXIT CONDITIONS, STAGE   4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.859       6.085       1.080     519.275      13.047     192.936       1.496

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  81132.977       0.513     109.234  229406.234


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.818   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.825    2412.607       6.085     519.275       1.000       1.000       0.730
W Kg/sec =  10.8294544

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     57.591    2411.271       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57255.371   18694.520       2.263     379.651     167.762     286.949       1.710

     ROTOR LEADING EDGE CONDITIONS, STAGE   5
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       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   295.99    -0.10   295.99     0.27   385.48
MEAN    15.91     0.00    -0.02   295.99    -0.10   295.99     0.27
HUB     13.07     0.00    -0.02   295.99    -0.10   295.99     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     52.50    47.36     5.14   385.71   486.27     5.79   511.97     0.44
MEAN    48.55    44.80     3.75   335.03   447.13     5.79   511.97     0.40
HUB     42.92    38.84     4.08   275.18   404.22     5.79   511.97     0.36

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   306.76   207.94   225.54  1122.56     0.27
MEAN    15.50   302.94   200.23   227.33  1120.49     0.27
HUB     12.59   315.50   216.76   229.25  1118.43     0.28

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    377.71   282.29   169.77     0.25  3732.24
MEAN   326.29   259.94   126.06     0.23  3104.67     1.88
HUB    265.07   234.28    48.31     0.21  2730.32

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      6.57     1.08     6.23   531.91     1.02   524.07     0.92     0.91
MEAN     6.48     1.07     6.16   529.79     1.02   522.14     0.92     0.91
HUB      6.43     1.06     6.09   528.52     1.02   520.22     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.67    36.97    31.50     5.47     0.93     0.49     2.90
MEAN    41.37    29.01    23.50     5.51     0.92     0.48     3.34     0.91
HUB     43.40    11.90     6.50     5.40     0.92     0.49     4.06


   blockage3   Cor/Incid
      0.950       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     15.219     306.742     203.899     229.163    1120.590       0.274       -0.010

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.489       6.159     522.230      46.000      41.661      33.000       -8.661

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     15.219     241.207     203.899     315.841    1123.797       0.215       0.349

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       6.483       6.278     525.223     440.827       0.036       0.485

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4          Mach4       cp 3-4
     14.701     226.731       0.000     226.731    1124.401       0.202       0.404

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.294     525.787       0.000       0.060       0.061       0.396

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.863       6.475       1.064     530.073      10.797     218.261       1.692

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  67151.258       0.471      90.410  328018.500

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    461722.84    621.6457     77.8681      1.5357      0.8020     17.8182      1.1629
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NPSS: Inlet Mach number .73, Altitude 38334ft, dT 22R, Thrust 10%
Stage 4 stator Blocked @ 27%

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
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         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.825   EfDer =  0.931

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.818    2412.625       4.216     455.811       1.000       1.000       0.980
 W Kg/sec =  10.826273

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     77.845    2573.685       1.401       0.248      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57238.551   18689.027       3.667     831.557     226.755     619.754       2.733

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   167.33    -0.06   167.33     0.16   463.33
  MEAN    17.06     0.00    -0.02   167.33    -0.06   167.33     0.16
  HUB     12.51     0.00    -0.02   167.33    -0.06   167.33     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.93    50.47    18.46   434.35   465.52     4.14   453.48     0.45
  MEAN    65.02    47.20    17.82   359.19   396.30     4.14   453.48     0.38
  HUB     57.58    38.62    18.96   263.39   312.09     4.14   453.48     0.30

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   384.35   311.55   225.08  1057.78     0.36
  MEAN    18.04   384.35   309.50   227.89  1054.52     0.36
  HUB     15.00   409.76   337.94   231.72  1050.61     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    434.35   256.40   122.80     0.24  6428.39
  MEAN   379.73   238.47    70.23     0.23  5583.13     1.92
  HUB    315.81   232.78    22.13     0.22  5069.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      4.85     1.15     4.42   477.59     1.05   465.27     0.92     0.85
  MEAN     4.76     1.13     4.34   474.72     1.04   462.41     0.92     0.85
  HUB      4.71     1.12     4.24   472.98     1.04   458.98     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     54.15    28.62    24.20     4.42     0.93     0.56     2.90
  MEAN    53.64    17.13    12.70     4.43     0.95     0.51     3.51     0.85
  HUB     55.56    -5.45    -9.30     3.85     0.95     0.38     4.78


   blockage3   Cor/Incid
      0.950       0.931

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     387.120     308.899     233.332    1054.745       0.367       0.002
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     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      4.768       4.344     462.602      24.000      52.934      35.400     -17.534

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     246.779     308.899     395.371    1063.168       0.232       0.553

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       4.752       4.577     470.020     528.796       0.046       0.670

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     18.083     230.972       0.000     230.972    1063.880       0.217       0.514

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       4.568     470.649       0.000       0.060       0.117       0.533

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.777       4.721       1.120     475.098      19.286     157.243       1.219

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 119893.047       0.636     161.372  249777.828


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.825   EfDer =  0.935

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.818    2412.625       4.721     475.098       1.000       1.000       0.980
W Kg/sec =  10.826273

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     70.981    2520.905       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57238.551   18689.027       2.856     590.487     206.760     474.134       2.293

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   221.28    -0.08   221.28     0.21   452.07
 MEAN    18.08     0.00    -0.02   221.28    -0.08   221.28     0.21
 HUB     15.21     0.00    -0.02   221.28    -0.08   221.28     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.92    46.36    16.56   432.66   486.03     4.58   471.02     0.46
 MEAN    59.83    42.30    17.53   380.62   440.34     4.58   471.02     0.41
 HUB     55.36    37.84    17.52   320.23   389.31     4.58   471.02     0.37

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   352.98   266.49   231.46  1077.90     0.33
 MEAN    18.01   348.54   258.56   233.73  1075.22     0.32
 HUB     15.22   364.46   277.45   236.34  1072.51     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    429.93   283.34   163.43     0.26  5443.38
 MEAN   379.18   263.02   120.63     0.24  4657.96     1.85
 HUB    320.51   240.23    43.06     0.22  4224.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      5.29     1.12     4.91   493.53     1.04   483.15     0.92     0.86
 MEAN     5.21     1.10     4.84   490.87     1.03   480.75     0.92     0.86
 HUB      5.16     1.09     4.76   489.41     1.03   478.33     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     49.02    35.23    31.50     3.73     0.93     0.51     2.90
 MEAN    47.89    27.30    23.50     3.80     0.95     0.49     3.30     0.86
 HUB     49.58    10.33     6.50     3.83     0.95     0.47     3.92


   blockage3   Cor/Incid
      0.950       0.935

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     17.960     351.813     259.282     237.793    1075.448       0.327        0.005

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.215       4.842     480.952      46.000      47.475      30.600     -16.875

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     17.960     240.532     259.282     353.671    1081.575       0.222        0.497

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       5.204       5.027     486.448     511.151       0.040        0.569

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4        cp 3-4
     17.823     238.434       0.000     238.434    1081.669       0.220        0.424

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       5.003     486.532       0.000       0.060       0.113        0.434

    STAGE EXIT CONDITIONS, STAGE   2
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.784       5.176        1.096     491.272      16.174     173.865       1.348

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 100554.086       0.544     135.342  226107.359


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.825   EfDer =  0.955

   W act       RPM act         Pt          Tt            POTS         POTH        AeroBl
     23.818     2412.625        5.176     491.272        1.000        1.000        0.980
W Kg/sec =  10.826273

   W cor       RPM cor         GAMMA         Cp          R            Blades        THK
     65.832     2479.061        1.401        0.248      53.349       56.000        0.050

   CFM        SCFM             A1/A*       Area1        A*        AthrRotor   ChokeMargin
  57238.551   18689.027        2.845     545.479     191.765     429.765        2.241

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1       Stator    Alfa     C1       CU1        Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   225.95    -0.08   225.95      0.21   434.18
 MEAN    17.74      0.00    -0.02   225.95    -0.08   225.95      0.21
 HUB     15.05      0.00    -0.02   225.95    -0.08   225.95      0.21

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     61.87     46.36    15.51   422.56   479.24      5.02   487.02      0.44
 MEAN    58.83     43.40    15.43   373.47   436.57      5.02   487.02      0.40
 HUB     54.51     38.84    15.67   316.86   389.24      5.02   487.02      0.36

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   344.03    250.40    235.91   1094.56      0.31
 MEAN    17.51   342.00    245.62    237.98   1092.22      0.31
 HUB     14.85   360.47    268.66    240.34   1089.87      0.33
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	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	417.08	288.85	166.68	0.26	4962.02	
MEAN	368.59	267.88	122.97	0.25	4301.31	1.79
HUB	312.65	244.33	43.99	0.22	3990.76	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	5.74	1.11	5.36	508.08	1.03	498.21	0.92	0.87
MEAN	5.66	1.09	5.29	505.84	1.03	496.09	0.92	0.87
HUB	5.62	1.09	5.21	504.79	1.03	493.95	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	46.71	35.24	31.50	3.74	0.93	0.49	2.90	
MEAN	45.90	27.33	23.50	3.83	0.95	0.47	3.28	0.87
HUB	48.18	10.37	6.50	3.87	0.95	0.46	3.87	

blockage3	Cor/Incid
0.950	0.955

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	345.170	247.230	240.873	1092.458	0.316	0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
5.669	5.290	496.301	46.000	45.746	31.500	-14.246

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	246.887	247.230	349.394	1097.784	0.225	0.462

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	5.661	5.465	501.152	471.992	0.032	0.543

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	240.682	0.000	240.682	1098.060	0.219	0.414

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.451	501.404	0.000	0.060	0.096	0.425

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.811	5.636	1.089	506.234	14.962	179.007	1.388

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
93029.805	0.535	125.215	224398.781

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =17.825 EfDer = 0.968

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
23.818	2412.625	5.636	506.234	1.000	1.000	0.980

W Kg/sec = 10.826273

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
61.368	2442.150	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
57238.551	18689.027	2.872	513.330	178.762	401.059	2.244

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	227.11	-0.08	227.11	0.21	410.45
MEAN	16.97	0.00	-0.02	227.11	-0.08	227.11	0.21	
HUB	14.32	0.00	-0.02	227.11	-0.08	227.11	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.75	46.36	14.39	405.50	464.84	5.47	501.93	0.42
MEAN	57.57	43.80	13.77	357.30	423.44	5.47	501.93	0.39

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HUB     53.02    37.84    15.18   301.50   377.52     5.47   501.93     0.34

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   330.01   230.66   236.01  1109.48     0.30
MEAN    16.57   328.18   226.05   237.92  1107.35     0.30
HUB     13.89   345.68   248.74   240.05  1105.21     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    397.50   289.03   166.84     0.26  4356.45
MEAN   348.95   267.78   122.90     0.24  3747.88     1.74
HUB    292.44   243.99    43.70     0.22  3456.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      6.16     1.09     5.79   520.99     1.03   511.91     0.92     0.89
MEAN     6.09     1.08     5.73   518.93     1.03   509.95     0.92     0.89
HUB      6.05     1.07     5.65   517.94     1.02   507.98     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.34    35.26    31.50     3.76     0.93     0.46     2.90
MEAN    43.54    27.32    23.50     3.82     0.94     0.45     3.29     0.89
HUB     46.02    10.32     6.50     3.82     0.94     0.44     3.90


  blockage3   Cor/Incid
     0.680       0.968

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     407.718     227.323     338.464    1102.433       0.370      -0.481

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.095       5.546     505.425      46.000      33.887      32.400      -1.487

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     16.481     352.781     227.323     419.679    1106.225       0.319      -0.122

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.680       6.094       5.679     508.908     322.792       0.015       0.366

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     16.096     335.085       0.000     335.085    1107.328       0.303       0.440

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680       5.710     509.922       0.000       0.060       0.037      -0.037

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.860       6.085       1.080     519.283      13.049     192.893       1.495

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  81141.898       0.514     109.214  229333.797


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.825   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.818    2412.625       6.085     519.283       1.000       1.000       0.710
W Kg/sec =  10.826273

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     57.570    2411.271       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57238.551   18689.027       2.202     369.249     167.701     278.683       1.662
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ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	304.89	-0.10	304.89	0.27	385.48
MEAN	15.91	0.00	-0.02	304.89	-0.10	304.89	0.27	
HUB	13.07	0.00	-0.02	304.89	-0.10	304.89	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.68	47.36	4.32	385.71	491.74	5.77	511.53	0.44
MEAN	47.71	44.80	2.91	335.03	453.07	5.77	511.53	0.41
HUB	42.08	38.84	3.24	275.18	410.77	5.77	511.53	0.37

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	305.97	206.71	225.59	1122.53	0.27
MEAN	15.50	302.25	199.16	227.35	1120.48	0.27
HUB	12.59	314.92	215.92	229.25	1118.44	0.28

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	377.71	283.07	171.00	0.25	3710.33	
MEAN	326.29	260.48	127.12	0.23	3088.24	1.90
HUB	265.07	234.46	49.15	0.21	2719.77	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.56	1.08	6.23	531.85	1.02	524.04	0.92	0.90
MEAN	6.48	1.06	6.16	529.74	1.02	522.12	0.92	0.90
HUB	6.43	1.06	6.09	528.49	1.02	520.22	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.50	37.16	31.50	5.66	0.93	0.50	2.90	
MEAN	41.22	29.21	23.50	5.71	0.91	0.49	3.34	0.90
HUB	43.28	12.10	6.50	5.60	0.91	0.49	4.06	

blockage3	Cor/Incid
0.950	0.985

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	306.041	202.816	229.187	1120.578	0.273	-0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
6.484	6.157	522.218	46.000	41.507	33.000	-8.507

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	241.268	202.816	315.190	1123.744	0.215	0.347

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	6.479	6.274	525.173	440.827	0.035	0.483

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	226.784	0.000	226.784	1124.348	0.202	0.402

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	6.290	525.738	0.000	0.060	0.060	0.394

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.858	6.471	1.063	530.025	10.742	219.301	1.700

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
66808.867	0.468	89.922	337888.312

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
461427.72	621.0657	77.8453	1.5348	0.8013	17.8249	1.1628

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NPSS: Inlet Mach number .73, Altitude 38334ft, dT 22R, Thrust 10%
Stage 4 stator Blocked @ 30%

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*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
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Fan Hub + 4 Stage LPC 100% 12-20-2010

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1

RESET = 0.000 BLEED = 0.000 DPInc = 17.838 EfDer = 0.931

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
23.805	2412.647	4.216	455.811	1.000	1.000	0.980

W Kg/sec = 10.8203182

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
77.802	2573.708	1.401	0.248	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
57207.066	18678.748	3.669	831.557	226.630	619.754	2.735

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	167.23	-0.06	167.23	0.16	463.33
MEAN	17.06	0.00	-0.02	167.23	-0.06	167.23	0.16	
HUB	12.51	0.00	-0.02	167.23	-0.06	167.23	0.16	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	68.94	50.47	18.47	434.35	465.49	4.14	453.48	0.45
MEAN	65.04	47.20	17.84	359.19	396.26	4.14	453.48	0.38
HUB	57.59	38.62	18.97	263.39	312.04	4.14	453.48	0.30

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	384.33	311.61	224.95	1057.79	0.36
MEAN	18.04	384.31	309.54	227.76	1054.53	0.36
HUB	15.00	409.68	337.93	231.59	1050.62	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	434.35	256.26	122.74	0.24	6429.72	
MEAN	379.74	238.33	70.19	0.23	5583.92	1.92
HUB	315.81	232.65	22.12	0.22	5069.72	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	4.85	1.15	4.42	477.59	1.05	465.27	0.92	0.85
MEAN	4.76	1.13	4.34	474.73	1.04	462.41	0.92	0.85
HUB	4.71	1.12	4.24	472.98	1.04	458.99	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	54.17	28.62	24.20	4.42	0.93	0.56	2.90	
MEAN	53.65	17.13	12.70	4.43	0.95	0.51	3.51	0.85
HUB	55.58	-5.46	-9.30	3.84	0.95	0.38	4.78	

blockage3	Cor/Incid
0.950	0.931

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     387.077     308.942     233.202    1054.751       0.367       0.002

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      4.768       4.344     462.607      24.000      52.953      35.400     -17.553

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     246.638     308.942     395.317    1063.177       0.232       0.553

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       4.752       4.577     470.028     528.796       0.046       0.670

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     18.083     230.842       0.000     230.842    1063.888       0.217       0.514

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       4.568     470.657       0.000       0.060       0.117       0.533

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.777       4.721       1.120     475.100      19.289     157.185       1.218

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 119908.219       0.636     161.304  249636.828


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.838   EfDer =  0.935

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.805    2412.647       4.721     475.100       1.000       1.000       0.980
W Kg/sec =  10.8203182

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     70.943    2520.921       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57207.066   18678.748       2.857     590.487     206.649     474.134       2.294

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   221.16    -0.08   221.16     0.21   452.07
 MEAN    18.08      0.00    -0.02   221.16    -0.08   221.16     0.21
 HUB     15.21      0.00    -0.02   221.16    -0.08   221.16     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.93    46.36    16.57   432.67   485.98     4.58   471.02     0.46
 MEAN    59.85    42.30    17.55   380.63   440.28     4.58   471.02     0.41
 HUB     55.38    37.84    17.54   320.24   389.24     4.58   471.02     0.37

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   352.96   266.58   231.33  1077.91     0.33
 MEAN    18.01   348.51   258.62   233.60  1075.23     0.32
 HUB     15.22   364.39   277.46   236.21  1072.52     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    429.93   283.19   163.35     0.26  5445.11
 MEAN   379.19   262.88   120.56     0.24  4659.15     1.85
 HUB    320.51   240.10    43.04     0.22  4225.01

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      5.29      1.12     4.91   493.54     1.04   483.16     0.92     0.86
 MEAN     5.21      1.10     4.84   490.88     1.03   480.75     0.92     0.86
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 HUB      5.16     1.09     4.76   489.41     1.03   478.34     0.92     0.86

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.05    35.23    31.50     3.73     0.93     0.51     2.90
 MEAN    47.91    27.30    23.50     3.80     0.95     0.49     3.30     0.86
 HUB     49.59    10.33     6.50     3.83     0.95     0.47     3.92


   blockage3   Cor/Incid
      0.950       0.935

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     351.774     259.348     237.663    1075.458       0.327       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.215       4.842     480.960      46.000      47.498      30.600     -16.898

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     240.398     259.348     353.628    1081.588       0.222       0.497

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.204       5.028     486.459     511.151       0.040       0.569

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     238.303       0.000     238.303    1081.681       0.220       0.424

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.004     486.543       0.000       0.060       0.113       0.434

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.784       5.176       1.096     491.278      16.178     173.788       1.347

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 100577.242       0.544     135.299  225976.641


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.838   EfDer =  0.955

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.805    2412.647       5.176     491.278       1.000       1.000       0.980
W Kg/sec =  10.8203182

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     65.798    2479.067       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57207.066   18678.748       2.846     545.479     191.663     429.765       2.242

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   225.83    -0.08   225.83     0.21   434.18
 MEAN    17.74     0.00    -0.02   225.83    -0.08   225.83     0.21
 HUB     15.05     0.00    -0.02   225.83    -0.08   225.83     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.88    46.36    15.52   422.56   479.19     5.02   487.03     0.44
 MEAN    58.84    43.40    15.44   373.47   436.51     5.02   487.03     0.40
 HUB     54.53    38.84    15.69   316.87   389.17     5.02   487.03     0.36

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   344.00   250.48   235.78  1094.57     0.31
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 MEAN    17.51   341.95   245.68   237.86  1092.24     0.31
 HUB     14.85   360.39   268.66   240.21  1089.88     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    417.09   288.71   166.61     0.26  4963.56
 MEAN   368.59   267.74   122.91     0.25  4302.33     1.80
 HUB    312.66   244.21    43.99     0.22  3990.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     5.74     1.11     5.36   508.09     1.03   498.22     0.92     0.87
 MEAN    5.66     1.09     5.29   505.85     1.03   496.10     0.92     0.87
 HUB     5.62     1.09     5.21   504.79     1.03   493.97     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    46.73    35.25    31.50     3.75     0.93     0.49     2.90
 MEAN   45.93    27.33    23.50     3.83     0.95     0.47     3.28     0.87
 HUB    48.20    10.38     6.50     3.88     0.95     0.46     3.87


  blockage3   Cor/Incid
     0.950       0.955

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     345.122     247.289     240.743    1092.471       0.316       0.007

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     5.669       5.290     496.313      46.000      45.768      31.500     -14.268

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth       Cmth      Aoth         Machth      cp 2-Th
    17.392     246.751     247.289     349.339    1097.800       0.225       0.462

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       5.661       5.465     501.167     471.992       0.032       0.544

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    17.121     240.552       0.000     240.552    1098.076       0.219       0.414

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.451     501.419       0.000       0.060       0.096       0.426

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.811       5.636       1.089     506.243      14.965     178.932       1.387

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93048.984       0.535     125.172  224267.828


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.838   EfDer =  0.968

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.805    2412.647       5.636     506.243       1.000       1.000       0.980
W Kg/sec =  10.8203182

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     61.336    2442.149       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57207.066   18678.748       2.873     513.330     178.669     401.059       2.245

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   226.98    -0.08   226.98     0.21   410.45
 MEAN    16.97     0.00    -0.02   226.98    -0.08   226.98     0.21
 HUB     14.32     0.00    -0.02   226.98    -0.08   226.98     0.21
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.77    46.36    14.41   405.51   464.78     5.47   501.95     0.42
MEAN    57.58    43.80    13.78   357.31   423.37     5.47   501.95     0.39
HUB     53.03    37.84    15.19   301.50   377.45     5.47   501.95     0.34

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   329.99   230.76   235.89  1109.50     0.30
MEAN    16.57   328.15   226.13   237.79  1107.37     0.30
HUB     13.89   345.58   248.73   239.92  1105.23     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    397.51   288.87   166.74     0.26  4358.33
MEAN   348.95   267.63   122.82     0.24  3749.25     1.74
HUB    292.44   243.87    43.71     0.22  3456.03

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      6.16     1.09     5.79   521.00     1.03   511.92     0.92     0.89
MEAN     6.09     1.08     5.73   518.94     1.03   509.96     0.92     0.89
HUB      6.05     1.07     5.65   517.95     1.02   507.99     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.37    35.26    31.50     3.76     0.93     0.46     2.90
MEAN    43.56    27.32    23.50     3.82     0.94     0.45     3.29     0.89
HUB     46.03    10.33     6.50     3.83     0.94     0.44     3.90


   blockage3   Cor/Incid
      0.650       0.968

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     422.776     227.406     356.407    1101.310       0.384      -0.588

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.095       5.506     504.395      46.000      32.540      32.400      -0.140

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     16.481     371.701     227.406     435.747    1104.997       0.336      -0.241

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.650       6.093       5.634     507.778     307.928       0.015       0.347

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     16.096     352.787       0.000     352.787    1106.239       0.319       0.441

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650       5.671     508.920       0.000       0.060       0.037      -0.143

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.860       6.085       1.080     519.296      13.052     192.802       1.495

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  81164.844       0.514     109.185  229199.234


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.838   EfDer =  0.972

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.805    2412.647       6.085     519.296       1.000       1.000       0.680
W Kg/sec =  10.8203182

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     57.537    2411.263       1.401       0.248      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
57207.066	18678.748	2.110	353.647	167.604	266.284	1.589

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	319.32	-0.11	319.32	0.29	385.48
MEAN	15.91	0.00	-0.02	319.32	-0.11	319.32	0.29	
HUB	13.07	0.00	-0.02	319.32	-0.11	319.32	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.39	47.36	3.03	385.72	500.83	5.74	510.80	0.45
MEAN	46.38	44.80	1.58	335.04	462.92	5.74	510.80	0.42
HUB	40.76	38.84	1.92	275.18	421.61	5.74	510.80	0.38

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	304.68	204.64	225.73	1122.48	0.27
MEAN	15.50	301.17	197.42	227.44	1120.45	0.27
HUB	12.59	313.99	214.51	229.29	1118.44	0.28

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	377.71	284.45	173.08	0.25	3673.20	
MEAN	326.29	261.42	128.88	0.23	3061.23	1.92
HUB	265.07	234.80	50.56	0.21	2702.14	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.55	1.08	6.22	531.73	1.02	523.99	0.92	0.89
MEAN	6.47	1.06	6.15	529.66	1.02	522.10	0.92	0.89
HUB	6.42	1.06	6.08	528.44	1.02	520.23	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.19	37.48	31.50	5.98	0.93	0.50	2.90	
MEAN	40.96	29.54	23.50	6.04	0.91	0.50	3.34	0.89
HUB	43.09	12.44	6.50	5.94	0.91	0.50	4.06	

blockage3	Cor/Incid
0.950	0.972

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	304.931	201.036	229.276	1120.553	0.272	-0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
6.476	6.151	522.195	46.000	41.245	33.000	-8.245

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	241.421	201.036	314.165	1123.652	0.215	0.343

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	6.471	6.266	525.088	440.827	0.034	0.478

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	226.920	0.000	226.920	1124.258	0.202	0.399

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	6.282	525.654	0.000	0.060	0.059	0.391

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.847	6.463	1.062	529.946	10.650	221.067	1.714

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
66235.320	0.464	89.101	353889.344

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    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     460934.59    620.0609     77.8025      1.5328      0.7996     17.8375      1.1626


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NPSS: Inlet Mach number .73, Altitude 38334ft, dT 22R, Thrust 10%
Stage 4 stator Blocked @ 35%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.869   EfDer =  0.931

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      23.771    2412.671       4.216     455.811       1.000       1.000       0.980
 W Kg/sec =  10.8050451

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
      77.693    2573.734       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57126.316   18652.383       3.674     831.557     226.311     619.754       2.739

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   166.99    -0.06   166.99     0.16   463.34
  MEAN    17.06     0.00    -0.02   166.99    -0.06   166.99     0.16
  HUB     12.51     0.00    -0.02   166.99    -0.06   166.99     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.97    50.47    18.50   434.35   465.40     4.14   453.49     0.45
  MEAN    65.07    47.20    17.87   359.19   396.17     4.14   453.49     0.38
  HUB     57.63    38.62    19.01   263.39   311.92     4.14   453.49     0.30

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   384.28   311.79   224.63  1057.81     0.36
  MEAN    18.04   384.19   309.64   227.44  1054.54     0.36
  HUB     15.00   409.45   337.89   231.26  1050.63     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    434.35   255.90   122.57     0.24  6433.36
  MEAN   379.74   237.99    70.10     0.23  5585.59     1.92
  HUB    315.82   232.31    22.08     0.22  5069.13

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      4.85     1.15     4.42   477.60     1.05   465.29     0.92     0.85
  MEAN     4.76     1.13     4.34   474.73     1.04   462.42     0.92     0.85
  HUB      4.71     1.12     4.24   472.98     1.04   459.00     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     54.23    28.62    24.20     4.42     0.93     0.57     2.90
  MEAN    53.70    17.13    12.70     4.43     0.95     0.51     3.51     0.85
  HUB     55.61    -5.45    -9.30     3.85     0.95     0.38     4.78
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   blockage3   Cor/Incid
      0.950       0.931

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     386.949     309.035     232.867    1054.767       0.367       0.002

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      4.767       4.344     462.621      24.000      53.001      35.400     -17.601

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     246.278     309.035     395.165    1063.200       0.232       0.554

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       4.752       4.577     470.048     528.796       0.046       0.671

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     18.083     230.511       0.000     230.511    1063.909       0.217       0.515

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       4.569     470.675       0.000       0.060       0.118       0.534

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.777       4.721       1.120     475.106      19.294     157.039       1.217

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 119942.562       0.636     161.122  249275.172


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.869   EfDer =  0.934

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.771    2412.671       4.721     475.106       1.000       1.000       0.980
W Kg/sec =  10.8050451

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     70.846    2520.932       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57126.316   18652.383       2.861     590.487     206.365     474.134       2.298

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   220.84    -0.08   220.84     0.21   452.07
 MEAN    18.08     0.00    -0.02   220.84    -0.08   220.84     0.21
 HUB     15.21     0.00    -0.02   220.84    -0.08   220.84     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.96    46.36    16.60   432.67   485.84     4.58   471.04     0.46
 MEAN    59.88    42.30    17.58   380.63   440.12     4.58   471.04     0.41
 HUB     55.42    37.84    17.58   320.24   389.07     4.58   471.04     0.37

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   352.91   266.80   231.01  1077.94     0.33
 MEAN    18.01   348.40   258.78   233.28  1075.25     0.32
 HUB     15.22   364.22   277.52   235.88  1072.54     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    429.93   282.81   163.14     0.26  5449.55
 MEAN   379.19   262.52   120.41     0.24  4661.97     1.86
 HUB    320.51   239.76    42.99     0.22  4225.87
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     5.29     1.12     4.91   493.56     1.04   483.18     0.92     0.85
 MEAN    5.21     1.10     4.84   490.90     1.03   480.78     0.92     0.85
 HUB     5.16     1.09     4.76   489.42     1.03   478.36     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    49.11    35.23    31.50     3.73     0.93     0.51     2.90
 MEAN   47.97    27.30    23.50     3.80     0.95     0.49     3.30     0.85
 HUB    49.64    10.33     6.50     3.83     0.95     0.47     3.92


   blockage3   Cor/Incid
      0.950       0.934

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     17.960     351.666     259.505     237.331    1075.481       0.327        0.005

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.215       4.842     480.981      46.000      47.556      30.600     -16.956

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     17.960     240.055     259.505     353.510    1081.620       0.222        0.498

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.204       5.028     486.488     511.151       0.040        0.570

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4          Mach4        cp 3-4
     17.823     237.966       0.000     237.966    1081.713       0.220        0.425

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       5.004     486.571       0.000       0.060       0.113        0.435

    STAGE EXIT CONDITIONS, STAGE   2
       Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
       0.783       5.176        1.096     491.293      16.187     173.591        1.346

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 100635.297       0.544     135.186  225641.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.869   EfDer =  0.954

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     23.771     2412.671       5.176     491.293       1.000        1.000        0.980
W Kg/sec =  10.8050451

   W cor       RPM cor         GAMMA         Cp          R           Blades        THK
     65.708     2479.054       1.401       0.248      53.349       56.000        0.050

   CFM        SCFM             A1/A*       Area1       A*        AthrRotor   ChokeMargin
  57126.316   18652.383        2.850     545.479     191.403     429.765        2.245

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1       Stator    Alfa     C1       CU1        Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   225.51    -0.08   225.51     0.21   434.18
 MEAN    17.74      0.00    -0.02   225.51    -0.08   225.51     0.21
 HUB     15.05      0.00    -0.02   225.51    -0.08   225.51     0.21

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     61.92     46.36    15.56   422.56   479.04      5.02   487.05     0.44
 MEAN    58.88     43.40    15.48   373.48   436.35      5.02   487.05     0.40
 HUB     54.57     38.84    15.73   316.87   388.99      5.02   487.05     0.36

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   343.95   250.72   235.46  1094.61     0.31
MEAN    17.51   341.84   245.84   237.53  1092.27     0.31
HUB     14.85   360.22   268.73   239.88  1089.92     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    417.09   288.30   166.37     0.26  4968.35
MEAN   368.59   267.37   122.76     0.24  4305.13     1.80
HUB    312.66   243.87    43.93     0.22  3991.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      5.74     1.11     5.36   508.12     1.03   498.26     0.92     0.87
MEAN     5.66     1.09     5.29   505.87     1.03   496.13     0.92     0.87
HUB      5.62     1.09     5.21   504.81     1.03   493.99     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.80    35.24    31.50     3.74     0.93     0.49     2.90
MEAN    45.98    27.33    23.50     3.83     0.95     0.47     3.28     0.87
HUB     48.25    10.38     6.50     3.88     0.95     0.46     3.87


   blockage3   Cor/Incid
      0.950       0.954

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     345.004     247.450     240.409    1092.505       0.316       0.007

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.669       5.290     496.344      46.000      45.827      31.500     -14.327

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     246.402     247.450     349.207    1097.843       0.224       0.463

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.661       5.465     501.206     471.992       0.033       0.545

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.121     240.216       0.000     240.216    1098.118       0.219       0.415

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.451     501.457       0.000       0.060       0.096       0.426

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.810       5.636       1.089     506.268      14.975     178.720       1.385

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93109.703       0.535     125.077  223932.391


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.869   EfDer =  0.968

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.771    2412.671       5.636     506.268       1.000       1.000       0.980
W Kg/sec =  10.8050451

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     61.253    2442.115       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57126.316   18652.383       2.877     513.330     178.427     401.059       2.248

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   226.67    -0.08   226.67     0.21   410.45
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```
 MEAN    16.97     0.00    -0.02   226.67    -0.08   226.67     0.21
 HUB     14.32     0.00    -0.02   226.67    -0.08   226.67     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.80    46.36    14.44   405.51   464.63     5.47   501.98     0.42
 MEAN    57.62    43.80    13.82   357.31   423.21     5.47   501.98     0.39
 HUB     53.07    37.84    15.23   301.50   377.27     5.47   501.98     0.34

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   329.91   230.98   235.56  1109.55     0.30
 MEAN    16.57   328.02   226.29   237.46  1107.42     0.30
 HUB     13.89   345.41   248.81   239.59  1105.27     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    397.51   288.48   166.53     0.26  4362.45
 MEAN   348.96   267.27   122.67     0.24  3751.82     1.74
 HUB    292.45   243.53    43.63     0.22  3457.13

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.16      1.09     5.79   521.04     1.03   511.97     0.92     0.89
 MEAN     6.09      1.08     5.73   518.97     1.03   510.00     0.92     0.89
 HUB      6.05      1.07     5.65   517.97     1.02   508.03     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.44    35.26    31.50     3.76     0.93     0.46     2.90
 MEAN    43.62    27.32    23.50     3.82     0.94     0.45     3.29     0.89
 HUB     46.08    10.32     6.50     3.82     0.94     0.44     3.90


   blockage3   Cor/Incid
      0.600       0.968

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     452.550     227.562     391.173    1098.972       0.412      -0.809

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.095       5.423     502.256      46.000      30.188      32.400       2.212

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     16.481     408.512     227.562     467.618    1102.425       0.371      -0.490

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.600       6.093       5.541     505.417     283.154       0.017       0.314

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     16.096     387.137       0.000     387.137    1103.970       0.351       0.441

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600       5.588     506.835       0.000       0.060       0.038      -0.364

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859       6.085       1.080     519.329      13.061     192.571       1.493

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  81220.656       0.514     109.106  228853.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.869   EfDer =  0.937

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.771    2412.671       6.085     519.329       1.000       1.000       0.630
W Kg/sec =  10.8050451
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
57.463	2411.209	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
57126.316	18652.383	1.957	327.644	167.391	245.618	1.467

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	346.82	-0.12	346.82	0.31	385.47
MEAN	15.91	0.00	-0.02	346.82	-0.12	346.82	0.31	
HUB	13.07	0.00	-0.02	346.82	-0.12	346.82	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.05	47.36	0.69	385.72	518.80	5.68	509.30	0.47
MEAN	44.02	44.80	-0.78	335.04	482.30	5.68	509.30	0.44
HUB	38.44	38.84	-0.40	275.18	442.80	5.68	509.30	0.40

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	302.23	200.54	226.11	1122.38	0.27
MEAN	15.50	299.11	193.96	227.70	1120.40	0.27
HUB	12.59	312.24	211.77	229.44	1118.45	0.28

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	377.72	287.26	177.18	0.26	3599.85	
MEAN	326.29	263.36	132.34	0.24	3007.80	1.98
HUB	265.08	235.55	53.30	0.21	2667.77	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.52	1.07	6.20	531.52	1.02	523.90	0.92	0.86
MEAN	6.45	1.06	6.14	529.51	1.02	522.06	0.92	0.86
HUB	6.41	1.05	6.07	528.36	1.02	520.24	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.57	38.08	31.50	6.58	0.93	0.51	2.90	
MEAN	40.43	30.16	23.50	6.66	0.90	0.51	3.34	0.86
HUB	42.71	13.08	6.50	6.58	0.90	0.53	4.06	

blockage3	Cor/Incid
0.950	0.937

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	302.823	197.516	229.541	1120.509	0.270	-0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
6.454	6.134	522.154	46.000	40.711	33.000	-7.711

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	241.817	197.516	312.231	1123.476	0.215	0.334

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	6.450	6.245	524.923	440.827	0.033	0.470

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	227.276	0.000	227.276	1124.085	0.202	0.392

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	6.261	525.492	0.000	0.060	0.056	0.384

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.817	6.442	1.059	529.798	10.468	224.640	1.741

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 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   65104.918       0.456      87.457  384275.750

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     460013.12    617.9478     77.6926      1.5280      0.7949     17.8695      1.1623


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NPSS: Inlet Mach number .73, Altitude 38334ft, dT 22R, Thrust 10%
Stage 4 stator Blocked @ 40%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.916   EfDer =  0.930

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      23.722    2412.680       4.216     455.811       1.000       1.000       0.980
 W Kg/sec =  10.7829542

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
      77.534    2573.744       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
   57009.523   18614.248       3.682     831.557     225.848     619.754       2.744

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   166.64    -0.06   166.64     0.16   463.34
  MEAN    17.06     0.00    -0.02   166.64    -0.06   166.64     0.16
  HUB     12.51     0.00    -0.02   166.64    -0.06   166.64     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     69.01    50.47    18.54   434.36   465.28     4.14   453.50     0.45
  MEAN    65.12    47.20    17.92   359.19   396.02     4.14   453.50     0.38
  HUB     57.69    38.62    19.07   263.39   311.73     4.14   453.50     0.30

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   384.20   312.02   224.17  1057.83     0.36
  MEAN    18.04   384.01   309.76   226.96  1054.56     0.36
  HUB     15.00   409.13   337.83   230.77  1050.66     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    434.36   255.38   122.34     0.24  6438.17
  MEAN   379.74   237.51    69.98     0.23  5587.87     1.93
  HUB    315.82   231.82    22.01     0.22  5068.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      4.85     1.15     4.42   477.62     1.05   465.31     0.92     0.85
  MEAN     4.76     1.13     4.34   474.74     1.04   462.44     0.92     0.85
  HUB      4.71     1.12     4.24   472.98     1.04   459.02     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     54.30    28.62    24.20     4.42     0.93     0.57     2.90
  MEAN    53.77    17.14    12.70     4.44     0.95     0.51     3.51     0.85
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HUB     55.66    -5.45    -9.30     3.85     0.95     0.38     4.78


   blockage3   Cor/Incid
      0.950       0.930

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     18.071     386.760     309.161     232.384    1054.789       0.367        0.002

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      4.767       4.344     462.640      24.000      53.069      35.400     -17.669

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     18.071     245.758     309.161     394.940    1063.233       0.231        0.555

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       4.752       4.578     470.077     528.796       0.046        0.672

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4          Mach4        cp 3-4
     18.083     230.033       0.000     230.033    1063.938       0.216        0.516

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       4.569     470.700       0.000       0.060       0.118        0.535

    STAGE EXIT CONDITIONS, STAGE   1
       Eff4        Pt4          PR4        Texit         Del T        Ns         Ns nondim
       0.776       4.720        1.120     475.113      19.301     156.833        1.216

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 119986.008       0.636     160.851  248752.219


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.916   EfDer =  0.934

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     23.722     2412.680        4.720     475.113       1.000        1.000        0.980
W Kg/sec =  10.7829542

   W cor       RPM cor         GAMMA         Cp          R            Blades       THK
     70.705     2520.923        1.401        0.248      53.349       56.000        0.050

   CFM        SCFM             A1/A*       Area1       A*        AthrRotor   ChokeMargin
  57009.523   18614.248        2.867     590.487     205.956     474.134        2.302

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1       Stator    Alfa     C1       CU1        Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   220.38    -0.08   220.38     0.21   452.07
 MEAN    18.08      0.00    -0.02   220.38    -0.08   220.38     0.21
 HUB     15.21      0.00    -0.02   220.38    -0.08   220.38     0.21

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     63.01     46.36    16.65   432.67   485.63      4.58   471.06     0.46
 MEAN    59.93     42.30    17.63   380.63   439.89      4.58   471.06     0.41
 HUB     55.47     37.84    17.63   320.24   388.81      4.58   471.06     0.37

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050        0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     20.42   352.84    267.11    230.54  1077.97      0.33
 MEAN    18.01   348.26    259.01    232.81  1075.28      0.32
 HUB     15.22   363.97    277.61    235.40  1072.57      0.34

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    429.94    282.25    162.83     0.26  5455.92
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 MEAN   379.19   262.00   120.18     0.24  4666.13     1.86
 HUB    320.51   239.28    42.91     0.22  4227.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     5.29     1.12     4.91   493.59     1.04   483.21     0.92     0.85
 MEAN    5.21     1.10     4.84   490.92     1.03   480.80     0.92     0.85
 HUB     5.16     1.09     4.76   489.43     1.03   478.38     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    49.20    35.23    31.50     3.73     0.93     0.51     2.90
 MEAN   48.05    27.30    23.50     3.80     0.95     0.49     3.30     0.85
 HUB    49.70    10.33     6.50     3.83     0.95     0.48     3.92


   blockage3   Cor/Incid
      0.950       0.934

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     351.513     259.737     236.851    1075.514       0.327       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.215       4.843     481.011      46.000      47.639      30.600     -17.039

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     239.559     259.737     353.344    1081.665       0.221       0.499

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.203       5.028     486.528     511.151       0.040       0.572

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.823     237.481       0.000     237.481    1081.757       0.220       0.426

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.004     486.611       0.000       0.060       0.114       0.436

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.783       5.175       1.096     491.313      16.200     173.305       1.343

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 100718.398       0.545     135.021  225157.844


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.916   EfDer =  0.954

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.722    2412.680       5.175     491.313       1.000       1.000       0.980
W Kg/sec =  10.7829542

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     65.579    2479.013       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57009.523   18614.248       2.855     545.479     191.028     429.765       2.250

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   225.06    -0.08   225.06     0.21   434.17
 MEAN    17.74     0.00    -0.02   225.06    -0.08   225.06     0.21
 HUB     15.05     0.00    -0.02   225.06    -0.08   225.06     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.96    46.36    15.60   422.57   478.83     5.02   487.09     0.44
 MEAN    58.93    43.40    15.53   373.48   436.11     5.02   487.09     0.40
 HUB     54.62    38.84    15.78   316.87   388.72     5.02   487.09     0.36
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      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   343.85   251.03   234.98  1094.66     0.31
MEAN    17.51   341.69   246.09   237.05  1092.32     0.31
HUB     14.85   359.95   268.80   239.40  1089.96     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    417.09   287.74   166.06     0.26  4974.41
MEAN   368.59   266.83   122.50     0.24  4309.54     1.80
HUB    312.66   243.38    43.86     0.22  3992.87

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      5.74     1.11     5.36   508.16     1.03   498.30     0.92     0.87
MEAN     5.66     1.09     5.29   505.91     1.03   496.17     0.92     0.87
HUB      5.62     1.09     5.21   504.84     1.03   494.03     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.89    35.25    31.50     3.75     0.93     0.49     2.90
MEAN    46.07    27.33    23.50     3.83     0.95     0.47     3.28     0.87
HUB     48.31    10.38     6.50     3.88     0.95     0.46     3.87


   blockage3   Cor/Incid
      0.950       0.954

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     344.852     247.704     239.929    1092.552       0.316       0.007

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.669       5.291     496.387      46.000      45.913      31.500     -14.413

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     245.898     247.704     349.031    1097.902       0.224       0.464

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.660       5.466     501.260     471.992       0.033       0.546

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.121     239.732       0.000     239.732    1098.175       0.218       0.416

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.452     501.510       0.000       0.060       0.097       0.427

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.809       5.636       1.089     506.301      14.988     178.422       1.383

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93191.297       0.536     124.930  223447.703


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.916   EfDer =  0.967

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     23.722    2412.680       5.636     506.301       1.000       1.000       0.980
W Kg/sec =  10.7829542

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     61.133    2442.043       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  57009.523   18614.248       2.883     513.330     178.079     401.059       2.252

     ROTOR LEADING EDGE CONDITIONS, STAGE   4
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       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   226.22    -0.08   226.22     0.21   410.43
MEAN    16.97     0.00    -0.02   226.22    -0.08   226.22     0.21
HUB     14.32     0.00    -0.02   226.22    -0.08   226.22     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.85    46.36    14.49   405.51   464.41     5.47   502.04     0.42
MEAN    57.67    43.80    13.87   357.31   422.97     5.47   502.04     0.38
HUB     53.13    37.84    15.29   301.50   376.99     5.47   502.04     0.34

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   329.82   231.33   235.09  1109.61     0.30
MEAN    16.57   327.84   226.53   236.99  1107.48     0.30
HUB     13.89   345.14   248.90   239.11  1105.33     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    397.51   287.90   166.18     0.26  4369.02
MEAN   348.96   266.74   122.42     0.24  3755.87     1.75
HUB    292.45   243.05    43.55     0.22  3458.28

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      6.16     1.09     5.80   521.10     1.03   512.03     0.92     0.89
MEAN     6.09     1.08     5.73   519.02     1.03   510.06     0.92     0.89
HUB      6.05     1.07     5.65   518.01     1.02   508.08     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.54    35.26    31.50     3.76     0.93     0.47     2.90
MEAN    43.71    27.32    23.50     3.82     0.95     0.45     3.29     0.89
HUB     46.15    10.32     6.50     3.82     0.95     0.44     3.90


  blockage3   Cor/Incid
     0.550       0.967

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    16.481     490.238     227.808     434.093    1095.778       0.447      -1.108

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     6.095       5.312     499.341      46.000      27.690      32.400       4.710

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    16.481     454.270     227.808     508.191    1098.881       0.413      -0.830

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.550       6.091       5.415     502.173     258.379       0.021       0.280

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    16.096     429.609       0.000     429.609    1100.867       0.390       0.437

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.550       5.476     503.990       0.000       0.060       0.044      -0.667

   STAGE EXIT CONDITIONS, STAGE   4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.855       6.082       1.079     519.376      13.075     192.232       1.490

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  81303.586       0.515     108.994  228354.656


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.916   EfDer =  0.886
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   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     23.722    2412.680       6.082     519.376       1.000       1.000       0.580
W Kg/sec =  10.7829542

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     57.370    2411.110       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 57009.523   18614.248       1.805     301.640     167.119     224.953       1.346

    ROTOR LEADING EDGE CONDITIONS, STAGE   5

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   379.83    -0.13   379.83     0.34   385.46
MEAN    15.91     0.00    -0.02   379.83    -0.13   379.83     0.34
HUB     13.07     0.00    -0.02   379.83    -0.13   379.83     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     45.45    47.36    -1.91   385.72   541.43     5.60   507.35     0.49
MEAN    41.43    44.80    -3.37   335.04   506.57     5.60   507.35     0.46
HUB     35.94    38.84    -2.90   275.18   469.11     5.60   507.35     0.42

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   299.34   195.47   226.70  1122.26     0.27
MEAN    15.50   296.70   189.74   228.10  1120.34     0.26
HUB     12.59   310.21   208.47   229.72  1118.46     0.28

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    377.72   290.87   182.25     0.26  3509.18
MEAN   326.30   265.85   136.56     0.24  2942.61     2.05
HUB    265.08   236.60    56.61     0.21  2626.32

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      6.49     1.07     6.17   531.26     1.02   523.79     0.92     0.81
MEAN     6.42     1.06     6.11   529.34     1.02   522.00     0.92     0.81
HUB      6.38     1.05     6.05   528.27     1.02   520.25     0.92     0.81

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.77    38.80    31.50     7.30     0.93     0.52     2.90
MEAN    39.75    30.91    23.50     7.41     0.89     0.53     3.34     0.81
HUB     42.22    13.84     6.50     7.34     0.89     0.55     4.06


  blockage3   Cor/Incid
     0.950       0.886

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    15.219     300.364     193.220     229.966    1120.452       0.268      -0.012

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     6.423       6.110     522.102      46.000      40.037      33.000      -7.037

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    15.219     242.407     193.220     309.993    1123.262       0.216       0.323

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       6.420       6.215     524.724     440.827       0.030       0.459

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    14.701     227.810       0.000     227.810    1123.875       0.203       0.383

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       6.231     525.296       0.000       0.060       0.053       0.375
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    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.772       6.412       1.054     529.622      10.246     229.234       1.777

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   63720.191       0.447      85.422  420626.656

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     458919.47    615.2183     77.5338      1.5209      0.7875     17.9155      1.1619
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DESCENT Operating Point #2

NPSS: Inlet Mach number .71, Altitude 37357ft, dT 22R, Thrust 10%
Stage 4 stator Blocked @ 10%

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
**********************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.803   EfDer =  0.932

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      24.514    2391.400       4.355     453.909       1.000       1.000       0.980
 W Kg/sec =  11.1427269

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
      77.412    2556.383       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
   56801.250   19235.312       3.688     831.557     225.492     619.754       2.748

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

         R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   166.03    -0.06   166.03     0.16   460.21
  MEAN    17.06     0.00    -0.02   166.03    -0.06   166.03     0.16
  HUB     12.51     0.00    -0.02   166.03    -0.06   166.03     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.91    50.47    18.44   430.53   461.48     4.28   451.61     0.44
  MEAN    65.00    47.20    17.80   356.03   392.89     4.28   451.61     0.38
  HUB     57.55    38.62    18.93   261.07   309.44     4.28   451.61     0.30

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   381.03   308.63   223.46  1055.42     0.36
  MEAN    18.04   381.10   306.70   226.20  1052.22     0.36
  HUB     15.00   406.36   335.03   229.96  1048.37     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    430.53   254.54   121.89     0.24  6368.29
  MEAN   376.39   236.70    69.69     0.22  5532.67     1.92
  HUB    313.03   231.01    22.00     0.22  5026.17

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      5.00     1.15     4.57   475.29     1.05   463.18     0.92     0.85
  MEAN     4.91     1.13     4.48   472.48     1.04   460.37     0.92     0.85
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 HUB      4.86     1.12     4.38   470.78     1.04   457.01     0.92     0.85

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     54.09    28.61    24.20     4.41     0.93     0.56     2.90
 MEAN    53.59    17.12    12.70     4.42     0.95     0.51     3.51     0.85
 HUB     55.53    -5.46    -9.30     3.84     0.95     0.38     4.78


   blockage3   Cor/Incid
      0.950       0.932

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     383.853     306.107     231.608    1052.435       0.365       0.002

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      4.916       4.484     460.566      24.000      52.888      35.400     -17.488

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     245.078     306.107     392.128    1060.718       0.231       0.552

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       4.900       4.721     467.844     528.796       0.046       0.669

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     18.083     229.371       0.000     229.371    1061.422       0.216       0.513

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       4.712     468.466       0.000       0.060       0.117       0.533

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.778       4.868       1.118     472.853      18.944     157.351       1.220

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 117765.211       0.635     163.141  257864.906


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.803   EfDer =  0.935

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.514    2391.400       4.868     472.853       1.000       1.000       0.980
W Kg/sec =  11.1427269

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     70.671    2504.652       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  56801.250   19235.312       2.868     590.487     205.856     474.134       2.303

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   219.75    -0.08   219.75     0.21   449.15
 MEAN    18.08     0.00    -0.02   219.75    -0.08   219.75     0.21
 HUB     15.21     0.00    -0.02   219.75    -0.08   219.75     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.87    46.36    16.51   428.86   481.95     4.73   468.83     0.45
 MEAN    59.79    42.30    17.49   377.27   436.67     4.73   468.83     0.41
 HUB     55.31    37.84    17.47   317.42   386.12     4.73   468.83     0.36

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   349.95   263.76   229.99  1075.21     0.33
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 MEAN    18.01   345.66   256.03   232.22  1072.58     0.32
 HUB     15.22   361.52   274.91   234.77  1069.92     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    426.14   281.54   162.38     0.26  5387.54
 MEAN   375.85   261.31   119.82     0.24  4612.47     1.85
 HUB    317.69   238.63    42.77     0.22  4186.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     5.45     1.12     5.06   490.94     1.04   480.73     0.92     0.86
 MEAN    5.36     1.10     4.99   488.34     1.03   478.37     0.92     0.86
 HUB     5.31     1.09     4.91   486.91     1.03   476.01     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    48.91    35.22    31.50     3.72     0.93     0.51     2.90
 MEAN   47.79    27.29    23.50     3.79     0.95     0.49     3.30     0.86
 HUB    49.50    10.33     6.50     3.83     0.95     0.47     3.92


  blockage3   Cor/Incid
     0.950       0.935

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.960     348.908     256.749     236.255    1072.804       0.325       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     5.371       4.991     478.577      46.000      47.380      30.600     -16.780

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth       Cmth      Aoth         Machth      cp 2-Th
    17.960     239.067     256.749     350.818    1078.823       0.222       0.495

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       5.360       5.179     483.962     511.151       0.039       0.567

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.823     236.964       0.000     236.964    1078.916       0.220       0.423

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.155     484.045       0.000       0.060       0.112       0.433

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.785       5.331       1.095     488.728      15.875     174.158       1.350

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98695.992       0.543     136.724  233506.828


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.803   EfDer =  0.955

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.514    2391.400       5.331     488.728       1.000       1.000       0.980
W Kg/sec =  11.1427269

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     65.608    2463.639       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  56801.250   19235.312       2.854     545.479     191.110     429.765       2.249

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   224.57    -0.08   224.57     0.21   431.48
 MEAN    17.74     0.00    -0.02   224.57    -0.08   224.57     0.21
 HUB     15.05     0.00    -0.02   224.57    -0.08   224.57     0.21
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.81    46.36    15.45   418.84   475.31     5.17   484.52     0.44
MEAN    58.76    43.40    15.36   370.18   433.04     5.17   484.52     0.40
HUB     54.44    38.84    15.60   314.08   386.16     5.17   484.52     0.36

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   341.15   247.69   234.59  1091.59     0.31
MEAN    17.51   339.23   243.09   236.62  1089.30     0.31
HUB     14.85   357.68   266.17   238.93  1086.99     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.41   287.22   165.72     0.26  4908.33
MEAN   365.34   266.34   122.26     0.24  4256.98     1.79
HUB    309.90   242.90    43.74     0.22  3953.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      5.90     1.11     5.51   505.20     1.03   495.50     0.92     0.87
MEAN     5.82     1.09     5.44   503.02     1.03   493.42     0.92     0.87
HUB      5.79     1.09     5.37   502.00     1.03   491.33     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.56    35.24    31.50     3.74     0.93     0.49     2.90
MEAN    45.77    27.32    23.50     3.82     0.95     0.47     3.28     0.87
HUB     48.09    10.37     6.50     3.87     0.95     0.46     3.87


   blockage3   Cor/Incid
      0.950       0.955

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     342.382     244.681     239.492    1089.533       0.314       0.007

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.833       5.447     493.633      46.000      45.614      31.500     -14.114

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     245.557     244.681     346.652    1094.759       0.224       0.460

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.824       5.624     498.379     471.992       0.032       0.541

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.121     239.369       0.000     239.369    1095.034       0.219       0.412

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.610     498.629       0.000       0.060       0.095       0.424

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.812       5.800       1.088     503.407      14.679     179.435       1.391

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91271.812       0.534     126.440  231825.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.803   EfDer =  0.969

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.514    2391.400       5.800     503.407       1.000       1.000       0.980
W Kg/sec =  11.1427269

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     61.212    2427.453       1.401       0.248      53.349      56.000       0.050
```

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
56801.250	19235.312	2.879	513.330	178.307	401.059	2.249

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	225.87	-0.08	225.87	0.21	407.98
MEAN	16.97	0.00	-0.02	225.87	-0.08	225.87	0.21	
HUB	14.32	0.00	-0.02	225.87	-0.08	225.87	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.67	46.36	14.31	401.94	461.12	5.63	499.15	0.42
MEAN	57.48	43.80	13.68	354.16	420.12	5.63	499.15	0.38
HUB	52.92	37.84	15.08	298.84	374.66	5.63	499.15	0.34

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	327.33	228.02	234.84	1106.27	0.30
MEAN	16.57	325.64	223.63	236.71	1104.18	0.29
HUB	13.89	343.11	246.38	238.80	1102.08	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	394.00	287.58	165.98	0.26	4306.56	
MEAN	345.88	266.41	122.25	0.24	3707.78	1.74
HUB	289.87	242.72	43.49	0.22	3423.30	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.33	1.09	5.96	517.86	1.03	508.93	0.92	0.89
MEAN	6.26	1.08	5.89	515.85	1.02	507.01	0.92	0.89
HUB	6.22	1.07	5.82	514.90	1.02	505.08	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.16	35.25	31.50	3.75	0.93	0.46	2.90	
MEAN	43.37	27.31	23.50	3.81	0.94	0.45	3.29	0.89
HUB	45.90	10.32	6.50	3.82	0.94	0.44	3.90	

blockage3	Cor/Incid
0.850	0.969

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	345.506	224.890	262.295	1103.352	0.313	-0.094

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
6.265	5.853	506.251	46.000	40.610	32.400	-8.210

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	273.002	224.890	353.703	1107.419	0.247	0.300

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	6.262	6.002	509.990	407.025	0.020	0.466

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	260.206	0.000	260.206	1108.036	0.235	0.414

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	6.011	510.558	0.000	0.060	0.059	0.324

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.845	6.247	1.077	516.203	12.796	193.487	1.500

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
79573.734	0.513	110.234	237001.141

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.803   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    24.514    2391.400       6.247     516.203       1.000       1.000       0.880
W Kg/sec =  11.1427269

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    57.547    2397.177       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 56801.250   19235.312       2.730     457.661     167.632     348.945       2.082

    ROTOR LEADING EDGE CONDITIONS, STAGE   5

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   241.79    -0.08   241.79     0.22   383.23
MEAN    15.91     0.00    -0.02   241.79    -0.08   241.79     0.22
HUB     13.07     0.00    -0.02   241.79    -0.08   241.79     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.70    47.36    10.34   382.32   452.43     6.04   511.33     0.41
MEAN    53.95    44.80     9.15   332.09   410.85     6.04   511.33     0.37
HUB     48.45    38.84     9.61   272.76   364.56     6.04   511.33     0.33

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   308.80   211.93   224.60  1119.31     0.28
MEAN    15.50   304.48   203.57   226.42  1117.21     0.27
HUB     12.59   316.60   219.27   228.39  1115.11     0.28

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    374.39   277.19   162.46     0.25  3803.59
MEAN   323.42   256.19   119.85     0.23  3156.18     1.77
HUB    262.74   232.49    43.47     0.21  2761.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      6.75     1.08     6.40   528.97     1.02   521.02     0.92     0.91
MEAN     6.66     1.07     6.33   526.80     1.02   519.07     0.92     0.91
HUB      6.61     1.06     6.25   525.47     1.02   517.12     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.34    35.88    31.50     4.38     0.93     0.47     2.90
MEAN    41.96    27.89    23.50     4.39     0.93     0.45     3.34     0.91
HUB     43.83    10.78     6.50     4.28     0.93     0.43     4.06


  blockage3   Cor/Incid
     0.950       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    15.219     308.344     207.303     228.258    1117.303       0.276      -0.011

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     6.669       6.325     519.152      46.000      42.246      33.000      -9.246

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    15.219     240.120     207.303     317.226    1120.655       0.214       0.359

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       6.663       6.453     522.272     440.827       0.038       0.495

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
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     14.701     225.729       0.000     225.729    1121.254       0.201       0.411

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.468     522.831       0.000       0.060       0.064       0.403

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864       6.654       1.065     527.078      10.875     213.534       1.655

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  67633.789       0.483      93.694  277954.719

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     454940.53    630.2330     77.4122      1.5279      0.8004     17.8026      1.1612


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NPSS: Inlet Mach number .71, Altitude 37357ft, dT 22R, Thrust 10%
Stage 4 stator Blocked @ 15%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  ******************
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         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.799   EfDer =  0.932

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      24.518    2391.464       4.355     453.909       1.000       1.000       0.980
 W Kg/sec =  11.144681

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
      77.426    2556.451       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
   56811.211   19238.686       3.687     831.557     225.531     619.754       2.748

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   166.06    -0.06   166.06     0.16   460.23
  MEAN    17.06     0.00    -0.02   166.06    -0.06   166.06     0.16
  HUB     12.51     0.00    -0.02   166.06    -0.06   166.06     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.91    50.47    18.44   430.54   461.50     4.28   451.61     0.44
  MEAN    65.00    47.20    17.80   356.04   392.91     4.28   451.61     0.38
  HUB     57.55    38.62    18.93   261.08   309.46     4.28   451.61     0.30

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   381.06   308.63   223.49  1055.42     0.36
  MEAN    18.04   381.12   306.70   226.24  1052.21     0.36
  HUB     15.00   406.39   335.04   230.00  1048.37     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    430.54   254.58   121.91     0.24  6368.25
  MEAN   376.40   236.74    69.70     0.22  5532.71     1.92
  HUB    313.04   231.05    21.99     0.22  5026.25
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      5.00     1.15     4.57   475.29     1.05   463.18     0.92     0.85
MEAN     4.91     1.13     4.48   472.49     1.04   460.37     0.92     0.85
HUB      4.86     1.12     4.38   470.78     1.04   457.01     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     54.09    28.61    24.20     4.41     0.93     0.56     2.90
MEAN    53.59    17.12    12.70     4.42     0.95     0.51     3.51     0.85
HUB     55.53    -5.46    -9.30     3.84     0.95     0.38     4.78


   blockage3   Cor/Incid
      0.950       0.932

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     18.071     383.880     306.109     231.649    1052.434       0.365        0.002

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      4.916       4.484     460.565      24.000      52.883      35.400     -17.483

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     18.071     245.121     306.109     392.157    1060.717       0.231        0.552

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       4.900       4.721     467.843     528.796       0.046        0.668

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4          Mach4        cp 3-4
     18.083     229.411       0.000     229.411    1061.421       0.216        0.513

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       4.712     468.465       0.000       0.060       0.117        0.532

    STAGE EXIT CONDITIONS, STAGE   1
       Eff4        Pt4          PR4        Texit        Del T        Ns         Ns nondim
       0.778       4.869        1.118     472.853      18.944     157.366        1.220

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 117769.000       0.635     163.175  257911.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.799   EfDer =  0.935

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     24.518     2391.464        4.869     472.853       1.000        1.000        0.980
W Kg/sec =  11.144681

   W cor       RPM cor         GAMMA         Cp          R           Blades        THK
     70.683     2504.717        1.401       0.248      53.349      56.000        0.050

   CFM        SCFM             A1/A*       Area1       A*        AthrRotor   ChokeMargin
  56811.211   19238.686        2.868     590.487     205.890     474.134        2.303

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1       Stator    Alfa     C1       CU1        Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   219.79    -0.08   219.79     0.21   449.16
 MEAN    18.08      0.00    -0.02   219.79    -0.08   219.79     0.21
 HUB     15.21      0.00    -0.02   219.79    -0.08   219.79     0.21

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     62.87     46.36    16.51   428.87   481.97      4.73   468.83     0.45
 MEAN    59.78     42.30    17.48   377.28   436.70      4.73   468.83     0.41
 HUB     55.31     37.84    17.47   317.42   386.15      4.73   468.83     0.36

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	349.98	263.76	230.03	1075.21	0.33
MEAN	18.01	345.67	256.01	232.26	1072.58	0.32
HUB	15.22	361.55	274.92	234.81	1069.92	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	426.15	281.58	162.39	0.26	5387.61	
MEAN	375.86	261.36	119.84	0.24	4612.15	1.85
HUB	317.70	238.67	42.77	0.22	4186.31	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	5.45	1.12	5.06	490.94	1.04	480.73	0.92	0.86
MEAN	5.36	1.10	4.99	488.34	1.03	478.37	0.92	0.86
HUB	5.31	1.09	4.91	486.91	1.03	476.01	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	48.91	35.22	31.50	3.72	0.93	0.51	2.90	
MEAN	47.79	27.29	23.50	3.79	0.95	0.49	3.30	0.86
HUB	49.50	10.32	6.50	3.82	0.95	0.47	3.92	

blockage3	Cor/Incid
0.950	0.935

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	348.921	256.732	236.294	1072.804	0.325	0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
5.371	4.991	478.577	46.000	47.374	30.600	-16.774

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	239.108	256.732	350.833	1078.823	0.222	0.495

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	5.360	5.180	483.961	511.151	0.039	0.567

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	237.004	0.000	237.004	1078.916	0.220	0.423

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.155	484.045	0.000	0.060	0.112	0.433

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.785	5.332	1.095	488.728	15.875	174.176	1.350

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
98697.906	0.543	136.751	233549.203

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =17.799 EfDer = 0.955

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
24.518	2391.464	5.332	488.728	1.000	1.000	0.980

W Kg/sec = 11.144681

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
65.619	2463.702	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
56811.211	19238.686	2.854	545.479	191.140	429.765	2.248

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	224.60	-0.08	224.60	0.21	431.49

```
 MEAN    17.74     0.00    -0.02   224.60    -0.08   224.60     0.21
 HUB     15.05     0.00    -0.02   224.60    -0.08   224.60     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.80    46.36    15.44   418.85   475.34     5.17   484.52     0.44
 MEAN    58.76    43.40    15.36   370.19   433.07     5.17   484.52     0.40
 HUB     54.44    38.84    15.60   314.09   386.19     5.17   484.52     0.36

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   341.17   247.68   234.63  1091.59     0.31
 MEAN    17.51   339.27   243.10   236.66  1089.30     0.31
 HUB     14.85   357.71   266.18   238.97  1086.99     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.42   287.27   165.75     0.26  4908.06
 MEAN   365.35   266.37   122.25     0.24  4257.20     1.79
 HUB    309.91   242.94    43.73     0.22  3953.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      5.90     1.11     5.51   505.20     1.03   495.50     0.92     0.87
 MEAN     5.82     1.09     5.44   503.02     1.03   493.42     0.92     0.87
 HUB      5.79     1.09     5.37   502.00     1.03   491.33     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.55    35.24    31.50     3.74     0.93     0.48     2.90
 MEAN    45.77    27.32    23.50     3.82     0.95     0.47     3.28     0.87
 HUB     48.08    10.37     6.50     3.87     0.95     0.46     3.87


   blockage3   Cor/Incid
      0.950       0.955

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     342.419     244.694     239.532    1089.533       0.314       0.007

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.833       5.447     493.632      46.000      45.611      31.500     -14.111

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     245.597     244.694     346.689    1094.759       0.224       0.459

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.824       5.624     498.379     471.992       0.032       0.541

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4        cp 3-4
     17.121     239.408       0.000     239.408    1095.034       0.219       0.412

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.610     498.629       0.000       0.060       0.095       0.424

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.812       5.800       1.088     503.408      14.680     179.449       1.391

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91275.422       0.534     126.467  231867.453


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.799   EfDer =  0.969

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.518    2391.464       5.800     503.408       1.000       1.000       0.980
W Kg/sec =  11.144681
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
61.222	2427.514	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
56811.211	19238.686	2.878	513.330	178.334	401.059	2.249

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	225.91	-0.08	225.91	0.21	407.99
MEAN	16.97	0.00	-0.02	225.91	-0.08	225.91	0.21	
HUB	14.32	0.00	-0.02	225.91	-0.08	225.91	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.67	46.36	14.31	401.95	461.15	5.63	499.15	0.42
MEAN	57.47	43.80	13.67	354.17	420.15	5.63	499.15	0.38
HUB	52.92	37.84	15.08	298.85	374.69	5.63	499.15	0.34

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	327.35	228.01	234.88	1106.27	0.30
MEAN	16.57	325.66	223.62	236.75	1104.18	0.29
HUB	13.89	343.15	246.40	238.83	1102.08	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	394.02	287.62	166.00	0.26	4306.36	
MEAN	345.89	266.45	122.27	0.24	3707.61	1.74
HUB	289.88	242.76	43.48	0.22	3423.57	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.33	1.09	5.96	517.86	1.03	508.93	0.92	0.89
MEAN	6.26	1.08	5.89	515.85	1.02	507.01	0.92	0.89
HUB	6.22	1.07	5.82	514.90	1.02	505.08	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.15	35.25	31.50	3.75	0.93	0.46	2.90	
MEAN	43.37	27.31	23.50	3.81	0.94	0.45	3.29	0.89
HUB	45.89	10.32	6.50	3.82	0.94	0.44	3.90	

blockage3	Cor/Incid
0.800	0.969

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	359.464	224.880	280.435	1102.460	0.326	-0.180

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
6.266	5.821	505.432	46.000	38.726	32.400	-6.326

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	291.975	224.880	368.538	1106.450	0.264	0.207

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.800	6.263	5.967	509.098	382.250	0.017	0.437

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	278.032	0.000	278.032	1107.170	0.251	0.423

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.800	5.982	509.760	0.000	0.060	0.050	0.247

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.852	6.250	1.078	516.205	12.797	193.505	1.500

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79575.258       0.513     110.256  237043.703


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.799   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.518    2391.464       6.250     516.205       1.000       1.000       0.830
W Kg/sec =  11.144681

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     57.525    2397.236       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  56811.211   19238.686       2.576     431.657     167.568     328.280       1.959

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   257.05    -0.09   257.05     0.23   383.24
 MEAN    15.91     0.00    -0.02   257.05    -0.09   257.05     0.23
 HUB     13.07     0.00    -0.02   257.05    -0.09   257.05     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.09    47.36     8.73   382.33   460.78     6.02   510.70     0.42
 MEAN    52.27    44.80     7.47   332.10   420.03     6.02   510.70     0.38
 HUB     46.71    38.84     7.87   272.76   374.87     6.02   510.70     0.34

      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   307.54   210.22   224.47  1119.27     0.27
 MEAN    15.50   303.39   202.09   226.29  1117.19     0.27
 HUB     12.59   315.63   218.02   228.24  1115.11     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    374.40   278.10   164.18     0.25  3773.01
 MEAN   323.43   256.77   121.34     0.23  3133.32     1.80
 HUB    262.75   232.58    44.73     0.21  2745.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.75     1.08     6.41   528.87     1.02   520.98     0.92     0.91
 MEAN     6.67     1.07     6.33   526.72     1.02   519.05     0.92     0.91
 HUB      6.61     1.06     6.26   525.42     1.02   517.12     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.12    36.18    31.50     4.68     0.93     0.47     2.90
 MEAN    41.77    28.20    23.50     4.70     0.93     0.46     3.34     0.91
 HUB     43.69    11.09     6.50     4.59     0.93     0.45     4.06


  blockage3   Cor/Incid
     0.950       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     307.229     205.796     228.117    1117.284       0.275      -0.011

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.671       6.330     519.134      46.000      42.055      33.000      -9.055

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     240.022     205.796     316.169    1120.579       0.214       0.356

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.665       6.456     522.200     440.827       0.037       0.492
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    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    14.701     225.632       0.000     225.632    1121.178       0.201       0.409

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.471     522.759       0.000       0.060       0.063       0.400

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869       6.657       1.065     527.003      10.798     214.973       1.666

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  67154.781       0.479      93.046  295664.500

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    454472.34    629.6948     77.4258      1.5286      0.8021     17.7992      1.1610


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NPSS: Inlet Mach number .71, Altitude 37357ft, dT 22R, Thrust 10%
Stage 4 stator Blocked @ 20%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.801   EfDer =  0.932

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      24.517    2391.528       4.355     453.909       1.000       1.000       0.980
 W Kg/sec =  11.1438637

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
      77.420    2556.519       1.401       0.248      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  56807.043   19237.273       3.687     831.557     225.515     619.754       2.748

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   166.04    -0.06   166.04     0.16   460.24
  MEAN    17.06     0.00    -0.02   166.04    -0.06   166.04     0.16
  HUB     12.51     0.00    -0.02   166.04    -0.06   166.04     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.91    50.47    18.44   430.55   461.51     4.28   451.61     0.44
  MEAN    65.00    47.20    17.80   356.05   392.91     4.28   451.61     0.38
  HUB     57.55    38.62    18.93   261.08   309.46     4.28   451.61     0.30

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   381.06   308.65   223.48  1055.42     0.36
  MEAN    18.04   381.11   306.70   226.23  1052.22     0.36
  HUB     15.00   406.38   335.04   229.98  1048.37     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    430.55   254.56   121.90     0.24  6368.67
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 MEAN   376.41   236.72    69.71     0.22  5532.71     1.92
 HUB    313.05   231.03    21.99     0.22  5026.25

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     5.00     1.15     4.57   475.29     1.05   463.18     0.92     0.85
 MEAN    4.91     1.13     4.48   472.49     1.04   460.37     0.92     0.85
 HUB     4.86     1.12     4.38   470.79     1.04   457.01     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    54.09    28.61    24.20     4.41     0.93     0.56     2.90
 MEAN   53.59    17.13    12.70     4.43     0.95     0.51     3.51     0.85
 HUB    55.53    -5.46    -9.30     3.84     0.95     0.38     4.78


   blockage3   Cor/Incid
      0.950       0.932

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     383.869     306.109     231.631    1052.436       0.365       0.002

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      4.916       4.484     460.567      24.000      52.885      35.400     -17.485

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     245.102     306.109     392.145    1060.719       0.231       0.552

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       4.900       4.721     467.845     528.796       0.046       0.669

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     18.083     229.393       0.000     229.393    1061.423       0.216       0.513

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       4.713     468.466       0.000       0.060       0.117       0.533

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.778       4.869       1.118     472.854      18.945     157.358       1.220

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 117775.070       0.635     163.171  257891.859


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.801   EfDer =  0.935

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.517    2391.528       4.869     472.854       1.000       1.000       0.980
W Kg/sec =  11.1438637

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     70.678    2504.781       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  56807.043   19237.273       2.868     590.487     205.875     474.134       2.303

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   219.77    -0.08   219.77     0.21   449.18
 MEAN    18.08     0.00    -0.02   219.77    -0.08   219.77     0.21
 HUB     15.21     0.00    -0.02   219.77    -0.08   219.77     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.87    46.36    16.51   428.88   481.98     4.73   468.83     0.45
 MEAN    59.78    42.30    17.48   377.29   436.70     4.73   468.83     0.41
 HUB     55.31    37.84    17.47   317.43   386.15     4.73   468.83     0.36
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      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   349.98   263.79   230.01  1075.22     0.33
MEAN    18.01   345.68   256.04   232.24  1072.58     0.32
HUB     15.22   361.54   274.92   234.79  1069.92     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    426.17   281.56   162.38     0.26  5388.07
MEAN   375.87   261.33   119.83     0.24  4612.63     1.85
HUB    317.70   238.66    42.78     0.22  4186.33

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      5.45     1.12     5.06   490.94     1.04   480.73     0.92     0.86
MEAN     5.36     1.10     4.99   488.34     1.03   478.38     0.92     0.86
HUB      5.32     1.09     4.91   486.91     1.03   476.01     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     48.91    35.22    31.50     3.72     0.93     0.51     2.90
MEAN    47.79    27.29    23.50     3.79     0.95     0.49     3.30     0.86
HUB     49.50    10.33     6.50     3.83     0.95     0.47     3.92


   blockage3   Cor/Incid
      0.950       0.935

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     348.929     256.758     236.277    1072.807       0.325       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.371       4.991     478.579      46.000      47.379      30.600     -16.779

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     239.089     256.758     350.839    1078.826       0.222       0.495

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.360       5.180     483.964     511.151       0.039       0.567

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     236.985       0.000     236.985    1078.919       0.220       0.423

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.155     484.048       0.000       0.060       0.112       0.433

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.785       5.332       1.095     488.731      15.877     174.161       1.350

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98707.188       0.543     136.754  233530.984


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.801   EfDer =  0.955

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.517    2391.528       5.332     488.731       1.000       1.000       0.980
W Kg/sec =  11.1438637

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     65.614    2463.761       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  56807.043   19237.273       2.854     545.479     191.125     429.765       2.249

     ROTOR LEADING EDGE CONDITIONS, STAGE   3
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       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   224.59    -0.08   224.59     0.21   431.50
MEAN    17.74     0.00    -0.02   224.59    -0.08   224.59     0.21
HUB     15.05     0.00    -0.02   224.59    -0.08   224.59     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.81    46.36    15.45   418.86   475.34     5.17   484.53     0.44
MEAN    58.76    43.40    15.36   370.20   433.07     5.17   484.53     0.40
HUB     54.44    38.84    15.60   314.09   386.19     5.17   484.53     0.36

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   341.17   247.70   234.61  1091.60     0.31
MEAN    17.51   339.26   243.10   236.64  1089.31     0.31
HUB     14.85   357.70   266.18   238.95  1087.00     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.43   287.24   165.73     0.26  4908.52
MEAN   365.36   266.36   122.26     0.24  4257.20     1.79
HUB    309.92   242.92    43.74     0.22  3953.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      5.90     1.11     5.51   505.21     1.03   495.50     0.92     0.87
MEAN     5.82     1.09     5.44   503.02     1.03   493.43     0.92     0.87
HUB      5.79     1.09     5.37   502.00     1.03   491.34     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.55    35.24    31.50     3.74     0.93     0.48     2.90
MEAN    45.77    27.32    23.50     3.82     0.95     0.47     3.28     0.87
HUB     48.09    10.37     6.50     3.87     0.95     0.46     3.87


  blockage3   Cor/Incid
     0.950       0.955

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     342.406     244.695     239.513    1089.537       0.314       0.007

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     5.833       5.447     493.636      46.000      45.613      31.500     -14.113

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     245.578     244.695     346.675    1094.764       0.224       0.460

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       5.825       5.624     498.383     471.992       0.032       0.541

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.121     239.389       0.000     239.389    1095.038       0.219       0.412

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       5.610     498.634       0.000       0.060       0.095       0.424

   STAGE EXIT CONDITIONS, STAGE   3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.812       5.800       1.088     503.412      14.681     179.439       1.391

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91281.305       0.534     126.466  231848.812


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.801   EfDer =  0.969
```

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
24.517	2391.528	5.800	503.412	1.000	1.000	0.980

W Kg/sec = 11.1438637

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
61.217	2427.571	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
56807.043	19237.273	2.879	513.330	178.320	401.059	2.249

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	225.89	-0.08	225.89	0.21	408.00
MEAN	16.97	0.00	-0.02	225.89	-0.08	225.89	0.21	
HUB	14.32	0.00	-0.02	225.89	-0.08	225.89	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.67	46.36	14.31	401.96	461.15	5.63	499.16	0.42
MEAN	57.48	43.80	13.68	354.18	420.15	5.63	499.16	0.38
HUB	52.92	37.84	15.08	298.86	374.69	5.63	499.16	0.34

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	327.35	228.04	234.86	1106.27	0.30
MEAN	16.57	325.67	223.65	236.73	1104.19	0.29
HUB	13.89	343.14	246.40	238.82	1102.08	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	394.03	287.60	165.99	0.26	4306.81	
MEAN	345.90	266.43	122.25	0.24	3708.07	1.74
HUB	289.88	242.74	43.49	0.22	3423.57	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.33	1.09	5.96	517.87	1.03	508.93	0.92	0.89
MEAN	6.26	1.08	5.89	515.86	1.02	507.02	0.92	0.89
HUB	6.22	1.07	5.82	514.90	1.02	505.09	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.16	35.25	31.50	3.75	0.93	0.46	2.90	
MEAN	43.37	27.31	23.50	3.81	0.94	0.45	3.29	0.89
HUB	45.90	10.32	6.50	3.82	0.94	0.44	3.90	

blockage3	Cor/Incid
0.750	0.969

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	375.993	224.908	301.309	1101.359	0.341	-0.287

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
6.266	5.780	504.424	46.000	36.739	32.400	-4.339

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	313.848	224.908	386.114	1105.254	0.284	0.090

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	6.264	5.922	507.998	357.476	0.016	0.407

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	298.567	0.000	298.567	1106.102	0.270	0.430

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	5.944	508.778	0.000	0.060	0.043	0.147

```
    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.856       6.253       1.078     516.210      12.798     193.487       1.500

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79583.609       0.513     110.259  237024.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.801   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    24.517    2391.528       6.253     516.210       1.000       1.000       0.780
W Kg/sec =  11.1438637

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    57.496    2397.289       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 56807.043   19237.273       2.422     405.654     167.483     307.615       1.837

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   274.42    -0.09   274.42     0.25   383.25
 MEAN    15.91     0.00    -0.02   274.42    -0.09   274.42     0.25
 HUB     13.07     0.00    -0.02   274.42    -0.09   274.42     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.34    47.36     6.98   382.34   470.70     5.99   509.93     0.43
 MEAN    50.44    44.80     5.64   332.10   430.89     5.99   509.93     0.39
 HUB     44.84    38.84     6.00   272.77   386.99     5.99   509.93     0.35

      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   306.06   208.12   224.40  1119.22     0.27
 MEAN    15.50   302.12   200.27   226.20  1117.16     0.27
 HUB     12.59   314.52   216.51   228.13  1115.11     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    374.41   279.30   166.29     0.25  3735.43
 MEAN   323.44   257.56   123.17     0.23  3105.14     1.83
 HUB    262.75   232.77    46.24     0.21  2727.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.75     1.08     6.41   528.75     1.02   520.94     0.92     0.91
 MEAN     6.67     1.07     6.34   526.63     1.02   519.02     0.92     0.91
 HUB      6.61     1.06     6.26   525.36     1.02   517.12     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.84    36.54    31.50     5.04     0.93     0.48     2.90
 MEAN    41.52    28.57    23.50     5.07     0.92     0.47     3.34     0.91
 HUB     43.50    11.46     6.50     4.96     0.92     0.47     4.06


  blockage3   Cor/Incid
     0.950       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     305.920     203.938     228.027    1117.260       0.274      -0.010

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.670       6.332     519.112      46.000      41.808      33.000      -8.808

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     239.989     203.938     314.937    1120.484       0.214       0.352
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   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.665       6.455     522.112     440.827       0.036       0.488

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     14.701     225.593       0.000     225.593    1121.083       0.201       0.406

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.471     522.671       0.000       0.060       0.062       0.397

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870       6.656       1.064     526.913      10.704     216.751       1.680

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  66567.961       0.475      92.227  315777.625

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    453915.16    628.8766     77.4201      1.5285      0.8030     17.8014      1.1608


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NPSS: Inlet Mach number .71, Altitude 37357ft, dT 22R, Thrust 10%
Stage 4 stator Blocked @ 25%

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
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         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.810   EfDer =  0.932

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.507    2391.580       4.355     453.909       1.000       1.000       0.980
 W Kg/sec =  11.1397724

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     77.392    2556.575       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  56786.188   19230.211       3.689     831.557     225.432     619.754       2.749

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   165.98    -0.06   165.98     0.16   460.25
  MEAN    17.06     0.00    -0.02   165.98    -0.06   165.98     0.16
  HUB     12.51     0.00    -0.02   165.98    -0.06   165.98     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.92    50.47    18.45   430.56   461.50     4.28   451.61     0.44
  MEAN    65.01    47.20    17.81   356.05   392.89     4.28   451.61     0.38
  HUB     57.56    38.62    18.94   261.09   309.43     4.28   451.61     0.30

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   381.05   308.70   223.39  1055.43     0.36
  MEAN    18.04   381.10   306.75   226.14  1052.22     0.36
  HUB     15.00   406.33   335.04   229.90  1048.37     0.39
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    430.56   254.47   121.86     0.24  6369.61
 MEAN   376.42   236.63    69.67     0.22  5533.59     1.92
 HUB    313.06   230.94    21.98     0.22  5026.25

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     5.00     1.15     4.57   475.30     1.05   463.19     0.92     0.85
 MEAN    4.91     1.13     4.48   472.49     1.04   460.38     0.92     0.85
 HUB     4.86     1.12     4.38   470.79     1.04   457.02     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    54.11    28.61    24.20     4.41     0.93     0.56     2.90
 MEAN   53.60    17.12    12.70     4.42     0.95     0.51     3.51     0.85
 HUB    55.54    -5.46    -9.30     3.84     0.95     0.38     4.78


  blockage3   Cor/Incid
     0.950       0.932

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    18.071     383.856     306.158     231.545    1052.440       0.365       0.002

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     4.916       4.484     460.570      24.000      52.900      35.400     -17.500

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    18.071     245.008     306.158     392.124    1060.726       0.231       0.552

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       4.900       4.721     467.851     528.796       0.046       0.669

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    18.083     229.307       0.000     229.307    1061.430       0.216       0.514

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       4.713     468.472       0.000       0.060       0.117       0.533

   STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.777       4.869       1.118     472.857      18.948     157.316       1.220

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 117790.438       0.635     163.133  257794.734


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.810   EfDer =  0.935

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     24.507    2391.580       4.869     472.857       1.000       1.000       0.980
W Kg/sec =  11.1397724

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     70.652    2504.830       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  56786.188   19230.211       2.869     590.487     205.801     474.134       2.304

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   219.69    -0.08   219.69     0.21   449.18
 MEAN    18.08     0.00    -0.02   219.69    -0.08   219.69     0.21
 HUB     15.21     0.00    -0.02   219.69    -0.08   219.69     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.88    46.36    16.52   428.89   481.95     4.73   468.83     0.45
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MEAN    59.79    42.30    17.49   377.30   436.67     4.73   468.83     0.41
HUB     55.32    37.84    17.48   317.44   386.11     4.73   468.83     0.36

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   349.97   263.83   229.93  1075.22     0.33
MEAN    18.01   345.65   256.09   232.16  1072.59     0.32
HUB     15.22   361.50   274.95   234.71  1069.93     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    426.18   281.46   162.34     0.26  5389.04
MEAN   375.88   261.24   119.79     0.24  4613.50     1.85
HUB    317.71   238.57    42.76     0.22  4186.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      5.45     1.12     5.06   490.95     1.04   480.74     0.92     0.86
MEAN     5.36     1.10     4.99   488.35     1.03   478.38     0.92     0.86
HUB      5.31     1.09     4.91   486.91     1.03   476.02     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     48.93    35.22    31.50     3.72     0.93     0.51     2.90
MEAN    47.81    27.29    23.50     3.79     0.95     0.49     3.30     0.86
HUB     49.52    10.33     6.50     3.83     0.95     0.47     3.92


  blockage3   Cor/Incid
     0.950       0.935

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     348.906     256.807     236.190    1072.814       0.325       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.371       4.992     478.585      46.000      47.395      30.600     -16.795

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     238.999     256.807     350.814    1078.836       0.222       0.496

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.360       5.180     483.973     511.151       0.039       0.567

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.823     236.898       0.000     236.898    1078.929       0.220       0.423

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.155     484.057       0.000       0.060       0.112       0.433

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.785       5.332       1.095     488.736      15.879     174.109       1.350

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98725.023       0.544     136.728  233440.578


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.810   EfDer =  0.955

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.507    2391.580       5.332     488.736       1.000       1.000       0.980
W Kg/sec =  11.1397724

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     65.590    2463.802       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
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  56786.188   19230.211       2.855     545.479     191.057     429.765       2.249

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   224.50    -0.08   224.50     0.21   431.51
 MEAN    17.74     0.00    -0.02   224.50    -0.08   224.50     0.21
 HUB     15.05     0.00    -0.02   224.50    -0.08   224.50     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.81    46.36    15.45   418.87   475.31     5.17   484.53     0.44
 MEAN    58.77    43.40    15.37   370.21   433.03     5.17   484.53     0.40
 HUB     54.45    38.84    15.61   314.10   386.15     5.17   484.53     0.36

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   341.16   247.76   234.52  1091.61     0.31
 MEAN    17.51   339.23   243.14   236.55  1089.32     0.31
 HUB     14.85   357.66   266.20   238.86  1087.01     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.44   287.14   165.68     0.26  4909.77
 MEAN   365.37   266.27   122.23     0.24  4257.99     1.79
 HUB    309.93   242.83    43.72     0.22  3954.28

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      5.90     1.11     5.51   505.22     1.03   495.51     0.92     0.87
 MEAN     5.82     1.09     5.44   503.03     1.03   493.44     0.92     0.87
 HUB      5.79     1.09     5.37   502.01     1.03   491.35     0.92     0.87

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.57    35.24    31.50     3.74     0.93     0.49     2.90
 MEAN    45.79    27.32    23.50     3.82     0.95     0.47     3.28     0.87
 HUB     48.10    10.37     6.50     3.87     0.95     0.46     3.87


    blockage3   Cor/Incid
       0.950       0.955

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
      17.392     342.377     244.740     239.425    1089.548       0.314       0.007

      Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
       5.833       5.447     493.646      46.000      45.629      31.500     -14.129

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
      17.392     245.486     244.740     346.642    1094.777       0.224       0.460

    BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
       0.950       5.825       5.624     498.395     471.992       0.032       0.541

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
      17.121     239.301       0.000     239.301    1095.051       0.219       0.413

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       5.610     498.645       0.000       0.060       0.095       0.424

     STAGE EXIT CONDITIONS, STAGE   3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.812       5.800       1.088     503.420      14.684     179.383       1.391

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   91299.508       0.534     126.444  231758.109
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.810   EfDer =  0.969

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    24.507    2391.580       5.800     503.420       1.000       1.000       0.980
W Kg/sec =  11.1397724

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    61.195    2427.604       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 56786.188   19230.211       2.880     513.330     178.256     401.059       2.250

    ROTOR LEADING EDGE CONDITIONS, STAGE   4

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   225.81    -0.08   225.81     0.21   408.01
MEAN    16.97     0.00    -0.02   225.81    -0.08   225.81     0.21
HUB     14.32     0.00    -0.02   225.81    -0.08   225.81     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.68    46.36    14.32   401.97   461.12     5.63   499.17     0.42
MEAN    57.49    43.80    13.69   354.19   420.11     5.63   499.17     0.38
HUB     52.93    37.84    15.09   298.87   374.64     5.63   499.17     0.34

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   327.34   228.10   234.78  1106.29     0.30
MEAN    16.57   325.63   223.69   236.64  1104.20     0.29
HUB     13.89   343.09   246.42   238.73  1102.10     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    394.03   287.50   165.94     0.26  4308.01
MEAN   345.90   266.33   122.21     0.24  3708.80     1.74
HUB    289.89   242.66    43.48     0.22  3423.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      6.33     1.09     5.96   517.88     1.03   508.95     0.92     0.89
MEAN     6.26     1.08     5.89   515.87     1.02   507.03     0.92     0.89
HUB      6.22     1.07     5.82   514.91     1.02   505.10     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.17    35.25    31.50     3.75     0.93     0.46     2.90
MEAN    43.39    27.31    23.50     3.81     0.94     0.45     3.29     0.89
HUB     45.91    10.32     6.50     3.82     0.94     0.44     3.90


  blockage3   Cor/Incid
     0.700       0.969

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
    16.481     395.770     224.952     325.624    1099.981       0.360       -0.420

    Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
     6.266       5.729     503.162      46.000      34.638      32.400       -2.238

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth      Aoth         Machth      cp 2-Th
    16.481     339.392     224.952     407.174    1103.751       0.307       -0.057

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.700       6.264       5.866     506.618     332.702       0.015       0.376

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4         Ao4          Mach4        cp 3-4
    16.096     322.522       0.000     322.522    1104.765       0.292       0.436
```

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.700	5.895	507.548	0.000	0.060	0.038	0.019

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.860	6.255	1.078	516.221	12.801	193.425	1.499

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
79600.875	0.513	110.243	236930.688

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =17.810 EfDer = 0.990

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
24.507	2391.580	6.255	516.221	1.000	1.000	0.730

W Kg/sec = 11.1397724

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
57.458	2397.316	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
56786.188	19230.211	2.268	379.651	167.374	286.949	1.714

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	294.39	-0.10	294.39	0.27	383.25
MEAN	15.91	0.00	-0.02	294.39	-0.10	294.39	0.27	
HUB	13.07	0.00	-0.02	294.39	-0.10	294.39	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.41	47.36	5.05	382.35	482.63	5.95	509.00	0.44
MEAN	48.45	44.80	3.65	332.11	443.88	5.95	509.00	0.40
HUB	42.83	38.84	3.99	272.78	401.41	5.95	509.00	0.36

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	304.30	205.47	224.45	1119.16	0.27
MEAN	15.50	300.63	198.00	226.21	1117.13	0.27
HUB	12.59	313.22	214.67	228.09	1115.11	0.28

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	374.42	280.93	168.95	0.25	3687.92	
MEAN	323.44	258.66	125.44	0.23	3070.16	1.87
HUB	262.76	233.10	48.09	0.21	2704.05	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.74	1.08	6.40	528.60	1.02	520.88	0.92	0.91
MEAN	6.66	1.06	6.33	526.53	1.02	518.99	0.92	0.91
HUB	6.61	1.06	6.26	525.30	1.02	517.12	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.47	36.97	31.50	5.47	0.93	0.49	2.90	
MEAN	41.20	29.01	23.50	5.51	0.92	0.48	3.34	0.91
HUB	43.26	11.91	6.50	5.41	0.92	0.48	4.06	

blockage3	Cor/Incid
0.950	0.990

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	304.391	201.632	228.032	1117.229	0.272	-0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
6.664	6.329	519.083	46.000	41.484	33.000	-8.484

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     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth       Aoth          Machth      cp 2-Th
      15.219     240.071     201.632     313.511    1120.366       0.214       0.346

    BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
       0.950       6.659       6.449     522.002     440.827       0.035       0.482

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
      14.701     225.660       0.000     225.660    1120.966       0.201       0.402

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       6.465     522.562       0.000       0.060       0.060       0.393

     STAGE EXIT CONDITIONS, STAGE   5
       Eff4        Pt4         PR4        Texit        Del T        Ns        Ns nondim
       0.863       6.650       1.063     526.807      10.586     219.000       1.698

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   65834.992       0.470      91.178  338844.031

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     453250.84    627.7257      77.3917      1.5272      0.8024     17.8102      1.1606


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NPSS: Inlet Mach number .71, Altitude 37357ft, dT 22R, Thrust 10%
Stage 4 stator Blocked @ 27%

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
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          Fan Hub + 4 Stage LPC 100%  12-20-2010

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.817   EfDer =  0.932

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
      24.500     2391.603        4.355     453.909        1.000        1.000        0.980
 W Kg/sec =  11.1364546

    W cor       RPM cor         GAMMA         Cp          R            Blades       THK
      77.369     2556.599        1.401        0.248      53.349       32.000        0.050

    CFM         SCFM            A1/A*       Area1        A*         AthrRotor   ChokeMargin
   56769.273   19224.484         3.690     831.557     225.365      619.754        2.750

      ROTOR LEADING EDGE CONDITIONS, STAGE   1

         R1       Stator    Alfa      C1       CU1        Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00     -0.02   165.93     -0.06   165.93      0.16   460.25
  MEAN    17.06      0.00     -0.02   165.93     -0.06   165.93      0.16
  HUB     12.51      0.00     -0.02   165.93     -0.06   165.93      0.16

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
  TIP     68.93     50.47     18.46   430.56    461.48      4.28   451.61      0.44
  MEAN    65.02     47.20     17.82   356.06    392.87      4.28   451.61      0.38
  HUB     57.57     38.62     18.95   261.09    309.40      4.28   451.61      0.30

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
     B2 axial    THK         AeroBl      Blades2
       0.700       0.050       0.950       32.000

           R2      C2       Cu2       Cm2      Ao2          Mach2
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 TIP     20.63   381.05   308.74   223.33  1055.43     0.36
 MEAN    18.04   381.08   306.78   226.07  1052.22     0.36
 HUB     15.00   406.28   335.03   229.83  1048.38     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    430.56   254.39   121.82     0.24  6370.50
 MEAN   376.42   236.56    69.65     0.22  5533.99     1.92
 HUB    313.06   230.87    21.97     0.22  5026.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     5.00     1.15     4.57   475.30     1.05   463.19     0.92     0.85
 MEAN    4.91     1.13     4.48   472.49     1.04   460.38     0.92     0.85
 HUB     4.86     1.12     4.38   470.79     1.04   457.02     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    54.12    28.61    24.20     4.41     0.93     0.56     2.90
 MEAN   53.61    17.12    12.70     4.42     0.95     0.51     3.51     0.85
 HUB    55.55    -5.46    -9.30     3.84     0.95     0.38     4.78


  blockage3   Cor/Incid
     0.950       0.932

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
    18.071     383.832     306.180     231.475    1052.443       0.365        0.002

    Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
     4.916       4.484     460.573      24.000      52.910      35.400     -17.510

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
    18.071     244.932     306.180     392.094    1060.731       0.231        0.553

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       4.900       4.721     467.856     528.796       0.046        0.669

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4         Ao4           Mach4        cp 3-4
    18.083     229.237       0.000     229.237    1061.435       0.216        0.514

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950       4.713     468.476       0.000       0.060       0.117        0.533

   STAGE EXIT CONDITIONS, STAGE   1
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.777       4.868        1.118     472.858      18.949     157.284       1.219

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 117799.922       0.635     163.097  257715.953


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.817   EfDer =  0.935

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     24.500     2391.603        4.868     472.858        1.000        1.000        0.980
W Kg/sec =  11.1364546

   W cor       RPM cor         GAMMA         Cp          R            Blades        THK
     70.632     2504.849        1.401        0.248      53.349       56.000        0.050

   CFM        SCFM            A1/A*       Area1        A*        AthrRotor   ChokeMargin
  56769.273   19224.484        2.870     590.487     205.741     474.134        2.305

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1       Stator    Alfa     C1       CU1        Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   219.62    -0.08   219.62     0.21   449.19
 MEAN    18.08      0.00    -0.02   219.62    -0.08   219.62     0.21
 HUB     15.21      0.00    -0.02   219.62    -0.08   219.62     0.21
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     62.89    46.36    16.53   428.89   481.92     4.73   468.84     0.45
MEAN    59.80    42.30    17.50   377.31   436.64     4.73   468.84     0.41
HUB     55.33    37.84    17.49   317.44   386.07     4.73   468.84     0.36

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   349.97   263.90   229.86  1075.23     0.33
MEAN    18.01   345.62   256.11   232.09  1072.59     0.32
HUB     15.22   361.48   274.97   234.64  1069.94     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    426.18   281.37   162.28     0.26  5390.34
MEAN   375.88   261.17   119.77     0.24  4613.89     1.85
HUB    317.71   238.50    42.74     0.22  4187.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      5.45     1.12     5.06   490.96     1.04   480.74     0.92     0.86
MEAN     5.36     1.10     4.99   488.35     1.03   478.39     0.92     0.86
HUB      5.31     1.09     4.91   486.92     1.03   476.02     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     48.94    35.22    31.50     3.72     0.93     0.51     2.90
MEAN    47.82    27.30    23.50     3.80     0.95     0.49     3.30     0.86
HUB     49.53    10.32     6.50     3.82     0.95     0.47     3.92


  blockage3   Cor/Incid
     0.950       0.935

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.960     348.874     256.828     236.119    1072.821       0.325       0.005

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     5.371       4.992     478.591      46.000      47.406      30.600     -16.806

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.960     238.926     256.828     350.780    1078.844       0.221       0.496

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       5.360       5.180     483.980     511.151       0.039       0.568

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
    17.823     236.826       0.000     236.826    1078.936       0.219       0.423

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       5.155     484.064       0.000       0.060       0.113       0.433

   STAGE EXIT CONDITIONS, STAGE   2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.785       5.332       1.095     488.740      15.882     174.064       1.349

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98740.008       0.544     136.708  233367.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.817   EfDer =  0.955

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.500    2391.603       5.332     488.740       1.000       1.000       0.980
W Kg/sec =  11.1364546

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
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    65.571    2463.815       1.401       0.248      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
56769.273   19224.484       2.856     545.479     191.001     429.765       2.250

    ROTOR LEADING EDGE CONDITIONS, STAGE   3

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   224.44    -0.08   224.44     0.21   431.51
MEAN    17.74     0.00    -0.02   224.44    -0.08   224.44     0.21
HUB     15.05     0.00    -0.02   224.44    -0.08   224.44     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.82    46.36    15.46   418.87   475.28     5.17   484.54     0.44
MEAN    58.78    43.40    15.38   370.21   433.00     5.17   484.54     0.40
HUB     54.46    38.84    15.62   314.10   386.11     5.17   484.54     0.36

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   341.14   247.81   234.45  1091.62     0.31
MEAN    17.51   339.21   243.19   236.48  1089.32     0.31
HUB     14.85   357.63   266.22   238.79  1087.01     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.45   287.06   165.64     0.26  4910.57
MEAN   365.37   266.18   122.19     0.24  4258.73     1.79
HUB    309.93   242.76    43.71     0.22  3954.56

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      5.90     1.11     5.51   505.23     1.03   495.52     0.92     0.87
MEAN     5.82     1.09     5.44   503.04     1.03   493.44     0.92     0.87
HUB      5.79     1.09     5.37   502.02     1.03   491.35     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.59    35.24    31.50     3.74     0.93     0.49     2.90
MEAN    45.80    27.32    23.50     3.82     0.95     0.47     3.28     0.87
HUB     48.11    10.37     6.50     3.87     0.95     0.46     3.87


  blockage3   Cor/Incid
     0.950       0.955

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     342.358     244.782     239.355    1089.556       0.314       0.007

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.833       5.447     493.654      46.000      45.642      31.500     -14.142

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     245.412     244.782     346.620    1094.787       0.224       0.460

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       5.825       5.624     498.405     471.992       0.032       0.541

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.121     239.230       0.000     239.230    1095.061       0.218       0.413

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.610     498.654       0.000       0.060       0.095       0.424

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.811       5.800       1.088     503.426      14.686     179.338       1.390

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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  91312.992       0.534     126.425  231684.531


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.817   EfDer =  0.969

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.500    2391.603       5.800     503.426       1.000       1.000       0.980
W Kg/sec =  11.1364546

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     61.177    2427.612       1.401       0.248      53.349      56.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 56769.273   19224.484       2.881     513.330     178.205     401.059       2.251

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   225.74    -0.08   225.74     0.21   408.01
 MEAN    16.97     0.00    -0.02   225.74    -0.08   225.74     0.21
 HUB     14.32     0.00    -0.02   225.74    -0.08   225.74     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.69    46.36    14.33   401.97   461.09     5.63   499.18     0.42
 MEAN    57.49    43.80    13.69   354.19   420.08     5.63   499.18     0.38
 HUB     52.94    37.84    15.10   298.87   374.60     5.63   499.18     0.34

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   327.33   228.16   234.71  1106.30     0.30
 MEAN    16.57   325.61   223.74   236.57  1104.21     0.29
 HUB     13.89   343.05   246.43   238.66  1102.11     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    394.04   287.40   165.88     0.26  4309.22
 MEAN   345.91   266.25   122.17     0.24  3709.48     1.74
 HUB    289.89   242.58    43.46     0.22  3424.04

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.33     1.09     5.96   517.89     1.03   508.96     0.92     0.89
 MEAN     6.26     1.08     5.89   515.88     1.02   507.04     0.92     0.89
 HUB      6.22     1.07     5.82   514.92     1.02   505.11     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.19    35.25    31.50     3.75     0.93     0.46     2.90
 MEAN    43.40    27.31    23.50     3.81     0.94     0.45     3.29     0.89
 HUB     45.92    10.32     6.50     3.82     0.94     0.44     3.90


  blockage3   Cor/Incid
     0.680       0.969

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     404.792     224.994     336.503    1099.332       0.368      -0.483

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.266       5.705     502.569      46.000      33.768      32.400      -1.368

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     16.481     350.846     224.994     416.791    1103.043       0.318      -0.127

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.680       6.264       5.840     505.967     322.792       0.015       0.364

    VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	333.251	0.000	333.251	1104.136	0.302	0.437

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	5.872	506.971	0.000	0.060	0.037	-0.042

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.860	6.255	1.079	516.229	12.803	193.370	1.499

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
79616.258	0.513	110.231	236854.828

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =17.817 EfDer = 0.984

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
24.500	2391.603	6.255	516.229	1.000	1.000	0.710

W Kg/sec = 11.1364546

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
57.438	2397.319	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
56769.273	19224.484	2.207	369.249	167.313	278.683	1.666

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	303.23	-0.10	303.23	0.27	383.25
MEAN	15.91	0.00	-0.02	303.23	-0.10	303.23	0.27	
HUB	13.07	0.00	-0.02	303.23	-0.10	303.23	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.59	47.36	4.23	382.35	488.08	5.94	508.56	0.44
MEAN	47.61	44.80	2.81	332.12	449.80	5.94	508.56	0.41
HUB	41.98	38.84	3.14	272.78	407.94	5.94	508.56	0.37

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	303.50	204.23	224.51	1119.13	0.27
MEAN	15.50	299.95	196.95	226.23	1117.12	0.27
HUB	12.59	312.66	213.85	228.09	1115.12	0.28

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	374.42	281.72	170.19	0.25	3665.83	
MEAN	323.45	259.20	126.49	0.23	3053.97	1.89
HUB	262.76	233.27	48.91	0.21	2693.77	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.74	1.08	6.40	528.53	1.02	520.85	0.92	0.90
MEAN	6.65	1.06	6.33	526.48	1.02	518.98	0.92	0.90
HUB	6.61	1.06	6.26	525.27	1.02	517.12	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.29	37.16	31.50	5.66	0.93	0.49	2.90	
MEAN	41.04	29.21	23.50	5.71	0.91	0.49	3.34	0.90
HUB	43.16	12.10	6.50	5.60	0.91	0.49	4.06	

blockage3	Cor/Incid
0.950	0.984

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	303.704	200.565	228.057	1117.217	0.272	-0.010

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     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.660       6.326     519.072      46.000      41.330      33.000      -8.330

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     240.132     200.565     312.873    1120.314       0.214       0.344

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.655       6.445     521.954     440.827       0.035       0.480

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     14.701     225.713       0.000     225.713    1120.915       0.201       0.400

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.461     522.514       0.000       0.060       0.059       0.392

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858       6.646       1.062     526.761      10.532     220.046       1.706

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  65497.543       0.467      90.683  349033.125

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    452966.72    627.1454     77.3687      1.5263      0.8017     17.8171      1.1605


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NPSS: Inlet Mach number .71, Altitude 37357ft, dT 22R, Thrust 10%
Stage 4 stator Blocked @ 30%

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********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS *******************
***************   Stator Vane, Gasplus Properties  *****************
********************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.830   EfDer =  0.931

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.487    2391.623       4.355     453.909       1.000       1.000       0.980
 W Kg/sec =  11.1303177

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     77.326    2556.621       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  56737.992   19213.891       3.692     831.557     225.241     619.754       2.752

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   165.84    -0.06   165.84     0.16   460.26
  MEAN    17.06     0.00    -0.02   165.84    -0.06   165.84     0.16
  HUB     12.51     0.00    -0.02   165.84    -0.06   165.84     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.94    50.47    18.47   430.57   461.45     4.28   451.62     0.44
  MEAN    65.03    47.20    17.83   356.06   392.84     4.28   451.62     0.38
  HUB     57.58    38.62    18.96   261.09   309.36     4.28   451.62     0.30

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
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     0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   381.02   308.81   223.20  1055.44     0.36
 MEAN    18.04   381.02   306.80   225.95  1052.23     0.36
 HUB     15.00   406.20   335.02   229.70  1048.38     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    430.57   254.25   121.76     0.24  6371.83
 MEAN   376.43   236.43    69.63     0.22  5534.37     1.92
 HUB    313.06   230.74    21.96     0.22  5026.07

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      5.00     1.15     4.57   475.30     1.05   463.20     0.92     0.85
 MEAN     4.91     1.13     4.48   472.49     1.04   460.39     0.92     0.85
 HUB      4.86     1.12     4.38   470.79     1.04   457.03     0.92     0.85

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     54.14    28.61    24.20     4.41     0.93     0.56     2.90
 MEAN    53.63    17.13    12.70     4.43     0.95     0.51     3.51     0.85
 HUB     55.56    -5.46    -9.30     3.84     0.95     0.38     4.78


   blockage3   Cor/Incid
      0.950       0.931

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     383.770     306.201     231.344    1052.450       0.365       0.002

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      4.916       4.484     460.579      24.000      52.928      35.400     -17.528

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     244.793     306.201     392.023    1060.740       0.231       0.553

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       4.900       4.722     467.863     528.796       0.046       0.669

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     18.083     229.109       0.000     229.109    1061.442       0.216       0.514

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       4.713     468.483       0.000       0.060       0.117       0.533

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.777       4.868       1.118     472.860      18.951     157.229       1.219

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 117812.070       0.635     163.024  257570.281


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.830   EfDer =  0.935

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.487    2391.623       4.868     472.860       1.000       1.000       0.980
W Kg/sec =  11.1303177

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     70.594    2504.865       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  56737.992   19213.891       2.872     590.487     205.631     474.134       2.306

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
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TIP     20.55     0.00    -0.02   219.50    -0.08   219.50     0.21   449.19
MEAN    18.08     0.00    -0.02   219.50    -0.08   219.50     0.21
HUB     15.21     0.00    -0.02   219.50    -0.08   219.50     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     62.90    46.36    16.54   428.90   481.87     4.73   468.84     0.45
MEAN    59.82    42.30    17.52   377.31   436.58     4.73   468.84     0.41
HUB     55.34    37.84    17.50   317.45   386.00     4.73   468.84     0.36

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   349.95   263.98   229.74  1075.24     0.33
MEAN    18.01   345.59   256.18   231.96  1072.60     0.32
HUB     15.22   361.40   274.99   234.51  1069.94     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    426.18   281.22   162.20     0.26  5392.06
MEAN   375.88   261.03   119.71     0.24  4615.06     1.85
HUB    317.72   238.37    42.73     0.22  4187.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      5.45     1.12     5.06   490.96     1.04   480.75     0.92     0.86
MEAN     5.36     1.10     4.99   488.35     1.03   478.40     0.92     0.86
HUB      5.31     1.09     4.91   486.92     1.03   476.03     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     48.97    35.22    31.50     3.72     0.93     0.51     2.90
MEAN    47.84    27.30    23.50     3.80     0.95     0.49     3.30     0.86
HUB     49.54    10.33     6.50     3.83     0.95     0.47     3.92


  blockage3   Cor/Incid
     0.950       0.935

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.960     348.835     256.894     235.990    1072.829       0.325       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     5.371       4.992     478.599      46.000      47.429      30.600     -16.829

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.960     238.793     256.894     350.737    1078.856       0.221       0.496

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       5.360       5.180     483.991     511.151       0.039       0.568

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.823     236.696       0.000     236.696    1078.948       0.219       0.423

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.156     484.074       0.000       0.060       0.113       0.433

   STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.784       5.331       1.095     488.746      15.886     173.988       1.349

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98762.586       0.544     136.664  233232.531


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.830   EfDer =  0.955

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.487    2391.623       5.331     488.746       1.000       1.000       0.980
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W Kg/sec =  11.1303177

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     65.536    2463.822       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 56737.992   19213.891       2.857     545.479     190.900     429.765       2.251

    ROTOR LEADING EDGE CONDITIONS, STAGE   3

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   224.31    -0.08   224.31     0.21   431.51
MEAN    17.74     0.00    -0.02   224.31    -0.08   224.31     0.21
HUB     15.05     0.00    -0.02   224.31    -0.08   224.31     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.84    46.36    15.48   418.88   475.23     5.17   484.55     0.44
MEAN    58.79    43.40    15.39   370.22   432.94     5.17   484.55     0.40
HUB     54.47    38.84    15.63   314.11   386.04     5.17   484.55     0.36

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

        R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   341.12   247.90   234.33  1091.63     0.31
MEAN    17.51   339.18   243.27   236.36  1089.34     0.31
HUB     14.85   357.57   266.26   238.66  1087.03     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.45   286.90   165.55     0.26  4912.54
MEAN   365.38   266.03   122.11     0.24  4260.16     1.79
HUB    309.93   242.63    43.68     0.22  3955.07

       Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      5.90     1.11     5.51   505.24     1.03   495.54     0.92     0.87
MEAN     5.82     1.09     5.44   503.05     1.03   493.46     0.92     0.87
HUB      5.79     1.09     5.37   502.02     1.03   491.36     0.92     0.87

       Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.61    35.24    31.50     3.74     0.93     0.49     2.90
MEAN    45.83    27.32    23.50     3.82     0.95     0.47     3.28     0.87
HUB     48.13    10.37     6.50     3.87     0.95     0.46     3.87


  blockage3   Cor/Incid
     0.950       0.955

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     342.327     244.865     239.225    1089.569       0.314       0.007

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     5.833       5.447     493.665      46.000      45.667      31.500     -14.167

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     245.275     244.865     346.581    1094.804       0.224       0.460

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       5.825       5.624     498.420     471.992       0.032       0.542

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    17.121     239.099       0.000     239.099    1095.078       0.218       0.413

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       5.610     498.670       0.000       0.060       0.095       0.424

   STAGE EXIT CONDITIONS, STAGE   3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
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      0.811       5.800       1.088     503.436      14.690     179.249       1.390

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91340.883       0.534     126.394  231549.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.830   EfDer =  0.969

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.487    2391.623       5.800     503.436       1.000       1.000       0.980
W Kg/sec =  11.1303177

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     61.145    2427.608       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  56737.992   19213.891       2.882     513.330     178.110     401.059       2.252

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   225.62    -0.08   225.62     0.21   408.01
 MEAN    16.97     0.00    -0.02   225.62    -0.08   225.62     0.21
 HUB     14.32     0.00    -0.02   225.62    -0.08   225.62     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.70    46.36    14.34   401.97   461.03     5.63   499.19     0.42
 MEAN    57.51    43.80    13.71   354.19   420.01     5.63   499.19     0.38
 HUB     52.96    37.84    15.12   298.87   374.53     5.63   499.19     0.34

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   327.29   228.24   234.58  1106.32     0.30
 MEAN    16.57   325.56   223.79   236.44  1104.23     0.29
 HUB     13.89   342.99   246.46   238.53  1102.12     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    394.04   287.26   165.80     0.26  4310.64
 MEAN   345.91   266.12   122.12     0.24  3710.39     1.74
 HUB    289.90   242.45    43.43     0.22  3424.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.33      1.09     5.96   517.91     1.03   508.98     0.92     0.89
 MEAN     6.26      1.08     5.89   515.89     1.02   507.05     0.92     0.89
 HUB      6.22      1.07     5.82   514.93     1.02   505.12     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.22    35.25    31.50     3.75     0.93     0.46     2.90
 MEAN    43.43    27.32    23.50     3.82     0.94     0.45     3.29     0.89
 HUB     45.94    10.32     6.50     3.82     0.94     0.44     3.90


  blockage3   Cor/Incid
     0.650       0.969

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     419.755     225.049     354.326    1098.221       0.382      -0.590

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.266       5.665     501.553      46.000      32.421      32.400      -0.021

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     16.481     369.650     225.049     432.768    1101.825       0.335      -0.247

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
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      0.650       6.264       5.794     504.851     307.928       0.015       0.345

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     16.096     350.848       0.000     350.848    1103.057       0.318       0.438

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650       5.832     505.980       0.000       0.060       0.037      -0.148

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.861       6.256       1.079     516.243      12.806     193.283       1.498

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79635.805       0.513     110.197  236715.234


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.830   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.487    2391.623       6.256     516.243       1.000       1.000       0.680
W Kg/sec =  11.1303177

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     57.404    2397.308       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  56737.992   19213.891       2.115     353.647     167.217     266.284       1.592

    ROTOR LEADING EDGE CONDITIONS, STAGE   5

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   317.59    -0.11   317.59     0.29   383.25
 MEAN    15.91     0.00    -0.02   317.59    -0.11   317.59     0.29
 HUB     13.07     0.00    -0.02   317.59    -0.11   317.59     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.29    47.36     2.93   382.35   497.13     5.91   507.83     0.45
 MEAN    46.29    44.80     1.49   332.12   459.60     5.91   507.83     0.42
 HUB     40.67    38.84     1.83   272.78   418.72     5.91   507.83     0.38

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   302.22   202.17   224.65  1119.08     0.27
 MEAN    15.50   298.87   195.19   226.32  1117.09     0.27
 HUB     12.59   311.72   212.43   228.13  1115.12     0.28

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    374.42   283.09   172.25     0.25  3628.90
 MEAN   323.45   260.14   128.26     0.23  3026.74     1.92
 HUB    262.76   233.62    50.33     0.21  2675.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.73     1.08     6.39   528.42     1.02   520.81     0.92     0.89
 MEAN     6.65     1.06     6.32   526.40     1.02   518.96     0.92     0.89
 HUB      6.60     1.06     6.25   525.22     1.02   517.12     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.98    37.48    31.50     5.98     0.93     0.50     2.90
 MEAN    40.78    29.54    23.50     6.04     0.91     0.50     3.34     0.89
 HUB     42.96    12.44     6.50     5.94     0.91     0.50     4.06


  blockage3   Cor/Incid
     0.950       0.970

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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      R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
      15.219     302.591     198.770     228.148    1117.193       0.271      -0.010

      Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
       6.650       6.320     519.050      46.000      41.064      33.000      -8.064

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
      15.219     240.288     198.770     311.846    1120.223       0.214       0.340

    BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
       0.950       6.646       6.436     521.869     440.827       0.034       0.475

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
      14.701     225.851       0.000     225.851    1120.825       0.202       0.396

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       6.452     522.430       0.000       0.060       0.058       0.388

     STAGE EXIT CONDITIONS, STAGE   5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.846       6.638       1.061     526.683      10.440     221.836       1.720

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   64927.789       0.463      89.845  365554.156

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     452479.12    626.1251     77.3260      1.5243      0.8000     17.8297      1.1603


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NPSS: Inlet Mach number .71, Altitude 37357ft, dT 22R, Thrust 10%
Stage 4 stator Blocked @ 35%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
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         Fan Hub + 4 Stage LPC 100%  12-20-2010

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.861   EfDer =  0.931

    W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
      24.452    2391.643       4.355     453.909       1.000       1.000       0.980
 W Kg/sec =  11.1146812

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
      77.217    2556.642       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
   56658.281   19186.896       3.697     831.557     224.924     619.754       2.755

      ROTOR LEADING EDGE CONDITIONS, STAGE   1

         R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   165.60    -0.06   165.60     0.16   460.26
  MEAN    17.06     0.00    -0.02   165.60    -0.06   165.60     0.16
  HUB     12.51     0.00    -0.02   165.60    -0.06   165.60     0.16

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.97    50.47    18.50   430.57   461.37     4.28   451.62     0.44
  MEAN    65.06    47.20    17.86   356.06   392.74     4.28   451.62     0.38
  HUB     57.62    38.62    19.00   261.10   309.23     4.28   451.62     0.30
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      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   380.96   308.96   222.88  1055.45     0.36
MEAN    18.04   380.90   306.89   225.63  1052.24     0.36
HUB     15.00   405.98   334.98   229.37  1048.40     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    430.57   253.90   121.61     0.24  6375.03
MEAN   376.43   236.10    69.54     0.22  5536.02     1.92
HUB    313.07   230.41    21.92     0.22  5025.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      5.00     1.15     4.57   475.31     1.05   463.21     0.92     0.85
MEAN     4.91     1.13     4.48   472.50     1.04   460.40     0.92     0.85
HUB      4.86     1.12     4.38   470.78     1.04   457.04     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     54.19    28.62    24.20     4.42     0.93     0.57     2.90
MEAN    53.68    17.13    12.70     4.43     0.95     0.51     3.51     0.85
HUB     55.60    -5.46    -9.30     3.84     0.95     0.38     4.78


  blockage3   Cor/Incid
     0.950       0.931

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     18.071      383.644     306.292     231.015     1052.465       0.365        0.002

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      4.916       4.484     460.592      24.000      52.975      35.400     -17.575

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     18.071      244.437     306.292     391.873     1060.762       0.230        0.554

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       4.900       4.722     467.883     528.796        0.046        0.670

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4        cp 3-4
     18.083     228.782       0.000     228.782     1061.462       0.216        0.514

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       4.713     468.500       0.000       0.060        0.117        0.533

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4        Pt4          PR4        Texit         Del T        Ns         Ns nondim
      0.777       4.868        1.118      472.865       18.956     157.087        1.218

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 117842.234       0.636     162.837  257199.047


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.861   EfDer =  0.934

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     24.452     2391.643        4.868      472.865        1.000        1.000        0.980
W Kg/sec =  11.1146812

   W cor       RPM cor         GAMMA         Cp          R            Blades        THK
     70.498     2504.874        1.401        0.248       53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*         AthrRotor   ChokeMargin
  56658.281   19186.896        2.876      590.487      205.350      474.134        2.309
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ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	219.19	-0.08	219.19	0.21	449.19
MEAN	18.08	0.00	-0.02	219.19	-0.08	219.19	0.21	
HUB	15.21	0.00	-0.02	219.19	-0.08	219.19	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.93	46.36	16.57	428.90	481.73	4.73	468.86	0.45
MEAN	59.85	42.30	17.55	377.31	436.42	4.73	468.86	0.41
HUB	55.38	37.84	17.54	317.45	385.83	4.73	468.86	0.36

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	349.90	264.20	229.42	1075.26	0.33
MEAN	18.01	345.50	256.35	231.64	1072.63	0.32
HUB	15.22	361.23	275.04	234.18	1069.96	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	426.19	280.84	161.99	0.26	5396.46	
MEAN	375.89	260.66	119.53	0.24	4618.29	1.85
HUB	317.72	238.04	42.68	0.22	4188.15	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	5.45	1.12	5.06	490.98	1.04	480.77	0.92	0.86
MEAN	5.36	1.10	4.99	488.37	1.03	478.42	0.92	0.86
HUB	5.31	1.09	4.91	486.93	1.03	476.05	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	49.03	35.23	31.50	3.73	0.93	0.51	2.90	
MEAN	47.90	27.30	23.50	3.80	0.95	0.49	3.30	0.86
HUB	49.59	10.33	6.50	3.83	0.95	0.47	3.92	

blockage3	Cor/Incid
0.950	0.934

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	348.746	257.074	235.663	1072.851	0.325	0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
5.371	4.992	478.619	46.000	47.488	30.600	-16.888

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	238.453	257.074	350.638	1078.887	0.221	0.497

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	5.360	5.180	484.019	511.151	0.039	0.569

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	236.363	0.000	236.363	1078.979	0.219	0.424

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.156	484.102	0.000	0.060	0.113	0.434

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.784	5.331	1.095	488.760	15.895	173.786	1.347

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
98822.352	0.544	136.555	232888.906

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =17.861 EfDer = 0.955

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
24.452	2391.643	5.331	488.760	1.000	1.000	0.980

W Kg/sec = 11.1146812

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
65.448	2463.806	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
56658.281	19186.896	2.861	545.479	190.642	429.765	2.254

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	224.00	-0.08	224.00	0.21	431.51
MEAN	17.74	0.00	-0.02	224.00	-0.08	224.00	0.21	
HUB	15.05	0.00	-0.02	224.00	-0.08	224.00	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.87	46.36	15.51	418.88	475.08	5.17	484.58	0.44
MEAN	58.83	43.40	15.43	370.22	432.78	5.17	484.58	0.40
HUB	54.51	38.84	15.67	314.11	385.86	5.17	484.58	0.36

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	341.06	248.12	234.00	1091.67	0.31
MEAN	17.51	339.07	243.43	236.03	1089.37	0.31
HUB	14.85	357.39	266.32	238.34	1087.06	0.33

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.45	286.52	165.33	0.26	4916.87	
MEAN	365.38	265.67	121.95	0.24	4262.97	1.79
HUB	309.93	242.29	43.62	0.22	3955.96	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	5.90	1.11	5.51	505.27	1.03	495.57	0.92	0.87
MEAN	5.82	1.09	5.44	503.07	1.03	493.49	0.92	0.87
HUB	5.79	1.09	5.37	502.04	1.03	491.39	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	46.68	35.24	31.50	3.74	0.93	0.49	2.90	
MEAN	45.88	27.32	23.50	3.82	0.95	0.47	3.28	0.87
HUB	48.17	10.37	6.50	3.87	0.95	0.46	3.87	

blockage3	Cor/Incid
0.950	0.955

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	342.212	245.026	238.895	1089.602	0.314	0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
5.833	5.447	493.695	46.000	45.726	31.500	-14.226

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	244.930	245.026	346.451	1094.845	0.224	0.461

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	5.824	5.625	498.458	471.992	0.032	0.543

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	238.767	0.000	238.767	1095.118	0.218	0.414

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.610	498.706	0.000	0.060	0.095	0.425

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    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.811       5.799       1.088     503.460      14.700     179.042       1.388

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91397.617       0.535     126.295  231204.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.861   EfDer =  0.968

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.452    2391.643       5.799     503.460       1.000       1.000       0.980
W Kg/sec =  11.1146812

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     61.062    2427.572       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 56658.281   19186.896       2.886     513.330     177.871     401.059       2.255

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   225.31    -0.08   225.31     0.21   408.00
 MEAN    16.97     0.00    -0.02   225.31    -0.08   225.31     0.21
 HUB     14.32     0.00    -0.02   225.31    -0.08   225.31     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.73    46.36    14.37   401.98   460.88     5.63   499.23     0.42
 MEAN    57.54    43.80    13.74   354.20   419.85     5.63   499.23     0.38
 HUB     53.00    37.84    15.16   298.87   374.35     5.63   499.23     0.34

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   327.23   228.48   234.26  1106.36     0.30
 MEAN    16.57   325.45   223.97   236.12  1104.27     0.29
 HUB     13.89   342.79   246.51   238.20  1102.16     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    394.04   286.86   165.56     0.26  4315.20
 MEAN   345.91   265.75   121.94     0.24  3713.40     1.74
 HUB    289.90   242.12    43.39     0.22  3425.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.33     1.09     5.96   517.94     1.03   509.02     0.92     0.89
 MEAN     6.26     1.08     5.89   515.92     1.02   507.09     0.92     0.89
 HUB      6.22     1.07     5.82   514.96     1.02   505.16     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.28    35.25    31.50     3.75     0.93     0.46     2.90
 MEAN    43.49    27.31    23.50     3.81     0.94     0.45     3.29     0.89
 HUB     45.98    10.32     6.50     3.82     0.94     0.44     3.90


  blockage3   Cor/Incid
     0.600       0.968

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     449.384     225.232     388.865    1095.904       0.410      -0.813

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.266       5.580     499.439      46.000      30.079      32.400       2.321

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
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     16.481     406.232     225.232     464.493    1099.276       0.370      -0.497

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.600       6.263       5.699     502.517     283.154       0.017       0.312

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     16.096     384.992       0.000     384.992    1100.807       0.350       0.438

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600       5.747     503.918       0.000       0.060       0.038      -0.371

    STAGE EXIT CONDITIONS, STAGE   4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859       6.255       1.079     516.275      12.816     193.046       1.496

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79693.680       0.513     110.122  236360.344


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.861   EfDer =  0.936

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.452    2391.643       6.255     516.275       1.000       1.000       0.630
W Kg/sec =  11.1146812

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     57.332    2397.252       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  56658.281   19186.896       1.962     327.644     167.007     245.618       1.471

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   344.92    -0.12   344.92     0.31   383.24
 MEAN    15.91     0.00    -0.02   344.92    -0.12   344.92     0.31
 HUB     13.07     0.00    -0.02   344.92    -0.12   344.92     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.96    47.36     0.60   382.36   515.03     5.84   506.36     0.47
 MEAN    43.93    44.80    -0.87   332.12   478.91     5.84   506.36     0.43
 HUB     38.35    38.84    -0.49   272.78   439.83     5.84   506.36     0.40

      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   299.79   198.06   225.04  1118.99     0.27
 MEAN    15.50   296.85   191.78   226.58  1117.04     0.27
 HUB     12.59   310.01   209.73   228.29  1115.13     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    374.43   285.91   176.36     0.26  3555.46
 MEAN   323.45   262.06   131.67     0.23  2974.01     1.97
 HUB    262.77   234.37    53.04     0.21  2642.06

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.70     1.07     6.37   528.21     1.02   520.72     0.92     0.86
 MEAN     6.62     1.06     6.31   526.26     1.02   518.91     0.92     0.86
 HUB      6.58     1.05     6.24   525.14     1.02   517.13     0.92     0.86

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.35    38.09    31.50     6.59     0.93     0.51     2.90
 MEAN    40.24    30.16    23.50     6.66     0.90     0.51     3.34     0.86
 HUB     42.57    13.08     6.50     6.58     0.90     0.52     4.06


   blockage3   Cor/Incid
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      0.950       0.936

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
      15.219     300.524     195.296     228.417    1117.147       0.269      -0.011

      Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
       6.628       6.303     519.007      46.000      40.530      33.000      -7.530

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
      15.219     240.685     195.296     309.952    1120.049       0.215       0.331

    BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
       0.950       6.624       6.414     521.707     440.827       0.032       0.467

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
      14.701     226.209       0.000     226.209    1120.654       0.202       0.389

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       6.431     522.271       0.000       0.060       0.055       0.382

     STAGE EXIT CONDITIONS, STAGE   5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.816       6.617       1.058     526.536      10.261     225.432       1.748

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   63814.465       0.455      88.180  396928.938

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     451570.38    623.9896     77.2174      1.5195      0.7951     17.8615      1.1600


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NPSS: Inlet Mach number .71, Altitude 37357ft, dT 22R, Thrust 10%
Stage 4 stator Blocked @ 40%

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
**********************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.907   EfDer =  0.931

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      24.403    2391.652       4.355     453.909       1.000       1.000       0.980
 W Kg/sec =  11.0920448

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
      77.060    2556.652       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
   56542.895   19147.822       3.705     831.557     224.466     619.754       2.761

      ROTOR LEADING EDGE CONDITIONS, STAGE   1

         R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   165.25    -0.06   165.25     0.16   460.26
  MEAN    17.06     0.00    -0.02   165.25    -0.06   165.25     0.16
  HUB     12.51     0.00    -0.02   165.25    -0.06   165.25     0.16

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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 TIP     69.01    50.47    18.54   430.57   461.25     4.28   451.63     0.44
 MEAN    65.11    47.20    17.91   356.06   392.59     4.28   451.63     0.38
 HUB     57.68    38.62    19.06   261.10   309.05     4.28   451.63     0.30

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   380.88   309.19   222.43  1055.48     0.36
 MEAN    18.04   380.73   307.01   225.16  1052.27     0.36
 HUB     15.00   405.66   334.91   228.89  1048.42     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    430.57   253.39   121.38     0.24  6379.80
 MEAN   376.43   235.62    69.42     0.22  5538.25     1.92
 HUB    313.07   229.93    21.85     0.22  5024.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      5.00     1.15     4.57   475.33     1.05   463.23     0.92     0.85
 MEAN     4.91     1.13     4.48   472.51     1.04   460.42     0.92     0.85
 HUB      4.86     1.11     4.38   470.78     1.04   457.06     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     54.27    28.62    24.20     4.42     0.93     0.57     2.90
 MEAN    53.74    17.14    12.70     4.44     0.95     0.51     3.51     0.85
 HUB     55.65    -5.45    -9.30     3.85     0.95     0.38     4.78


   blockage3   Cor/Incid
      0.950       0.931

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     383.456     306.416     230.538    1052.486       0.364       0.002

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      4.916       4.485     460.611      24.000      53.043      35.400     -17.643

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     243.924     306.416     391.650    1060.793       0.230       0.555

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       4.900       4.723     467.910     528.796       0.046       0.671

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     18.083     228.309       0.000     228.309    1061.490       0.215       0.515

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       4.713     468.525       0.000       0.060       0.118       0.534

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.776       4.868       1.118     472.872      18.963     156.881       1.216

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 117884.539       0.636     162.564  256661.719


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
  RESET =  0.000BLEED =  0.000 DPInc =17.907   EfDer =  0.934

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     24.403    2391.652       4.868     472.872       1.000       1.000       0.980
W Kg/sec =  11.0920448

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     70.358    2504.865       1.401       0.248      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
56542.895	19147.822	2.881	590.487	204.944	474.134	2.313

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	218.74	-0.08	218.74	0.21	449.19
MEAN	18.08	0.00	-0.02	218.74	-0.08	218.74	0.21	
HUB	15.21	0.00	-0.02	218.74	-0.08	218.74	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.98	46.36	16.62	428.90	481.53	4.73	468.88	0.45
MEAN	59.90	42.30	17.60	377.31	436.20	4.73	468.88	0.41
HUB	55.44	37.84	17.60	317.45	385.57	4.73	468.88	0.36

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	349.83	264.51	228.95	1075.30	0.33
MEAN	18.01	345.34	256.56	231.17	1072.66	0.32
HUB	15.22	360.99	275.12	233.71	1069.99	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	426.19	280.29	161.68	0.26	5402.79	
MEAN	375.89	260.15	119.33	0.24	4621.97	1.86
HUB	317.72	237.56	42.60	0.22	4189.35	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	5.45	1.12	5.06	491.01	1.04	480.81	0.92	0.85
MEAN	5.36	1.10	4.99	488.39	1.03	478.45	0.92	0.85
HUB	5.31	1.09	4.91	486.94	1.03	476.07	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	49.12	35.23	31.50	3.73	0.93	0.51	2.90	
MEAN	47.98	27.30	23.50	3.80	0.95	0.49	3.30	0.85
HUB	49.65	10.33	6.50	3.83	0.95	0.47	3.92	

blockage3	Cor/Incid
0.950	0.934

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	348.576	257.279	235.187	1072.884	0.325	0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
5.371	4.992	478.648	46.000	47.569	30.600	-16.969

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	237.963	257.279	350.455	1078.930	0.221	0.498

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	5.360	5.181	484.058	511.151	0.040	0.570

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	235.883	0.000	235.883	1079.022	0.219	0.425

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.156	484.140	0.000	0.060	0.114	0.435

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.783	5.331	1.095	488.780	15.908	173.505	1.345

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
98900.703	0.544	136.385	232391.594

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.907   EfDer =  0.954

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    24.403    2391.652       5.331     488.780       1.000       1.000       0.980
W Kg/sec =  11.0920448

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    65.320    2463.766       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 56542.895   19147.822       2.867     545.479     190.270     429.765       2.259

    ROTOR LEADING EDGE CONDITIONS, STAGE   3

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   223.55    -0.08   223.55     0.21   431.50
MEAN    17.74     0.00    -0.02   223.55    -0.08   223.55     0.21
HUB     15.05     0.00    -0.02   223.55    -0.08   223.55     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.92    46.36    15.56   418.88   474.87     5.17   484.61     0.44
MEAN    58.88    43.40    15.48   370.22   432.54     5.17   484.61     0.40
HUB     54.57    38.84    15.73   314.11   385.60     5.17   484.61     0.36

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   340.98   248.45   233.53  1091.72     0.31
MEAN    17.51   338.90   243.65   235.56  1089.42     0.31
HUB     14.85   357.13   266.39   237.86  1087.10     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.46   285.95   165.01     0.26  4923.32
MEAN   365.38   265.15   121.73     0.24  4266.88     1.80
HUB    309.94   241.82    43.55     0.22  3957.04

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      5.90     1.11     5.52   505.31     1.03   495.61     0.92     0.87
MEAN     5.82     1.09     5.44   503.10     1.03   493.53     0.92     0.87
HUB      5.79     1.09     5.37   502.06     1.03   491.43     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.77    35.24    31.50     3.74     0.93     0.49     2.90
MEAN    45.97    27.33    23.50     3.83     0.95     0.47     3.28     0.87
HUB     48.24    10.37     6.50     3.87     0.95     0.46     3.87


  blockage3   Cor/Incid
     0.950       0.954

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     342.040     245.251     238.419    1089.649       0.314       0.007

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     5.833       5.448     493.738      46.000      45.809      31.500     -14.309

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     244.431     245.251     346.258    1094.903       0.223       0.463

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       5.824       5.625     498.511     471.992       0.032       0.544

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    17.121     238.288       0.000     238.288    1095.174       0.218       0.415
```

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.611	498.758	0.000	0.060	0.096	0.426

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.810	5.799	1.088	503.492	14.712	178.744	1.386

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
91477.492	0.535	126.148	230706.828

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =17.907 EfDer = 0.968

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
24.403	2391.652	5.799	503.492	1.000	1.000	0.980

W Kg/sec = 11.0920448

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
60.944	2427.503	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
56542.895	19147.822	2.892	513.330	177.525	401.059	2.259

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	224.86	-0.08	224.86	0.21	407.99
MEAN	16.97	0.00	-0.02	224.86	-0.08	224.86	0.21	
HUB	14.32	0.00	-0.02	224.86	-0.08	224.86	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.78	46.36	14.42	401.98	460.66	5.63	499.28	0.42
MEAN	57.60	43.80	13.80	354.20	419.61	5.63	499.28	0.38
HUB	53.05	37.84	15.21	298.87	374.08	5.63	499.28	0.34

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	327.12	228.80	233.79	1106.43	0.30
MEAN	16.57	325.27	224.21	235.65	1104.33	0.29
HUB	13.89	342.52	246.59	237.73	1102.22	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	394.05	286.29	165.24	0.26	4321.29	
MEAN	345.91	265.22	121.70	0.24	3717.41	1.74
HUB	289.90	241.65	43.31	0.22	3426.21	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.33	1.09	5.96	518.00	1.03	509.08	0.92	0.89
MEAN	6.26	1.08	5.89	515.97	1.02	507.15	0.92	0.89
HUB	6.22	1.07	5.82	514.99	1.02	505.21	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.38	35.25	31.50	3.75	0.93	0.46	2.90	
MEAN	43.58	27.31	23.50	3.81	0.94	0.45	3.29	0.89
HUB	46.05	10.33	6.50	3.83	0.94	0.44	3.90	

blockage3	Cor/Incid
0.550	0.968

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	486.848	225.475	431.488	1092.740	0.446	-1.112

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
6.266	5.467	496.560	46.000	27.589	32.400	4.811

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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth          Machth      cp 2-Th
     16.481     451.691     225.475     504.840    1095.763       0.412       -0.838

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.550       6.261       5.570     499.311     258.379       0.021       0.278

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     16.096     427.197       0.000     427.197    1097.730       0.389       0.434

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.550       5.632     501.105       0.000       0.060       0.044      -0.675

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.855       6.253        1.078     516.320      12.828     192.712       1.494

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79771.883       0.514     110.006  235847.359


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.907   EfDer =  0.884

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     24.403     2391.652        6.253     516.320       1.000        1.000       0.580
W Kg/sec =  11.0920448

   W cor       RPM cor         GAMMA         Cp          R           Blades       THK
     57.240     2397.157        1.401        0.248      53.349      56.000       0.050

   CFM        SCFM             A1/A*       Area1       A*        AthrRotor   ChokeMargin
  56542.895   19147.822        1.809     301.640     166.738     224.953       1.349

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1       Stator    Alfa      C1       CU1        Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   377.74    -0.13   377.74      0.34   383.23
 MEAN    15.91      0.00    -0.02   377.74    -0.13   377.74      0.34
 HUB     13.07      0.00    -0.02   377.74    -0.13   377.74      0.34

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     45.36     47.36    -2.00   382.36   537.57      5.76   504.43      0.49
 MEAN    41.33     44.80    -3.47   332.12   503.07      5.76   504.43      0.46
 HUB     35.85     38.84    -2.99   272.79   466.01      5.76   504.43      0.42

      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   296.92   193.04    225.61  1118.86      0.27
 MEAN    15.50   294.44   187.55    226.98  1116.98      0.26
 HUB     12.59   307.98   206.41    228.57  1115.14      0.28

       U2        W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    374.43   289.49   181.39     0.26  3465.45
 MEAN   323.45   264.56   135.91     0.24  2908.59      2.04
 HUB    262.77   235.41    56.35     0.21  2600.44

         Pt2        PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP      6.66      1.07      6.34   527.95      1.02   520.60      0.92      0.81
 MEAN     6.59      1.05      6.28   526.08      1.02   518.86      0.92      0.81
 HUB      6.56      1.05      6.22   525.05      1.02   517.14      0.92      0.81

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.55    38.80    31.50     7.30     0.93     0.52     2.90
 MEAN    39.57    30.91    23.50     7.41     0.89     0.53     3.34     0.81
 HUB     42.08    13.85     6.50     7.35     0.89     0.55     4.06
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   blockage3   Cor/Incid
      0.950       0.884

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     298.062     190.985     228.836    1117.090       0.267      -0.012

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.597       6.278     518.955      46.000      39.848      33.000      -6.848

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     241.269     190.985     307.711    1119.835       0.215       0.319

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.593       6.383     521.508     440.827       0.030       0.456

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     14.701     226.737       0.000     226.737    1120.444       0.202       0.381

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.401     522.075       0.000       0.060       0.052       0.373

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.771       6.586       1.053     526.361      10.041     230.074       1.784

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  62443.766       0.445      86.110  434457.031

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    450478.38    621.2130     77.0601      1.5125      0.7878     17.9073      1.1596
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DESCENT Operating Point #3

NPSS: Inlet Mach number .67, Altitude 34281ft, dT 22R, Thrust 10%
Stage 4 stator Blocked @ 10%

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*********************************************************************
**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
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         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.759   EfDer =  0.932

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     26.699    2345.966       4.843     455.824       1.000       1.000       0.980
 W Kg/sec =  12.1360903

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     75.967    2502.542       1.401       0.248      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  55858.461   20950.121       3.758     831.557     221.279     619.754       2.801

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
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TIP     20.63     0.00    -0.02   163.19    -0.06   163.19     0.16   450.52
MEAN    17.06     0.00    -0.02   163.19    -0.06   163.19     0.16
HUB     12.51     0.00    -0.02   163.19    -0.06   163.19     0.16

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     68.88    50.47    18.41   422.35   452.83     4.76   453.60     0.43
MEAN    64.96    47.20    17.76   349.26   385.56     4.76   453.60     0.37
HUB     57.50    38.62    18.88   256.11   303.73     4.76   453.60     0.29

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   373.96   302.39   220.03  1057.19     0.35
MEAN    18.04   374.14   300.70   222.62  1054.12     0.35
HUB     15.00   399.00   328.72   226.15  1050.43     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    422.35   250.60   119.96     0.24  6239.40
MEAN   369.24   232.93    68.54     0.22  5424.45     1.91
HUB    307.09   227.18    21.63     0.22  4931.48

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      5.53     1.14     5.07   476.37     1.05   464.71     0.92     0.85
MEAN     5.43     1.12     4.98   473.69     1.04   462.01     0.92     0.85
HUB      5.38     1.11     4.87   472.06     1.04   458.79     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     53.96    28.60    24.20     4.40     0.93     0.56     2.90
MEAN    53.49    17.11    12.70     4.41     0.95     0.51     3.51     0.85
HUB     55.47    -5.46    -9.30     3.84     0.95     0.38     4.78


  blockage3   Cor/Incid
     0.950       0.932

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     376.863     300.119     227.935    1054.325       0.357       0.002

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.440       4.980     462.197      24.000      52.784      35.400     -17.384

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     241.556     300.119     385.254    1062.254       0.227       0.550

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       5.424       5.232     469.175     528.796       0.045       0.666

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     18.083     226.052       0.000     226.052    1062.939       0.213       0.512

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.223     469.780       0.000       0.060       0.116       0.531

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.778       5.390       1.113     474.042      18.218     157.578       1.222

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 113263.406       0.635     170.893  279817.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
  RESET =  0.000BLEED =  0.000 DPInc =17.759   EfDer =  0.936

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.699    2345.966       5.390     474.042       1.000       1.000       0.980
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W Kg/sec =  12.1360903

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     69.612    2453.983       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 55858.461   20950.121       2.912     590.487     202.767     474.134       2.338

    ROTOR LEADING EDGE CONDITIONS, STAGE   2

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   216.58    -0.07   216.58     0.20   440.07
MEAN    18.08     0.00    -0.02   216.58    -0.07   216.58     0.20
HUB     15.21     0.00    -0.02   216.58    -0.07   216.58     0.20

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     62.76    46.36    16.40   420.71   473.25     5.24   470.13     0.45
MEAN    59.67    42.30    17.37   370.11   428.88     5.24   470.13     0.40
HUB     55.19    37.84    17.35   311.39   379.36     5.24   470.13     0.36

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

        R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   343.56   257.80   227.09  1076.15     0.32
MEAN    18.01   339.54   250.51   229.19  1073.63     0.32
HUB     15.22   355.35   269.51   231.60  1071.09     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    418.05   277.93   160.24     0.26  5265.87
MEAN   368.71   257.87   118.20     0.24  4513.04     1.84
HUB    311.65   235.40    42.15     0.22  4103.82

       Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      6.00     1.11     5.59   491.38     1.04   481.54     0.92     0.86
MEAN     5.91     1.10     5.52   488.90     1.03   479.29     0.92     0.86
HUB      5.86     1.09     5.43   487.56     1.03   477.03     0.92     0.86

       Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     48.62    35.21    31.50     3.71     0.93     0.51     2.90
MEAN    47.54    27.28    23.50     3.78     0.95     0.49     3.30     0.86
HUB     49.33    10.31     6.50     3.81     0.95     0.47     3.92


  blockage3   Cor/Incid
     0.950       0.936

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.960     342.752     251.214     233.175    1073.849       0.319       0.005

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     5.923       5.519     479.483      46.000      47.133      30.600     -16.533

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.960     236.219     251.214     344.830    1079.593       0.219       0.491

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       5.911       5.717     484.627     511.151       0.038       0.562

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    17.823     234.092       0.000     234.092    1079.686       0.217       0.419

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       5.691     484.710       0.000       0.060       0.111       0.429

   STAGE EXIT CONDITIONS, STAGE   2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
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      0.786       5.881       1.091     489.280      15.239     174.885       1.356

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94749.758       0.542     142.959  253671.406


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.759   EfDer =  0.957

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.699    2345.966       5.881     489.280       1.000       1.000       0.980
W Kg/sec =  12.1360903

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     64.816    2415.466       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  55858.461   20950.121       2.889     545.479     188.798     429.765       2.276

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   221.86    -0.08   221.86     0.21   423.04
 MEAN    17.74     0.00    -0.02   221.86    -0.08   221.86     0.21
 HUB     15.05     0.00    -0.02   221.86    -0.08   221.86     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.64    46.36    15.28   410.88   467.02     5.71   485.18     0.43
 MEAN    58.58    43.40    15.18   363.15   425.62     5.71   485.18     0.39
 HUB     54.25    38.84    15.41   308.11   379.74     5.71   485.18     0.35

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   335.08   241.63   232.15  1091.83     0.31
 MEAN    17.51   333.47   237.52   234.07  1089.64     0.31
 HUB     14.85   351.92   260.83   236.25  1087.44     0.32

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    405.56   284.19   163.92     0.26  4788.30
 MEAN   358.40   263.44   120.88     0.24  4159.54     1.78
 HUB    304.02   240.17    43.18     0.22  3874.55

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.48     1.10     6.07   505.05     1.03   495.68     0.92     0.88
 MEAN     6.40     1.09     6.00   502.98     1.03   493.70     0.92     0.88
 HUB      6.36     1.08     5.92   502.04     1.03   491.71     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.15    35.23    31.50     3.73     0.93     0.48     2.90
 MEAN    45.42    27.31    23.50     3.81     0.95     0.47     3.28     0.88
 HUB     47.83    10.36     6.50     3.86     0.95     0.46     3.87


  blockage3   Cor/Incid
     0.950       0.957

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     336.580     239.080     236.911    1089.866       0.309       0.007

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.411       6.000     493.907      46.000      45.261      31.500     -13.761

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     243.162     239.080     341.009    1094.838       0.222       0.454

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
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      0.950       6.402       6.186     498.423     471.992       0.031       0.534

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.121     236.989       0.000     236.989    1095.109       0.216       0.408

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.171     498.671       0.000       0.060       0.092       0.419

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.814       6.376       1.084     503.354      14.074     180.568       1.400

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  87513.047       0.532     132.040  252139.906


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.759   EfDer =  0.971

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.699    2345.966       6.376     503.354       1.000       1.000       0.980
W Kg/sec =  12.1360903

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     60.635    2381.458       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  55858.461   20950.121       2.906     513.330     176.622     401.059       2.271

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   223.64    -0.08   223.64     0.20   400.25
 MEAN    16.97     0.00    -0.02   223.64    -0.08   223.64     0.20
 HUB     14.32     0.00    -0.02   223.64    -0.08   223.64     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.44    46.36    14.08   394.30   453.37     6.19   499.18     0.41
 MEAN    57.24    43.80    13.44   347.43   413.25     6.19   499.18     0.38
 HUB     52.67    37.84    14.83   293.16   368.79     6.19   499.18     0.34

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   321.72   221.99   232.87  1105.86     0.29
 MEAN    16.57   320.39   218.18   234.63  1103.88     0.29
 HUB     13.89   337.96   241.32   236.61  1101.88     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    386.52   285.13   164.53     0.26  4192.67
 MEAN   339.31   264.06   121.13     0.24  3617.31     1.72
 HUB    284.36   240.49    43.04     0.22  3353.03

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.94     1.09     6.54   517.16     1.03   508.53     0.92     0.89
 MEAN     6.86     1.08     6.47   515.26     1.02   506.70     0.92     0.89
 HUB      6.82     1.07     6.39   514.39     1.02   504.87     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.63    35.24    31.50     3.74     0.93     0.45     2.90
 MEAN    42.92    27.31    23.50     3.81     0.94     0.44     3.29     0.89
 HUB     45.56    10.31     6.50     3.81     0.94     0.43     3.90


   blockage3   Cor/Incid
      0.850       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     340.182     219.402     259.974    1103.062       0.308       -0.095

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.867       6.428     505.956      46.000      40.162      32.400      -7.762

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth       Cmth      Aoth         Machth      cp 2-Th
     16.481     270.836     219.402     348.553    1106.907       0.245       0.290

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.850       6.863       6.583     509.489     407.025       0.019       0.458

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     16.096     258.114       0.000     258.114    1107.516       0.233       0.408

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850       6.594     510.050       0.000       0.060       0.056       0.317

    STAGE EXIT CONDITIONS, STAGE   4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.848       6.848       1.074     515.605      12.251     195.131       1.513

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  76187.617       0.510     114.952  258040.609


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.759   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.699    2345.966       6.848     515.605       1.000       1.000       0.880
W Kg/sec =  12.1360903

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     57.141    2352.996       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  55858.461   20950.121       2.750     457.661     166.445     348.945       2.096

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   239.86    -0.08   239.86     0.22   376.17
 MEAN    15.91     0.00    -0.02   239.86    -0.08   239.86     0.22
 HUB     13.07     0.00    -0.02   239.86    -0.08   239.86     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.41    47.36    10.05   375.05   445.26     6.63   510.81     0.40
 MEAN    53.64    44.80     8.84   325.78   404.62     6.63   510.81     0.37
 HUB     48.14    38.84     9.30   267.57   359.41     6.63   510.81     0.32

      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   303.61   205.88   223.15  1118.34     0.27
 MEAN    15.50   299.79   198.26   224.88  1116.34     0.27
 HUB     12.59   312.16   214.57   226.73  1114.35     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    367.28   275.39   161.40     0.25  3694.99
 MEAN   317.27   254.43   119.01     0.23  3073.86     1.76
 HUB    257.75   230.81    43.18     0.21  2702.47

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      7.38     1.08     7.01   527.77     1.02   520.08     0.92     0.91
 MEAN     7.29     1.06     6.93   525.72     1.02   518.23     0.92     0.91
 HUB      7.23     1.06     6.85   524.50     1.02   516.38     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.70    35.88    31.50     4.38     0.93     0.46     2.90
 MEAN    41.40    27.89    23.50     4.39     0.93     0.44     3.34     0.91
 HUB     43.42    10.78     6.50     4.28     0.93     0.43     4.06


   blockage3   Cor/Incid
      0.950       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     15.219     303.561     201.895     226.689    1116.436       0.272       -0.011

     Pt3         Ps3         Ts3        Vane No.     Alpha3     Vane A3      Incid3
      7.291       6.925     518.315      46.000      41.689      33.000       -8.689

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     15.219     238.641     201.895     312.588    1119.592       0.213       0.350

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       7.285       7.058     521.250     440.827       0.036       0.486

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     14.701     224.328       0.000     224.328    1120.185       0.200       0.404

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       7.075     521.803       0.000       0.060       0.061       0.396

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.867       7.275        1.062     525.998      10.393     215.841       1.673

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   64641.809       0.479     97.532  302886.719

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     436355.62    658.3766      75.9673      1.5022      0.8026     17.7595      1.1540


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NPSS: Inlet Mach number .67, Altitude 34281ft, dT 22R, Thrust 10%
Stage 4 stator Blocked @ 15%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
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          Fan Hub + 4 Stage LPC 100%  12-20-2010

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.758   EfDer =  0.932

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
      26.702     2346.031        4.843     455.824        1.000        1.000        0.980
 W Kg/sec =  12.137454

    W cor       RPM cor         GAMMA         Cp          R           Blades       THK
      75.976     2502.611        1.401        0.248      53.349       32.000       0.050

    CFM        SCFM             A1/A*       Area1       A*        AthrRotor   ChokeMargin
   55864.738   20952.477        3.758     831.557     221.304     619.754        2.800
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    ROTOR LEADING EDGE CONDITIONS, STAGE   1

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   163.21    -0.06   163.21     0.16   450.53
MEAN    17.06     0.00    -0.02   163.21    -0.06   163.21     0.16
HUB     12.51     0.00    -0.02   163.21    -0.06   163.21     0.16

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     68.87    50.47    18.40   422.36   452.85     4.76   453.60     0.43
MEAN    64.96    47.20    17.76   349.27   385.57     4.76   453.60     0.37
HUB     57.50    38.62    18.88   256.12   303.75     4.76   453.60     0.29

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   373.98   302.39   220.05  1057.19     0.35
MEAN    18.04   374.16   300.71   222.64  1054.12     0.35
HUB     15.00   399.02   328.73   226.18  1050.43     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    422.36   250.63   119.97     0.24  6239.50
MEAN   369.25   232.95    68.54     0.22  5424.61     1.91
HUB    307.09   227.21    21.64     0.22  4931.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      5.53     1.14     5.07   476.37     1.05   464.71     0.92     0.85
MEAN     5.43     1.12     4.98   473.69     1.04   462.01     0.92     0.85
HUB      5.38     1.11     4.87   472.07     1.04   458.79     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     53.96    28.60    24.20     4.40     0.93     0.56     2.90
MEAN    53.48    17.11    12.70     4.41     0.95     0.51     3.51     0.85
HUB     55.47    -5.46    -9.30     3.84     0.95     0.38     4.78


  blockage3   Cor/Incid
     0.950       0.932

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     376.886     300.128     227.961    1054.324       0.357       0.002

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.440       4.980     462.196      24.000      52.782      35.400     -17.382

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     241.583     300.128     385.278    1062.254       0.227       0.550

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.424       5.232     469.175     528.796       0.045       0.666

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     18.083     226.077       0.000     226.077    1062.939       0.213       0.512

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.223     469.780       0.000       0.060       0.116       0.531

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.778       5.390       1.113     474.043      18.219     157.585       1.222

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 113269.664       0.635     170.921  279849.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
  RESET =  0.000BLEED =  0.000 DPInc =17.758   EfDer =  0.936
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
26.702	2346.031	5.390	474.043	1.000	1.000	0.980

W Kg/sec = 12.137454

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
69.620	2454.048	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
55864.738	20952.477	2.912	590.487	202.788	474.134	2.338

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	216.61	-0.07	216.61	0.20	440.08
MEAN	18.08	0.00	-0.02	216.61	-0.07	216.61	0.20	
HUB	15.21	0.00	-0.02	216.61	-0.07	216.61	0.20	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.76	46.36	16.40	420.72	473.27	5.24	470.13	0.45
MEAN	59.67	42.30	17.37	370.12	428.91	5.24	470.13	0.40
HUB	55.18	37.84	17.34	311.39	379.38	5.24	470.13	0.36

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	343.56	257.79	227.11	1076.15	0.32
MEAN	18.01	339.54	250.50	229.22	1073.63	0.32
HUB	15.22	355.38	269.52	231.62	1071.09	0.33

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	418.06	277.97	160.27	0.26	5265.62	
MEAN	368.72	257.91	118.22	0.24	4512.82	1.84
HUB	311.66	235.43	42.14	0.22	4104.08	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.00	1.11	5.59	491.38	1.04	481.54	0.92	0.86
MEAN	5.91	1.10	5.52	488.90	1.03	479.29	0.92	0.86
HUB	5.86	1.09	5.43	487.56	1.03	477.03	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	48.62	35.21	31.50	3.71	0.93	0.51	2.90	
MEAN	47.54	27.28	23.50	3.78	0.95	0.49	3.30	0.86
HUB	49.32	10.31	6.50	3.81	0.95	0.47	3.92	

blockage3	Cor/Incid
0.950	0.936

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	342.760	251.202	233.200	1073.850	0.319	0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
5.923	5.519	479.484	46.000	47.128	30.600	-16.528

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	236.244	251.202	344.839	1079.594	0.219	0.491

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	5.911	5.717	484.627	511.151	0.038	0.562

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	234.117	0.000	234.117	1079.687	0.217	0.419

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.692	484.711	0.000	0.060	0.111	0.429

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    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.787       5.881       1.091     489.282      15.239     174.898       1.356

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94751.086       0.542     142.977  253700.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.758   EfDer =  0.957

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.702    2346.031       5.881     489.282       1.000       1.000       0.980
W Kg/sec =  12.137454

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     64.822    2415.530       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 55864.738   20952.477       2.889     545.479     188.817     429.765       2.276

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   221.88    -0.08   221.88     0.21   423.05
 MEAN    17.74     0.00    -0.02   221.88    -0.08   221.88     0.21
 HUB     15.05     0.00    -0.02   221.88    -0.08   221.88     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.64    46.36    15.28   410.89   467.04     5.71   485.18     0.43
 MEAN    58.58    43.40    15.18   363.16   425.64     5.71   485.18     0.39
 HUB     54.25    38.84    15.41   308.12   379.76     5.71   485.18     0.35

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   335.09   241.62   232.17  1091.83     0.31
 MEAN    17.51   333.50   237.54   234.09  1089.64     0.31
 HUB     14.85   351.93   260.82   236.28  1087.44     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    405.57   284.22   163.95     0.26  4788.10
 MEAN   358.41   263.46   120.87     0.24  4159.83     1.78
 HUB    304.02   240.20    43.20     0.22  3874.38

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.48     1.10     6.07   505.05     1.03   495.68     0.92     0.88
 MEAN     6.40     1.09     6.00   502.98     1.03   493.70     0.92     0.88
 HUB      6.36     1.08     5.92   502.04     1.03   491.71     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.14    35.23    31.50     3.73     0.93     0.48     2.90
 MEAN    45.42    27.31    23.50     3.81     0.95     0.47     3.28     0.88
 HUB     47.83    10.36     6.50     3.86     0.95     0.46     3.87


  blockage3   Cor/Incid
     0.950       0.957

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     336.610     239.097     236.937    1089.866       0.309       0.007

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.411       6.000     493.907      46.000      45.260      31.500     -13.760

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
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     17.392     243.187     239.097     341.039    1094.839       0.222       0.454

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.402       6.186     498.424     471.992       0.031       0.534

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     17.121     237.013       0.000     237.013    1095.110       0.216       0.408

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.172     498.671       0.000       0.060       0.092       0.419

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4        Pt4           PR4       Texit        Del T       Ns        Ns nondim
      0.814       6.376       1.084     503.356      14.074     180.579       1.400

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  87514.945       0.532     132.058  252168.922


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.758   EfDer =  0.971

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.702    2346.031       6.376     503.356       1.000       1.000       0.980
W Kg/sec =  12.137454

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     60.641    2381.521       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 55864.738   20952.477       2.906     513.330     176.640     401.059       2.270

    ROTOR LEADING EDGE CONDITIONS, STAGE   4

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   223.66    -0.08   223.66     0.20   400.26
 MEAN    16.97     0.00    -0.02   223.66    -0.08   223.66     0.20
 HUB     14.32     0.00    -0.02   223.66    -0.08   223.66     0.20

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.44    46.36    14.08   394.31   453.39     6.19   499.18     0.41
 MEAN    57.23    43.80    13.43   347.44   413.27     6.19   499.18     0.38
 HUB     52.67    37.84    14.83   293.17   368.81     6.19   499.18     0.34

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   321.74   221.98   232.89  1105.86     0.29
 MEAN    16.57   320.41   218.17   234.66  1103.88     0.29
 HUB     13.89   337.97   241.31   236.63  1101.88     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    386.53   285.16   164.55     0.26  4192.49
 MEAN   339.32   264.08   121.15     0.24  3617.16     1.72
 HUB    284.37   240.52    43.06     0.22  3352.90

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.94     1.09     6.54   517.16     1.03   508.53     0.92     0.89
 MEAN     6.86     1.08     6.47   515.27     1.02   506.71     0.92     0.89
 HUB      6.82     1.07     6.39   514.40     1.02   504.87     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.63    35.24    31.50     3.74     0.93     0.45     2.90
 MEAN    42.91    27.31    23.50     3.81     0.94     0.44     3.29     0.89
 HUB     45.56    10.31     6.50     3.81     0.94     0.43     3.90


   blockage3   Cor/Incid
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      0.800       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     354.078     219.393     277.917    1102.187       0.321      -0.183

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.867       6.393     505.153      46.000      38.288      32.400      -5.888

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     16.481     289.626     219.393     363.340    1105.954       0.262       0.195

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.800       6.864       6.545     508.612     382.250       0.017       0.430

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     16.096     275.776       0.000     275.776    1106.664       0.249       0.416

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.800       6.562     509.265       0.000       0.060       0.048       0.237

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854       6.852       1.075     515.607      12.251     195.148       1.513

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  76186.852       0.510     114.964  258070.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.758   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.702    2346.031       6.852     515.607       1.000       1.000       0.830
W Kg/sec =  12.137454

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     57.119    2353.058       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  55864.738   20952.477       2.594     431.657     166.381     328.280       1.973

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   254.99    -0.09   254.99     0.23   376.18
 MEAN    15.91     0.00    -0.02   254.99    -0.09   254.99     0.23
 HUB     13.07     0.00    -0.02   254.99    -0.09   254.99     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.80    47.36     8.44   375.07   453.60     6.60   510.19     0.41
 MEAN    51.96    44.80     7.16   325.79   413.78     6.60   510.19     0.37
 HUB     46.39    38.84     7.55   267.58   369.68     6.60   510.19     0.33

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   302.36   204.15   223.03  1118.30     0.27
 MEAN    15.50   298.71   196.76   224.75  1116.32     0.27
 HUB     12.59   311.23   213.34   226.60  1114.35     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    367.29   276.32   163.13     0.25  3664.10
 MEAN   317.28   255.03   120.53     0.23  3050.65     1.79
 HUB    257.75   230.91    44.41     0.21  2687.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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  TIP      7.38     1.08     7.01   527.67     1.02   520.05     0.92     0.91
  MEAN     7.29     1.06     6.93   525.65     1.02   518.21     0.92     0.91
  HUB      7.23     1.06     6.85   524.45     1.02   516.38     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     42.47    36.18    31.50     4.68     0.93     0.47     2.90
  MEAN    41.20    28.20    23.50     4.70     0.93     0.45     3.34     0.91
  HUB     43.27    11.09     6.50     4.59     0.93     0.45     4.06


    blockage3   Cor/Incid
       0.950       1.000

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
      15.219     302.450     200.365     226.562    1116.416       0.271      -0.010

      Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
       7.293       6.930     518.297      46.000      41.489      33.000      -8.489

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
      15.219     238.557     200.365     311.537    1119.516       0.213       0.347

    BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
       0.950       7.287       7.060     521.179     440.827       0.035       0.482

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
      14.701     224.243       0.000     224.243    1120.109       0.200       0.402

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       7.077     521.731       0.000       0.060       0.060       0.393

     STAGE EXIT CONDITIONS, STAGE   5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.871       7.278       1.062     525.924      10.317     217.325       1.685

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   64169.988       0.476      96.831  322149.156

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     435892.53    657.7517     75.9758      1.5027      0.8042     17.7575      1.1538


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NPSS: Inlet Mach number .67, Altitude 34281ft, dT 22R, Thrust 10%
Stage 4 stator Blocked @ 20%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

          Fan Hub + 4 Stage LPC 100%  12-20-2010

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.761   EfDer =  0.932

    W act       RPM act        Pt         Tt           POTS        POTH       AeroBl
      26.699     2346.087       4.843     455.824       1.000       1.000       0.980
 W Kg/sec =  12.1360455

    W cor       RPM cor        GAMMA        Cp         R           Blades       THK
      75.967     2502.671       1.401       0.248      53.349      32.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
55858.254	20950.043	3.758	831.557	221.278	619.754	2.801

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	163.19	-0.06	163.19	0.16	450.54
MEAN	17.06	0.00	-0.02	163.19	-0.06	163.19	0.16	
HUB	12.51	0.00	-0.02	163.19	-0.06	163.19	0.16	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	68.88	50.47	18.41	422.37	452.85	4.76	453.60	0.43
MEAN	64.96	47.20	17.76	349.28	385.57	4.76	453.60	0.37
HUB	57.50	38.62	18.88	256.12	303.74	4.76	453.60	0.29

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	373.99	302.42	220.02	1057.19	0.35
MEAN	18.04	374.15	300.72	222.61	1054.12	0.35
HUB	15.00	399.01	328.74	226.15	1050.43	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	422.37	250.60	119.95	0.24	6240.02	
MEAN	369.26	232.93	68.54	0.22	5424.67	1.91
HUB	307.10	227.18	21.63	0.22	4931.75	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	5.53	1.14	5.07	476.38	1.05	464.71	0.92	0.85
MEAN	5.43	1.12	4.98	473.69	1.04	462.01	0.92	0.85
HUB	5.38	1.11	4.87	472.07	1.04	458.79	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	53.96	28.60	24.20	4.40	0.93	0.56	2.90	
MEAN	53.49	17.11	12.70	4.41	0.95	0.51	3.51	0.85
HUB	55.47	-5.46	-9.30	3.84	0.95	0.38	4.78	

blockage3	Cor/Incid
0.950	0.932

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	376.872	300.132	227.933	1054.327	0.357	0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
5.440	4.980	462.198	24.000	52.785	35.400	-17.385

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	241.553	300.132	385.262	1062.257	0.227	0.550

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	5.424	5.232	469.178	528.796	0.045	0.666

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	226.050	0.000	226.050	1062.941	0.213	0.512

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.223	469.782	0.000	0.060	0.116	0.531

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.778	5.390	1.113	474.044	18.220	157.572	1.221

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
113276.875	0.635	170.912	279816.031

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.761   EfDer =  0.936

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    26.699    2346.087       5.390     474.044       1.000       1.000       0.980
W Kg/sec =  12.1360455

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    69.611    2454.104       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 55858.254   20950.043       2.912     590.487     202.765     474.134       2.338

    ROTOR LEADING EDGE CONDITIONS, STAGE   2

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   216.58    -0.07   216.58     0.20   440.09
MEAN    18.08     0.00    -0.02   216.58    -0.07   216.58     0.20
HUB     15.21     0.00    -0.02   216.58    -0.07   216.58     0.20

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     62.77    46.36    16.41   420.73   473.27     5.24   470.13     0.45
MEAN    59.67    42.30    17.37   370.12   428.90     5.24   470.13     0.40
HUB     55.19    37.84    17.35   311.40   379.37     5.24   470.13     0.36

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

        R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   343.57   257.82   227.08  1076.15     0.32
MEAN    18.01   339.55   250.53   229.19  1073.64     0.32
HUB     15.22   355.36   269.53   231.60  1071.10     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    418.07   277.94   160.25     0.26  5266.16
MEAN   368.73   257.87   118.20     0.24  4513.34     1.84
HUB    311.67   235.40    42.14     0.22  4104.16

       Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     6.00     1.11     5.59   491.39     1.04   481.54     0.92     0.86
MEAN    5.91     1.10     5.52   488.91     1.03   479.29     0.92     0.86
HUB     5.86     1.09     5.43   487.56     1.03   477.03     0.92     0.86

       Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     48.63    35.21    31.50     3.71     0.93     0.51     2.90
MEAN    47.55    27.28    23.50     3.78     0.95     0.49     3.30     0.86
HUB     49.33    10.31     6.50     3.81     0.95     0.47     3.92


  blockage3   Cor/Incid
     0.950       0.936

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.960     342.763     251.231     233.172    1073.853       0.319       0.005

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     5.923       5.519     479.487      46.000      47.135      30.600     -16.535

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.960     236.215     251.231     344.840    1079.598       0.219       0.491

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       5.911       5.717     484.631     511.151       0.038       0.562

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    17.823     234.088       0.000     234.088    1079.691       0.217       0.419
```

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.692	484.715	0.000	0.060	0.111	0.429

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.786	5.881	1.091	489.284	15.241	174.878	1.356

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
94761.148	0.542	142.976	253669.469

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =17.761 EfDer = 0.957

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
26.699	2346.087	5.881	489.284	1.000	1.000	0.980

W Kg/sec = 12.1360455

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
64.815	2415.580	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
55858.254	20950.043	2.889	545.479	188.794	429.765	2.276

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	221.85	-0.08	221.85	0.21	423.06
MEAN	17.74	0.00	-0.02	221.85	-0.08	221.85	0.21	
HUB	15.05	0.00	-0.02	221.85	-0.08	221.85	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.64	46.36	15.28	410.90	467.04	5.71	485.18	0.43
MEAN	58.59	43.40	15.19	363.17	425.64	5.71	485.18	0.39
HUB	54.25	38.84	15.41	308.13	379.75	5.71	485.18	0.35

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	335.09	241.65	232.14	1091.83	0.31
MEAN	17.51	333.49	237.54	234.07	1089.65	0.31
HUB	14.85	351.92	260.83	236.25	1087.45	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	405.58	284.19	163.93	0.26	4788.61	
MEAN	358.42	263.44	120.88	0.24	4159.89	1.78
HUB	304.03	240.17	43.20	0.22	3874.43	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.48	1.10	6.07	505.05	1.03	495.69	0.92	0.88
MEAN	6.40	1.09	6.00	502.98	1.03	493.71	0.92	0.88
HUB	6.36	1.08	5.92	502.04	1.03	491.72	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	46.15	35.23	31.50	3.73	0.93	0.48	2.90	
MEAN	45.42	27.31	23.50	3.81	0.95	0.47	3.28	0.88
HUB	47.83	10.36	6.50	3.86	0.95	0.46	3.87	

blockage3	Cor/Incid
0.950	0.957

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	336.592	239.100	236.908	1089.871	0.309	0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
6.411	6.000	493.912	46.000	45.264	31.500	-13.764

```
    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth          Machth      cp 2-Th
     17.392     243.158     239.100     341.020    1094.844       0.222       0.454

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.402       6.186     498.429     471.992       0.031       0.534

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     17.121     236.985       0.000     236.985    1095.115       0.216       0.408

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.172     498.676       0.000       0.060       0.092       0.419

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4        Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.814       6.377       1.084     503.359      14.075     180.563       1.400

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  87521.211       0.532     132.052  252137.234


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.761   EfDer =  0.971

   W act       RPM act        Pt          Tt           POTS        POTH       AeroBl
     26.699    2346.087       6.377     503.359       1.000       1.000       0.980
W Kg/sec =  12.1360455

   W cor       RPM cor        GAMMA        Cp          R           Blades       THK
     60.634    2381.568       1.401       0.248      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1       A*       AthrRotor   ChokeMargin
  55858.254   20950.043       2.906     513.330     176.619     401.059       2.271

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   223.63    -0.08   223.63     0.20   400.27
 MEAN    16.97     0.00    -0.02   223.63    -0.08   223.63     0.20
 HUB     14.32     0.00    -0.02   223.63    -0.08   223.63     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.45    46.36    14.09   394.32   453.39     6.19   499.19     0.41
 MEAN    57.24    43.80    13.44   347.45   413.26     6.19   499.19     0.38
 HUB     52.67    37.84    14.83   293.18   368.80     6.19   499.19     0.34

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   321.73   222.01   232.86  1105.87     0.29
 MEAN    16.57   320.41   218.20   234.63  1103.89     0.29
 HUB     13.89   337.96   241.31   236.61  1101.88     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    386.54   285.12   164.53     0.26  4193.01
 MEAN   339.32   264.05   121.13     0.24  3617.68     1.72
 HUB    284.38   240.49    43.06     0.22  3352.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.94     1.09     6.54   517.17     1.03   508.53     0.92     0.89
 MEAN     6.86     1.08     6.47   515.27     1.02   506.71     0.92     0.89
 HUB      6.82     1.07     6.39   514.40     1.02   504.88     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.63    35.24    31.50     3.74     0.93     0.45     2.90
 MEAN    42.92    27.31    23.50     3.81     0.94     0.44     3.29     0.89
 HUB     45.56    10.32     6.50     3.82     0.94     0.43     3.90
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   blockage3   Cor/Incid
      0.750       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     370.523     219.424     298.563    1101.108       0.336      -0.291

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.867       6.349     504.164      46.000      36.313      32.400      -3.913

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     16.481     311.287     219.424     380.850    1104.779       0.282       0.076

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.750       6.865       6.497     507.532     357.476       0.015       0.400

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     16.096     296.123       0.000     296.123    1105.615       0.268       0.423

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750       6.521     508.300       0.000       0.060       0.042       0.136

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859       6.854       1.075     515.612      12.252     195.124       1.513

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  76195.969       0.510     114.965  258037.344


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.761   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.699    2346.087       6.854     515.612       1.000       1.000       0.780
W Kg/sec =  12.1360455

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     57.090    2353.102       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  55858.254   20950.043       2.439     405.654     166.297     307.615       1.850

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   272.20    -0.09   272.20     0.25   376.18
 MEAN    15.91     0.00    -0.02   272.20    -0.09   272.20     0.25
 HUB     13.07     0.00    -0.02   272.20    -0.09   272.20     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.04    47.36     6.68   375.07   463.51     6.57   509.43     0.42
 MEAN    50.13    44.80     5.33   325.79   424.61     6.57   509.43     0.38
 HUB     44.52    38.84     5.68   267.59   381.77     6.57   509.43     0.34

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   300.88   202.01   222.98  1118.25     0.27
 MEAN    15.50   297.45   194.92   224.69  1116.30     0.27
 HUB     12.59   310.11   211.81   226.50  1114.35     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    367.29   277.56   165.28     0.25  3625.78
 MEAN   317.29   255.85   122.37     0.23  3022.24     1.82
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  HUB    257.76   231.12    45.95     0.21  2667.89

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     7.37     1.08     7.01   527.55     1.02   520.00     0.92     0.91
  MEAN    7.29     1.06     6.93   525.56     1.02   518.18     0.92     0.91
  HUB     7.23     1.06     6.85   524.40     1.02   516.38     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP    42.17    36.55    31.50     5.05     0.93     0.48     2.90
  MEAN   40.94    28.57    23.50     5.07     0.92     0.47     3.34     0.91
  HUB    43.08    11.47     6.50     4.97     0.92     0.46     4.06


    blockage3   Cor/Incid
       0.950       0.998

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
      15.219     301.158     198.491     226.490    1116.391       0.270       -0.010

      Pt3         Ps3         Ts3        Vane No.     Alpha3     Vane A3      Incid3
       7.291       6.931     518.273      46.000      41.231      33.000       -8.231

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
      15.219     238.543     198.491     310.324    1119.421       0.213       0.342

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950       7.286       7.058     521.091     440.827       0.034       0.478

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4         Ao4          Mach4       cp 3-4
      14.701     224.223       0.000     224.223    1120.015       0.200       0.398

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       7.076     521.643       0.000       0.060       0.059       0.390

     STAGE EXIT CONDITIONS, STAGE   5
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.870       7.277        1.062      525.835      10.223     219.180       1.699

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   63584.641       0.471      95.937  344028.250

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     435339.88    656.8416      75.9670      1.5024      0.8048     17.7607      1.1536


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NPSS: Inlet Mach number .67, Altitude 34281ft, dT 22R, Thrust 10%
Stage 4 stator Blocked @ 25%

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*********************************************************************
**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

          Fan Hub + 4 Stage LPC 100%  12-20-2010

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.771   EfDer =  0.932

    W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
      26.688    2346.119       4.843     455.824       1.000       1.000       0.980
 W Kg/sec =  12.1308174
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
75.934	2502.706	1.401	0.248	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
55834.191	20941.020	3.760	831.557	221.183	619.754	2.802

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	163.12	-0.06	163.12	0.16	450.55
MEAN	17.06	0.00	-0.02	163.12	-0.06	163.12	0.16	
HUB	12.51	0.00	-0.02	163.12	-0.06	163.12	0.16	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	68.89	50.47	18.42	422.37	452.83	4.76	453.60	0.43
MEAN	64.97	47.20	17.77	349.29	385.55	4.76	453.60	0.37
HUB	57.51	38.62	18.89	256.13	303.71	4.76	453.60	0.29

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	373.97	302.47	219.93	1057.19	0.35
MEAN	18.04	374.12	300.75	222.52	1054.12	0.35
HUB	15.00	398.96	328.74	226.05	1050.43	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	422.37	250.49	119.90	0.24	6241.10	
MEAN	369.27	232.83	68.52	0.22	5425.25	1.91
HUB	307.11	227.08	21.63	0.22	4931.82	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	5.53	1.14	5.07	476.38	1.05	464.72	0.92	0.85
MEAN	5.43	1.12	4.98	473.69	1.04	462.02	0.92	0.85
HUB	5.38	1.11	4.87	472.07	1.04	458.79	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	53.98	28.60	24.20	4.40	0.93	0.56	2.90	
MEAN	53.50	17.11	12.70	4.41	0.95	0.51	3.51	0.85
HUB	55.49	-5.47	-9.30	3.83	0.95	0.38	4.78	

blockage3	Cor/Incid
0.950	0.932

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	376.837	300.163	227.833	1054.332	0.357	0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
5.440	4.980	462.203	24.000	52.800	35.400	-17.400

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	241.445	300.163	385.219	1062.264	0.227	0.551

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	5.424	5.232	469.184	528.796	0.045	0.666

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	225.950	0.000	225.950	1062.948	0.213	0.512

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.223	469.788	0.000	0.060	0.116	0.531

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.778	5.390	1.113	474.046	18.222	157.525	1.221

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 113290.156       0.635     170.859  279692.406


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.771   EfDer =  0.936

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.688    2346.119       5.390     474.046       1.000       1.000       0.980
W Kg/sec =  12.1308174

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     69.582    2454.133       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 55834.191   20941.020       2.913     590.487     202.679     474.134       2.339

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   216.49    -0.07   216.49     0.20   440.09
 MEAN    18.08     0.00    -0.02   216.49    -0.07   216.49     0.20
 HUB     15.21     0.00    -0.02   216.49    -0.07   216.49     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.78    46.36    16.42   420.74   473.23     5.24   470.14     0.45
 MEAN    59.68    42.30    17.38   370.13   428.86     5.24   470.14     0.40
 HUB     55.20    37.84    17.36   311.41   379.32     5.24   470.14     0.36

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   343.56   257.89   226.99  1076.16     0.32
 MEAN    18.01   339.52   250.58   229.09  1073.64     0.32
 HUB     15.22   355.32   269.56   231.50  1071.10     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    418.07   277.82   160.18     0.26  5267.68
 MEAN   368.73   257.76   118.15     0.24  4514.34     1.84
 HUB    311.67   235.30    42.11     0.22  4104.64

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.00     1.11     5.59   491.39     1.04   481.55     0.92     0.86
 MEAN     5.91     1.10     5.52   488.91     1.03   479.30     0.92     0.86
 HUB      5.86     1.09     5.43   487.56     1.03   477.03     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.65    35.21    31.50     3.71     0.93     0.51     2.90
 MEAN    47.57    27.28    23.50     3.78     0.95     0.49     3.30     0.86
 HUB     49.34    10.31     6.50     3.81     0.95     0.47     3.92


  blockage3   Cor/Incid
     0.950       0.936

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     342.735     251.286     233.072    1073.861       0.319       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.923       5.519     479.494      46.000      47.154      30.600     -16.554

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     236.111     251.286     344.809    1079.609       0.219       0.492

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       5.911       5.717     484.641     511.151       0.038       0.563
```

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	233.986	0.000	233.986	1079.702	0.217	0.420

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.692	484.724	0.000	0.060	0.111	0.429

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.786	5.881	1.091	489.290	15.244	174.812	1.355

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
94782.773	0.542	142.947	253554.734

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =17.771 EfDer = 0.957

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
26.688	2346.119	5.881	489.290	1.000	1.000	0.980

W Kg/sec = 12.1308174

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
64.787	2415.600	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
55834.191	20941.020	2.890	545.479	188.715	429.765	2.277

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	221.76	-0.08	221.76	0.21	423.06
MEAN	17.74	0.00	-0.02	221.76	-0.08	221.76	0.21	
HUB	15.05	0.00	-0.02	221.76	-0.08	221.76	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.65	46.36	15.29	410.91	467.00	5.71	485.19	0.43
MEAN	58.60	43.40	15.20	363.17	425.59	5.71	485.19	0.39
HUB	54.26	38.84	15.42	308.13	379.69	5.71	485.19	0.35

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	335.07	241.72	232.04	1091.84	0.31
MEAN	17.51	333.47	237.62	233.97	1089.66	0.31
HUB	14.85	351.87	260.85	236.15	1087.46	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	405.59	284.07	163.87	0.26	4789.99	
MEAN	358.42	263.31	120.81	0.24	4161.21	1.78
HUB	304.04	240.07	43.18	0.22	3874.81	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.48	1.10	6.07	505.06	1.03	495.70	0.92	0.88
MEAN	6.40	1.09	6.00	502.99	1.03	493.72	0.92	0.88
HUB	6.36	1.08	5.92	502.05	1.03	491.73	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	46.17	35.23	31.50	3.73	0.93	0.48	2.90	
MEAN	45.44	27.31	23.50	3.81	0.95	0.47	3.28	0.88
HUB	47.85	10.36	6.50	3.86	0.95	0.46	3.87	

blockage3	Cor/Incid
0.950	0.957

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	336.575	239.176	236.807	1089.883	0.309	0.007

```
     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.411       6.001     493.922      46.000      45.285      31.500     -13.785

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     243.051     239.176     340.997    1094.859       0.222       0.454

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.402       6.186     498.442     471.992       0.031       0.535

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.121     236.882       0.000     236.882    1095.130       0.216       0.408

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.172     498.689       0.000       0.060       0.092       0.420

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.814       6.376       1.084     503.369      14.079     180.492       1.399

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  87543.414       0.532     132.029  252021.828


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.771   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.688    2346.119       6.376     503.369       1.000       1.000       0.980
W Kg/sec =  12.1308174

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     60.608    2381.580       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  55834.191   20941.020       2.908     513.330     176.544     401.059       2.272

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   223.54    -0.08   223.54     0.20   400.27
 MEAN    16.97     0.00    -0.02   223.54    -0.08   223.54     0.20
 HUB     14.32     0.00    -0.02   223.54    -0.08   223.54     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.46    46.36    14.10   394.32   453.34     6.19   499.20     0.41
 MEAN    57.25    43.80    13.45   347.45   413.22     6.19   499.20     0.38
 HUB     52.68    37.84    14.84   293.18   368.74     6.19   499.20     0.34

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   321.71   222.08   232.76  1105.89     0.29
 MEAN    16.57   320.37   218.25   234.53  1103.90     0.29
 HUB     13.89   337.90   241.33   236.51  1101.90     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    386.54   285.00   164.47     0.26  4194.34
 MEAN   339.33   263.94   121.08     0.24  3618.49     1.72
 HUB    284.38   240.39    43.05     0.22  3353.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.94     1.09     6.54   517.18     1.03   508.55     0.92     0.89
 MEAN     6.86     1.08     6.47   515.28     1.02   506.72     0.92     0.89
 HUB      6.82     1.07     6.39   514.41     1.02   504.89     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     43.65    35.24    31.50     3.74     0.93     0.45     2.90
 MEAN    42.94    27.31    23.50     3.81     0.94     0.44     3.29     0.89
 HUB     45.58    10.32     6.50     3.82     0.94     0.43     3.90


   blockage3   Cor/Incid
      0.700       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     16.481     390.175     219.473     322.595    1099.759       0.355       -0.426

     Pt3         Ps3         Ts3        Vane No.     Alpha3     Vane A3      Incid3
      6.867       6.295     502.930      46.000      34.229      32.400       -1.829

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     16.481     336.566     219.473     401.802    1103.305       0.305       -0.073

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.700       6.865       6.436     506.178     332.702       0.014       0.370

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     16.096     319.843       0.000     319.843    1104.302       0.290       0.427

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.700       6.468     507.094       0.000       0.060       0.038       0.005

    STAGE EXIT CONDITIONS, STAGE   4
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.861       6.856        1.075     515.624      12.255     195.051       1.512

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  76213.438       0.510     114.941  257917.984


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.771   EfDer =  0.988

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     26.688     2346.119        6.856     515.624        1.000        1.000        0.730
W Kg/sec =  12.1308174

   W cor       RPM cor         GAMMA         Cp          R            Blades        THK
     57.052     2353.108        1.401        0.248      53.349       56.000        0.050

   CFM        SCFM             A1/A*       Area1       A*        AthrRotor   ChokeMargin
  55834.191   20941.020        2.284     379.651     166.186     286.949        1.727

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1       Stator    Alfa     C1       CU1        Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   291.98    -0.10   291.98      0.26   376.19
 MEAN    15.91      0.00    -0.02   291.98    -0.10   291.98      0.26
 HUB     13.07      0.00    -0.02   291.98    -0.10   291.98      0.26

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     52.11     47.36     4.75   375.08   475.41      6.53   508.52      0.43
 MEAN    48.14     44.80     3.34   325.80   437.57      6.53   508.52      0.40
 HUB     42.52     38.84     3.68   267.59   396.12      6.53   508.52      0.36

      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   299.16    199.36    223.05  1118.19      0.27
 MEAN    15.50   295.98    192.65    224.70  1116.26      0.27
 HUB     12.59   308.85    210.00    226.47  1114.35      0.28
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       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    367.30    279.20    167.94      0.25  3578.42
 MEAN   317.29    256.96    124.65      0.23  2987.17      1.86
 HUB    257.76    231.45     47.76      0.21  2645.24

         Pt2        PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP      7.36      1.07      7.01   527.40      1.02   519.94      0.92      0.90
 MEAN     7.28      1.06      6.93   525.46      1.02   518.15      0.92      0.90
 HUB      7.23      1.05      6.85   524.33      1.02   516.38      0.92      0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.79    36.98    31.50      5.48     0.93     0.48     2.90
 MEAN    40.61    29.02    23.50      5.52     0.92     0.48     3.34     0.90
 HUB     42.84    11.91     6.50      5.41     0.92     0.48     4.06


    blockage3   Cor/Incid
       0.950       0.988

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
      15.219     299.652     196.180     226.505     1116.361       0.268       -0.010

      Pt3         Ps3         Ts3        Vane No.     Alpha3     Vane A3      Incid3
       7.283       6.927     518.245       46.000      40.896      33.000       -7.896

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
      15.219     238.633     196.180     308.921     1119.307       0.213       0.337

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950       7.278       7.051     520.984      440.827       0.033       0.473

     VANED DIFFUSER EXIT:
    R4           C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
      14.701     224.298       0.000     224.298     1119.901       0.200       0.394

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       7.069     521.537       0.000       0.060       0.057       0.386

     STAGE EXIT CONDITIONS, STAGE   5
       Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
       0.863       7.270       1.060     525.732      10.108     221.484       1.717

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   62868.332       0.466      94.815  369105.625

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     434698.12    655.5907      75.9343      1.5010      0.8040     17.7707      1.1534


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NPSS: Inlet Mach number .67, Altitude 34281ft, dT 22R, Thrust 10%
Stage 4 stator Blocked @ 27%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

          Fan Hub + 4 Stage LPC 100%  12-20-2010

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.777   EfDer =  0.932

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
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    26.680    2346.150       4.843     455.824       1.000       1.000       0.980
W Kg/sec =  12.1273174

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    75.912    2502.738       1.401       0.248      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 55818.082   20934.977       3.761     831.557     221.119     619.754       2.803

    ROTOR LEADING EDGE CONDITIONS, STAGE   1

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   163.07    -0.06   163.07     0.16   450.56
MEAN    17.06     0.00    -0.02   163.07    -0.06   163.07     0.16
HUB     12.51     0.00    -0.02   163.07    -0.06   163.07     0.16

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     68.89    50.47    18.42   422.38   452.82     4.76   453.61     0.43
MEAN    64.98    47.20    17.78   349.29   385.53     4.76   453.61     0.37
HUB     57.52    38.62    18.90   256.13   303.68     4.76   453.61     0.29

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   373.97   302.51   219.86  1057.20     0.35
MEAN    18.04   374.09   300.77   222.45  1054.13     0.35
HUB     15.00   398.92   328.73   225.98  1050.44     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    422.38   250.42   119.87     0.24  6241.95
MEAN   369.27   232.76    68.50     0.22  5425.62     1.91
HUB    307.11   227.02    21.62     0.22  4931.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      5.53     1.14     5.07   476.38     1.05   464.72     0.92     0.85
MEAN     5.43     1.12     4.98   473.69     1.04   462.02     0.92     0.85
HUB      5.38     1.11     4.87   472.07     1.04   458.79     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     53.99    28.60    24.20     4.40     0.93     0.56     2.90
MEAN    53.51    17.12    12.70     4.42     0.95     0.51     3.51     0.85
HUB     55.49    -5.47    -9.30     3.83     0.95     0.38     4.78


  blockage3   Cor/Incid
     0.950       0.932

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    18.071     376.813     300.184     227.766    1054.335       0.357       0.002

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     5.440       4.980     462.206      24.000      52.810      35.400     -17.410

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    18.071     241.373     300.184     385.190    1062.269       0.227       0.551

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       5.424       5.232     469.188     528.796       0.045       0.666

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    18.083     225.884       0.000     225.884    1062.952       0.213       0.512

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       5.223     469.792       0.000       0.060       0.116       0.531

   STAGE EXIT CONDITIONS, STAGE   1
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      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.778       5.390       1.113     474.047      18.224     157.495       1.221

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 113299.266       0.635     170.823  279609.781


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.777   EfDer =  0.936

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.680    2346.150       5.390     474.047       1.000       1.000       0.980
W Kg/sec =  12.1273174

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     69.562    2454.161       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  55818.082   20934.977       2.914     590.487     202.622     474.134       2.340

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   216.42    -0.07   216.42     0.20   440.10
 MEAN    18.08     0.00    -0.02   216.42    -0.07   216.42     0.20
 HUB     15.21     0.00    -0.02   216.42    -0.07   216.42     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.78    46.36    16.42   420.74   473.21     5.24   470.14     0.45
 MEAN    59.69    42.30    17.39   370.13   428.83     5.24   470.14     0.40
 HUB     55.21    37.84    17.37   311.41   379.29     5.24   470.14     0.36

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   343.56   257.95   226.92  1076.17     0.32
 MEAN    18.01   339.51   250.63   229.02  1073.65     0.32
 HUB     15.22   355.27   269.55   231.43  1071.11     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    418.08   277.73   160.12     0.26  5268.96
 MEAN   368.74   257.68   118.11     0.24  4515.12     1.84
 HUB    311.68   235.23    42.13     0.22  4104.49

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.00     1.11     5.59   491.40     1.04   481.56     0.92     0.86
 MEAN     5.91     1.10     5.52   488.92     1.03   479.30     0.92     0.86
 HUB      5.86     1.09     5.43   487.56     1.03   477.04     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.66    35.21    31.50     3.71     0.93     0.51     2.90
 MEAN    47.58    27.28    23.50     3.78     0.95     0.49     3.30     0.86
 HUB     49.35    10.32     6.50     3.82     0.95     0.47     3.92


  blockage3   Cor/Incid
     0.950       0.936

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.960     342.722     251.330     233.005    1073.866       0.319       0.005

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     5.923       5.519     479.498      46.000      47.167      30.600     -16.567

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.960     236.041     251.330     344.793    1079.616       0.219       0.492
```

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	5.911	5.717	484.647	511.151	0.038	0.563

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	233.918	0.000	233.918	1079.709	0.217	0.420

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.692	484.731	0.000	0.060	0.111	0.430

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.786	5.881	1.091	489.294	15.246	174.769	1.355

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
94797.195	0.542	142.927	253477.891

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =17.777 EfDer = 0.957

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
26.680	2346.150	5.881	489.294	1.000	1.000	0.980

W Kg/sec = 12.1273174

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
64.769	2415.622	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
55818.082	20934.977	2.891	545.479	188.662	429.765	2.278

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	221.69	-0.08	221.69	0.21	423.07
MEAN	17.74	0.00	-0.02	221.69	-0.08	221.69	0.21	
HUB	15.05	0.00	-0.02	221.69	-0.08	221.69	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.66	46.36	15.30	410.91	466.97	5.71	485.20	0.43
MEAN	58.60	43.40	15.20	363.18	425.56	5.71	485.20	0.39
HUB	54.27	38.84	15.43	308.13	379.66	5.71	485.20	0.35

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	335.07	241.78	231.98	1091.85	0.31
MEAN	17.51	333.45	237.66	233.90	1089.67	0.31
HUB	14.85	351.83	260.87	236.08	1087.46	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	405.59	283.98	163.81	0.26	4791.19	
MEAN	358.43	263.24	120.77	0.24	4161.93	1.78
HUB	304.04	240.00	43.17	0.22	3875.05	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.48	1.10	6.07	505.07	1.03	495.71	0.92	0.88
MEAN	6.40	1.09	6.00	503.00	1.03	493.73	0.92	0.88
HUB	6.36	1.08	5.92	502.05	1.03	491.73	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	46.19	35.23	31.50	3.73	0.93	0.48	2.90	
MEAN	45.46	27.31	23.50	3.81	0.95	0.47	3.28	0.88
HUB	47.86	10.36	6.50	3.86	0.95	0.46	3.87	

blockage3	Cor/Incid
0.950	0.957

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     336.557     239.218     236.739    1089.891       0.309       0.007

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.411       6.001     493.929      46.000      45.298      31.500     -13.798

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth       Cmth       Aoth         Machth      cp 2-Th
     17.392     242.979     239.218     340.975    1094.869       0.222       0.454

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.402       6.186     498.452     471.992       0.031       0.535

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.121     236.813       0.000     236.813    1095.140       0.216       0.408

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.172     498.698       0.000       0.060       0.093       0.420

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.814       6.377       1.084     503.375      14.081     180.444       1.399

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  87559.367       0.532     132.015  251944.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.777   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.680    2346.150       6.377     503.375       1.000       1.000       0.980
W Kg/sec =  12.1273174

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     60.591    2381.596       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  55818.082   20934.977       2.908     513.330     176.494     401.059       2.272

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   223.47    -0.08   223.47     0.20   400.28
 MEAN    16.97     0.00    -0.02   223.47    -0.08   223.47     0.20
 HUB     14.32     0.00    -0.02   223.47    -0.08   223.47     0.20

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.46    46.36    14.10   394.33   453.32     6.19   499.21     0.41
 MEAN    57.26    43.80    13.46   347.46   413.18     6.19   499.21     0.38
 HUB     52.69    37.84    14.85   293.19   368.71     6.19   499.21     0.34

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   321.70   222.14   232.69  1105.90     0.29
 MEAN    16.57   320.34   218.29   234.46  1103.91     0.29
 HUB     13.89   337.86   241.35   236.44  1101.91     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    386.55   284.92   164.41     0.26  4195.51
 MEAN   339.33   263.86   121.05     0.24  3619.14     1.72
 HUB    284.38   240.32    43.04     0.22  3353.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.94     1.09     6.54   517.19     1.03   508.56     0.92     0.89
 MEAN     6.86     1.08     6.47   515.29     1.02   506.73     0.92     0.89
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 HUB      6.82     1.07     6.39   514.42     1.02   504.90     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.67    35.24    31.50     3.74     0.93     0.46     2.90
 MEAN    42.95    27.31    23.50     3.81     0.94     0.44     3.29     0.89
 HUB     45.59    10.32     6.50     3.82     0.94     0.43     3.90


   blockage3   Cor/Incid
      0.680       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     399.139     219.513     333.355    1099.123       0.363      -0.490

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.867       6.269     502.349      46.000      33.365      32.400      -0.965

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     16.481     347.909     219.513     411.372    1102.609       0.316      -0.144

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.680       6.866       6.407     505.540     322.792       0.014       0.357

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     16.096     330.475       0.000     330.475    1103.684       0.299       0.429

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680       6.443     506.526       0.000       0.060       0.037      -0.057

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862       6.856       1.075     515.633      12.258     194.997       1.512

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  76228.242       0.510     114.931  257837.969


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.777   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.680    2346.150       6.856     515.633       1.000       1.000       0.710
W Kg/sec =  12.1273174

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     57.032    2353.118       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  55818.082   20934.977       2.223     369.249     166.129     278.683       1.678

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   300.74    -0.10   300.74     0.27   376.19
 MEAN    15.91     0.00    -0.02   300.74    -0.10   300.74     0.27
 HUB     13.07     0.00    -0.02   300.74    -0.10   300.74     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.28    47.36     3.92   375.08   480.85     6.51   508.09     0.44
 MEAN    47.30    44.80     2.50   325.80   443.47     6.51   508.09     0.40
 HUB     41.67    38.84     2.83   267.60   402.63     6.51   508.09     0.36

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   298.39   198.14   223.11  1118.16     0.27
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 MEAN    15.50   295.33   191.61   224.74  1116.25     0.26
 HUB     12.59   308.29   209.17   226.48  1114.35     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    367.30   280.00   169.17     0.25  3556.45
 MEAN   317.30   257.50   125.69     0.23  2971.14     1.88
 HUB    257.77   231.64    48.60     0.21  2634.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     7.36     1.07     7.00   527.34     1.02   519.92     0.92     0.90
 MEAN    7.27     1.06     6.93   525.41     1.02   518.14     0.92     0.90
 HUB     7.23     1.05     6.85   524.31     1.02   516.38     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    41.61    37.17    31.50     5.67     0.93     0.49     2.90
 MEAN   40.45    29.22    23.50     5.72     0.91     0.48     3.34     0.90
 HUB    42.72    12.11     6.50     5.61     0.91     0.49     4.06


   blockage3   Cor/Incid
      0.950       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     15.219      298.988     195.123     226.541     1116.349       0.268       -0.010

     Pt3         Ps3         Ts3        Vane No.     Alpha3     Vane A3      Incid3
      7.278       6.924      518.234      46.000      40.739      33.000       -7.739

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     15.219      238.705     195.123     308.307     1119.256       0.213       0.334

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       7.274       7.046     520.937     440.827       0.032       0.470

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4          Mach4       cp 3-4
     14.701      224.361       0.000     224.361     1119.851       0.200       0.392

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       7.064     521.490       0.000       0.060       0.056       0.384

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.857       7.265        1.060     525.688      10.055     222.563       1.725

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  62538.066       0.464      94.290  380195.375

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    434422.16    654.9855      75.9124      1.5000      0.8032     17.7775      1.1533


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NPSS: Inlet Mach number .67, Altitude 34281ft, dT 22R, Thrust 10%
Stage 4 stator Blocked @ 30%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
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          Fan Hub + 4 Stage LPC 100%  12-20-2010

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
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 RESET =  0.000BLEED =  0.000 DPInc =17.791   EfDer =  0.932

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.665    2346.163       4.843     455.824       1.000       1.000       0.980
W Kg/sec =  12.1202726

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     75.868    2502.752       1.401       0.248      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  55785.656   20922.814       3.763     831.557     220.990     619.754       2.804

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   162.97    -0.06   162.97     0.16   450.56
 MEAN    17.06     0.00    -0.02   162.97    -0.06   162.97     0.16
 HUB     12.51     0.00    -0.02   162.97    -0.06   162.97     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     68.90    50.47    18.43   422.38   452.78     4.76   453.61     0.43
 MEAN    64.99    47.20    17.79   349.29   385.49     4.76   453.61     0.37
 HUB     57.54    38.62    18.92   256.13   303.63     4.76   453.61     0.29

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.63   373.95   302.58   219.74  1057.20     0.35
 MEAN    18.04   374.05   300.81   222.32  1054.13     0.35
 HUB     15.00   398.84   328.73   225.85  1050.44     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    422.38   250.27   119.80     0.24  6243.32
 MEAN   369.27   232.62    68.46     0.22  5426.44     1.91
 HUB    307.11   226.88    21.61     0.22  4931.61

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      5.53     1.14     5.07   476.39     1.05   464.72     0.92     0.85
 MEAN     5.43     1.12     4.98   473.70     1.04   462.03     0.92     0.85
 HUB      5.38     1.11     4.87   472.07     1.04   458.80     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     54.01    28.60    24.20     4.40     0.93     0.56     2.90
 MEAN    53.53    17.12    12.70     4.42     0.95     0.51     3.51     0.85
 HUB     55.51    -5.47    -9.30     3.83     0.95     0.38     4.78


  blockage3   Cor/Incid
     0.950       0.932

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    18.071     376.768     300.230     227.632    1054.341       0.357       0.002

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     5.440       4.980     462.211      24.000      52.831      35.400     -17.431

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    18.071     241.228     300.230     385.135    1062.279       0.227       0.551

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       5.424       5.232     469.197     528.796       0.045       0.667

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    18.083     225.750       0.000     225.750    1062.961       0.212       0.512

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950       5.223     469.799       0.000       0.060       0.117       0.531

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4        Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.778       5.390       1.113     474.050      18.226     157.433       1.220

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 113314.062       0.635     170.746  279443.281


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.791   EfDer =  0.936

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.665    2346.163       5.390     474.050       1.000       1.000       0.980
W Kg/sec =  12.1202726

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     69.523    2454.168       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  55785.656   20922.814       2.916     590.487     202.507     474.134       2.341

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   216.30    -0.07   216.30     0.20   440.10
 MEAN    18.08     0.00    -0.02   216.30    -0.07   216.30     0.20
 HUB     15.21     0.00    -0.02   216.30    -0.07   216.30     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.80    46.36    16.44   420.74   473.15     5.24   470.15     0.44
 MEAN    59.70    42.30    17.40   370.14   428.77     5.24   470.15     0.40
 HUB     55.22    37.84    17.38   311.41   379.22     5.24   470.15     0.36

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   343.54   258.04   226.79  1076.18     0.32
 MEAN    18.01   339.47   250.69   228.89  1073.66     0.32
 HUB     15.22   355.22   269.59   231.30  1071.12     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    418.08   277.57   160.04     0.26  5270.75
 MEAN   368.74   257.54   118.04     0.24  4516.34     1.84
 HUB    311.68   235.09    42.08     0.22  4105.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.00     1.11     5.59   491.41     1.04   481.57     0.92     0.86
 MEAN     5.91     1.10     5.52   488.92     1.03   479.31     0.92     0.86
 HUB      5.86     1.09     5.43   487.57     1.03   477.05     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.69    35.21    31.50     3.71     0.93     0.51     2.90
 MEAN    47.60    27.28    23.50     3.78     0.95     0.49     3.30     0.86
 HUB     49.37    10.31     6.50     3.81     0.95     0.47     3.92


  blockage3   Cor/Incid
     0.950       0.936

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     342.680     251.398     232.870    1073.876       0.319       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      5.923       5.519     479.507      46.000      47.191      30.600     -16.591

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.960     235.902     251.398     344.747    1079.629       0.219       0.492

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.911       5.718     484.659     511.151       0.038       0.563

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     233.782       0.000     233.782    1079.722       0.217       0.420

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.692     484.742       0.000       0.060       0.111       0.430

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.786       5.881       1.091     489.300      15.251     174.683       1.354

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94822.812       0.542     142.883  253323.469


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.791   EfDer =  0.957

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.665    2346.163       5.881     489.300       1.000       1.000       0.980
W Kg/sec =  12.1202726

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     64.733    2415.620       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  55785.656   20922.814       2.893     545.479     188.556     429.765       2.279

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   221.57    -0.08   221.57     0.21   423.07
 MEAN    17.74     0.00    -0.02   221.57    -0.08   221.57     0.21
 HUB     15.05     0.00    -0.02   221.57    -0.08   221.57     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.67    46.36    15.31   410.92   466.91     5.71   485.21     0.43
 MEAN    58.62    43.40    15.22   363.18   425.50     5.71   485.21     0.39
 HUB     54.29    38.84    15.45   308.14   379.59     5.71   485.21     0.35

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   335.05   241.88   231.84  1091.87     0.31
 MEAN    17.51   333.40   237.72   233.76  1089.68     0.31
 HUB     14.85   351.77   260.91   235.95  1087.48     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    405.59   283.82   163.71     0.26  4793.22
 MEAN   358.43   263.09   120.71     0.24  4162.97     1.78
 HUB    304.04   239.86    43.14     0.22  3875.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.48     1.10     6.07   505.08     1.03   495.72     0.92     0.88
 MEAN     6.40     1.09     6.00   503.01     1.03   493.74     0.92     0.88
 HUB      6.36     1.08     5.92   502.06     1.03   491.74     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.21    35.23    31.50     3.73     0.93     0.48     2.90
 MEAN    45.48    27.31    23.50     3.81     0.95     0.47     3.28     0.88
 HUB     47.88    10.36     6.50     3.86     0.95     0.46     3.87
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   blockage3   Cor/Incid
      0.950       0.957

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     336.503     239.278     236.602    1089.906       0.309       0.007

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.411       6.001     493.943      46.000      45.322      31.500     -13.822

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     242.836     239.278     340.915    1094.887       0.222       0.455

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.402       6.187     498.468     471.992       0.031       0.535

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.121     236.676       0.000     236.676    1095.157       0.216       0.409

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.172     498.714       0.000       0.060       0.093       0.420

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.814       6.376       1.084     503.385      14.085     180.354       1.398

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  87584.414       0.532     131.976  251789.453


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.791   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.665    2346.163       6.376     503.385       1.000       1.000       0.980
W Kg/sec =  12.1202726

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     60.557    2381.584       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  55785.656   20922.814       2.910     513.330     176.395     401.059       2.274

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   223.34    -0.08   223.34     0.20   400.27
 MEAN    16.97     0.00    -0.02   223.34    -0.08   223.34     0.20
 HUB     14.32     0.00    -0.02   223.34    -0.08   223.34     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.48    46.36    14.12   394.33   453.26     6.19   499.23     0.41
 MEAN    57.27    43.80    13.47   347.46   413.12     6.19   499.23     0.38
 HUB     52.71    37.84    14.87   293.19   368.63     6.19   499.23     0.34

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   321.68   222.24   232.56  1105.92     0.29
 MEAN    16.57   320.30   218.37   234.33  1103.93     0.29
 HUB     13.89   337.79   241.38   236.30  1101.93     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    386.55   284.75   164.31     0.26  4197.44
 MEAN   339.34   263.71   120.96     0.24  3620.56     1.72
 HUB    284.39   240.18    43.01     0.22  3353.87
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      6.94     1.09     6.54   517.21     1.03   508.58     0.92     0.89
MEAN     6.86     1.08     6.47   515.31     1.02   506.75     0.92     0.89
HUB      6.82     1.07     6.39   514.43     1.02   504.91     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.70    35.24    31.50     3.74     0.93     0.46     2.90
MEAN    42.98    27.30    23.50     3.80     0.94     0.44     3.29     0.89
HUB     45.61    10.31     6.50     3.81     0.94     0.43     3.90


   blockage3   Cor/Incid
      0.650       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     414.005     219.599     350.965    1098.036       0.377      -0.598

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.867       6.225     501.355      46.000      32.034      32.400       0.366

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth       Cmth      Aoth         Machth      cp 2-Th
     16.481     366.508     219.599     427.261    1101.416       0.333      -0.266

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.650       6.865       6.358     504.447     307.928       0.015       0.338

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4        cp 3-4
     16.096     347.890       0.000     347.890    1102.626       0.316       0.429

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650       6.399     505.556       0.000       0.060       0.037      -0.165

    STAGE EXIT CONDITIONS, STAGE   4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.862       6.857       1.075     515.647      12.262     194.891       1.511

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  76254.625       0.510     114.904  257677.891


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.791   EfDer =  0.967

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.665    2346.163       6.857     515.647       1.000       1.000       0.680
W Kg/sec =  12.1202726

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     56.999    2353.098       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  55785.656   20922.814       2.130     353.647     166.031     266.284       1.604

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   314.96    -0.11   314.96     0.29   376.18
 MEAN    15.91     0.00    -0.02   314.96    -0.11   314.96     0.29
 HUB     13.07     0.00    -0.02   314.96    -0.11   314.96     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.99    47.36     2.63   375.09   489.87     6.48   507.38     0.44
 MEAN    45.98    44.80     1.18   325.80   453.23     6.48   507.38     0.41
 HUB     40.36    38.84     1.52   267.60   413.36     6.48   507.38     0.37

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     17.94   297.14   196.09   223.26  1118.11     0.27
  MEAN    15.50   294.26   189.84   224.83  1116.23     0.26
  HUB     12.59   307.38   207.77   226.53  1114.36     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    367.31   281.35   171.22     0.25  3519.76
  MEAN   317.30   258.44   127.46     0.23  2943.87     1.90
  HUB    257.77   231.98    50.00     0.21  2617.25

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     7.34     1.07     6.99   527.24     1.02   519.87     0.92     0.88
  MEAN    7.26     1.06     6.92   525.34     1.02   518.12     0.92     0.88
  HUB     7.22     1.05     6.85   524.26     1.02   516.39     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP    41.29    37.49    31.50     5.99     0.93     0.49     2.90
  MEAN   40.18    29.55    23.50     6.05     0.91     0.49     3.34     0.88
  HUB    42.53    12.45     6.50     5.95     0.91     0.50     4.06


    blockage3   Cor/Incid
       0.950       0.967

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
      15.219     297.889     193.326     226.633    1116.328       0.267       -0.010

      Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
       7.268       6.917     518.214      46.000      40.465      33.000      -7.465

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
      15.219     238.861     193.326     307.294    1119.169       0.213       0.330

    BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
       0.950       7.264       7.037     520.856     440.827       0.031       0.465

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
      14.701     224.500       0.000     224.500    1119.765       0.200       0.388

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       7.055     521.411       0.000       0.060       0.055       0.381

     STAGE EXIT CONDITIONS, STAGE   5
       Eff4        Pt4          PR4        Texit         Del T       Ns        Ns nondim
       0.844       7.255        1.058     525.613       9.966     224.397       1.740

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   61982.320       0.459      93.397  398153.562

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     433958.22    653.9059      75.8683      1.4981      0.8013     17.7907      1.1531


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NPSS: Inlet Mach number .67, Altitude 34281ft, dT 22R, Thrust 10%
Stage 4 stator Blocked @ 35%

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*********************************************************************
**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
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        Fan Hub + 4 Stage LPC 100%  12-20-2010

    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
 RESET =  0.000BLEED =  0.000 DPInc =17.822   EfDer =  0.932

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    26.628    2346.174       4.843     455.824       1.000       1.000       0.980
W Kg/sec =  12.1034088

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    75.763    2502.764       1.401       0.248      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 55708.035   20893.705       3.768     831.557     220.683     619.754       2.808

    ROTOR LEADING EDGE CONDITIONS, STAGE   1

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   162.74    -0.06   162.74     0.16   450.56
MEAN    17.06     0.00    -0.02   162.74    -0.06   162.74     0.16
HUB     12.51     0.00    -0.02   162.74    -0.06   162.74     0.16

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     68.93    50.47    18.46   422.38   452.70     4.76   453.61     0.43
MEAN    65.02    47.20    17.82   349.29   385.40     4.76   453.61     0.37
HUB     57.57    38.62    18.95   256.13   303.51     4.76   453.61     0.29

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   373.89   302.73   219.43  1057.22     0.35
MEAN    18.04   373.94   300.90   222.01  1054.15     0.35
HUB     15.00   398.61   328.68   225.53  1050.46     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    422.38   249.93   119.65     0.24  6246.50
MEAN   369.27   232.30    68.37     0.22  5428.04     1.92
HUB    307.11   226.56    21.56     0.22  4930.85

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      5.53     1.14     5.07   476.40     1.05   464.74     0.92     0.85
MEAN     5.43     1.12     4.98   473.70     1.04   462.04     0.92     0.85
HUB      5.38     1.11     4.87   472.06     1.04   458.81     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     54.06    28.60    24.20     4.40     0.93     0.56     2.90
MEAN    53.58    17.12    12.70     4.42     0.95     0.51     3.51     0.85
HUB     55.54    -5.46    -9.30     3.84     0.95     0.38     4.78


  blockage3   Cor/Incid
     0.950       0.932

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    18.071     376.645     300.318     227.311    1054.355       0.357       0.002

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     5.440       4.981     462.223      24.000      52.878      35.400     -17.478

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    18.071     240.882     300.318     384.987    1062.299       0.227       0.552

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       5.424       5.233     469.215     528.796       0.045       0.668

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
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     18.083     225.432       0.000     225.432    1062.979       0.212       0.513

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.223     469.816       0.000       0.060       0.117       0.532

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.777       5.390       1.113     474.054      18.231     157.293       1.219

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 113342.141       0.635     170.551  279044.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.822   EfDer =  0.936

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.628    2346.174       5.390     474.054       1.000       1.000       0.980
W Kg/sec =  12.1034088

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     69.429    2454.168       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  55708.035   20893.705       2.920     590.487     202.233     474.134       2.344

    ROTOR LEADING EDGE CONDITIONS, STAGE   2

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   215.99    -0.07   215.99     0.20   440.10
 MEAN    18.08     0.00    -0.02   215.99    -0.07   215.99     0.20
 HUB     15.21     0.00    -0.02   215.99    -0.07   215.99     0.20

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.83    46.36    16.47   420.75   473.01     5.24   470.16     0.44
 MEAN    59.74    42.30    17.44   370.14   428.61     5.24   470.16     0.40
 HUB     55.26    37.84    17.42   311.41   379.05     5.24   470.16     0.36

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   343.49   258.26   226.48  1076.20     0.32
 MEAN    18.01   339.37   250.85   228.58  1073.68     0.32
 HUB     15.22   355.05   269.64   230.98  1071.14     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    418.08   277.20   159.83     0.26  5275.10
 MEAN   368.74   257.19   117.89     0.24  4519.07     1.84
 HUB    311.68   234.77    42.03     0.22  4105.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.00     1.11     5.59   491.43     1.04   481.59     0.92     0.86
 MEAN     5.91     1.10     5.52   488.94     1.03   479.33     0.92     0.86
 HUB      5.86     1.09     5.43   487.58     1.03   477.06     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.75    35.21    31.50     3.71     0.93     0.51     2.90
 MEAN    47.66    27.28    23.50     3.78     0.95     0.49     3.30     0.86
 HUB     49.42    10.31     6.50     3.81     0.95     0.47     3.92


  blockage3   Cor/Incid
     0.950       0.936

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     342.573     251.550     232.549    1073.897       0.319       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
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      5.923       5.519     479.527      46.000      47.248      30.600     -16.648

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     235.570     251.550     344.631    1079.659       0.218       0.493

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       5.911       5.718     484.686     511.151       0.038       0.564

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     17.823     233.457       0.000     233.457    1079.751       0.216       0.421

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       5.692     484.768       0.000       0.060       0.111       0.430

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.785       5.881       1.091     489.314      15.259     174.486       1.353

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94876.891       0.543     142.765  252954.484


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.822   EfDer =  0.956

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     26.628    2346.174       5.881     489.314       1.000       1.000       0.980
W Kg/sec =  12.1034088

   W cor       RPM cor         GAMMA         Cp          R           Blades        THK
     64.646    2415.598       1.401       0.248      53.349      56.000       0.050

   CFM        SCFM            A1/A*       Area1       A*        AthrRotor   ChokeMargin
  55708.035   20893.705       2.897     545.479     188.303     429.765       2.282

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1       Stator    Alfa      C1       CU1        Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   221.26    -0.08   221.26      0.20   423.06
 MEAN    17.74      0.00    -0.02   221.26    -0.08   221.26      0.20
 HUB     15.05      0.00    -0.02   221.26    -0.08   221.26      0.20

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     61.70    46.36    15.34   410.92   466.77      5.71   485.23      0.43
 MEAN    58.65    43.40    15.25   363.18   425.34      5.71   485.23      0.39
 HUB     54.33    38.84    15.49   308.14   379.41      5.71   485.23      0.35

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
   B2 axial    THK         AeroBl      Blades2
     0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   334.99   242.10   231.53  1091.90      0.31
 MEAN    17.51   333.29   237.88   233.44  1089.71      0.31
 HUB     14.85   351.60   260.96   235.63  1087.51      0.32

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    405.59   283.43   163.49      0.26  4797.55
 MEAN   358.43   262.74   120.56      0.24  4165.73      1.78
 HUB    304.04   239.53    43.08      0.22  3876.44

         Pt2        PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP      6.48      1.10      6.07   505.11      1.03   495.75      0.92      0.87
 MEAN     6.40      1.09      6.00   503.03      1.03   493.77      0.92      0.87
 HUB      6.36      1.08      5.92   502.08      1.03   491.77      0.92      0.87

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.28    35.23    31.50     3.73     0.93     0.48     2.90
 MEAN    45.54    27.31    23.50     3.81     0.95     0.47     3.28     0.87
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HUB     47.92    10.36     6.50     3.86     0.95     0.46     3.87


   blockage3   Cor/Incid
      0.950       0.956

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     17.392     336.388     239.436     236.279    1089.937       0.309        0.007

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.411       6.001     493.971      46.000      45.380      31.500     -13.880

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     17.392     242.497     239.436     340.785    1094.926       0.221        0.456

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       6.402       6.187     498.504     471.992       0.031        0.536

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4          Mach4        cp 3-4
     17.121     236.350       0.000     236.350    1095.195       0.216        0.409

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       6.172     498.749       0.000       0.060       0.093        0.421

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4        Pt4          PR4        Texit        Del T        Ns         Ns nondim
      0.813       6.376       1.084     503.407      14.094     180.145        1.396

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  87639.062       0.533     131.874  251419.172


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.822   EfDer =  0.970

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     26.628     2346.174       6.376     503.407       1.000        1.000        0.980
W Kg/sec =  12.1034088

   W cor       RPM cor         GAMMA         Cp          R           Blades        THK
     60.476     2381.543       1.401       0.248      53.349      56.000        0.050

   CFM        SCFM             A1/A*       Area1       A*        AthrRotor   ChokeMargin
  55708.035   20893.705        2.914     513.330     176.160     401.059        2.277

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1       Stator    Alfa     C1       CU1        Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   223.04    -0.08   223.04     0.20   400.27
 MEAN    16.97      0.00    -0.02   223.04    -0.08   223.04     0.20
 HUB     14.32      0.00    -0.02   223.04    -0.08   223.04     0.20

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     60.51     46.36    14.15   394.33   453.11      6.19   499.26      0.41
 MEAN    57.31     43.80    13.51   347.46   412.95      6.19   499.26      0.38
 HUB     52.75     37.84    14.91   293.19   368.45      6.19   499.26      0.34

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   321.60    222.46    232.24  1105.96      0.29
 MEAN    16.57   320.17    218.52    234.01  1103.97      0.29
 HUB     13.89   337.62    241.45    235.98  1101.96      0.31

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    386.55    284.37    164.09     0.26  4201.51
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 MEAN   339.34   263.35   120.81     0.24  3623.07     1.73
 HUB    284.39   239.86    42.93     0.22  3354.89

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     6.94     1.09     6.54   517.24     1.03   508.62     0.92     0.89
 MEAN    6.86     1.08     6.47   515.34     1.02   506.79     0.92     0.89
 HUB     6.82     1.07     6.39   514.45     1.02   504.95     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    43.77    35.24    31.50     3.74     0.93     0.46     2.90
 MEAN   43.04    27.31    23.50     3.81     0.94     0.44     3.29     0.89
 HUB    45.66    10.31     6.50     3.81     0.94     0.43     3.90


  blockage3   Cor/Incid
     0.600       0.970

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    16.481     443.380     219.752     385.091    1095.767       0.405      -0.823

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     6.867       6.134     499.286      46.000      29.711      32.400       2.689

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    16.481     402.700     219.752     458.758    1098.912       0.366      -0.519

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.600       6.865       6.256     502.156     283.154       0.017       0.306

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    16.096     381.693       0.000     381.693    1100.414       0.347       0.428

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.600       6.308     503.530       0.000       0.060       0.039      -0.392

   STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.860       6.856       1.075     515.678      12.270     194.659       1.509

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  76306.820       0.511     114.822  257296.031


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.822   EfDer =  0.930

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.628    2346.174       6.856     515.678       1.000       1.000       0.630
W Kg/sec =  12.1034088

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     56.930    2353.039       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 55708.035   20893.705       1.976     327.644     165.830     245.618       1.481

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   342.04    -0.12   342.04     0.31   376.17
 MEAN    15.91     0.00    -0.02   342.04    -0.12   342.04     0.31
 HUB     13.07     0.00    -0.02   342.04    -0.12   342.04     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.65    47.36     0.29   375.09   507.71     6.41   505.92     0.46
 MEAN    43.62    44.80    -1.18   325.81   472.46     6.41   505.92     0.43
 HUB     38.05    38.84    -0.79   267.60   434.35     6.41   505.92     0.39
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      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   294.76   192.01   223.65  1118.01     0.26
MEAN    15.50   292.27   186.43   225.09  1116.18     0.26
HUB     12.59   305.70   205.08   226.70  1114.36     0.27

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    367.31   284.17   175.30     0.25  3446.75
MEAN   317.30   260.37   130.87     0.23  2891.13     1.96
HUB    257.77   232.74    52.69     0.21  2583.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      7.31     1.07     6.97   527.03     1.02   519.78     0.92     0.85
MEAN     7.24     1.06     6.90   525.20     1.02   518.07     0.92     0.85
HUB      7.20     1.05     6.83   524.18     1.02   516.39     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.65    38.09    31.50     6.59     0.93     0.50     2.90
MEAN    39.63    30.17    23.50     6.67     0.90     0.51     3.34     0.85
HUB     42.13    13.08     6.50     6.58     0.90     0.52     4.06


   blockage3   Cor/Incid
      0.950       0.930

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     295.857     189.851     226.910    1116.280       0.265      -0.011

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.243       6.898     518.170      46.000      39.919      33.000      -6.919

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     239.266     189.851     305.437    1118.996       0.214       0.321

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       7.240       7.013     520.695     440.827       0.030       0.457

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     14.701     224.865       0.000     224.865    1119.595       0.201       0.381

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       7.031     521.252       0.000       0.060       0.053       0.374

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.812       7.232       1.055     525.468       9.791     228.096       1.768

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  60893.973       0.451      91.630  432280.219

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    433058.88    651.6429     75.7627      1.4932      0.7962     17.8221      1.1528


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NPSS:  Inlet Mach number .67,  Altitude 34281ft, dT 22R, Thrust 10%
               Stage 4 stator Blocked @ 40%

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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
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********** Stator Vane, Gasplus Properties **********

Fan Hub + 4 Stage LPC 100% 12-20-2010

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
RESET = 0.000BLEED = 0.000 DPInc =17.865 EfDer = 0.931

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
26.577	2346.153	4.843	455.824	1.000	1.000	0.980

W Kg/sec = 12.0803185

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
75.618	2502.742	1.401	0.248	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
55601.758	20853.844	3.775	831.557	220.262	619.754	2.814

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	162.42	-0.06	162.42	0.16	450.56
MEAN	17.06	0.00	-0.02	162.42	-0.06	162.42	0.16	
HUB	12.51	0.00	-0.02	162.42	-0.06	162.42	0.16	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	68.97	50.47	18.50	422.38	452.58	4.76	453.62	0.43
MEAN	65.06	47.20	17.86	349.29	385.26	4.76	453.62	0.37
HUB	57.63	38.62	19.01	256.13	303.34	4.76	453.62	0.29

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	373.80	302.93	219.00	1057.24	0.35
MEAN	18.04	373.77	301.01	221.58	1054.17	0.35
HUB	15.00	398.32	328.62	225.09	1050.48	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	422.38	249.46	119.45	0.24	6250.60	
MEAN	369.27	231.85	68.26	0.22	5430.02	1.92
HUB	307.11	226.11	21.51	0.22	4929.99	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	5.53	1.14	5.07	476.41	1.05	464.76	0.92	0.85
MEAN	5.43	1.12	4.98	473.71	1.04	462.06	0.92	0.85
HUB	5.38	1.11	4.87	472.06	1.04	458.83	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	54.13	28.61	24.20	4.41	0.93	0.56	2.90	
MEAN	53.64	17.12	12.70	4.42	0.95	0.51	3.51	0.85
HUB	55.59	-5.46	-9.30	3.84	0.95	0.38	4.78	

blockage3	Cor/Incid
0.950	0.931

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	376.467	300.428	226.871	1054.374	0.357	0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
5.440	4.981	462.240	24.000	52.941	35.400	-17.541

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	240.408	300.428	384.776	1062.327	0.226	0.553

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	5.424	5.233	469.240	528.796	0.045	0.669

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	224.996	0.000	224.996	1063.004	0.212	0.513

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	5.224	469.838	0.000	0.060	0.117	0.532

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.777	5.389	1.113	474.060	18.236	157.101	1.218

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
113376.672	0.636	170.277	278499.188

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =17.865 EfDer = 0.935

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
26.577	2346.153	5.389	474.060	1.000	1.000	0.980

W Kg/sec = 12.0803185

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
69.300	2454.132	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
55601.758	20853.844	2.925	590.487	201.858	474.134	2.349

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	215.58	-0.07	215.58	0.20	440.09
MEAN	18.08	0.00	-0.02	215.58	-0.07	215.58	0.20	
HUB	15.21	0.00	-0.02	215.58	-0.07	215.58	0.20	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.87	46.36	16.51	420.74	472.82	5.24	470.18	0.44
MEAN	59.79	42.30	17.49	370.14	428.40	5.24	470.18	0.40
HUB	55.31	37.84	17.47	311.41	378.81	5.24	470.18	0.36

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	343.42	258.53	226.05	1076.23	0.32
MEAN	18.01	339.22	251.04	228.14	1073.71	0.32
HUB	15.22	354.81	269.71	230.54	1071.16	0.33

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	418.08	276.68	159.55	0.26	5280.76	
MEAN	368.74	256.71	117.70	0.24	4522.53	1.85
HUB	311.68	234.33	41.97	0.22	4106.90	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	6.00	1.11	5.59	491.45	1.04	481.62	0.92	0.86
MEAN	5.91	1.10	5.52	488.95	1.03	479.36	0.92	0.86
HUB	5.86	1.09	5.43	487.59	1.03	477.09	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	48.83	35.21	31.50	3.71	0.93	0.51	2.90	
MEAN	47.74	27.29	23.50	3.79	0.95	0.49	3.30	0.86
HUB	49.48	10.32	6.50	3.82	0.95	0.47	3.92	

blockage3	Cor/Incid
0.950	0.935

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

```
    17.960     342.417     251.743     232.110    1073.926       0.319       0.005

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
     5.922       5.519     479.552      46.000      47.324      30.600     -16.724

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
    17.960     235.117     251.743     344.462    1079.697       0.218       0.494

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       5.911       5.719     484.720     511.151       0.038       0.566

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
    17.823     233.012       0.000     233.012    1079.788       0.216       0.421

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       5.693     484.802       0.000       0.060       0.112       0.431

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4        Pt4          PR4        Texit        Del T        Ns        Ns nondim
     0.785       5.881       1.091     489.330      15.270     174.223       1.351

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94944.820       0.543     142.595  252449.469


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.865   EfDer =  0.956

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.577    2346.153       5.881     489.330       1.000       1.000       0.980
W Kg/sec =  12.0803185

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     64.528    2415.536       1.401       0.248      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1       A*        AthrRotor   ChokeMargin
  55601.758   20853.844       2.902     545.479     187.959     429.765       2.286

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   220.84    -0.08   220.84     0.20   423.05
 MEAN    17.74     0.00    -0.02   220.84    -0.08   220.84     0.20
 HUB     15.05     0.00    -0.02   220.84    -0.08   220.84     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.75    46.36    15.39   410.91   466.57     5.71   485.26     0.43
 MEAN    58.70    43.40    15.30   363.18   425.12     5.71   485.26     0.39
 HUB     54.38    38.84    15.54   308.13   379.16     5.71   485.26     0.35

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   334.89   242.38   231.09  1091.95     0.31
 MEAN    17.51   333.14   238.09   233.01  1089.75     0.31
 HUB     14.85   351.35   261.02   235.19  1087.54     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    405.59   282.92   163.22     0.26  4802.98
 MEAN   358.43   262.25   120.34     0.24  4169.51     1.78
 HUB    304.04   239.09    43.02     0.22  3877.32

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.48     1.10     6.07   505.15     1.03   495.79     0.92     0.87
 MEAN     6.40     1.09     6.00   503.06     1.03   493.81     0.92     0.87
 HUB      6.36     1.08     5.92   502.10     1.03   491.80     0.92     0.87
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.37    35.23    31.50     3.73     0.93     0.48     2.90
 MEAN    45.62    27.31    23.50     3.81     0.95     0.47     3.28     0.87
 HUB     47.98    10.37     6.50     3.87     0.95     0.46     3.87


   blockage3   Cor/Incid
      0.950       0.956

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     336.234     239.654     235.838    1089.977       0.308       0.007

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.411       6.001     494.008      46.000      45.460      31.500     -13.960

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     242.035     239.654     340.610    1094.977       0.221       0.457

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       6.402       6.188     498.550     471.992       0.031       0.538

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.121     235.906       0.000     235.906    1095.245       0.215       0.410

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.173     498.794       0.000       0.060       0.094       0.421

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.813       6.376       1.084     503.435      14.105     179.868       1.394

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  87707.188       0.533     131.725  250913.141


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.865   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.577    2346.153       6.376     503.435       1.000       1.000       0.980
W Kg/sec =  12.0803185

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     60.367    2381.458       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  55601.758   20853.844       2.919     513.330     175.840     401.059       2.281

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   222.62    -0.08   222.62     0.20   400.25
 MEAN    16.97     0.00    -0.02   222.62    -0.08   222.62     0.20
 HUB     14.32     0.00    -0.02   222.62    -0.08   222.62     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.56    46.36    14.20   394.33   452.90     6.19   499.30     0.41
 MEAN    57.36    43.80    13.56   347.46   412.72     6.19   499.30     0.38
 HUB     52.80    37.84    14.96   293.19   368.19     6.19   499.30     0.34

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   321.49   222.75   231.81  1106.02     0.29
 MEAN    16.57   320.00   218.73   233.57  1104.02     0.29
 HUB     13.89   337.37   241.52   235.55  1102.01     0.31
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    386.55   283.84   163.80     0.26  4207.06
 MEAN   339.33   262.87   120.60     0.24  3626.53     1.73
 HUB    284.38   239.41    42.86     0.22  3355.87

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      6.94     1.09     6.54   517.29     1.03   508.67     0.92     0.89
 MEAN     6.86     1.08     6.47   515.38     1.02   506.84     0.92     0.89
 HUB      6.82     1.07     6.39   514.48     1.02   504.99     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.86    35.24    31.50     3.74     0.93     0.46     2.90
 MEAN    43.12    27.31    23.50     3.81     0.94     0.44     3.29     0.89
 HUB     45.72    10.31     6.50     3.81     0.94     0.43     3.90


   blockage3   Cor/Incid
      0.550       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     480.519     219.961     427.218    1092.665       0.440      -1.127

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      6.867       6.012     496.463      46.000      27.243      32.400       5.157

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     16.481     447.688     219.961     498.806    1095.458       0.409      -0.866

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.550       6.862       6.116     499.004     258.379       0.021       0.273

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     16.096     423.492       0.000     423.492    1097.385       0.386       0.422

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.550       6.183     500.762       0.000       0.060       0.046      -0.700

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.855       6.853       1.075     515.716      12.281     194.346       1.507

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  76374.188       0.511     114.704  256774.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.865   EfDer =  0.877

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     26.577    2346.153       6.853     515.716       1.000       1.000       0.580
W Kg/sec =  12.0803185

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     56.846    2352.931       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  55601.758   20853.844       1.822     301.640     165.588     224.953       1.359

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   374.58    -0.13   374.58     0.34   376.16
 MEAN    15.91     0.00    -0.02   374.58    -0.13   374.58     0.34
 HUB     13.07     0.00    -0.02   374.58    -0.13   374.58     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.05    47.36    -2.31   375.08   530.18     6.32   504.02     0.48
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MEAN    41.03    44.80    -3.77   325.80   496.53     6.32   504.02     0.45
HUB     35.56    38.84    -3.28   267.60   460.42     6.32   504.02     0.42

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   291.99   187.03   224.23  1117.88     0.26
MEAN    15.50   289.96   182.27   225.51  1116.11     0.26
HUB     12.59   303.71   201.77   227.00  1114.37     0.27

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    367.30   287.71   180.28     0.26  3357.63
MEAN   317.30   262.84   135.03     0.24  2826.82     2.03
HUB    257.77   233.80    56.00     0.21  2541.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      7.27     1.06     6.94   526.77     1.02   519.66     0.92     0.80
MEAN     7.21     1.05     6.88   525.02     1.02   518.01     0.92     0.80
HUB      7.17     1.05     6.81   524.08     1.02   516.39     0.92     0.80

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.83    38.80    31.50     7.30     0.93     0.52     2.90
MEAN    38.95    30.91    23.50     7.41     0.88     0.52     3.34     0.80
HUB     41.63    13.86     6.50     7.36     0.88     0.55     4.06


   blockage3   Cor/Incid
      0.950       0.877

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     293.491     185.614     227.342    1116.216       0.263      -0.013

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.210       6.871     518.111      46.000      39.230      33.000      -6.230

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     239.859     185.614     303.290    1118.782       0.214       0.309

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       7.207       6.979     520.496     440.827       0.028       0.446

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     14.701     225.404       0.000     225.404    1119.384       0.201       0.372

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.999     521.057       0.000       0.060       0.050       0.365

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.766       7.199       1.051     525.293       9.577     232.856       1.805

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  59562.648       0.441      89.456  473142.344

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    431965.53    648.7575     75.6182      1.4865      0.7886     17.8648      1.1524
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DESCENT Operating Point #4

NPSS: Inlet Mach number .55, Altitude 25666ft, dT 22R, Thrust 10%

Stage 3 stator Blocked @ 10%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.330   EfDer =  0.937

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.328    2233.146       6.504     476.516       1.000       1.000       0.980
 W Kg/sec =  15.149272

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     72.200    2329.896       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54280.141   26151.674       3.954     831.557     210.299     619.754       2.947

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   158.39    -0.05   158.39     0.15   419.44
  MEAN    17.06     0.00    -0.02   158.39    -0.05   158.39     0.15
  HUB     12.51     0.00    -0.02   158.39    -0.05   158.39     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.50    50.47    18.03   402.03   432.16     6.40   474.42     0.40
  MEAN    64.53    47.20    17.33   332.47   368.32     6.40   474.42     0.34
  HUB     56.99    38.62    18.37   243.79   290.77     6.40   474.42     0.27

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   357.04   285.31   214.66  1079.33     0.33
  MEAN    18.04   358.09   284.96   216.84  1076.65     0.33
  HUB     15.00   382.91   313.52   219.84  1073.40     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    402.03   244.35   116.73     0.23  5887.01
  MEAN   351.48   226.82    66.52     0.21  5140.55     1.87
  HUB    292.32   220.86    21.20     0.21  4703.47

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      7.29     1.12     6.76   494.97     1.04   484.33     0.92     0.86
  MEAN     7.19     1.10     6.66   492.63     1.03   481.93     0.92     0.86
  HUB      7.13     1.10     6.53   491.26     1.03   479.03     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     53.04    28.54    24.20     4.34     0.93     0.55     2.90
  MEAN    52.73    17.05    12.70     4.35     0.95     0.50     3.51     0.86
  HUB     54.96    -5.51    -9.30     3.79     0.95     0.36     4.78


   blockage3   Cor/Incid
      0.950       0.937

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     360.814     284.411     222.029    1076.825       0.335       0.001

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.195       6.657     482.090      24.000      52.022      35.400     -16.622
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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth          Machth      cp 2-Th
     18.071     236.437     284.411     369.854    1083.724       0.218       0.537

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       7.178       6.944     488.287     528.796       0.040       0.650

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     18.083     221.146       0.000     221.146    1084.371       0.204       0.502

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.935     488.871       0.000       0.060       0.111       0.520

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.784       7.139        1.098     492.950      16.435     159.617       1.237

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102201.281       0.632     192.488  337288.219


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.330   EfDer =  0.943

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     33.328    2233.146       7.139     492.950       1.000       1.000       0.980
W Kg/sec =  15.149272

   W cor      RPM cor        GAMMA        Cp          R           Blades       THK
     66.903    2290.729       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54280.141   26151.674       3.030     590.487     194.870     474.134       2.433

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   211.92    -0.07   211.92     0.20   410.79
 MEAN    18.08     0.00    -0.02   211.92    -0.07   211.92     0.20
 HUB     15.21     0.00    -0.02   211.92    -0.07   211.92     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.12    46.36    15.76   400.48   453.15     6.95   489.20     0.42
 MEAN    58.98    42.30    16.68   352.31   411.19     6.95   489.20     0.38
 HUB     54.44    37.84    16.60   296.41   364.43     6.95   489.20     0.34

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   328.34   240.63   223.39  1095.93     0.30
 MEAN    18.01   325.55   235.12   225.17  1093.76     0.30
 HUB     15.22   341.93   255.53   227.21  1091.56     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    397.94   273.23   157.32     0.25  4915.09
 MEAN   350.98   253.23   115.86     0.23  4235.79     1.80
 HUB    296.66   230.90    41.13     0.21  3891.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      7.83     1.10     7.36   508.35     1.03   499.36     0.92     0.86
 MEAN     7.74     1.08     7.27   506.22     1.03   497.38     0.92     0.86
 HUB      7.69     1.08     7.18   505.14     1.02   495.39     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.13    35.15    31.50     3.65     0.93     0.49     2.90
 MEAN    46.24    27.23    23.50     3.73     0.95     0.47     3.30     0.86
 HUB     48.36    10.26     6.50     3.76     0.95     0.46     3.92
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   blockage3   Cor/Incid
      0.950       0.943

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     328.744     235.778     229.087    1093.949       0.301       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.747       7.276     497.560      46.000      45.825      30.600     -15.225

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     232.937     235.778     331.438    1098.873       0.212       0.470

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       7.736       7.497     502.048     511.151       0.033       0.538

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     230.656       0.000     230.656    1098.969       0.210       0.403

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       7.470     502.136       0.000       0.060       0.102       0.413

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.796       7.703       1.079     506.574      13.624     179.069       1.388

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  84730.875       0.535     159.584  306937.656


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.330   EfDer =  0.964

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.328    2233.146       7.703     506.574       1.000       1.000       0.980
W Kg/sec =  15.149272

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     62.857    2259.716       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54280.141   26151.674       2.979     545.479     183.087     429.765       2.347

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   218.64    -0.08   218.64     0.20   395.76
 MEAN    17.74     0.00    -0.02   218.64    -0.08   218.64     0.20
 HUB     15.05     0.00    -0.02   218.64    -0.08   218.64     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.80    46.36    14.44   391.12   448.15     7.49   502.59     0.41
 MEAN    57.69    43.40    14.29   345.69   409.09     7.49   502.59     0.37
 HUB     53.30    38.84    14.46   293.29   365.88     7.49   502.59     0.33

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   320.98   223.93   229.96  1109.57     0.29
 MEAN    17.51   320.66   221.79   231.58  1107.71     0.29
 HUB     14.85   339.77   246.89   233.43  1105.83     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    386.05   281.36   162.12     0.25  4437.63
 MEAN   341.17   260.54   119.37     0.24  3884.16     1.73
 HUB    289.40   237.27    42.51     0.21  3667.40
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      8.37     1.09     7.90   520.48     1.03   511.89     0.92     0.88
MEAN     8.29     1.08     7.82   518.75     1.02   510.17     0.92     0.88
HUB      8.25     1.07     7.73   518.07     1.02   508.44     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.24    35.18    31.50     3.68     0.93     0.46     2.90
MEAN    43.76    27.27    23.50     3.77     0.95     0.45     3.28     0.88
HUB     46.61    10.32     6.50     3.82     0.95     0.44     3.87


   blockage3   Cor/Incid
      0.850       0.964

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     17.392     346.069     223.248     264.432    1106.554       0.313       -0.130

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      8.301       7.756     509.108      46.000      40.173      31.500      -8.673

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     17.392     272.383     223.248     352.182    1110.677       0.245       0.283

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850       8.296       7.955     512.909     420.871       0.020       0.451

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     17.121     264.895       0.000     264.895    1111.041       0.238       0.406

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850       7.954     513.244       0.000       0.060       0.061       0.281

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.840       8.276       1.074     519.097      12.523     186.208       1.443

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  77891.227       0.523     146.702  306240.156


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.330   EfDer =  0.994

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     33.328    2233.146       8.276     519.097       1.000       1.000       0.880
W Kg/sec =  15.149272

   W cor      RPM cor        GAMMA        Cp          R           Blades       THK
     59.223    2232.293       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54280.141   26151.674       2.672     460.950     172.505     358.716       2.079

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   248.02    -0.09   248.02     0.22   375.18
 MEAN    16.97     0.00    -0.02   248.02    -0.09   248.02     0.22
 HUB     14.32     0.00    -0.02   248.02    -0.09   248.02     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.55    46.36    10.19   375.34   449.95     7.99   513.97     0.40
 MEAN    53.14    43.80     9.34   330.72   413.46     7.99   513.97     0.37
 HUB     48.38    37.84    10.54   279.07   373.42     7.99   513.97     0.34

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
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     0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   307.18   201.81   231.59  1121.71     0.27
 MEAN    16.57   307.41   200.43   233.09  1120.06     0.27
 HUB     13.89   325.91   226.08   234.74  1118.40     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    367.93   285.01   166.12     0.25  3811.80
 MEAN   322.99   263.35   122.56     0.24  3323.31     1.71
 HUB    270.69   238.94    44.61     0.21  3141.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     8.90     1.08     8.44   531.04     1.02   523.17     0.92     0.91
 MEAN    8.82     1.07     8.37   529.51     1.02   521.63     0.92     0.91
 HUB     8.79     1.06     8.28   528.94     1.02   520.08     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    41.07    35.65    31.50     4.15     0.93     0.44     2.90
 MEAN   40.69    27.74    23.50     4.24     0.93     0.44     3.29     0.91
 HUB    43.92    10.76     6.50     4.26     0.93     0.44     3.90


   blockage3   Cor/Incid
      0.950       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     305.009     201.554     228.924    1120.535       0.272       0.040

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      8.828       8.384     522.071      46.000      41.362      32.400      -8.962

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     16.481     239.169     201.554     312.771    1123.737       0.213       0.396

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       8.824       8.549     525.059     456.573       0.018       0.474

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     16.096     228.149       0.000     228.149    1124.196       0.203       0.362

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       8.554     525.488       0.000       0.060       0.063       0.405

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.863       8.803       1.064     529.829      10.732     204.657       1.586

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  66764.344       0.493     125.745  351954.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.330   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.328    2233.146       8.803     529.829       1.000       1.000       0.980
W Kg/sec =  15.149272

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     56.248    2209.568       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54280.141   26151.674       3.111     509.668     163.840     390.276       2.382

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
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TIP     18.32     0.00    -0.02   213.78    -0.07   213.78     0.19   353.24
MEAN    15.91     0.00    -0.02   213.78    -0.07   213.78     0.19
HUB     13.07     0.00    -0.02   213.78    -0.07   213.78     0.19

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.09    47.36    11.73   357.02   416.19     8.58   526.02     0.37
MEAN    55.42    44.80    10.62   310.11   376.72     8.58   526.02     0.33
HUB     50.00    38.84    11.16   254.71   332.59     8.58   526.02     0.30

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   293.92   190.66   223.69  1132.55     0.26
MEAN    15.50   291.57   185.28   225.14  1130.84     0.26
HUB     12.59   305.08   204.13   226.73  1129.12     0.27

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    349.61   274.41   158.96     0.24  3421.74
MEAN   302.02   253.61   116.74     0.22  2872.50     1.65
HUB    245.35   230.44    41.22     0.20  2571.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      9.38     1.07     8.95   540.55     1.02   533.34     0.92     0.90
MEAN     9.28     1.05     8.86   538.83     1.02   531.74     0.92     0.90
HUB      9.23     1.05     8.78   537.88     1.02   530.12     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.44    35.40    31.50     3.90     0.93     0.42     2.90
MEAN    39.45    27.41    23.50     3.91     0.94     0.40     3.34     0.90
HUB     42.00    10.30     6.50     3.80     0.94     0.38     4.06


   blockage3   Cor/Incid
      0.950       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     295.129     188.673     226.944    1130.934       0.261      -0.011

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      9.290       8.860     531.823      46.000      39.739      33.000      -6.739

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     239.410     188.673     304.819    1133.572       0.211       0.318

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       9.286       9.002     534.307     440.827       0.029       0.453

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     14.701     225.009       0.000     225.009    1134.163       0.198       0.379

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       9.025     534.865       0.000       0.060       0.052       0.371

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864       9.276       1.054     539.087       9.258     223.205       1.730

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  57595.789       0.471     108.477  330925.500

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    389183.50    732.9952     72.2002      1.4263      0.8151     17.3303      1.1313
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NPSS: Inlet Mach number .55, Altitude 25666ft, dT 22R, Thrust 10%
Stage 3 stator Blocked @ 15%

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*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*****************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.327   EfDer =  0.937

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.334    2233.190       6.504     476.516       1.000       1.000       0.980
 W Kg/sec =  15.1516809

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     72.212    2329.942       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54288.770   26155.832       3.954     831.557     210.333     619.754       2.947

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   158.41    -0.05   158.41     0.15   419.45
  MEAN    17.06     0.00    -0.02   158.41    -0.05   158.41     0.15
  HUB     12.51     0.00    -0.02   158.41    -0.05   158.41     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.50    50.47    18.03   402.04   432.18     6.40   474.42     0.40
  MEAN    64.53    47.20    17.33   332.47   368.33     6.40   474.42     0.34
  HUB     56.99    38.62    18.37   243.80   290.79     6.40   474.42     0.27

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   357.05   285.29   214.70  1079.33     0.33
  MEAN    18.04   358.09   284.95   216.88  1076.65     0.33
  HUB     15.00   382.95   313.53   219.87  1073.40     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    402.04   244.39   116.75     0.23  5886.68
  MEAN   351.49   226.86    66.54     0.21  5140.27     1.87
  HUB    292.32   220.89    21.21     0.21  4703.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      7.29     1.12     6.76   494.97     1.04   484.33     0.92     0.86
  MEAN     7.19     1.10     6.66   492.63     1.03   481.93     0.92     0.86
  HUB      7.13     1.10     6.53   491.26     1.03   479.03     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     53.04    28.54    24.20     4.34     0.93     0.55     2.90
  MEAN    52.72    17.06    12.70     4.36     0.95     0.50     3.51     0.86
  HUB     54.96    -5.51    -9.30     3.79     0.95     0.36     4.78


   blockage3   Cor/Incid
      0.950       0.937

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     360.823     284.395     222.065    1076.825       0.335       0.001
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     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.195       6.657     482.090      24.000      52.016      35.400     -16.616

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     236.476     284.395     369.866    1083.722       0.218       0.537

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       7.178       6.944     488.286     528.796       0.040       0.650

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     18.083     221.181       0.000     221.181    1084.370       0.204       0.502

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.935     488.869       0.000       0.060       0.111       0.520

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.784       7.139       1.098     492.950      16.434     159.634       1.237

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102200.711       0.632     192.517  337343.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.327   EfDer =  0.943

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.334    2233.190       7.139     492.950       1.000       1.000       0.980
W Kg/sec =  15.1516809

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     66.913    2290.774       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54288.770   26155.832       3.030     590.487     194.900     474.134       2.433

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   211.95    -0.07   211.95     0.20   410.80
 MEAN    18.08     0.00    -0.02   211.95    -0.07   211.95     0.20
 HUB     15.21     0.00    -0.02   211.95    -0.07   211.95     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.11    46.36    15.75   400.48   453.18     6.95   489.20     0.42
 MEAN    58.97    42.30    16.67   352.31   411.22     6.95   489.20     0.38
 HUB     54.44    37.84    16.60   296.42   364.46     6.95   489.20     0.34

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   328.35   240.61   223.43  1095.93     0.30
 MEAN    18.01   325.56   235.11   225.21  1093.76     0.30
 HUB     15.22   341.95   255.52   227.24  1091.56     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    397.95   273.27   157.34     0.25  4914.81
 MEAN   350.98   253.27   115.88     0.23  4235.55     1.79
 HUB    296.67   230.94    41.15     0.21  3890.86

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      7.83     1.10     7.36   508.35     1.03   499.36     0.92     0.86
 MEAN     7.74     1.08     7.27   506.22     1.03   497.38     0.92     0.86
 HUB      7.69     1.08     7.18   505.14     1.02   495.39     0.92     0.86

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.12    35.15    31.50     3.65     0.93     0.49     2.90
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 MEAN    46.23    27.23    23.50     3.73     0.95     0.47     3.30     0.86
 HUB     48.35    10.26     6.50     3.76     0.95     0.46     3.92


   blockage3   Cor/Incid
      0.950       0.943

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     17.960     328.759     235.765     229.123    1093.948       0.301        0.005

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.747       7.276     497.558      46.000      45.818      30.600     -15.218

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     17.960     232.974     235.765     331.454    1098.871       0.212        0.470

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       7.736       7.497     502.046     511.151       0.033        0.538

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4          Mach4       cp 3-4
     17.823     230.692       0.000     230.692    1098.967       0.210        0.403

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       7.470     502.135       0.000       0.060       0.102        0.412

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.796       7.703        1.079     506.574      13.623     179.092        1.388

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  84727.836       0.535     159.603  306988.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.327   EfDer =  0.964

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     33.334     2233.190        7.703     506.574       1.000        1.000        0.980
W Kg/sec =  15.1516809

   W cor       RPM cor         GAMMA         Cp          R            Blades       THK
     62.866     2259.761        1.401        0.248      53.349       56.000        0.050

   CFM        SCFM             A1/A*       Area1       A*        AthrRotor   ChokeMargin
  54288.770   26155.832        2.979     545.479     183.114     429.765        2.347

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1       Stator    Alfa     C1       CU1        Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   218.67     -0.08   218.67      0.20   395.77
 MEAN    17.74      0.00    -0.02   218.67     -0.08   218.67      0.20
 HUB     15.05      0.00    -0.02   218.67     -0.08   218.67      0.20

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     60.80     46.36    14.44   391.13    448.17      7.49   502.59      0.41
 MEAN    57.69     43.40    14.29   345.69    409.11      7.49   502.59      0.37
 HUB     53.30     38.84    14.46   293.30    365.90      7.49   502.59      0.33

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050        0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   321.00    223.92    229.99   1109.57      0.29
 MEAN    17.51   320.67    221.78    231.62   1107.71      0.29
 HUB     14.85   339.78    246.87    233.46   1105.82      0.31

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
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 TIP    386.06   281.40   162.14     0.25  4437.42
 MEAN   341.17   260.58   119.39     0.24  3883.96     1.73
 HUB    289.40   237.30    42.53     0.21  3667.22

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     8.37     1.09     7.90   520.48     1.03   511.88     0.92     0.88
 MEAN    8.29     1.08     7.82   518.74     1.02   510.17     0.92     0.88
 HUB     8.25     1.07     7.73   518.07     1.02   508.44     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    44.23    35.18    31.50     3.68     0.93     0.46     2.90
 MEAN   43.76    27.27    23.50     3.77     0.95     0.45     3.28     0.88
 HUB    46.60    10.32     6.50     3.82     0.95     0.44     3.87


   blockage3   Cor/Incid
      0.800       0.964

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     360.211     223.236     282.697    1105.648       0.326      -0.220

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      8.301       7.712     508.274      46.000      38.297      31.500      -6.797

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     291.253     223.236     366.964    1109.715       0.262       0.187

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.800       8.297       7.908     512.021     395.310       0.018       0.422

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.121     283.035       0.000     283.035    1110.142       0.255       0.414

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.800       7.914     512.414       0.000       0.060       0.052       0.198

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.846       8.280       1.075     519.096      12.522     186.230       1.444

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  77889.133       0.523     146.721  306291.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.327   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.334    2233.190       8.280     519.096       1.000       1.000       0.830
W Kg/sec =  15.1516809

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     59.200    2232.338       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54288.770   26155.832       2.521     434.759     172.438     337.544       1.957

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   263.71    -0.09   263.71     0.24   375.19
 MEAN    16.97     0.00    -0.02   263.71    -0.09   263.71     0.24
 HUB     14.32     0.00    -0.02   263.71    -0.09   263.71     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.91    46.36     8.55   375.34   458.80     7.96   513.30     0.41
 MEAN    51.44    43.80     7.64   330.73   423.07     7.96   513.30     0.38
 HUB     46.63    37.84     8.79   279.07   384.03     7.96   513.30     0.35
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      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   305.97   200.13   231.45  1121.67     0.27
MEAN    16.57   306.34   198.95   232.94  1120.04     0.27
HUB     13.89   324.91   224.81   234.58  1118.40     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    367.94   285.88   167.81     0.25  3780.17
MEAN   323.00   263.91   124.05     0.24  3298.91     1.74
HUB    270.69   239.02    45.89     0.21  3123.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      8.90     1.07     8.45   530.94     1.02   523.13     0.92     0.91
MEAN     8.82     1.07     8.37   529.43     1.02   521.61     0.92     0.91
HUB      8.79     1.06     8.29   528.88     1.02   520.08     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.85    35.94    31.50     4.44     0.93     0.45     2.90
MEAN    40.50    28.04    23.50     4.54     0.93     0.45     3.29     0.91
HUB     43.78    11.07     6.50     4.57     0.93     0.45     3.90


  blockage3   Cor/Incid
     0.950       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    16.481     303.919     200.069     228.778    1120.511       0.271       0.041

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     8.831       8.391     522.049      46.000      41.170      32.400      -8.770

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    16.481     239.069     200.069     311.739    1123.658       0.213       0.393

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       8.828       8.553     524.985     456.573       0.018       0.471

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4        cp 3-4
     16.096     228.042       0.000     228.042    1124.118       0.203       0.359

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       8.558     525.415       0.000       0.060       0.062       0.403

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.868       8.807       1.064     529.752      10.656     206.059       1.597

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  66287.492       0.490     124.867  374432.031


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.327   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.334    2233.190       8.807     529.752       1.000       1.000       0.980
W Kg/sec =  15.1516809

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     56.227    2209.773       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54288.770   26155.832       3.112     509.668     163.778     390.276       2.383
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ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	213.68	-0.07	213.68	0.19	353.27
MEAN	15.91	0.00	-0.02	213.68	-0.07	213.68	0.19	
HUB	13.07	0.00	-0.02	213.68	-0.07	213.68	0.19	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.10	47.36	11.74	357.02	416.15	8.59	525.94	0.37
MEAN	55.44	44.80	10.64	310.12	376.67	8.59	525.94	0.33
HUB	50.01	38.84	11.17	254.71	332.53	8.59	525.94	0.30

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	293.90	190.75	223.58	1132.48	0.26
MEAN	15.50	291.52	185.33	225.04	1130.77	0.26
HUB	12.59	305.02	204.16	226.62	1129.05	0.27

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	349.62	274.28	158.87	0.24	3423.47	
MEAN	302.02	253.49	116.70	0.22	2873.28	1.65
HUB	245.36	230.33	41.20	0.20	2571.28	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	9.38	1.07	8.95	540.48	1.02	533.27	0.92	0.90
MEAN	9.29	1.05	8.87	538.75	1.02	531.67	0.92	0.90
HUB	9.24	1.05	8.78	537.81	1.02	530.05	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.47	35.40	31.50	3.90	0.93	0.42	2.90	
MEAN	39.47	27.41	23.50	3.91	0.94	0.40	3.34	0.90
HUB	42.01	10.30	6.50	3.80	0.94	0.38	4.06	

blockage3	Cor/Incid
0.950	0.988

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	295.079	188.724	226.837	1130.858	0.261	-0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
9.295	8.865	531.751	46.000	39.760	33.000	-6.760

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	239.294	188.724	304.760	1133.498	0.211	0.318

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	9.291	9.006	534.237	440.827	0.029	0.454

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	224.901	0.000	224.901	1134.089	0.198	0.379

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	9.029	534.794	0.000	0.060	0.052	0.371

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.864	9.281	1.054	539.012	9.261	223.102	1.729

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
57614.777	0.471	108.530	331009.375

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR

388719.97 732.2385 72.2117 1.4269 0.8172 17.3271 1.1312

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NPSS: Inlet Mach number .55, Altitude 25666ft, dT 22R, Thrust 10%
Stage 3 stator Blocked @ 20%

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS *******************
****************   Stator Vane, Gasplus Properties  *****************
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         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.330   EfDer =  0.937

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.331    2233.250       6.504     476.516       1.000       1.000       0.980
 W Kg/sec =  15.150363

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     72.205    2330.004       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54284.047   26153.557       3.954     831.557     210.314     619.754       2.947

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   158.40    -0.05   158.40     0.15   419.46
  MEAN    17.06     0.00    -0.02   158.40    -0.05   158.40     0.15
  HUB     12.51     0.00    -0.02   158.40    -0.05   158.40     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.50    50.47    18.03   402.05   432.18     6.40   474.42     0.40
  MEAN    64.53    47.20    17.33   332.48   368.34     6.40   474.42     0.34
  HUB     56.99    38.62    18.37   243.80   290.79     6.40   474.42     0.27

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   357.06   285.31   214.68  1079.33     0.33
  MEAN    18.04   358.10   284.97   216.86  1076.65     0.33
  HUB     15.00   382.94   313.54   219.85  1073.40     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    402.05   244.37   116.74     0.23  5887.15
  MEAN   351.50   226.83    66.53     0.21  5140.74     1.87
  HUB    292.33   220.87    21.20     0.21  4703.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      7.29     1.12     6.76   494.97     1.04   484.33     0.92     0.86
  MEAN     7.19     1.10     6.66   492.63     1.03   481.93     0.92     0.86
  HUB      7.13     1.10     6.53   491.26     1.03   479.03     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     53.04    28.54    24.20     4.34     0.93     0.55     2.90
  MEAN    52.73    17.05    12.70     4.35     0.95     0.50     3.51     0.86
  HUB     54.96    -5.51    -9.30     3.79     0.95     0.36     4.78


   blockage3   Cor/Incid
      0.950       0.937

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     360.832     284.421     222.045    1076.826       0.335       0.001

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.195       6.657     482.091      24.000      52.021      35.400     -16.621

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth       Cmth      Aoth         Machth      cp 2-Th
     18.071     236.454     284.421     369.873    1083.725       0.218       0.537

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       7.179       6.944     488.288     528.796       0.040       0.650

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     18.083     221.161       0.000     221.161    1084.372       0.204       0.502

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.935     488.872       0.000       0.060       0.111       0.520

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.784       7.139       1.098     492.952      16.436     159.621       1.237

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102209.820       0.632     192.518  337313.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.330   EfDer =  0.943

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.331    2233.250       7.139     492.952       1.000       1.000       0.980
W Kg/sec =  15.150363

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     66.907    2290.832       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54284.047   26153.557       3.030     590.487     194.882     474.134       2.433

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   211.93    -0.07   211.93     0.20   410.81
 MEAN    18.08     0.00    -0.02   211.93    -0.07   211.93     0.20
 HUB     15.21     0.00    -0.02   211.93    -0.07   211.93     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.12    46.36    15.76   400.49   453.18     6.95   489.21     0.42
 MEAN    58.98    42.30    16.68   352.32   411.21     6.95   489.21     0.38
 HUB     54.44    37.84    16.60   296.42   364.45     6.95   489.21     0.34

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   328.35   240.64   223.41  1095.93     0.30
 MEAN    18.01   325.57   235.13   225.18  1093.76     0.30
 HUB     15.22   341.96   255.55   227.22  1091.57     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    397.96   273.24   157.32     0.25  4915.33
 MEAN   350.99   253.24   115.86     0.23  4236.06     1.80
 HUB    296.68   230.91    41.13     0.21  3891.38

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      7.83     1.10     7.36   508.36     1.03   499.36     0.92     0.86
 MEAN     7.74     1.08     7.27   506.23     1.03   497.39     0.92     0.86
 HUB      7.69     1.08     7.18   505.15     1.02   495.39     0.92     0.86
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.13    35.15    31.50     3.65     0.93     0.49     2.90
 MEAN    46.24    27.23    23.50     3.73     0.95     0.47     3.30     0.86
 HUB     48.36    10.26     6.50     3.76     0.95     0.46     3.92


   blockage3   Cor/Incid
      0.950       0.943

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     17.960     328.765     235.793     229.102    1093.951       0.301       0.005

     Pt3          Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.747       7.276     497.561      46.000      45.825      30.600     -15.225

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     17.960     232.952     235.793     331.459    1098.875       0.212       0.470

   BlockageThr  PtTh         PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       7.736       7.497     502.051     511.151       0.033       0.538

    VANED DIFFUSER EXIT:
   R4           C4           Cu4         Cm4         Ao4           Mach4       cp 3-4
     17.823     230.670       0.000     230.670    1098.972       0.210       0.403

   Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       7.470     502.139       0.000       0.060       0.102       0.413

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.796       7.703       1.079     506.577      13.625     179.069       1.388

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  84740.172       0.535     159.613  306959.906


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.330   EfDer =  0.964

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     33.331    2233.250       7.703     506.577       1.000       1.000       0.980
W Kg/sec =  15.150363

   W cor       RPM cor         GAMMA         Cp          R           Blades        THK
     62.860    2259.813       1.401       0.248      53.349      56.000       0.050

   CFM        SCFM            A1/A*       Area1       A*        AthrRotor   ChokeMargin
  54284.047   26153.557       2.979     545.479     183.097     429.765       2.347

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1       Stator    Alfa      C1       CU1        Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   218.65    -0.08   218.65      0.20   395.78
 MEAN    17.74      0.00    -0.02   218.65    -0.08   218.65      0.20
 HUB     15.05      0.00    -0.02   218.65    -0.08   218.65      0.20

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     60.80    46.36    14.44   391.14   448.17      7.49   502.59      0.41
 MEAN    57.69    43.40    14.29   345.70   409.11      7.49   502.59      0.37
 HUB     53.30    38.84    14.46   293.31   365.90      7.49   502.59      0.33

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   321.00   223.95   229.97  1109.57      0.29
 MEAN    17.51   320.68   221.81   231.59  1107.71      0.29
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 HUB     14.85   339.77   246.88   233.44  1105.83     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    386.07   281.37   162.12     0.25  4437.95
 MEAN   341.18   260.55   119.37     0.24  3884.48     1.73
 HUB    289.41   237.28    42.53     0.21  3667.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     8.37     1.09     7.90   520.48     1.03   511.89     0.92     0.88
 MEAN    8.29     1.08     7.82   518.75     1.02   510.17     0.92     0.88
 HUB     8.25     1.07     7.73   518.07     1.02   508.44     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    44.24    35.18    31.50     3.68     0.93     0.46     2.90
 MEAN   43.76    27.27    23.50     3.77     0.95     0.45     3.28     0.88
 HUB    46.60    10.33     6.50     3.83     0.95     0.44     3.87


  blockage3   Cor/Incid
     0.750       0.964

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.392     376.944     223.266     303.709    1104.533       0.341      -0.331

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     8.301       7.658     507.250      46.000      36.321      31.500      -4.821

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     312.990     223.266     384.461    1108.533       0.282       0.068

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.750       8.298       7.851     510.930     369.750       0.016       0.393

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4        cp 3-4
    17.121     303.927       0.000     303.927    1109.039       0.274       0.419

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750       7.863     511.397       0.000       0.060       0.044       0.093

   STAGE EXIT CONDITIONS, STAGE   3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.851       8.284       1.075     519.101      12.524     186.210       1.443

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  77897.859       0.523     146.725  306261.594


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.330   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.331    2233.250       8.284     519.101       1.000       1.000       0.780
W Kg/sec =  15.150363

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     59.168    2232.387       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54284.047   26153.557       2.371     408.569     172.345     316.373       1.836

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   281.58    -0.10   281.58     0.25   375.20
 MEAN    16.97     0.00    -0.02   281.58    -0.10   281.58     0.25
 HUB     14.32     0.00    -0.02   281.58    -0.10   281.58     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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TIP     53.13    46.36     6.77   375.35   469.31     7.92   512.49     0.42
MEAN    49.60    43.80     5.80   330.74   434.44     7.92   512.49     0.39
HUB     44.75    37.84     6.91   279.08   396.52     7.92   512.49     0.36

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   304.56   198.06   231.36  1121.63     0.27
MEAN    16.57   305.09   197.15   232.84  1120.01     0.27
HUB     13.89   323.75   223.26   234.45  1118.40     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    367.95   287.04   169.89     0.26  3741.23
MEAN   323.00   264.68   125.86     0.24  3269.14     1.78
HUB    270.70   239.20    47.44     0.21  3102.47

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      8.90     1.07     8.45   530.82     1.02   523.09     0.92     0.91
MEAN     8.82     1.06     8.37   529.34     1.02   521.58     0.92     0.91
HUB      8.79     1.06     8.29   528.82     1.02   520.08     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.57    36.29    31.50     4.79     0.93     0.46     2.90
MEAN    40.25    28.39    23.50     4.89     0.92     0.46     3.29     0.91
HUB     43.60    11.44     6.50     4.94     0.92     0.47     3.90


  blockage3   Cor/Incid
     0.950       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    16.481     302.651     198.256     228.675    1120.485       0.270       0.041

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     8.830       8.393     522.024      46.000      40.924      32.400      -8.524

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    16.481     239.026     198.256     310.546    1123.565       0.213       0.389

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       8.827       8.553     524.898     456.573       0.017       0.467

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
    16.096     227.986       0.000     227.986    1124.025       0.203       0.356

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       8.558     525.328       0.000       0.060       0.060       0.400

   STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869       8.807       1.063     529.663      10.562     207.790       1.611

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  65703.945       0.485     123.757  399972.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.330   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.331    2233.250       8.807     529.663       1.000       1.000       0.980
W Kg/sec =  15.150363

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     56.218    2210.017       1.401       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
54284.047	26153.557	3.112	509.668	163.753	390.276	2.383

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	213.63	-0.07	213.63	0.19	353.31
MEAN	15.91	0.00	-0.02	213.63	-0.07	213.63	0.19	
HUB	13.07	0.00	-0.02	213.63	-0.07	213.63	0.19	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.11	47.36	11.75	357.03	416.13	8.59	525.86	0.37
MEAN	55.44	44.80	10.65	310.12	376.65	8.59	525.86	0.33
HUB	50.02	38.84	11.18	254.72	332.50	8.59	525.86	0.30

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	293.89	190.81	223.53	1132.39	0.26
MEAN	15.50	291.50	185.36	224.98	1130.68	0.26
HUB	12.59	304.98	204.17	226.56	1128.95	0.27

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	349.63	274.20	158.82	0.24	3424.49	
MEAN	302.03	253.43	116.67	0.22	2873.85	1.65
HUB	245.36	230.28	41.20	0.20	2571.41	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	9.38	1.07	8.95	540.39	1.02	533.19	0.92	0.90
MEAN	9.29	1.05	8.87	538.67	1.02	531.58	0.92	0.90
HUB	9.24	1.05	8.78	537.72	1.02	529.96	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.49	35.39	31.50	3.89	0.93	0.42	2.90	
MEAN	39.49	27.41	23.50	3.91	0.94	0.40	3.34	0.90
HUB	42.02	10.31	6.50	3.81	0.94	0.38	4.06	

blockage3	Cor/Incid
0.950	0.988

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	295.060	188.761	226.780	1130.767	0.261	-0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
9.295	8.865	531.665	46.000	39.772	33.000	-6.772

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	239.233	188.761	304.735	1133.409	0.211	0.318

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	9.291	9.006	534.153	440.827	0.029	0.454

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	224.844	0.000	224.844	1134.000	0.198	0.379

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	9.030	534.710	0.000	0.060	0.052	0.372

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.864	9.281	1.054	538.926	9.263	223.043	1.729

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
57627.652	0.471	108.545	331019.969

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    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     388179.47    731.1569     72.2054      1.4269      0.8183     17.3297      1.1310


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NPSS: Inlet Mach number .55, Altitude 25666ft, dT 22R, Thrust 10%
Stage 3 stator Blocked @ 25%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.338   EfDer =  0.937

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.320    2233.301       6.504     476.516       1.000       1.000       0.980
 W Kg/sec =  15.1453171

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     72.181    2330.058       1.401       0.248      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54265.969   26144.848       3.955     831.557     210.244     619.754       2.948

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   158.35    -0.05   158.35     0.15   419.47
  MEAN    17.06     0.00    -0.02   158.35    -0.05   158.35     0.15
  HUB     12.51     0.00    -0.02   158.35    -0.05   158.35     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.51    50.47    18.04   402.06   432.17     6.40   474.42     0.40
  MEAN    64.54    47.20    17.34   332.49   368.32     6.40   474.42     0.34
  HUB     57.00    38.62    18.38   243.81   290.76     6.40   474.42     0.27

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   357.05   285.36   214.61  1079.33     0.33
  MEAN    18.04   358.07   284.99   216.78  1076.65     0.33
  HUB     15.00   382.88   313.52   219.78  1073.40     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    402.06   244.29   116.71     0.23  5888.02
  MEAN   351.51   226.76    66.51     0.21  5141.09     1.87
  HUB    292.34   220.80    21.19     0.21  4703.55

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      7.29      1.12     6.76   494.97     1.04   484.34     0.92     0.86
  MEAN     7.19      1.10     6.66   492.63     1.03   481.93     0.92     0.86
  HUB      7.13      1.10     6.53   491.26     1.03   479.03     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     53.05    28.54    24.20     4.34     0.93     0.55     2.90
  MEAN    52.74    17.06    12.70     4.36     0.95     0.50     3.51     0.86
  HUB     54.97    -5.51    -9.30     3.79     0.95     0.36     4.78


    blockage3   Cor/Incid
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      0.950       0.937

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     360.801     284.441     221.970    1076.829       0.335       0.001

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.195       6.657     482.094      24.000      52.032      35.400     -16.632

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     236.372     284.441     369.835    1083.730       0.218       0.538

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       7.178       6.944     488.293     528.796       0.040       0.650

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     18.083     221.086       0.000     221.086    1084.377       0.204       0.502

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.935     488.876       0.000       0.060       0.111       0.520

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.784       7.139       1.098     492.953      16.437     159.586       1.237

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102218.930       0.632     192.471  337198.156


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.338   EfDer =  0.943

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.320    2233.301       7.139     492.953       1.000       1.000       0.980
W Kg/sec =  15.1453171

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     66.885    2290.881       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54265.969   26144.848       3.031     590.487     194.819     474.134       2.434

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   211.86    -0.07   211.86     0.20   410.82
 MEAN    18.08     0.00    -0.02   211.86    -0.07   211.86     0.20
 HUB     15.21     0.00    -0.02   211.86    -0.07   211.86     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.13    46.36    15.77   400.50   453.15     6.95   489.21     0.42
 MEAN    58.99    42.30    16.69   352.33   411.18     6.95   489.21     0.38
 HUB     54.45    37.84    16.61   296.43   364.42     6.95   489.21     0.34

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   328.35   240.70   223.33  1095.94     0.30
 MEAN    18.01   325.55   235.18   225.11  1093.76     0.30
 HUB     15.22   341.92   255.57   227.15  1091.57     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    397.97   273.15   157.27     0.25  4916.66
 MEAN   351.00   253.16   115.82     0.23  4236.87     1.80
 HUB    296.68   230.84    41.11     0.21  3891.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP      7.83     1.10     7.36   508.36     1.03   499.37     0.92     0.86
 MEAN     7.74     1.08     7.27   506.23     1.03   497.39     0.92     0.86
 HUB      7.69     1.08     7.18   505.15     1.02   495.40     0.92     0.86

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.14    35.15    31.50     3.65     0.93     0.49     2.90
 MEAN    46.25    27.23    23.50     3.73     0.95     0.47     3.30     0.86
 HUB     48.37    10.26     6.50     3.76     0.95     0.46     3.92


   blockage3   Cor/Incid
      0.950       0.943

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     328.744     235.838     229.025    1093.957       0.301       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.747       7.276     497.567      46.000      45.840      30.600     -15.240

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     232.872     235.838     331.435    1098.883       0.212       0.470

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       7.736       7.498     502.058     511.151       0.033       0.539

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     230.592       0.000     230.592    1098.980       0.210       0.403

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       7.470     502.146       0.000       0.060       0.102       0.413

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.796       7.703       1.079     506.581      13.628     179.015       1.388

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  84757.820       0.535     159.593  306853.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.338   EfDer =  0.964

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.320    2233.301       7.703     506.581       1.000       1.000       0.980
W Kg/sec =  15.1453171

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     62.840    2259.856       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54265.969   26144.848       2.980     545.479     183.037     429.765       2.348

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   218.58    -0.08   218.58     0.20   395.79
 MEAN    17.74     0.00    -0.02   218.58    -0.08   218.58     0.20
 HUB     15.05     0.00    -0.02   218.58    -0.08   218.58     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.81    46.36    14.45   391.15   448.14     7.49   502.60     0.41
 MEAN    57.70    43.40    14.30   345.71   409.07     7.49   502.60     0.37
 HUB     53.31    38.84    14.47   293.31   365.86     7.49   502.60     0.33

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	320.99	224.01	229.89	1109.58	0.29
MEAN	17.51	320.65	221.85	231.52	1107.72	0.29
HUB	14.85	339.73	246.89	233.36	1105.84	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	386.08	281.28	162.07	0.25	4439.21	
MEAN	341.19	260.46	119.34	0.24	3885.22	1.73
HUB	289.42	237.21	42.52	0.21	3667.47	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	8.37	1.09	7.90	520.49	1.03	511.90	0.92	0.88
MEAN	8.29	1.08	7.82	518.76	1.02	510.18	0.92	0.88
HUB	8.25	1.07	7.73	518.07	1.02	508.45	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.26	35.18	31.50	3.68	0.93	0.46	2.90	
MEAN	43.78	27.27	23.50	3.77	0.95	0.45	3.28	0.88
HUB	46.61	10.33	6.50	3.83	0.95	0.44	3.87	

blockage3	Cor/Incid
0.700	0.964

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	396.962	223.309	328.195	1103.133	0.360	-0.471

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
8.301	7.590	505.965	46.000	34.232	31.500	-2.732

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	338.371	223.309	405.416	1107.043	0.306	-0.082

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.700	8.298	7.777	509.558	344.189	0.015	0.362

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	328.316	0.000	328.316	1107.651	0.296	0.423

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.700	7.796	510.117	0.000	0.060	0.039	-0.043

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.855	8.287	1.076	519.108	12.526	186.154	1.443

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
77914.195	0.523	146.707	306153.562

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =17.338 EfDer = 0.991

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
33.320	2233.301	8.287	519.108	1.000	1.000	0.730

W Kg/sec = 15.1453171

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
59.130	2232.424	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
54265.969	26144.848	2.220	382.379	172.233	295.201	1.714

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	302.14	-0.10	302.14	0.27	375.20
MEAN	16.97	0.00	-0.02	302.14	-0.10	302.14	0.27	

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HUB     14.32     0.00    -0.02   302.14    -0.10   302.14     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.18    46.36     4.82   375.36   481.94     7.87   511.49     0.43
MEAN    47.60    43.80     3.80   330.75   448.05     7.87   511.49     0.40
HUB     42.74    37.84     4.90   279.09   411.38     7.87   511.49     0.37

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   302.91   195.47   231.39  1121.56     0.27
MEAN    16.57   303.63   194.88   232.83  1119.97     0.27
HUB     13.89   322.43   221.39   234.41  1118.39     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    367.96   288.61   172.49     0.26  3692.51
MEAN   323.01   265.76   128.13     0.24  3231.74     1.82
HUB    270.71   239.54    49.31     0.21  3076.67

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      8.89     1.07     8.45   530.68     1.02   523.03     0.92     0.91
MEAN     8.81     1.06     8.37   529.23     1.02   521.55     0.92     0.91
HUB      8.78     1.06     8.29   528.75     1.02   520.08     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.19    36.70    31.50     5.20     0.93     0.47     2.90
MEAN    39.93    28.82    23.50     5.32     0.92     0.47     3.29     0.91
HUB     43.36    11.88     6.50     5.38     0.92     0.49     3.90


  blockage3   Cor/Incid
     0.950       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     301.162     195.980     228.671    1120.447       0.269       0.042

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      8.823       8.390     521.989      46.000      40.598      32.400      -8.198

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     16.481     239.102     195.980     309.156    1123.444       0.213       0.383

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       8.819       8.545     524.785     456.573       0.017       0.462

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     16.096     228.040       0.000     228.040    1123.906       0.203       0.352

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       8.551     525.216       0.000       0.060       0.059       0.396

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.863       8.800       1.062     529.553      10.445     209.976       1.628

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  64978.391       0.480     122.350  429308.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.338   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.320    2233.301       8.800     529.553       1.000       1.000       0.980
W Kg/sec =  15.1453171
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
56.236	2210.297	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
54265.969	26144.848	3.111	509.668	163.806	390.276	2.383

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	213.68	-0.07	213.68	0.19	353.35
MEAN	15.91	0.00	-0.02	213.68	-0.07	213.68	0.19	
HUB	13.07	0.00	-0.02	213.68	-0.07	213.68	0.19	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.11	47.36	11.75	357.04	416.16	8.58	525.75	0.37
MEAN	55.44	44.80	10.64	310.13	376.68	8.58	525.75	0.33
HUB	50.02	38.84	11.18	254.72	332.54	8.58	525.75	0.30

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	293.90	190.76	223.58	1132.27	0.26
MEAN	15.50	291.53	185.35	225.03	1130.56	0.26
HUB	12.59	305.01	204.15	226.62	1128.84	0.27

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	349.64	274.28	158.88	0.24	3423.58	
MEAN	302.04	253.49	116.69	0.22	2873.62	1.65
HUB	245.37	230.33	41.22	0.20	2571.26	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	9.38	1.07	8.95	540.28	1.02	533.08	0.92	0.90
MEAN	9.28	1.05	8.86	538.56	1.02	531.47	0.92	0.90
HUB	9.23	1.05	8.77	537.61	1.02	529.85	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.47	35.40	31.50	3.90	0.93	0.42	2.90	
MEAN	39.48	27.41	23.50	3.91	0.94	0.40	3.34	0.90
HUB	42.02	10.31	6.50	3.81	0.94	0.38	4.06	

blockage3	Cor/Incid
0.950	0.988

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	295.090	188.747	226.833	1130.647	0.261	-0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
9.288	8.858	531.553	46.000	39.764	33.000	-6.764

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	239.288	188.747	304.769	1133.289	0.211	0.318

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	9.284	8.999	534.040	440.827	0.029	0.454

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	224.895	0.000	224.895	1133.880	0.198	0.379

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	9.023	534.597	0.000	0.060	0.052	0.371

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.864	9.274	1.054	538.815	9.262	223.094	1.729

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 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   57620.730       0.471     108.496  330964.812

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     387490.03    729.6153     72.1814      1.4259      0.8180     17.3378      1.1307


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NPSS: Inlet Mach number .55, Altitude 25666ft, dT 22R, Thrust 10%
Stage 3 stator Blocked @ 27%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.343   EfDer =  0.937

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      33.312    2233.318       6.504     476.516       1.000       1.000       0.980
 W Kg/sec =  15.1416359

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
      72.164    2330.076       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
   54252.781   26138.492       3.956     831.557     210.193     619.754       2.948

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   158.31    -0.05   158.31     0.15   419.47
  MEAN    17.06     0.00    -0.02   158.31    -0.05   158.31     0.15
  HUB     12.51     0.00    -0.02   158.31    -0.05   158.31     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.51    50.47    18.04   402.07   432.16     6.40   474.43     0.40
  MEAN    64.54    47.20    17.34   332.49   368.30     6.40   474.43     0.34
  HUB     57.01    38.62    18.39   243.81   290.74     6.40   474.43     0.27

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   357.05   285.40   214.55  1079.33     0.33
  MEAN    18.04   358.05   285.01   216.73  1076.65     0.33
  HUB     15.00   382.87   313.54   219.72  1073.40     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    402.07   244.22   116.67     0.23  5888.83
  MEAN   351.51   226.70    66.50     0.21  5141.38     1.87
  HUB    292.34   220.74    21.20     0.21  4703.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      7.29     1.12     6.76   494.97     1.04   484.34     0.92     0.86
  MEAN     7.19     1.10     6.66   492.63     1.03   481.94     0.92     0.86
  HUB      7.13     1.10     6.53   491.26     1.03   479.03     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     53.06    28.54    24.20     4.34     0.93     0.55     2.90
  MEAN    52.75    17.06    12.70     4.36     0.95     0.50     3.51     0.86
  HUB     54.98    -5.51    -9.30     3.79     0.95     0.36     4.78
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   blockage3   Cor/Incid
      0.950       0.937

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     360.779     284.457     221.914    1076.833       0.335       0.001

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.195       6.657     482.097      24.000      52.041      35.400     -16.641

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     236.312     284.457     369.809    1083.734       0.218       0.538

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       7.179       6.944     488.296     528.796       0.040       0.650

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     18.083     221.031       0.000     221.031    1084.381       0.204       0.502

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.935     488.879       0.000       0.060       0.111       0.521

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.784       7.139       1.098     492.955      16.439     159.557       1.237

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102228.609       0.632     192.442  337114.344


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.343   EfDer =  0.943

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.312    2233.318       7.139     492.955       1.000       1.000       0.980
W Kg/sec =  15.1416359

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     66.869    2290.895       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54252.781   26138.492       3.032     590.487     194.772     474.134       2.434

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   211.81    -0.07   211.81     0.20   410.82
 MEAN    18.08     0.00    -0.02   211.81    -0.07   211.81     0.20
 HUB     15.21     0.00    -0.02   211.81    -0.07   211.81     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.13    46.36    15.77   400.51   453.13     6.95   489.21     0.42
 MEAN    58.99    42.30    16.69   352.33   411.16     6.95   489.21     0.38
 HUB     54.46    37.84    16.62   296.43   364.39     6.95   489.21     0.34

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   328.34   240.74   223.28  1095.94     0.30
 MEAN    18.01   325.52   235.19   225.05  1093.77     0.30
 HUB     15.22   341.87   255.55   227.09  1091.57     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    397.97   273.08   157.23     0.25  4917.47
 MEAN   351.00   253.10   115.81     0.23  4237.14     1.80
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 HUB    296.69   230.79    41.13     0.21  3891.41

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     7.83     1.10     7.36   508.37     1.03   499.37     0.92     0.86
 MEAN    7.74     1.08     7.27   506.23     1.03   497.40     0.92     0.86
 HUB     7.69     1.08     7.18   505.15     1.02   495.40     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    47.16    35.15    31.50     3.65     0.93     0.49     2.90
 MEAN   46.26    27.23    23.50     3.73     0.95     0.47     3.30     0.86
 HUB    48.38    10.27     6.50     3.77     0.95     0.46     3.92


   blockage3   Cor/Incid
      0.950       0.943

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     328.715     235.853     228.969    1093.962       0.300       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.747       7.276     497.571      46.000      45.848      30.600     -15.248

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     232.814     235.853     331.405    1098.889       0.212       0.471

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       7.736       7.498     502.063     511.151       0.033       0.539

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.823     230.535       0.000     230.535    1098.985       0.210       0.403

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       7.470     502.151       0.000       0.060       0.102       0.413

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.796       7.703       1.079     506.584      13.629     178.984       1.387

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  84763.898       0.535     159.565  306774.906


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.343   EfDer =  0.964

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.312    2233.318       7.703     506.584       1.000       1.000       0.980
W Kg/sec =  15.1416359

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     62.825    2259.868       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54252.781   26138.492       2.981     545.479     182.994     429.765       2.349

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   218.52    -0.08   218.52     0.20   395.79
 MEAN    17.74     0.00    -0.02   218.52    -0.08   218.52     0.20
 HUB     15.05     0.00    -0.02   218.52    -0.08   218.52     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.81    46.36    14.45   391.15   448.12     7.49   502.60     0.41
 MEAN    57.71    43.40    14.31   345.71   409.05     7.49   502.60     0.37
 HUB     53.32    38.84    14.48   293.32   365.83     7.49   502.60     0.33

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
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B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	320.97	224.05	229.84	1109.59	0.29
MEAN	17.51	320.64	221.89	231.46	1107.73	0.29
HUB	14.85	339.70	246.90	233.31	1105.84	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	386.08	281.21	162.03	0.25	4439.93	
MEAN	341.19	260.39	119.30	0.24	3885.91	1.73
HUB	289.42	237.15	42.51	0.21	3667.66	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	8.37	1.09	7.90	520.50	1.03	511.90	0.92	0.88
MEAN	8.29	1.08	7.82	518.76	1.02	510.19	0.92	0.88
HUB	8.25	1.07	7.73	518.08	1.02	508.45	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.27	35.18	31.50	3.68	0.93	0.46	2.90	
MEAN	43.79	27.27	23.50	3.77	0.95	0.45	3.28	0.88
HUB	46.62	10.33	6.50	3.83	0.95	0.44	3.87	

blockage3	Cor/Incid
0.680	0.964

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	406.101	223.349	339.166	1102.470	0.368	-0.536

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
8.301	7.558	505.357	46.000	33.366	31.500	-1.866

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	349.761	223.349	414.991	1106.338	0.316	-0.153

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	8.299	7.743	508.909	333.965	0.015	0.349

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	339.256	0.000	339.256	1106.994	0.306	0.423

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	7.764	509.513	0.000	0.060	0.038	-0.109

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.856	8.287	1.076	519.112	12.528	186.113	1.443

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
77925.211	0.523	146.692	306075.062

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =17.343 EfDer = 0.985

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
33.312	2233.318	8.287	519.112	1.000	1.000	0.710

W Kg/sec = 15.1416359

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
59.111	2232.432	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
54252.781	26138.492	2.160	371.903	172.178	286.733	1.665

ROTOR LEADING EDGE CONDITIONS, STAGE 4

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       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   311.26    -0.11   311.26     0.28   375.21
MEAN    16.97     0.00    -0.02   311.26    -0.11   311.26     0.28
HUB     14.32     0.00    -0.02   311.26    -0.11   311.26     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.34    46.36     3.98   375.37   487.71     7.85   511.03     0.44
MEAN    46.75    43.80     2.95   330.75   454.26     7.85   511.03     0.41
HUB     41.89    37.84     4.05   279.09   418.13     7.85   511.03     0.38

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   302.17   194.27   231.45  1121.53     0.27
MEAN    16.57   302.98   193.84   232.86  1119.95     0.27
HUB     13.89   321.83   220.51   234.42  1118.39     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    367.96   289.37   173.69     0.26  3669.80
MEAN   323.01   266.29   129.18     0.24  3214.48     1.84
HUB    270.71   239.73    50.20     0.21  3064.45

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      8.88     1.07     8.44   530.61     1.02   523.00     0.92     0.90
MEAN     8.80     1.06     8.37   529.18     1.02   521.53     0.92     0.90
HUB      8.78     1.06     8.29   528.71     1.02   520.08     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.01    36.89    31.50     5.39     0.93     0.47     2.90
MEAN    39.77    29.02    23.50     5.52     0.91     0.48     3.29     0.90
HUB     43.25    12.09     6.50     5.59     0.91     0.49     3.90


   blockage3   Cor/Incid
      0.950       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     300.502     194.929     228.701    1120.429       0.268       0.042

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      8.817       8.387     521.972      46.000      40.442      32.400      -8.042

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     16.481     239.171     194.929     308.545    1123.388       0.213       0.381

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       8.814       8.540     524.732     456.573       0.017       0.459

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     16.096     228.097       0.000     228.097    1123.850       0.203       0.350

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       8.546     525.164       0.000       0.060       0.058       0.395

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858       8.795       1.061     529.503      10.391     211.008       1.636

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  64639.719       0.477     121.682  442296.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.343   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
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     33.312    2233.318       8.795     529.503       1.000       1.000       0.980
W Kg/sec =  15.1416359

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     56.252    2210.419       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 54252.781   26138.492       3.111     509.668     163.853     390.276       2.382

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   213.73    -0.07   213.73     0.19   353.37
 MEAN    15.91     0.00    -0.02   213.73    -0.07   213.73     0.19
 HUB     13.07     0.00    -0.02   213.73    -0.07   213.73     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.10    47.36    11.74   357.05   416.19     8.58   525.69     0.37
 MEAN    55.43    44.80    10.63   310.13   376.71     8.58   525.69     0.34
 HUB     50.01    38.84    11.17   254.73   332.57     8.58   525.69     0.30

      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   293.92   190.73   223.63  1132.21     0.26
 MEAN    15.50   291.56   185.32   225.09  1130.50     0.26
 HUB     12.59   305.06   204.17   226.67  1128.78     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    349.64   274.34   158.90     0.24  3423.13
 MEAN   302.04   253.55   116.72     0.22  2873.22     1.65
 HUB    245.37   230.39    41.20     0.20  2571.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      9.37     1.07     8.94   540.23     1.02   533.02     0.92     0.90
 MEAN     9.28     1.05     8.86   538.50     1.02   531.42     0.92     0.90
 HUB      9.23     1.05     8.77   537.56     1.02   529.80     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.46    35.40    31.50     3.90     0.93     0.42     2.90
 MEAN    39.47    27.41    23.50     3.91     0.94     0.40     3.34     0.90
 HUB     42.01    10.30     6.50     3.80     0.94     0.38     4.06


  blockage3   Cor/Incid
     0.950       0.988

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    15.219     295.116     188.721     226.888    1130.592       0.261      -0.011

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     9.282       8.852     531.501      46.000      39.753      33.000      -6.753

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    15.219     239.347     188.721     304.799    1133.233       0.211       0.318

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       9.278       8.994     533.987     440.827       0.029       0.454

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    14.701     224.950       0.000     224.950    1133.824       0.198       0.379

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       9.017     534.544       0.000       0.060       0.052       0.371

   STAGE EXIT CONDITIONS, STAGE   5
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      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864       9.268       1.054     538.764       9.261     223.136       1.730

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   57616.504       0.471     108.461  330911.219

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     387173.94    728.8428     72.1638      1.4251      0.8173     17.3435      1.1306


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NPSS: Inlet Mach number .55, Altitude 25666ft, dT 22R, Thrust 10%
Stage 3 stator Blocked @ 30%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.355   EfDer =  0.937

    W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     33.295    2233.340       6.504     476.516       1.000       1.000       0.980
 W Kg/sec =  15.1340895

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     72.128    2330.099       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54225.742   26125.465       3.958     831.557     210.089     619.754       2.950

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   158.23    -0.05   158.23     0.15   419.48
  MEAN    17.06     0.00    -0.02   158.23    -0.05   158.23     0.15
  HUB     12.51     0.00    -0.02   158.23    -0.05   158.23     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.52    50.47    18.05   402.07   432.13     6.40   474.43     0.40
  MEAN    64.56    47.20    17.36   332.49   368.27     6.40   474.43     0.34
  HUB     57.02    38.62    18.40   243.81   290.70     6.40   474.43     0.27

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   357.03   285.45   214.45  1079.34     0.33
  MEAN    18.04   358.02   285.04   216.62  1076.66     0.33
  HUB     15.00   382.78   313.52   219.61  1073.41     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    402.07   244.10   116.62     0.23  5890.01
  MEAN   351.51   226.59    66.47     0.21  5142.00     1.88
  HUB    292.34   220.63    21.17     0.21  4703.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      7.29     1.12     6.76   494.98     1.04   484.34     0.92     0.86
  MEAN     7.19     1.10     6.66   492.63     1.03   481.94     0.92     0.86
  HUB      7.13     1.10     6.53   491.26     1.03   479.04     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     53.08    28.54    24.20     4.34     0.93     0.55     2.90
 MEAN    52.77    17.06    12.70     4.36     0.95     0.50     3.51     0.86
 HUB     54.99    -5.51    -9.30     3.79     0.95     0.36     4.78


   blockage3   Cor/Incid
      0.950       0.937

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     18.071     360.737     284.491     221.802    1076.837       0.335        0.001

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.195       6.657     482.101      24.000      52.058      35.400     -16.658

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth        Aoth         Machth      cp 2-Th
     18.071     236.190     284.491     369.758    1083.741       0.218        0.538

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       7.178       6.945     488.303     528.796       0.040        0.651

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4        cp 3-4
     18.083     220.919       0.000     220.919    1084.387       0.204        0.502

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       6.935     488.885       0.000       0.060       0.112        0.521

    STAGE EXIT CONDITIONS, STAGE   1
       Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
       0.784       7.139        1.098     492.956      16.441     159.506        1.236

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102238.672       0.632     192.365  336942.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.355   EfDer =  0.943

   W act       RPM act         Pt          Tt            POTS         POTH        AeroBl
     33.295     2233.340        7.139     492.956        1.000        1.000        0.980
W Kg/sec =  15.1340895

   W cor       RPM cor         GAMMA         Cp          R            Blades        THK
     66.837     2290.914        1.401        0.248      53.349       56.000        0.050

   CFM        SCFM             A1/A*       Area1       A*        AthrRotor   ChokeMargin
  54225.742   26125.465        3.033     590.487     194.677     474.134        2.435

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1       Stator    Alfa     C1       CU1        Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   211.70    -0.07   211.70      0.20   410.82
 MEAN    18.08      0.00    -0.02   211.70    -0.07   211.70      0.20
 HUB     15.21      0.00    -0.02   211.70    -0.07   211.70      0.20

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     62.14     46.36    15.78   400.51   453.08      6.95   489.22      0.42
 MEAN    59.01     42.30    16.71   352.34   411.11      6.95   489.22      0.38
 HUB     54.47     37.84    16.63   296.44   364.33      6.95   489.22      0.34

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     20.42   328.33    240.82    223.16   1095.95      0.30
 MEAN    18.01   325.49    235.25    224.94   1093.78      0.30
 HUB     15.22   341.82    255.59    226.98   1091.58      0.31
```

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	397.98	272.95	157.16	0.25	4919.08	
MEAN	351.01	252.98	115.76	0.23	4238.17	1.80
HUB	296.69	230.67	41.10	0.21	3891.91	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	7.83	1.10	7.36	508.37	1.03	499.38	0.92	0.86
MEAN	7.74	1.08	7.27	506.24	1.03	497.40	0.92	0.86
HUB	7.69	1.08	7.18	505.15	1.02	495.41	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	47.18	35.15	31.50	3.65	0.93	0.49	2.90	
MEAN	46.28	27.23	23.50	3.73	0.95	0.47	3.30	0.86
HUB	48.39	10.26	6.50	3.76	0.95	0.46	3.92	

blockage3	Cor/Incid
0.950	0.943

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	328.677	235.911	228.855	1093.970	0.300	0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
7.747	7.276	497.578	46.000	45.870	30.600	-15.270

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	232.695	235.911	331.363	1098.899	0.212	0.471

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	7.736	7.498	502.072	511.151	0.033	0.539

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	230.419	0.000	230.419	1098.995	0.210	0.403

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	7.470	502.160	0.000	0.060	0.102	0.413

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.796	7.703	1.079	506.589	13.633	178.907	1.387

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
84785.156	0.535	159.526	306615.219

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =17.355 EfDer = 0.964

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
33.295	2233.340	7.703	506.589	1.000	1.000	0.980

W Kg/sec = 15.1340895

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
62.794	2259.879	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
54225.742	26125.465	2.982	545.479	182.905	429.765	2.350

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	218.41	-0.08	218.41	0.20	395.79
MEAN	17.74	0.00	-0.02	218.41	-0.08	218.41	0.20	
HUB	15.05	0.00	-0.02	218.41	-0.08	218.41	0.20	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.83	46.36	14.47	391.16	448.07	7.49	502.61	0.41
MEAN	57.72	43.40	14.32	345.72	408.99	7.49	502.61	0.37

```
HUB     53.33    38.84    14.49   293.32   365.76     7.49   502.61     0.33

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   320.94   224.12   229.72  1109.60     0.29
MEAN    17.51   320.59   221.94   231.34  1107.74     0.29
HUB     14.85   339.64   246.93   233.19  1105.85     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    386.09   281.08   161.97     0.25  4441.39
MEAN   341.20   260.27   119.25     0.23  3886.81     1.73
HUB    289.42   237.03    42.49     0.21  3668.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      8.37     1.09     7.90   520.51     1.03   511.92     0.92     0.88
MEAN     8.29     1.08     7.82   518.77     1.02   510.20     0.92     0.88
HUB      8.25     1.07     7.73   518.08     1.02   508.46     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.29    35.19    31.50     3.69     0.93     0.46     2.90
MEAN    43.81    27.27    23.50     3.77     0.95     0.45     3.28     0.88
HUB     46.64    10.33     6.50     3.83     0.95     0.44     3.87


  blockage3   Cor/Incid
     0.650       0.964

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     421.242     223.400     357.124    1101.339       0.382      -0.648

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      8.301       7.503     504.320      46.000      32.028      31.500      -0.528

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     368.436     223.400     430.874    1105.130       0.333      -0.275

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.650       8.299       7.683     507.798     318.628       0.015       0.330

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
    17.121     357.185       0.000     357.185    1105.871       0.323       0.422

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.650       7.710     508.479       0.000       0.060       0.037      -0.221

   STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857       8.288       1.076     519.120      12.531     186.035       1.442

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  77943.812       0.523     146.654  305914.156


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.355   EfDer =  0.972

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.295    2233.340       8.288     519.120       1.000       1.000       0.680
W Kg/sec =  15.1340895

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     59.078    2232.436       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54225.742   26125.465       2.070     356.188     172.082     274.030       1.592
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ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	326.06	-0.11	326.06	0.29	375.21
MEAN	16.97	0.00	-0.02	326.06	-0.11	326.06	0.29	
HUB	14.32	0.00	-0.02	326.06	-0.11	326.06	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.03	46.36	2.67	375.37	497.30	7.80	510.25	0.45
MEAN	45.42	43.80	1.62	330.75	464.53	7.80	510.25	0.42
HUB	40.57	37.84	2.73	279.09	429.27	7.80	510.25	0.39

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	300.97	192.23	231.58	1121.47	0.27
MEAN	16.57	301.94	192.11	232.95	1119.92	0.27
HUB	13.89	320.88	219.07	234.47	1118.39	0.29

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	367.96	290.70	175.73	0.26	3631.53	
MEAN	323.02	267.21	130.91	0.24	3185.89	1.87
HUB	270.71	240.09	51.64	0.21	3044.45	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	8.87	1.07	8.43	530.50	1.02	522.94	0.92	0.89
MEAN	8.79	1.06	8.36	529.10	1.02	521.50	0.92	0.89
HUB	8.77	1.06	8.28	528.66	1.02	520.07	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.70	37.19	31.50	5.69	0.93	0.48	2.90	
MEAN	39.51	29.33	23.50	5.83	0.91	0.49	3.29	0.89
HUB	43.06	12.42	6.50	5.92	0.91	0.51	3.90	

blockage3	Cor/Incid
0.950	0.972

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	299.445	193.189	228.791	1120.397	0.267	0.041

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
8.806	8.379	521.942	46.000	40.177	32.400	-7.777

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	239.325	193.189	307.569	1123.293	0.213	0.376

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	8.803	8.529	524.644	456.573	0.016	0.455

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	228.229	0.000	228.229	1123.756	0.203	0.347

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	8.535	525.076	0.000	0.060	0.057	0.391

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.847	8.785	1.060	529.420	10.300	212.750	1.649

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
64076.273	0.473	120.561	463350.281

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

```
 RESET =  0.000BLEED =  0.000 DPInc =17.355   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.295    2233.340       8.785     529.420       1.000       1.000       0.980
W Kg/sec =  15.1340895

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     56.288    2210.613       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54225.742   26125.465       3.109     509.668     163.956     390.276       2.380

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   213.86    -0.07   213.86     0.19   353.40
 MEAN    15.91     0.00    -0.02   213.86    -0.07   213.86     0.19
 HUB     13.07     0.00    -0.02   213.86    -0.07   213.86     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.09    47.36    11.73   357.05   416.26     8.57   525.61     0.37
 MEAN    55.42    44.80    10.62   310.14   376.78     8.57   525.61     0.34
 HUB     49.99    38.84    11.15   254.73   332.66     8.57   525.61     0.30

      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   293.95   190.63   223.76  1132.11     0.26
 MEAN    15.50   291.63   185.28   225.21  1130.41     0.26
 HUB     12.59   305.15   204.16   226.80  1128.69     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    349.64   274.51   159.01     0.24  3421.26
 MEAN   302.04   253.68   116.77     0.22  2872.51     1.65
 HUB    245.37   230.52    41.22     0.20  2571.29

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      9.36     1.07     8.93   540.14     1.02   532.93     0.92     0.90
 MEAN     9.27     1.05     8.85   538.42     1.02   531.33     0.92     0.90
 HUB      9.21     1.05     8.76   537.48     1.02   529.71     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.43    35.40    31.50     3.90     0.93     0.42     2.90
 MEAN    39.44    27.41    23.50     3.91     0.94     0.40     3.34     0.90
 HUB     41.99    10.30     6.50     3.80     0.94     0.38     4.06


   blockage3   Cor/Incid
      0.950       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     295.187     188.674     227.019    1130.497       0.261      -0.011

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      9.271       8.841     531.412      46.000      39.730      33.000      -6.730

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     239.486     188.674     304.879    1133.136       0.211       0.318

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       9.267       8.983     533.896     440.827       0.029       0.453

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     14.701     225.080       0.000     225.080    1133.728       0.199       0.378

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950       9.006     534.454       0.000       0.060       0.052       0.371

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864       9.257       1.054     538.679       9.258     223.252       1.731

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   57599.320       0.471     108.375  330792.562

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     386643.22    727.4811     72.1279      1.4233      0.8154     17.3550      1.1305


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NPSS: Inlet Mach number .55, Altitude 25666ft, dT 22R, Thrust 10%
Stage 3 stator Blocked @ 35%

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*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*****************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.385   EfDer =  0.936

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      33.252    2233.382       6.504     476.516       1.000       1.000       0.980
 W Kg/sec =  15.1146364

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
      72.035    2330.142       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
   54156.039   26091.885       3.963     831.557     209.819     619.754       2.954

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   158.02    -0.05   158.02     0.15   419.48
  MEAN    17.06     0.00    -0.02   158.02    -0.05   158.02     0.15
  HUB     12.51     0.00    -0.02   158.02    -0.05   158.02     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.55    50.47    18.08   402.08   432.06     6.41   474.43     0.40
  MEAN    64.58    47.20    17.38   332.50   368.19     6.41   474.43     0.34
  HUB     57.06    38.62    18.44   243.82   290.59     6.41   474.43     0.27

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   356.97   285.59   214.17  1079.35     0.33
  MEAN    18.04   357.92   285.13   216.34  1076.67     0.33
  HUB     15.00   382.59   313.49   219.32  1073.42     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    402.08   243.80   116.49     0.23  5892.79
  MEAN   351.52   226.30    66.39     0.21  5143.62     1.88
  HUB    292.35   220.34    21.14     0.21  4703.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP      7.29     1.12     6.76   494.99     1.04   484.36     0.92     0.86
  MEAN     7.19     1.10     6.66   492.64     1.03   481.95     0.92     0.86
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 HUB      7.13     1.10     6.53   491.26     1.03   479.05     0.92     0.86

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     53.13    28.54    24.20     4.34     0.93     0.55     2.90
 MEAN    52.81    17.06    12.70     4.36     0.95     0.50     3.51     0.86
 HUB     55.02    -5.51    -9.30     3.79     0.95     0.36     4.78


   blockage3   Cor/Incid
      0.950       0.936

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     360.630     284.581     221.513    1076.849       0.335       0.001

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.195       6.657     482.112      24.000      52.103      35.400     -16.703

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     235.877     284.581     369.627    1083.760       0.218       0.539

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       7.178       6.945     488.320     528.796       0.040       0.652

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     18.083     220.630       0.000     220.630    1084.404       0.203       0.502

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       6.935     488.900       0.000       0.060       0.112       0.521

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.783       7.139       1.098     492.961      16.445     159.371       1.235

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102266.570       0.633     192.170  336499.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.385   EfDer =  0.943

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.252    2233.382       7.139     492.961       1.000       1.000       0.980
W Kg/sec =  15.1146364

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     66.753    2290.946       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54156.039   26091.885       3.037     590.487     194.432     474.134       2.439

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   211.42    -0.07   211.42     0.19   410.83
 MEAN    18.08     0.00    -0.02   211.42    -0.07   211.42     0.19
 HUB     15.21     0.00    -0.02   211.42    -0.07   211.42     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.18    46.36    15.82   400.52   452.96     6.95   489.23     0.42
 MEAN    59.04    42.30    16.74   352.34   410.97     6.95   489.23     0.38
 HUB     54.51    37.84    16.67   296.44   364.17     6.95   489.23     0.34

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   328.28   241.02   222.88  1095.97     0.30
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 MEAN    18.01   325.40   235.41   224.65  1093.80     0.30
 HUB     15.22   341.67   255.64   226.69  1091.60     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    397.98   272.60   156.96     0.25  4923.17
 MEAN   351.01   252.65   115.60     0.23  4241.08     1.80
 HUB    296.70   230.37    41.05     0.21  3892.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     7.83     1.10     7.36   508.39     1.03   499.40     0.92     0.86
 MEAN    7.74     1.08     7.27   506.25     1.03   497.42     0.92     0.86
 HUB     7.69     1.08     7.18   505.16     1.02   495.42     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    47.24    35.16    31.50     3.66     0.93     0.49     2.90
 MEAN   46.34    27.23    23.50     3.73     0.95     0.47     3.30     0.86
 HUB    48.44    10.27     6.50     3.77     0.95     0.46     3.92


  blockage3   Cor/Incid
     0.950       0.943

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.960     328.589     236.073     228.561    1093.989       0.300       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     7.747       7.277     497.596      46.000      45.926      30.600     -15.326

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth       Cmth      Aoth         Machth      cp 2-Th
    17.960     232.390     236.073     331.264    1098.926       0.211       0.472

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       7.736       7.498     502.097     511.151       0.033       0.540

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    17.823     230.121       0.000     230.121    1099.022       0.209       0.404

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       7.471     502.185       0.000       0.060       0.103       0.414

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.795       7.703       1.079     506.602      13.641     178.711       1.385

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  84837.352       0.536     159.419  306203.781


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.385   EfDer =  0.964

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.252    2233.382       7.703     506.602       1.000       1.000       0.980
W Kg/sec =  15.1146364

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     62.716    2259.892       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54156.039   26091.885       2.986     545.479     182.676     429.765       2.353

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   218.13    -0.08   218.13     0.20   395.79
 MEAN    17.74     0.00    -0.02   218.13    -0.08   218.13     0.20
 HUB     15.05     0.00    -0.02   218.13    -0.08   218.13     0.20
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.86    46.36    14.50   391.16   447.94     7.49   502.63     0.41
MEAN    57.76    43.40    14.36   345.72   408.85     7.49   502.63     0.37
HUB     53.37    38.84    14.53   293.32   365.60     7.49   502.63     0.33

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   320.88   224.34   229.43  1109.63     0.29
MEAN    17.51   320.48   222.09   231.05  1107.77     0.29
HUB     14.85   339.48   247.00   232.89  1105.88     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    386.10   280.72   161.76     0.25  4445.62
MEAN   341.20   259.94   119.11     0.23  3889.42     1.73
HUB    289.43   236.73    42.43     0.21  3669.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      8.37     1.09     7.90   520.53     1.03   511.95     0.92     0.88
MEAN     8.29     1.08     7.82   518.79     1.02   510.22     0.92     0.88
HUB      8.25     1.07     7.73   518.10     1.02   508.49     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.36    35.19    31.50     3.69     0.93     0.46     2.90
MEAN    43.87    27.27    23.50     3.77     0.95     0.45     3.28     0.88
HUB     46.68    10.32     6.50     3.82     0.95     0.44     3.87


   blockage3   Cor/Incid
      0.600       0.964

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     451.201     223.550     391.928    1098.979       0.411      -0.880

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      8.301       7.391     502.161      46.000      29.700      31.500       1.800

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     404.739     223.550     462.372    1102.603       0.367      -0.529

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.600       8.298       7.560     505.478     293.068       0.017       0.298

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.121     391.998       0.000     391.998    1103.526       0.355       0.418

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600       7.595     506.325       0.000       0.060       0.038      -0.458

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.856       8.288       1.076     519.141      12.540     185.824       1.440

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  77996.391       0.523     146.564  305499.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.385   EfDer =  0.938

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.252    2233.382       8.288     519.141       1.000       1.000       0.630
W Kg/sec =  15.1146364

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     59.006    2232.432       1.401       0.248      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
54156.039	26091.885	1.920	329.998	171.873	252.858	1.471

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	354.29	-0.12	354.29	0.32	375.21
MEAN	16.97	0.00	-0.02	354.29	-0.12	354.29	0.32	
HUB	14.32	0.00	-0.02	354.29	-0.12	354.29	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.66	46.36	0.30	375.38	516.25	7.72	508.67	0.47
MEAN	43.04	43.80	-0.76	330.76	484.77	7.72	508.67	0.44
HUB	38.24	37.84	0.40	279.10	451.09	7.72	508.67	0.41

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	298.71	188.23	231.93	1121.36	0.27
MEAN	16.57	299.97	188.67	233.20	1119.86	0.27
HUB	13.89	319.14	216.30	234.66	1118.38	0.29

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	367.97	293.43	179.74	0.26	3556.18	
MEAN	323.02	269.14	134.35	0.24	3129.11	1.93
HUB	270.72	240.89	54.42	0.22	3006.14	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	8.83	1.07	8.41	530.28	1.02	522.84	0.92	0.86
MEAN	8.77	1.06	8.34	528.95	1.02	521.44	0.92	0.86
HUB	8.75	1.06	8.27	528.56	1.02	520.07	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.06	37.77	31.50	6.27	0.93	0.49	2.90	
MEAN	38.97	29.95	23.50	6.45	0.90	0.50	3.29	0.86
HUB	42.67	13.06	6.50	6.56	0.90	0.53	3.90	

blockage3	Cor/Incid
0.950	0.938

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	297.431	189.734	229.055	1120.337	0.265	0.041

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
8.777	8.357	521.886	46.000	39.636	32.400	-7.236

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	239.722	189.734	305.721	1123.108	0.213	0.367

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	8.775	8.501	524.471	456.573	0.015	0.446

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	228.579	0.000	228.579	1123.574	0.203	0.340

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	8.509	524.906	0.000	0.060	0.054	0.385

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.817	8.758	1.057	529.264	10.122	216.269	1.677

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
62969.875	0.465	118.327	503393.719

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.385   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.252    2233.382       8.758     529.264       1.000       1.000       0.980
W Kg/sec =  15.1146364

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     56.378    2210.980       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 54156.039   26091.885       3.104     509.668     164.220     390.276       2.377

    ROTOR LEADING EDGE CONDITIONS, STAGE   5

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   214.18    -0.07   214.18     0.19   353.46
MEAN    15.91     0.00    -0.02   214.18    -0.07   214.18     0.19
HUB     13.07     0.00    -0.02   214.18    -0.07   214.18     0.19

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.05    47.36    11.69   357.06   416.43     8.54   525.44     0.37
MEAN    55.38    44.80    10.58   310.14   376.97     8.54   525.44     0.34
HUB     49.95    38.84    11.11   254.73   332.87     8.54   525.44     0.30

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   294.07   190.41   224.10  1131.93     0.26
MEAN    15.50   291.77   185.08   225.56  1130.22     0.26
HUB     12.59   305.36   204.09   227.14  1128.51     0.27

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    349.65   274.91   159.24     0.24  3417.36
MEAN   302.05   254.08   116.97     0.22  2869.43     1.64
HUB    245.38   230.87    41.29     0.20  2570.43

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      9.33     1.07     8.90   539.97     1.02   532.76     0.92     0.90
MEAN     9.24     1.05     8.82   538.25     1.02   531.15     0.92     0.90
HUB      9.19     1.05     8.73   537.32     1.02   529.54     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.35    35.40    31.50     3.90     0.93     0.42     2.90
MEAN    39.37    27.41    23.50     3.91     0.94     0.40     3.34     0.90
HUB     41.94    10.30     6.50     3.80     0.94     0.38     4.06


  blockage3   Cor/Incid
     0.950       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    15.219     295.322     188.471     227.363    1130.315       0.261      -0.010

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     9.243       8.814     531.241      46.000      39.657      33.000      -6.657

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    15.219     239.856     188.471     305.044    1132.945       0.212       0.316

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       9.239       8.955     533.716     440.827       0.029       0.452

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
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     14.701     225.424       0.000     225.424    1133.539       0.199       0.377

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       8.978     534.276       0.000       0.060       0.051       0.370

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865       9.229       1.054     538.514       9.250     223.571       1.733

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  57549.727       0.471     108.142  330460.156

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     385619.91    724.6230     72.0351      1.4190      0.8102     17.3846      1.1301


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NPSS: Inlet Mach number .55, Altitude 25666ft, dT 22R, Thrust 10%
Stage 3 stator Blocked @ 40%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  ******************
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         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.426   EfDer =  0.936

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      33.192    2233.407       6.504     476.516       1.000       1.000       0.980
 W Kg/sec =  15.0873184

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
      71.905    2330.169       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
   54058.156   26044.725       3.970     831.557     209.439     619.754       2.959

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   157.73    -0.05   157.73     0.15   419.49
  MEAN    17.06     0.00    -0.02   157.73    -0.05   157.73     0.15
  HUB     12.51     0.00    -0.02   157.73    -0.05   157.73     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.58    50.47    18.11   402.08   431.96     6.41   474.44     0.40
  MEAN    64.63    47.20    17.43   332.50   368.07     6.41   474.44     0.34
  HUB     57.11    38.62    18.49   243.82   290.44     6.41   474.44     0.27

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   356.89   285.79   213.77  1079.37     0.33
  MEAN    18.04   357.76   285.24   215.94  1076.69     0.33
  HUB     15.00   382.32   313.44   218.92  1073.44     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    402.08   243.36   116.30     0.23  5896.90
  MEAN   351.53   225.89    66.29     0.21  5145.50     1.88
  HUB    292.35   219.93    21.09     0.20  4702.28
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      7.29     1.12     6.76   495.00     1.04   484.37     0.92     0.86
MEAN     7.19     1.10     6.66   492.64     1.03   481.97     0.92     0.86
HUB      7.13     1.10     6.53   491.26     1.03   479.06     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     53.20    28.55    24.20     4.35     0.93     0.55     2.90
MEAN    52.87    17.06    12.70     4.36     0.95     0.50     3.51     0.86
HUB     55.07    -5.50    -9.30     3.80     0.95     0.37     4.78


   blockage3   Cor/Incid
      0.950       0.936

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     18.071     360.462     284.685     221.106    1076.867       0.335        0.001

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      7.195       6.658     482.128      24.000      52.165      35.400     -16.765

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     18.071     235.437     284.685     369.426    1083.786       0.217        0.540

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       7.178       6.946     488.343     528.796       0.040        0.653

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4          Mach4        cp 3-4
     18.083     220.225       0.000     220.225    1084.427       0.203        0.503

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       6.936     488.921       0.000       0.060       0.112        0.522

    STAGE EXIT CONDITIONS, STAGE   1
       Eff4        Pt4          PR4        Texit         Del T        Ns         Ns nondim
       0.783       7.138        1.098     492.967      16.451     159.185        1.234

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102301.867       0.633     191.889  335878.031


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.426   EfDer =  0.942

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     33.192     2233.407        7.138     492.967       1.000        1.000        0.980
W Kg/sec =  15.0873184

   W cor       RPM cor         GAMMA         Cp          R           Blades        THK
     66.635     2290.959        1.401       0.248      53.349      56.000        0.050

   CFM        SCFM            A1/A*       Area1       A*        AthrRotor   ChokeMargin
  54058.156   26044.725        3.042     590.487     194.089     474.134        2.443

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1       Stator    Alfa     C1       CU1        Cm1      Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   211.04    -0.07   211.04      0.19   410.83
 MEAN    18.08      0.00    -0.02   211.04    -0.07   211.04      0.19
 HUB     15.21      0.00    -0.02   211.04    -0.07   211.04      0.19

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     62.22     46.36    15.86   400.52   452.78      6.95   489.25      0.42
 MEAN    59.09     42.30    16.79   352.35   410.78      6.95   489.25      0.38
 HUB     54.56     37.84    16.72   296.45   363.95      6.95   489.25      0.34

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000
```

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	328.21	241.31	222.47	1096.00	0.30
MEAN	18.01	325.27	235.61	224.25	1093.82	0.30
HUB	15.22	341.44	255.70	226.28	1091.62	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	397.99	272.11	156.68	0.25	4928.99	
MEAN	351.02	252.20	115.41	0.23	4244.61	1.80
HUB	296.70	229.96	41.00	0.21	3893.62	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	7.84	1.10	7.36	508.42	1.03	499.43	0.92	0.86
MEAN	7.74	1.08	7.27	506.27	1.03	497.45	0.92	0.86
HUB	7.68	1.08	7.18	505.17	1.02	495.45	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	47.33	35.16	31.50	3.66	0.93	0.49	2.90	
MEAN	46.42	27.23	23.50	3.73	0.95	0.47	3.30	0.86
HUB	48.49	10.27	6.50	3.77	0.95	0.46	3.92	

blockage3	Cor/Incid
0.950	0.942

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	328.443	236.270	228.148	1094.016	0.300	0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
7.747	7.277	497.620	46.000	46.002	30.600	-15.402

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	231.963	236.270	331.104	1098.962	0.211	0.473

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	7.736	7.499	502.130	511.151	0.033	0.541

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	229.702	0.000	229.702	1099.058	0.209	0.405

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	7.471	502.217	0.000	0.060	0.103	0.415

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.795	7.702	1.079	506.618	13.652	178.443	1.383

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
84904.914	0.536	159.257	305626.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =17.426 EfDer = 0.963

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
33.192	2233.407	7.702	506.618	1.000	1.000	0.980

W Kg/sec = 15.0873184

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
62.606	2259.881	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
54058.156	26044.725	2.991	545.479	182.355	429.765	2.357

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	217.74	-0.07	217.74	0.20	395.79

```
MEAN    17.74     0.00    -0.02   217.74    -0.07   217.74     0.20
HUB     15.05     0.00    -0.02   217.74    -0.07   217.74     0.20

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.90    46.36    14.54   391.17   447.75     7.49   502.66     0.41
MEAN    57.80    43.40    14.40   345.73   408.64     7.49   502.66     0.37
HUB     53.42    38.84    14.58   293.33   365.37     7.49   502.66     0.33

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   320.79   224.63   229.01  1109.68     0.29
MEAN    17.51   320.32   222.30   230.63  1107.81     0.29
HUB     14.85   339.24   247.07   232.48  1105.92     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    386.10   280.21   161.47     0.25  4451.36
MEAN   341.21   259.48   118.91     0.23  3892.99     1.73
HUB    289.43   236.30    42.36     0.21  3670.06

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      8.38     1.09     7.90   520.57     1.03   511.99     0.92     0.88
MEAN     8.29     1.08     7.82   518.82     1.02   510.26     0.92     0.88
HUB      8.25     1.07     7.73   518.12     1.02   508.52     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.45    35.19    31.50     3.69     0.93     0.46     2.90
MEAN    43.95    27.27    23.50     3.77     0.95     0.45     3.28     0.88
HUB     46.74    10.33     6.50     3.83     0.95     0.44     3.87


   blockage3   Cor/Incid
      0.550       0.963

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     489.109     223.756     434.926    1095.751       0.446      -1.193

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      8.301       7.239     499.216      46.000      27.224      31.500       4.276

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     449.828     223.756     502.406    1099.122       0.409      -0.876

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.550       8.296       7.392     502.292     267.507       0.020       0.264

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.121     435.113       0.000     435.113    1100.310       0.395       0.408

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.550       7.438     503.378       0.000       0.060       0.043      -0.781

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.852       8.285       1.076     519.169      12.550     185.537       1.438

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  78064.156       0.524     146.426  304917.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.426   EfDer =  0.886

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.192    2233.407       8.285     519.169       1.000       1.000       0.580
W Kg/sec =  15.0873184
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
58.919	2232.399	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
54058.156	26044.725	1.770	303.808	171.618	231.687	1.350

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	388.26	-0.13	388.26	0.35	375.20
MEAN	16.97	0.00	-0.02	388.26	-0.13	388.26	0.35	
HUB	14.32	0.00	-0.02	388.26	-0.13	388.26	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	44.04	46.36	-2.32	375.38	540.14	7.61	506.60	0.49
MEAN	40.44	43.80	-3.36	330.76	510.13	7.61	506.60	0.46
HUB	35.72	37.84	-2.12	279.10	478.24	7.61	506.60	0.43

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	296.07	183.32	232.49	1121.22	0.26
MEAN	16.57	297.67	184.45	233.63	1119.78	0.27
HUB	13.89	317.09	212.88	235.01	1118.37	0.28

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	367.97	296.90	184.65	0.26	3463.67	
MEAN	323.03	271.63	138.57	0.24	3059.40	2.00
HUB	270.72	242.02	57.84	0.22	2958.85	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	8.79	1.06	8.37	530.02	1.02	522.71	0.92	0.81
MEAN	8.73	1.05	8.31	528.76	1.02	521.37	0.92	0.81
HUB	8.71	1.05	8.24	528.44	1.02	520.05	0.92	0.81

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.26	38.46	31.50	6.96	0.93	0.51	2.90	
MEAN	38.29	30.67	23.50	7.17	0.89	0.52	3.29	0.81
HUB	42.17	13.83	6.50	7.33	0.89	0.55	3.90	

blockage3	Cor/Incid
0.950	0.886

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	295.082	185.492	229.491	1120.256	0.263	0.040

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
8.737	8.325	521.811	46.000	38.948	32.400	-6.548

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	240.326	185.492	303.585	1122.877	0.214	0.356

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	8.735	8.461	524.256	456.573	0.014	0.435

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	229.120	0.000	229.120	1123.347	0.204	0.331

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	8.470	524.695	0.000	0.060	0.051	0.377

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.772	8.719	1.052	529.073	9.904	220.820	1.712

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  61609.441       0.455     115.562  551445.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.426   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     33.192    2233.407       8.719     529.073       1.000       1.000       0.980
W Kg/sec =  15.0873184

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     56.516    2211.406       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  54058.156   26044.725       3.096     509.668     164.622     390.276       2.371

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   214.69    -0.07   214.69     0.19   353.53
 MEAN    15.91     0.00    -0.02   214.69    -0.07   214.69     0.19
 HUB     13.07     0.00    -0.02   214.69    -0.07   214.69     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.99    47.36    11.63   357.06   416.70     8.50   525.23     0.37
 MEAN    55.31    44.80    10.51   310.15   377.26     8.50   525.23     0.34
 HUB     49.88    38.84    11.04   254.74   333.20     8.50   525.23     0.30

      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   294.22   190.02   224.63  1131.69     0.26
 MEAN    15.50   292.01   184.81   226.09  1129.99     0.26
 HUB     12.59   305.69   203.98   227.68  1128.28     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    349.65   275.58   159.63     0.24  3410.31
 MEAN   302.05   254.68   117.24     0.23  2865.32     1.64
 HUB    245.38   231.41    41.40     0.21  2569.10

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      9.29     1.07     8.86   539.76     1.02   532.54     0.92     0.90
 MEAN     9.20     1.05     8.78   538.05     1.02   530.94     0.92     0.90
 HUB      9.15     1.05     8.69   537.12     1.02   529.33     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.23    35.40    31.50     3.90     0.93     0.42     2.90
 MEAN    39.26    27.41    23.50     3.91     0.94     0.40     3.34     0.90
 HUB     41.86    10.31     6.50     3.81     0.94     0.38     4.06


  blockage3   Cor/Incid
     0.950       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     295.562     188.201     227.898    1130.084       0.262      -0.011

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      9.201       8.774     531.025      46.000      39.550      33.000      -6.550

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     240.429     188.201     305.329    1132.703       0.212       0.315

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       9.198       8.913     533.489     440.827       0.029       0.450
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     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
      14.701     225.957       0.000     225.957    1133.300       0.199       0.376

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       8.937     534.052       0.000       0.060       0.051       0.369

     STAGE EXIT CONDITIONS, STAGE   5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.865       9.188       1.054     538.310       9.237     224.072       1.737

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   57469.277       0.470     107.796  329982.156

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     384349.66    720.9307     71.9050      1.4127      0.8020     17.4260      1.1297


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DESCENT Operating Point #5

NPSS: Inlet Mach number .49, Altitude 20047ft, dT 22R, Thrust 10%
Stage 2 stator Blocked @ 10%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

          Fan Hub + 4 Stage LPC 100%  12-20-2010

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.079   EfDer =  0.939

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      38.728    2175.993       7.909     491.734       1.000       1.000       0.980
 W Kg/sec =  17.6035442

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
      70.086    2234.860       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
   53525.422   30388.400       4.074     831.557     204.137     619.754       3.036

      ROTOR LEADING EDGE CONDITIONS, STAGE   1

         R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   156.08    -0.05   156.08     0.14   402.33
  MEAN    17.06     0.00    -0.02   156.08    -0.05   156.08     0.14
  HUB     12.51     0.00    -0.02   156.08    -0.05   156.08     0.14

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.28    50.47    17.81   391.75   421.75     7.80   489.70     0.39
  MEAN    64.28    47.20    17.08   323.96   359.65     7.80   489.70     0.33
  HUB     56.70    38.62    18.08   237.55   284.29     7.80   489.70     0.26

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   348.54   276.57   212.12  1095.61     0.32
  MEAN    18.04   350.05   276.94   214.09  1093.12     0.32
  HUB     15.00   374.89   305.83   216.82  1090.10     0.34
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	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.75	241.37	115.18	0.22	5706.67	
MEAN	342.49	223.90	65.55	0.20	4995.85	1.85
HUB	284.84	217.83	21.00	0.20	4588.15	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	8.78	1.11	8.19	509.16	1.04	499.02	0.92	0.86
MEAN	8.67	1.10	8.07	506.99	1.03	496.77	0.92	0.86
HUB	8.61	1.09	7.93	505.74	1.03	494.02	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	52.51	28.50	24.20	4.30	0.93	0.54	2.90	
MEAN	52.29	17.02	12.70	4.32	0.95	0.49	3.51	0.86
HUB	54.67	-5.53	-9.30	3.77	0.95	0.36	4.78	

blockage3	Cor/Incid
0.950	0.939

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	352.781	276.404	219.214	1093.287	0.323	0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
8.680	8.075	496.913	24.000	51.582	35.400	-16.182

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	234.025	276.404	362.170	1099.664	0.213	0.530

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	8.663	8.393	502.727	528.796	0.037	0.641

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	218.828	0.000	218.828	1100.292	0.199	0.496

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	8.384	503.301	0.000	0.060	0.108	0.515

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.787	8.619	1.090	507.297	15.562	160.817	1.247

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
96797.914	0.631	211.846	382494.906

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =17.079 EfDer = 0.947

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
38.728	2175.993	8.619	507.297	1.000	1.000	0.980

W Kg/sec = 17.6035442

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
65.325	2200.313	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
53525.422	30388.400	3.103	590.487	190.270	474.134	2.492

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	209.71	-0.07	209.71	0.19	394.58
MEAN	18.08	0.00	-0.02	209.71	-0.07	209.71	0.19	
HUB	15.21	0.00	-0.02	209.71	-0.07	209.71	0.19	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.75	46.36	15.39	390.23	443.07	8.40	503.63	0.40
MEAN	58.58	42.30	16.28	343.29	402.34	8.40	503.63	0.37

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HUB     54.02    37.84    16.18   288.82   356.99     8.40   503.63     0.32

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2      Ao2         Mach2
TIP     20.42   320.76   231.80   221.70  1111.01     0.29
MEAN    18.01   318.60   227.23   223.32  1109.01     0.29
HUB     15.22   335.28   248.42   225.17  1106.99     0.30

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    387.76   271.06   155.96     0.24  4734.82
MEAN   341.99   251.08   114.76     0.23  4093.71     1.77
HUB    289.07   228.81    40.66     0.21  3782.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      9.38     1.09     8.86   521.75     1.03   513.17     0.92     0.87
MEAN     9.28     1.08     8.76   519.79     1.02   511.33     0.92     0.87
HUB      9.23     1.07     8.66   518.85     1.02   509.47     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.28    35.12    31.50     3.62     0.93     0.48     2.90
MEAN    45.50    27.20    23.50     3.70     0.95     0.46     3.30     0.87
HUB     47.81    10.23     6.50     3.73     0.95     0.45     3.92


  blockage3   Cor/Incid
     0.850       0.947

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     342.867     227.868     256.192    1107.921       0.309      -0.125

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      9.291       8.694     510.323      46.000      41.651      30.600     -11.051

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     260.988     227.868     346.466    1112.390       0.235       0.326

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.850       9.283       8.934     514.448     455.853       0.025       0.470

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.823     257.995       0.000     257.995    1112.530       0.232       0.413

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850       8.916     514.578       0.000       0.060       0.075       0.293

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.817       9.257       1.074     520.130      12.834     181.499       1.407

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79835.703       0.531     174.724  348746.594


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.079   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.728    2175.993       9.257     520.130       1.000       1.000       0.880
W Kg/sec =  17.6035442

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     61.587    2172.999       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  53525.422   30388.400       2.731     489.818     179.386     384.470       2.143
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ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	242.69	-0.08	242.69	0.22	380.58
MEAN	17.74	0.00	-0.02	242.69	-0.08	242.69	0.22	
HUB	15.05	0.00	-0.02	242.69	-0.08	242.69	0.22	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.52	46.36	11.16	381.11	451.90	8.95	515.22	0.41
MEAN	54.23	43.40	10.83	336.84	415.23	8.95	515.22	0.37
HUB	49.67	38.84	10.83	285.79	374.99	8.95	515.22	0.34

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	312.24	212.88	228.43	1123.59	0.28
MEAN	17.51	312.68	211.91	229.92	1121.90	0.28
HUB	14.85	332.14	238.10	231.58	1120.21	0.30

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	376.17	280.79	163.30	0.25	4218.76	
MEAN	332.43	259.59	120.52	0.23	3711.35	1.75
HUB	281.99	235.70	43.89	0.21	3537.00	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	10.00	1.08	9.48	533.01	1.02	524.88	0.92	0.90
MEAN	9.91	1.07	9.39	531.46	1.02	523.30	0.92	0.90
HUB	9.88	1.07	9.29	530.93	1.02	521.72	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.98	35.56	31.50	4.06	0.93	0.46	2.90	
MEAN	42.67	27.66	23.50	4.16	0.94	0.45	3.28	0.90
HUB	45.79	10.73	6.50	4.23	0.94	0.45	3.87	

blockage3	Cor/Incid
0.950	0.987

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	315.670	213.304	232.699	1122.099	0.281	0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
9.923	9.392	523.486	46.000	42.510	31.500	-11.010

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	240.136	213.304	321.191	1125.846	0.213	0.407

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	9.916	9.606	526.988	471.992	0.022	0.486

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	233.769	0.000	233.769	1126.115	0.208	0.374

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	9.595	527.240	0.000	0.060	0.074	0.386

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.850	9.888	1.068	531.798	11.668	190.977	1.480

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
72592.602	0.513	158.872	390086.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

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 RESET =  0.000BLEED =  0.000 DPInc =17.079   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.728    2175.993       9.888     531.798       1.000       1.000       0.980
W Kg/sec =  17.6035442

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     58.298    2149.028       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  53525.422   30388.400       3.023     513.330     169.806     401.059       2.362

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   220.65    -0.08   220.65     0.20   361.19
 MEAN    16.97     0.00    -0.02   220.65    -0.08   220.65     0.20
 HUB     14.32     0.00    -0.02   220.65    -0.08   220.65     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.90    46.36    12.54   365.73   427.20     9.63   527.74     0.38
 MEAN    55.61    43.80    11.81   322.26   390.62     9.63   527.74     0.35
 HUB     50.95    37.84    13.11   271.92   350.24     9.63   527.74     0.31

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   302.78   195.26   231.41  1134.78     0.27
 MEAN    16.57   303.49   194.75   232.76  1133.26     0.27
 HUB     13.89   322.22   221.24   234.27  1131.72     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    358.51   283.21   163.26     0.25  3687.89
 MEAN   314.72   261.86   119.97     0.23  3229.04     1.64
 HUB    263.76   238.10    42.52     0.21  3074.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     10.56     1.07    10.05   543.05     1.02   535.41     0.92     0.90
 MEAN    10.47     1.06     9.96   541.65     1.02   533.97     0.92     0.90
 HUB     10.45     1.06     9.87   541.18     1.02   532.52     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.16    35.20    31.50     3.70     0.93     0.42     2.90
 MEAN    39.92    27.27    23.50     3.77     0.94     0.40     3.29     0.90
 HUB     43.36    10.29     6.50     3.79     0.94     0.40     3.90


  blockage3   Cor/Incid
     0.950       0.982

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    16.481     301.034     195.845     228.618    1133.720       0.266       0.040

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
    10.488       9.986     534.404      46.000      40.585      32.400      -8.185

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    16.481     239.124     195.845     309.088    1136.675       0.210       0.383

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950      10.485      10.166     537.194     456.573       0.017       0.461

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    16.096     228.062       0.000     228.062    1137.131       0.201       0.352

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      10.173     537.625       0.000       0.060       0.059       0.396

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.853      10.462       1.058     541.963      10.165     206.712       1.602

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  63248.191       0.492     138.421  358650.281


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.079   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.728    2175.993      10.462     541.963       1.000       1.000       0.980
W Kg/sec =  17.6035442

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     55.620    2128.780       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  53525.422   30388.400       3.146     509.668     162.009     390.276       2.409

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   213.72    -0.07   213.72     0.19   340.32
 MEAN    15.91     0.00    -0.02   213.72    -0.07   213.72     0.19
 HUB     13.07     0.00    -0.02   213.72    -0.07   213.72     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.44    47.36    11.08   347.88   408.35    10.21   538.15     0.36
 MEAN    54.74    44.80     9.94   302.17   370.17    10.21   538.15     0.33
 HUB     49.28    38.84    10.44   248.19   327.58    10.21   538.15     0.29

      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   288.36   181.42   224.14  1144.85     0.25
 MEAN    15.50   286.88   177.39   225.45  1143.30     0.25
 HUB     12.59   301.01   197.81   226.89  1141.74     0.26

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    340.66   274.95   159.25     0.24  3255.96
 MEAN   294.29   253.95   116.89     0.22  2750.36     1.61
 HUB    239.07   230.61    41.26     0.20  2491.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     11.08     1.06    10.60   551.90     1.02   544.96     0.92     0.91
 MEAN    10.99     1.05    10.51   550.36     1.02   543.49     0.92     0.91
 HUB     10.94     1.05    10.42   549.57     1.01   542.01     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.99    35.39    31.50     3.89     0.93     0.40     2.90
 MEAN    38.20    27.41    23.50     3.91     0.94     0.38     3.34     0.91
 HUB     41.08    10.31     6.50     3.81     0.94     0.37     4.06


   blockage3   Cor/Incid
      0.950       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     290.301     180.647     227.247    1143.390       0.254      -0.010

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     10.991      10.509     543.579      46.000      38.483      33.000      -5.483

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     240.032     180.647     300.415    1145.726       0.210       0.297

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      10.989      10.657     545.802     440.827       0.025       0.433

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     14.701     225.575       0.000     225.575    1146.315       0.197       0.361

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.686     546.364       0.000       0.060       0.047       0.354

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      10.978       1.049     550.607       8.644     228.881       1.774

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  53795.125       0.464     117.733  377956.094

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     366269.53    801.5966     70.0860      1.3881      0.8225     17.0786      1.1197


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NPSS: Inlet Mach number .49, Altitude 20047ft, dT 22R, Thrust 10% Stage 2 stator Blocked @ 15%

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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
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         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.074   EfDer =  0.939

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.737    2176.063       7.909     491.734       1.000       1.000       0.980
 W Kg/sec =  17.6077271

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     70.103    2234.932       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
   53538.141   30395.621       4.073     831.557     204.185     619.754       3.035

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   156.12    -0.05   156.12     0.14   402.34
  MEAN    17.06     0.00    -0.02   156.12    -0.05   156.12     0.14
  HUB     12.51     0.00    -0.02   156.12    -0.05   156.12     0.14

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.27    50.47    17.80   391.76   421.77     7.80   489.70     0.39
  MEAN    64.27    47.20    17.07   323.97   359.67     7.80   489.70     0.33
  HUB     56.69    38.62    18.07   237.56   284.32     7.80   489.70     0.26

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   348.56   276.54   212.17  1095.60     0.32
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 MEAN    18.04   350.06   276.92   214.14  1093.12     0.32
 HUB     15.00   374.93   305.84   216.87  1090.10     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.76   241.43   115.21     0.22  5706.20
 MEAN   342.50   223.96    65.58     0.20  4995.43     1.85
 HUB    284.85   217.88    20.99     0.20  4588.28

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     8.78     1.11     8.19   509.16     1.04   499.02     0.92     0.86
 MEAN    8.67     1.10     8.07   506.99     1.03   496.76     0.92     0.86
 HUB     8.61     1.09     7.93   505.74     1.03   494.02     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    52.50    28.50    24.20     4.30     0.93     0.54     2.90
 MEAN   52.28    17.03    12.70     4.33     0.95     0.49     3.51     0.86
 HUB    54.66    -5.53    -9.30     3.77     0.95     0.36     4.78


  blockage3   Cor/Incid
     0.950       0.939

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    18.071     352.795     276.381     219.266    1093.286       0.323       0.001

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     8.680       8.075     496.912      24.000      51.573      35.400     -16.173

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth       Cmth      Aoth         Machth      cp 2-Th
    18.071     234.083     276.381     362.189    1099.661       0.213       0.530

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       8.663       8.393     502.725     528.796       0.037       0.641

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    18.083     218.881       0.000     218.881    1100.290       0.199       0.496

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       8.384     503.299       0.000       0.060       0.108       0.514

   STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.787       8.619       1.090     507.296      15.562     160.844       1.247

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96796.203       0.631     211.893  382587.719


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.074   EfDer =  0.947

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.737    2176.063       8.619     507.296       1.000       1.000       0.980
W Kg/sec =  17.6077271

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     65.340    2200.385       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  53538.141   30395.621       3.103     590.487     190.314     474.134       2.491

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   209.76    -0.07   209.76     0.19   394.59
 MEAN    18.08     0.00    -0.02   209.76    -0.07   209.76     0.19
 HUB     15.21     0.00    -0.02   209.76    -0.07   209.76     0.19
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.75    46.36    15.39   390.24   443.11     8.40   503.63     0.40
MEAN    58.58    42.30    16.28   343.30   402.38     8.40   503.63     0.37
HUB     54.02    37.84    16.18   288.83   357.03     8.40   503.63     0.32

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   320.78   231.78   221.76  1111.00     0.29
MEAN    18.01   318.62   227.21   223.37  1109.01     0.29
HUB     15.22   335.30   248.39   225.22  1106.99     0.30

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    387.77   271.13   155.99     0.24  4734.42
MEAN   342.00   251.14   114.79     0.23  4093.37     1.77
HUB    289.08   228.86    40.69     0.21  3782.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      9.38     1.09     8.86   521.75     1.03   513.17     0.92     0.87
MEAN     9.28     1.08     8.76   519.79     1.02   511.32     0.92     0.87
HUB      9.23     1.07     8.66   518.84     1.02   509.47     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.27    35.12    31.50     3.62     0.93     0.48     2.90
MEAN    45.49    27.20    23.50     3.70     0.95     0.46     3.30     0.87
HUB     47.80    10.24     6.50     3.74     0.95     0.45     3.92


   blockage3   Cor/Incid
      0.800       0.947

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     356.217     227.849     273.817    1107.075       0.322      -0.211

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      9.291       8.648     509.544      46.000      39.765      30.600      -9.165

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     278.950     227.849     360.178    1111.514       0.251       0.238

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.800       9.285       8.887     513.638     428.205       0.022       0.441

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     275.567       0.000     275.567    1111.683       0.248       0.421

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.800       8.875     513.794       0.000       0.060       0.064       0.216

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.824       9.263       1.075     520.129      12.833     181.534       1.407

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79831.719       0.531     174.757  348832.656


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.074   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.737    2176.063       9.263     520.129       1.000       1.000       0.830
W Kg/sec =  17.6077271

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     61.562    2173.071       1.401       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
53538.141	30395.621	2.576	461.987	179.312	361.823	2.018

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	258.00	-0.09	258.00	0.23	380.59
MEAN	17.74	0.00	-0.02	258.00	-0.09	258.00	0.23	
HUB	15.05	0.00	-0.02	258.00	-0.09	258.00	0.23	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.91	46.36	9.55	381.12	460.31	8.92	514.58	0.41
MEAN	52.56	43.40	9.16	336.85	424.37	8.92	514.58	0.38
HUB	47.93	38.84	9.09	285.80	385.09	8.92	514.58	0.35

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	311.09	211.41	228.21	1123.56	0.28
MEAN	17.51	311.64	210.60	229.71	1121.89	0.28
HUB	14.85	331.15	236.92	231.36	1120.21	0.30

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	376.19	281.48	164.78	0.25	4189.83	
MEAN	332.44	260.02	121.84	0.23	3688.46	1.78
HUB	282.00	235.71	45.08	0.21	3519.59	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	10.01	1.08	9.49	532.92	1.02	524.85	0.92	0.91
MEAN	9.92	1.07	9.40	531.39	1.02	523.29	0.92	0.91
HUB	9.89	1.07	9.30	530.87	1.02	521.73	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.81	35.83	31.50	4.33	0.93	0.47	2.90	
MEAN	42.51	27.94	23.50	4.44	0.93	0.46	3.28	0.91
HUB	45.68	11.03	6.50	4.53	0.93	0.47	3.87	

blockage3	Cor/Incid
0.950	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	314.618	211.982	232.483	1122.083	0.280	0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
9.931	9.402	523.470	46.000	42.359	31.500	-10.859

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	239.962	211.982	320.184	1125.778	0.213	0.404

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	9.924	9.615	526.924	471.992	0.022	0.484

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	233.588	0.000	233.588	1126.047	0.207	0.373

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	9.604	527.176	0.000	0.060	0.074	0.384

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.858	9.896	1.068	531.727	11.598	192.105	1.489

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
72156.719	0.510	157.956	414966.688

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.074   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    38.737    2176.063       9.896     531.727       1.000       1.000       0.980
W Kg/sec =  17.6077271

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    58.258    2149.241       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 53538.141   30395.621       3.025     513.330     169.691     401.059       2.363

    ROTOR LEADING EDGE CONDITIONS, STAGE   4

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   220.48    -0.08   220.48     0.20   361.22
MEAN    16.97     0.00    -0.02   220.48    -0.08   220.48     0.20
HUB     14.32     0.00    -0.02   220.48    -0.08   220.48     0.20

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.92    46.36    12.56   365.74   427.12     9.64   527.67     0.38
MEAN    55.63    43.80    11.83   322.27   390.53     9.64   527.67     0.35
HUB     50.97    37.84    13.13   271.93   350.14     9.64   527.67     0.31

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   302.73   195.39   231.23  1134.72     0.27
MEAN    16.57   303.41   194.84   232.58  1133.20     0.27
HUB     13.89   322.14   221.31   234.09  1131.65     0.28

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    358.53   282.99   163.14     0.25  3690.43
MEAN   314.73   261.66   119.89     0.23  3230.56     1.64
HUB    263.77   237.91    42.46     0.21  3075.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     10.57     1.07    10.06   542.99     1.02   535.35     0.92     0.90
MEAN    10.48     1.06     9.97   541.59     1.02   533.91     0.92     0.90
HUB     10.46     1.06     9.88   541.11     1.02   532.46     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.20    35.20    31.50     3.70     0.93     0.42     2.90
MEAN    39.95    27.27    23.50     3.77     0.94     0.40     3.29     0.90
HUB     43.39    10.28     6.50     3.78     0.94     0.40     3.90


  blockage3   Cor/Incid
     0.950       0.981

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    16.481     300.959     195.937     228.441    1133.656       0.265       0.040

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
    10.497       9.995     534.343      46.000      40.620      32.400      -8.220

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    16.481     238.934     195.937     309.000    1136.615       0.210       0.383

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950      10.494      10.175     537.136     456.573       0.017       0.462

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
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    16.096     227.883       0.000     227.883    1137.070       0.200       0.352

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950     10.182      537.566        0.000       0.060       0.059       0.396

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.853     10.472       1.058     541.898      10.170     206.555       1.601

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  63282.410       0.492     138.529  358761.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.074   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.737    2176.063      10.472     541.898       1.000       1.000       0.980
W Kg/sec =  17.6077271

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     55.581    2128.977       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  53538.141   30395.621       3.148     509.668     161.896     390.276       2.411

    ROTOR LEADING EDGE CONDITIONS, STAGE   5

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   213.55    -0.07   213.55     0.19   340.35
 MEAN    15.91     0.00    -0.02   213.55    -0.07   213.55     0.19
 HUB     13.07     0.00    -0.02   213.55    -0.07   213.55     0.19

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.46    47.36    11.10   347.89   408.27    10.22   538.09     0.36
 MEAN    54.76    44.80     9.96   302.18   370.08    10.22   538.09     0.33
 HUB     49.30    38.84    10.46   248.20   327.48    10.22   538.09     0.29

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   288.31   181.56   223.96  1144.79     0.25
 MEAN    15.50   286.80   177.49   225.28  1143.24     0.25
 HUB     12.59   300.90   197.85   226.71  1141.68     0.26

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    340.68   274.73   159.12     0.24  3258.50
 MEAN   294.30   253.76   116.80     0.22  2751.85     1.61
 HUB    239.08   230.43    41.23     0.20  2491.88

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     11.09     1.06    10.61   551.84     1.02   544.91     0.92     0.91
 MEAN    10.99     1.05    10.52   550.30     1.02   543.44     0.92     0.91
 HUB     10.94     1.05    10.43   549.50     1.01   541.95     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.03    35.39    31.50     3.89     0.93     0.40     2.90
 MEAN    38.23    27.41    23.50     3.91     0.94     0.39     3.34     0.91
 HUB     41.11    10.31     6.50     3.81     0.94     0.37     4.06


  blockage3   Cor/Incid
     0.950       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    15.219     290.222     180.745     227.068    1143.331       0.254      -0.010

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
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     11.001      10.519     543.522      46.000      38.520      33.000      -5.520

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     239.839     180.745     300.319    1145.671       0.209       0.297

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      10.999      10.667     545.749     440.827       0.025       0.434

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     14.701     225.395       0.000     225.395    1146.259       0.197       0.362

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.696     546.310       0.000       0.060       0.047       0.355

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      10.988       1.049     550.547       8.649     228.703       1.773

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  53825.164       0.464     117.827  378070.031

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    365892.22    800.9611     70.1026      1.3893      0.8257     17.0739      1.1196


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NPSS: Inlet Mach number .49, Altitude 20047ft, dT 22R, Thrust 10%
Stage 2 stator Blocked @ 20%

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*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*****************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.069   EfDer =  0.940

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      38.746    2176.122       7.909     491.734       1.000       1.000       0.980
 W Kg/sec =  17.611681

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
      70.118    2234.992       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
   53550.164   30402.449       4.072     831.557     204.231     619.754       3.035

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   156.16    -0.05   156.16     0.14   402.36
  MEAN    17.06     0.00    -0.02   156.16    -0.05   156.16     0.14
  HUB     12.51     0.00    -0.02   156.16    -0.05   156.16     0.14

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.27    50.47    17.80   391.77   421.79     7.80   489.70     0.39
  MEAN    64.27    47.20    17.07   323.98   359.70     7.80   489.70     0.33
  HUB     56.69    38.62    18.07   237.57   284.34     7.80   489.70     0.26

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	348.57	276.52	212.22	1095.60	0.32
MEAN	18.04	350.09	276.93	214.19	1093.12	0.32
HUB	15.00	374.99	305.89	216.92	1090.09	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.77	241.49	115.25	0.22	5705.76	
MEAN	342.51	224.01	65.58	0.20	4995.55	1.85
HUB	284.85	217.94	21.03	0.20	4588.95	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	8.78	1.11	8.19	509.16	1.04	499.02	0.92	0.86
MEAN	8.67	1.10	8.07	506.99	1.03	496.76	0.92	0.86
HUB	8.61	1.09	7.93	505.75	1.03	494.01	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	52.50	28.50	24.20	4.30	0.93	0.54	2.90	
MEAN	52.28	17.02	12.70	4.32	0.95	0.49	3.51	0.86
HUB	54.66	-5.54	-9.30	3.76	0.95	0.36	4.78	

blockage3	Cor/Incid
0.950	0.940

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	352.831	276.387	219.316	1093.284	0.323	0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
8.680	8.075	496.911	24.000	51.568	35.400	-16.168

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	234.136	276.387	362.228	1099.660	0.213	0.529

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	8.663	8.393	502.723	528.796	0.037	0.641

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	218.930	0.000	218.930	1100.289	0.199	0.496

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	8.384	503.298	0.000	0.060	0.108	0.514

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.788	8.619	1.090	507.297	15.563	160.861	1.247

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
96800.953	0.631	211.951	382675.438

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =17.069 EfDer = 0.947

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
38.746	2176.122	8.619	507.297	1.000	1.000	0.980

W Kg/sec = 17.611681

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
65.354	2200.443	1.401	0.248	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
53550.164	30402.449	3.102	590.487	190.355	474.134	2.491

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	209.81	-0.07	209.81	0.19	394.60

```
MEAN    18.08     0.00    -0.02   209.81    -0.07   209.81     0.19
HUB     15.21     0.00    -0.02   209.81    -0.07   209.81     0.19

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.74    46.36    15.38   390.25   443.14     8.40   503.62     0.40
MEAN    58.57    42.30    16.27   343.31   402.41     8.40   503.62     0.37
HUB     54.01    37.84    16.17   288.84   357.06     8.40   503.62     0.32

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   320.80   231.76   221.81  1111.00     0.29
MEAN    18.01   318.64   227.19   223.42  1109.01     0.29
HUB     15.22   335.34   248.41   225.27  1106.99     0.30

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    387.78   271.18   156.02     0.24  4734.06
MEAN   342.01   251.20   114.82     0.23  4093.07     1.77
HUB    289.09   228.91    40.68     0.21  3782.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      9.39     1.09     8.86   521.75     1.03   513.17     0.92     0.87
MEAN     9.28     1.08     8.76   519.79     1.02   511.32     0.92     0.87
HUB      9.23     1.07     8.66   518.85     1.02   509.46     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.26    35.12    31.50     3.62     0.93     0.48     2.90
MEAN    45.48    27.20    23.50     3.70     0.95     0.46     3.30     0.87
HUB     47.80    10.24     6.50     3.74     0.95     0.45     3.92


   blockage3   Cor/Incid
      0.750       0.947

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     372.054     227.832     294.137    1106.030       0.336      -0.316

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      9.292       8.591     508.582      46.000      37.761      30.600      -7.161

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     299.675     227.832     376.447    1110.431       0.270       0.129

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.750       9.287       8.828     512.638     400.556       0.019       0.410

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4        cp 3-4
     17.823     295.843       0.000     295.843    1110.638       0.266       0.429

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750       8.822     512.829       0.000       0.060       0.054       0.117

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.831       9.268       1.075     520.130      12.833     181.560       1.407

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79831.148       0.531     174.795  348913.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.069   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.746    2176.122       9.268     520.130       1.000       1.000       0.780
W Kg/sec =  17.611681
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
61.539	2173.128	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
53550.164	30402.449	2.422	434.156	179.245	339.175	1.892

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	275.48	-0.09	275.48	0.25	380.60
MEAN	17.74	0.00	-0.02	275.48	-0.09	275.48	0.25	
HUB	15.05	0.00	-0.02	275.48	-0.09	275.48	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.15	46.36	7.79	381.13	470.34	8.88	513.80	0.42
MEAN	50.73	43.40	7.33	336.86	435.23	8.88	513.80	0.39
HUB	46.06	38.84	7.22	285.80	397.02	8.88	513.80	0.36

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	309.72	209.53	228.08	1123.51	0.28
MEAN	17.51	310.40	208.92	229.57	1121.86	0.28
HUB	14.85	329.99	235.46	231.20	1120.21	0.29

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	376.20	282.49	166.67	0.25	4152.69	
MEAN	332.45	260.70	123.54	0.23	3659.07	1.81
HUB	282.01	235.84	46.54	0.21	3498.06	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	10.01	1.08	9.49	532.81	1.02	524.81	0.92	0.91
MEAN	9.92	1.07	9.41	531.30	1.02	523.26	0.92	0.91
HUB	9.89	1.07	9.31	530.81	1.02	521.73	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.57	36.16	31.50	4.66	0.93	0.48	2.90	
MEAN	42.30	28.29	23.50	4.79	0.93	0.47	3.28	0.91
HUB	45.52	11.38	6.50	4.88	0.93	0.48	3.87	

blockage3	Cor/Incid
0.950	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	313.370	210.286	232.337	1122.058	0.279	0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
9.934	9.410	523.447	46.000	42.148	31.500	-10.648

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	239.874	210.286	318.998	1125.688	0.213	0.401

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	9.928	9.619	526.839	471.992	0.022	0.480

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	233.487	0.000	233.487	1125.957	0.207	0.370

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	9.608	527.091	0.000	0.060	0.072	0.382

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.863	9.901	1.068	531.639	11.509	193.555	1.500

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
71601.211	0.506	156.775	443333.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =17.069 EfDer = 0.981

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
38.746	2176.122	9.901	531.639	1.000	1.000	0.980

W Kg/sec = 17.611681

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
58.239	2149.478	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
53550.164	30402.449	3.026	513.330	169.634	401.059	2.364

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	220.38	-0.08	220.38	0.20	361.26
MEAN	16.97	0.00	-0.02	220.38	-0.08	220.38	0.20	
HUB	14.32	0.00	-0.02	220.38	-0.08	220.38	0.20	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.93	46.36	12.57	365.75	427.08	9.64	527.59	0.38
MEAN	55.64	43.80	11.84	322.28	390.49	9.64	527.59	0.35
HUB	50.99	37.84	13.15	271.94	350.09	9.64	527.59	0.31

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	302.71	195.48	231.13	1134.63	0.27
MEAN	16.57	303.38	194.92	232.48	1133.11	0.27
HUB	13.89	322.08	221.32	233.99	1131.57	0.28

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	358.54	282.86	163.05	0.25	3692.15	
MEAN	314.74	261.54	119.83	0.23	3231.81	1.64
HUB	263.77	237.81	42.45	0.21	3075.26	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	10.57	1.07	10.06	542.91	1.02	535.27	0.92	0.90
MEAN	10.49	1.06	9.98	541.50	1.02	533.83	0.92	0.90
HUB	10.46	1.06	9.89	541.03	1.02	532.37	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.22	35.20	31.50	3.70	0.93	0.42	2.90	
MEAN	39.98	27.27	23.50	3.77	0.94	0.41	3.29	0.90
HUB	43.41	10.28	6.50	3.78	0.94	0.40	3.90	

blockage3	Cor/Incid
0.950	0.981

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	300.934	196.013	228.342	1133.567	0.265	0.040

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
10.503	10.000	534.259	46.000	40.643	32.400	-8.243

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	238.827	196.013	308.965	1136.530	0.210	0.384

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	10.499	10.181	537.055	456.573	0.017	0.462

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	227.782	0.000	227.782	1136.984	0.200	0.352

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	10.187	537.485	0.000	0.060	0.059	0.397

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.853	10.477	1.058	541.812	10.174	206.463	1.600

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
63304.059	0.492	138.608	358881.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =17.069 EfDer = 0.992

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
38.746	2176.122	10.477	541.812	1.000	1.000	0.980

W Kg/sec = 17.611681

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
55.562	2129.202	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
53550.164	30402.449	3.149	509.668	161.840	390.276	2.411

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	213.45	-0.07	213.45	0.19	340.39
MEAN	15.91	0.00	-0.02	213.45	-0.07	213.45	0.19	
HUB	13.07	0.00	-0.02	213.45	-0.07	213.45	0.19	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.47	47.36	11.11	347.90	408.23	10.22	538.01	0.36
MEAN	54.77	44.80	9.97	302.19	370.04	10.22	538.01	0.33
HUB	49.31	38.84	10.47	248.20	327.42	10.22	538.01	0.29

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	288.27	181.63	223.86	1144.71	0.25
MEAN	15.50	286.75	177.54	225.18	1143.16	0.25
HUB	12.59	300.84	197.87	226.61	1141.59	0.26

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	340.68	274.61	159.06	0.24	3259.73	
MEAN	294.30	253.65	116.76	0.22	2752.60	1.61
HUB	239.09	230.33	41.22	0.20	2492.13	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	11.10	1.06	10.62	551.76	1.02	544.83	0.92	0.91
MEAN	11.00	1.05	10.53	550.21	1.02	543.36	0.92	0.91
HUB	10.95	1.05	10.43	549.42	1.01	541.87	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.05	35.39	31.50	3.89	0.93	0.40	2.90	
MEAN	38.25	27.41	23.50	3.91	0.94	0.39	3.34	0.91
HUB	41.13	10.31	6.50	3.81	0.94	0.37	4.06	

blockage3	Cor/Incid
0.950	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

```
     15.219     290.173     180.794     226.967    1143.247       0.254      -0.010

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
     11.007      10.524     543.442      46.000      38.540      33.000      -5.540

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     15.219     239.730     180.794     300.262    1145.590       0.209       0.298

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      11.004      10.673     545.671     440.827       0.026       0.434

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     14.701     225.294       0.000     225.294    1146.177       0.197       0.362

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.701     546.231       0.000       0.060       0.047       0.355

    STAGE EXIT CONDITIONS, STAGE   5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.870      10.994       1.049     550.464       8.652     228.609       1.772

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  53840.730       0.464     117.887  378194.219

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    365378.09    800.0153      70.1184      1.3900      0.8282     17.0694      1.1194


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NPSS: Inlet Mach number .49, Altitude 20047ft, dT 22R, Thrust 10%
Stage 2 stator Blocked @ 25%

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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
****************   Stator Vane, Gasplus Properties  ******************
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         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.074   EfDer =  0.939

    W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     38.740    2176.191       7.909     491.734       1.000       1.000       0.980
 W Kg/sec =  17.6089096

    W cor      RPM cor        GAMMA        Cp         R           Blades      THK
     70.107    2235.064       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
   53541.734   30397.662       4.072     831.557     204.199     619.754       3.035

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   156.13    -0.05   156.13     0.14   402.37
  MEAN    17.06     0.00    -0.02   156.13    -0.05   156.13     0.14
  HUB     12.51     0.00    -0.02   156.13    -0.05   156.13     0.14

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.27    50.47    17.80   391.78   421.80     7.80   489.70     0.39
  MEAN    64.27    47.20    17.07   323.99   359.69     7.80   489.70     0.33
  HUB     56.69    38.62    18.07   237.58   284.33     7.80   489.70     0.26
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      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   348.59   276.57   212.18  1095.60     0.32
MEAN    18.04   350.08   276.93   214.16  1093.12     0.32
HUB     15.00   374.98   305.89   216.88  1090.10     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.78   241.44   115.21     0.22  5706.85
MEAN   342.52   223.98    65.59     0.20  4995.62     1.85
HUB    284.86   217.90    21.03     0.20  4589.01

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      8.78     1.11     8.19   509.16     1.04   499.02     0.92     0.86
MEAN     8.67     1.10     8.07   506.99     1.03   496.76     0.92     0.86
HUB      8.61     1.09     7.93   505.75     1.03   494.02     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     52.51    28.50    24.20     4.30     0.93     0.54     2.90
MEAN    52.28    17.03    12.70     4.33     0.95     0.49     3.51     0.86
HUB     54.66    -5.54    -9.30     3.76     0.95     0.36     4.78


   blockage3   Cor/Incid
      0.950       0.939

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     352.811     276.391     219.280    1093.287       0.323       0.001

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      8.680       8.075     496.914      24.000      51.573      35.400     -16.173

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     234.097     276.391     362.206    1099.664       0.213       0.530

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       8.663       8.393     502.727     528.796       0.037       0.641

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     18.083     218.894       0.000     218.894    1100.292       0.199       0.496

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       8.384     503.301       0.000       0.060       0.108       0.514

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.787       8.619       1.090     507.299      15.565     160.839       1.247

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96811.773       0.631     211.941  382613.969


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.074   EfDer =  0.947

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.740    2176.191       8.619     507.299       1.000       1.000       0.980
W Kg/sec =  17.6089096

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     65.344    2200.510       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  53541.734   30397.662       3.103     590.487     190.325     474.134       2.491

     ROTOR LEADING EDGE CONDITIONS, STAGE   2
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       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   209.78    -0.07   209.78     0.19   394.61
MEAN    18.08     0.00    -0.02   209.78    -0.07   209.78     0.19
HUB     15.21     0.00    -0.02   209.78    -0.07   209.78     0.19

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.75    46.36    15.39   390.26   443.13     8.40   503.63     0.40
MEAN    58.58    42.30    16.28   343.32   402.40     8.40   503.63     0.37
HUB     54.02    37.84    16.18   288.85   357.05     8.40   503.63     0.32

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   320.79   231.79   221.77  1111.01     0.29
MEAN    18.01   318.64   227.23   223.38  1109.01     0.29
HUB     15.22   335.32   248.42   225.23  1106.99     0.30

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    387.79   271.14   156.00     0.24  4734.68
MEAN   342.02   251.15   114.80     0.23  4093.67     1.77
HUB    289.10   228.88    40.68     0.21  3782.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      9.39     1.09     8.86   521.75     1.03   513.17     0.92     0.87
MEAN     9.28     1.08     8.76   519.80     1.02   511.33     0.92     0.87
HUB      9.23     1.07     8.66   518.85     1.02   509.47     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.27    35.12    31.50     3.62     0.93     0.48     2.90
MEAN    45.49    27.20    23.50     3.70     0.95     0.46     3.30     0.87
HUB     47.80    10.24     6.50     3.74     0.95     0.45     3.92


  blockage3   Cor/Incid
     0.700       0.947

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.960     391.000     227.865     317.739    1104.721       0.354      -0.448

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     9.292       8.520     507.380      46.000      35.646      30.600      -5.046

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.960     323.770     227.865     395.916    1109.077       0.292      -0.009

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.700       9.288       8.754     511.389     372.907       0.017       0.378

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.823     319.424       0.000     319.424    1109.330       0.288       0.434

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.700       8.754     511.622       0.000       0.060       0.045      -0.010

   STAGE EXIT CONDITIONS, STAGE   2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.837       9.273       1.076     520.134      12.835     181.532       1.407

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79841.969       0.531     174.791  348855.438


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.074   EfDer =  0.998
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
38.740	2176.191	9.273	520.134	1.000	1.000	0.730

W Kg/sec = 17.6089096

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
61.499	2173.190	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
53541.734	30397.662	2.268	406.326	179.128	316.528	1.767

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	295.52	-0.10	295.52	0.27	380.61
MEAN	17.74	0.00	-0.02	295.52	-0.10	295.52	0.27	
HUB	15.05	0.00	-0.02	295.52	-0.10	295.52	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.22	46.36	5.86	381.15	482.37	8.83	512.85	0.43
MEAN	48.75	43.40	5.35	336.87	448.20	8.83	512.85	0.40
HUB	44.05	38.84	5.21	285.81	411.19	8.83	512.85	0.37

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	308.08	207.19	228.00	1123.46	0.27
MEAN	17.51	308.93	206.84	229.47	1121.83	0.28
HUB	14.85	328.64	233.69	231.06	1120.21	0.29

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	376.21	283.82	169.02	0.25	4106.38	
MEAN	332.46	261.60	125.62	0.23	3622.93	1.85
HUB	282.01	236.06	48.32	0.21	3471.82	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	10.01	1.08	9.50	532.67	1.02	524.75	0.92	0.91
MEAN	9.92	1.07	9.41	531.19	1.02	523.23	0.92	0.91
HUB	9.89	1.07	9.32	530.73	1.02	521.72	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.26	36.55	31.50	5.05	0.93	0.49	2.90	
MEAN	42.03	28.70	23.50	5.20	0.92	0.49	3.28	0.91
HUB	45.32	11.81	6.50	5.31	0.92	0.50	3.87	

blockage3	Cor/Incid
0.950	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	311.896	208.201	232.232	1122.026	0.278	0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
9.932	9.412	523.417	46.000	41.877	31.500	-10.377

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	239.841	208.201	317.603	1125.575	0.213	0.396

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	9.926	9.617	526.734	471.992	0.021	0.476

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	233.436	0.000	233.436	1125.845	0.207	0.367

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	9.607	526.986	0.000	0.060	0.071	0.379

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.863	9.900	1.068	531.532	11.398	195.353	1.514

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
70915.461	0.501	155.249	475821.562

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =17.074 EfDer = 0.981

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
38.740	2176.191	9.900	531.532	1.000	1.000	0.980

W Kg/sec = 17.6089096

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
58.232	2149.763	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
53541.734	30397.662	3.026	513.330	169.615	401.059	2.365

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	220.33	-0.08	220.33	0.20	361.31
MEAN	16.97	0.00	-0.02	220.33	-0.08	220.33	0.20	
HUB	14.32	0.00	-0.02	220.33	-0.08	220.33	0.20	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.94	46.36	12.58	365.76	427.07	9.64	527.48	0.38
MEAN	55.65	43.80	11.85	322.29	390.47	9.64	527.48	0.35
HUB	50.99	37.84	13.15	271.95	350.06	9.64	527.48	0.31

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	302.70	195.53	231.08	1134.53	0.27
MEAN	16.57	303.35	194.94	232.42	1133.00	0.27
HUB	13.89	322.04	221.32	233.94	1131.45	0.28

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	358.55	282.79	163.02	0.25	3693.05	
MEAN	314.75	261.49	119.81	0.23	3232.25	1.64
HUB	263.78	237.76	42.46	0.21	3075.20	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	10.57	1.07	10.06	542.80	1.02	535.16	0.92	0.90
MEAN	10.49	1.06	9.98	541.40	1.02	533.72	0.92	0.90
HUB	10.46	1.06	9.89	540.92	1.02	532.27	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.24	35.20	31.50	3.70	0.93	0.42	2.90	
MEAN	39.99	27.27	23.50	3.77	0.94	0.41	3.29	0.90
HUB	43.41	10.29	6.50	3.79	0.94	0.40	3.90	

blockage3	Cor/Incid
0.950	0.981

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	300.912	196.039	228.290	1133.457	0.265	0.040

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
10.501	9.999	534.155	46.000	40.654	32.400	-8.254

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	238.772	196.039	308.939	1136.421	0.210	0.384

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	10.498	10.180	536.952	456.573	0.017	0.462

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	227.730	0.000	227.730	1136.876	0.200	0.353

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	10.186	537.382	0.000	0.060	0.059	0.397

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.853	10.475	1.058	541.707	10.175	206.422	1.600

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
63314.258	0.493	138.608	358876.969

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =17.074 EfDer = 0.992

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
38.740	2176.191	10.475	541.707	1.000	1.000	0.980

W Kg/sec = 17.6089096

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
55.555	2129.477	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
53541.734	30397.662	3.150	509.668	161.819	390.276	2.412

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	213.41	-0.07	213.41	0.19	340.43
MEAN	15.91	0.00	-0.02	213.41	-0.07	213.41	0.19	
HUB	13.07	0.00	-0.02	213.41	-0.07	213.41	0.19	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.48	47.36	11.12	347.91	408.21	10.22	537.91	0.36
MEAN	54.78	44.80	9.98	302.20	370.02	10.22	537.91	0.33
HUB	49.32	38.84	10.48	248.21	327.39	10.22	537.91	0.29

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	288.27	181.68	223.81	1144.60	0.25
MEAN	15.50	286.73	177.58	225.12	1143.05	0.25
HUB	12.59	300.83	197.92	226.56	1141.49	0.26

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	340.70	274.54	159.01	0.24	3260.72	
MEAN	294.31	253.59	116.74	0.22	2753.17	1.61
HUB	239.09	230.27	41.18	0.20	2492.71	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	11.10	1.06	10.62	551.66	1.02	544.73	0.92	0.91
MEAN	11.00	1.05	10.53	550.11	1.02	543.25	0.92	0.91
HUB	10.95	1.05	10.43	549.32	1.01	541.77	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.07	35.39	31.50	3.89	0.93	0.40	2.90	
MEAN	38.27	27.41	23.50	3.91	0.94	0.39	3.34	0.91
HUB	41.14	10.30	6.50	3.80	0.94	0.37	4.06	

blockage3	Cor/Incid
0.950	0.992

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     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
      15.219     290.155     180.832     226.913    1143.141       0.254      -0.010

      Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      11.006      10.523     543.340      46.000      38.552      33.000      -5.552

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
      15.219     239.672     180.832     300.238    1145.485       0.209       0.298

    BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
       0.950      11.003      10.672     545.571     440.827       0.026       0.434

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
      14.701     225.239       0.000     225.239    1146.072       0.197       0.362

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      10.700     546.130       0.000       0.060       0.047       0.355

     STAGE EXIT CONDITIONS, STAGE   5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.870      10.993       1.049     550.361       8.654     228.541       1.772

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   53856.250       0.464     117.903  378187.562

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     364739.72    798.4918     70.1073      1.3899      0.8294     17.0737      1.1192


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NPSS: Inlet Mach number .49, Altitude 20047ft, dT 22R, Thrust 10%
Stage 2 stator Blocked @ 27%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.077   EfDer =  0.939

    W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
      38.734    2176.221       7.909     491.734       1.000       1.000       0.980
 W Kg/sec =  17.6062717

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
      70.097    2235.094       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
   53533.715   30393.109       4.073     831.557     204.169     619.754       3.035

      ROTOR LEADING EDGE CONDITIONS, STAGE   1

         R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   156.11    -0.05   156.11     0.14   402.37
  MEAN    17.06     0.00    -0.02   156.11    -0.05   156.11     0.14
  HUB     12.51     0.00    -0.02   156.11    -0.05   156.11     0.14

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.28    50.47    17.81   391.79   421.79     7.80   489.70     0.39
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MEAN    64.28    47.20    17.08   323.99   359.69     7.80   489.70     0.33
HUB     56.70    38.62    18.08   237.58   284.32     7.80   489.70     0.26

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   348.58   276.58   212.15  1095.61     0.32
MEAN    18.04   350.08   276.97   214.12  1093.12     0.32
HUB     15.00   374.93   305.86   216.85  1090.10     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.79   241.41   115.20     0.22  5707.00
MEAN   342.52   223.94    65.56     0.20  4996.27     1.85
HUB    284.87   217.86    21.00     0.20  4588.62

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      8.78     1.11     8.19   509.16     1.04   499.02     0.92     0.86
MEAN     8.67     1.10     8.07   506.99     1.03   496.77     0.92     0.86
HUB      8.61     1.09     7.93   505.75     1.03   494.02     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     52.51    28.50    24.20     4.30     0.93     0.54     2.90
MEAN    52.29    17.02    12.70     4.32     0.95     0.49     3.51     0.86
HUB     54.66    -5.53    -9.30     3.77     0.95     0.36     4.78


  blockage3   Cor/Incid
     0.950       0.939

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
    18.071     352.820     276.427     219.248    1093.288       0.323        0.001

    Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
     8.680       8.075     496.914      24.000      51.580      35.400     -16.180

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
    18.071     234.060     276.427     362.210    1099.666       0.213        0.530

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       8.663       8.393     502.729     528.796       0.037        0.641

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4         Ao4           Mach4        cp 3-4
    18.083     218.861       0.000     218.861    1100.294       0.199        0.496

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950       8.384     503.303       0.000       0.060       0.108        0.515

   STAGE EXIT CONDITIONS, STAGE   1
     Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
     0.787       8.619        1.090     507.299      15.565     160.824        1.247

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96815.758       0.631     211.918  382555.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.077   EfDer =  0.947

   W act       RPM act         Pt          Tt            POTS         POTH        AeroBl
     38.734     2176.221        8.619     507.299        1.000        1.000        0.980
W Kg/sec =  17.6062717

   W cor       RPM cor         GAMMA         Cp          R            Blades        THK
     65.334     2200.538        1.401        0.248      53.349       56.000        0.050

   CFM         SCFM             A1/A*       Area1        A*        AthrRotor   ChokeMargin
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 53533.715   30393.109       3.103     590.487     190.297     474.134       2.492

    ROTOR LEADING EDGE CONDITIONS, STAGE   2

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   209.74    -0.07   209.74     0.19   394.62
MEAN    18.08     0.00    -0.02   209.74    -0.07   209.74     0.19
HUB     15.21     0.00    -0.02   209.74    -0.07   209.74     0.19

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.75    46.36    15.39   390.27   443.12     8.40   503.63     0.40
MEAN    58.58    42.30    16.28   343.33   402.39     8.40   503.63     0.37
HUB     54.02    37.84    16.18   288.85   357.03     8.40   503.63     0.32

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   320.80   231.83   221.74  1111.01     0.29
MEAN    18.01   318.62   227.23   223.35  1109.01     0.29
HUB     15.22   335.30   248.42   225.20  1107.00     0.30

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    387.80   271.10   155.97     0.24  4735.35
MEAN   342.03   251.12   114.79     0.23  4093.79     1.77
HUB    289.10   228.84    40.68     0.21  3782.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      9.39     1.09     8.86   521.76     1.03   513.17     0.92     0.87
MEAN     9.28     1.08     8.76   519.80     1.02   511.33     0.92     0.87
HUB      9.23     1.07     8.66   518.85     1.02   509.47     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.27    35.12    31.50     3.62     0.93     0.48     2.90
MEAN    45.49    27.20    23.50     3.70     0.95     0.46     3.30     0.87
HUB     47.81    10.24     6.50     3.74     0.95     0.45     3.92


  blockage3   Cor/Incid
     0.680       0.947

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.960     399.639     227.872     328.307    1104.103       0.362      -0.510

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     9.292       8.487     506.812      46.000      34.764      30.600      -4.164

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.960     334.570     227.872     404.800    1108.436       0.302      -0.074

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.680       9.288       8.719     510.797     361.848       0.016       0.365

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    17.823     329.995       0.000     329.995    1108.711       0.298       0.435

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.680       8.721     511.051       0.000       0.060       0.043      -0.071

   STAGE EXIT CONDITIONS, STAGE   2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.838       9.274       1.076     520.135      12.836     181.510       1.407

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79848.805       0.531     174.780  348801.000
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.077   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    38.734    2176.221       9.274     520.135       1.000       1.000       0.710
W Kg/sec =  17.6062717

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    61.480    2173.216       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 53533.715   30393.109       2.207     395.194     179.073     307.469       1.717

    ROTOR LEADING EDGE CONDITIONS, STAGE   3

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   304.41    -0.10   304.41     0.27   380.61
MEAN    17.74     0.00    -0.02   304.41    -0.10   304.41     0.27
HUB     15.05     0.00    -0.02   304.41    -0.10   304.41     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.39    46.36     5.03   381.15   487.87     8.80   512.41     0.44
MEAN    47.91    43.40     4.51   336.87   454.11     8.80   512.41     0.41
HUB     43.21    38.84     4.37   285.82   417.63     8.80   512.41     0.38

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   307.34   206.09   228.01  1123.43     0.27
MEAN    17.51   308.29   205.89   229.46  1121.81     0.27
HUB     14.85   328.04   232.88   231.04  1120.21     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    376.21   284.48   170.12     0.25  4084.75
MEAN   332.47   262.05   126.58     0.23  3606.29     1.87
HUB    282.02   236.21    49.14     0.21  3459.78

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     10.00     1.08     9.49   532.61     1.02   524.73     0.92     0.91
MEAN     9.91     1.07     9.41   531.14     1.02   523.22     0.92     0.91
HUB      9.89     1.07     9.32   530.70     1.02   521.72     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.11    36.73    31.50     5.23     0.93     0.49     2.90
MEAN    41.90    28.88    23.50     5.38     0.92     0.49     3.28     0.91
HUB     45.23    12.01     6.50     5.51     0.92     0.51     3.87


  blockage3   Cor/Incid
     0.950       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
    17.392     311.248     207.241     232.221    1122.010       0.277       0.009

    Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
     9.928       9.411     523.402      46.000      41.747      31.500     -10.247

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.392     239.866     207.241     316.993    1125.521       0.213       0.394

  BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       9.923       9.613     526.683     471.992       0.021       0.473

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4         Ao4          Mach4       cp 3-4
    17.121     233.450       0.000     233.450    1125.792       0.207       0.365
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	9.604	526.937	0.000	0.060	0.070	0.377

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.861	9.897	1.067	531.483	11.347	196.196	1.521

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
70598.016	0.499	154.531	490209.656

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =17.077 EfDer = 0.981

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
38.734	2176.221	9.897	531.483	1.000	1.000	0.980

W Kg/sec = 17.6062717

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
58.238	2149.891	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
53533.715	30393.109	3.026	513.330	169.633	401.059	2.364

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	220.35	-0.08	220.35	0.20	361.33
MEAN	16.97	0.00	-0.02	220.35	-0.08	220.35	0.20	
HUB	14.32	0.00	-0.02	220.35	-0.08	220.35	0.20	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.94	46.36	12.58	365.77	427.08	9.64	527.43	0.38
MEAN	55.65	43.80	11.85	322.29	390.48	9.64	527.43	0.35
HUB	50.99	37.84	13.15	271.95	350.07	9.64	527.43	0.31

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	302.70	195.51	231.09	1134.47	0.27
MEAN	16.57	303.37	194.95	232.44	1132.95	0.27
HUB	13.89	322.06	221.33	233.95	1131.40	0.28

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	358.55	282.82	163.05	0.25	3692.62	
MEAN	314.76	261.49	119.80	0.23	3232.42	1.64
HUB	263.79	237.77	42.46	0.21	3075.38	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	10.57	1.07	10.06	542.75	1.02	535.11	0.92	0.90
MEAN	10.48	1.06	9.97	541.35	1.02	533.67	0.92	0.90
HUB	10.46	1.06	9.88	540.87	1.02	532.22	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.23	35.20	31.50	3.70	0.93	0.42	2.90	
MEAN	39.99	27.27	23.50	3.77	0.94	0.41	3.29	0.90
HUB	43.41	10.29	6.50	3.79	0.94	0.40	3.90	

blockage3	Cor/Incid
0.950	0.981

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	300.929	196.050	228.304	1133.404	0.266	0.040

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
10.498	9.996	534.105	46.000	40.653	32.400	-8.253

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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth          Machth      cp 2-Th
     16.481     238.786     196.050     308.957    1136.369       0.210       0.384

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      10.495      10.176     536.902     456.573       0.017       0.462

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     16.096     227.743       0.000     227.743    1136.823       0.200       0.353

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.183     537.332       0.000       0.060       0.059       0.397

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.853       10.472        1.058     541.658      10.175     206.430       1.600

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  63314.605       0.492     138.588  358849.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.077   EfDer =  0.992

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     38.734    2176.221      10.472     541.658       1.000       1.000       0.980
W Kg/sec =  17.6062717

   W cor      RPM cor        GAMMA        Cp          R           Blades       THK
     55.561    2129.602       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1       A*        AthrRotor   ChokeMargin
  53533.715   30393.109       3.149     509.668     161.835     390.276       2.412

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   213.42    -0.07   213.42     0.19   340.45
 MEAN    15.91      0.00    -0.02   213.42    -0.07   213.42     0.19
 HUB     13.07      0.00    -0.02   213.42    -0.07   213.42     0.19

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     58.48     47.36    11.12   347.92   408.22     10.22   537.86     0.36
 MEAN    54.78     44.80     9.98   302.21   370.03     10.22   537.86     0.33
 HUB     49.32     38.84    10.48   248.21   327.40     10.22   537.86     0.29

      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   288.28   181.69    223.82   1144.55      0.25
 MEAN    15.50   286.75   177.59    225.13   1143.00      0.25
 HUB     12.59   300.83   197.89    226.57   1141.43      0.26

       U2        W2       Wu2      MachRel2  DelRCu     Ws1/W2
 TIP    340.70    274.55   159.01      0.24   3260.90
 MEAN   294.32    253.60   116.73      0.22   2753.39      1.61
 HUB    239.10    230.29    41.20      0.20   2492.46

         Pt2        PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     11.09      1.06     10.62    551.61      1.02    544.68      0.92      0.91
 MEAN    11.00      1.05     10.52    550.06      1.02    543.20      0.92      0.91
 HUB     10.95      1.05     10.43    549.27      1.01    541.72      0.92      0.91

         Alfa2   Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.07     35.39     31.50      3.89     0.93      0.40      2.90
 MEAN    38.27     27.41     23.50      3.91     0.94      0.39      3.34      0.91
 HUB     41.13     10.31      6.50      3.81     0.94      0.37      4.06
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   blockage3   Cor/Incid
      0.950       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     290.174     180.846     226.926    1143.088       0.254      -0.010

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     11.003      10.520     543.290      46.000      38.553      33.000      -5.553

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     239.685     180.846     300.257    1145.433       0.209       0.298

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      11.000      10.669     545.521     440.827       0.026       0.434

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     14.701     225.251       0.000     225.251    1146.021       0.197       0.362

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.697     546.081       0.000       0.060       0.047       0.355

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      10.989       1.049     550.312       8.654     228.546       1.772

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   53857.742       0.464     117.888  378157.656

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     364434.94    797.7051     70.0968      1.3895      0.8293     17.0774      1.1191


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NPSS: Inlet Mach number .49, Altitude 20047ft, dT 22R, Thrust 10%
Stage 2 stator Blocked @ 30%

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*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*****************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.086   EfDer =  0.939

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      38.719    2176.240       7.909     491.734       1.000       1.000       0.980
 W Kg/sec =  17.5995464

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
      70.070    2235.114       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
   53513.266   30381.498       4.074     831.557     204.091     619.754       3.037

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

         R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   156.05    -0.05   156.05     0.14   402.38
  MEAN    17.06     0.00    -0.02   156.05    -0.05   156.05     0.14
  HUB     12.51     0.00    -0.02   156.05    -0.05   156.05     0.14
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     68.29    50.47    17.82   391.79   421.77     7.80   489.70     0.39
MEAN    64.29    47.20    17.09   323.99   359.66     7.80   489.70     0.33
HUB     56.71    38.62    18.09   237.58   284.29     7.80   489.70     0.26

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   348.56   276.63   212.07  1095.61     0.32
MEAN    18.04   350.05   276.99   214.04  1093.13     0.32
HUB     15.00   374.88   305.86   216.77  1090.10     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.79   241.32   115.16     0.22  5707.99
MEAN   342.53   223.85    65.54     0.20  4996.71     1.85
HUB    284.87   217.78    20.99     0.20  4588.53

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      8.78     1.11     8.19   509.16     1.04   499.03     0.92     0.86
MEAN     8.67     1.10     8.07   506.99     1.03   496.77     0.92     0.86
HUB      8.61     1.09     7.93   505.75     1.03   494.02     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     52.53    28.50    24.20     4.30     0.93     0.54     2.90
MEAN    52.31    17.02    12.70     4.32     0.95     0.49     3.51     0.86
HUB     54.67    -5.53    -9.30     3.77     0.95     0.36     4.78


   blockage3   Cor/Incid
      0.950       0.939

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     352.785     276.451     219.162    1093.292       0.323       0.001

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      8.680       8.075     496.917      24.000      51.594      35.400     -16.194

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     233.968     276.451     362.169    1099.672       0.213       0.530

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       8.663       8.394     502.734     528.796       0.038       0.641

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     18.083     218.776       0.000     218.776    1100.299       0.199       0.496

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       8.384     503.308       0.000       0.060       0.109       0.515

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.787       8.619       1.090     507.301      15.567     160.783       1.246

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96825.062       0.631     211.858  382406.219


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.086   EfDer =  0.947

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.719    2176.240       8.619     507.301       1.000       1.000       0.980
W Kg/sec =  17.5995464

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
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    65.310    2200.554       1.401       0.248      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
53513.266   30381.498       3.104     590.487     190.225     474.134       2.492

    ROTOR LEADING EDGE CONDITIONS, STAGE   2

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   209.66    -0.07   209.66     0.19   394.62
MEAN    18.08     0.00    -0.02   209.66    -0.07   209.66     0.19
HUB     15.21     0.00    -0.02   209.66    -0.07   209.66     0.19

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.76    46.36    15.40   390.27   443.09     8.40   503.63     0.40
MEAN    58.59    42.30    16.29   343.33   402.35     8.40   503.63     0.37
HUB     54.03    37.84    16.19   288.86   356.99     8.40   503.63     0.32

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   320.79   231.90   221.65  1111.02     0.29
MEAN    18.01   318.60   227.28   223.26  1109.02     0.29
HUB     15.22   335.26   248.45   225.11  1107.00     0.30

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    387.80   270.99   155.91     0.24  4736.81
MEAN   342.03   251.03   114.75     0.23  4094.69     1.77
HUB    289.10   228.75    40.66     0.21  3783.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      9.39     1.09     8.86   521.76     1.03   513.18     0.92     0.87
MEAN     9.28     1.08     8.76   519.80     1.02   511.34     0.92     0.87
HUB      9.23     1.07     8.66   518.85     1.02   509.48     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.29    35.12    31.50     3.62     0.93     0.48     2.90
MEAN    45.51    27.20    23.50     3.70     0.95     0.46     3.30     0.87
HUB     47.82    10.24     6.50     3.74     0.95     0.45     3.92


  blockage3   Cor/Incid
     0.650       0.947

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     17.960      413.973     227.923     345.579     1103.047       0.375       -0.616

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      9.292       8.430     505.843      46.000      33.406      30.600      -2.806

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960      352.236     227.923     419.546     1107.342       0.318       -0.185

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.650       9.289       8.659     509.789     345.258       0.016       0.345

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4          Mach4       cp 3-4
     17.823      347.289       0.000     347.289     1107.655       0.314       0.435

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650       8.664     510.078       0.000       0.060       0.039      -0.176

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.840       9.276       1.076     520.140      12.839     181.445       1.407

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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  79866.648       0.531     174.752  348662.156


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.086   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.719    2176.240       9.276     520.140       1.000       1.000       0.680
W Kg/sec =  17.5995464

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     61.445    2173.226       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 53513.266   30381.498       2.115     378.495     178.971     293.880       1.642

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   318.82    -0.11   318.82     0.29   380.62
 MEAN    17.74     0.00    -0.02   318.82    -0.11   318.82     0.29
 HUB     15.05     0.00    -0.02   318.82    -0.11   318.82     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.10    46.36     3.74   381.15   497.00     8.76   511.66     0.45
 MEAN    46.59    43.40     3.19   336.88   463.90     8.76   511.66     0.42
 HUB     41.89    38.84     3.05   285.82   428.25     8.76   511.66     0.39

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   306.14   204.24   228.05  1123.38     0.27
 MEAN    17.51   307.21   204.26   229.47  1121.78     0.27
 HUB     14.85   327.05   231.49   231.03  1120.20     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    376.22   285.63   171.98     0.25  4048.17
 MEAN   332.47   262.86   128.21     0.23  3577.79     1.90
 HUB    282.02   236.49    50.53     0.21  3439.32

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      9.99     1.08     9.49   532.50     1.02   524.68     0.92     0.90
 MEAN     9.90     1.07     9.40   531.06     1.02   523.19     0.92     0.90
 HUB      9.88     1.07     9.31   530.64     1.02   521.72     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.85    37.02    31.50     5.52     0.93     0.50     2.90
 MEAN    41.67    29.19    23.50     5.69     0.92     0.50     3.28     0.90
 HUB     45.06    12.34     6.50     5.84     0.92     0.52     3.87


  blockage3   Cor/Incid
     0.950       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     310.169     205.597     232.238    1121.981       0.276       0.009

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      9.920       9.406     523.375      46.000      41.518      31.500     -10.018

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     239.944     205.597     315.980    1125.430       0.213       0.390

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       9.914       9.605     526.598     471.992       0.020       0.470

    VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	233.510	0.000	233.510	1125.701	0.207	0.362

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	9.596	526.852	0.000	0.060	0.069	0.374

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.854	9.889	1.066	531.400	11.260	197.637	1.532

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
70056.914	0.495	153.288	513506.656

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =17.086 EfDer = 0.981

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
38.719	2176.240	9.889	531.400	1.000	1.000	0.980

W Kg/sec = 17.5995464

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
58.257	2150.077	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
53513.266	30381.498	3.025	513.330	169.687	401.059	2.364

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	220.40	-0.08	220.40	0.20	361.36
MEAN	16.97	0.00	-0.02	220.40	-0.08	220.40	0.20	
HUB	14.32	0.00	-0.02	220.40	-0.08	220.40	0.20	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.93	46.36	12.57	365.77	427.11	9.63	527.35	0.38
MEAN	55.64	43.80	11.84	322.30	390.51	9.63	527.35	0.35
HUB	50.99	37.84	13.15	271.96	350.11	9.63	527.35	0.31

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	302.72	195.47	231.15	1134.38	0.27
MEAN	16.57	303.39	194.91	232.49	1132.86	0.27
HUB	13.89	322.09	221.33	234.01	1131.31	0.28

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	358.56	282.89	163.09	0.25	3691.86	
MEAN	314.76	261.57	119.85	0.23	3231.75	1.64
HUB	263.79	237.83	42.46	0.21	3075.31	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	10.56	1.07	10.05	542.67	1.02	535.03	0.92	0.90
MEAN	10.48	1.06	9.97	541.27	1.02	533.59	0.92	0.90
HUB	10.45	1.06	9.88	540.79	1.02	532.13	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.22	35.21	31.50	3.71	0.93	0.42	2.90	
MEAN	39.97	27.27	23.50	3.77	0.94	0.41	3.29	0.90
HUB	43.40	10.28	6.50	3.78	0.94	0.40	3.90	

blockage3	Cor/Incid
0.950	0.981

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	300.946	196.009	228.361	1133.314	0.266	0.040

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
10.490	9.988	534.020	46.000	40.640	32.400	-8.240

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	238.846	196.009	308.977	1136.277	0.210	0.384

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	10.487	10.168	536.816	456.573	0.017	0.462

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	227.800	0.000	227.800	1136.732	0.200	0.352

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	10.175	537.246	0.000	0.060	0.059	0.396

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.853	10.464	1.058	541.574	10.174	206.481	1.601

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
63305.402	0.492	138.515	358758.469

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =17.086 EfDer = 0.992

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
38.719	2176.240	10.464	541.574	1.000	1.000	0.980

W Kg/sec = 17.5995464

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
55.578	2129.786	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
53513.266	30381.498	3.148	509.668	161.886	390.276	2.411

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	213.47	-0.07	213.47	0.19	340.48
MEAN	15.91	0.00	-0.02	213.47	-0.07	213.47	0.19	
HUB	13.07	0.00	-0.02	213.47	-0.07	213.47	0.19	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.47	47.36	11.11	347.92	408.25	10.21	537.77	0.36
MEAN	54.77	44.80	9.97	302.21	370.06	10.21	537.77	0.33
HUB	49.31	38.84	10.47	248.22	327.44	10.21	537.77	0.29

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	288.30	181.66	223.87	1144.46	0.25
MEAN	15.50	286.77	177.56	225.19	1142.91	0.25
HUB	12.59	300.87	197.90	226.63	1141.34	0.26

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	340.70	274.62	159.05	0.24	3260.26	
MEAN	294.32	253.66	116.76	0.22	2752.86	1.61
HUB	239.10	230.34	41.20	0.20	2492.51	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	11.09	1.06	10.61	551.52	1.02	544.59	0.92	0.91
MEAN	10.99	1.05	10.52	549.98	1.02	543.12	0.92	0.91
HUB	10.94	1.05	10.42	549.18	1.01	541.63	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.06	35.39	31.50	3.89	0.93	0.40	2.90	

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 MEAN    38.25    27.41    23.50     3.91     0.94     0.39     3.34     0.91
 HUB     41.13    10.30     6.50     3.80     0.94     0.37     4.06


   blockage3   Cor/Incid
      0.950       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     15.219      290.195     180.812     226.981     1142.998       0.254       -0.010

     Pt3         Ps3         Ts3        Vane No.     Alpha3     Vane A3      Incid3
     10.994      10.512      543.204      46.000      38.541      33.000      -5.541

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth        Aoth         Machth      cp 2-Th
     15.219      239.744     180.812     300.283     1145.341       0.209       0.298

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       10.991      10.661     545.434     440.827       0.026       0.434

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4          Mach4       cp 3-4
     14.701      225.306       0.000     225.306     1145.929       0.197       0.362

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       10.689      545.994       0.000       0.060       0.047       0.355

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4        Pt4           PR4        Texit         Del T       Ns         Ns nondim
      0.870       10.981        1.049      550.227       8.653     228.597       1.772

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  53851.203       0.464     117.829  378061.094

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    363905.25    796.2413      70.0701      1.3884      0.8285     17.0863      1.1190


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NPSS: Inlet Mach number .49, Altitude 20047ft, dT 22R, Thrust 10% Stage 2 stator Blocked @ 35%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
****************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.112   EfDer =  0.939

    W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
      38.676    2176.327       7.909     491.734       1.000       1.000       0.980
 W Kg/sec =  17.5802269

    W cor      RPM cor        GAMMA        Cp         R           Blades      THK
      69.993    2235.204       1.401       0.248      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
   53454.523   30348.148       4.079     831.557     203.867     619.754       3.040

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
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TIP     20.63     0.00    -0.02   155.87    -0.05   155.87     0.14   402.39
MEAN    17.06     0.00    -0.02   155.87    -0.05   155.87     0.14
HUB     12.51     0.00    -0.02   155.87    -0.05   155.87     0.14

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     68.31    50.47    17.84   391.81   421.72     7.80   489.71     0.39
MEAN    64.31    47.20    17.11   324.01   359.60     7.80   489.71     0.33
HUB     56.74    38.62    18.12   237.59   284.20     7.80   489.71     0.26

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   348.53   276.77   211.83  1095.62     0.32
MEAN    18.04   349.96   277.06   213.80  1093.14     0.32
HUB     15.00   374.72   305.83   216.52  1090.11     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.81   241.05   115.04     0.22  5710.87
MEAN   342.54   223.61    65.48     0.20  4997.91     1.85
HUB    284.88   217.53    20.95     0.20  4588.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      8.78     1.11     8.19   509.17     1.04   499.04     0.92     0.86
MEAN     8.67     1.10     8.08   507.00     1.03   496.78     0.92     0.86
HUB      8.61     1.09     7.93   505.75     1.03   494.03     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     52.57    28.50    24.20     4.30     0.93     0.54     2.90
MEAN    52.34    17.03    12.70     4.33     0.95     0.49     3.51     0.86
HUB     54.70    -5.53    -9.30     3.77     0.95     0.36     4.78


  blockage3   Cor/Incid
     0.950       0.939

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     352.686     276.518     218.917    1093.303       0.323       0.001

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      8.680       8.076     496.928      24.000      51.632      35.400     -16.232

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     233.702     276.518     362.048    1099.688       0.213       0.531

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950       8.663       8.394     502.749     528.796       0.038       0.642

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     18.083     218.531       0.000     218.531    1100.313       0.199       0.496

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       8.385     503.321       0.000       0.060       0.109       0.515

   STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.787       8.619       1.090     507.305      15.571     160.665       1.245

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96852.203       0.631     211.684  381977.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.112   EfDer =  0.947

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.676    2176.327       8.619     507.305       1.000       1.000       0.980
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W Kg/sec =  17.5802269

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     65.239    2200.633       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 53454.523   30348.148       3.107     590.487     190.020     474.134       2.495

    ROTOR LEADING EDGE CONDITIONS, STAGE   2

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   209.43    -0.07   209.43     0.19   394.63
MEAN    18.08     0.00    -0.02   209.43    -0.07   209.43     0.19
HUB     15.21     0.00    -0.02   209.43    -0.07   209.43     0.19

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.79    46.36    15.43   390.29   442.99     8.40   503.65     0.40
MEAN    58.62    42.30    16.32   343.34   402.24     8.40   503.65     0.37
HUB     54.06    37.84    16.22   288.87   356.86     8.40   503.65     0.32

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

        R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   320.73   232.06   221.40  1111.04     0.29
MEAN    18.01   318.53   227.43   223.02  1109.04     0.29
HUB     15.22   335.14   248.51   224.86  1107.02     0.30

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    387.82   270.71   155.76     0.24  4740.10
MEAN   342.05   250.75   114.61     0.23  4097.33     1.77
HUB    289.12   228.50    40.61     0.21  3784.18

       Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      9.39     1.09     8.86   521.78     1.03   513.20     0.92     0.87
MEAN     9.28     1.08     8.76   519.82     1.02   511.35     0.92     0.87
HUB      9.23     1.07     8.66   518.86     1.02   509.49     0.92     0.87

       Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.35    35.13    31.50     3.63     0.93     0.48     2.90
MEAN    45.56    27.20    23.50     3.70     0.95     0.46     3.30     0.87
HUB     47.86    10.24     6.50     3.74     0.95     0.45     3.92


  blockage3   Cor/Incid
     0.600       0.947

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.960     442.309     228.069     378.974    1100.851       0.402      -0.834

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     9.292       8.313     503.831      46.000      31.040      30.600      -0.440

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.960     386.454     228.069     448.734    1105.062       0.350      -0.417

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.600       9.289       8.535     507.693     317.610       0.016       0.312

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    17.823     380.789       0.000     380.789    1105.457       0.344       0.433

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.600       8.546     508.055       0.000       0.060       0.037      -0.397

   STAGE EXIT CONDITIONS, STAGE   2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
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      0.842       9.277       1.076     520.152      12.846     181.271       1.405

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79913.727       0.531     174.663  348262.906


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.112   EfDer =  0.962

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.676    2176.327       9.277     520.152       1.000       1.000       0.630
W Kg/sec =  17.5802269

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     61.368    2173.288       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  53454.523   30348.148       1.962     350.665     178.748     271.233       1.517

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   346.26    -0.12   346.26     0.31   380.63
 MEAN    17.74     0.00    -0.02   346.26    -0.12   346.26     0.31
 HUB     15.05     0.00    -0.02   346.26    -0.12   346.26     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.76    46.36     1.40   381.17   515.05     8.67   510.15     0.46
 MEAN    44.22    43.40     0.82   336.89   483.19     8.67   510.15     0.44
 HUB     39.55    38.84     0.71   285.83   449.07     8.67   510.15     0.41

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   303.84   200.53   228.27  1123.28     0.27
 MEAN    17.51   305.19   201.06   229.61  1121.72     0.27
 HUB     14.85   325.22   228.82   231.11  1120.19     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    376.23   288.06   175.70     0.26  3974.86
 MEAN   332.49   264.56   131.43     0.24  3521.93     1.96
 HUB    282.03   237.16    53.21     0.21  3399.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      9.96     1.07     9.47   532.29     1.02   524.59     0.92     0.88
 MEAN     9.88     1.06     9.38   530.90     1.02   523.13     0.92     0.88
 HUB      9.86     1.06     9.30   530.53     1.02   521.71     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.30    37.59    31.50     6.09     0.93     0.51     2.90
 MEAN    41.21    29.79    23.50     6.29     0.91     0.52     3.28     0.88
 HUB     44.71    12.97     6.50     6.47     0.91     0.54     3.87


  blockage3   Cor/Incid
     0.950       0.962

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     308.157     202.376     232.388    1121.922       0.275       0.008

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      9.895       9.389     523.320      46.000      41.051      31.500      -9.551

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     240.215     202.376     314.101    1125.248       0.213       0.382

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
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      0.950       9.890       9.580     526.427     471.992       0.019       0.462

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.121     233.743       0.000     233.743    1125.522       0.208       0.357

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       9.573     526.683       0.000       0.060       0.066       0.368

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.833       9.866       1.063     531.241      11.089     200.550       1.555

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  68991.406       0.487     150.791  557768.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.112   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.676    2176.327       9.866     531.241       1.000       1.000       0.980
W Kg/sec =  17.5802269

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     58.321    2150.486       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  53454.523   30348.148       3.022     513.330     169.874     401.059       2.361

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   220.62    -0.08   220.62     0.20   361.43
 MEAN    16.97     0.00    -0.02   220.62    -0.08   220.62     0.20
 HUB     14.32     0.00    -0.02   220.62    -0.08   220.62     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.91    46.36    12.55   365.79   427.23     9.60   527.18     0.38
 MEAN    55.61    43.80    11.81   322.31   390.65     9.60   527.18     0.35
 HUB     50.96    37.84    13.12   271.97   350.26     9.60   527.18     0.31

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   302.81   195.34   231.38  1134.20     0.27
 MEAN    16.57   303.50   194.81   232.72  1132.68     0.27
 HUB     13.89   322.24   221.29   234.24  1131.13     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    358.57   283.16   163.23     0.25  3689.46
 MEAN   314.77   261.82   119.96     0.23  3230.11     1.64
 HUB    263.80   238.06    42.51     0.21  3074.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     10.54     1.07    10.03   542.50     1.02   534.86     0.92     0.90
 MEAN    10.45     1.06     9.94   541.10     1.02   533.42     0.92     0.90
 HUB     10.42     1.06     9.85   540.63     1.02   531.97     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.17    35.20    31.50     3.70     0.93     0.42     2.90
 MEAN    39.93    27.27    23.50     3.77     0.94     0.40     3.29     0.90
 HUB     43.37    10.29     6.50     3.79     0.94     0.40     3.90


   blockage3   Cor/Incid
      0.950       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     301.051     195.909     228.585    1133.135       0.266       0.040

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     10.466       9.964     533.851      46.000      40.598      32.400      -8.198

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth       Cmth      Aoth         Machth      cp 2-Th
     16.481     239.084     195.909     309.098    1136.094       0.210       0.383

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      10.462      10.144     536.643     456.573       0.017       0.462

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     16.096     228.024       0.000     228.024    1136.550       0.201       0.352

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.151     537.074       0.000       0.060       0.059       0.396

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.853      10.440       1.058     541.411      10.170     206.656       1.602

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  63279.352       0.492     138.306  358460.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.112   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.676    2176.327      10.440     541.411       1.000       1.000       0.980
W Kg/sec =  17.5802269

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     55.638    2130.193       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  53454.523   30348.148       3.145     509.668     162.062     390.276       2.408

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   213.68    -0.07   213.68     0.19   340.55
 MEAN    15.91     0.00    -0.02   213.68    -0.07   213.68     0.19
 HUB     13.07     0.00    -0.02   213.68    -0.07   213.68     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.45    47.36    11.09   347.93   408.37    10.19   537.60     0.36
 MEAN    54.75    44.80     9.95   302.22   370.19    10.19   537.60     0.33
 HUB     49.29    38.84    10.45   248.23   327.58    10.19   537.60     0.29

      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   288.38   181.51   224.09  1144.27     0.25
 MEAN    15.50   286.89   177.47   225.41  1142.72     0.25
 HUB     12.59   301.01   197.85   226.85  1141.16     0.26

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    340.72   274.89   159.21     0.24  3257.66
 MEAN   294.33   253.90   116.86     0.22  2751.58     1.61
 HUB    239.11   230.57    41.26     0.20  2491.90

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     11.06     1.06    10.58   551.35     1.02   544.42     0.92     0.91
 MEAN    10.96     1.05    10.49   549.81     1.02   542.94     0.92     0.91
 HUB     10.91     1.05    10.40   549.02     1.01   541.46     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.01    35.39    31.50     3.89     0.93     0.40     2.90
 MEAN    38.21    27.40    23.50     3.90     0.94     0.39     3.34     0.91
 HUB     41.09    10.31     6.50     3.81     0.94     0.37     4.06


   blockage3   Cor/Incid
      0.950       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     15.219     290.316     180.727     227.203    1142.815       0.254       -0.010

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
     10.968      10.487     543.030      46.000      38.500      33.000      -5.500

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     15.219     239.980     180.727     300.421    1145.155       0.210       0.297

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      10.966      10.635     545.257     440.827       0.025       0.433

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     14.701     225.526       0.000     225.526    1145.744       0.197       0.361

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.663     545.818       0.000       0.060       0.047       0.355

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.870      10.955        1.049     550.060       8.649     228.802       1.774

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   53824.793       0.464     117.642  377746.094

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     362861.47    793.0861      69.9931      1.3852      0.8247     17.1123      1.1186


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NPSS: Inlet Mach number .49, Altitude 20047ft, dT 22R, Thrust 10%
Stage 2 stator Blocked @ 40%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

          Fan Hub + 4 Stage LPC 100%  12-20-2010

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.153   EfDer =  0.939

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
      38.611     2176.447        7.909      491.734        1.000        1.000        0.980
 W Kg/sec =  17.5502262

    W cor       RPM cor         GAMMA         Cp          R           Blades       THK
      69.874     2235.327        1.401        0.248       53.349       32.000       0.050

    CFM        SCFM             A1/A*       Area1        A*        AthrRotor   ChokeMargin
   53363.305   30296.361        4.086      831.557      203.519      619.754        3.045
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ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	155.60	-0.05	155.60	0.14	402.42
MEAN	17.06	0.00	-0.02	155.60	-0.05	155.60	0.14	
HUB	12.51	0.00	-0.02	155.60	-0.05	155.60	0.14	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	68.34	50.47	17.87	391.83	421.64	7.80	489.71	0.39
MEAN	64.35	47.20	17.15	324.02	359.50	7.80	489.71	0.33
HUB	56.79	38.62	18.17	237.60	284.07	7.80	489.71	0.26

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	348.47	276.97	211.46	1095.64	0.32
MEAN	18.04	349.84	277.19	213.43	1093.16	0.32
HUB	15.00	374.49	305.81	216.14	1090.13	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.83	240.64	114.85	0.22	5715.05	
MEAN	342.56	223.22	65.37	0.20	5000.35	1.86
HUB	284.90	217.15	20.92	0.20	4587.85	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	8.78	1.11	8.19	509.19	1.04	499.06	0.92	0.86
MEAN	8.67	1.10	8.08	507.01	1.03	496.79	0.92	0.86
HUB	8.61	1.09	7.93	505.75	1.03	494.04	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	52.64	28.51	24.20	4.31	0.93	0.54	2.90	
MEAN	52.40	17.03	12.70	4.33	0.95	0.49	3.51	0.86
HUB	54.75	-5.53	-9.30	3.77	0.95	0.36	4.78	

blockage3	Cor/Incid
0.950	0.939

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	352.556	276.653	218.537	1093.319	0.322	0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
8.680	8.076	496.943	24.000	51.694	35.400	-16.294

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	233.289	276.653	361.885	1099.713	0.212	0.532

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	8.663	8.395	502.772	528.796	0.038	0.643

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	218.150	0.000	218.150	1100.337	0.198	0.497

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	8.385	503.342	0.000	0.060	0.109	0.516

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.786	8.618	1.090	507.313	15.578	160.478	1.244

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
96897.758	0.631	211.423	381312.031

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =17.153 EfDer = 0.946

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   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.611    2176.447       8.618     507.313       1.000       1.000       0.980
W Kg/sec =  17.5502262

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     65.130    2200.738       1.401       0.248      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  53363.305   30296.361       3.113     590.487     189.701     474.134       2.499

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   209.07    -0.07   209.07     0.19   394.65
MEAN    18.08     0.00    -0.02   209.07    -0.07   209.07     0.19
HUB     15.21     0.00    -0.02   209.07    -0.07   209.07     0.19

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.83    46.36    15.47   390.31   442.84     8.40   503.67     0.40
MEAN    58.67    42.30    16.37   343.36   402.06     8.40   503.67     0.37
HUB     54.11    37.84    16.27   288.88   356.66     8.40   503.67     0.32

     ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

        R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   320.69   232.36   221.02  1111.07     0.29
MEAN    18.01   318.41   227.64   222.63  1109.07     0.29
HUB     15.22   334.94   248.58   224.48  1107.04     0.30

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    387.84   270.23   155.48     0.24  4746.20
MEAN   342.06   250.32   114.42     0.23  4101.10     1.77
HUB    289.13   228.11    40.55     0.21  3785.19

       Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP      9.39     1.09     8.86   521.81     1.03   513.23     0.92     0.87
MEAN     9.28     1.08     8.76   519.84     1.02   511.38     0.92     0.87
HUB      9.23     1.07     8.66   518.87     1.02   509.51     0.92     0.87

       Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.43    35.13    31.50     3.63     0.93     0.48     2.90
MEAN    45.64    27.20    23.50     3.70     0.95     0.46     3.30     0.87
HUB     47.92    10.24     6.50     3.74     0.95     0.45     3.92


  blockage3   Cor/Incid
     0.550       0.946

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    17.960     478.050     228.280     420.024    1097.870       0.435      -1.128

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     9.292       8.156     501.106      46.000      28.524      30.600       2.076

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    17.960     428.649     228.280     485.645    1101.956       0.389      -0.731

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.550       9.288       8.367     504.843     289.961       0.018       0.277

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4        cp 3-4
    17.823     422.080       0.000     422.080    1102.464       0.383       0.424

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.550       8.384     505.309       0.000       0.060       0.038      -0.699
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    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.841       9.277       1.076     520.171      12.858     181.000       1.403

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79987.008       0.532     174.525  347643.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.153   EfDer =  0.919

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.611    2176.447       9.277     520.171       1.000       1.000       0.580
W Kg/sec =  17.5502262

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     61.269    2173.368       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 53363.305   30296.361       1.809     322.834     178.458     248.585       1.393

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   379.19    -0.13   379.18     0.34   380.64
 MEAN    17.74     0.00    -0.02   379.19    -0.13   379.18     0.34
 HUB     15.05     0.00    -0.02   379.19    -0.13   379.18     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.16    46.36    -1.20   381.19   537.76     8.55   508.18     0.49
 MEAN    41.63    43.40    -1.77   336.91   507.32     8.55   508.18     0.46
 HUB     37.02    38.84    -1.82   285.85   474.94     8.55   508.18     0.43

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   301.14   195.90   228.71  1123.15     0.27
 MEAN    17.51   302.82   197.06   229.93  1121.65     0.27
 HUB     14.85   323.08   225.51   231.36  1120.18     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    376.25   291.27   180.36     0.26  3883.30
 MEAN   332.50   266.86   135.44     0.24  3452.19     2.03
 HUB    282.05   238.17    56.54     0.21  3350.75

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP      9.91     1.07     9.43   532.03     1.02   524.46     0.92     0.84
 MEAN     9.84     1.06     9.35   530.71     1.02   523.06     0.92     0.84
 HUB      9.82     1.06     9.27   530.40     1.02   521.69     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.58    38.26    31.50     6.76     0.93     0.52     2.90
 MEAN    40.60    30.50    23.50     7.00     0.89     0.53     3.28     0.84
 HUB     44.27    13.73     6.50     7.23     0.89     0.56     3.87


  blockage3   Cor/Incid
     0.950       0.919

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     305.793     198.355     232.733    1121.843       0.273       0.007

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      9.854       9.358     523.246      46.000      40.440      31.500      -8.940

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
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     17.392     240.716     198.355     311.912    1125.019       0.214       0.372

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950       9.850       9.540     526.213     471.992       0.018       0.452

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.121     234.192       0.000     234.192    1125.295       0.208       0.349

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       9.535     526.471       0.000       0.060       0.062       0.361

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.796       9.827       1.059     531.046      10.876     204.336       1.584

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  67663.477       0.478     147.636  610727.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.153   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.611    2176.447       9.827     531.046       1.000       1.000       0.980
W Kg/sec =  17.5502262

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     58.438    2150.998       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  53363.305   30296.361       3.016     513.330     170.216     401.059       2.356

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   221.04    -0.08   221.04     0.20   361.52
 MEAN    16.97     0.00    -0.02   221.04    -0.08   221.04     0.20
 HUB     14.32     0.00    -0.02   221.04    -0.08   221.04     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.86    46.36    12.50   365.81   427.47     9.57   526.97     0.38
 MEAN    55.57    43.80    11.77   322.33   390.90     9.57   526.97     0.35
 HUB     50.91    37.84    13.07   271.98   350.54     9.57   526.97     0.31

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   302.96   195.05   231.82  1133.97     0.27
 MEAN    16.57   303.70   194.60   233.17  1132.45     0.27
 HUB     13.89   322.52   221.24   234.68  1130.91     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    358.59   283.70   163.54     0.25  3684.06
 MEAN   314.79   262.32   120.18     0.23  3226.64     1.63
 HUB    263.81   238.51    42.57     0.21  3074.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     10.50     1.07     9.99   542.29     1.02   534.64     0.92     0.90
 MEAN    10.41     1.06     9.90   540.90     1.02   533.20     0.92     0.90
 HUB     10.38     1.06     9.81   540.43     1.02   531.75     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.08    35.20    31.50     3.70     0.93     0.41     2.90
 MEAN    39.85    27.27    23.50     3.77     0.94     0.40     3.29     0.90
 HUB     43.31    10.28     6.50     3.78     0.94     0.40     3.90


   blockage3   Cor/Incid
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      0.950       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     301.242     195.698     229.017    1132.908       0.266       0.040

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     10.425       9.924     533.638      46.000      40.514      32.400      -8.114

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     16.481     239.543     195.698     309.320    1135.858       0.211       0.382

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      10.421      10.103     536.421     456.573       0.017       0.460

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     16.096     228.457       0.000     228.457    1136.316       0.201       0.351

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.110     536.854       0.000       0.060       0.058       0.395

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854      10.399       1.058     541.207      10.161     207.005       1.605

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  63222.043       0.492     137.945  357975.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.153   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     38.611    2176.447      10.399     541.207       1.000       1.000       0.980
W Kg/sec =  17.5502262

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     55.750    2130.711       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  53363.305   30296.361       3.139     509.668     162.387     390.276       2.403

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   214.08    -0.07   214.08     0.19   340.63
 MEAN    15.91     0.00    -0.02   214.08    -0.07   214.08     0.19
 HUB     13.07     0.00    -0.02   214.08    -0.07   214.08     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.40    47.36    11.04   347.95   408.60    10.14   537.38     0.36
 MEAN    54.70    44.80     9.90   302.24   370.44    10.14   537.38     0.33
 HUB     49.23    38.84    10.39   248.24   327.86    10.14   537.38     0.29

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   288.52   181.21   224.52  1144.04     0.25
 MEAN    15.50   287.09   177.25   225.83  1142.49     0.25
 HUB     12.59   301.30   197.80   227.27  1140.93     0.26

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    340.74   275.42   159.53     0.24  3252.26
 MEAN   294.35   254.39   117.10     0.22  2748.13     1.61
 HUB    239.12   231.00    41.32     0.20  2491.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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  TIP     11.02     1.06    10.54   551.13     1.02   544.19     0.92     0.91
  MEAN    10.92     1.05    10.45   549.60     1.02   542.72     0.92     0.91
  HUB     10.87     1.05    10.36   548.81     1.01   541.24     0.92     0.91

          Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     38.91    35.39    31.50     3.89     0.93     0.40     2.90
  MEAN    38.13    27.41    23.50     3.91     0.94     0.38     3.34     0.91
  HUB     41.03    10.30     6.50     3.80     0.94     0.37     4.06


    blockage3   Cor/Incid
       0.950       0.992

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
      15.219     290.510     180.501     227.630    1142.580       0.254      -0.010

      Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      10.925      10.445     542.808      46.000      38.413      33.000      -5.413

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
      15.219     240.440     180.501     300.652    1144.911       0.210       0.295

    BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
       0.950      10.923      10.592     545.026     440.827       0.025       0.432

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
      14.701     225.954       0.000     225.954    1145.503       0.197       0.360

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      10.620     545.589       0.000       0.060       0.046       0.353

     STAGE EXIT CONDITIONS, STAGE   5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.870      10.913       1.049     549.847       8.640     229.211       1.777

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   53768.270       0.463     117.318  377234.562

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     361538.56    788.8461     69.8737      1.3798      0.8173     17.1526      1.1182


********************************************************************************
DESCENT   Operating Point #6

NPSS:   Inlet Mach number .45,  Altitude 15435ft, dT 22R, Thrust 10%
                Stage 1 stator Blocked @ 10%

*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

          Fan Hub + 4 Stage LPC 100%  12-20-2010

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.206   EfDer =  0.938

    W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
      42.946    2116.039       9.306     504.972       1.000       1.000       0.980
 W Kg/sec =  19.5209999

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
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    66.934    2144.610       1.401       0.249      53.349      32.000       0.050

  CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
51802.062   33698.441       4.265     831.557     194.954     619.754       3.179

    ROTOR LEADING EDGE CONDITIONS, STAGE   1

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   150.92    -0.05   150.92     0.14   386.08
MEAN    17.06     0.00    -0.02   150.92    -0.05   150.92     0.14
HUB     12.51     0.00    -0.02   150.92    -0.05   150.92     0.14

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     68.39    50.47    17.92   380.95   409.81     9.18   503.07     0.37
MEAN    64.41    47.20    17.21   315.03   349.36     9.18   503.07     0.32
HUB     56.85    38.62    18.23   231.01   275.98     9.18   503.07     0.25

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   338.81   269.28   205.62  1109.67     0.31
MEAN    18.04   340.07   269.53   207.38  1107.35     0.31
HUB     15.00   363.85   297.27   209.79  1104.53     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    380.95   233.99   111.67     0.21  5556.38
MEAN   333.05   216.89    63.52     0.20  4862.09     1.86
HUB    276.99   210.77    20.29     0.19  4459.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     10.25     1.10     9.61   521.47     1.03   511.89     0.92     0.86
MEAN    10.13     1.09     9.49   519.41     1.03   509.76     0.92     0.86
HUB     10.06     1.08     9.33   518.21     1.03   507.16     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     52.63    28.51    24.20     4.31     0.93     0.54     2.90
MEAN    52.43    17.03    12.70     4.33     0.95     0.49     3.51     0.86
HUB     54.79    -5.52    -9.30     3.78     0.95     0.36     4.78


  blockage3   Cor/Incid
     0.850       0.938

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     359.749     269.004     238.864    1106.417       0.325      -0.096

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     10.138       9.422     508.895      24.000      48.396      35.400     -12.996

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     255.636     269.004     371.097    1112.213       0.230       0.424

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.850      10.125       9.759     514.241     472.297       0.030       0.586

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     18.083     238.543       0.000     238.543    1112.975       0.214       0.517

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.850       9.768     514.946       0.000       0.060       0.087       0.439

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.800      10.086       1.084     519.694      14.722     160.287       1.243

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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  91591.797       0.631     222.287  415396.469


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.206   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.946    2116.039      10.086     519.694       1.000       1.000       0.880
W Kg/sec =  19.5209999

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     62.650    2114.015       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 51802.062   33698.441       2.906     530.233     182.476     424.221       2.325

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   227.31    -0.08   227.31     0.20   379.10
 MEAN    18.08     0.00    -0.02   227.31    -0.08   227.31     0.20
 HUB     15.21     0.00    -0.02   227.31    -0.08   227.31     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.08    46.36    12.72   379.47   442.41     9.80   515.38     0.40
 MEAN    55.76    42.30    13.46   333.83   403.94     9.80   515.38     0.36
 HUB     51.02    37.84    13.18   280.87   361.38     9.80   515.38     0.32

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   310.54   224.01   215.07  1124.01     0.28
 MEAN    18.01   308.48   219.70   216.55  1122.16     0.27
 HUB     15.22   324.63   240.35   218.21  1120.30     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    377.07   263.97   153.07     0.23  4575.86
 MEAN   332.57   244.20   112.87     0.22  3958.16     1.82
 HUB    281.11   221.99    40.76     0.20  3659.97

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     10.93     1.08    10.36   533.28     1.03   525.23     0.92     0.89
 MEAN    10.81     1.07    10.26   531.44     1.02   523.50     0.92     0.89
 HUB     10.76     1.07    10.15   530.56     1.02   521.77     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.17    35.44    31.50     3.94     0.93     0.49     2.90
 MEAN    45.41    27.53    23.50     4.03     0.94     0.48     3.30     0.89
 HUB     47.76    10.58     6.50     4.08     0.94     0.47     3.92


   blockage3   Cor/Incid
      0.950       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     311.569     220.314     220.311    1122.330       0.278       0.005

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     10.826      10.261     523.659      46.000      45.001      30.600     -14.401

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     224.811     220.314     314.767    1126.483       0.200       0.457

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      10.815      10.518     527.542     511.151       0.029       0.523

    VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	222.462	0.000	222.462	1126.577	0.197	0.392

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	10.486	527.630	0.000	0.060	0.097	0.401

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.823	10.776	1.068	531.759	12.065	182.357	1.414

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
75067.359	0.528	182.183	424106.188

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =17.206 EfDer = 0.968

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
42.946	2116.039	10.776	531.759	1.000	1.000	0.980

W Kg/sec = 19.5209999

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
59.319	2089.896	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
51802.062	33698.441	3.157	545.479	172.777	429.765	2.487

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	210.92	-0.07	210.92	0.19	366.02
MEAN	17.74	0.00	-0.02	210.92	-0.07	210.92	0.19	
HUB	15.05	0.00	-0.02	210.92	-0.07	210.92	0.19	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.36	46.36	14.00	370.61	426.49	10.52	528.05	0.38
MEAN	57.23	43.40	13.83	327.56	389.65	10.52	528.05	0.35
HUB	52.81	38.84	13.97	277.91	348.95	10.52	528.05	0.31

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	305.48	208.75	223.03	1135.72	0.27
MEAN	17.51	305.78	207.77	224.34	1134.14	0.27
HUB	14.85	324.61	233.16	225.84	1132.54	0.29

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	365.81	272.78	157.06	0.24	4136.82	
MEAN	323.27	252.33	115.50	0.22	3638.67	1.70
HUB	274.22	229.55	41.05	0.20	3463.59	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	11.56	1.07	11.00	544.04	1.02	536.25	0.92	0.89
MEAN	11.47	1.06	10.90	542.56	1.02	534.76	0.92	0.89
HUB	11.43	1.06	10.80	542.04	1.02	533.25	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.11	35.15	31.50	3.65	0.93	0.44	2.90	
MEAN	42.80	27.24	23.50	3.74	0.94	0.43	3.28	0.89
HUB	45.91	10.30	6.50	3.80	0.94	0.43	3.87	

blockage3	Cor/Incid
0.950	0.968

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	308.706	209.136	227.072	1134.319	0.272	0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
11.483	10.906	534.927	46.000	42.645	31.500	-11.145

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	234.549	209.136	314.247	1137.877	0.206	0.409

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	11.476	11.140	538.287	471.992	0.022	0.488

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	228.323	0.000	228.323	1138.131	0.201	0.375

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	11.127	538.528	0.000	0.060	0.075	0.387

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.832	11.444	1.062	542.877	11.118	189.407	1.468

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
69188.773	0.517	167.916	379724.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =17.206 EfDer = 0.982

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
42.946	2116.039	11.444	542.877	1.000	1.000	0.980

W Kg/sec = 19.5209999

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
56.435	2068.384	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
51802.062	33698.441	3.123	513.330	164.380	401.059	2.440

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	215.54	-0.07	215.54	0.19	347.63
MEAN	16.97	0.00	-0.02	215.54	-0.07	215.54	0.19	
HUB	14.32	0.00	-0.02	215.54	-0.07	215.54	0.19	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.79	46.36	12.43	355.65	415.93	11.16	539.00	0.37
MEAN	55.49	43.80	11.69	313.38	380.41	11.16	539.00	0.33
HUB	50.82	37.84	12.98	264.43	341.21	11.16	539.00	0.30

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	294.95	188.84	226.57	1146.19	0.26
MEAN	16.57	295.76	188.65	227.78	1144.78	0.26
HUB	13.89	314.15	214.92	229.14	1143.36	0.27

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	348.64	277.25	159.79	0.24	3566.78	
MEAN	306.05	256.25	117.40	0.22	3127.96	1.63
HUB	256.49	232.88	41.58	0.20	2986.24	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	12.16	1.06	11.61	553.46	1.02	546.20	0.92	0.90
MEAN	12.07	1.05	11.52	552.16	1.02	544.86	0.92	0.90
HUB	12.04	1.05	11.43	551.74	1.02	543.51	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.81	35.19	31.50	3.69	0.93	0.41	2.90	

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 MEAN    39.63    27.27    23.50     3.77     0.94     0.40     3.29     0.90
 HUB     43.17    10.28     6.50     3.78     0.94     0.40     3.90


   blockage3   Cor/Incid
      0.950       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     16.481     293.350     189.713     223.747    1145.215       0.256        0.040

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
     12.085      11.545     545.274      46.000      40.294      32.400      -7.894

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     16.481     234.276     189.713     301.457    1147.942       0.204        0.378

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      12.081      11.735     547.874     456.573       0.016        0.456

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4          Mach4       cp 3-4
     16.096     223.427       0.000     223.427    1148.375       0.195        0.348

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      11.743     548.288       0.000       0.060       0.057        0.392

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.854      12.058       1.054     552.453       9.576     207.738        1.610

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  59597.180       0.490     144.638  391171.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.206   EfDer =  0.993

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     42.946     2116.039       12.058     552.453       1.000        1.000        0.980
W Kg/sec =  19.5209999

   W cor       RPM cor         GAMMA         Cp          R            Blades       THK
     54.033     2050.380        1.401        0.249      53.349       56.000        0.050

   CFM        SCFM             A1/A*       Area1       A*        AthrRotor   ChokeMargin
  51802.062   33698.441        3.238     509.668     157.385     390.276        2.480

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1       Stator    Alfa     C1       CU1        Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   209.40    -0.07   209.40      0.18   327.79
 MEAN    15.91      0.00    -0.02   209.40    -0.07   209.40      0.18
 HUB     13.07      0.00    -0.02   209.40    -0.07   209.40      0.18

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     58.25     47.36    10.89   338.30   397.92     11.78   548.80      0.35
 MEAN    54.53     44.80     9.73   293.85   360.89     11.78   548.80      0.31
 HUB     49.06     38.84    10.22   241.35   319.58     11.78   548.80      0.28

      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050        0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   281.13    174.95    220.06   1155.54      0.24
 MEAN    15.50   279.91    171.47    221.24   1154.12      0.24
 HUB     12.59   293.93    192.02    222.54   1152.67      0.26

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
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  TIP    331.28   269.94   156.33     0.23  3139.84
  MEAN   286.18   249.21   114.71     0.22  2658.52     1.60
  HUB    232.49   226.19    40.46     0.20  2418.53

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     12.72     1.05    12.20   561.77     1.02   555.18     0.92     0.91
  MEAN    12.61     1.05    12.11   560.34     1.01   553.81     0.92     0.91
  HUB     12.56     1.04    12.01   559.63     1.01   552.42     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     38.48    35.39    31.50     3.89     0.93     0.40     2.90
  MEAN    37.78    27.41    23.50     3.91     0.94     0.38     3.34     0.91
  HUB     40.79    10.30     6.50     3.80     0.94     0.36     4.06


    blockage3   Cor/Incid
       0.950       0.993

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
      15.219     283.225     174.614     222.994    1154.203       0.245       -0.010

      Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      12.619      12.101     553.888      46.000      38.063      33.000      -5.063

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
      15.219     235.743     174.614     293.368    1156.343       0.204       0.290

    BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
       0.950      12.617      12.257     555.943     440.827       0.024       0.426

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
      14.701     221.563       0.000     221.563    1156.905       0.192       0.355

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      12.288     556.484       0.000       0.060       0.045       0.348

     STAGE EXIT CONDITIONS, STAGE   5
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.871      12.606       1.045     560.579       8.126     230.726       1.789

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   50583.902       0.461     122.764  412772.219

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     346029.03    839.7878     66.9345      1.3546      0.8249     17.2064      1.1101


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NPSS: Inlet Mach number .45, Altitude 15435ft, dT 22R, Thrust 10%
Stage 1 stator Blocked @ 15%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

          Fan Hub + 4 Stage LPC 100%  12-20-2010

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.195   EfDer =  0.938

    W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
      42.969     2116.084       9.306     504.972       1.000       1.000       0.980
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W Kg/sec =  19.5313644

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     66.970    2144.656       1.401       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 51829.566   33716.332       4.263     831.557     195.058     619.754       3.177

    ROTOR LEADING EDGE CONDITIONS, STAGE   1

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   151.00    -0.05   151.00     0.14   386.09
MEAN    17.06     0.00    -0.02   151.00    -0.05   151.00     0.14
HUB     12.51     0.00    -0.02   151.00    -0.05   151.00     0.14

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     68.38    50.47    17.91   380.96   409.84     9.18   503.07     0.37
MEAN    64.39    47.20    17.19   315.04   349.40     9.18   503.07     0.32
HUB     56.84    38.62    18.22   231.01   276.03     9.18   503.07     0.25

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   338.85   269.24   205.73  1109.66     0.31
MEAN    18.04   340.13   269.52   207.49  1107.35     0.31
HUB     15.00   363.94   297.30   209.91  1104.53     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    380.96   234.11   111.72     0.21  5555.56
MEAN   333.06   217.00    63.54     0.20  4861.91     1.86
HUB    276.99   210.89    20.31     0.19  4460.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     10.25     1.10     9.61   521.46     1.03   511.88     0.92     0.86
MEAN    10.13     1.09     9.49   519.40     1.03   509.75     0.92     0.86
HUB     10.06     1.08     9.33   518.21     1.03   507.16     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     52.62    28.50    24.20     4.30     0.93     0.54     2.90
MEAN    52.41    17.03    12.70     4.33     0.95     0.49     3.51     0.86
HUB     54.78    -5.53    -9.30     3.77     0.95     0.36     4.78


  blockage3   Cor/Incid
     0.800       0.938

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    18.071     370.650     268.994     254.997    1105.694       0.335      -0.159

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
    10.138       9.379     508.231      24.000      46.530      35.400     -11.130

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    18.071     272.992     268.994     383.252    1111.385       0.246       0.352

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.800      10.127       9.710     513.475     444.048       0.027       0.556

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    18.083     254.429       0.000     254.429    1112.269       0.229       0.528

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.800       9.733     514.292       0.000       0.060       0.075       0.386

   STAGE EXIT CONDITIONS, STAGE   1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
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      0.808      10.095       1.085     519.694      14.722     160.336       1.243

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91590.273       0.631     222.401  415621.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.195   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.969    2116.084      10.095     519.694       1.000       1.000       0.830
W Kg/sec =  19.5313644

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     62.633    2114.060       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51829.566   33716.332       2.741     500.106     182.426     399.264       2.189

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   241.59    -0.08   241.59     0.22   379.11
 MEAN    18.08     0.00    -0.02   241.59    -0.08   241.59     0.22
 HUB     15.21     0.00    -0.02   241.59    -0.08   241.59     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.52    46.36    11.16   379.48   449.93     9.77   514.82     0.40
 MEAN    54.12    42.30    11.82   333.84   412.15     9.77   514.82     0.37
 HUB     49.31    37.84    11.47   280.87   370.54     9.77   514.82     0.33

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   309.58   222.91   214.82  1124.00     0.28
 MEAN    18.01   307.62   218.71   216.32  1122.15     0.27
 HUB     15.22   323.80   239.44   217.99  1120.30     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    377.08   264.42   154.17     0.24  4553.58
 MEAN   332.58   244.46   113.87     0.22  3940.46     1.85
 HUB    281.11   221.93    41.67     0.20  3646.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     10.94     1.08    10.38   533.21     1.03   525.21     0.92     0.90
 MEAN    10.82     1.07    10.27   531.39     1.02   523.49     0.92     0.90
 HUB     10.77     1.07    10.16   530.52     1.02   521.77     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.06    35.67    31.50     4.17     0.93     0.50     2.90
 MEAN    45.31    27.76    23.50     4.26     0.94     0.49     3.30     0.90
 HUB     47.69    10.82     6.50     4.32     0.94     0.48     3.92


  blockage3   Cor/Incid
     0.950       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     310.701     219.324     220.073    1122.322       0.277       0.006

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     10.840      10.277     523.651      46.000      44.902      30.600     -14.302

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     224.603     219.324     313.926    1126.435       0.199       0.455

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
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      0.950      10.829      10.533     527.497     511.151       0.028       0.521

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     222.247       0.000     222.247    1126.529       0.197       0.391

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.501     527.584       0.000       0.060       0.096       0.400

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.834      10.790       1.069     531.706      12.012     183.184       1.420

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  74738.555       0.526     181.481  451110.719


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.195   EfDer =  0.967

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.969    2116.084      10.790     531.706       1.000       1.000       0.980
W Kg/sec =  19.5313644

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     59.267    2090.044       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51829.566   33716.332       3.160     545.479     172.625     429.765       2.490

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   210.72    -0.07   210.72     0.19   366.05
 MEAN    17.74     0.00    -0.02   210.72    -0.07   210.72     0.19
 HUB     15.05     0.00    -0.02   210.72    -0.07   210.72     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.38    46.36    14.02   370.62   426.40    10.53   528.00     0.38
 MEAN    57.25    43.40    13.85   327.56   389.55    10.53   528.00     0.35
 HUB     52.84    38.84    14.00   277.92   348.83    10.53   528.00     0.31

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   305.43   208.91   222.81  1135.68     0.27
 MEAN    17.51   305.70   207.89   224.13  1134.09     0.27
 HUB     14.85   324.50   233.22   225.63  1132.49     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    365.82   272.52   156.91     0.24  4139.93
 MEAN   323.28   252.09   115.40     0.22  3640.65     1.70
 HUB    274.22   229.32    41.00     0.20  3464.45

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     11.58     1.07    11.01   543.99     1.02   536.21     0.92     0.89
 MEAN    11.48     1.06    10.92   542.51     1.02   534.71     0.92     0.89
 HUB     11.45     1.06    10.81   541.99     1.02   533.20     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.16    35.15    31.50     3.65     0.93     0.44     2.90
 MEAN    42.85    27.24    23.50     3.74     0.94     0.43     3.28     0.89
 HUB     45.95    10.30     6.50     3.80     0.94     0.43     3.87


  blockage3   Cor/Incid
     0.950       0.967

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     308.623     209.250     226.853    1134.274       0.272       0.007

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     11.499      10.922     534.884      46.000      42.688      31.500     -11.188

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth       Cmth      Aoth         Machth      cp 2-Th
     17.392     234.319     209.250     314.151    1137.837       0.206       0.410

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      11.491      11.156     538.249     471.992       0.022       0.489

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.121     228.102       0.000     228.102    1138.091       0.200       0.376

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      11.143     538.489       0.000       0.060       0.076       0.387

    STAGE EXIT CONDITIONS, STAGE   3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.831      11.460       1.062     542.830      11.124     189.242       1.467

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  69226.844       0.517     168.098  379942.094


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.195   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.969    2116.084      11.460     542.830       1.000       1.000       0.980
W Kg/sec =  19.5313644

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     56.385    2068.517       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51829.566   33716.332       3.126     513.330     164.233     401.059       2.442

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   215.33    -0.07   215.33     0.19   347.66
 MEAN    16.97     0.00    -0.02   215.33    -0.07   215.33     0.19
 HUB     14.32     0.00    -0.02   215.33    -0.07   215.33     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.81    46.36    12.45   355.66   415.83    11.18   538.96     0.37
 MEAN    55.51    43.80    11.71   313.39   380.30    11.18   538.96     0.33
 HUB     50.85    37.84    13.01   264.44   341.08    11.18   538.96     0.30

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   294.88   189.00   226.35  1146.16     0.26
 MEAN    16.57   295.68   188.80   227.56  1144.74     0.26
 HUB     13.89   314.03   214.97   228.92  1143.32     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    348.64   276.98   159.64     0.24  3569.79
 MEAN   306.06   255.99   117.26     0.22  3130.41     1.63
 HUB    256.50   232.65    41.53     0.20  2986.98

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     12.18     1.06    11.63   553.42     1.02   546.17     0.92     0.90
 MEAN    12.09     1.05    11.54   552.12     1.02   544.83     0.92     0.90
 HUB     12.06     1.05    11.44   551.69     1.02   543.47     0.92     0.90
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.86    35.19    31.50     3.69     0.93     0.41     2.90
 MEAN    39.68    27.26    23.50     3.76     0.94     0.40     3.29     0.90
 HUB     43.20    10.28     6.50     3.78     0.94     0.40     3.90


   blockage3   Cor/Incid
      0.950       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     16.481     293.281     189.862     223.532    1145.176       0.256        0.040

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
     12.102      11.562     545.237      46.000      40.344      32.400      -7.944

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     16.481     234.044     189.862     301.370    1147.909       0.204        0.379

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      12.098      11.753     547.843     456.573       0.016        0.457

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4        cp 3-4
     16.096     223.209       0.000     223.209    1148.342       0.194        0.348

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      11.760     548.256       0.000       0.060       0.057        0.392

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.854      12.075        1.054     552.412       9.582     207.539        1.609

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  59636.391       0.491     144.810  391391.906


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.195   EfDer =  0.993

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     42.969     2116.084       12.075     552.412       1.000        1.000        0.980
W Kg/sec =  19.5313644

   W cor       RPM cor         GAMMA         Cp          R            Blades       THK
     53.985     2050.499        1.401        0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*        AthrRotor   ChokeMargin
 51829.566   33716.332         3.241     509.668     157.243     390.276        2.482

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1       Stator    Alfa      C1       CU1        Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02    209.20    -0.07    209.20      0.18   327.81
 MEAN    15.91      0.00    -0.02    209.20    -0.07    209.20      0.18
 HUB     13.07      0.00    -0.02    209.20    -0.07    209.20      0.18

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     58.27     47.36    10.91   338.30    397.82     11.80    548.76      0.35
 MEAN    54.56     44.80     9.76   293.85    360.77     11.80    548.76      0.31
 HUB     49.09     38.84    10.25   241.35    319.45     11.80    548.76      0.28

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500       0.050        0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94    281.06    175.11    219.84   1155.52      0.24
 MEAN    15.50    279.81    171.58    221.03   1154.09      0.24
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 HUB     12.59   293.80   192.07   222.32  1152.64     0.25

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    331.29   269.67   156.18     0.23  3142.74
 MEAN   286.18   248.97   114.60     0.22  2660.30     1.60
 HUB    232.49   225.97    40.42     0.20  2419.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     12.73     1.05    12.22   561.74     1.02   555.15     0.92     0.91
 MEAN    12.63     1.05    12.12   560.30     1.01   553.77     0.92     0.91
 HUB     12.58     1.04    12.02   559.59     1.01   552.39     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.54    35.39    31.50     3.89     0.93     0.40     2.90
 MEAN    37.82    27.41    23.50     3.91     0.94     0.38     3.34     0.91
 HUB     40.83    10.30     6.50     3.80     0.94     0.37     4.06


   blockage3   Cor/Incid
      0.950       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     283.125     174.731     222.776    1154.172       0.245      -0.010

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     12.638      12.119     553.858      46.000      38.108      33.000      -5.108

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     235.508     174.731     293.249    1156.317       0.204       0.290

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      12.635      12.275     555.917     440.827       0.024       0.427

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     14.701     221.344       0.000     221.344    1156.878       0.191       0.355

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      12.306     556.457       0.000       0.060       0.045       0.349

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      12.624       1.046     560.544       8.132     230.503       1.787

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  50617.785       0.461     122.911  413000.969

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    345809.84    839.7014     66.9700      1.3565      0.8294     17.1948      1.1100


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NPSS: Inlet Mach number .45, Altitude 15435ft, dT 22R, Thrust 10%
Stage 1 stator Blocked @ 20%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.187   EfDer =  0.938
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
42.986	2116.151	9.306	504.972	1.000	1.000	0.980

W Kg/sec = 19.5388641

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
66.996	2144.723	1.401	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
51849.469	33729.277	4.261	831.557	195.133	619.754	3.176

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	151.06	-0.05	151.06	0.14	386.10
MEAN	17.06	0.00	-0.02	151.06	-0.05	151.06	0.14	
HUB	12.51	0.00	-0.02	151.06	-0.05	151.06	0.14	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	68.37	50.47	17.90	380.97	409.88	9.18	503.07	0.37
MEAN	64.39	47.20	17.19	315.05	349.44	9.18	503.07	0.32
HUB	56.83	38.62	18.21	231.02	276.07	9.18	503.07	0.25

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	338.87	269.21	205.81	1109.66	0.31
MEAN	18.04	340.18	269.51	207.57	1107.35	0.31
HUB	15.00	364.01	297.34	209.99	1104.53	0.33

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	380.97	234.20	111.76	0.21	5554.89	
MEAN	333.07	217.08	63.56	0.20	4861.86	1.86
HUB	277.00	210.97	20.33	0.19	4460.70	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	10.25	1.10	9.61	521.46	1.03	511.88	0.92	0.86
MEAN	10.13	1.09	9.49	519.41	1.03	509.75	0.92	0.86
HUB	10.06	1.08	9.33	518.21	1.03	507.16	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	52.60	28.50	24.20	4.30	0.93	0.54	2.90	
MEAN	52.40	17.02	12.70	4.32	0.95	0.49	3.51	0.86
HUB	54.77	-5.53	-9.30	3.77	0.95	0.36	4.78	

blockage3	Cor/Incid
0.750	0.938

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	383.603	268.991	273.486	1104.807	0.347	-0.237

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
10.138	9.327	507.416	24.000	44.525	35.400	-9.125

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	292.918	268.991	397.690	1110.366	0.264	0.263

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	10.129	9.650	512.535	415.799	0.024	0.523

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	272.631	0.000	272.631	1111.403	0.245	0.538

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	9.688	513.492	0.000	0.060	0.063	0.319

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    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.816      10.102       1.086     519.694      14.722     160.370       1.243

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91591.797       0.631     222.490  415783.906


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.187   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.986    2116.151      10.102     519.694       1.000       1.000       0.780
W Kg/sec =  19.5388641

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     62.608    2114.126       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 51849.469   33729.277       2.577     469.979     182.352     374.307       2.053

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   257.81    -0.09   257.81     0.23   379.12
 MEAN    18.08     0.00    -0.02   257.81    -0.09   257.81     0.23
 HUB     15.21     0.00    -0.02   257.81    -0.09   257.81     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.82    46.36     9.46   379.49   458.86     9.73   514.15     0.41
 MEAN    52.33    42.30    10.03   333.85   421.88     9.73   514.15     0.38
 HUB     47.46    37.84     9.62   280.88   381.33     9.73   514.15     0.34

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   308.38   221.49   214.58  1123.97     0.27
 MEAN    18.01   306.53   217.41   216.09  1122.14     0.27
 HUB     15.22   322.81   238.31   217.75  1120.31     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    377.09   265.06   155.61     0.24  4524.60
 MEAN   332.59   244.87   115.18     0.22  3917.15     1.88
 HUB    281.12   221.92    42.81     0.20  3629.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     10.95     1.08    10.40   533.12     1.03   525.19     0.92     0.91
 MEAN    10.84     1.07    10.29   531.32     1.02   523.48     0.92     0.91
 HUB     10.78     1.07    10.18   530.47     1.02   521.77     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.91    35.95    31.50     4.45     0.93     0.51     2.90
 MEAN    45.17    28.06    23.50     4.56     0.94     0.50     3.30     0.91
 HUB     47.58    11.12     6.50     4.62     0.94     0.50     3.92


  blockage3   Cor/Incid
     0.950       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     309.610     218.020     219.830    1122.310       0.276       0.006

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     10.851      10.292     523.640      46.000      44.763      30.600     -14.163

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
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     17.960     224.402     218.020     312.872    1126.371       0.199       0.453

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      10.841      10.545     527.436     511.151       0.028       0.519

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     17.823     222.035       0.000     222.035    1126.465       0.197       0.389

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.514     527.524       0.000       0.060       0.095       0.398

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.844      10.803       1.069     531.637      11.943     184.240       1.428

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  74313.281       0.523     180.518  481786.781


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.187   EfDer =  0.967

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.986    2116.151      10.803     531.637       1.000       1.000       0.980
W Kg/sec =  19.5388641

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     59.217    2090.244       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
 51849.469   33729.277       3.163     545.479     172.478     429.765       2.492

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   210.52    -0.07   210.52     0.19   366.08
 MEAN    17.74     0.00    -0.02   210.52    -0.07   210.52     0.19
 HUB     15.05     0.00    -0.02   210.52    -0.07   210.52     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.41    46.36    14.05   370.63   426.31    10.54   527.94     0.38
 MEAN    57.28    43.40    13.88   327.57   389.45    10.54   527.94     0.35
 HUB     52.86    38.84    14.02   277.93   348.72    10.54   527.94     0.31

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   305.38   209.06   222.60  1135.62     0.27
 MEAN    17.51   305.61   207.99   223.91  1134.03     0.27
 HUB     14.85   324.39   233.27   225.42  1132.43     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    365.83   272.27   156.77     0.24  4142.86
 MEAN   323.29   251.86   115.30     0.22  3642.46     1.70
 HUB    274.23   229.11    40.96     0.20  3465.16

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     11.60     1.07    11.03   543.93     1.02   536.15     0.92     0.89
 MEAN    11.50     1.06    10.93   542.45     1.02   534.66     0.92     0.89
 HUB     11.46     1.06    10.83   541.92     1.02   533.14     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.20    35.16    31.50     3.66     0.93     0.45     2.90
 MEAN    42.89    27.25    23.50     3.75     0.95     0.43     3.28     0.89
 HUB     45.98    10.30     6.50     3.80     0.95     0.43     3.87


    blockage3   Cor/Incid
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      0.950       0.967

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
      17.392     308.535     209.354     226.638    1134.214       0.272       0.007

      Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
      11.512      10.935     534.826      46.000      42.730      31.500     -11.230

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
      17.392     234.092     209.354     314.051    1137.782       0.206       0.411

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      11.505      11.170     538.196     471.992       0.022       0.489

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
      17.121     227.884       0.000     227.884    1138.035       0.200       0.376

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      11.157     538.435       0.000       0.060       0.076       0.388

     STAGE EXIT CONDITIONS, STAGE   3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.831      11.474       1.062     542.768      11.130     189.085       1.466

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  69262.625       0.518     168.249  380112.312


      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.187   EfDer =  0.982

    W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
      42.986    2116.151      11.474     542.768       1.000       1.000       0.980
W Kg/sec =  19.5388641

    W cor      RPM cor        GAMMA        Cp          R           Blades       THK
      56.337    2068.701       1.401       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51849.469   33729.277       3.128     513.330     164.091     401.059       2.444

      ROTOR LEADING EDGE CONDITIONS, STAGE   4

         R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   215.13    -0.07   215.13     0.19   347.69
 MEAN    16.97     0.00    -0.02   215.13    -0.07   215.13     0.19
 HUB     14.32     0.00    -0.02   215.13    -0.07   215.13     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.84    46.36    12.48   355.67   415.73    11.19   538.91     0.37
 MEAN    55.54    43.80    11.74   313.40   380.19    11.19   538.91     0.33
 HUB     50.88    37.84    13.04   264.45   340.96    11.19   538.91     0.30

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   294.82   189.16   226.13  1146.10     0.26
 MEAN    16.57   295.58   188.91   227.34  1144.69     0.26
 HUB     13.89   313.90   215.01   228.70  1143.26     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    348.66   276.72   159.50     0.24  3572.69
 MEAN   306.07   255.75   117.16     0.22  3132.16     1.63
 HUB    256.51   232.43    41.49     0.20  2987.61

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     12.19     1.06    11.64   553.37     1.02   546.12     0.92     0.90
 MEAN    12.10     1.05    11.55   552.06     1.02   544.77     0.92     0.90
 HUB     12.07     1.05    11.46   551.63     1.02   543.41     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.91    35.20    31.50     3.70     0.93     0.41     2.90
 MEAN    39.72    27.26    23.50     3.76     0.94     0.40     3.29     0.90
 HUB     43.23    10.28     6.50     3.78     0.94     0.40     3.90


   blockage3   Cor/Incid
      0.950       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     293.188     189.968     223.318    1145.122       0.256       0.040

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     12.116      11.576     545.185      46.000      40.387      32.400      -7.987

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     16.481     233.816     189.968     301.261    1147.860       0.204       0.379

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      12.113      11.768     547.795     456.573       0.016       0.457

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     16.096     222.994       0.000     222.994    1148.292       0.194       0.349

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      11.775     548.207       0.000       0.060       0.058       0.393

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854      12.089       1.054     552.355       9.587     207.357       1.607

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  59671.020       0.491     144.950  391562.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.187   EfDer =  0.992

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     42.986    2116.151      12.089     552.355       1.000       1.000       0.980
W Kg/sec =  19.5388641

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     53.937    2050.669       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51849.469   33729.277       3.244     509.668     157.105     390.276       2.484

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   209.00    -0.07   209.00     0.18   327.84
 MEAN    15.91     0.00    -0.02   209.00    -0.07   209.00     0.18
 HUB     13.07     0.00    -0.02   209.00    -0.07   209.00     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.30    47.36    10.94   338.31   397.73    11.81   548.71     0.35
 MEAN    54.59    44.80     9.79   293.86   360.66    11.81   548.71     0.31
 HUB     49.12    38.84    10.28   241.36   319.33    11.81   548.71     0.28

      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   281.01   175.29   219.63  1155.47      0.24
 MEAN    15.50   279.73   171.73   220.81  1154.04      0.24
 HUB     12.59   293.67   192.12   222.11  1152.59      0.25

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    331.30   269.40   156.00     0.23  3146.10
 MEAN   286.19   248.72   114.46     0.22  2662.54     1.60
 HUB    232.50   225.75    40.38     0.20  2419.71

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     12.75     1.05    12.24   561.69     1.02   555.10     0.92     0.91
 MEAN    12.65     1.05    12.14   560.26     1.01   553.73     0.92     0.91
 HUB     12.60     1.04    12.04   559.53     1.01   552.34     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.59    35.39    31.50     3.89     0.93     0.40     2.90
 MEAN    37.87    27.40    23.50     3.90     0.94     0.38     3.34     0.91
 HUB     40.86    10.30     6.50     3.80     0.94     0.37     4.06


    blockage3   Cor/Incid
       0.950       0.992

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
      15.219      283.047     174.879     222.561     1154.125       0.245      -0.010

      Pt3         Ps3         Ts3        Vane No.     Alpha3     Vane A3      Incid3
      12.653      12.134      553.811      46.000      38.159      33.000      -5.159

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
      15.219      235.275     174.879     293.150     1156.275       0.203       0.291

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950       12.651      12.291     555.876     440.827       0.024       0.427

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
      14.701      221.127       0.000     221.127     1156.835       0.191       0.356

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       12.321      556.415       0.000       0.060       0.046       0.349

     STAGE EXIT CONDITIONS, STAGE   5
        Eff4        Pt4          PR4        Texit         Del T        Ns         Ns nondim
        0.871       12.640       1.046      560.493       8.138      230.265       1.785

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   50657.355       0.462     123.054  413178.406

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     345496.06    839.2616      66.9957      1.3582       0.8337     17.1867      1.1099


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NPSS: Inlet Mach number .45, Altitude 15435ft, dT 22R, Thrust 10%
Stage 1 stator Blocked @ 25%

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

          Fan Hub + 4 Stage LPC 100%  12-20-2010
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
 RESET =  0.000BLEED =  0.000 DPInc =17.180   EfDer =  0.938

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    42.999    2116.202       9.306     504.972       1.000       1.000       0.980
W Kg/sec =  19.5450897

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
    67.017    2144.775       1.401       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
 51865.988   33740.027       4.260     831.557     195.195     619.754       3.175

    ROTOR LEADING EDGE CONDITIONS, STAGE   1

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   151.11    -0.05   151.11     0.14   386.11
MEAN    17.06     0.00    -0.02   151.11    -0.05   151.11     0.14
HUB     12.51     0.00    -0.02   151.11    -0.05   151.11     0.14

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     68.37    50.47    17.90   380.98   409.90     9.18   503.07     0.37
MEAN    64.38    47.20    17.18   315.06   349.47     9.18   503.07     0.32
HUB     56.82    38.62    18.20   231.03   276.10     9.18   503.07     0.25

     ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   338.89   269.18   205.88  1109.66     0.31
MEAN    18.04   340.20   269.49   207.64  1107.34     0.31
HUB     15.00   364.06   297.34   210.06  1104.52     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    380.98   234.28   111.80     0.21  5554.35
MEAN   333.08   217.16    63.59     0.20  4861.37     1.86
HUB    277.01   211.04    20.33     0.19  4460.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     10.25     1.10     9.61   521.46     1.03   511.88     0.92     0.86
MEAN    10.13     1.09     9.49   519.40     1.03   509.75     0.92     0.86
HUB     10.06     1.08     9.33   518.22     1.03   507.16     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     52.59    28.50    24.20     4.30     0.93     0.54     2.90
MEAN    52.39    17.03    12.70     4.33     0.95     0.49     3.51     0.86
HUB     54.76    -5.53    -9.30     3.77     0.95     0.36     4.78


  blockage3   Cor/Incid
     0.700       0.938

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    18.071     399.169     268.964     294.948    1103.699       0.362      -0.334

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
    10.138       9.261     506.398      24.000      42.362      35.400      -6.962

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    18.071     316.109     268.964     415.050    1109.089       0.285       0.151

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.700      10.131       9.575     511.356     387.549       0.020       0.489

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    18.083     293.773       0.000     293.773    1110.320       0.265       0.547
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.700	9.629	512.492	0.000	0.060	0.053	0.232

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.824	10.110	1.086	519.694	14.722	160.404	1.243

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
91588.375	0.631	222.553	415918.938

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =17.180 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
42.999	2116.202	10.110	519.694	1.000	1.000	0.730

W Kg/sec = 19.5450897

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
62.582	2114.178	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
51865.988	33740.027	2.413	439.852	182.279	349.351	1.917

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	276.47	-0.10	276.47	0.25	379.13
MEAN	18.08	0.00	-0.02	276.47	-0.10	276.47	0.25	
HUB	15.21	0.00	-0.02	276.47	-0.10	276.47	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.93	46.36	7.57	379.50	469.61	9.68	513.32	0.42
MEAN	50.38	42.30	8.08	333.86	433.54	9.68	513.32	0.39
HUB	45.46	37.84	7.62	280.89	394.19	9.68	513.32	0.35

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	306.91	219.61	214.39	1123.93	0.27
MEAN	18.01	305.23	215.75	215.91	1122.12	0.27
HUB	15.22	321.60	236.85	217.56	1120.31	0.29

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	377.10	266.02	157.49	0.24	4486.41	
MEAN	332.60	245.50	116.85	0.22	3887.32	1.92
HUB	281.13	222.02	44.28	0.20	3607.04	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	10.96	1.08	10.41	533.01	1.03	525.15	0.92	0.91
MEAN	10.84	1.07	10.30	531.23	1.02	523.46	0.92	0.91
HUB	10.79	1.07	10.19	530.40	1.02	521.77	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.69	36.30	31.50	4.80	0.93	0.51	2.90	
MEAN	44.98	28.42	23.50	4.92	0.93	0.51	3.30	0.91
HUB	47.43	11.50	6.50	5.00	0.93	0.51	3.92	

blockage3	Cor/Incid
0.950	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	308.305	216.353	219.644	1122.286	0.275	0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
10.859	10.304	523.617	46.000	44.568	30.600	-13.968

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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth          Machth      cp 2-Th
     17.960     224.269     216.353     311.617    1126.281       0.199       0.449

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      10.849      10.553     527.352     511.151       0.028       0.515

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     17.823     221.888       0.000     221.888    1126.376       0.197       0.387

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.523     527.440       0.000       0.060       0.094       0.396

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.851      10.812       1.069     531.548      11.854     185.616       1.439

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  73760.398       0.519     179.232  517031.781


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.180   EfDer =  0.967

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.999    2116.202      10.812     531.548       1.000       1.000       0.980
W Kg/sec =  19.5450897

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     59.184    2090.470       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51865.988   33740.027       3.164     545.479     172.382     429.765       2.493

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   210.38    -0.07   210.38     0.19   366.12
 MEAN    17.74     0.00    -0.02   210.38    -0.07   210.38     0.19
 HUB     15.05     0.00    -0.02   210.38    -0.07   210.38     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.42    46.36    14.06   370.64   426.25    10.55   527.86     0.38
 MEAN    57.30    43.40    13.90   327.58   389.38    10.55   527.86     0.35
 HUB     52.88    38.84    14.04   277.93   348.64    10.55   527.86     0.31

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   305.34   209.16   222.45  1135.54      0.27
 MEAN    17.51   305.56   208.07   223.77  1133.95      0.27
 HUB     14.85   324.30   233.30   225.27  1132.34      0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    365.84   272.09   156.68     0.24  4144.86
 MEAN   323.30   251.69   115.23     0.22  3643.95      1.70
 HUB    274.24   228.96    40.94     0.20  3465.53

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     11.60     1.07    11.04   543.85     1.02   536.07     0.92     0.88
 MEAN    11.51     1.06    10.94   542.36     1.02   534.57     0.92     0.88
 HUB     11.47     1.06    10.84   541.83     1.02   533.06     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.24    35.16    31.50     3.66     0.93     0.45     2.90
 MEAN    42.92    27.25    23.50     3.75     0.95     0.43     3.28     0.88
 HUB     46.00    10.30     6.50     3.80     0.95     0.43     3.87
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   blockage3   Cor/Incid
      0.950       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     308.483     209.440     226.488    1134.127       0.272       0.007

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     11.522      10.944     534.743      46.000      42.760      31.500     -11.260

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     233.934     209.440     313.991    1137.699       0.206       0.411

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      11.515      11.180     538.117     471.992       0.022       0.490

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.121     227.731       0.000     227.731    1137.951       0.200       0.377

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      11.166     538.356       0.000       0.060       0.076       0.388

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.831      11.483       1.062     542.682      11.134     188.975       1.465

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  69288.094       0.518     168.365  380273.406


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.180   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.999    2116.202      11.483     542.682       1.000       1.000       0.980
W Kg/sec =  19.5450897

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     56.305    2068.914       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51865.988   33740.027       3.130     513.330     163.998     401.059       2.446

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   214.98    -0.07   214.98     0.19   347.72
 MEAN    16.97     0.00    -0.02   214.98    -0.07   214.98     0.19
 HUB     14.32     0.00    -0.02   214.98    -0.07   214.98     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.86    46.36    12.50   355.68   415.67    11.20   538.83     0.37
 MEAN    55.56    43.80    11.76   313.40   380.11    11.20   538.83     0.33
 HUB     50.90    37.84    13.06   264.45   340.87    11.20   538.83     0.30

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   294.79   189.29   225.98  1146.02     0.26
 MEAN    16.57   295.52   189.00   227.19  1144.61     0.26
 HUB     13.89   313.81   215.04   228.55  1143.18     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    348.66   276.53   159.37     0.24  3575.25
 MEAN   306.08   255.58   117.08     0.22  3133.65     1.63
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 HUB    256.51   232.28    41.47     0.20  2987.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     12.20     1.06    11.65   553.29     1.02   546.04     0.92     0.90
 MEAN    12.11     1.05    11.56   551.98     1.02   544.70     0.92     0.90
 HUB     12.08     1.05    11.47   551.55     1.02   543.33     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.95    35.19    31.50     3.69     0.93     0.41     2.90
 MEAN    39.76    27.26    23.50     3.76     0.94     0.40     3.29     0.90
 HUB     43.26    10.28     6.50     3.78     0.94     0.40     3.90


   blockage3   Cor/Incid
      0.950       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     293.132     190.059     223.169    1145.041       0.256       0.040

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     12.127      11.586     545.106      46.000      40.419      32.400      -8.019

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     16.481     233.656     190.059     301.193    1147.783       0.204       0.380

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      12.123      11.778     547.720     456.573       0.016       0.458

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     16.096     222.842       0.000     222.842    1148.214       0.194       0.349

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      11.785     548.132       0.000       0.060       0.058       0.393

    STAGE EXIT CONDITIONS, STAGE   4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.854      12.099       1.054     552.274       9.592     207.218       1.606

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  59699.531       0.491     145.065  391725.031


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.180   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.999    2116.202      12.099     552.274       1.000       1.000       0.980
W Kg/sec =  19.5450897

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     53.906    2050.869       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51865.988   33740.027       3.246     509.668     157.013     390.276       2.486

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   208.86    -0.07   208.86     0.18   327.87
 MEAN    15.91     0.00    -0.02   208.86    -0.07   208.86     0.18
 HUB     13.07     0.00    -0.02   208.86    -0.07   208.86     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.32    47.36    10.96   338.32   397.66    11.82   548.64     0.35
 MEAN    54.60    44.80     9.80   293.87   360.59    11.82   548.64     0.31
 HUB     49.14    38.84    10.30   241.37   319.24    11.82   548.64     0.28

      ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
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    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   280.96   175.41   219.48  1155.40     0.24
MEAN    15.50   279.67   171.83   220.66  1153.96     0.24
HUB     12.59   293.57   192.15   221.96  1152.52     0.25

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    331.30   269.21   155.90     0.23  3148.12
MEAN   286.20   248.54   114.37     0.22  2664.04     1.60
HUB    232.50   225.60    40.36     0.20  2420.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     12.76     1.05    12.25   561.62     1.02   555.03     0.92     0.91
MEAN    12.66     1.05    12.15   560.18     1.01   553.65     0.92     0.91
HUB     12.61     1.04    12.05   559.46     1.01   552.27     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.63    35.39    31.50     3.89     0.93     0.40     2.90
MEAN    37.91    27.40    23.50     3.90     0.94     0.38     3.34     0.91
HUB     40.88    10.30     6.50     3.80     0.94     0.37     4.06


   blockage3   Cor/Incid
      0.950       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     282.989     174.977     222.409    1154.048       0.245      -0.010

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     12.664      12.145     553.737      46.000      38.193      33.000      -5.193

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     235.112     174.977     293.078    1156.202       0.203       0.292

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      12.662      12.302     555.806     440.827       0.024       0.428

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     14.701     220.974       0.000     220.974    1156.761       0.191       0.357

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      12.332     556.344       0.000       0.060       0.046       0.350

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      12.651       1.046     560.416       8.142     230.107       1.784

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  50682.441       0.462     123.154  413346.531

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    345018.84    838.3694     67.0171      1.3594      0.8373     17.1800      1.1098


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NPSS: Inlet Mach number .45, Altitude 15435ft, dT 22R, Thrust 10%
Stage 1 stator Blocked @ 27%

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*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
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         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.179   EfDer =  0.938

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     43.001    2116.229       9.306     504.972       1.000       1.000       0.980
 W Kg/sec =  19.5458183

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     67.020    2144.803       1.401       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51867.922   33741.281       4.260     831.557     195.202     619.754       3.175

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   151.12    -0.05   151.12     0.14   386.12
  MEAN    17.06     0.00    -0.02   151.12    -0.05   151.12     0.14
  HUB     12.51     0.00    -0.02   151.12    -0.05   151.12     0.14

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.37    50.47    17.90   380.99   409.91     9.18   503.07     0.37
  MEAN    64.38    47.20    17.18   315.06   349.47     9.18   503.07     0.32
  HUB     56.82    38.62    18.20   231.03   276.11     9.18   503.07     0.25

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   338.91   269.20   205.89  1109.66     0.31
  MEAN    18.04   340.20   269.48   207.64  1107.34     0.31
  HUB     15.00   364.06   297.34   210.06  1104.52     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    380.99   234.27   111.78     0.21  5554.77
  MEAN   333.08   217.17    63.60     0.20  4861.29     1.86
  HUB    277.01   211.04    20.33     0.19  4460.74

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     10.25     1.10     9.61   521.46     1.03   511.88     0.92     0.86
  MEAN    10.13     1.09     9.49   519.40     1.03   509.75     0.92     0.86
  HUB     10.06     1.08     9.33   518.21     1.03   507.16     0.92     0.86

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     52.59    28.50    24.20     4.30     0.93     0.54     2.90
  MEAN    52.38    17.03    12.70     4.33     0.95     0.49     3.51     0.86
  HUB     54.76    -5.53    -9.30     3.77     0.95     0.36     4.78


    blockage3   Cor/Incid
       0.680       0.938

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
      18.071     406.288     268.959     304.517    1103.178       0.368      -0.379

      Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
      10.138       9.231     505.920      24.000      41.452      35.400      -6.052

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
      18.071     326.473     268.959     422.994    1108.486       0.295       0.098

    BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
       0.680      10.132       9.540     510.800     376.250       0.019       0.475
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	303.205	0.000	303.205	1109.812	0.273	0.551

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	9.601	512.023	0.000	0.060	0.049	0.189

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.826	10.112	1.087	519.694	14.722	160.405	1.243

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
91591.414	0.631	222.568	415934.719

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =17.179 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
43.001	2116.229	10.112	519.694	1.000	1.000	0.710

W Kg/sec = 19.5458183

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
62.569	2114.205	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
51867.922	33741.281	2.347	427.802	182.239	339.368	1.862

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	284.73	-0.10	284.73	0.26	379.13
MEAN	18.08	0.00	-0.02	284.73	-0.10	284.73	0.26	
HUB	15.21	0.00	-0.02	284.73	-0.10	284.73	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.13	46.36	6.77	379.51	474.52	9.66	512.93	0.43
MEAN	49.55	42.30	7.25	333.86	438.86	9.66	512.93	0.40
HUB	44.62	37.84	6.78	280.89	400.03	9.66	512.93	0.36

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	306.24	218.73	214.34	1123.91	0.27
MEAN	18.01	304.63	214.96	215.85	1122.11	0.27
HUB	15.22	321.04	236.15	217.49	1120.31	0.29

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	377.11	266.50	158.38	0.24	4468.44	
MEAN	332.60	245.83	117.64	0.22	3873.19	1.94
HUB	281.13	222.09	44.98	0.20	3596.43	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	10.96	1.08	10.41	532.96	1.03	525.13	0.92	0.91
MEAN	10.84	1.07	10.30	531.19	1.02	523.45	0.92	0.91
HUB	10.79	1.07	10.19	530.37	1.02	521.77	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.58	36.46	31.50	4.96	0.93	0.52	2.90	
MEAN	44.88	28.59	23.50	5.09	0.93	0.51	3.30	0.91
HUB	47.36	11.69	6.50	5.19	0.93	0.52	3.92	

blockage3	Cor/Incid
0.950	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	307.707	215.563	219.581	1122.275	0.274	0.007

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     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     10.860      10.307     523.607      46.000      44.471      30.600     -13.871

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.960     224.233     215.563     311.043    1126.238       0.199       0.448

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      10.850      10.554     527.311     511.151       0.027       0.514

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.823     221.844       0.000     221.844    1126.333       0.197       0.386

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.524     527.400       0.000       0.060       0.093       0.395

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.853      10.813       1.069     531.506      11.812     186.269       1.444

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  73498.375       0.517     178.602  532614.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.179   EfDer =  0.967

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     43.001    2116.229      10.813     531.506       1.000       1.000       0.980
W Kg/sec =  19.5458183

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     59.175    2090.579       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51867.922   33741.281       3.165     545.479     172.356     429.765       2.493

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   210.34    -0.07   210.34     0.19   366.14
 MEAN    17.74     0.00    -0.02   210.34    -0.07   210.34     0.19
 HUB     15.05     0.00    -0.02   210.34    -0.07   210.34     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.43    46.36    14.07   370.64   426.23    10.55   527.82     0.38
 MEAN    57.30    43.40    13.90   327.59   389.36    10.55   527.82     0.35
 HUB     52.89    38.84    14.05   277.94   348.62    10.55   527.82     0.31

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   305.34   209.20   222.41  1135.49     0.27
 MEAN    17.51   305.54   208.10   223.72  1133.91     0.27
 HUB     14.85   324.27   233.29   225.22  1132.30     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    365.84   272.03   156.64     0.24  4145.78
 MEAN   323.30   251.64   115.21     0.22  3644.34     1.70
 HUB    274.24   228.92    40.96     0.20  3465.41

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     11.61     1.07    11.04   543.81     1.02   536.03     0.92     0.88
 MEAN    11.51     1.06    10.94   542.32     1.02   534.53     0.92     0.88
 HUB     11.47     1.06    10.84   541.79     1.02   533.02     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     43.25    35.16    31.50     3.66     0.93     0.45     2.90
 MEAN    42.93    27.25    23.50     3.75     0.95     0.43     3.28     0.88
 HUB     46.01    10.31     6.50     3.81     0.95     0.43     3.87


   blockage3   Cor/Incid
      0.950       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     17.392     308.465     209.462     226.443    1134.086       0.272        0.007

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
     11.524      10.946     534.704      46.000      42.769      31.500     -11.269

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth        Aoth         Machth      cp 2-Th
     17.392     233.887     209.462     313.970    1137.659       0.206        0.411

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      11.516      11.182     538.078     471.992       0.022        0.490

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     17.121     227.686       0.000     227.686    1137.911       0.200        0.377

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      11.168     538.317       0.000       0.060       0.076        0.388

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.831       11.485       1.062     542.642      11.136     188.942       1.465

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  69296.461       0.518     168.391  380307.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.179   EfDer =  0.982

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     43.001     2116.229       11.485     542.642       1.000        1.000        0.980
W Kg/sec =  19.5458183

   W cor       RPM cor         GAMMA         Cp          R            Blades        THK
     56.296     2069.018        1.401        0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1       A*        AthrRotor   ChokeMargin
  51867.922   33741.281         3.131     513.330     163.973     401.059        2.446

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1       Stator    Alfa     C1       CU1        Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   214.94    -0.07   214.94      0.19   347.74
 MEAN    16.97      0.00    -0.02   214.94    -0.07   214.94      0.19
 HUB     14.32      0.00    -0.02   214.94    -0.07   214.94      0.19

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     58.86     46.36    12.50   355.69   415.65     11.20   538.79      0.37
 MEAN    55.56     43.80    11.76   313.41   380.09     11.20   538.79      0.33
 HUB     50.90     37.84    13.06   264.46   340.85     11.20   538.79      0.30

      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88    294.76    189.31    225.93   1145.99      0.26
 MEAN    16.57    295.50    189.02    227.14   1144.57      0.26
 HUB     13.89    313.80    215.07    228.50   1143.14      0.27
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    348.67   276.48   159.36     0.24  3575.64
MEAN   306.08   255.53   117.06     0.22  3134.06     1.63
HUB    256.51   232.23    41.44     0.20  2988.41

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     12.20     1.06    11.66   553.25     1.02   546.01     0.92     0.90
MEAN    12.11     1.05    11.56   551.94     1.02   544.66     0.92     0.90
HUB     12.08     1.05    11.47   551.51     1.02   543.30     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.96    35.20    31.50     3.70     0.93     0.41     2.90
MEAN    39.77    27.26    23.50     3.76     0.94     0.40     3.29     0.90
HUB     43.27    10.28     6.50     3.78     0.94     0.40     3.90


  blockage3   Cor/Incid
     0.950       0.982

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    16.481     293.114     190.084     223.124    1145.002       0.256       0.040

    Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
    12.129      11.588     545.068      46.000      40.428      32.400      -8.028

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    16.481     233.608     190.084     301.172    1147.745       0.204       0.380

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950      12.125      11.780     547.683     456.573       0.016       0.458

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    16.096     222.797       0.000     222.797    1148.176       0.194       0.349

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      11.787     548.095       0.000       0.060       0.058       0.393

   STAGE EXIT CONDITIONS, STAGE   4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.854      12.101       1.054     552.235       9.593     207.179       1.606

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  59707.887       0.491     145.091  391758.938


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.179   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     43.001    2116.229      12.101     552.235       1.000       1.000       0.980
W Kg/sec =  19.5458183

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     53.897    2050.968       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51867.922   33741.281       3.247     509.668     156.988     390.276       2.486

    ROTOR LEADING EDGE CONDITIONS, STAGE   5

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   208.82    -0.07   208.82     0.18   327.88
MEAN    15.91     0.00    -0.02   208.82    -0.07   208.82     0.18
HUB     13.07     0.00    -0.02   208.82    -0.07   208.82     0.18

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.32    47.36    10.96   338.33   397.64    11.83   548.60     0.35
MEAN    54.61    44.80     9.81   293.87   360.57    11.83   548.60     0.31
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HUB     49.14    38.84    10.30   241.37   319.22    11.83   548.60     0.28

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   280.94   175.43   219.43  1155.36     0.24
MEAN    15.50   279.65   171.85   220.62  1153.93     0.24
HUB     12.59   293.56   192.18   221.91  1152.48     0.25

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    331.31   269.17   155.88     0.23  3148.51
MEAN   286.20   248.49   114.35     0.22  2664.44     1.61
HUB    232.51   225.55    40.33     0.20  2420.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     12.76     1.05    12.25   561.58     1.02   554.99     0.92     0.91
MEAN    12.66     1.05    12.15   560.14     1.01   553.62     0.92     0.91
HUB     12.61     1.04    12.05   559.42     1.01   552.23     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.64    35.39    31.50     3.89     0.93     0.40     2.90
MEAN    37.92    27.40    23.50     3.90     0.94     0.38     3.34     0.91
HUB     40.89    10.30     6.50     3.80     0.94     0.37     4.06


   blockage3   Cor/Incid
      0.950       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     282.969     175.003     222.364    1154.010       0.245      -0.010

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     12.666      12.147     553.700      46.000      38.203      33.000      -5.203

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     235.062     175.003     293.054    1156.165       0.203       0.292

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      12.664      12.304     555.770     440.827       0.024       0.428

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     14.701     220.928       0.000     220.928    1156.724       0.191       0.357

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      12.335     556.308       0.000       0.060       0.046       0.350

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      12.653       1.046     560.379       8.143     230.060       1.783

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  50690.414       0.462     123.178  413381.188

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    344784.53    837.8313     67.0196      1.3596      0.8383     17.1795      1.1097
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NPSS: Inlet Mach number .45, Altitude 15435ft, dT 22R, Thrust 10%
Stage 1 stator Blocked @ 30%

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**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*********************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.183   EfDer =  0.938

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.995    2116.283       9.306     504.972       1.000       1.000       0.980
 W Kg/sec =  19.5434074

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     67.011    2144.857       1.401       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51861.527   33737.121       4.261     831.557     195.178     619.754       3.175

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   151.10    -0.05   151.10     0.14   386.13
 MEAN    17.06     0.00    -0.02   151.10    -0.05   151.10     0.14
 HUB     12.51     0.00    -0.02   151.10    -0.05   151.10     0.14

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     68.37    50.47    17.90   381.00   409.91     9.18   503.07     0.37
 MEAN    64.38    47.20    17.18   315.07   349.47     9.18   503.07     0.32
 HUB     56.82    38.62    18.20   231.04   276.10     9.18   503.07     0.25

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   338.90   269.21   205.86  1109.66     0.31
 MEAN    18.04   340.21   269.52   207.62  1107.34     0.31
 HUB     15.00   364.04   297.34   210.04  1104.53     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    381.00   234.26   111.79     0.21  5554.83
 MEAN   333.09   217.13    63.57     0.20  4861.88     1.86
 HUB    277.02   211.02    20.32     0.19  4460.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     10.25     1.10     9.61   521.46     1.03   511.88     0.92     0.86
 MEAN    10.13     1.09     9.49   519.41     1.03   509.75     0.92     0.86
 HUB     10.06     1.08     9.33   518.22     1.03   507.16     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     52.60    28.50    24.20     4.30     0.93     0.54     2.90
 MEAN    52.39    17.03    12.70     4.33     0.95     0.49     3.51     0.86
 HUB     54.76    -5.53    -9.30     3.77     0.95     0.36     4.78


   blockage3   Cor/Incid
      0.650       0.938

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     418.112     268.992     320.095    1102.292       0.379      -0.456

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     10.139       9.179     505.108      24.000      40.042      35.400      -4.642

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     18.071     343.379     268.992     436.195    1107.462       0.310       0.008
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BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	10.133	9.479	509.857	359.300	0.018	0.453

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	318.570	0.000	318.570	1108.949	0.287	0.555

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	9.552	511.227	0.000	0.060	0.044	0.116

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.830	10.116	1.087	519.695	14.723	160.391	1.243

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
91597.867	0.631	222.557	415882.531

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =17.183 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
42.995	2116.283	10.116	519.695	1.000	1.000	0.680

W Kg/sec = 19.5434074

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
62.540	2114.256	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
51861.527	33737.121	2.249	409.725	182.156	324.394	1.781

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	298.10	-0.10	298.10	0.27	379.14
MEAN	18.08	0.00	-0.02	298.10	-0.10	298.10	0.27	
HUB	15.21	0.00	-0.02	298.10	-0.10	298.10	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.86	46.36	5.50	379.52	482.67	9.62	512.28	0.43
MEAN	48.25	42.30	5.95	333.87	447.66	9.62	512.28	0.40
HUB	43.31	37.84	5.47	280.90	409.66	9.62	512.28	0.37

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	305.12	217.23	214.27	1123.88	0.27
MEAN	18.01	303.63	213.62	215.77	1122.09	0.27
HUB	15.22	320.16	235.04	217.39	1120.30	0.29

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	377.12	267.35	159.89	0.24	4437.96	
MEAN	332.61	246.40	118.99	0.22	3849.12	1.97
HUB	281.14	222.22	46.10	0.20	3579.54	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	10.96	1.08	10.41	532.87	1.03	525.10	0.92	0.91
MEAN	10.84	1.07	10.31	531.12	1.02	523.43	0.92	0.91
HUB	10.79	1.07	10.20	530.32	1.02	521.77	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.39	36.73	31.50	5.23	0.93	0.52	2.90	
MEAN	44.71	28.88	23.50	5.38	0.92	0.52	3.30	0.91
HUB	47.23	11.97	6.50	5.47	0.92	0.53	3.92	

blockage3	Cor/Incid
0.950	0.999

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.960     306.705     214.218     219.497    1122.256       0.273       0.007

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     10.859      10.309     523.589      46.000      44.303      30.600     -13.703

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth       Cmth       Aoth         Machth      cp 2-Th
     17.960     224.193     214.218     310.084    1126.166       0.199       0.445

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      10.849      10.553     527.243     511.151       0.027       0.511

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.823     221.792       0.000     221.792    1126.261       0.197       0.384

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.524     527.333       0.000       0.060       0.092       0.393

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.853      10.813       1.069     531.437      11.742     187.363       1.452

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  73060.539       0.514     177.516  557802.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.183   EfDer =  0.967

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.995    2116.283      10.813     531.437       1.000       1.000       0.980
W Kg/sec =  19.5434074

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     59.165    2090.769       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51861.527   33737.121       3.165     545.479     172.327     429.765       2.494

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   210.29    -0.07   210.29     0.19   366.17
 MEAN    17.74     0.00    -0.02   210.29    -0.07   210.29     0.19
 HUB     15.05     0.00    -0.02   210.29    -0.07   210.29     0.19

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.44    46.36    14.08   370.65   426.22    10.55   527.75     0.38
 MEAN    57.31    43.40    13.91   327.60   389.34    10.55   527.75     0.35
 HUB     52.90    38.84    14.06   277.94   348.59    10.55   527.75     0.31

     ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   305.34   209.27   222.35  1135.43     0.27
 MEAN    17.51   305.53   208.14   223.67  1133.84     0.27
 HUB     14.85   324.24   233.30   225.17  1132.23     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    365.85   271.96   156.59     0.24  4147.00
 MEAN   323.31   251.58   115.17     0.22  3645.07     1.70
 HUB    274.25   228.86    40.95     0.20  3465.61

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     11.61     1.07    11.04   543.75     1.02   535.97     0.92     0.88
 MEAN    11.51     1.06    10.94   542.26     1.02   534.47     0.92     0.88
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 HUB     11.47     1.06    10.84   541.72     1.02   532.95     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.26    35.15    31.50     3.65     0.93     0.45     2.90
 MEAN    42.94    27.25    23.50     3.75     0.95     0.43     3.28     0.88
 HUB     46.02    10.31     6.50     3.81     0.95     0.43     3.87


   blockage3   Cor/Incid
      0.950       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     308.454     209.504     226.389    1134.016       0.272       0.007

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     11.524      10.946     534.638      46.000      42.782      31.500     -11.282

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     233.828     209.504     313.955    1137.591       0.206       0.411

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      11.516      11.182     538.014     471.992       0.022       0.490

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.121     227.630       0.000     227.630    1137.843       0.200       0.377

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      11.168     538.252       0.000       0.060       0.076       0.388

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.831      11.485       1.062     542.575      11.138     188.894       1.464

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  69311.242       0.518     168.407  380295.281


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.183   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.995    2116.283      11.485     542.575       1.000       1.000       0.980
W Kg/sec =  19.5434074

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     56.286    2069.198       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51861.527   33737.121       3.131     513.330     163.944     401.059       2.446

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   214.89    -0.07   214.89     0.19   347.77
 MEAN    16.97     0.00    -0.02   214.89    -0.07   214.89     0.19
 HUB     14.32     0.00    -0.02   214.89    -0.07   214.89     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.87    46.36    12.51   355.69   415.63    11.20   538.72     0.37
 MEAN    55.57    43.80    11.77   313.42   380.07    11.20   538.72     0.33
 HUB     50.91    37.84    13.07   264.46   340.82    11.20   538.72     0.30

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   294.76   189.38   225.88  1145.92     0.26
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 MEAN    16.57   295.49   189.07   227.08  1144.50     0.26
 HUB     13.89   313.77   215.09   228.44  1143.07     0.27

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    348.68   276.40   159.30     0.24  3576.95
 MEAN   306.09   255.46   117.02     0.22  3134.87     1.63
 HUB    256.52   232.17    41.43     0.20  2988.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     12.20     1.06    11.66   553.19     1.02   545.94     0.92     0.90
 MEAN    12.11     1.05    11.57   551.88     1.02   544.59     0.92     0.90
 HUB     12.08     1.05    11.47   551.44     1.02   543.23     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.98    35.19    31.50     3.69     0.93     0.41     2.90
 MEAN    39.78    27.26    23.50     3.76     0.94     0.40     3.29     0.90
 HUB     43.28    10.28     6.50     3.78     0.94     0.40     3.90


  blockage3   Cor/Incid
     0.950       0.982

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    16.481     293.104     190.132     223.068    1144.935       0.256       0.040

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
    12.129      11.588     545.005      46.000      40.443      32.400      -8.043

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth       Cmth      Aoth         Machth      cp 2-Th
    16.481     233.547     190.132     301.156    1147.680       0.203       0.380

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950      12.125      11.780     547.621     456.573       0.016       0.458

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
    16.096     222.740       0.000     222.740    1148.111       0.194       0.349

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      11.788     548.032       0.000       0.060       0.058       0.393

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854      12.101       1.054     552.171       9.596     207.116       1.606

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  59724.195       0.491     145.113  391743.969


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.183   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.995    2116.283      12.101     552.171       1.000       1.000       0.980
W Kg/sec =  19.5434074

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     53.887    2051.139       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51861.527   33737.121       3.247     509.668     156.958     390.276       2.486

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   208.76    -0.07   208.76     0.18   327.91
 MEAN    15.91     0.00    -0.02   208.76    -0.07   208.76     0.18
 HUB     13.07     0.00    -0.02   208.76    -0.07   208.76     0.18
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.33    47.36    10.97   338.33   397.62    11.83   548.54     0.35
MEAN    54.62    44.80     9.82   293.88   360.54    11.83   548.54     0.31
HUB     49.15    38.84    10.31   241.38   319.19    11.83   548.54     0.28

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   280.92   175.47   219.38  1155.30     0.24
MEAN    15.50   279.62   171.87   220.56  1153.86     0.24
HUB     12.59   293.51   192.16   221.86  1152.41     0.25

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    331.32   269.10   155.84     0.23  3149.30
MEAN   286.21   248.44   114.34     0.22  2664.74     1.61
HUB    232.51   225.49    40.35     0.20  2420.28

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     12.76     1.05    12.25   561.52     1.02   554.93     0.92     0.91
MEAN    12.66     1.05    12.15   560.08     1.01   553.56     0.92     0.91
HUB     12.61     1.04    12.05   559.35     1.01   552.17     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.66    35.39    31.50     3.89     0.93     0.40     2.90
MEAN    37.93    27.40    23.50     3.90     0.94     0.38     3.34     0.91
HUB     40.90    10.31     6.50     3.81     0.94     0.37     4.06


   blockage3   Cor/Incid
      0.950       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     282.937     175.023     222.306    1153.946       0.245      -0.010

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     12.666      12.147     553.638      46.000      38.214      33.000      -5.214

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     235.001     175.023     293.016    1156.103       0.203       0.292

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      12.664      12.304     555.709     440.827       0.024       0.428

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     14.701     220.871       0.000     220.871    1156.661       0.191       0.357

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      12.335     556.246       0.000       0.060       0.046       0.350

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      12.653       1.046     560.316       8.145     230.013       1.783

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   50697.227       0.462     123.180  413363.375

    OVERALL EXIT CONDITIONS; ALL 5  STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
     344391.06    836.7720     67.0113      1.3596      0.8393     17.1828      1.1096
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NPSS: Inlet Mach number .45, Altitude 15435ft, dT 22R, Thrust 10%

Stage 1 stator Blocked @ 35%

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*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*****************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.193   EfDer =  0.938

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.978    2116.350       9.306     504.972       1.000       1.000       0.980
 W Kg/sec =  19.5352726

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     66.983    2144.925       1.401       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51839.938   33723.078       4.262     831.557     195.097     619.754       3.177

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   151.03    -0.05   151.03     0.14   386.14
 MEAN    17.06     0.00    -0.02   151.03    -0.05   151.03     0.14
 HUB     12.51     0.00    -0.02   151.03    -0.05   151.03     0.14

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     68.38    50.47    17.91   381.01   409.90     9.18   503.07     0.37
 MEAN    64.39    47.20    17.19   315.08   349.45     9.18   503.07     0.32
 HUB     56.83    38.62    18.21   231.04   276.07     9.18   503.07     0.25

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   338.90   269.28   205.77  1109.66     0.31
 MEAN    18.04   340.17   269.54   207.53  1107.35     0.31
 HUB     15.00   364.01   297.37   209.95  1104.53     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    381.01   234.15   111.73     0.21  5556.34
 MEAN   333.10   217.05    63.56     0.20  4862.26     1.86
 HUB    277.03   210.93    20.34     0.19  4461.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     10.25     1.10     9.61   521.47     1.03   511.88     0.92     0.86
 MEAN    10.13     1.09     9.49   519.41     1.03   509.75     0.92     0.86
 HUB     10.06     1.08     9.33   518.22     1.03   507.16     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     52.61    28.50    24.20     4.30     0.93     0.54     2.90
 MEAN    52.41    17.03    12.70     4.33     0.95     0.49     3.51     0.86
 HUB     54.78    -5.53    -9.30     3.77     0.95     0.36     4.78


   blockage3   Cor/Incid
      0.600       0.938

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     441.518     269.013     350.099    1100.462       0.401      -0.614

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     10.139       9.073     503.432      24.000      37.538      35.400      -2.138
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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth          Machth      cp 2-Th
     18.071     376.086     269.013     462.395    1105.330       0.340       -0.180

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.600      10.134       9.353     507.896     331.051       0.016       0.415

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     18.083     348.213       0.000     348.213    1107.161       0.315       0.559

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600       9.448     509.580       0.000       0.060       0.038      -0.038

    STAGE EXIT CONDITIONS, STAGE   1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.833      10.120       1.087     519.698      14.726     160.340       1.243

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91614.578       0.631     222.505  415706.031


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
 RESET =  0.000BLEED =  0.000 DPInc =17.193   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.978    2116.350      10.120     519.698       1.000       1.000       0.630
W Kg/sec =  19.5352726

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     62.490    2114.317       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51839.938   33723.078       2.086     379.599     182.010     299.437       1.645

     ROTOR LEADING EDGE CONDITIONS, STAGE   2

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   323.57    -0.11   323.57     0.29   379.15
 MEAN    18.08      0.00    -0.02   323.57    -0.11   323.57     0.29
 HUB     15.21      0.00    -0.02   323.57    -0.11   323.57     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.56    46.36     3.20   379.53   498.83     9.54   510.96     0.45
 MEAN    45.91    42.30     3.61   333.88   465.03     9.54   510.96     0.42
 HUB     40.97    37.84     3.13   280.91   428.57     9.54   510.96     0.39

      ROTOR EXIT CONDITIONS, STAGE   2    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   302.93   214.09   214.31  1123.80     0.27
 MEAN    18.01   301.71   210.89   215.77  1122.04     0.27
 HUB     15.22   318.44   232.74   217.34  1120.29     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    377.13   269.27   163.03     0.24  4374.11
 MEAN   332.62   247.74   121.73     0.22  3800.08     2.02
 HUB    281.15   222.67    48.41     0.20  3544.62

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     10.94     1.08    10.40   532.68     1.02   525.03     0.92     0.91
 MEAN    10.83     1.07    10.30   530.98     1.02   523.38     0.92     0.91
 HUB     10.78     1.07    10.19   530.22     1.02   521.76     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.97    37.26    31.50     5.76     0.93     0.53     2.90
 MEAN    44.34    29.43    23.50     5.93     0.92     0.54     3.30     0.91
 HUB     46.96    12.56     6.50     6.06     0.92     0.55     3.92
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   blockage3   Cor/Incid
      0.950       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     17.960      304.798     211.479     219.495     1122.207       0.272       0.007

     Pt3         Ps3         Ts3        Vane No.     Alpha3     Vane A3      Incid3
     10.847      10.304      523.543      46.000      43.934      30.600     -13.334

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     17.960      224.286     211.479     308.266     1126.009       0.199       0.439

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       10.838      10.542      527.097     511.151       0.026       0.504

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4           Mach4       cp 3-4
     17.823      221.855       0.000     221.855     1126.106       0.197       0.379

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       10.514      527.187       0.000       0.060       0.089       0.389

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.846       10.803        1.067      531.294       11.596     189.668       1.470

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  72152.922       0.507     175.238  605704.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.193   EfDer =  0.967

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     42.978     2116.350       10.803      531.294       1.000        1.000       0.980
W Kg/sec =  19.5352726

   W cor       RPM cor         GAMMA         Cp          R            Blades       THK
     59.189     2091.116        1.401        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*        AthrRotor   ChokeMargin
  51839.938   33723.078        3.164      545.479      172.397      429.765       2.493

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1       Stator    Alfa      C1       CU1        Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00     -0.02   210.35     -0.07   210.35      0.19   366.24
 MEAN    17.74      0.00     -0.02   210.35     -0.07   210.35      0.19
 HUB     15.05      0.00     -0.02   210.35     -0.07   210.35      0.19

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     60.43     46.36     14.07   370.67    426.26     10.54    527.60      0.38
 MEAN    57.30     43.40     13.90   327.61    389.38     10.54    527.60      0.35
 HUB     52.89     38.84     14.05   277.95    348.63     10.54    527.60      0.31

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP      19.81   305.35    209.22    222.41   1135.27      0.27
 MEAN     17.51   305.57    208.13    223.73   1133.68      0.27
 HUB      14.85   324.30    233.33    225.23   1132.07      0.29

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP     365.86    272.04    156.64      0.24   4146.09
 MEAN    323.32    251.64    115.19      0.22   3644.90      1.70
 HUB     274.26    228.92     40.93      0.20   3466.02
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    11.60     1.07    11.03   543.60     1.02   535.82     0.92     0.88
 MEAN   11.50     1.06    10.93   542.11     1.02   534.32     0.92     0.88
 HUB    11.46     1.06    10.83   541.58     1.02   532.81     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    43.25    35.16    31.50     3.66     0.93     0.45     2.90
 MEAN   42.93    27.24    23.50     3.74     0.95     0.43     3.28     0.88
 HUB    46.01    10.30     6.50     3.80     0.95     0.43     3.87


   blockage3   Cor/Incid
      0.950       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     308.493     209.494     226.452    1133.861       0.272       0.007

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     11.513      10.935     534.492      46.000      42.772      31.500     -11.272

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     233.892     209.494     313.996    1137.436       0.206       0.411

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      11.506      11.171     537.868     471.992       0.022       0.490

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     17.121     227.692       0.000     227.692    1137.689       0.200       0.377

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      11.157     538.106       0.000       0.060       0.076       0.388

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.831      11.474       1.062     542.432      11.138     188.930       1.465

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  69309.586       0.518     168.332  380218.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.193   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.978    2116.350      11.474     542.432       1.000       1.000       0.980
W Kg/sec =  19.5352726

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     56.308    2069.537       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51839.938   33723.078       3.130     513.330     164.007     401.059       2.445

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

       R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP    19.26     0.00    -0.02   214.95    -0.07   214.95     0.19   347.83
 MEAN   16.97     0.00    -0.02   214.95    -0.07   214.95     0.19
 HUB    14.32     0.00    -0.02   214.95    -0.07   214.95     0.19

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP    58.86    46.36    12.50   355.71   415.67    11.19   538.58     0.37
 MEAN   55.56    43.80    11.76   313.43   380.11    11.19   538.58     0.33
 HUB    50.91    37.84    13.07   264.47   340.86    11.19   538.58     0.30

     ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
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     0.500       0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   294.79   189.35   225.94  1145.77     0.26
 MEAN    16.57   295.52   189.04   227.14  1144.35     0.26
 HUB     13.89   313.82   215.10   228.50  1142.92     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    348.69   276.47   159.34     0.24  3576.29
 MEAN   306.10   255.53   117.06     0.22  3134.37     1.63
 HUB    256.53   232.23    41.43     0.20  2988.78

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     12.19     1.06    11.64   553.05     1.02   545.80     0.92     0.90
 MEAN    12.10     1.05    11.55   551.73     1.02   544.45     0.92     0.90
 HUB     12.07     1.05    11.46   551.30     1.02   543.09     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.96    35.19    31.50     3.69     0.93     0.41     2.90
 MEAN    39.77    27.26    23.50     3.76     0.94     0.40     3.29     0.90
 HUB     43.27    10.28     6.50     3.78     0.94     0.40     3.90


   blockage3   Cor/Incid
      0.950       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     16.481     293.128     190.102     223.126    1144.782       0.256       0.040

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     12.118      11.577     544.859      46.000      40.431      32.400      -8.031

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     16.481     233.609     190.102     301.184    1147.526       0.204       0.380

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      12.114      11.769     547.474     456.573       0.016       0.458

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     16.096     222.798       0.000     222.798    1147.958       0.194       0.349

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      11.777     547.886       0.000       0.060       0.058       0.393

    STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854      12.090       1.054     552.027       9.595     207.163       1.606

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  59719.508       0.491     145.041  391663.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.193   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.978    2116.350      12.090     552.027       1.000       1.000       0.980
W Kg/sec =  19.5352726

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     53.907    2051.471       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51839.938   33723.078       3.246     509.668     157.017     390.276       2.486

     ROTOR LEADING EDGE CONDITIONS, STAGE   5

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
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TIP     18.32     0.00    -0.02   208.82    -0.07   208.82     0.18   327.96
MEAN    15.91     0.00    -0.02   208.82    -0.07   208.82     0.18
HUB     13.07     0.00    -0.02   208.82    -0.07   208.82     0.18

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.32    47.36    10.96   338.35   397.66    11.81   548.39     0.35
MEAN    54.61    44.80     9.81   293.89   360.58    11.81   548.39     0.31
HUB     49.15    38.84    10.31   241.39   319.23    11.81   548.39     0.28

     ROTOR EXIT CONDITIONS, STAGE   5    SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   280.95   175.45   219.43  1155.14     0.24
MEAN    15.50   279.65   171.85   220.62  1153.71     0.24
HUB     12.59   293.57   192.19   221.91  1152.26     0.25

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    331.33   269.16   155.88     0.23  3148.86
MEAN   286.22   248.50   114.37     0.22  2664.45     1.61
HUB    232.52   225.55    40.33     0.20  2420.61

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     12.75     1.05    12.24   561.37     1.02   554.79     0.92     0.91
MEAN    12.65     1.05    12.14   559.93     1.01   553.41     0.92     0.91
HUB     12.60     1.04    12.04   559.21     1.01   552.02     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.64    35.39    31.50     3.89     0.93     0.40     2.90
MEAN    37.92    27.40    23.50     3.90     0.94     0.38     3.34     0.91
HUB     40.89    10.30     6.50     3.80     0.94     0.37     4.06


   blockage3   Cor/Incid
      0.950       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     15.219     282.969     175.004     222.362    1153.795       0.245      -0.010

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     12.655      12.136     553.492      46.000      38.203      33.000      -5.203

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     15.219     235.060     175.004     293.052    1155.950       0.203       0.292

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      12.653      12.293     555.563     440.827       0.024       0.428

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4       cp 3-4
     14.701     220.926       0.000     220.926    1156.509       0.191       0.357

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      12.323     556.100       0.000       0.060       0.046       0.350

    STAGE EXIT CONDITIONS, STAGE   5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      12.641       1.046     560.171       8.144     230.053       1.783

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  50696.352       0.462     123.126  413276.562

   OVERALL EXIT CONDITIONS; ALL 5  STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR     Efficiency      Rotor1Inc   TR
    343492.94    834.2424     66.9834      1.3584      0.8389     17.1930      1.1093
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NPSS: Inlet Mach number .45, Altitude 15435ft, dT 22R, Thrust 10%
Stage 1 stator Blocked @ 40%

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*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*****************  COMDES Version 12.1 for NPSS ********************
***************   Stator Vane, Gasplus Properties  *****************
*****************************************************************

         Fan Hub + 4 Stage LPC 100%  12-20-2010

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
  RESET =  0.000BLEED =  0.000 DPInc =17.221   EfDer =  0.938

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.928    2116.439       9.306     504.972       1.000       1.000       0.980
 W Kg/sec =  19.5125008

    W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     66.905    2145.015       1.401       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51779.508   33683.766       4.267     831.557     194.869     619.754       3.180

     ROTOR LEADING EDGE CONDITIONS, STAGE   1

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   150.85    -0.05   150.85     0.14   386.16
  MEAN    17.06     0.00    -0.02   150.85    -0.05   150.85     0.14
  HUB     12.51     0.00    -0.02   150.85    -0.05   150.85     0.14

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.40    50.47    17.93   381.02   409.85     9.18   503.07     0.37
  MEAN    64.42    47.20    17.22   315.09   349.39     9.18   503.07     0.32
  HUB     56.87    38.62    18.25   231.05   275.98     9.18   503.07     0.25

      ROTOR EXIT CONDITIONS, STAGE   1    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   338.85   269.40   205.53  1109.67     0.31
  MEAN    18.04   340.10   269.64   207.28  1107.36     0.31
  HUB     15.00   363.84   297.34   209.70  1104.54     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    381.02   233.88   111.62     0.21  5558.84
  MEAN   333.11   216.79    63.48     0.20  4864.07     1.86
  HUB    277.04   210.68    20.29     0.19  4460.69

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     10.25     1.10     9.61   521.48     1.03   511.90     0.92     0.86
  MEAN    10.13     1.09     9.49   519.41     1.03   509.76     0.92     0.86
  HUB     10.06     1.08     9.33   518.22     1.03   507.17     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     52.66    28.51    24.20     4.31     0.93     0.54     2.90
  MEAN    52.45    17.03    12.70     4.33     0.95     0.49     3.51     0.86
  HUB     54.81    -5.53    -9.30     3.77     0.95     0.36     4.78


   blockage3   Cor/Incid
      0.550       0.938

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     18.071     470.977     269.114     386.519    1098.012       0.429      -0.824
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Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
10.139	8.933	501.193	24.000	34.848	35.400	0.552

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	416.083	269.114	495.528	1102.454	0.377	-0.432

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.550	10.134	9.184	505.256	302.801	0.017	0.375

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	384.272	0.000	384.272	1104.770	0.348	0.558

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.550	9.307	507.381	0.000	0.060	0.037	-0.249

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.834	10.121	1.088	519.702	14.730	160.215	1.242

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
91642.297	0.631	222.312	415212.188

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =17.221 EfDer = 0.965

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
42.928	2116.439	10.121	519.702	1.000	1.000	0.580

W Kg/sec = 19.5125008

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
62.411	2114.397	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
51779.508	33683.766	1.922	349.472	181.781	274.480	1.510

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	353.99	-0.12	353.99	0.32	379.17
MEAN	18.08	0.00	-0.02	353.99	-0.12	353.99	0.32	
HUB	15.21	0.00	-0.02	353.99	-0.12	353.99	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.00	46.36	0.64	379.55	519.09	9.43	509.25	0.47
MEAN	43.34	42.30	1.04	333.89	486.70	9.43	509.25	0.44
HUB	38.45	37.84	0.61	280.92	451.99	9.43	509.25	0.41

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	300.30	210.13	214.53	1123.69	0.27
MEAN	18.01	299.41	207.44	215.90	1121.97	0.27
HUB	15.22	316.40	229.87	217.42	1120.28	0.28

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	377.15	271.88	167.01	0.24	4293.37	
MEAN	332.63	249.57	125.19	0.22	3738.23	2.09
HUB	281.16	223.39	51.29	0.20	3501.20	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	10.91	1.08	10.38	532.45	1.02	524.92	0.92	0.88
MEAN	10.80	1.07	10.28	530.80	1.02	523.32	0.92	0.88
HUB	10.76	1.06	10.18	530.10	1.02	521.74	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.41	37.90	31.50	6.40	0.93	0.55	2.90	

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 MEAN    43.85    30.11    23.50     6.61     0.91     0.55     3.30     0.88
 HUB     46.59    13.27     6.50     6.77     0.91     0.57     3.92


   blockage3   Cor/Incid
      0.950       0.965

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3         Ao3          Mach3        cp 2-3
     17.960     302.520     208.024     219.646    1122.139       0.270        0.006

     Pt3         Ps3         Ts3       Vane No.     Alpha3     Vane A3      Incid3
     10.817      10.284     523.479      46.000      43.443      30.600     -12.843

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth       Aoth         Machth      cp 2-Th
     17.960     224.558     208.024     306.105    1125.807       0.199        0.431

   BlockageThr  PtTh        PsTh        TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      10.809      10.513     526.908     511.151       0.025        0.496

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4         Ao4          Mach4       cp 3-4
     17.823     222.088       0.000     222.088    1125.906       0.197        0.374

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      10.487     527.000       0.000       0.060       0.086        0.383

    STAGE EXIT CONDITIONS, STAGE   2
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.825      10.776       1.065     531.115      11.413     192.646        1.493

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  71010.578       0.499     172.263  662690.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
 RESET =  0.000BLEED =  0.000 DPInc =17.221   EfDer =  0.967

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     42.928     2116.439       10.776     531.115       1.000        1.000        0.980
W Kg/sec =  19.5125008

   W cor       RPM cor         GAMMA         Cp          R            Blades       THK
     59.258     2091.557        1.401        0.249      53.349       56.000        0.050

   CFM        SCFM             A1/A*       Area1       A*        AthrRotor   ChokeMargin
  51779.508   33683.766        3.160     545.479     172.599     429.765        2.490

     ROTOR LEADING EDGE CONDITIONS, STAGE   3

        R1       Stator    Alfa     C1       CU1        Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   210.57    -0.07   210.57      0.19   366.31
 MEAN    17.74      0.00    -0.02   210.57    -0.07   210.57      0.19
 HUB     15.05      0.00    -0.02   210.57    -0.07   210.57      0.19

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     60.41     46.36    14.05   370.68   426.38     10.52   527.42      0.38
 MEAN    57.28     43.40    13.88   327.62   389.52     10.52   527.42      0.35
 HUB     52.86     38.84    14.02   277.96   348.78     10.52   527.42      0.31

      ROTOR EXIT CONDITIONS, STAGE   3    SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050        0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   305.42    209.07    222.64   1135.07      0.27
 MEAN    17.51   305.65    208.01    223.96   1133.48      0.27
 HUB     14.85   324.44    233.30    225.46   1131.87      0.29

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
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 TIP    365.88   272.32   156.81     0.24  4143.10
 MEAN   323.34   251.91   115.33     0.22  3642.74     1.70
 HUB    274.27   229.15    40.97     0.20  3465.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     11.57     1.07    11.00   543.41     1.02   535.63     0.92     0.89
 MEAN    11.47     1.06    10.90   541.93     1.02   534.13     0.92     0.89
 HUB     11.43     1.06    10.80   541.40     1.02   532.62     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.20    35.16    31.50     3.66     0.93     0.45     2.90
 MEAN    42.88    27.25    23.50     3.75     0.95     0.43     3.28     0.89
 HUB     45.98    10.30     6.50     3.80     0.95     0.43     3.87


   blockage3   Cor/Incid
      0.950       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
     17.392     308.580     209.370     226.684    1133.661       0.272       0.007

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
     11.484      10.907     534.304      46.000      42.726      31.500     -11.226

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
     17.392     234.136     209.370     314.095    1137.231       0.206       0.411

   BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
      0.950      11.477      11.142     537.674     471.992       0.022       0.489

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4           Mach4       cp 3-4
     17.121     227.926       0.000     227.926    1137.484       0.200       0.376

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      11.129     537.913       0.000       0.060       0.076       0.388

    STAGE EXIT CONDITIONS, STAGE   3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.831      11.445       1.062     542.247      11.133     189.100       1.466

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  69278.547       0.518     168.061  379887.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
 RESET =  0.000BLEED =  0.000 DPInc =17.221   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.928    2116.439      11.445     542.247       1.000       1.000       0.980
W Kg/sec =  19.5125008

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     56.373    2069.975       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51779.508   33683.766       3.126     513.330     164.196     401.059       2.443

     ROTOR LEADING EDGE CONDITIONS, STAGE   4

        R1      Stator    Alfa     C1      CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   215.17    -0.07   215.17     0.19   347.90
 MEAN    16.97     0.00    -0.02   215.17    -0.07   215.17     0.19
 HUB     14.32     0.00    -0.02   215.17    -0.07   215.17     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.84    46.36    12.48   355.72   415.80    11.16   538.39     0.37
 MEAN    55.54    43.80    11.74   313.44   380.25    11.16   538.39     0.33
 HUB     50.88    37.84    13.04   264.48   341.01    11.16   538.39     0.30
```

```
      ROTOR EXIT CONDITIONS, STAGE   4    SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   294.86   189.18   226.17  1145.56     0.26
MEAN    16.57   295.63   188.93   227.37  1144.15     0.26
HUB     13.89   313.96   215.06   228.74  1142.72     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    348.70   276.76   159.52     0.24  3573.20
MEAN   306.11   255.79   117.17     0.22  3132.64     1.63
HUB    256.54   232.47    41.48     0.20  2988.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     12.16     1.06    11.61   552.85     1.02   545.60     0.92     0.90
MEAN    12.07     1.05    11.52   551.54     1.02   544.25     0.92     0.90
HUB     12.04     1.05    11.43   551.12     1.02   542.89     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.91    35.20    31.50     3.70     0.93     0.41     2.90
MEAN    39.72    27.26    23.50     3.76     0.94     0.40     3.29     0.90
HUB     43.23    10.28     6.50     3.78     0.94     0.40     3.90


  blockage3   Cor/Incid
     0.950       0.982

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3        Ao3          Mach3        cp 2-3
    16.481     293.233     189.997     223.352    1144.578       0.256       0.040

     Pt3         Ps3        Ts3       Vane No.     Alpha3     Vane A3      Incid3
    12.087      11.548     544.665      46.000      40.387      32.400      -7.987

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth      Aoth         Machth      cp 2-Th
    16.481     233.849     189.997     301.304    1147.318       0.204       0.379

  BlockageThr  PtTh        PsTh       TsTh       AreaTh        w 2-Th  DiffFact4
     0.950      12.084      11.739     547.276     456.573       0.016       0.457

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4        Ao4          Mach4        cp 3-4
     16.096     223.025       0.000     223.025    1147.750       0.194       0.349

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      11.747     547.689       0.000       0.060       0.058       0.393

   STAGE EXIT CONDITIONS, STAGE   4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.854      12.060       1.054     551.838       9.590     207.357       1.607

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  59688.863       0.491     144.798  391322.219


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
 RESET =  0.000BLEED =  0.000 DPInc =17.221   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     42.928    2116.439      12.060     551.838       1.000       1.000       0.980
W Kg/sec =  19.5125008

   W cor      RPM cor        GAMMA        Cp         R           Blades       THK
     53.969    2051.909       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1       A*       AthrRotor   ChokeMargin
  51779.508   33683.766       3.242     509.668     157.197     390.276       2.483
```

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	209.03	-0.07	209.03	0.18	328.03
MEAN	15.91	0.00	-0.02	209.03	-0.07	209.03	0.18	
HUB	13.07	0.00	-0.02	209.03	-0.07	209.03	0.18	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.30	47.36	10.94	338.36	397.78	11.78	548.19	0.35
MEAN	54.59	44.80	9.79	293.90	360.71	11.78	548.19	0.31
HUB	49.12	38.84	10.28	241.40	319.37	11.78	548.19	0.28

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	281.03	175.30	219.65	1154.93	0.24
MEAN	15.50	279.77	171.76	220.84	1153.50	0.24
HUB	12.59	293.70	192.14	222.13	1152.05	0.25

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	331.34	269.44	156.05	0.23	3146.12	
MEAN	286.23	248.74	114.47	0.22	2663.09	1.60
HUB	232.53	225.78	40.39	0.20	2419.98	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	12.72	1.05	12.21	561.17	1.02	554.59	0.92	0.91
MEAN	12.62	1.05	12.11	559.74	1.01	553.21	0.92	0.91
HUB	12.57	1.04	12.01	559.02	1.01	551.82	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.59	35.39	31.50	3.89	0.93	0.40	2.90	
MEAN	37.88	27.40	23.50	3.90	0.94	0.38	3.34	0.91
HUB	40.86	10.31	6.50	3.81	0.94	0.37	4.06	

blockage3	Cor/Incid
0.950	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	283.090	174.914	222.587	1153.587	0.245	-0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
12.624	12.105	553.293	46.000	38.161	33.000	-5.161

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	235.300	174.914	293.191	1155.739	0.204	0.291

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	12.621	12.262	555.360	440.827	0.024	0.427

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	221.149	0.000	221.149	1156.299	0.191	0.356

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	12.292	555.899	0.000	0.060	0.046	0.349

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.871	12.610	1.046	559.978	8.140	230.272	1.785

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
50669.145	0.462	122.917	412915.938

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
342289.44	830.3504	66.9053	1.3550	0.8348	17.2205	1.1089

Appendix J.—Overall Pressure Ratio and Efficiency Versus Parametrically Varying Blockages; Along the Engine Operating Line in the Flight Trajectory; Plot File for Figures 7 and 8

```
VARIABLES = Blockage Percent, Overall Pressure Ratio, Overall Efficiency
ZONE T="Altitude = 35K; 75.6% Thrust", I = 6.0
0      2.3173      0.8664
10     2.2867      0.8632
15     2.2681      0.8558
20     2.2390      0.8436
25     2.1946      0.8238
27     2.1693      0.8121
ZONE T="Altitude = 35K; 69.9% Thrust", I = 6.0
0      2.2860      0.8688
10     2.2731      0.8653
15     2.2564      0.8587
20     2.2304      0.8476
25     2.1899      0.8295
27     2.1674      0.8191
ZONE T="Altitude = 38K; 10% Thrust", I = 9.0
0      1.5335      0.7949
10     1.5363      0.7997
15     1.5370      0.8015
20     1.5370      0.8024
25     1.5357      0.8020
27     1.5348      0.8013
30     1.5328      0.7996
35     1.5280      0.7949
40     1.5209      0.7875
ZONE T="Altitude = 37K; 10% Thrust", I = 9.0
0      1.5253      0.7956
10     1.5279      0.8004
15     1.5286      0.8021
20     1.5285      0.8030
25     1.5272      0.8024
27     1.5263      0.8017
30     1.5243      0.8000
35     1.5195      0.7951
40     1.5125      0.7878
ZONE T="Altitude = 34K; 10% Thrust", I = 9.0
0      1.4999      0.7980
10     1.5022      0.8026
15     1.5027      0.8042
20     1.5024      0.8048
25     1.5010      0.8040
27     1.5000      0.8032
30     1.4981      0.8013
35     1.4932      0.7962
40     1.4865      0.7886
ZONE T="Altitude = 25K; 10% Thrust", I = 9.0
0      1.4237      0.8094
10     1.4263      0.8151
15     1.4269      0.8172
20     1.4269      0.8183
25     1.4259      0.8180
27     1.4251      0.8173
30     1.4233      0.8154
35     1.4190      0.8102
40     1.4127      0.8020
ZONE T="Altitude = 20K; 10% Thrust", I = 9.0
```

```
0       1.3849      0.8153
10      1.3881      0.8225
15      1.3893      0.8257
20      1.3900      0.8282
25      1.3899      0.8294
27      1.3895      0.8293
30      1.3884      0.8285
35      1.3852      0.8247
40      1.3798      0.8173
ZONE T="Altitude = 15K; 10% Thrust", I = 9.0
0       1.3505      0.8157
10      1.3546      0.8249
15      1.3565      0.8294
20      1.3582      0.8337
25      1.3594      0.8373
27      1.3596      0.8383
30      1.3596      0.8393
35      1.3584      0.8389
40      1.3550      0.8348
```

Appendix K.—Rotor Relative Velocity Ratio and Efficiency of Each Stage Versus Parametrically Varying Blockages; Along the Engine Operating Line in the Flight Trajectory; Plot File for Figures 10 to 19

```
VARIABLES = Blockage Percent, Rotor Relative Velocity Ratio (Ws1/W2), Stage Efficiency
ZONE T="Stg 1 blockage percent in Stg 2; Alt 35K ft, Thrust = 75.6%", I = 6.0
.0      1.31    .872
.1      1.31    .873
.15     1.32    .874
.2      1.33    .875
.25     1.34    .877
.27     1.35    .877
ZONE T="Stg 2 blockage percent in Stg 2; Alt 35K ft, Thrust = 75.6%", I = 6.0
.0      1.44    .879
.1      1.45    .869
.15     1.46    .856
.2      1.47    .832
.25     1.48    .787
.27     1.49    .754
ZONE T="Stg 3 blockage percent in Stg 2; Alt 35K ft, Thrust = 75.6%", I = 6.0
.0      1.47    .880
.1      1.53    .861
.15     1.58    .835
.2      1.63    .793
.25     1.69    .733
.27     1.73    .703
ZONE T="Stg 4 blockage percent in Stg 2; Alt 35K ft, Thrust = 75.6%", I = 6.0
.0      1.48    .880
.1      1.48    .880
.15     1.47    .880
.2      1.47    .879
.25     1.46    .877
.27     1.45    .876
ZONE T="Stg 5 blockage percent in Stg 2; Alt 35K ft, Thrust = 75.6%", I = 6.0
.0      1.52    .882
.1      1.52    .881
.15     1.51    .881
.2      1.50    .880
.25     1.49    .879
.27     1.48    .878
ZONE T="Stg 1 blockage percent in Stg 4; Alt 38K ft, Thrust = 10%", I = 9.0
.0      1.92    .777
.1      1.92    .777
.15     1.92    .777
.2      1.92    .777
.25     1.92    .777
.27     1.92    .777
.3      1.92    .777
.35     1.92    .777
.40     1.93    .776
ZONE T="Stg 2 blockage percent in Stg 4; Alt 38K ft, Thrust = 10%", I = 9.0
.0      1.86    .783
.1      1.85    .784
.15     1.85    .784
.2      1.85    .784
.25     1.85    .784
.27     1.85    .784
.3      1.85    .784
.35     1.86    .783
.40     1.86    .783
```

```
ZONE T="Stg 3 blockage percent in Stg 4; Alt 38K ft, Thrust = 10%", I = 9.0
.0      1.80    .809
.1      1.79    .811
.15     1.79    .811
.2      1.79    .811
.25     1.79    .811
.27     1.79    .811
.3      1.80    .811
.35     1.80    .810
.40     1.80    .809
ZONE T="Stg 4 blockage percent in Stg 4; Alt 38K ft, Thrust = 10%", I = 9.0
.0      1.75    .828
.1      1.74    .845
.15     1.74    .851
.2      1.74    .856
.25     1.74    .859
.27     1.74    .860
.3      1.74    .860
.35     1.74    .859
.40     1.75    .855
ZONE T="Stg 5 blockage percent in Stg 4; Alt 25K ft, Thrust = 10%", I = 9.0
.0      1.74    .846
.1      1.78    .864
.15     1.81    .869
.2      1.84    .869
.25     1.88    .863
.27     1.90    .858
.3      1.92    .847
.35     1.98    .817
.40     2.05    .772
ZONE T="Stg 1 blockage percent in Stg 3; Alt 25K ft, Thrust = 10%", I = 9.0
.0      1.87    .784
.1      1.87    .784
.15     1.87    .784
.2      1.87    .784
.25     1.87    .784
.27     1.87    .784
.3      1.88    .784
.35     1.88    .783
.40     1.88    .783
ZONE T="Stg 2 blockage percent in Stg 3; Alt 25K ft, Thrust = 10%", I = 9.0
.0      1.80    .796
.1      1.80    .796
.15     1.79    .796
.2      1.80    .796
.25     1.80    .796
.27     1.80    .796
.3      1.80    .796
.35     1.80    .795
.40     1.80    .795
ZONE T="Stg 3 blockage percent in Stg 3; Alt 25K ft, Thrust = 10%", I = 9.0
.0      1.73    .825
.1      1.73    .840
.15     1.73    .846
.2      1.73    .851
.25     1.73    .855
.27     1.73    .856
.3      1.73    .857
.35     1.73    .856
.40     1.73    .852
ZONE T="Stg 4 blockage percent in Stg 3; Alt 25K ft, Thrust = 10%", I = 9.0
.0      1.66    .847
```

```
.1      1.71    .863
.15     1.74    .868
.2      1.78    .869
.25     1.82    .863
.27     1.84    .858
.3      1.87    .847
.35     1.93    .817
.40     2.00    .772
ZONE T="Stg 5 blockage percent in Stg 3; Alt 20K ft, Thrust = 10%", I = 9.0
.0      1.64    .865
.1      1.65    .864
.15     1.65    .864
.2      1.65    .864
.25     1.65    .864
.27     1.65    .864
.3      1.65    .864
.35     1.64    .865
.40     1.64    .865
ZONE T="Stg 1 blockage percent in Stg 2; Alt 20K ft, Thrust = 10%", I = 9.0
.0      1.85    .787
.1      1.85    .787
.15     1.85    .787
.2      1.85    .788
.25     1.85    .787
.27     1.85    .787
.3      1.85    .787
.35     1.85    .787
.40     1.86    .786
ZONE T="Stg 2 blockage percent in Stg 2; Alt 20K ft, Thrust = 10%", I = 9.0
.0      1.77    .801
.1      1.77    .817
.15     1.77    .824
.2      1.77    .831
.25     1.77    .837
.27     1.77    .838
.3      1.77    .840
.35     1.77    .842
.40     1.77    .841
ZONE T="Stg 3 blockage percent in Stg 2; Alt 20K ft, Thrust = 10%", I = 9.0
.0      1.70    .832
.1      1.75    .850
.15     1.78    .858
.2      1.81    .863
.25     1.85    .863
.27     1.87    .861
.3      1.90    .854
.35     1.96    .833
.40     2.03    .796
ZONE T="Stg 4 blockage percent in Stg 2; Alt 20K ft, Thrust = 10%", I = 9.0
.0      1.63    .854
.1      1.64    .853
.15     1.64    .853
.2      1.64    .853
.25     1.64    .853
.27     1.64    .853
.3      1.64    .853
.35     1.64    .853
.40     1.63    .854
ZONE T="Stg 5 blockage percent in Stg 2; Alt 20K ft, Thrust = 10%", I = 9.0
.0      1.61    .870
.1      1.61    .870
.15     1.61    .870
```

```
.2     1.61    .870
.25    1.61    .870
.27    1.61    .870
.3     1.61    .870
.35    1.61    .870
.40    1.61    .870
ZONE T="Stg 1 blockage percent in Stg 1; Alt 15K ft, Thrust = 10%", I = 9.0
.0     1.86    .785
.1     1.86    .800
.15    1.86    .808
.2     1.86    .816
.25    1.86    .824
.27    1.86    .826
.3     1.86    .830
.35    1.86    .833
.40    1.86    .834
ZONE T="Stg 2 blockage percent in Stg 1; Alt 15K ft, Thrust = 10%", I = 9.0
.0     1.77    .801
.1     1.82    .823
.15    1.85    .834
.2     1.88    .844
.25    1.92    .851
.27    1.94    .853
.3     1.97    .853
.35    2.02    .846
.40    2.09    .825
ZONE T="Stg 3 blockage percent in Stg 1; Alt 15K ft, Thrust = 10%", I = 9.0
.0     1.69    .832
.1     1.70    .832
.15    1.70    .831
.2     1.70    .831
.25    1.70    .831
.27    1.70    .831
.3     1.70    .831
.35    1.70    .831
.40    1.70    .831
ZONE T="Stg 4 blockage percent in Stg 1; Alt 15K ft, Thrust = 10%", I = 9.0
.0     1.63    .855
.1     1.63    .854
.15    1.63    .854
.2     1.63    .854
.25    1.63    .854
.27    1.63    .854
.3     1.63    .854
.35    1.63    .854
.40    1.63    .854
ZONE T="Stg 5 blockage percent in Stg 1; Alt 15K ft, Thrust = 10%", I = 9.0
.0     1.60    .872
.1     1.60    .871
.15    1.60    .871
.2     1.60    .871
.25    1.60    .871
.27    1.61    .871
.3     1.61    .871
.35    1.61    .871
.40    1.60    .871
```

Appendix L.—Overall Performance Characteristic Map; Plot File Data; Stator 2 Blockage Parametrically Varied From 0% (Baseline) Up to 40%; Plot File for Figures 20 and 21

```
Flow_Corrected, Pressure_Ratio, Efficiency, Incidence_Rotor1, Temperature_Ratio
ZONE T=" 110% Baseline Blockages 4137 RPM corrected", I = 17.0
206.3230      2.2794      0.8126      2.5142      1.3279
203.8517      2.3806      0.8341      2.9529      1.3385
202.2476      2.4331      0.8434      3.2376      1.3443
201.0352      2.4669      0.8485      3.4529      1.3483
198.2180      2.5330      0.8567      3.9532      1.3564
195.2791      2.5876      0.8613      4.4756      1.3638
192.3645      2.6299      0.8629      4.9942      1.3703
189.4935      2.6638      0.8626      5.5058      1.3760
186.6652      2.6912      0.8611      6.0106      1.3812
183.8792      2.7134      0.8586      6.5087      1.3860
181.1348      2.7315      0.8554      7.0004      1.3904
178.4314      2.7462      0.8518      7.4857      1.3944
175.7682      2.7581      0.8477      7.9649      1.3983
173.0626      2.7674      0.8431      8.4529      1.4020
170.2964      2.7741      0.8380      8.9531      1.4056
167.1750      2.7796      0.8319      9.5192      1.4095
164.6798      2.7825      0.8268      9.9730      1.4125
ZONE T=" 110% Stat 2 10% Ice Block 4137.6 RPM corrected", I = 19.0
209.4333      1.7061      0.5884      1.9620      1.2813
207.3546      2.0105      0.7237      2.3311      1.3064
206.3230      2.1031      0.7554      2.5142      1.3145
203.8517      2.2601      0.7998      2.9529      1.3293
201.0352      2.3834      0.8275      3.4529      1.3417
198.2180      2.4730      0.8433      3.9532      1.3515
195.2791      2.5446      0.8530      4.4756      1.3600
192.3645      2.6006      0.8583      4.9942      1.3673
189.4935      2.6449      0.8607      5.5058      1.3737
186.6652      2.6805      0.8612      6.0106      1.3794
183.8792      2.7095      0.8604      6.5087      1.3845
181.1348      2.7331      0.8585      7.0004      1.3892
178.4314      2.7521      0.8558      7.4857      1.3936
175.7682      2.7672      0.8524      7.9649      1.3976
173.0626      2.7793      0.8484      8.4529      1.4014
170.2964      2.7884      0.8437      8.9531      1.4052
167.1750      2.7962      0.8380      9.5192      1.4092
164.6798      2.8007      0.8332      9.9730      1.4123
162.0477      2.8040      0.8280     10.4530      1.4154
ZONE T=" 110% Stat 2 20% Ice Block 4137.6 RPM corrected", I = 16.0
201.0352      1.8944      0.6593      3.4529      1.3049
200.1901      2.0514      0.7188      3.6029      1.3183
199.2340      2.1564      0.7530      3.7727      1.3273
198.2180      2.2343      0.7755      3.9532      1.3343
195.2791      2.3842      0.8119      4.4756      1.3485
192.3645      2.4819      0.8302      4.9942      1.3587
189.4935      2.5538      0.8407      5.5058      1.3669
186.6652      2.6095      0.8467      6.0106      1.3739
183.8792      2.6537      0.8499      6.5087      1.3800
181.1348      2.6895      0.8511      7.0004      1.3854
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178.4314      2.7187      0.8509      7.4857      1.3903
175.7682      2.7428      0.8497      7.9649      1.3949
173.0626      2.7627      0.8475      8.4529      1.3992
170.2964      2.7786      0.8443      8.9531      1.4032
167.1750      2.7930      0.8402      9.5192      1.4076
166.1645      2.7970      0.8387      9.7028      1.4090
ZONE T=" 110% Stat 2 27% Ice Block 4137.6 RPM corrected", I = 6.0
186.6652      2.4106      0.7961      6.0106      1.3605
183.8792      2.5173      0.8174      6.5087      1.3707
181.1348      2.5852      0.8275      7.0004      1.3783
178.4314      2.6355      0.8329      7.4857      1.3846
175.7682      2.6751      0.8357      7.9649      1.3900
173.0626      2.7073      0.8366      8.4529      1.3951
ZONE T=" 105% Baseline Blockages 3949.3 RPM corrected", I = 14.0
199.2340      2.0035      0.7782      2.4621      1.2833
196.2604      2.1310      0.8172      2.9953      1.2964
193.3312      2.2235      0.8397      3.5215      1.3066
190.4457      2.2930      0.8528      4.0409      1.3150
188.1599      2.3383      0.8596      4.4532      1.3208
185.3932      2.3829      0.8642      4.9534      1.3271
182.6354      2.4198      0.8665      5.4534      1.3328
179.8873      2.4504      0.8669      5.9529      1.3380
174.0149      2.4999      0.8635      7.0256      1.3479
168.8593      2.5293      0.8572      7.9735      1.3556
163.5658      2.5485      0.8481      8.9533      1.3628
158.2028      2.5605      0.8375      9.9531      1.3694
152.7519      2.5667      0.8258     10.9770      1.3758
147.4851      2.5682      0.8138     11.9740      1.3816
ZONE T=" 105% Stat 2 10% Ice Block 3949.3 RPM corrected", I = 21.0
199.2340      1.8007      0.6856      2.4621      1.2679
197.8862      1.9071      0.7329      2.7037      1.2775
196.2604      2.0056      0.7703      2.9953      1.2867
193.3312      2.1346      0.8104      3.5215      1.2997
190.4457      2.2282      0.8337      4.0409      1.3098
188.1599      2.2868      0.8456      4.4532      1.3165
185.3932      2.3451      0.8552      4.9534      1.3237
182.6354      2.3927      0.8611      5.4534      1.3301
179.8873      2.4319      0.8642      5.9529      1.3358
176.6515      2.4698      0.8655      6.5431      1.3419
174.0149      2.4952      0.8650      7.0256      1.3466
171.4177      2.5160      0.8633      7.5023      1.3508
168.8593      2.5323      0.8606      7.9735      1.3547
166.2643      2.5456      0.8571      8.4529      1.3584
163.5658      2.5569      0.8530      8.9533      1.3621
160.6038      2.5668      0.8479      9.5045      1.3660
158.2028      2.5731      0.8434      9.9531      1.3691
155.0663      2.5793      0.8371     10.5413      1.3729
152.7519      2.5825      0.8323     10.9770      1.3756
150.2315      2.5848      0.8269     11.4532      1.3785
147.4851      2.5861      0.8207     11.9740      1.3816
ZONE T=" 105% Stat 2 20% Ice Block 3949.3 RPM corrected", I = 17.0
193.3312      1.7304      0.6332      3.5215      1.2689
192.3645      1.8596      0.6953      3.6953      1.2800
190.4457      2.0095      0.7548      4.0409      1.2935
188.1599      2.1227      0.7913      4.4532      1.3044
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185.3932      2.2205      0.8172      4.9534      1.3145
182.6354      2.2946      0.8332      5.4534      1.3228
179.8873      2.3536      0.8434      5.9529      1.3298
176.6515      2.4093      0.8506      6.5431      1.3371
174.0149      2.4464      0.8538      7.0256      1.3425
171.4177      2.4771      0.8552      7.5023      1.3473
168.8593      2.5020      0.8551      7.9735      1.3517
166.2643      2.5227      0.8538      8.4529      1.3559
163.5658      2.5408      0.8515      8.9533      1.3600
160.6038      2.5572      0.8482      9.5045      1.3642
158.2028      2.5682      0.8449      9.9531      1.3675
155.0663      2.5797      0.8401     10.5413      1.3716
152.7519      2.5862      0.8362     10.9770      1.3745
ZONE T=" 105% Stat 2 27% Ice Block 3949.3 RPM corrected", I = 10.0
182.6354      1.8233      0.6532      5.4534      1.2877
182.0450      1.9756      0.7203      5.5606      1.2993
179.8873      2.1613      0.7817      5.9529      1.3163
176.6515      2.2823      0.8132      6.5431      1.3283
174.0149      2.3465      0.8259      7.0256      1.3355
171.4177      2.3956      0.8334      7.5023      1.3416
168.8593      2.4341      0.8377      7.9735      1.3468
166.2643      2.4660      0.8398      8.4529      1.3517
163.5658      2.4936      0.8405      8.9533      1.3564
160.6038      2.5188      0.8397      9.5045      1.3611
ZONE T=" 100% Baseline Blockages 3761.1 RPM corrected", I = 20.0
190.2553      1.8420      0.7636      2.7031      1.2507
188.5460      1.9109      0.7916      3.0144      1.2577
185.7319      1.9995      0.8216      3.5283      1.2675
184.7755      2.0253      0.8293      3.7034      1.2704
182.9599      2.0686      0.8408      4.0364      1.2756
180.2291      2.1238      0.8533      4.5386      1.2825
177.5392      2.1686      0.8612      5.0352      1.2886
174.8894      2.2059      0.8660      5.5263      1.2940
172.2791      2.2371      0.8686      6.0120      1.2990
169.7079      2.2633      0.8695      6.4923      1.3035
167.1750      2.2853      0.8691      6.9673      1.3077
164.5934      2.3037      0.8673      7.4534      1.3117
161.9505      2.3192      0.8645      7.9532      1.3156
159.0018      2.3336      0.8604      8.5135      1.3196
156.6287      2.3430      0.8566      8.9664      1.3228
151.2282      2.3589      0.8465     10.0040      1.3296
146.0140      2.3680      0.8352     11.0152      1.3357
140.9795      2.3722      0.8234     12.0004      1.3413
136.1186      2.3728      0.8114     12.9602      1.3465
133.4166      2.3719      0.8046     13.4974      1.3492
ZONE T=" 100% Stat 2 10% Ice Block 3761.1 RPM corrected", I = 13.0
188.5460      1.7861      0.7296      3.0144      1.2480
185.7319      1.9105      0.7833      3.5283      1.2604
182.9599      2.0010      0.8146      4.0364      1.2701
177.5392      2.1285      0.8484      5.0352      1.2851
172.2791      2.2148      0.8633      6.0120      1.2966
167.1750      2.2751      0.8683      6.9673      1.3061
161.9505      2.3169      0.8664      7.9532      1.3144
156.6287      2.3466      0.8604      8.9664      1.3220
151.2282      2.3670      0.8516     10.0040      1.3291
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146.0140      2.3794      0.8413     11.0152      1.3354
140.9795      2.3859      0.8301     12.0004      1.3411
136.1186      2.3882      0.8185     12.9602      1.3464
133.4166      2.3879      0.8117     13.4974      1.3492
ZONE T=" 100% Stat 2 20% Ice Block 3761.1 RPM corrected", I = 11.0
184.8033      1.6776      0.6571      3.6983      1.2433
182.9599      1.8040      0.7230      4.0364      1.2549
180.2291      1.9263      0.7741      4.5386      1.2672
177.5392      2.0141      0.8043      5.0352      1.2764
172.2791      2.1383      0.8374      6.0120      1.2908
167.1750      2.2226      0.8526      6.9673      1.3018
161.9505      2.2827      0.8577      7.9532      1.3113
156.6287      2.3265      0.8567      8.9664      1.3197
151.2282      2.3579      0.8516     10.0040      1.3274
146.0140      2.3783      0.8438     11.0152      1.3342
140.9795      2.3905      0.8344     12.0004      1.3402
ZONE T=" 100% Stat 2 27% Ice Block 3761.1 RPM corrected", I = 9.0
174.8894      1.8330      0.7152      5.5263      1.2653
172.2791      1.9860      0.7773      6.0120      1.2797
169.7079      2.0688      0.8039      6.4923      1.2883
167.1750      2.1291      0.8198      6.9673      1.2951
164.5934      2.1772      0.8301      7.4534      1.3011
161.9505      2.2175      0.8369      7.9532      1.3065
156.6287      2.2801      0.8431      8.9664      1.3162
151.2282      2.3253      0.8430     10.0040      1.3247
146.0140      2.3565      0.8389     11.0152      1.3321
ZONE T=" 100% Stat 2 30% Ice Block 3761.1 RPM corrected", I = 5.0
167.1750      2.0295      0.7809      6.9673      1.2881
164.5934      2.1097      0.8054      7.4534      1.2964
161.9505      2.1655      0.8187      7.9532      1.3029
156.6287      2.2447      0.8317      8.9664      1.3137
151.2282      2.2999      0.8354     10.0040      1.3229
ZONE T=" 95% Baseline Blockages 3572.9 RPM corrected", I = 17.0
181.0216      1.7094      0.7505      2.9530      1.2214
179.3280      1.7675      0.7798      3.2685      1.2275
178.3378      1.7961      0.7924      3.4534      1.2307
175.6672      1.8635      0.8190      3.9536      1.2386
173.0107      1.9184      0.8372      4.4535      1.2453
170.3689      1.9648      0.8501      4.9531      1.2514
167.7381      2.0045      0.8591      5.4531      1.2568
164.6798      2.0437      0.8660      6.0376      1.2626
159.8008      2.0923      0.8702      6.9773      1.2709
154.7835      2.1290      0.8688      7.9532      1.2785
149.6973      2.1560      0.8632      8.9529      1.2855
144.5575      2.1749      0.8547      9.9739      1.2920
139.5732      2.1869      0.8445     10.9747      1.2978
134.7507      2.1938      0.8333     11.9530      1.3032
129.4638      2.1971      0.8199     13.0371      1.3088
125.0000      2.1971      0.8079     13.9618      1.3134
120.0866      2.1944      0.7943     14.9898      1.3182
ZONE T=" 95% Stat 2 10% Ice Block 3572.9 RPM corrected", I = 25.0
181.0216      1.5911      0.6718      2.9530      1.2120
178.3378      1.7087      0.7423      3.4534      1.2237
175.6672      1.7960      0.7845      3.9536      1.2330
173.0107      1.8650      0.8123      4.4535      1.2409
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170.3689      1.9225      0.8320      4.9531      1.2477
167.7381      1.9713      0.8463      5.4531      1.2538
164.6798      2.0193      0.8578      6.0376      1.2602
162.2220      2.0517      0.8638      6.5098      1.2649
159.8008      2.0787      0.8672      6.9773      1.2692
157.3488      2.1018      0.8687      7.4530      1.2732
154.7835      2.1227      0.8689      7.9532      1.2772
151.9881      2.1420      0.8677      8.5014      1.2813
149.6973      2.1555      0.8657      8.9529      1.2845
146.7477      2.1700      0.8622      9.5375      1.2885
144.5575      2.1790      0.8589      9.9739      1.2913
142.1652      2.1872      0.8549     10.4530      1.2943
139.5732      2.1944      0.8499     10.9747      1.2974
136.8026      2.2005      0.8441     11.5355      1.3006
134.7507      2.2039      0.8395     11.9530      1.3029
132.0858      2.2071      0.8332     12.4979      1.3059
129.4638      2.2092      0.8266     13.0371      1.3087
127.4519      2.2100      0.8215     13.4528      1.3108
125.0000      2.2103      0.8150     13.9618      1.3133
122.5186      2.2098      0.8083     14.4797      1.3158
121.2147      2.2092      0.8047     14.7528      1.3171
ZONE T=" 95% Stat 2 20% Ice Block 3572.9 RPM corrected", I = 13.0
175.6672      1.6234      0.6794      3.9536      1.2194
173.0107      1.7356      0.7425      4.4535      1.2307
170.3689      1.8174      0.7799      4.9531      1.2396
167.7381      1.8837      0.8058      5.4531      1.2471
164.6798      1.9479      0.8271      6.0376      1.2547
162.2220      1.9912      0.8392      6.5098      1.2602
159.8008      2.0272      0.8474      6.9773      1.2650
154.7835      2.0875      0.8571      7.9532      1.2741
149.6973      2.1330      0.8596      8.9529      1.2822
144.5575      2.1666      0.8571      9.9739      1.2896
139.5732      2.1894      0.8509     10.9747      1.2961
134.7507      2.2043      0.8425     11.9530      1.3019
129.4638      2.2145      0.8314     13.0371      1.3079
ZONE T=" 95% Stat 2 27% Ice Block 3572.9 RPM corrected", I = 15.0
167.7381      1.7073      0.7103      5.4531      1.2334
164.6798      1.8303      0.7697      6.0376      1.2459
162.2220      1.8956      0.7953      6.5098      1.2531
159.8008      1.9466      0.8122      6.9773      1.2591
157.3488      1.9899      0.8245      7.4530      1.2645
154.7835      2.0284      0.8335      7.9532      1.2697
151.9881      2.0640      0.8401      8.5014      1.2749
149.6973      2.0891      0.8435      8.9529      1.2788
146.7477      2.1168      0.8459      9.5375      1.2836
144.5575      2.1344      0.8463      9.9739      1.2869
142.1652      2.1513      0.8458     10.4530      1.2904
139.5732      2.1669      0.8443     10.9747      1.2940
136.8026      2.1810      0.8417     11.5355      1.2977
134.7507      2.1899      0.8392     11.9530      1.3003
132.0858      2.1997      0.8353     12.4979      1.3036
ZONE T=" 95% Stat 2 30% Ice Block 3572.9 RPM corrected", I = 11.0
163.5577      1.7150      0.7085      6.2529      1.2361
161.9951      1.7971      0.7442      6.5535      1.2459
159.8008      1.8775      0.7793      6.9773      1.2540
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157.3488      1.9373      0.8008      7.4530      1.2607
154.7835      1.9857      0.8152      7.9532      1.2666
151.9881      2.0285      0.8256      8.5014      1.2723
149.6973      2.0582      0.8313      8.9529      1.2766
146.7477      2.0906      0.8359      9.5375      1.2817
144.5575      2.1112      0.8378      9.9739      1.2852
139.5732      2.1493      0.8382     10.9747      1.2927
138.6880      2.1550      0.8379     11.1535      1.2939
ZONE T=" 90% Baseline Blockages 3384.6 RPM corrected ", I = 16.0
171.4177      1.6064      0.7440      3.2406      1.1957
170.3092      1.6381      0.7634      3.4530      1.1991
167.7087      1.6988      0.7951      3.9535      1.2064
164.6798      1.7572      0.8209      4.5402      1.2137
162.2220      1.7986      0.8367      5.0193      1.2191
157.4157      1.8653      0.8569      5.9641      1.2284
151.9881      1.9221      0.8676      7.0442      1.2375
147.4741      1.9579      0.8697      7.9534      1.2443
142.3999      1.9881      0.8670      8.9875      1.2512
137.4901      2.0092      0.8606     10.0004      1.2574
132.7495      2.0234      0.8517     10.9901      1.2629
128.1724      2.0324      0.8414     11.9567      1.2680
123.1343      2.0380      0.8286     13.0332      1.2733
118.8768      2.0399      0.8169     13.9533      1.2776
114.2156      2.0394      0.8034     14.9715      1.2822
109.7261      2.0366      0.7899     15.9629      1.2864
ZONE T=" 90% Stat 2 10% Ice Block 3384.6 RPM corrected", I = 27.0
171.3535      1.5240      0.6794      3.2529      1.1890
168.8593      1.6075      0.7373      3.7317      1.1978
167.7087      1.6399      0.7567      3.9535      1.2014
164.6798      1.7109      0.7936      4.5402      1.2098
162.2220      1.7604      0.8158      5.0193      1.2158
159.8008      1.8034      0.8329      5.4939      1.2212
157.4157      1.8398      0.8452      5.9641      1.2260
154.9500      1.8730      0.8547      6.4531      1.2306
151.9881      1.9067      0.8622      7.0442      1.2358
149.7197      1.9291      0.8658      7.4999      1.2395
147.4741      1.9488      0.8679      7.9534      1.2429
144.5575      1.9708      0.8687      8.5462      1.2472
142.3999      1.9848      0.8681      8.9875      1.2502
140.1344      1.9976      0.8666      9.4533      1.2532
137.4901      2.0103      0.8637     10.0004      1.2566
135.3162      2.0191      0.8607     10.4528      1.2593
132.7495      2.0279      0.8564     10.9901      1.2624
130.1144      2.0351      0.8513     11.5453      1.2655
128.1724      2.0394      0.8471     11.9567      1.2676
125.6281      2.0439      0.8412     12.4987      1.2704
123.1343      2.0472      0.8350     13.0332      1.2731
121.1874      2.0489      0.8300     13.4528      1.2751
118.8768      2.0503      0.8238     13.9533      1.2775
116.5287      2.0509      0.8172     14.4648      1.2799
114.2156      2.0508      0.8105     14.9715      1.2821
111.9483      2.0500      0.8039     15.4709      1.2843
109.7261      2.0487      0.7972     15.9629      1.2864
ZONE T=" 90% Stat 2 20% Ice Block 3384.6 RPM corrected", I = 12.0
162.2220      1.6746      0.7627      5.0193      1.2089
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159.8008      1.7288      0.7895      5.4939      1.2153
157.4157      1.7748      0.8095      5.9641      1.2209
154.9500      1.8167      0.8255      6.4531      1.2262
151.9881      1.8603      0.8397      7.0442      1.2320
147.4741      1.9149      0.8532      7.9534      1.2400
142.3999      1.9622      0.8599      8.9875      1.2480
137.4901      1.9965      0.8601     10.0004      1.2549
132.7495      2.0203      0.8558     10.9901      1.2611
128.1724      2.0370      0.8489     11.9567      1.2666
123.1343      2.0493      0.8389     13.0332      1.2723
118.8768      2.0557      0.8289     13.9533      1.2769
ZONE T=" 90% Stat 2 27% Ice Block 3384.6 RPM corrected", I = 11.0
162.2220      1.5114      0.6437      5.0193      1.1953
159.8008      1.6173      0.7165      5.4939      1.2063
157.4157      1.6836      0.7538      5.9641      1.2137
154.9500      1.7392      0.7809      6.4531      1.2202
151.9881      1.7950      0.8044      7.0442      1.2270
147.4741      1.8636      0.8277      7.9534      1.2361
142.3999      1.9230      0.8420      8.9875      1.2449
137.4901      1.9667      0.8477     10.0004      1.2525
132.7495      1.9990      0.8478     10.9901      1.2591
128.1724      2.0225      0.8443     11.9567      1.2651
123.1343      2.0409      0.8372     13.0332      1.2711
ZONE T=" 90% Stat 2 30% Ice Block 3384.6 RPM corrected", I = 14.0
158.2068      1.4826      0.6105      5.8079      1.1958
157.4157      1.5664      0.6738      5.9641      1.2038
154.9500      1.6739      0.7399      6.4531      1.2151
151.9881      1.7488      0.7777      7.0442      1.2235
149.7197      1.7929      0.7963      7.4999      1.2288
147.4741      1.8300      0.8100      7.9534      1.2336
144.5575      1.8710      0.8228      8.5462      1.2392
142.3999      1.8973      0.8296      8.9875      1.2430
140.1344      1.9217      0.8347      9.4533      1.2468
137.4901      1.9467      0.8386     10.0004      1.2510
135.3162      1.9646      0.8404     10.4528      1.2542
132.7495      1.9832      0.8411     10.9901      1.2579
128.1724      2.0102      0.8395     11.9567      1.2640
126.8939      2.0165      0.8384     12.2286      1.2657
ZONE T=" 90% Stat 2 35% Ice Block 3384.6 RPM corrected", I = 6.0
146.4874      1.7228      0.7451      8.1535      1.2265
144.5575      1.7865      0.7771      8.5462      1.2329
142.3999      1.8299      0.7947      8.9875      1.2380
140.1344      1.8646      0.8063      9.4533      1.2426
137.4901      1.8977      0.8151     10.0004      1.2474
133.8794      1.9346      0.8223     10.7532      1.2533
ZONE T=" 85% Baseline Blockages 3197.3 RPM corrected", I = 17.0
162.1044      1.5115      0.7336      3.4535      1.1714
159.5892      1.5634      0.7688      3.9533      1.1778
156.6287      1.6157      0.7990      4.5460      1.1846
154.2909      1.6521      0.8174      5.0175      1.1894
151.9881      1.6845      0.8320      5.4850      1.1938
149.6973      1.7136      0.8436      5.9530      1.1980
144.5575      1.7687      0.8605      7.0142      1.2064
140.0713      1.8063      0.8673      7.9532      1.2130
135.3568      1.8370      0.8683      8.9530      1.2194
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130.7028      1.8597      0.8646      9.9532      1.2252
126.1111      1.8761      0.8577     10.9531      1.2305
121.2965      1.8880      0.8476     12.0155      1.2358
117.0996      1.8946      0.8372     12.9533      1.2402
112.5109      1.8986      0.8244     13.9913      1.2448
108.0884      1.8997      0.8111     15.0041      1.2491
103.8398      1.8987      0.7977     15.9884      1.2530
99.7208       1.8958      0.7841     16.9533      1.2567
ZONE T=" 85% Stat 2 10% Ice Block 3197.3 RPM corrected", I = 15.0
156.6287      1.5767      0.7700      4.5460      1.1811
154.2909      1.6187      0.7943      5.0175      1.1864
151.9881      1.6561      0.8137      5.4850      1.1913
149.6973      1.6898      0.8294      5.9530      1.1957
144.5575      1.7524      0.8525      7.0142      1.2047
140.0713      1.7956      0.8633      7.9532      1.2117
135.3568      1.8314      0.8676      8.9530      1.2184
130.7028      1.8583      0.8665      9.9532      1.2244
126.1111      1.8781      0.8614     10.9531      1.2299
121.2965      1.8927      0.8527     12.0155      1.2354
117.0996      1.9011      0.8432     12.9533      1.2399
112.5109      1.9067      0.8311     13.9913      1.2446
108.0884      1.9089      0.8182     15.0041      1.2489
103.8398      1.9085      0.8049     15.9884      1.2529
101.7785      1.9075      0.7983     16.4700      1.2548
ZONE T=" 85% Stat 2 20% Ice Block 3197.3 RPM corrected", I = 12.0
154.2909      1.5503      0.7412      5.0175      1.1807
149.6973      1.6347      0.7911      5.9530      1.1913
147.2640      1.6732      0.8105      6.4535      1.1962
144.5575      1.7113      0.8273      7.0142      1.2013
140.0713      1.7648      0.8463      7.9532      1.2090
135.3568      1.8095      0.8572      8.9530      1.2162
130.7028      1.8433      0.8606      9.9532      1.2227
126.1111      1.8687      0.8590     10.9531      1.2286
121.2965      1.8884      0.8533     12.0155      1.2343
117.0996      1.9007      0.8458     12.9533      1.2391
112.5109      1.9097      0.8355     13.9913      1.2439
108.0884      1.9146      0.8239     15.0041      1.2484
ZONE T=" 85% Stat 2 27% Ice Block 3197.3 RPM corrected", I = 12.0
151.9881      1.5189      0.7079      5.4850      1.1799
149.6973      1.5680      0.7408      5.9530      1.1858
147.2640      1.6139      0.7682      6.4535      1.1915
144.5575      1.6589      0.7920      7.0142      1.1972
142.3999      1.6909      0.8069      7.4643      1.2014
140.0713      1.7219      0.8198      7.9532      1.2057
135.3568      1.7751      0.8376      8.9530      1.2135
130.7028      1.8168      0.8467      9.9532      1.2205
126.1111      1.8490      0.8497     10.9531      1.2268
121.2965      1.8749      0.8479     12.0155      1.2329
117.0996      1.8913      0.8428     12.9533      1.2379
112.5109      1.9044      0.8348     13.9913      1.2430
ZONE T=" 85% Stat 2 30% Ice Block 3197.3 RPM corrected", I = 11.0
149.6973      1.5160      0.6984      5.9530      1.1814
147.2640      1.5748      0.7386      6.4535      1.1883
144.5575      1.6266      0.7691      7.0142      1.1946
142.3999      1.6622      0.7875      7.4643      1.1992
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140.0713      1.6962      0.8031      7.9532      1.2037
135.3568      1.7542      0.8250      8.9530      1.2119
130.7028      1.7996      0.8371      9.9532      1.2192
126.1111      1.8351      0.8424     10.9531      1.2257
121.2965      1.8641      0.8426     12.0155      1.2320
119.3307      1.8738      0.8414     12.4534      1.2345
115.9461      1.8880      0.8380     13.2130      1.2385
ZONE T=" 85% Stat 2 35% Ice Block 3197.3 RPM corrected", I = 7.0
140.9795      1.5990      0.7374      7.7622      1.1954
139.5732      1.6354      0.7599      8.0582      1.1993
137.4901      1.6742      0.7805      8.4989      1.2040
135.3568      1.7059      0.7948      8.9530      1.2082
130.7028      1.7610      0.8146      9.9532      1.2163
126.1111      1.8032      0.8248     10.9531      1.2233
122.5186      1.8301      0.8285     11.7444      1.2284
ZONE T=" 80% Baseline Blockages 3009.1 RPM corrected", I = 19.0
153.5195      1.4133      0.7086      3.4810      1.1472
151.2282      1.4527      0.7418      3.9538      1.1524
148.8259      1.4898      0.7693      4.4533      1.1574
146.0140      1.5299      0.7961      5.0429      1.1629
143.8347      1.5585      0.8132      5.5035      1.1668
141.6879      1.5845      0.8273      5.9606      1.1705
136.8026      1.6357      0.8501      7.0126      1.1783
132.0858      1.6754      0.8622      8.0445      1.1850
127.9930      1.7029      0.8665      8.9529      1.1903
123.1343      1.7283      0.8656     10.0471      1.1962
118.8887      1.7448      0.8608     11.0174      1.2010
114.7895      1.7566      0.8534     11.9669      1.2054
110.2775      1.7656      0.8428     13.0264      1.2101
106.3821      1.7704      0.8320     13.9532      1.2139
102.2312      1.7731      0.8194     14.9531      1.2178
97.7779      1.7735      0.8047     16.0399      1.2219
93.9346      1.7721      0.7913     16.9895      1.2253
89.7911      1.7686      0.7762     18.0251      1.2288
88.0087      1.7665      0.7695     18.4744      1.2303
ZONE T=" 80% Stat 2 10% Ice Block 3009.1 RPM corrected", I = 15.0
143.8347      1.5346      0.7937      5.5035      1.1646
141.6879      1.5630      0.8108      5.9606      1.1685
139.3919      1.5911      0.8260      6.4529      1.1725
136.8026      1.6199      0.8397      7.0126      1.1767
132.0858      1.6647      0.8566      8.0445      1.1837
127.9930      1.6962      0.8641      8.9529      1.1893
123.1343      1.7256      0.8664     10.0471      1.1954
118.8887      1.7451      0.8637     11.0174      1.2004
114.7895      1.7592      0.8578     11.9669      1.2050
110.2775      1.7702      0.8484     13.0264      1.2097
106.3821      1.7764      0.8384     13.9532      1.2136
102.2312      1.7802      0.8262     14.9531      1.2176
97.7779      1.7814      0.8119     16.0399      1.2218
93.9346      1.7804      0.7986     16.9895      1.2252
92.9976      1.7798      0.7953     17.2226      1.2260
ZONE T=" 80% Stat 2 20% Ice Block 3009.1 RPM corrected", I = 14.0
146.0140      1.4506      0.7220      5.0429      1.1559
143.8347      1.4865      0.7497      5.5035      1.1606
141.6879      1.5194      0.7730      5.9606      1.1649
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139.3919      1.5521      0.7940      6.4529      1.1692
136.8026      1.5858      0.8134      7.0126      1.1738
132.0858      1.6387      0.8386      8.0445      1.1814
127.9930      1.6761      0.8518      8.9529      1.1874
123.1343      1.7113      0.8589     10.0471      1.1939
118.8887      1.7354      0.8598     11.0174      1.1992
114.7895      1.7536      0.8568     11.9669      1.2039
110.2775      1.7684      0.8500     13.0264      1.2089
106.3821      1.7775      0.8419     13.9532      1.2130
102.2312      1.7837      0.8313     14.9531      1.2171
97.7779      1.7871      0.8181     16.0399      1.2214
ZONE T=" 80% Stat 2 27% Ice Block 3009.1 RPM corrected", I = 12.0
141.6879      1.4719      0.7288      5.9606      1.1608
139.3919      1.5081      0.7551      6.4529      1.1656
136.8026      1.5454      0.7797      7.0126      1.1705
134.7608      1.5724      0.7956      7.4574      1.1742
132.0858      1.6046      0.8127      8.0445      1.1787
127.9930      1.6476      0.8315      8.9529      1.1851
123.1343      1.6893      0.8447     10.0471      1.1920
118.8887      1.7184      0.8498     11.0174      1.1976
114.7895      1.7406      0.8499     11.9669      1.2026
110.2775      1.7593      0.8460     13.0264      1.2078
106.3821      1.7714      0.8401     13.9532      1.2121
102.2312      1.7807      0.8315     14.9531      1.2164
ZONE T=" 80% Stat 2 30% Ice Block 3009.1 RPM corrected", I = 13.0
141.6879      1.4437      0.7015      5.9606      1.1583
139.3919      1.4834      0.7325      6.4529      1.1634
136.8026      1.5232      0.7604      7.0126      1.1686
134.7608      1.5517      0.7784      7.4574      1.1725
132.0858      1.5857      0.7977      8.0445      1.1772
130.1144      1.6085      0.8092      8.4806      1.1804
127.9930      1.6310      0.8193      8.9529      1.1838
123.1343      1.6754      0.8352     10.0471      1.1909
118.8887      1.7068      0.8423     11.0174      1.1967
114.7895      1.7314      0.8445     11.9669      1.2019
110.2775      1.7525      0.8423     13.0264      1.2072
106.3821      1.7662      0.8375     13.9532      1.2115
105.4131      1.7690      0.8359     14.1854      1.2126
ZONE T=" 80% Stat 2 35% Ice Block 3009.1 RPM corrected", I = 8.0
136.8026      1.4522      0.6944      7.0126      1.1626
134.7608      1.5014      0.7347      7.4574      1.1682
132.0858      1.5449      0.7643      8.0445      1.1738
127.9930      1.5968      0.7933      8.9529      1.1810
123.1343      1.6463      0.8145     10.0471      1.1887
118.8887      1.6816      0.8253     11.0174      1.1947
114.7895      1.7097      0.8306     11.9669      1.2001
111.8588      1.7267      0.8318     12.6533      1.2038
ZONE T=" 70% Baseline Blockages 2632.6 RPM corrected", I = 20.0
136.1186      1.2669      0.6602      3.4667      1.1063
133.9698      1.2921      0.6919      3.9529      1.1102
131.4253      1.3211      0.7258      4.5345      1.1145
129.4638      1.3427      0.7491      4.9872      1.1177
127.4614      1.3639      0.7704      5.4532      1.1208
125.0000      1.3885      0.7930      6.0315      1.1244
121.1299      1.4237      0.8213      6.9532      1.1298
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117.0002      1.4564      0.8425      7.9535      1.1351
112.9435      1.4834      0.8554      8.9532      1.1400
108.6316      1.5069      0.8618     10.0345      1.1448
104.8861      1.5232      0.8623     10.9895      1.1487
101.1634      1.5360      0.8589     11.9532      1.1525
97.2890      1.5460      0.8520     12.9716      1.1562
93.4649      1.5531      0.8425     13.9922      1.1597
89.7911      1.5576      0.8314     14.9870      1.1630
86.2617      1.5601      0.8192     15.9559      1.1660
82.4566      1.5608      0.8048     17.0148      1.1692
78.8194      1.5599      0.7899     18.0407      1.1721
75.3427      1.5575      0.7747     19.0337      1.1749
72.0193      1.5536      0.7591     19.9940      1.1774
ZONE T=" 70% Stat 2 10% Ice Block 2632.6 RPM corrected", I = 15.0
125.0000      1.3731      0.7740      6.0315      1.1230
123.1343      1.3918      0.7910      6.4740      1.1257
121.1299      1.4109      0.8070      6.9532      1.1285
118.8887      1.4308      0.8222      7.4939      1.1316
117.0002      1.4465      0.8329      7.9535      1.1341
112.9435      1.4764      0.8498      8.9532      1.1391
108.6316      1.5028      0.8599     10.0345      1.1441
104.8861      1.5213      0.8629     10.9895      1.1481
101.1634      1.5360      0.8616     11.9532      1.1520
97.2890      1.5478      0.8564     12.9716      1.1558
93.4649      1.5562      0.8481     13.9922      1.1594
89.7911      1.5617      0.8378     14.9870      1.1628
86.2617      1.5649      0.8261     15.9559      1.1658
82.4566      1.5662      0.8119     17.0148      1.1691
80.0137      1.5659      0.8021     17.7024      1.1711
ZONE T=" 70% Stat 2 20% Ice Block 2632.6 RPM corrected", I = 16.0
129.4638      1.2980      0.6848      4.9872      1.1134
127.4614      1.3215      0.7123      5.4532      1.1168
125.0000      1.3492      0.7424      6.0315      1.1208
123.1343      1.3693      0.7626      6.4740      1.1237
121.1299      1.3899      0.7817      6.9532      1.1266
117.0002      1.4279      0.8123      7.9535      1.1324
112.9435      1.4608      0.8340      8.9532      1.1376
108.6316      1.4905      0.8489     10.0345      1.1428
104.8861      1.5121      0.8558     10.9895      1.1471
101.1634      1.5297      0.8578     11.9532      1.1511
97.2890      1.5442      0.8556     12.9716      1.1551
93.4649      1.5551      0.8498     13.9922      1.1588
89.7911      1.5626      0.8415     14.9870      1.1623
86.2617      1.5674      0.8313     15.9559      1.1654
82.4566      1.5701      0.8183     17.0148      1.1688
80.8198      1.5705      0.8122     17.4748      1.1701
ZONE T=" 70% Stat 2 27% Ice Block 2632.6 RPM corrected", I = 15.0
125.0000      1.3257      0.7098      6.0315      1.1186
123.1343      1.3462      0.7318      6.4740      1.1216
121.1299      1.3675      0.7530      6.9532      1.1247
118.8887      1.3901      0.7738      7.4939      1.1280
117.0002      1.4082      0.7891      7.9535      1.1307
114.7895      1.4281      0.8045      8.4962      1.1337
112.9435      1.4437      0.8155      8.9532      1.1361
108.6316      1.4759      0.8342     10.0345      1.1415
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104.8861      1.4994      0.8438     10.9895      1.1459
101.1634      1.5192      0.8487     11.9532      1.1501
97.2890      1.5361      0.8494     12.9716      1.1542
93.4649      1.5494      0.8462     13.9922      1.1581
89.7911      1.5590      0.8401     14.9870      1.1616
86.2617      1.5657      0.8318     15.9559      1.1649
84.5493      1.5681      0.8270     16.4306      1.1665
ZONE T=" 70% Stat 2 30% Ice Block 2632.6 RPM corrected", I = 13.0
125.0000      1.3149      0.6949      6.0315      1.1175
123.1343      1.3356      0.7175      6.4740      1.1206
121.1299      1.3569      0.7393      6.9532      1.1237
118.8887      1.3797      0.7609      7.4939      1.1271
117.0002      1.3980      0.7768      7.9535      1.1298
112.9435      1.4340      0.8046      8.9532      1.1353
108.6316      1.4675      0.8254     10.0345      1.1408
104.8861      1.4923      0.8369     10.9895      1.1453
101.1634      1.5129      0.8429     11.9532      1.1495
97.2890      1.5308      0.8447     12.9716      1.1537
93.4649      1.5451      0.8428     13.9922      1.1577
89.7911      1.5558      0.8378     14.9870      1.1613
88.0087      1.5600      0.8344     15.4747      1.1630
ZONE T=" 70% Stat 2 35% Ice Block 2632.6 RPM corrected", I = 12.0
125.0000      1.2945      0.6667      6.0315      1.1152
123.1343      1.3169      0.6929      6.4740      1.1185
121.1299      1.3389      0.7165      6.9532      1.1218
118.8887      1.3620      0.7392      7.4939      1.1253
117.0002      1.3803      0.7558      7.9535      1.1281
112.9435      1.4167      0.7851      8.9532      1.1338
108.6316      1.4510      0.8078     10.0345      1.1394
104.8861      1.4771      0.8214     10.9895      1.1441
101.1634      1.4996      0.8301     11.9532      1.1484
97.2890      1.5194      0.8344     12.9716      1.1527
93.4649      1.5353      0.8343     13.9922      1.1568
91.6096      1.5419      0.8331     14.4928      1.1587
ZONE T=" 70% Stat 2 40% Ice Block 2632.6 RPM corrected", I = 7.0
117.7028      1.3494      0.7208      7.7821      1.1245
115.9461      1.3707      0.7424      8.2116      1.1275
114.2156      1.3878      0.7573      8.6379      1.1301
112.9435      1.3992      0.7663      8.9532      1.1319
108.6316      1.4337      0.7898     10.0345      1.1378
104.8861      1.4599      0.8040     10.9895      1.1425
101.1634      1.4829      0.8136     11.9532      1.1470
ZONE T=" 60% Baseline Blockages 2257. RPM corrected", I = 22.0
117.7028      1.1757      0.6291      3.5438      1.0755
115.9461      1.1902      0.6569      3.9922      1.0779
114.1585      1.2048      0.6834      4.4529      1.0803
111.9483      1.2226      0.7137      5.0288      1.0831
110.2775      1.2358      0.7347      5.4688      1.0852
108.4552      1.2497      0.7556      5.9532      1.0874
104.7498      1.2766      0.7917      6.9532      1.0916
101.1179      1.3006      0.8189      7.9529      1.0956
97.2890      1.3228      0.8393      9.0280      1.0995
93.9346      1.3396      0.8507      9.9879      1.1028
90.6187      1.3536      0.8567     10.9534      1.1059
87.1308      1.3658      0.8579     11.9868      1.1090
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83.7060      1.3754      0.8548     13.0194      1.1120
80.4157      1.3824      0.8483     14.0280      1.1147
77.2548      1.3873      0.8395     15.0123      1.1172
74.2182      1.3906      0.8290     15.9719      1.1196
70.9444      1.3926      0.8157     17.0217      1.1221
67.8150      1.3931      0.8016     18.0398      1.1244
64.8237      1.3924      0.7867     19.0262      1.1266
61.9643      1.3906      0.7714     19.9809      1.1286
58.9348      1.3874      0.7536     21.0048      1.1306
57.4761      1.3852      0.7444     21.5023      1.1316
ZONE T=" 60%  Stat 2 10% Ice Block  2257. RPM corrected", I = 15.0
108.4552      1.2396      0.7354      5.9532      1.0864
106.4752      1.2549      0.7579      6.4851      1.0888
104.7498      1.2678      0.7756      6.9532      1.0908
102.8040      1.2817      0.7934      7.4864      1.0930
101.1179      1.2932      0.8069      7.9529      1.0948
97.2890      1.3172      0.8315      9.0280      1.0989
93.9346      1.3356      0.8462      9.9879      1.1022
90.6187      1.3512      0.8551     10.9534      1.1054
87.1308      1.3649      0.8589     11.9868      1.1086
83.7060      1.3757      0.8579     13.0194      1.1116
80.4157      1.3837      0.8530     14.0280      1.1144
77.2548      1.3895      0.8452     15.0123      1.1170
74.2182      1.3933      0.8355     15.9719      1.1194
70.9444      1.3958      0.8227     17.0217      1.1220
67.8150      1.3967      0.8088     18.0398      1.1243
ZONE T=" 60%  Stat 2 20% Ice Block  2257. RPM corrected", I = 16.0
108.4552      1.2264      0.7081      5.9532      1.0851
106.4752      1.2417      0.7318      6.4851      1.0875
104.7498      1.2548      0.7508      6.9532      1.0896
102.8040      1.2691      0.7703      7.4864      1.0918
101.1179      1.2811      0.7855      7.9529      1.0937
99.2594      1.2938      0.8005      8.4720      1.0958
97.2890      1.3066      0.8142      9.0280      1.0979
93.9346      1.3265      0.8327      9.9879      1.1013
90.6187      1.3439      0.8453     10.9534      1.1046
87.1308      1.3595      0.8528     11.9868      1.1079
83.7060      1.3722      0.8551     13.0194      1.1111
80.4157      1.3819      0.8530     14.0280      1.1139
77.2548      1.3891      0.8475     15.0123      1.1166
74.2182      1.3942      0.8395     15.9719      1.1191
70.9444      1.3978      0.8283     17.0217      1.1217
67.8150      1.3995      0.8154     18.0398      1.1241
ZONE T=" 60%  Stat 2 27% Ice Block 2257. RPM corrected", I = 16.0
110.7153      1.1984      0.6568      5.3531      1.0811
108.4552      1.2163      0.6875      5.9532      1.0840
106.4752      1.2317      0.7122      6.4851      1.0864
104.7498      1.2449      0.7321      6.9532      1.0885
102.8040      1.2589      0.7515      7.4864      1.0908
101.1179      1.2707      0.7669      7.9529      1.0927
97.2890      1.2963      0.7969      9.0280      1.0970
93.9346      1.3169      0.8173      9.9879      1.1005
90.6187      1.3352      0.8322     10.9534      1.1038
87.1308      1.3520      0.8424     11.9868      1.1072
83.7060      1.3661      0.8473     13.0194      1.1104
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80.4157      1.3773      0.8478     14.0280      1.1134
77.2548      1.3859      0.8447     15.0123      1.1161
74.2182      1.3923      0.8387     15.9719      1.1187
70.9444      1.3971      0.8295     17.0217      1.1213
69.5361      1.3986      0.8246     17.4781      1.1224
ZONE T=" 60%  Stat 2 30% Ice Block 2257. RPM corrected", I = 14.0
108.4552      1.2117      0.6782      5.9532      1.0835
106.4752      1.2268      0.7027      6.4851      1.0859
104.7498      1.2399      0.7225      6.9532      1.0880
102.8040      1.2542      0.7429      7.4864      1.0903
101.1179      1.2663      0.7591      7.9529      1.0923
97.2890      1.2917      0.7891      9.0280      1.0965
93.9346      1.3122      0.8097      9.9879      1.1001
90.6187      1.3306      0.8251     10.9534      1.1034
87.1308      1.3479      0.8362     11.9868      1.1069
83.7060      1.3624      0.8422     13.0194      1.1101
80.4157      1.3742      0.8438     14.0280      1.1131
77.2548      1.3834      0.8418     15.0123      1.1159
74.2182      1.3904      0.8369     15.9719      1.1184
70.9444      1.3960      0.8287     17.0217      1.1211
ZONE T=" 60% Stat 2 35% Ice Block 2257. RPM corrected", I = 13.0
108.4552      1.2057      0.6677      5.9532      1.0825
106.4752      1.2203      0.6911      6.4851      1.0850
104.7498      1.2327      0.7099      6.9532      1.0871
102.8040      1.2466      0.7295      7.4864      1.0894
101.1179      1.2582      0.7451      7.9529      1.0914
97.2890      1.2836      0.7758      9.0280      1.0957
93.9346      1.3043      0.7972      9.9879      1.0993
90.6187      1.3226      0.8129     10.9534      1.1027
87.1308      1.3399      0.8245     11.9868      1.1062
83.7060      1.3550      0.8316     13.0194      1.1094
80.4157      1.3675      0.8347     14.0280      1.1125
77.2548      1.3777      0.8344     15.0123      1.1153
74.2182      1.3857      0.8313     15.9719      1.1179
ZONE T=" 60%  Stat 2 40% Ice Block 2257. RPM corrected", I = 13.0
108.4552      1.2020      0.6652      5.9532      1.0814
106.4752      1.2169      0.6892      6.4851      1.0840
104.7498      1.2290      0.7070      6.9532      1.0861
102.8040      1.2421      0.7248      7.4864      1.0885
101.1179      1.2530      0.7388      7.9529      1.0904
99.2594      1.2648      0.7527      8.4720      1.0926
97.2890      1.2768      0.7660      9.0280      1.0947
95.7963      1.2856      0.7751      9.4531      1.0964
93.9346      1.2963      0.7853      9.9879      1.0984
90.6187      1.3142      0.8005     10.9534      1.1018
87.1308      1.3316      0.8124     11.9868      1.1053
83.7060      1.3466      0.8198     13.0194      1.1087
80.4157      1.3592      0.8233     14.0280      1.1117
ZONE T=" 50% Baseline Blockages 1880.5 RPM corrected", I = 24.0
99.2594      1.1100      0.5986      3.4637      1.0508
97.6119      1.1195      0.6276      3.9534      1.0524
95.8370      1.1298      0.6572      4.4873      1.0542
94.3052      1.1386      0.6813      4.9535      1.0557
92.5326      1.1488      0.7073      5.4992      1.0574
91.0741      1.1570      0.7272      5.9534      1.0587
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89.3421      1.1666      0.7490      6.4986      1.0603
87.9141      1.1743      0.7654      6.9531      1.0616
84.5493      1.1914      0.7983      8.0419      1.0645
81.6341      1.2051      0.8204      9.0055      1.0670
78.8194      1.2169      0.8362      9.9539      1.0692
75.7213      1.2284      0.8475     11.0185      1.0717
73.0520      1.2368      0.8525     11.9530      1.0737
70.2367      1.2443      0.8535     12.9562      1.0758
67.4759      1.2503      0.8506     13.9573      1.0778
64.7751      1.2549      0.8444     14.9533      1.0797
61.9643      1.2584      0.8351     16.0072      1.0816
59.4811      1.2605      0.8246     16.9529      1.0832
56.8929      1.2617      0.8119     17.9529      1.0849
54.1208      1.2620      0.7962     19.0400      1.0867
51.7336      1.2614      0.7813     19.9894      1.0881
49.2043      1.2598      0.7637     21.0082      1.0896
46.7987      1.2572      0.7451     21.9893      1.0910
45.1851      1.2548      0.7314     22.6539      1.0920
ZONE T=" 40% Baseline Blockages 1504. RPM corrected", I = 25.0
80.0137      1.0661      0.5805      3.4576      1.0319
78.4253      1.0725      0.6130      4.0348      1.0331
77.2548      1.0772      0.6359      4.4657      1.0339
75.7213      1.0835      0.6644      5.0372      1.0350
74.5911      1.0880      0.6842      5.4636      1.0358
73.1105      1.0940      0.7088      6.0289      1.0368
72.0121      1.0984      0.7258      6.4532      1.0376
70.5897      1.1040      0.7463      7.0089      1.0385
68.1558      1.1132      0.7772      7.9764      1.0402
65.7516      1.1218      0.8024      8.9529      1.0417
63.2192      1.1301      0.8230     10.0038      1.0434
60.9785      1.1367      0.8362     10.9531      1.0447
58.6402      1.1428      0.8452     11.9632      1.0462
56.3352      1.1481      0.8493     12.9783      1.0476
54.1208      1.1523      0.8493     13.9717      1.0488
51.9714      1.1556      0.8457     14.9530      1.0501
49.7001      1.1584      0.8386     16.0081      1.0513
47.5078      1.1603      0.8288     17.0439      1.0526
45.6130      1.1614      0.8183     17.9529      1.0536
43.4090      1.1620      0.8038     19.0260      1.0547
41.4943      1.1620      0.7894     19.9719      1.0557
39.4656      1.1614      0.7723     20.9874      1.0567
37.5361      1.1601      0.7540     21.9660      1.0577
35.5225      1.1580      0.7323     23.0000      1.0587
33.6169      1.1550      0.7085     23.9903      1.0595
ZONE T=" Surge Baseline Blockage", I = 11.0
164.6798      2.7825      0.8268      9.9730      1.4125
147.4851      2.5682      0.8138     11.9740      1.3816
133.4166      2.3719      0.8046     13.4974      1.3492
120.0866      2.1944      0.7943     14.9898      1.3182
109.7261      2.0366      0.7899     15.9629      1.2864
99.7208      1.8958      0.7841     16.9533      1.2567
88.0087      1.7665      0.7695     18.4744      1.2303
72.0193      1.5536      0.7591     19.9940      1.1774
57.4761      1.3852      0.7444     21.5023      1.1316
45.1851      1.2548      0.7314     22.6539      1.0920
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33.6169      1.1550      0.7085     23.9903      1.0595
ZONE T=" Surge 10% Blockage", I = 9.0
162.0477      2.8040      0.8280     10.4530      1.4154
147.4851      2.5682      0.8138     11.9740      1.3816
133.4166      2.3879      0.8117     13.4974      1.3492
121.2147      2.2092      0.8047     14.7528      1.3171
109.7261      2.0487      0.7972     15.9629      1.2864
101.7785      1.9075      0.7983     16.4700      1.2548
92.9976      1.7798      0.7953     17.2226      1.2260
80.0137      1.5659      0.8021     17.7024      1.1711
67.8150      1.3967      0.8088     18.0398      1.1243
ZONE T=" Surge 20% Blockage", I = 9.0
166.1645      2.7970      0.8387      9.7028      1.4090
152.7519      2.5862      0.8362     10.9770      1.3745
140.9795      2.3905      0.8344     12.0004      1.3402
129.4638      2.2145      0.8314     13.0371      1.3079
118.8768      2.0557      0.8289     13.9533      1.2769
108.0884      1.9146      0.8239     15.0041      1.2484
97.7779      1.7871      0.8181     16.0399      1.2214
80.8198      1.5705      0.8122     17.4748      1.1701
67.8150      1.3995      0.8154     18.0398      1.1241
ZONE T=" Surge 27% Blockage", I = 9.0
173.0626      2.7073      0.8366      8.4529      1.3951
160.6038      2.5188      0.8397      9.5045      1.3611
146.0140      2.3565      0.8389     11.0152      1.3321
132.0858      2.1997      0.8353     12.4979      1.3036
123.1343      2.0409      0.8372     13.0332      1.2711
112.5109      1.9044      0.8348     13.9913      1.2430
102.2312      1.7807      0.8315     14.9531      1.2164
84.5493      1.5681      0.8270     16.4306      1.1665
69.5361      1.3986      0.8246     17.4781      1.1224
ZONE T=" Surge 30% Blockage", I = 7.0
151.2282      2.2999      0.8354     10.0040      1.3229
138.6880      2.1550      0.8379     11.1535      1.2939
126.8939      2.0165      0.8384     12.2286      1.2657
115.9461      1.8880      0.8380     13.2130      1.2385
105.4131      1.7690      0.8359     14.1854      1.2126
88.0087      1.5600      0.8344     15.4747      1.1630
70.9444      1.3960      0.8287     17.0217      1.1211
ZONE T=" Surge 35% Blockage", I = 5.0
133.8794      1.9346      0.8223     10.7532      1.2533
122.5186      1.8301      0.8285     11.7444      1.2284
111.8588      1.7267      0.8318     12.6533      1.2038
91.6096      1.5419      0.8331     14.4928      1.1587
74.2182      1.3857      0.8313     15.9719      1.1179
ZONE T=" Surge 40% Blockage", I = 2.0
101.1634      1.4829      0.8136     11.9532      1.1470
80.4157      1.3592      0.8233     14.0280      1.1117
```

Appendix M.—Compressor Flow Analysis 110% to 60% RPM; Complete Map; With Stator 2 Blockages Varied Parametrically From 10% to 40%; Figures 20 and 21

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 110% Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 1.962   EfDer =  0.976

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     214.386    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   97.44803

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     209.433    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM        SCFM           A1/A*      Area1        A*      AthrRotor  ChokeMargin
  164923.109  168221.234       1.363     831.557     609.915     619.754       1.016

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   534.70    -0.18   534.70     0.49   744.88
  MEAN    17.06     0.00    -0.02   534.70    -0.18   534.70     0.49
  HUB     12.51     0.00    -0.02   534.70    -0.18   534.70     0.49

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     54.44    50.47     3.97   747.85   919.49    12.83   498.93     0.84
  MEAN    49.16    47.20     1.96   618.44   817.68    12.83   498.93     0.75
  HUB     40.31    38.62     1.69   453.49   701.23    12.83   498.93     0.64

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   802.88   356.68   719.30  1111.00     0.72
  MEAN    18.04   850.92   428.99   734.86  1106.53     0.77
  HUB     15.00  1004.38   623.09   787.74  1092.42     0.92

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   818.78   391.17     0.74  7362.13
  MEAN   653.81   768.48   224.82     0.69  7740.46     1.16
  HUB    543.76   791.73    79.33     0.72  9348.61

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.33     1.28    13.65   565.68     1.08   511.94     0.92     0.89
  MEAN    19.57     1.30    13.22   567.89     1.09   507.56     0.92     0.89
  HUB     20.60     1.36    11.92   577.25     1.10   493.42     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     26.38    28.54    24.20     4.34     0.93     0.18     2.90
  MEAN    30.28    17.01    12.70     4.31     0.91     0.14     3.51     0.89
  HUB     38.34    -5.75    -9.30     3.55     0.91    -0.03     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.976

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     878.195     428.159     766.750    1103.331       0.796      -0.031

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     19.762      13.010     505.857      24.000      29.179      35.400       6.221

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     813.446     428.159     919.247    1113.267       0.731       0.111

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.539      13.693     515.006     528.796       0.042       0.324

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     736.613       0.000     736.613    1123.985       0.655       0.198

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      14.379     524.954       0.000       0.060       0.092       0.210

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.783      19.193       1.270     570.272      47.462     246.038       1.907

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 295494.062       0.528    3579.948 2248360.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 1.962   EfDer =  0.968

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    214.386    4154.000      19.193     570.272       1.000       1.000       0.980
W Kg/sec =   97.44803

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    172.167    3961.717       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 164923.109  168221.234       1.178     590.487     501.414     474.134       0.946

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   688.24    -0.24   688.24     0.61   710.44
 MEAN    18.08     0.00    -0.02   688.24    -0.24   688.24     0.61
 HUB     15.21     0.00    -0.02   688.24    -0.24   688.24     0.61

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.27    46.36     0.91   744.95  1014.38    14.94   530.73     0.90
 MEAN    43.61    42.30     1.31   655.35   950.51    14.94   530.73     0.84
 HUB     38.71    37.84     0.87   551.37   882.01    14.94   530.73     0.78

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   727.07   253.34   681.51  1157.43     0.63
 MEAN    18.01   747.17   293.09   687.28  1155.56     0.65
 HUB     15.22   813.23   420.79   695.91  1153.62     0.70

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   837.56   486.89     0.72  5178.10
 MEAN   652.87   775.76   359.78     0.67  5282.80     1.31
 HUB    551.84   708.14   131.05     0.61  6409.26

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.52     1.17    17.25   600.41     1.05   556.31     0.92     0.89
 MEAN    22.59     1.18    17.05   601.02     1.05   554.45     0.92     0.89
 HUB     23.36     1.22    16.76   607.57     1.07   552.43     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.39    35.54    31.50     4.04     0.93     0.22     2.90
 MEAN    23.10    27.63    23.50     4.13     0.91     0.23     3.30     0.89
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 HUB     31.16    10.67     6.50     4.17     0.91     0.26     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.968

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     922.175     293.912     874.084    1131.407       0.815      -0.404

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.763      14.703     532.005      46.000      18.585      30.600      12.015

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     920.898     293.912     966.663    1131.665       0.814      -0.435

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      22.412      14.496     532.207     455.853       0.071       0.068

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.823     957.708       0.000     957.708    1126.356       0.850      -0.198

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.850      13.556     526.535       0.000       0.060       0.183      -0.597

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.638      21.758       1.134     602.998      32.726     310.716       2.409

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 203876.766       0.372    2469.993 2078047.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 1.962   EfDer =  0.835

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    214.386    4154.000      21.758     602.998       1.000       1.000       0.880
W Kg/sec =   97.44803

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    156.168    3852.713       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 164923.109  168221.234       1.077     489.817     454.856     384.470       0.845

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   831.18    -0.29   831.18     0.73   674.76
 MEAN    17.74     0.00    -0.02   831.18    -0.29   831.18     0.73
 HUB     15.05     0.00    -0.02   831.18    -0.29   831.18     0.73

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     41.21    46.36    -5.15   727.55  1104.81    15.32   545.35     0.96
 MEAN    37.74    43.40    -5.66   643.03  1051.05    15.32   545.35     0.92
 HUB     33.29    38.84    -5.55   545.57   994.39    15.32   545.35     0.87

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   744.15   185.05   720.78  1179.96     0.63
 MEAN    17.51   758.70   241.27   719.31  1181.42     0.64
 HUB     14.85   822.08   387.08   725.25  1182.11     0.70

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   896.48   533.07     0.76  3671.57
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 MEAN   634.62   819.84   393.35     0.69  4228.89     1.35
 HUB    538.32   740.85   151.24     0.63  5752.48

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.88     1.10    18.27   624.35     1.04   578.20     0.92     0.76
 MEAN    24.22     1.11    18.35   627.59     1.04   579.62     0.92     0.76
 HUB     25.15     1.16    18.20   636.46     1.06   580.14     0.92     0.76

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     14.40    36.49    31.50     4.99     0.93     0.22     2.90
 MEAN    18.54    28.67    23.50     5.17     0.87     0.25     3.28     0.76
 HUB     28.09    11.78     6.50     5.28     0.87     0.31     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.835

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     772.474     242.854     733.306    1180.849       0.654      -0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.358      18.269     579.680      46.000      18.324      31.500      13.176

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     784.259     242.854     821.000    1179.289       0.665      -0.067

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.039      17.864     578.149     471.992       0.062       0.106

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     772.498       0.000     772.498    1180.871       0.654      -0.097

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.670     579.679       0.000       0.060       0.140      -0.098

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.525      23.560       1.083     629.468      26.470     364.479       2.825

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 164996.719       0.320    1998.956 2426813.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 1.962   EfDer =  0.900

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    214.386    4154.000      23.560     629.468       1.000       1.000       0.980
W Kg/sec =   97.44803

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    147.353    3770.838       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 164923.109  168221.234       1.196     513.330     429.218     401.059       0.934

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   705.71    -0.24   705.71     0.59   633.77
 MEAN    16.97     0.00    -0.02   705.71    -0.24   705.71     0.59
 HUB     14.32     0.00    -0.02   705.71    -0.24   705.71     0.59

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.70    46.36    -1.66   698.18   992.89    18.56   587.94     0.84
 MEAN    41.09    43.80    -2.71   615.20   936.37    18.56   587.94     0.79
 HUB     36.35    37.84    -1.49   519.11   876.21    18.56   587.94     0.74
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      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   751.76   157.29   735.13  1201.52     0.63
MEAN    16.57   761.95   215.98   730.70  1203.77     0.63
HUB     13.89   817.64   363.57   732.36  1205.10     0.68

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    684.41   904.58   527.12     0.75  2974.24
MEAN   600.81   825.84   384.83     0.69  3583.82     1.20
HUB    503.52   745.61   139.95     0.62  5053.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.48     1.08    19.56   646.76     1.03   599.68     0.92     0.82
MEAN    25.88     1.10    19.76   650.30     1.03   601.94     0.92     0.82
HUB     26.88     1.14    19.74   658.84     1.05   603.17     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     12.08    35.64    31.50     4.14     0.93     0.12     2.90
MEAN    16.47    27.77    23.50     4.27     0.89     0.15     3.29     0.82
HUB     26.40    10.82     6.50     4.32     0.89     0.20     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.900

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     744.252     217.199     711.854    1206.987       0.617       0.057

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.015      20.125     605.780      46.000      16.968      32.400      15.432

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     779.134     217.199     808.842    1202.565       0.648      -0.056

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.642      19.334     601.349     456.573       0.068       0.095

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     746.880       0.000     746.880    1206.672       0.619      -0.119

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.364     605.454       0.000       0.060       0.157      -0.051

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.505      25.078       1.064     651.968      22.500     388.215       3.009

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 140325.469       0.300    1700.061 2037123.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 1.962   EfDer =  0.863

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    214.386    4154.000      25.078     651.968       1.000       1.000       0.980
W Kg/sec =   97.44803

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    140.886    3705.199       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 164923.109  168221.234       1.242     509.668     410.418     390.276       0.951

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   678.82    -0.23   678.82     0.56   592.34
MEAN    15.91     0.00    -0.02   678.82    -0.23   678.82     0.56
HUB     13.07     0.00    -0.02   678.82    -0.23   678.82     0.56

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     44.38    47.36    -2.98   664.11   949.82    20.28   613.57     0.78
MEAN    40.37    44.80    -4.43   576.85   890.97    20.28   613.57     0.73
HUB     34.93    38.84    -3.91   473.79   827.95    20.28   613.57     0.68

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   728.85   132.61   716.68  1222.92     0.60
MEAN    15.50   737.18   183.67   713.93  1224.59     0.60
HUB     12.59   784.55   319.48   716.55  1225.48     0.64

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    650.33   884.12   517.72     0.72  2383.32
MEAN   561.80   807.88   378.12     0.66  2850.22     1.18
HUB    456.39   729.52   136.92     0.60  4025.25

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.58     1.06    20.90   665.82     1.02   621.58     0.92     0.79
MEAN    26.88     1.07    21.04   668.53     1.03   623.28     0.92     0.79
HUB     27.65     1.10    20.98   675.35     1.04   624.11     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     10.48    35.84    31.50     4.34     0.93     0.09     2.90
MEAN    14.43    27.91    23.50     4.41     0.88     0.12     3.34     0.79
HUB     24.03    10.82     6.50     4.32     0.88     0.17     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.863

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     748.719     187.041     724.980    1224.050       0.612      -0.022

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.915      20.906     623.185      46.000      14.467      33.000      18.533

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     837.852     187.041     858.475    1212.424       0.691      -0.337

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.057      18.933     611.401     440.827       0.162       0.059

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    14.701     767.434       0.000     767.434    1221.740       0.628      -0.190

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      19.755     620.821       0.000       0.060       0.208      -0.201

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.286      25.774       1.028     669.899      17.931     449.608       3.485

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 111893.047       0.265    1355.599 2084724.375

   OVERALL EXIT CONDITIONS; ALL          5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    916586.06  11104.5576    209.4333      1.7061      0.5884      1.9620      1.2813
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 110% Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 2.331   EfDer =  0.980

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     212.258    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   96.48080

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     207.355    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  163286.172  166551.547       1.377     831.557     603.862     619.754       1.026

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   527.77    -0.18   527.77     0.48   744.88
  MEAN    17.06     0.00    -0.02   527.77    -0.18   527.77     0.48
  HUB     12.51     0.00    -0.02   527.77    -0.18   527.77     0.48

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     54.80    50.47     4.33   747.85   915.47    12.89   499.55     0.83
  MEAN    49.53    47.20     2.33   618.44   813.16    12.89   499.55     0.74
  HUB     40.68    38.62     2.06   453.49   695.96    12.89   499.55     0.63

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   793.50   364.24   704.96  1113.18     0.71
  MEAN    18.04   841.32   433.02   721.33  1108.29     0.76
  HUB     15.00   991.28   621.39   772.34  1094.30     0.91

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   802.57   383.60     0.72  7518.10
  MEAN   653.81   754.36   220.80     0.68  7813.05     1.18
  HUB    543.76   776.23    77.63     0.71  9323.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.44     1.29    13.85   566.59     1.08   514.09     0.92     0.90
  MEAN    19.63     1.30    13.39   568.31     1.09   509.32     0.92     0.90
  HUB     20.60     1.36    12.10   577.10     1.10   495.39     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     27.32    28.55    24.20     4.35     0.93     0.19     2.90
  MEAN    30.98    17.02    12.70     4.32     0.91     0.15     3.51     0.90
  HUB     38.82    -5.74    -9.30     3.56     0.91    -0.01     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     866.062     432.178     750.523    1105.685       0.783      -0.026

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.826      13.216     508.019      24.000      29.935      35.400       5.465

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     790.243     432.178     900.701    1117.042       0.707       0.138

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.628      14.051     518.508     528.796       0.039       0.340

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     715.694       0.000     715.694    1127.109       0.635       0.224

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      14.735     527.885       0.000       0.060       0.082       0.239

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.801      19.336       1.280     570.667      47.857     242.928       1.883

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 297948.094       0.533    3573.851 2219237.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 2.331   EfDer =  0.977

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    212.258    4154.000      19.336     570.667       1.000       1.000       0.980
W Kg/sec =   96.48080

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    169.254    3960.349       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 163286.172  166551.547       1.198     590.487     492.929     474.134       0.962

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   670.35    -0.23   670.35     0.59   710.20
 MEAN    18.08     0.00    -0.02   670.35    -0.23   670.35     0.59
 HUB     15.21     0.00    -0.02   670.35    -0.23   670.35     0.59

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.03    46.36     1.67   744.95  1002.33    15.25   533.15     0.88
 MEAN    44.36    42.30     2.06   655.35   937.63    15.25   533.15     0.83
 HUB     39.45    37.84     1.61   551.37   868.12    15.25   533.15     0.77

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   712.31   269.13   659.51  1161.51     0.61
 MEAN    18.01   733.01   303.94   667.03  1158.85     0.63
 HUB     15.22   799.04   424.68   676.84  1156.24     0.69

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   810.49   471.11     0.70  5500.34
 MEAN   652.87   752.79   348.93     0.65  5478.04     1.34
 HUB    551.84   688.68   127.16     0.60  6468.41

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.94     1.19    17.79   602.68     1.06   560.34     0.92     0.89
 MEAN    22.92     1.19    17.50   602.55     1.06   557.72     0.92     0.89
 HUB     23.61     1.22    17.15   608.31     1.07   555.06     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.20    35.54    31.50     4.04     0.93     0.24     2.90
 MEAN    24.50    27.61    23.50     4.11     0.91     0.25     3.30     0.89
 HUB     32.11    10.64     6.50     4.14     0.91     0.27     3.92
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   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     888.008     304.789     834.064    1138.465       0.780      -0.362

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.100      15.449     538.677      46.000      20.074      30.600      10.526

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     861.186     304.789     913.530    1142.602       0.754      -0.323

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      22.817      15.650     542.595     455.853       0.060       0.132

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     872.625       0.000     872.625    1141.088       0.765      -0.048

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      15.174     540.962       0.000       0.060       0.141      -0.407

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.716      22.356       1.156     604.510      33.844     299.017       2.318

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 210845.516       0.385    2529.066 2036670.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 2.331   EfDer =  0.878

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    212.258    4154.000      22.356     604.510       1.000       1.000       0.880
W Kg/sec =   96.48080

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    150.670    3847.891       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 163286.172  166551.547       1.116     489.817     438.839     384.470       0.876

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   775.94    -0.27   775.94     0.67   673.91
 MEAN    17.74     0.00    -0.02   775.94    -0.27   775.94     0.67
 HUB     15.05     0.00    -0.02   775.94    -0.27   775.94     0.67

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.17    46.36    -3.19   727.55  1063.86    16.51   554.27     0.92
 MEAN    39.66    43.40    -3.74   643.03  1007.93    16.51   554.27     0.87
 HUB     35.12    38.84    -3.72   545.57   948.70    16.51   554.27     0.82

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   707.12   222.88   671.08  1190.18     0.59
 MEAN    17.51   724.88   267.60   673.68  1189.66     0.61
 HUB     14.85   788.62   397.62   681.04  1188.82     0.66

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   834.04   495.25     0.70  4420.52
 MEAN   634.62   767.17   367.02     0.64  4689.49     1.39
 HUB    538.32   695.43   140.70     0.58  5908.71
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.14     1.12    19.79   630.22     1.04   588.52     0.92     0.80
MEAN    25.32     1.13    19.70   631.78     1.05   587.97     0.92     0.80
HUB     26.13     1.17    19.44   638.87     1.06   587.02     0.92     0.80

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     18.37    36.43    31.50     4.93     0.93     0.25     2.90
MEAN    21.66    28.58    23.50     5.08     0.88     0.28     3.28     0.80
HUB     30.28    11.67     6.50     5.17     0.88     0.32     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.878

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     735.387     269.356     684.281    1189.812       0.618       -0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.468      19.678     588.502      46.000      21.486      31.500      10.014

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     716.410     269.356     765.373    1192.133       0.601       0.024

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.260      19.785     590.800     471.992       0.045       0.175

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     697.070       0.000     697.070    1194.436       0.584       0.027

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.838     593.082       0.000       0.060       0.091       0.033

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.673      24.989       1.118     633.626      29.116     327.857       2.542

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 181502.156       0.352    2177.096 2317643.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 2.331   EfDer =  0.949

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    212.258    4154.000      24.989     633.626       1.000       1.000       0.980
W Kg/sec =   96.48080

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    138.001    3758.444       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 163286.172  166551.547       1.277     513.330     401.976     401.059       0.998

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   643.09    -0.22   643.09     0.54   631.68
 MEAN    16.97     0.00    -0.02   643.09    -0.22   643.09     0.54
 HUB     14.32     0.00    -0.02   643.09    -0.22   643.09     0.54

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.36    46.36     1.00   698.18   949.39    20.55   599.14     0.79
 MEAN    43.74    43.80    -0.06   615.20   890.12    20.55   599.14     0.74
 HUB     38.92    37.84     1.08   519.11   826.60    20.55   599.14     0.69

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	687.54	216.42	652.59	1219.35	0.56
MEAN	16.57	703.74	256.19	655.45	1218.43	0.58
HUB	13.89	761.50	378.00	661.06	1217.31	0.63

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	684.41	803.05	467.99	0.66	4090.19	
MEAN	600.81	740.53	344.63	0.61	4249.75	1.29
HUB	503.52	672.87	125.52	0.55	5253.57	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.95	1.12	22.52	657.40	1.04	618.00	0.92	0.87
MEAN	28.07	1.12	22.39	658.33	1.04	617.05	0.92	0.87
HUB	28.84	1.15	22.15	664.16	1.05	615.83	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	18.35	35.65	31.50	4.15	0.93	0.19	2.90	
MEAN	21.35	27.73	23.50	4.23	0.90	0.21	3.29	0.87
HUB	29.76	10.75	6.50	4.25	0.90	0.24	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.949

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	688.626	257.626	638.619	1221.498	0.564	0.061

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
28.227	22.747	620.418	46.000	21.970	32.400	10.430

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	677.804	257.626	725.114	1222.711	0.554	0.066

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	28.032	22.747	621.651	456.573	0.043	0.194

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	641.643	0.000	641.643	1226.618	0.523	0.053

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.061	625.630	0.000	0.060	0.083	0.119

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.744	27.793	1.112	659.962	26.336	329.279	2.553

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
164278.234	0.351	1970.498	1946391.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 2.331 EfDer = 0.943

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
212.258	4154.000	27.793	659.962	1.000	1.000	0.980

W Kg/sec = 96.48080

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
126.635	3682.690	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
163286.172	166551.547	1.382	509.668	368.898	390.276	1.058

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	590.28	-0.20	590.28	0.48	588.74

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MEAN    15.91     0.00    -0.02   590.28    -0.20   590.28     0.48
HUB     13.07     0.00    -0.02   590.28    -0.20   590.28     0.48

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     48.38    47.36     1.02   664.11   888.68    23.75   630.92     0.72
MEAN    44.35    44.80    -0.45   576.85   825.49    23.75   630.92     0.67
HUB     38.76    38.84    -0.08   473.79   757.04    23.75   630.92     0.61

     ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   639.98   215.19   602.71  1248.57     0.51
MEAN    15.50   653.54   240.93   607.51  1246.47     0.52
HUB     12.59   702.06   340.11   614.17  1244.28     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    650.33   743.37   435.14     0.60  3864.31
MEAN   561.80   687.04   320.87     0.55  3737.05     1.30
HUB    456.39   625.08   116.28     0.50  4284.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     30.75     1.11    25.70   682.41     1.03   648.28     0.92     0.86
MEAN    30.65     1.10    25.41   681.67     1.03   646.08     0.92     0.86
HUB     31.08     1.12    25.04   684.85     1.04   643.78     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     19.65    35.83    31.50     4.33     0.93     0.20     2.90
MEAN    21.63    27.84    23.50     4.34     0.90     0.21     3.34     0.86
HUB     28.98    10.72     6.50     4.22     0.90     0.23     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.943

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     661.037     245.346     613.820    1246.808       0.530      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.717      25.363     646.558      46.000      21.787      33.000      11.213

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     663.191     245.346     707.119    1246.579       0.532      -0.064

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.358      25.034     646.320     440.827       0.086       0.201

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     610.721       0.000     610.721    1251.939       0.488       0.082

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.809     651.890       0.000       0.060       0.083       0.078

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.738      30.373       1.093     682.973      23.012     347.635       2.695

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 143643.203       0.340    1722.983 1966448.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    998217.19  11973.4941    207.3546      2.0105      0.7237      2.3311      1.3064
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 110% Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 2.514   EfDer =  0.981

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     211.202    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   96.00080

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     206.323    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  162473.812  165722.922       1.384     831.557     600.857     619.754       1.031

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   524.36    -0.18   524.36     0.48   744.88
  MEAN    17.06     0.00    -0.02   524.36    -0.18   524.36     0.48
  HUB     12.51     0.00    -0.02   524.36    -0.18   524.36     0.48

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     54.97    50.47     4.50   747.85   913.51    12.92   499.84     0.83
  MEAN    49.71    47.20     2.51   618.44   810.95    12.92   499.84     0.74
  HUB     40.87    38.62     2.25   453.49   693.38    12.92   499.84     0.63

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   789.09   367.88   698.09  1114.22     0.71
  MEAN    18.04   836.74   434.97   714.80  1109.13     0.75
  HUB     15.00   985.01   620.57   764.94  1095.19     0.90

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   794.80   379.97     0.71  7593.10
  MEAN   653.81   747.55   218.85     0.67  7848.16     1.19
  HUB    543.76   768.78    76.82     0.70  9310.85

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.50     1.29    13.95   567.03     1.08   515.10     0.92     0.90
  MEAN    19.66     1.30    13.48   568.51     1.09   510.15     0.92     0.90
  HUB     20.61     1.36    12.19   577.03     1.10   496.33     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     27.79    28.56    24.20     4.36     0.93     0.20     2.90
  MEAN    31.32    17.02    12.70     4.32     0.91     0.16     3.51     0.90
  HUB     39.05    -5.73    -9.30     3.57     0.91    -0.01     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.981

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     860.388     434.122     742.835    1106.781       0.777      -0.024

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      19.856      13.313     509.027      24.000      30.303      35.400       5.097

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      18.071     779.652     434.122     892.367    1118.740       0.697       0.150
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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.669      14.214     520.086     528.796       0.038       0.348

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     706.248       0.000     706.248    1128.505       0.626       0.235

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      14.895     529.197       0.000       0.060       0.078       0.252

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.809      19.400       1.284     570.856      48.046     241.424       1.872

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 299130.250       0.535    3570.180 2204906.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 2.514   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    211.202    4154.000      19.400     570.856       1.000       1.000       0.980
W Kg/sec =   96.00080

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    167.885    3959.690       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 162473.812  165722.922       1.208     590.487     488.942     474.134       0.970

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   662.19    -0.23   662.19     0.58   710.08
 MEAN    18.08     0.00    -0.02   662.19    -0.23   662.19     0.58
 HUB     15.21     0.00    -0.02   662.19    -0.23   662.19     0.58

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.37    46.36     2.01   744.95   996.89    15.39   534.25     0.88
 MEAN    44.71    42.30     2.41   655.35   931.81    15.39   534.25     0.82
 HUB     39.79    37.84     1.95   551.37   861.83    15.39   534.25     0.76

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   706.00   276.16   649.74  1163.30     0.61
 MEAN    18.01   726.80   308.80   657.94  1160.32     0.63
 HUB     15.22   792.70   426.45   668.22  1157.42     0.68

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   798.45   464.07     0.69  5643.98
 MEAN   652.87   742.48   344.07     0.64  5565.53     1.35
 HUB    551.84   679.88   125.39     0.59  6495.33

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.12     1.19    18.03   603.70     1.06   562.11     0.92     0.90
 MEAN    23.07     1.19    17.70   603.24     1.06   559.17     0.92     0.90
 HUB     23.73     1.22    17.33   608.66     1.07   556.24     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.03    35.54    31.50     4.04     0.93     0.25     2.90
 MEAN    25.14    27.61    23.50     4.11     0.91     0.25     3.30     0.90
 HUB     32.55    10.63     6.50     4.13     0.91     0.27     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.980
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     874.200     309.663     817.518    1141.334       0.766      -0.346

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.250      15.762     541.398      46.000      20.746      30.600       9.854

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     838.665     309.663     894.008    1146.680       0.731      -0.281

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      22.995      16.105     546.480     455.853       0.055       0.153

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     844.186       0.000     844.186    1146.005       0.737      -0.002

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      15.750     545.717       0.000       0.060       0.126      -0.345

    STAGE EXIT CONDITIONS, STAGE            2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.743      22.597       1.165     605.200      34.344     293.938       2.279

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 213964.016       0.390    2553.704 2017359.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 2.514   EfDer =  0.894

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    211.202    4154.000      22.597     605.200       1.000       1.000       0.880
W Kg/sec =   96.00080

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    148.405    3845.697       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 162473.812  165722.922       1.133     489.817     432.243     384.470       0.889

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   755.72    -0.26   755.72     0.65   673.53
 MEAN    17.74     0.00    -0.02   755.72    -0.26   755.72     0.65
 HUB     15.05     0.00    -0.02   755.72    -0.26   755.72     0.65

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.92    46.36    -2.44   727.55  1049.20    16.97   557.54     0.91
 MEAN    40.41    43.40    -2.99   643.03   992.44    16.97   557.54     0.86
 HUB     35.84    38.84    -3.00   545.57   932.23    16.97   557.54     0.80

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   694.18   236.99   652.47  1193.98     0.58
 MEAN    17.51   712.59   277.56   656.31  1192.79     0.60
 HUB     14.85   776.13   401.59   664.15  1191.42     0.65

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   810.68   481.13     0.68  4700.06
 MEAN   634.62   747.15   357.06     0.63  4863.79     1.41
 HUB    538.32   678.08   136.73     0.57  5967.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.65     1.14    20.40   632.53     1.05   592.34     0.92     0.82
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 MEAN    25.76     1.14    20.23   633.49     1.05   591.14     0.92     0.82
 HUB     26.52     1.17    19.94   639.91     1.06   589.68     0.92     0.82

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.96    36.40    31.50     4.90     0.93     0.27     2.90
 MEAN    22.92    28.55    23.50     5.05     0.89     0.29     3.28     0.82
 HUB     31.16    11.63     6.50     5.13     0.89     0.33     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.894

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     722.209     279.385     665.981    1193.132       0.605       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.918      20.231     591.787      46.000      22.758      31.500       8.742

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     692.823     279.385     747.034    1196.624       0.579       0.056

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.746      20.510     595.256     471.992       0.040       0.199

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     672.486       0.000     672.486    1198.953       0.561       0.067

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.616     597.573       0.000       0.060       0.077       0.074

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.715      25.530       1.130     635.309      30.109     315.515       2.446

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 187696.766       0.364    2240.199 2277048.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 2.514   EfDer =  0.963

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    211.202    4154.000      25.530     635.309       1.000       1.000       0.980
W Kg/sec =   96.00080

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    134.588    3753.463       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 162473.812  165722.922       1.309     513.330     392.031     401.059       1.023

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   622.02    -0.21   622.02     0.52   630.85
 MEAN    16.97     0.00    -0.02   622.02    -0.21   622.02     0.52
 HUB     14.32     0.00    -0.02   622.02    -0.21   622.02     0.52

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.31    46.36     1.95   698.18   935.24    21.28   603.04     0.78
 MEAN    44.69    43.80     0.89   615.20   875.01    21.28   603.04     0.73
 HUB     39.86    37.84     2.02   519.11   810.31    21.28   603.04     0.67

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     18.88   669.37   235.13   626.71  1224.98     0.55
 MEAN    16.57   686.19   269.25   631.16  1223.26     0.56
 HUB     13.89   743.78   382.75   637.74  1221.45     0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   771.12   449.28     0.63  4443.32
 MEAN   600.81   712.95   331.56     0.58  4466.11     1.32
 HUB    503.52   649.07   120.77     0.53  5319.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.87     1.13    23.56   661.13     1.04   623.78     0.92     0.88
 MEAN    28.89     1.13    23.33   661.27     1.04   622.01     0.92     0.88
 HUB     29.56     1.16    23.01   666.22     1.05   620.11     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.56    35.64    31.50     4.14     0.93     0.22     2.90
 MEAN    23.10    27.71    23.50     4.21     0.91     0.23     3.29     0.88
 HUB     30.97    10.72     6.50     4.22     0.91     0.26     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.963

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     672.114     270.762     615.163    1226.203       0.548       0.060

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.047      23.678     625.203      46.000      23.757      32.400       8.643

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     648.147     270.762     702.429    1228.788       0.527       0.104

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.898      23.905     627.842     456.573       0.036       0.224

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     612.783       0.000     612.783    1232.422       0.497       0.099

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.255     631.561       0.000       0.060       0.066       0.165

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.791      28.722       1.125     662.874      27.565     312.933       2.426

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 171956.609       0.367    2052.337 1914408.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 2.514   EfDer =  0.962

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    211.202    4154.000      28.722     662.874       1.000       1.000       0.980
W Kg/sec =   96.00080

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    122.197    3674.592       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 162473.812  165722.922       1.432     509.668     355.969     390.276       1.096

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   565.16    -0.19   565.16     0.46   587.45
 MEAN    15.91     0.00    -0.02   565.16    -0.19   565.16     0.46
 HUB     13.07     0.00    -0.02   565.16    -0.19   565.16     0.46
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       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.61    47.36     2.25   664.11   872.19    24.89   636.25     0.71
 MEAN    45.60    44.80     0.80   576.85   807.71    24.89   636.26     0.65
 HUB     39.99    38.84     1.15   473.79   737.62    24.89   636.25     0.60

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   619.91   237.13   572.76  1255.55     0.49
 MEAN    15.50   633.06   256.51   578.76  1252.69     0.51
 HUB     12.59   680.56   345.81   586.16  1249.83     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   706.25   413.21     0.56  4257.61
 MEAN   561.80   654.34   305.28     0.52  3978.45     1.34
 HUB    456.39   596.50   110.59     0.48  4356.26

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.15     1.12    27.22   687.60     1.04   655.58     0.92     0.88
 MEAN    31.92     1.11    26.81   685.98     1.03   652.58     0.92     0.88
 HUB     32.24     1.12    26.35   688.17     1.04   649.58     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.49    35.81    31.50     4.31     0.93     0.24     2.90
 MEAN    23.90    27.81    23.50     4.31     0.91     0.24     3.34     0.88
 HUB     30.54    10.68     6.50     4.18     0.91     0.25     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.962

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     640.119     261.218     584.396    1253.104       0.511      -0.006

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      31.997      26.776     653.102      46.000      24.084      33.000       8.916

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     624.548     261.218     676.974    1254.677       0.498       0.001

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      31.741      26.796     654.743     440.827       0.068       0.237

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     576.716       0.000     576.716    1259.257       0.458       0.139

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      27.514     659.532       0.000       0.060       0.062       0.136

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.797      31.772       1.106     687.250      24.376     325.746       2.525

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  152179.016       0.360    1816.287 1930727.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1024926.62  12232.7070    206.3230      2.1031      0.7554      2.5142      1.3145


****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
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****************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 110% Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 2.953   EfDer =  0.985

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     208.672    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   94.85092

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     203.852    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  160527.719  163737.922       1.401     831.557     593.660     619.754       1.044

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   516.27    -0.18   516.27     0.47   744.88
  MEAN    17.06     0.00    -0.02   516.27    -0.18   516.27     0.47
  HUB     12.51     0.00    -0.02   516.27    -0.18   516.27     0.47

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.39    50.47     4.92   747.85   908.89    12.98   500.55     0.83
  MEAN    50.15    47.20     2.95   618.44   805.75    12.98   500.55     0.73
  HUB     41.31    38.62     2.69   453.49   687.28    12.98   500.55     0.63

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   779.13   376.30   682.24  1116.58     0.70
  MEAN    18.04   826.24   439.51   699.64  1111.06     0.74
  HUB     15.00   970.58   618.71   747.80  1097.25     0.88

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   776.85   371.55     0.70  7766.73
  MEAN   653.81   731.73   214.30     0.66  7930.12     1.21
  HUB    543.76   751.55    74.96     0.68  9282.95

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.63     1.30    14.17   568.04     1.09   517.40     0.92     0.90
  MEAN    19.73     1.31    13.66   568.99     1.09   512.07     0.92     0.90
  HUB     20.61     1.36    12.39   576.87     1.10   498.47     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     28.88    28.57    24.20     4.37     0.93     0.22     2.90
  MEAN    32.14    17.03    12.70     4.33     0.91     0.17     3.51     0.90
  HUB     39.60    -5.72    -9.30     3.58     0.91     0.01     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.985

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     847.611     438.660     725.273    1109.239       0.764      -0.020

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      19.926      13.532     511.292      24.000      31.166      35.400       4.234

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      18.071     756.255     438.660     874.268    1122.436       0.674       0.177

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      19.762      14.574     523.530     528.796       0.035       0.364
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	685.564	0.000	685.564	1131.531	0.606	0.260

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.242	532.043	0.000	0.060	0.069	0.279

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.825	19.538	1.293	571.298	48.488	237.915	1.844

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
301882.188	0.540	3559.869	2170892.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 2.953 EfDer = 0.987

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
208.672	4154.000	19.538	571.298	1.000	1.000	0.980

W Kg/sec = 94.85092

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
164.772	3958.158	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
160527.719	163737.922	1.230	590.487	479.876	474.134	0.988

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	644.17	-0.22	644.17	0.57	709.81
MEAN	18.08	0.00	-0.02	644.17	-0.22	644.17	0.57	
HUB	15.21	0.00	-0.02	644.17	-0.22	644.17	0.57	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.16	46.36	2.80	744.95	985.00	15.71	536.65	0.87
MEAN	45.50	42.30	3.20	655.35	919.09	15.71	536.65	0.81
HUB	40.57	37.84	2.73	551.37	848.06	15.71	536.65	0.75

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	692.92	291.37	628.69	1167.12	0.59
MEAN	18.01	713.63	319.43	638.15	1163.48	0.61
HUB	15.22	779.00	430.32	649.36	1159.99	0.67

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	740.23	772.48	448.87	0.66	5954.29	
MEAN	652.87	720.01	333.44	0.62	5756.92	1.37
HUB	551.84	660.63	121.53	0.57	6554.07	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.53	1.20	18.54	605.95	1.06	565.88	0.92	0.90
MEAN	23.39	1.20	18.14	604.80	1.06	562.30	0.92	0.90
HUB	23.97	1.23	17.71	609.44	1.07	558.81	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	24.87	35.53	31.50	4.03	0.93	0.27	2.90	
MEAN	26.59	27.59	23.50	4.09	0.92	0.27	3.30	0.90
HUB	33.53	10.60	6.50	4.10	0.92	0.29	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.987

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

```
     17.960     846.659     320.326     783.724    1147.100       0.738      -0.315

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.576      16.410     546.882      46.000      22.231      30.600       8.369

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     795.189     320.326     857.283    1154.475       0.689      -0.203

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      23.372      17.012     553.937     455.853       0.047       0.190

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     792.928       0.000     792.928    1154.838       0.687       0.077

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      16.832     554.241       0.000       0.060       0.100      -0.236

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4           PR4       Texit        Del T       Ns         Ns nondim
      0.789      23.081       1.181     606.729      35.431     283.213       2.195

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 220736.828       0.403    2602.983 1973673.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 2.953   EfDer =  0.924

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    208.672    4154.000       23.081     606.729       1.000        1.000        0.880
W Kg/sec =   94.85092

   W cor       RPM cor         GAMMA        Cp          R           Blades       THK
    143.737    3840.849        1.401        0.249      53.349      56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 160527.719  163737.922        1.170     489.817     418.643     384.470       0.918

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   717.28    -0.25   717.28      0.62   672.68
 MEAN    17.74      0.00    -0.02   717.28    -0.25   717.28      0.62
 HUB     15.05      0.00    -0.02   717.28    -0.25   717.28      0.62

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     45.42     46.36    -0.94   727.55  1021.85     17.86   563.80      0.88
 MEAN    41.89     43.40    -1.51   643.03   963.48     17.86   563.80      0.83
 HUB     37.27     38.84    -1.57   545.57   901.34     17.86   563.80      0.77

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP      19.81   671.03    263.95   616.94  1201.17      0.56
 MEAN     17.51   689.87    296.70   622.80  1198.85      0.58
 HUB      14.85   752.48    409.20   631.49  1196.52      0.63

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP     718.12   766.09    454.18      0.64  5233.73
 MEAN    634.62   708.57    337.92      0.59  5198.60      1.45
 HUB     538.32   644.55    129.12      0.54  6080.41

         Pt2        PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP      26.68      1.16     21.58   637.17      1.05   599.60      0.92      0.85
 MEAN     26.66      1.15     21.29   636.96      1.05   597.26      0.92      0.85
 HUB      27.30      1.18     20.91   642.09      1.06   594.86      0.92      0.85
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.16    36.36    31.50     4.86     0.93     0.29     2.90
 MEAN    25.47    28.48    23.50     4.98     0.90     0.31     3.28     0.85
 HUB     32.94    11.56     6.50     5.06     0.90     0.34     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.924

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     698.148     298.648     631.047    1199.452       0.582       0.005

     Pt3          Ps3         Ts3          Vane No.     Alpha3     Vane A3      Incid3
     26.823      21.319     598.066       46.000      25.326      31.500       6.174

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     649.731     298.648     715.081    1204.900       0.539       0.115

   BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.950      26.707       21.908     603.512     471.992       0.031       0.243

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     628.976       0.000     628.976    1207.110       0.521       0.135

   Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.075     605.727        0.000       0.060       0.055       0.145

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4        Pt4           PR4        Texit        Del T       Ns         Ns nondim
       0.780       26.568        1.151      638.738      32.009     293.580       2.276

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 199557.312       0.387    2353.229 2197770.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 2.953   EfDer =  0.983

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    208.672     4154.000       26.568     638.738       1.000        1.000       0.980
W Kg/sec =   94.85092

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
    128.122     3743.374        1.401        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 160527.719  163737.922        1.375      513.330     373.196      401.059       1.075

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02    584.11    -0.20    584.11      0.48    629.15
 MEAN    16.97      0.00    -0.02    584.11    -0.20    584.11      0.48
 HUB     14.32      0.00    -0.02    584.11    -0.20    584.11      0.48

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     50.09     46.36      3.73   698.18    910.46     22.66    610.29      0.75
 MEAN    46.49     43.80      2.69   615.20    848.47     22.66    610.29      0.70
 HUB     41.64     37.84      3.80   519.11    781.58     22.66    610.29      0.65

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500        0.050        0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88    640.73    267.45    582.24   1234.78      0.52
 MEAN    16.57    657.25    292.14    588.76   1231.87      0.53
 HUB     13.89    713.49    391.16    596.71   1228.99      0.58
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   716.14   416.96     0.58  5053.40
 MEAN   600.81   664.77   308.68     0.54  4845.22     1.37
 HUB    503.52   607.19   112.36     0.49  5436.13

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.61     1.15    25.47   668.10     1.05   633.87     0.92     0.90
 MEAN    30.43     1.15    25.07   666.89     1.04   630.88     0.92     0.90
 HUB     30.93     1.16    24.61   670.33     1.05   627.89     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.67    35.61    31.50     4.11     0.93     0.26     2.90
 MEAN    26.39    27.67    23.50     4.17     0.91     0.27     3.29     0.90
 HUB     33.25    10.66     6.50     4.16     0.91     0.29     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.983

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     645.075     293.778     574.297    1234.552       0.523       0.060

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.601      25.401     633.740      46.000      27.092      32.400       5.308

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     598.703     293.778     666.896    1239.228       0.483       0.170

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.512      26.006     638.550     456.573       0.026       0.276

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     566.036       0.000     566.036    1242.303       0.456       0.171

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.361     641.723       0.000       0.060       0.046       0.234

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.845      30.398       1.144     668.442      29.703     286.693       2.222

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 185321.094       0.396    2185.352 1853300.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 2.953   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    208.672    4154.000      30.398     668.442       1.000       1.000       0.980
W Kg/sec =   94.85092

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    114.554    3659.257       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 160527.719  163737.922       1.527     509.668     333.705     390.276       1.170

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   523.91    -0.18   523.91     0.42   585.00
 MEAN    15.91     0.00    -0.02   523.91    -0.18   523.91     0.42
 HUB     13.07     0.00    -0.02   523.91    -0.18   523.91     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.74    47.36     4.38   664.11   846.03    26.91   645.57     0.68
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 MEAN    47.76    44.80     2.96   576.85   779.39    26.91   645.57     0.63
 HUB     42.14    38.84     3.30   473.79   706.50    26.91   645.57     0.57

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   591.76   271.76   525.67  1266.95     0.47
 MEAN    15.50   602.71   281.39   533.00  1263.08     0.48
 HUB     12.59   647.28   354.99   541.26  1259.27     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   647.80   378.57     0.51  4878.69
 MEAN   561.80   602.26   280.41     0.48  4363.75     1.41
 HUB    456.39   550.68   101.41     0.44  4471.63

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.65     1.14    29.84   696.77     1.04   667.59     0.92     0.90
 MEAN    34.19     1.12    29.25   693.78     1.04   663.51     0.92     0.90
 HUB     34.28     1.13    28.63   694.40     1.04   659.49     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.34    35.76    31.50     4.26     0.93     0.29     2.90
 MEAN    27.83    27.75    23.50     4.25     0.91     0.28     3.34     0.90
 HUB     33.26    10.61     6.50     4.11     0.91     0.28     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     609.401     286.550     537.828    1263.546       0.482      -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.272      29.227     664.034      46.000      28.048      33.000       4.952

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     567.171     286.550     635.448    1267.479       0.447       0.100

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      34.136      29.751     668.175     440.827       0.046       0.295

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     526.418       0.000     526.418    1270.997       0.414       0.217

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.340     671.889       0.000       0.060       0.045       0.214

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.851      34.144       1.123     694.983      26.541     294.190       2.281

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 165734.875       0.392    1954.386 1866601.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1073232.25  12655.8184    203.8517      2.2601      0.7998      2.9529      1.3293


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*******************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 110% Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    205.789    4154.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   93.54043

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    201.035    4137.640       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 158309.812  161475.672       1.420     831.557     585.458     619.754       1.059

     ROTOR LEADING EDGE CONDITIONS, STAGE           1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   507.18    -0.17   507.18     0.46   744.88
 MEAN    17.06     0.00    -0.02   507.18    -0.17   507.18     0.46
 HUB     12.51     0.00    -0.02   507.18    -0.17   507.18     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.86    50.47     5.39   747.85   903.75    13.05   501.33     0.82
 MEAN    50.65    47.20     3.45   618.44   799.95    13.05   501.33     0.73
 HUB     41.81    38.62     3.19   453.49   680.47    13.05   501.33     0.62

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   768.72   385.45   665.11  1119.08     0.69
 MEAN    18.04   815.01   444.50   683.13  1113.13     0.73
 HUB     15.00   955.06   616.73   729.23  1099.46     0.87

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    747.85   757.43   362.40     0.68  7955.34
 MEAN   653.81   714.47   209.32     0.64  8019.94     1.23
 HUB    543.76   732.87    72.97     0.67  9253.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.77     1.31    14.41   569.14     1.09   519.83     0.92     0.90
 MEAN    19.81     1.31    13.86   569.51     1.09   514.12     0.92     0.90
 HUB     20.62     1.36    12.60   576.69     1.10   500.75     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.09    28.59    24.20     4.39     0.93     0.24     2.90
 MEAN    33.05    17.04    12.70     4.34     0.92     0.19     3.51     0.90
 HUB     40.22    -5.71    -9.30     3.59     0.92     0.03     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     834.264     443.634     706.531    1111.793       0.750      -0.016

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.002      13.762     513.649      24.000      32.125      35.400       3.275

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     732.311     443.634     856.207    1126.138       0.650       0.204

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.858      14.941     526.989     528.796       0.032       0.381

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     18.083     664.602       0.000     664.602    1134.551       0.586       0.284

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.589     534.889       0.000       0.060       0.061       0.305

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.840      19.671       1.302     571.781      48.971     234.066       1.814

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 304886.438       0.545    3545.622 2132648.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    205.789    4154.000      19.671     571.781       1.000       1.000       0.980
W Kg/sec =   93.54043

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    161.458    3956.488       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 158309.812  161475.672       1.256     590.487     470.224     474.134       1.008

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   625.70    -0.22   625.70     0.55   709.51
 MEAN    18.08     0.00    -0.02   625.70    -0.22   625.70     0.55
 HUB     15.21     0.00    -0.02   625.70    -0.22   625.70     0.55

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.98    46.36     3.62   744.95   973.02    16.02   539.09     0.85
 MEAN    46.34    42.30     4.04   655.35   906.24    16.02   539.09     0.80
 HUB     41.40    37.84     3.56   551.37   834.12    16.02   539.09     0.73

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   680.71   306.47   607.81  1170.84     0.58
 MEAN    18.01   700.90   330.10   618.30  1166.62     0.60
 HUB     15.22   765.38   434.23   630.28  1162.57     0.66

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   746.72   433.76     0.64  6262.61
 MEAN   652.87   697.47   322.77     0.60  5949.00     1.40
 HUB    551.84   641.16   117.62     0.55  6613.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.94     1.22    19.04   608.22     1.06   569.55     0.92     0.91
 MEAN    23.71     1.21    18.57   606.40     1.06   565.40     0.92     0.91
 HUB     24.20     1.23    18.08   610.27     1.07   561.39     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.76    35.51    31.50     4.01     0.93     0.29     2.90
 MEAN    28.10    27.57    23.50     4.07     0.92     0.29     3.30     0.91
 HUB     34.56    10.57     6.50     4.07     0.92     0.30     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     821.716     331.027     752.089    1152.376       0.713      -0.289

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     23.895      17.019     551.924      46.000      23.756      30.600       6.844

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     756.768     331.027     826.000    1161.277       0.652      -0.135

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      23.734      17.837     560.483     455.853       0.040       0.222

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     750.507       0.000     750.507    1162.113       0.646       0.138

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      17.763     561.272       0.000       0.060       0.080      -0.149

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.823      23.519       1.196     608.297      36.516     272.875       2.115

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 227502.594       0.415    2645.700 1927383.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.948

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    205.789    4154.000      23.519     608.297       1.000       1.000       0.880
W Kg/sec =   93.54043

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    139.287    3835.896       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 158309.812  161475.672       1.207     489.817     405.683     384.470       0.948

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   683.77    -0.24   683.77     0.58   671.81
 MEAN    17.74     0.00    -0.02   683.77    -0.24   683.77     0.58
 HUB     15.05     0.00    -0.02   683.77    -0.24   683.77     0.58

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.79    46.36     0.43   727.55   998.61    18.66   569.28     0.85
 MEAN    43.25    43.40    -0.15   643.03   938.79    18.66   569.28     0.80
 HUB     38.60    38.84    -0.24   545.57   874.90    18.66   569.28     0.75

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   652.77   287.34   586.13  1207.38     0.54
 MEAN    17.51   671.11   313.46   593.41  1204.19     0.56
 HUB     14.85   732.29   415.88   602.74  1201.09     0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   727.40   430.78     0.60  5696.95
 MEAN   634.62   674.74   321.17     0.56  5491.70     1.49
 HUB    538.32   615.06   122.44     0.51  6179.30

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.63     1.17    22.64   641.42     1.05   605.88     0.92     0.87
 MEAN    27.47     1.17    22.24   640.23     1.05   602.66     0.92     0.87
 HUB     28.00     1.19    21.78   644.23     1.06   599.50     0.92     0.87

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.12    36.31    31.50     4.81     0.93     0.32     2.90
 MEAN    27.84    28.42    23.50     4.92     0.90     0.33     3.28     0.87
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 HUB     34.60    11.48     6.50     4.98     0.90     0.36     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.948

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     678.529     315.512     600.711    1204.936       0.563       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.646      22.288     603.544      46.000      27.710      31.500       3.790

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     613.948     315.512     690.275    1211.869       0.507       0.166

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.564      23.130     610.509     471.992       0.025       0.281

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     593.804       0.000     593.804    1213.882       0.489       0.188

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.319     612.539       0.000       0.060       0.042       0.200

    STAGE EXIT CONDITIONS, STAGE            3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.822      27.469       1.168     641.962      33.665     275.987       2.139

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 209892.750       0.407    2440.910 2125297.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    205.789    4154.000      27.469     641.962       1.000       1.000       0.980
W Kg/sec =   93.54043

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    122.516    3733.962       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 158309.812  161475.672       1.438     513.330     356.866     401.059       1.124

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   552.98    -0.19   552.98     0.45   627.57
 MEAN    16.97     0.00    -0.02   552.98    -0.19   552.98     0.45
 HUB     14.32     0.00    -0.02   552.98    -0.19   552.98     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.63    46.36     5.27   698.18   890.79    23.84   616.46     0.73
 MEAN    48.06    43.80     4.26   615.20   827.33    23.84   616.46     0.68
 HUB     43.20    37.84     5.36   519.11   758.59    23.84   616.46     0.62

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   620.90   292.80   547.52  1242.59     0.50
 MEAN    16.57   635.99   310.31   555.15  1238.90     0.51
 HUB     13.89   690.14   397.90   563.89  1235.27     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   673.16   391.61     0.54  5531.73
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 MEAN   600.81   626.56   290.50     0.51  5146.22     1.43
 HUB    503.52   573.69   105.62     0.46  5529.53

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.09     1.17    27.06   674.10     1.05   641.96     0.92     0.91
 MEAN    31.75     1.16    26.52   671.86     1.05   638.14     0.92     0.91
 HUB     32.09     1.17    25.96   674.09     1.05   634.38     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.14    35.57    31.50     4.07     0.93     0.30     2.90
 MEAN    29.20    27.62    23.50     4.12     0.92     0.30     3.29     0.91
 HUB     35.21    10.61     6.50     4.11     0.92     0.31     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     625.337     312.052     541.914    1241.354       0.504       0.058

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.923      26.841     640.742      46.000      29.935      32.400       2.465

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     561.122     312.052     642.055    1247.494       0.450       0.223

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.863      27.730     647.095     456.573       0.021       0.319

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     531.130       0.000     531.130    1250.125       0.425       0.222

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.055     649.827       0.000       0.060       0.039       0.282

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      31.766       1.156     673.352      31.390     267.604       2.074

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 195867.938       0.418    2277.811 1798075.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.996

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    205.789    4154.000      31.766     673.352       1.000       1.000       0.980
W Kg/sec =   93.54043

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    108.502    3645.889       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 158309.812  161475.672       1.612     509.668     316.079     390.276       1.235

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   492.73    -0.17   492.73     0.39   582.86
 MEAN    15.91     0.00    -0.02   492.73    -0.17   492.73     0.39
 HUB     13.07     0.00    -0.02   492.73    -0.17   492.73     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.43    47.36     6.07   664.11   827.07    28.55   653.12     0.66
 MEAN    49.51    44.80     4.71   576.85   758.77    28.55   653.12     0.61
 HUB     43.89    38.84     5.05   473.79   683.68    28.55   653.12     0.55
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      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   574.32   296.82   491.68  1275.64     0.45
MEAN    15.50   582.49   299.58   499.54  1271.16     0.46
HUB     12.59   623.77   361.73   508.17  1266.75     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    650.33   605.57   353.52     0.47  5328.00
MEAN   561.80   564.18   262.22     0.44  4645.46     1.47
HUB    456.39   516.92    94.67     0.41  4556.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     36.66     1.15    31.90   704.28     1.05   676.79     0.92     0.91
MEAN    36.01     1.13    31.18   700.32     1.04   672.04     0.92     0.91
HUB     35.92     1.13    30.43   699.80     1.04   667.38     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.12    35.72    31.50     4.22     0.93     0.33     2.90
MEAN    30.95    27.70    23.50     4.20     0.92     0.31     3.34     0.91
HUB     35.44    10.55     6.50     4.05     0.92     0.31     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      589.089     305.073     503.941    1271.612       0.463      -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.096      31.156      672.548      46.000      31.190      33.000       1.810

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      527.652     305.073     609.496    1277.006       0.413       0.168

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       36.008      32.014     678.265     440.827       0.037       0.341

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     491.060       0.000     491.060    1279.927       0.384       0.273

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       32.528     681.371       0.000       0.060       0.038       0.270

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      36.006       1.133     701.467      28.115     273.199       2.118

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  175593.828       0.415    2042.037 1811017.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1113743.50  12952.0801    201.0352      2.3834      0.8275      3.4529      1.3417


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 110% Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
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 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    202.905    4154.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   92.22959

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    198.218    4137.640       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 156091.328  159212.812       1.441     831.557     577.254     619.754       1.074

    ROTOR LEADING EDGE CONDITIONS, STAGE             1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   498.21    -0.17   498.21     0.45   744.88
MEAN    17.06     0.00    -0.02   498.21    -0.17   498.21     0.45
HUB     12.51     0.00    -0.02   498.21    -0.17   498.21     0.45

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.33    50.47     5.86   747.85   898.75    13.12   502.08     0.82
MEAN    51.15    47.20     3.95   618.44   794.29    13.12   502.08     0.72
HUB     42.32    38.62     3.70   453.49   673.81    13.12   502.08     0.61

     ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
TIP     20.63   759.20   394.15   648.86  1121.41     0.68
MEAN    18.04   804.48   449.27   667.34  1115.08     0.72
HUB     15.00   940.42   614.87   711.56  1101.53     0.85

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    747.85   739.00   353.69     0.66  8134.91
MEAN   653.81   697.98   204.54     0.63  8105.99     1.25
HUB    543.76   715.10    71.12     0.65  9225.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.90     1.32    14.64   570.18     1.09   522.09     0.92     0.91
MEAN    19.88     1.32    14.05   570.01     1.09   516.03     0.92     0.91
HUB     20.62     1.36    12.80   576.53     1.10   502.86     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.28    28.59    24.20     4.39     0.93     0.25     2.90
MEAN    33.95    17.04    12.70     4.34     0.92     0.20     3.51     0.91
HUB     40.83    -5.71    -9.30     3.59     0.92     0.04     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     821.996     448.398     688.924    1114.127       0.738      -0.013

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.072      13.974     515.808      24.000      33.059      35.400       2.341

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     710.612     448.398     840.256    1129.420       0.629       0.228

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.943      15.270     530.066     528.796       0.030       0.396

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     645.728       0.000     645.728    1137.226       0.568       0.305

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      15.895     537.416       0.000       0.060       0.055       0.327

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.851      19.786       1.310     572.242      49.432     230.360       1.786

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 307759.969       0.550    3528.884 2094922.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    202.905    4154.000      19.786     572.242       1.000       1.000       0.980
W Kg/sec =   92.22959

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    158.340    3954.891       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 156091.328  159212.812       1.280     590.487     461.142     474.134       1.028

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   608.92    -0.21   608.92     0.53   709.22
 MEAN    18.08     0.00    -0.02   608.92    -0.21   608.92     0.53
 HUB     15.21     0.00    -0.02   608.92    -0.21   608.92     0.53

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.75    46.36     4.39   744.95   962.31    16.30   541.29     0.84
 MEAN    47.11    42.30     4.81   655.35   894.73    16.30   541.29     0.78
 HUB     42.17    37.84     4.33   551.37   821.60    16.30   541.29     0.72

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   670.60   319.85   589.40  1174.07     0.57
 MEAN    18.01   689.97   339.63   600.60  1169.37     0.59
 HUB     15.22   753.37   437.72   613.16  1164.88     0.65

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   723.97   420.39     0.62  6535.55
 MEAN   652.87   677.37   313.24     0.58  6120.49     1.43
 HUB    551.84   623.69   114.12     0.54  6666.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.29     1.23    19.47   610.27     1.07   572.74     0.92     0.91
 MEAN    23.99     1.21    18.95   607.86     1.06   568.13     0.92     0.91
 HUB     24.39     1.23    18.41   611.04     1.07   563.67     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.49    35.50    31.50     4.00     0.93     0.30     2.90
 MEAN    29.49    27.54    23.50     4.04     0.92     0.30     3.30     0.91
 HUB     35.52    10.54     6.50     4.04     0.92     0.31     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     801.299     340.582     725.317    1156.746       0.693      -0.268

    Pt3        Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.171     17.532     556.116      46.000      25.153      30.600       5.447

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	725.517	340.582	801.480	1166.750	0.622	-0.080

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	24.041	18.518	565.776	455.853	0.035	0.247

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	717.388	0.000	717.388	1167.768	0.614	0.184

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	18.502	566.756	0.000	0.060	0.066	-0.083

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.845	23.876	1.207	609.723	37.481	263.974	2.046

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
233515.641	0.426	2677.573	1883930.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 3.953 EfDer = 0.964

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
202.905	4154.000	23.876	609.723	1.000	1.000	0.880

W Kg/sec = 92.22959

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
135.445	3831.407	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
156091.328	159212.812	1.242	489.817	394.491	384.470	0.975

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	656.71	-0.23	656.71	0.56	671.03
MEAN	17.74	0.00	-0.02	656.71	-0.23	656.71	0.56	
HUB	15.05	0.00	-0.02	656.71	-0.23	656.71	0.56	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.94	46.36	1.58	727.55	980.27	19.31	573.73	0.83
MEAN	44.41	43.40	1.01	643.03	919.27	19.31	573.73	0.78
HUB	39.73	38.84	0.89	545.57	853.91	19.31	573.73	0.73

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	639.52	306.02	561.55	1212.32	0.53
MEAN	17.51	656.88	326.94	569.74	1208.52	0.54
HUB	14.85	716.45	421.23	579.54	1204.84	0.59

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	718.12	696.54	412.10	0.57	6066.86	
MEAN	634.62	647.51	307.68	0.54	5727.57	1.52
HUB	538.32	591.25	117.09	0.49	6258.61	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	28.41	1.19	23.50	645.00	1.06	610.88	0.92	0.88
MEAN	28.14	1.18	23.01	643.03	1.05	607.03	0.92	0.88
HUB	28.56	1.20	22.48	646.12	1.06	603.29	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.59	36.27	31.50	4.77	0.93	0.34	2.90	
MEAN	29.85	28.37	23.50	4.87	0.91	0.35	3.28	0.88
HUB	36.01	11.42	6.50	4.92	0.91	0.37	3.87	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.964

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     663.766     329.083     576.446    1209.328       0.549       0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.316      23.068     607.949      46.000      29.721      31.500       1.779

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     586.195     329.083     672.250    1217.349       0.482       0.206

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.251      24.102     616.040     471.992       0.022       0.312

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     567.187       0.000     567.187    1219.155       0.465       0.226

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.281     617.870       0.000       0.060       0.038       0.239

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.845      28.167       1.180     644.715      34.992     262.736       2.037

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 218172.047       0.423    2501.637 2063649.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    202.905    4154.000      28.167     644.715       1.000       1.000       0.980
W Kg/sec =   92.22959

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.057    3725.983       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 156091.328  159212.812       1.493     513.330     343.879     401.059       1.166

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   529.17    -0.18   529.17     0.43   626.23
 MEAN    16.97     0.00    -0.02   529.17    -0.18   529.17     0.43
 HUB     14.32     0.00    -0.02   529.17    -0.18   529.17     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.85    46.36     6.49   698.18   876.20    24.76   621.36     0.72
 MEAN    49.31    43.80     5.51   615.20   811.61    24.76   621.36     0.66
 HUB     44.46    37.84     6.62   519.11   741.40    24.76   621.36     0.61

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   607.84   311.46   521.97  1248.49     0.49
 MEAN    16.57   621.21   323.82   530.13  1244.30     0.50
 HUB     13.89   673.18   402.93   539.27  1240.18     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   641.52   372.94     0.51  5883.96
 MEAN   600.81   598.13   276.99     0.48  5370.12     1.47
 HUB    503.52   548.57   100.59     0.44  5599.36
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     33.23     1.18    28.25   678.90     1.05   648.09     0.92     0.91
MEAN    32.76     1.16    27.63   675.91     1.05   643.73     0.92     0.91
HUB     32.97     1.17    26.98   677.25     1.05   639.46     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.82    35.55    31.50     4.05     0.93     0.33     2.90
MEAN    31.42    27.59    23.50     4.09     0.92     0.32     3.29     0.91
HUB     36.77    10.57     6.50     4.07     0.92     0.33     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     611.685     325.645     517.797    1246.581       0.491       0.056

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.933      27.931     646.150      46.000      32.166      32.400       0.234

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     533.862     325.645     625.343    1253.732       0.426       0.262

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      32.883      29.026     653.585     456.573       0.019       0.352

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096     505.850       0.000     505.850    1256.060       0.403       0.259

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.321     656.014       0.000       0.060       0.037       0.317

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.878      32.790       1.164     677.352      32.638     254.218       1.971

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 203674.938       0.435    2335.408 1751218.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    202.905    4154.000      32.790     677.352       1.000       1.000       0.980
W Kg/sec =   92.22959

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.949    3635.107       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 156091.328  159212.812       1.683     509.668     302.815     390.276       1.289

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   469.97    -0.16   469.97     0.37   581.14
 MEAN    15.91     0.00    -0.02   469.97    -0.16   469.97     0.37
 HUB     13.07     0.00    -0.02   469.97    -0.16   469.97     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.72    47.36     7.36   664.11   813.71    29.78   658.95     0.65
 MEAN    50.84    44.80     6.04   576.85   744.19    29.78   658.95     0.59
 HUB     45.24    38.84     6.40   473.79   667.46    29.78   658.95     0.53

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   563.57   314.50   467.66  1282.07     0.44
 MEAN    15.50   569.16   312.51   475.70  1277.22     0.45
 HUB     12.59   607.47   366.52   484.43  1272.43     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   575.75   335.83     0.45  5645.11
 MEAN   561.80   537.06   249.29     0.42  4845.67     1.52
 HUB    456.39   492.70    89.87     0.39  4616.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     38.15     1.16    33.40   710.12     1.05   683.65     0.92     0.91
 MEAN    37.35     1.14    32.59   705.48     1.04   678.48     0.92     0.91
 HUB     37.13     1.13    31.76   704.15     1.04   673.40     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.92    35.68    31.50     4.18     0.93     0.36     2.90
 MEAN    33.30    27.66    23.50     4.16     0.93     0.34     3.34     0.91
 HUB     37.11    10.51     6.50     4.01     0.93     0.33     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     575.775     318.236     479.836    1277.644       0.451      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     37.442      32.570     678.955      46.000      33.553      33.000      -0.553

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     500.417     318.236     593.036    1283.987       0.390       0.215

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      37.366      33.648     685.713     440.827       0.035       0.376

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     466.456       0.000     466.456    1286.546       0.363       0.312

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      34.114     688.449       0.000       0.060       0.037       0.309

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      37.360       1.139     706.580      29.228     259.127       2.009

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  182573.953       0.432    2093.457 1764545.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1145696.62  13136.9590    198.2180      2.4730      0.8433      3.9532      1.3515


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 110% Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 4.476   EfDer =  0.995
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   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    199.897    4154.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   90.86214

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    195.279    4137.640       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 153777.031  156852.234       1.462     831.557     568.695     619.754       1.090

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   488.97    -0.17   488.97     0.44   744.88
MEAN    17.06     0.00    -0.02   488.97    -0.17   488.97     0.44
HUB     12.51     0.00    -0.02   488.97    -0.17   488.97     0.44

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.83    50.47     6.36   747.85   893.66    13.19   502.84     0.81
MEAN    51.68    47.20     4.48   618.44   788.52    13.19   502.84     0.72
HUB     42.85    38.62     4.23   453.49   667.01    13.19   502.84     0.61

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   750.10   402.82   632.76  1123.66     0.67
MEAN    18.04   794.18   454.08   651.57  1116.99     0.71
HUB     15.00   925.98   613.05   693.99  1103.56     0.84

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    747.85   720.71   345.03     0.64  8313.69
MEAN   653.81   681.49   199.74     0.61  8192.65     1.28
HUB    543.76   697.44    69.29     0.63  9197.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.03     1.33    14.85   571.22     1.09   524.27     0.92     0.91
MEAN    19.95     1.32    14.24   570.52     1.09   517.90     0.92     0.91
HUB     20.62     1.36    12.99   576.37     1.10   504.92     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.48    28.60    24.20     4.40     0.93     0.27     2.90
MEAN    34.87    17.04    12.70     4.34     0.92     0.22     3.51     0.91
HUB     41.46    -5.70    -9.30     3.60     0.92     0.06     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     810.206     453.197     671.600    1116.359       0.726      -0.010

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.140      14.179     517.877      24.000      34.012      35.400       1.388

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     689.863     453.197     825.408    1132.494       0.609       0.251

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.023      15.580     532.955     528.796       0.029       0.412

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     627.747       0.000     627.747    1139.735       0.551       0.324

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.179     539.791       0.000       0.060       0.051       0.348
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    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.860     19.888       1.316     572.704     49.894     226.629       1.757

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 310635.781       0.555    3509.049 2056097.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 4.476   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    199.897    4154.000      19.888     572.704       1.000       1.000       0.980
W Kg/sec =   90.86214

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    155.253    3953.296       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
153777.031  156852.234       1.306     590.487     452.151     474.134       1.049

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   592.81    -0.20   592.81     0.52   708.93
MEAN    18.08     0.00    -0.02   592.81    -0.20   592.81     0.52
HUB     15.21     0.00    -0.02   592.81    -0.20   592.81     0.52

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.50    46.36     5.14   744.95   952.19    16.55   543.36     0.83
MEAN    47.88    42.30     5.58   655.35   883.84    16.55   543.36     0.77
HUB     42.94    37.84     5.10   551.37   809.72    16.55   543.36     0.71

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   661.71   332.35   572.19  1177.04     0.56
MEAN    18.01   680.06   348.63   583.89  1171.94     0.58
HUB     15.22   742.17   441.05   596.90  1167.04     0.64

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    740.23   702.69   407.89     0.60  6790.78
MEAN   652.87   658.40   304.24     0.56  6282.47     1.45
HUB    551.84   607.10   110.79     0.52  6717.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.62     1.24    19.86   612.22     1.07   575.67     0.92     0.91
MEAN    24.24     1.22    19.29   609.26     1.06   570.66     0.92     0.91
HUB     24.56     1.23    18.70   611.79     1.07   565.82     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.15    35.48    31.50     3.98     0.93     0.32     2.90
MEAN    30.84    27.52    23.50     4.02     0.92     0.31     3.30     0.91
HUB     36.46    10.52     6.50     4.02     0.92     0.32     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     783.358     349.607     701.017    1160.632       0.675      -0.250

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.420      17.991     559.858      46.000      26.506      30.600       4.094

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     697.949     349.607     780.614    1171.530       0.596      -0.032
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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      24.313      19.120     570.421     455.853       0.031       0.270

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     688.921       0.000     688.921    1172.607       0.588       0.221

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      19.139     571.467       0.000       0.060       0.056      -0.028

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.860      24.183       1.216     611.092      38.387     255.828       1.983

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 239168.406       0.436    2701.729 1840968.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 4.476   EfDer =  0.977

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    199.897    4154.000      24.183     611.092       1.000       1.000       0.880
W Kg/sec =   90.86214

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    131.888    3827.114       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 153777.031  156852.234       1.275     489.817     384.133     384.470       1.001

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   632.92    -0.22   632.92     0.54   670.28
 MEAN    17.74     0.00    -0.02   632.92    -0.22   632.92     0.54
 HUB     15.05     0.00    -0.02   632.92    -0.22   632.92     0.54

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.99    46.36     2.63   727.55   964.49    19.87   577.66     0.82
 MEAN    45.46    43.40     2.06   643.03   902.42    19.87   577.66     0.77
 HUB     40.77    38.84     1.93   545.57   835.75    19.87   577.66     0.71

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   629.05   322.22   540.26  1216.60     0.52
 MEAN    17.51   645.14   338.71   549.07  1212.31     0.53
 HUB     14.85   702.94   425.92   559.21  1208.16     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   669.79   395.90     0.55  6387.59
 MEAN   634.62   623.73   295.91     0.51  5933.46     1.55
 HUB    538.32   570.40   112.40     0.47  6328.13

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.09     1.20    24.24   648.23     1.06   615.22     0.92     0.89
 MEAN    28.72     1.19    23.68   645.59     1.06   610.87     0.92     0.89
 HUB     29.04     1.20    23.08   647.89     1.06   606.66     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.81    36.23    31.50     4.73     0.93     0.36     2.90
 MEAN    31.67    28.32    23.50     4.82     0.91     0.37     3.28     0.89
 HUB     37.29    11.37     6.50     4.87     0.91     0.38     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.977
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     651.645     340.930     555.345    1213.154       0.537       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.895      23.739     611.802      46.000      31.546      31.500      -0.046

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     562.581     340.930     657.822    1222.069       0.460       0.240

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.837      24.934     620.827     471.992       0.021       0.340

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     544.697       0.000     544.697    1223.694       0.445       0.257

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.095     622.479       0.000       0.060       0.037       0.271

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.860      28.755       1.189     647.237      36.146     251.724       1.951

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 225376.359       0.437    2545.929 2006618.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 4.476   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    199.897    4154.000      28.755     647.237       1.000       1.000       0.980
W Kg/sec =   90.86214

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    114.153    3718.715       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 153777.031  156852.234       1.544     513.330     332.509     401.059       1.206

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   508.91    -0.18   508.91     0.41   625.01
 MEAN    16.97     0.00    -0.02   508.91    -0.18   508.91     0.41
 HUB     14.32     0.00    -0.02   508.91    -0.18   508.91     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.92    46.36     7.56   698.18   864.11    25.54   625.64     0.70
 MEAN    50.41    43.80     6.61   615.20   798.54    25.54   625.64     0.65
 HUB     45.58    37.84     7.74   519.11   727.08    25.54   625.64     0.59

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   598.08   326.92   500.82  1253.47     0.48
 MEAN    16.57   609.60   335.08   509.25  1248.90     0.49
 HUB     13.89   659.32   407.12   518.61  1244.41     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   615.32   357.49     0.49  6175.67
 MEAN   600.81   574.41   265.73     0.46  5556.54     1.51
 HUB    503.52   527.49    96.40     0.42  5657.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.18     1.19    29.24   683.11     1.06   653.29     0.92     0.91
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 MEAN    33.60     1.17    28.55   679.52     1.05   648.53     0.92     0.91
 HUB     33.70     1.17    27.83   680.10     1.05   643.85     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.14    35.52    31.50     4.02     0.93     0.35     2.90
 MEAN    33.34    27.56    23.50     4.06     0.93     0.34     3.29     0.91
 HUB     38.13    10.53     6.50     4.03     0.93     0.35     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     601.003     336.964     497.655    1251.044       0.480       0.054

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.773      28.836     650.789      46.000      34.102      32.400      -1.702

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     511.489     336.964     612.508    1259.000       0.406       0.295

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.724      30.098     659.093     456.573       0.019       0.381

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     485.137       0.000     485.137    1261.090       0.385       0.289

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.362     661.284       0.000       0.060       0.038       0.345

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      33.628       1.169     680.910      33.673     243.517       1.888

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 210153.547       0.449    2373.967 1707574.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 4.476   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    199.897    4154.000      33.628     680.910       1.000       1.000       0.980
W Kg/sec =   90.86214

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    100.118    3625.598       1.401       0.250      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 153777.031  156852.234       1.747     509.668     291.659     390.276       1.338

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   451.22    -0.16   451.22     0.36   579.62
 MEAN    15.91     0.00    -0.02   451.22    -0.16   451.22     0.36
 HUB     13.07     0.00    -0.02   451.22    -0.16   451.22     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.81    47.36     8.45   664.11   803.03    30.79   663.94     0.64
 MEAN    51.97    44.80     7.17   576.85   732.49    30.79   663.94     0.58
 HUB     46.41    38.84     7.57   473.79   654.39    30.79   663.94     0.52

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     17.94   555.91   328.72   448.31  1287.43     0.43
 MEAN    15.50   559.08   322.96   456.37  1282.31     0.44
 HUB     12.59   594.55   370.38   465.10  1277.25     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   551.74   321.61     0.43  5900.07
 MEAN   561.80   515.09   238.84     0.40  5007.50     1.56
 HUB    456.39   472.98    86.01     0.37  4665.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     39.35     1.17    34.62   715.15     1.05   689.40     0.92     0.91
 MEAN    38.44     1.14    33.74   709.97     1.04   683.92     0.92     0.91
 HUB     38.10     1.13    32.84   707.98     1.04   678.53     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.25    35.66    31.50     4.16     0.93     0.38     2.90
 MEAN    35.29    27.63    23.50     4.13     0.93     0.36     3.34     0.91
 HUB     38.53    10.48     6.50     3.98     0.93     0.35     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     565.738     328.877     460.326    1282.711       0.441      -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     38.534      33.714     684.365      46.000      35.544      33.000      -2.544

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     478.801     328.877     580.870    1289.783       0.371       0.251

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      38.452      34.960     691.931     440.827       0.037       0.406

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     446.827       0.000     446.827    1292.079       0.346       0.342

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      35.388     694.397       0.000       0.060       0.039       0.338

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.882      38.442       1.143     711.034      30.124     248.196       1.924

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188196.438       0.445    2125.932 1721493.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1173530.50  13256.6055    195.2791      2.5446      0.8530      4.4756      1.3600


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

   Fan-Core + 4 Stage LPC 110% Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 4.994   EfDer =  0.997

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    196.913    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   89.50601
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
192.365	4137.640	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
151481.891	154511.203	1.484	831.557	560.207	619.754	1.106

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	479.94	-0.17	479.94	0.44	744.88
MEAN	17.06	0.00	-0.02	479.94	-0.17	479.94	0.44	
HUB	12.51	0.00	-0.02	479.94	-0.17	479.94	0.44	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.32	50.47	6.85	747.85	888.74	13.26	503.57	0.81
MEAN	52.19	47.20	4.99	618.44	782.95	13.26	503.57	0.71
HUB	43.39	38.62	4.77	453.49	660.41	13.26	503.57	0.60

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	741.83	411.04	617.54	1125.75	0.66
MEAN	18.04	784.60	458.66	636.57	1118.77	0.70
HUB	15.00	912.42	611.33	677.34	1105.46	0.83

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	747.85	703.42	336.81	0.62	8483.07	
MEAN	653.81	665.81	195.15	0.60	8275.29	1.30
HUB	543.76	680.70	67.57	0.62	9172.02	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.16	1.33	15.05	572.21	1.09	526.28	0.92	0.91
MEAN	20.02	1.33	14.41	571.00	1.09	519.63	0.92	0.91
HUB	20.61	1.36	13.18	576.22	1.10	506.82	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.65	28.61	24.20	4.41	0.93	0.29	2.90	
MEAN	35.77	17.04	12.70	4.34	0.92	0.24	3.51	0.91
HUB	42.07	-5.70	-9.30	3.60	0.92	0.07	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	799.372	457.773	655.317	1118.400	0.715	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.202	14.367	519.772	24.000	34.936	35.400	0.464

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	670.832	457.773	812.140	1135.255	0.591	0.272

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.093	15.860	535.557	528.796	0.028	0.426

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	611.280	0.000	611.280	1141.995	0.535	0.341

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.431	541.934	0.000	0.060	0.048	0.367

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.866	19.975	1.322	573.144	50.334	223.054	1.729

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 313369.875       0.560    3487.100 2018101.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 4.994   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    196.913    4154.000      19.975     573.144       1.000       1.000       0.980
W Kg/sec =   89.50601

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    152.328    3951.781       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 151481.891  154511.203       1.331     590.487     443.634     474.134       1.069

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   577.95    -0.20   577.95     0.50   708.66
 MEAN    18.08     0.00    -0.02   577.95    -0.20   577.95     0.50
 HUB     15.21     0.00    -0.02   577.95    -0.20   577.95     0.50

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.20    46.36     5.84   744.95   943.01    16.78   545.26     0.82
 MEAN    48.60    42.30     6.30   655.35   873.94    16.78   545.26     0.76
 HUB     43.66    37.84     5.82   551.37   798.91    16.78   545.26     0.70

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   654.21   343.63   556.69  1179.68     0.55
 MEAN    18.01   671.38   356.78   568.74  1174.24     0.57
 HUB     15.22   732.11   444.07   582.06  1169.00     0.63

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   683.52   396.60     0.58  7021.06
 MEAN   652.87   641.20   296.09     0.55  6429.14     1.48
 HUB    551.84   591.95   107.77     0.51  6763.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.90     1.25    20.20   614.00     1.07   578.27     0.92     0.91
 MEAN    24.45     1.22    19.59   610.55     1.07   572.93     0.92     0.91
 HUB     24.70     1.24    18.96   612.50     1.07   567.76     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.69    35.47    31.50     3.97     0.93     0.34     2.90
 MEAN    32.10    27.50    23.50     4.00     0.93     0.33     3.30     0.91
 HUB     37.34    10.49     6.50     3.99     0.93     0.33     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     768.033     357.779     679.610    1163.990       0.660      -0.235

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.635      18.387     563.102      46.000      27.764      30.600       2.836

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     674.194     357.779     763.245    1175.611       0.573       0.010

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      24.544      19.634     574.401     455.853       0.028       0.290
```

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	664.815	0.000	664.815	1176.686	0.565	0.252

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	19.674	575.450	0.000	0.060	0.049	0.018

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.870	24.438	1.223	612.351	39.207	248.629	1.927

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
244279.094	0.446	2718.276	1800285.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 4.994 EfDer = 0.986

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
196.913	4154.000	24.438	612.351	1.000	1.000	0.880

W Kg/sec = 89.50601

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
128.698	3823.178	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
151481.891	154511.203	1.307	489.817	374.840	384.470	1.026

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	612.44	-0.21	612.44	0.52	669.59
MEAN	17.74	0.00	-0.02	612.44	-0.21	612.44	0.52	
HUB	15.05	0.00	-0.02	612.44	-0.21	612.44	0.52	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.92	46.36	3.56	727.55	951.16	20.35	581.05	0.80
MEAN	46.41	43.40	3.01	643.03	888.17	20.35	581.05	0.75
HUB	41.71	38.84	2.87	545.57	820.34	20.35	581.05	0.69

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	620.94	335.97	522.19	1220.22	0.51
MEAN	17.51	635.63	348.74	531.42	1215.55	0.52
HUB	14.85	691.63	429.89	541.80	1211.04	0.57

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	718.12	647.09	382.15	0.53	6659.78	
MEAN	634.62	603.43	285.88	0.50	6109.06	1.58
HUB	538.32	552.54	108.43	0.46	6387.09	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	29.66	1.21	24.85	651.07	1.06	618.90	0.92	0.90
MEAN	29.20	1.19	24.23	647.87	1.06	614.16	0.92	0.90
HUB	29.43	1.20	23.59	649.49	1.06	609.58	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.76	36.20	31.50	4.70	0.93	0.38	2.90	
MEAN	33.28	28.28	23.50	4.78	0.91	0.38	3.28	0.90
HUB	38.43	11.32	6.50	4.82	0.91	0.39	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.986

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

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     17.392     641.875     351.033     537.382    1216.416       0.528       0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.377      24.297     615.097      46.000      33.154      31.500      -1.654

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     542.801     351.033     646.419    1226.062       0.443       0.269

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.318      25.623     624.891     471.992       0.021       0.364

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     525.900       0.000     525.900    1227.539       0.428       0.282

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.765     626.398       0.000       0.060       0.038       0.296

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4           PR4       Texit        Del T       Ns        Ns nondim
      0.869      29.233       1.196     649.477      37.126     242.688       1.881

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 231500.328       0.449    2576.077 1955099.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 4.994   EfDer =  0.999

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    196.913     4154.000       29.233     649.477       1.000        1.000        0.980
W Kg/sec =   89.50601

   W cor       RPM cor         GAMMA        Cp          R           Blades       THK
    110.800     3712.297        1.401       0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 151481.891  154511.203        1.591     513.330     322.741     401.059       1.243

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   491.89    -0.17   491.89      0.40   623.93
 MEAN    16.97      0.00    -0.02   491.89    -0.17   491.89      0.40
 HUB     14.32      0.00    -0.02   491.89    -0.17   491.89      0.40

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     54.84     46.36      8.48   698.18   854.20     26.18   629.30      0.69
 MEAN    51.36     43.80      7.56   615.20   787.80     26.18   629.30      0.64
 HUB     46.55     37.84      8.71   519.11   715.26     26.18   629.30      0.58

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2       Cm2     Ao2          Mach2
 TIP     18.88   590.79    339.63    483.41  1257.63      0.47
 MEAN    16.57   600.53    344.39    491.96  1252.78      0.48
 HUB     13.89   648.06    410.57    501.42  1248.01      0.52

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    684.41    593.76    344.78      0.47  6415.56
 MEAN   600.81    554.77    256.42      0.44  5710.82      1.55
 HUB    503.52    509.96     92.95      0.41  5705.19

         Pt2        PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     34.95      1.20     30.04    686.74      1.06    657.64      0.92      0.91
 MEAN    34.29      1.17     29.29    682.65      1.05    652.58      0.92      0.91
 HUB     34.28      1.17     28.52    682.62      1.05    647.60      0.92      0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.09    35.50    31.50     4.00     0.93     0.37     2.90
 MEAN    34.99    27.53    23.50     4.03     0.93     0.36     3.29     0.91
 HUB     39.31    10.50     6.50     4.00     0.93     0.36     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     592.683     346.331     480.965    1254.802       0.472       0.053

     Pt3          Ps3         Ts3          Vane No.     Alpha3     Vane A3      Incid3
     34.453      29.569     654.711      46.000      35.757      32.400      -3.357

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     493.180     346.331     602.637    1263.407       0.390       0.322

   BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.950      34.399      30.965     663.721     456.573       0.020       0.407

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     468.209       0.000     468.209    1265.311       0.370       0.312

   Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      31.198     665.723       0.000       0.060       0.040       0.366

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.880      34.294       1.173     684.003      34.526     234.945       1.821

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 215495.344       0.460    2397.978 1667802.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 4.994   EfDer =  0.998

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    196.913    4154.000       34.294     684.003       1.000        1.000       0.980
W Kg/sec =   89.50601

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     96.926    3617.391        1.401       0.250      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 151481.891  154511.203        1.805     509.668     282.362     390.276       1.382

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   435.85    -0.15   435.85      0.34   578.30
 MEAN    15.91      0.00    -0.02   435.85    -0.15   435.85      0.34
 HUB     13.07      0.00    -0.02   435.85    -0.15   435.85      0.34

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     56.73    47.36     9.37   664.11   794.48    31.60   668.18      0.63
 MEAN    52.93    44.80     8.13   576.85   723.12    31.60   668.18      0.57
 HUB     47.40    38.84     8.56   473.79   643.88    31.60   668.18      0.51

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   550.40   340.16   432.70  1291.88      0.43
 MEAN    15.50   551.38   331.38   440.69  1286.56      0.43
 HUB     12.59   584.31   373.49   449.35  1281.29      0.46
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   532.39   310.17     0.41  6105.23
 MEAN   561.80   497.30   230.42     0.39  5137.97     1.60
 HUB    456.39   456.93    82.90     0.36  4704.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     40.31     1.18    35.58   719.43     1.05   694.19     0.92     0.91
 MEAN    39.31     1.15    34.64   713.82     1.04   688.49     0.92     0.91
 HUB     38.87     1.13    33.70   711.30     1.04   682.85     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.17    35.63    31.50     4.13     0.93     0.40     2.90
 MEAN    36.94    27.60    23.50     4.10     0.93     0.38     3.34     0.91
 HUB     39.73    10.45     6.50     3.95     0.93     0.36     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     558.096     337.455     444.517    1286.936       0.434      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     39.397      34.619     688.896      46.000      37.204      33.000      -4.204

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     461.519     337.455     571.731    1294.577       0.357       0.279

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      39.302      35.995     697.101     440.827       0.040       0.432

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     431.082       0.000     431.082    1296.678       0.332       0.365

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      36.392     699.365       0.000       0.060       0.043       0.361

    STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.879      39.287       1.146     714.848      30.845     239.618       1.858

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  192725.359       0.456    2144.599 1682309.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1197370.00  13324.0293    192.3645      2.6006      0.8583      4.9942      1.3673



**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 110% Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.506   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     193.974    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   88.17013

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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   189.493    4137.640       1.402       0.249      53.349      32.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
149221.016  152205.109       1.507     831.557     551.846     619.754       1.123

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   471.15    -0.16   471.15     0.43   744.88
MEAN    17.06     0.00    -0.02   471.15    -0.16   471.15     0.43
HUB     12.51     0.00    -0.02   471.15    -0.16   471.15     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.79    50.47     7.32   747.85   884.02    13.32   504.27     0.80
MEAN    52.71    47.20     5.51   618.44   777.59    13.32   504.27     0.71
HUB     43.92    38.62     5.30   453.49   654.05    13.32   504.27     0.59

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   734.34   418.81   603.21  1127.67     0.65
MEAN    18.04   775.71   463.02   622.36  1120.42     0.69
HUB     15.00   899.72   609.72   661.62  1107.23     0.81

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    747.85   687.11   329.04     0.61  8643.35
MEAN   653.81   650.95   190.79     0.58  8353.89     1.32
HUB    543.76   664.90    65.96     0.60  9147.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.27     1.34    15.24   573.14     1.10   528.13     0.92     0.91
MEAN    20.08     1.33    14.57   571.46     1.09   521.24     0.92     0.91
HUB     20.61     1.36    13.34   576.08     1.10   508.58     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.77    28.61    24.20     4.41     0.93     0.30     2.90
MEAN    36.65    17.04    12.70     4.34     0.92     0.25     3.51     0.91
HUB     42.66    -5.69    -9.30     3.61     0.92     0.09     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     789.432     462.125     640.034    1120.266       0.705      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.259      14.539     521.508      24.000      35.830      35.400      -0.430

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     653.324     462.125     800.244    1137.746       0.574       0.291

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.154      16.113     537.910     528.796       0.028       0.440

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     596.127       0.000     596.127    1144.042       0.521       0.357

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.657     543.879       0.000       0.060       0.045       0.383

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      20.049       1.327     573.560      50.750     219.640       1.703

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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315964.094       0.565    3463.492 1981140.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.506   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    193.974    4154.000      20.049     573.560       1.000       1.000       0.980
W Kg/sec =   88.17013

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    149.557    3950.345       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149221.016  152205.109       1.356     590.487     435.561     474.134       1.089

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   564.21    -0.19   564.21     0.49   708.40
 MEAN    18.08     0.00    -0.02   564.21    -0.19   564.21     0.49
 HUB     15.21     0.00    -0.02   564.21    -0.19   564.21     0.49

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.87    46.36     6.51   744.95   934.65    16.99   546.98     0.81
 MEAN    49.28    42.30     6.98   655.35   864.91    16.99   546.98     0.75
 HUB     44.35    37.84     6.51   551.37   789.03    16.99   546.98     0.69

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   647.82   353.87   542.63  1182.03     0.55
 MEAN    18.01   663.75   364.21   554.90  1176.31     0.56
 HUB     15.22   723.03   446.82   568.44  1170.78     0.62

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   666.13   386.37     0.56  7229.98
 MEAN   652.87   625.49   288.66     0.53  6562.96     1.50
 HUB    551.84   578.06   105.02     0.49  6804.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.15     1.25    20.50   615.63     1.07   580.60     0.92     0.91
 MEAN    24.64     1.23    19.85   611.75     1.07   574.97     0.92     0.91
 HUB     24.82     1.24    19.19   613.16     1.07   569.52     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.11    35.45    31.50     3.95     0.93     0.35     2.90
 MEAN    33.28    27.48    23.50     3.98     0.93     0.34     3.30     0.91
 HUB     38.17    10.47     6.50     3.97     0.93     0.34     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     754.774     365.235     660.521    1166.930       0.647      -0.223

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.821      18.730     565.950      46.000      28.940      30.600       1.660

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     653.369     365.235     748.523    1179.157       0.554       0.046

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      24.741      20.078     577.872     455.853       0.026       0.309

   VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	643.924	0.000	643.924	1180.202	0.546	0.278

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	20.129	578.895	0.000	0.060	0.044	0.056

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.876	24.650	1.230	613.513	39.953	242.207	1.878

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
248926.688	0.454	2728.650	1761746.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 5.506 EfDer = 0.992

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
193.974	4154.000	24.650	613.513	1.000	1.000	0.880

W Kg/sec = 88.17013

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
125.804	3819.555	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
149221.016	152205.109	1.337	489.817	366.412	384.470	1.049

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	594.47	-0.20	594.47	0.50	668.95
MEAN	17.74	0.00	-0.02	594.47	-0.20	594.47	0.50	
HUB	15.05	0.00	-0.02	594.47	-0.20	594.47	0.50	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.76	46.36	4.40	727.55	939.69	20.76	584.02	0.79
MEAN	47.26	43.40	3.86	643.03	875.87	20.76	584.02	0.74
HUB	42.55	38.84	3.71	545.57	807.01	20.76	584.02	0.68

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	614.51	347.88	506.56	1223.36	0.50
MEAN	17.51	627.77	357.47	516.06	1218.38	0.52
HUB	14.85	682.00	433.38	526.60	1213.56	0.56

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	718.12	627.44	370.24	0.51	6895.56	
MEAN	634.62	585.77	277.15	0.48	6261.71	1.61
HUB	538.32	536.95	104.94	0.44	6438.81	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.14	1.22	25.37	653.60	1.07	622.10	0.92	0.91
MEAN	29.60	1.20	24.70	649.92	1.06	617.04	0.92	0.91
HUB	29.75	1.21	24.01	650.95	1.06	612.14	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.48	36.16	31.50	4.66	0.93	0.40	2.90	
MEAN	34.71	28.24	23.50	4.74	0.92	0.39	3.28	0.91
HUB	39.45	11.27	6.50	4.77	0.92	0.40	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	633.814	359.816	521.779	1219.250	0.520	0.014

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.780      24.765     617.969      46.000      34.590      31.500      -3.090

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     525.831     359.816     637.155    1229.516       0.428       0.294

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.717      26.202     628.418     471.992       0.022       0.386

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     509.802       0.000     509.802    1230.870       0.414       0.303

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.324     629.804       0.000       0.060       0.040       0.318

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      29.626       1.202     651.491      37.978     235.062       1.822

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 236819.469       0.459    2595.935 1907903.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.506   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    193.974    4154.000      29.626     651.491       1.000       1.000       0.980
W Kg/sec =   88.17013

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    107.865    3706.555       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149221.016  152205.109       1.634     513.330     314.194     401.059       1.276

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   477.25    -0.16   477.25     0.39   622.96
 MEAN    16.97     0.00    -0.02   477.25    -0.16   477.25     0.39
 HUB     14.32     0.00    -0.02   477.25    -0.16   477.25     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.65    46.36     9.29   698.18   845.85    26.72   632.50     0.69
 MEAN    52.20    43.80     8.40   615.20   778.74    26.72   632.50     0.63
 HUB     47.41    37.84     9.57   519.11   705.27    26.72   632.50     0.57

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   585.15   350.35   468.68  1261.19     0.46
 MEAN    16.57   593.18   352.25   477.26  1256.13     0.47
 HUB     13.89   638.66   413.50   486.73  1251.12     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   575.55   334.06     0.46  6617.73
 MEAN   600.81   538.10   248.56     0.43  5841.00     1.58
 HUB    503.52   494.99    90.02     0.40  5745.83

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     35.58     1.20    30.70   689.93     1.06   661.38     0.92     0.91
 MEAN    34.84     1.18    29.91   685.42     1.05   656.08     0.92     0.91
 HUB     34.75     1.17    29.09   684.86     1.05   650.85     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.78    35.48    31.50     3.98     0.93     0.39     2.90
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 MEAN    36.43    27.51    23.50     4.01     0.93     0.38     3.29     0.91
 HUB     40.35    10.48     6.50     3.98     0.93     0.37     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     585.959     354.235     466.761    1258.045       0.466        0.051

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     35.008      30.169     658.107      46.000      37.196      32.400      -4.796

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     477.745     354.235     594.746    1267.186       0.377        0.345

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      34.946      31.678     667.705     456.573       0.022        0.429

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096     453.949       0.000     453.949    1268.939       0.358        0.331

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      31.880     669.554       0.000       0.060       0.044        0.384

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.876       34.831       1.176     686.737      35.246     227.858        1.766

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 220002.641       0.470    2411.595 1631053.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.506   EfDer =  0.996

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    193.974     4154.000       34.831     686.737       1.000        1.000        0.980
W Kg/sec =   88.17013

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     94.197     3610.183        1.401       0.250      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 149221.016  152205.109        1.857     509.668     274.413     390.276        1.422

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   422.86    -0.15   422.86      0.33   577.15
 MEAN    15.91      0.00    -0.02   422.86    -0.15   422.86      0.33
 HUB     13.07      0.00    -0.02   422.86    -0.15   422.86      0.33

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     57.52     47.36    10.16   664.11   787.43     32.26   671.84      0.62
 MEAN    53.76     44.80     8.96   576.85   715.36     32.26   671.84      0.56
 HUB     48.26     38.84     9.42   473.79   635.16     32.26   671.84      0.50

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   546.26    349.68    419.67   1295.67      0.42
 MEAN    15.50   545.28    338.41    427.56   1290.20      0.42
 HUB     12.59   575.88    376.08    436.12   1284.77      0.45

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
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  TIP    650.33   516.25   300.65     0.40  6275.91
  MEAN   561.80   482.40   223.39     0.37  5246.81     1.64
  HUB    456.39   443.45    80.31     0.35  4736.75

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     41.08     1.18    36.35   723.15     1.05   698.29     0.92     0.91
  MEAN    40.00     1.15    35.38   717.18     1.04   692.41     0.92     0.91
  HUB     39.48     1.13    34.39   714.22     1.04   686.59     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     39.80    35.62    31.50     4.12     0.93     0.42     2.90
  MEAN    38.36    27.59    23.50     4.09     0.93     0.40     3.34     0.91
  HUB     40.77    10.43     6.50     3.93     0.93     0.37     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.996

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     552.050     344.612     431.279    1290.555       0.428      -0.006

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      40.088      35.348     692.791      46.000      38.626      33.000      -5.626

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     447.184     344.612     564.563    1298.661       0.344       0.302

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      39.976      36.827     701.522     440.827       0.043       0.454

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     417.992       0.000     417.992    1300.607       0.321       0.384

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      37.197     703.626       0.000       0.060       0.047       0.379

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.875      39.957       1.147     718.183      31.445     232.615       1.803

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  196496.297       0.465    2153.926 1646087.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1218209.12  13353.5986    189.4935      2.6449      0.8607      5.5058      1.3737


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 110% Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 6.011   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     191.079    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   86.85419

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     186.665    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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146993.875  149933.438       1.530     831.557     543.610     619.754       1.140

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   462.59    -0.16   462.59     0.42   744.88
MEAN    17.06     0.00    -0.02   462.59    -0.16   462.59     0.42
HUB     12.51     0.00    -0.02   462.59    -0.16   462.59     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.27    50.47     7.80   747.85   879.49    13.38   504.94     0.80
MEAN    53.21    47.20     6.01   618.44   772.43    13.38   504.94     0.70
HUB     44.44    38.62     5.82   453.49   647.91    13.38   504.94     0.59

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   727.54   426.16   589.66  1129.45     0.64
MEAN    18.04   767.44   467.17   608.86  1121.97     0.68
HUB     15.00   887.80   608.21   646.73  1108.87     0.80

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    747.85   671.70   321.68     0.59  8795.07
MEAN   653.81   636.82   186.64     0.57  8428.69     1.35
HUB    543.76   649.94    64.45     0.59  9125.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.38     1.35    15.41   574.03     1.10   529.84     0.92     0.91
MEAN    20.13     1.33    14.72   571.89     1.09   522.73     0.92     0.91
HUB     20.60     1.36    13.50   575.95     1.10   510.21     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.86    28.61    24.20     4.41     0.93     0.32     2.90
MEAN    37.50    17.04    12.70     4.34     0.93     0.26     3.51     0.91
HUB     43.24    -5.69    -9.30     3.61     0.93     0.10     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     780.264     466.267     625.625    1121.981       0.695      -0.003

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.310      14.696     523.106      24.000      36.696      35.400      -1.296

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     637.088     466.267     789.485    1140.013       0.559       0.309

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.207      16.342     540.055     528.796       0.028       0.453

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     582.057       0.000     582.057    1145.912       0.508       0.371

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.860     545.659       0.000       0.060       0.044       0.398

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.874      20.111       1.331     573.956      51.146     216.372       1.677

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 318428.000       0.569    3438.405 1945162.625
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 6.011   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    191.079    4154.000      20.111     573.956       1.000       1.000       0.980
W Kg/sec =   86.85419

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    146.916    3948.984       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 146993.875  149933.438       1.380     590.487     427.870     474.134       1.108

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   551.40    -0.19   551.40     0.48   708.16
 MEAN    18.08     0.00    -0.02   551.40    -0.19   551.40     0.48
 HUB     15.21     0.00    -0.02   551.40    -0.19   551.40     0.48

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.50    46.36     7.14   744.95   926.97    17.18   548.57     0.81
 MEAN    49.93    42.30     7.63   655.35   856.60    17.18   548.57     0.75
 HUB     45.01    37.84     7.17   551.37   779.91    17.18   548.57     0.68

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   642.32   363.24   529.74  1184.15     0.54
 MEAN    18.01   656.96   371.06   542.14  1178.19     0.56
 HUB     15.22   714.74   449.36   555.82  1172.41     0.61

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   650.19   376.99     0.55  7421.33
 MEAN   652.87   611.01   281.81     0.52  6686.23     1.52
 HUB    551.84   565.18   102.48     0.48  6843.53

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.36     1.26    20.76   617.14     1.08   582.70     0.92     0.91
 MEAN    24.81     1.23    20.08   612.86     1.07   576.83     0.92     0.91
 HUB     24.92     1.24    19.39   613.78     1.07   571.14     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.44    35.44    31.50     3.94     0.93     0.37     2.90
 MEAN    34.39    27.47    23.50     3.97     0.93     0.35     3.30     0.91
 HUB     38.95    10.45     6.50     3.95     0.93     0.35     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     743.120     372.103     643.248    1169.544       0.635      -0.211

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.982      19.031     568.488      46.000      30.048      30.600       0.552

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     634.779     372.103     735.802    1182.295       0.537       0.079

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      24.908      20.466     580.951     455.853       0.025       0.326

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.823     625.422       0.000     625.422    1183.297       0.529       0.301
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	20.522	581.936	0.000	0.060	0.041	0.090

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	24.829	1.235	614.593	40.637	236.407	1.833

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
253194.625	0.462	2734.010	1725039.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 6.011 EfDer = 0.996

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
191.079	4154.000	24.829	614.593	1.000	1.000	0.880

W Kg/sec = 86.85419

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
123.143	3816.197	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
146993.875	149933.438	1.366	489.817	358.664	384.470	1.072

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	578.40	-0.20	578.40	0.49	668.36
MEAN	17.74	0.00	-0.02	578.40	-0.20	578.40	0.49	
HUB	15.05	0.00	-0.02	578.40	-0.20	578.40	0.49	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.52	46.36	5.16	727.55	929.60	21.11	586.68	0.78
MEAN	48.04	43.40	4.64	643.03	865.04	21.11	586.68	0.73
HUB	43.34	38.84	4.50	545.57	795.24	21.11	586.68	0.67

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	609.29	358.37	492.76	1226.11	0.50
MEAN	17.51	621.13	365.20	502.42	1220.89	0.51
HUB	14.85	673.59	436.45	513.07	1215.82	0.55

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	718.12	610.11	359.75	0.50	7103.30	
MEAN	634.62	570.10	269.42	0.47	6396.94	1.64
HUB	538.32	523.09	101.87	0.43	6484.24	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.55	1.23	25.80	655.89	1.07	624.92	0.92	0.91
MEAN	29.94	1.21	25.09	651.78	1.06	619.59	0.92	0.91
HUB	30.02	1.21	24.36	652.29	1.06	614.43	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.03	36.13	31.50	4.63	0.93	0.41	2.90	
MEAN	36.01	28.20	23.50	4.70	0.92	0.40	3.28	0.91
HUB	40.39	11.23	6.50	4.73	0.92	0.41	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	627.015	367.597	507.957	1221.759	0.513	0.014

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
30.120	25.162	620.517	46.000	35.892	31.500	-4.392

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	510.941	367.597	629.435	1232.562	0.415	0.316

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	30.051	26.696	631.539	471.992	0.024	0.406

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	495.699	0.000	495.699	1233.811	0.402	0.321

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	26.797	632.819	0.000	0.060	0.043	0.336

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.876	29.952	1.206	653.323	38.730	228.476	1.771

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
241513.453	0.468	2607.877	1864047.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.011 EfDer = 0.995

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
191.079	4154.000	29.952	653.323	1.000	1.000	0.980

W Kg/sec = 86.85419

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
105.248	3701.354	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
146993.875	149933.438	1.674	513.330	306.574	401.059	1.308

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	464.38	-0.16	464.38	0.38	622.09
MEAN	16.97	0.00	-0.02	464.38	-0.16	464.38	0.38	
HUB	14.32	0.00	-0.02	464.38	-0.16	464.38	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.38	46.36	10.02	698.18	838.65	27.17	635.34	0.68
MEAN	52.96	43.80	9.16	615.20	770.92	27.17	635.34	0.62
HUB	48.19	37.84	10.35	519.11	696.63	27.17	635.34	0.56

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	580.66	359.62	455.89	1264.30	0.46
MEAN	16.57	587.07	359.09	464.44	1259.07	0.47
HUB	13.89	630.59	416.01	473.89	1253.88	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	684.41	559.75	324.79	0.44	6792.72	
MEAN	600.81	523.58	241.72	0.42	5954.19	1.61
HUB	503.52	481.90	87.51	0.38	5780.69	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	36.11	1.21	31.24	692.78	1.06	664.66	0.92	0.91
MEAN	35.30	1.18	30.41	687.91	1.05	659.17	0.92	0.91
HUB	35.14	1.17	29.56	686.90	1.05	653.74	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.27	35.47	31.50	3.97	0.93	0.41	2.90	
MEAN	37.71	27.50	23.50	4.00	0.93	0.39	3.29	0.91
HUB	41.28	10.46	6.50	3.96	0.93	0.38	3.90	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     580.390     361.107     454.372    1260.900       0.460       0.050

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     35.466      30.668     661.105      46.000      38.476      32.400      -6.076

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     464.377     361.107     588.255    1270.501       0.366       0.365

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      35.394      32.272     671.211     456.573       0.024       0.448

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     441.605       0.000     441.605    1272.129       0.347       0.348

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.445     672.932       0.000       0.060       0.049       0.399

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      35.267       1.177     689.193      35.870     221.819       1.720

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 223907.188       0.478    2417.763 1596636.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.011   EfDer =  0.993

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    191.079    4154.000      35.267     689.193       1.000       1.000       0.980
W Kg/sec =   86.85419

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     91.806    3603.747       1.401       0.250      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 146993.875  149933.438       1.906     509.668     267.450     390.276       1.459

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   411.58    -0.14   411.58     0.32   576.12
 MEAN    15.91     0.00    -0.02   411.58    -0.14   411.58     0.32
 HUB     13.07     0.00    -0.02   411.58    -0.14   411.58     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.22    47.36    10.86   664.11   781.43    32.81   675.08     0.61
 MEAN    54.50    44.80     9.70   576.85   708.75    32.81   675.08     0.56
 HUB     49.03    38.84    10.19   473.79   627.71    32.81   675.08     0.49

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   543.03   357.84   408.46  1298.99     0.42
 MEAN    15.50   540.27   344.44   416.24  1293.40     0.42
 HUB     12.59   568.73   378.29   424.68  1287.84     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   502.39   292.50     0.39  6422.18
 MEAN   561.80   469.57   217.35     0.36  5340.28     1.67
 HUB    456.39   431.80    78.11     0.34  4764.48
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         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     41.70     1.18    36.98   726.45     1.05   701.88      0.92     0.91
 MEAN    40.56     1.15    35.97   720.17     1.04   695.86      0.92     0.91
 HUB     39.97     1.13    34.96   716.83     1.04   689.89      0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.22    35.61    31.50     4.11     0.93     0.44     2.90
 MEAN    39.61    27.57    23.50     4.07     0.94     0.41     3.34     0.91
 HUB     41.69    10.42     6.50     3.92     0.94     0.38     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     547.102     350.758     419.869    1293.725       0.423      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     40.650      35.943     696.216      46.000      39.875      33.000      -6.875

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     434.911     350.758     558.729    1302.225       0.334       0.322

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      40.519      37.507     705.394     440.827       0.047       0.473

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     406.766       0.000     406.766    1304.046       0.312       0.400

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      37.853     707.368       0.000       0.060       0.052       0.394

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      40.495       1.148     721.153      31.960     226.702       1.757

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 199728.938       0.472    2156.685 1612116.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1236772.25  13354.7402    186.6652      2.6805      0.8612      6.0106      1.3794


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 110% Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.509   EfDer =  1.000

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    188.227    4154.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   85.55788

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    183.879    4137.640       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 144799.969  147695.656       1.553     831.557     535.496     619.754       1.157

     ROTOR LEADING EDGE CONDITIONS, STAGE            1
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   454.26    -0.16   454.26     0.41   744.88
MEAN    17.06     0.00    -0.02   454.26    -0.16   454.26     0.41
HUB     12.51     0.00    -0.02   454.26    -0.16   454.26     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.73    50.47     8.26   747.85   875.13    13.44   505.57     0.79
MEAN    53.71    47.20     6.51   618.44   767.47    13.44   505.57     0.70
HUB     44.96    38.62     6.34   453.49   641.99    13.44   505.57     0.58

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   721.34   433.16   576.81  1131.10     0.64
MEAN    18.04   759.72   471.13   595.99  1123.41     0.68
HUB     15.00   876.55   606.78   632.58  1110.41     0.79

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    747.85   657.07   314.69     0.58  8939.32
MEAN   653.81   623.37   182.69     0.55  8499.94     1.37
HUB    543.76   635.72    63.03     0.57  9103.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.47     1.36    15.57   574.87     1.10   531.42     0.92     0.91
MEAN    20.18     1.34    14.85   572.31     1.09   524.13     0.92     0.91
HUB     20.58     1.36    13.64   575.82     1.10   511.73     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     36.91    28.62    24.20     4.42     0.93     0.33     2.90
MEAN    38.33    17.04    12.70     4.34     0.93     0.28     3.51     0.91
HUB     43.81    -5.69    -9.30     3.61     0.93     0.12     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     771.766     470.213     611.982    1123.565       0.687      -0.002

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.357      14.841     524.584      24.000      37.537      35.400      -2.137

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     621.933     470.213     779.680    1142.091       0.545       0.325

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.253      16.550     542.026     528.796       0.028       0.466

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    18.083     568.894       0.000     568.894    1147.635       0.496       0.385

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.044     547.301       0.000       0.060       0.044       0.412

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.876      20.165       1.335     574.333      51.523     213.237       1.653

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 320772.969       0.574    3412.029 1910119.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.509   EfDer =  0.998
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
188.227	4154.000	20.165	574.333	1.000	1.000	0.980

W Kg/sec = 85.55788

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
144.387	3947.688	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
144799.969	147695.656	1.404	590.487	420.506	474.134	1.128

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	539.36	-0.19	539.36	0.47	707.93
MEAN	18.08	0.00	-0.02	539.36	-0.19	539.36	0.47	
HUB	15.21	0.00	-0.02	539.36	-0.19	539.36	0.47	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.10	46.36	7.74	744.95	919.85	17.34	550.04	0.80
MEAN	50.55	42.30	8.25	655.35	848.90	17.34	550.04	0.74
HUB	45.64	37.84	7.80	551.37	771.44	17.34	550.04	0.67

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	637.53	371.91	517.81	1186.08	0.54
MEAN	18.01	650.87	377.42	530.27	1179.92	0.55
HUB	15.22	707.12	451.72	544.03	1173.92	0.60

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	740.23	635.45	368.33	0.54	7598.17	
MEAN	652.87	597.55	275.45	0.51	6800.59	1.54
HUB	551.84	553.16	100.12	0.47	6879.42	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.56	1.27	20.99	618.55	1.08	584.61	0.92	0.91
MEAN	24.95	1.24	20.28	613.90	1.07	578.54	0.92	0.91
HUB	25.01	1.24	19.56	614.36	1.07	572.62	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.69	35.42	31.50	3.92	0.93	0.38	2.90	
MEAN	35.44	27.45	23.50	3.95	0.93	0.36	3.30	0.91
HUB	39.70	10.43	6.50	3.93	0.93	0.36	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	732.742	378.475	627.430	1171.896	0.625	-0.202

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.122	19.297	570.777	46.000	31.099	30.600	-0.499

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	617.947	378.475	724.639	1185.111	0.521	0.108

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	25.051	20.809	583.723	455.853	0.025	0.342

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	608.759	0.000	608.759	1186.066	0.513	0.321

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	20.867	584.664	0.000	0.060	0.039	0.120

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    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      24.980       1.239     615.604      41.271     231.112       1.792

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 257147.453       0.469    2735.251 1689925.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.509   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    188.227    4154.000      24.980     615.604       1.000       1.000       0.880
W Kg/sec =   85.55788

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    120.672    3813.062       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
144799.969  147695.656       1.394     489.817     351.465     384.470       1.094

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   563.82    -0.19   563.82     0.47   667.81
MEAN    17.74     0.00    -0.02   563.82    -0.19   563.82     0.47
HUB     15.05     0.00    -0.02   563.82    -0.19   563.82     0.47

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     52.23    46.36     5.87   727.55   920.60    21.42   589.08     0.77
MEAN    48.76    43.40     5.36   643.03   855.35    21.42   589.08     0.72
HUB     44.07    38.84     5.23   545.57   784.70    21.42   589.08     0.66

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   605.00   367.80   480.37  1228.59     0.49
MEAN    17.51   615.41   372.15   490.13  1223.15     0.50
HUB     14.85   666.15   439.21   500.84  1217.86     0.55

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    718.12   594.54   350.32     0.48  7289.99
MEAN   634.62   555.99   262.47     0.45  6518.55     1.66
HUB    538.32   510.55    99.11     0.42  6525.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     30.91     1.24    26.18   657.99     1.07   627.45     0.92     0.91
MEAN    30.24     1.21    25.43   653.50     1.06   621.90     0.92     0.91
HUB     30.24     1.21    24.67   653.54     1.06   616.52     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.44    36.10    31.50     4.60     0.93     0.42     2.90
MEAN    37.21    28.17    23.50     4.67     0.92     0.42     3.28     0.91
HUB     41.25    11.19     6.50     4.69     0.92     0.42     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     621.168     374.595     495.508    1224.014       0.507       0.014

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    30.410      25.504     622.813      46.000      37.089      31.500      -5.589

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     497.632     374.595     622.864    1235.295       0.403       0.336
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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.332      27.120     634.346     471.992       0.026       0.425

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     483.107       0.000     483.107    1236.452       0.391       0.337

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.201     635.534       0.000       0.060       0.047       0.352

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      30.223       1.210     655.010      39.406     222.665       1.726

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 245734.641       0.477    2613.854 1822866.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.509   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    188.227    4154.000      30.223     655.010       1.000       1.000       0.980
W Kg/sec =   85.55788

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.878    3696.585       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 144799.969  147695.656       1.713     513.330     299.671     401.059       1.338

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   452.86    -0.16   452.86     0.37   621.29
 MEAN    16.97     0.00    -0.02   452.86    -0.16   452.86     0.37
 HUB     14.32     0.00    -0.02   452.86    -0.16   452.86     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.04    46.36    10.68   698.18   832.33    27.56   637.91     0.67
 MEAN    53.65    43.80     9.85   615.20   764.03    27.56   637.91     0.62
 HUB     48.91    37.84    11.07   519.11   689.00    27.56   637.91     0.56

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   576.99   367.82   444.55  1267.08     0.46
 MEAN    16.57   581.88   365.14   453.05  1261.70     0.46
 HUB     13.89   623.52   418.24   462.44  1256.37     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   545.76   316.59     0.43  6947.50
 MEAN   600.81   510.68   235.67     0.40  6054.45     1.64
 HUB    503.52   470.23    85.28     0.37  5811.62

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     36.55     1.21    31.70   695.36     1.06   667.60     0.92     0.91
 MEAN    35.69     1.18    30.84   690.17     1.05   661.94     0.92     0.91
 HUB     35.46     1.17    29.96   688.76     1.05   656.35     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.60    35.46    31.50     3.96     0.93     0.42     2.90
 MEAN    38.87    27.48    23.50     3.98     0.94     0.40     3.29     0.91
 HUB     42.13    10.45     6.50     3.95     0.94     0.39     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     575.663     367.195     443.347    1263.459       0.456       0.048

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     35.849      31.088     663.799      46.000      39.633      32.400      -7.233

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     452.546     367.195     582.778    1273.465       0.355       0.383

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      35.766      32.774     674.355     456.573       0.026       0.467

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     430.682       0.000     430.682    1274.984       0.338       0.362

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.919     675.965       0.000       0.060       0.054       0.411

    STAGE EXIT CONDITIONS, STAGE             4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.867      35.626       1.179     691.431      36.421     216.550       1.679

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 227362.734       0.485    2418.434 1564075.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.509   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    188.227    4154.000      35.626     691.431       1.000       1.000       0.980
W Kg/sec =   85.55788

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.670    3597.909       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 144799.969  147695.656       1.951     509.668     261.230     390.276       1.494

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   401.59    -0.14   401.59     0.31   575.19
 MEAN    15.91     0.00    -0.02   401.59    -0.14   401.59     0.31
 HUB     13.07     0.00    -0.02   401.59    -0.14   401.59     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.84    47.36    11.48   664.11   776.21    33.26   678.00     0.61
 MEAN    55.16    44.80    10.36   576.85   702.99    33.26   678.00     0.55
 HUB     49.72    38.84    10.88   473.79   621.20    33.26   678.00     0.49

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   540.45   364.98   398.60  1301.94     0.42
 MEAN    15.50   536.05   349.74   406.25  1296.25     0.41
 HUB     12.59   562.52   380.22   414.56  1290.59     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   490.21   285.36     0.38  6550.22
 MEAN   561.80   458.27   212.06     0.35  5422.26     1.70
 HUB    456.39   421.50    76.17     0.33  4788.82

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     42.22     1.19    37.50   729.43     1.05   705.10     0.92     0.91
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 MEAN    41.03     1.15    36.47   722.89     1.05   698.95     0.92     0.91
 HUB     40.37     1.13    35.43   719.21     1.04   692.85     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.48    35.60    31.50     4.10     0.93     0.45     2.90
 MEAN    40.72    27.56    23.50     4.06     0.94     0.42     3.34     0.91
 HUB     42.53    10.41     6.50     3.91     0.94     0.40     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     542.936     356.148     409.802    1296.558       0.419      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     41.110      36.437     699.284      46.000      40.993      33.000      -7.993

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     424.139     356.148     553.837    1305.401       0.325       0.339

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      40.960      38.071     708.855     440.827       0.052       0.490

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     396.901       0.000     396.901    1307.115       0.304       0.413

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      38.396     710.718       0.000       0.060       0.058       0.407

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864      40.932       1.149     723.842      32.411     221.580       1.718

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 202561.234       0.479    2154.623 1586241.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1253579.00  13334.1895    183.8792      2.7095      0.8604      6.5087      1.3845


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 110% Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.000   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    185.418    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   84.28091

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    181.135    4137.640       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  142638.812  145491.297       1.576     831.557     527.504     619.754       1.175

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   446.14    -0.15   446.14     0.40   744.88
```

```
 MEAN    17.06     0.00    -0.02   446.14    -0.15   446.14     0.40
 HUB     12.51     0.00    -0.02   446.14    -0.15   446.14     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.19    50.47     8.72   747.85   870.94    13.50   506.19     0.79
 MEAN    54.20    47.20     7.00   618.44   762.69    13.50   506.19     0.69
 HUB     45.48    38.62     6.86   453.49   636.27    13.50   506.19     0.58

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   715.69   439.82   564.59  1132.64     0.63
 MEAN    18.04   752.51   474.92   583.71  1124.76     0.67
 HUB     15.00   865.93   605.44   619.10  1111.85     0.78

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    747.85   643.15   308.03     0.57  9076.70
 MEAN   653.81   610.51   178.90     0.54  8568.29     1.39
 HUB    543.76   622.17    61.68     0.56  9083.48

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.57     1.36    15.71   575.67     1.10   532.90     0.92     0.91
 MEAN    20.23     1.34    14.98   572.71     1.10   525.43     0.92     0.91
 HUB     20.57     1.36    13.77   575.71     1.10   513.15     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.92    28.62    24.20     4.42     0.93     0.35     2.90
 MEAN    39.13    17.04    12.70     4.34     0.93     0.29     3.51     0.91
 HUB     44.36    -5.69    -9.30     3.61     0.93     0.13     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     763.873     473.997     599.022    1125.034       0.679      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.399      14.975     525.957      24.000      38.354      35.400      -2.954

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     607.702     473.997     770.698    1144.008       0.531       0.341

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.293      16.741     543.847     528.796       0.029       0.479

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     556.502       0.000     556.502    1149.233       0.484       0.397

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.211     548.826       0.000       0.060       0.043       0.424

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      20.210       1.338     574.693      51.883     210.222       1.630

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 323014.562       0.578    3384.592 1875968.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.000   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    185.418    4154.000      20.210     574.693       1.000       1.000       0.980
W Kg/sec =   84.28091
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
141.957	3946.452	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
142638.812	145491.297	1.428	590.487	413.428	474.134	1.147

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	527.99	-0.18	527.99	0.46	707.71
MEAN	18.08	0.00	-0.02	527.99	-0.18	527.99	0.46	
HUB	15.21	0.00	-0.02	527.99	-0.18	527.99	0.46	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.68	46.36	8.32	744.95	913.23	17.50	551.42	0.79
MEAN	51.15	42.30	8.85	655.35	841.72	17.50	551.42	0.73
HUB	46.25	37.84	8.41	551.37	763.53	17.50	551.42	0.66

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	633.33	379.98	506.68	1187.86	0.53
MEAN	18.01	645.36	383.36	519.15	1181.52	0.55
HUB	15.22	700.05	453.93	532.94	1175.32	0.60

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	740.23	621.70	360.26	0.52	7762.87	
MEAN	652.87	584.94	269.51	0.50	6907.57	1.57
HUB	551.84	541.86	97.91	0.46	6912.90	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.73	1.27	21.20	619.86	1.08	586.38	0.92	0.91
MEAN	25.07	1.24	20.46	614.89	1.07	580.12	0.92	0.91
HUB	25.08	1.24	19.72	614.92	1.07	574.01	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.87	35.41	31.50	3.91	0.93	0.39	2.90	
MEAN	36.44	27.44	23.50	3.94	0.93	0.37	3.30	0.91
HUB	40.42	10.41	6.50	3.91	0.93	0.37	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	723.408	384.435	612.804	1174.036	0.616	-0.193

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.244	19.534	572.864	46.000	32.102	30.600	-1.502

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	602.528	384.435	714.724	1187.669	0.507	0.135

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	25.173	21.113	586.245	455.853	0.025	0.357

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	593.550	0.000	593.550	1188.577	0.499	0.339

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	21.171	587.142	0.000	0.060	0.038	0.147

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.881	25.108	1.242	616.556	41.863	226.233	1.754

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 260835.438       0.476    2733.070 1656213.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.000   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    185.418    4154.000      25.108     616.556       1.000       1.000       0.880
W Kg/sec =   84.28091

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    118.354    3810.118       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 142638.812  145491.297       1.421     489.817     344.716     384.470       1.115

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   550.43    -0.19   550.43     0.46   667.30
 MEAN    17.74     0.00    -0.02   550.43    -0.19   550.43     0.46
 HUB     15.05     0.00    -0.02   550.43    -0.19   550.43     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.90    46.36     6.54   727.55   912.45    21.69   591.28     0.77
 MEAN    49.45    43.40     6.05   643.03   846.58    21.69   591.28     0.71
 HUB     44.76    38.84     5.92   545.57   775.13    21.69   591.28     0.65

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   601.40   376.34   469.10  1230.82     0.49
 MEAN    17.51   610.42   378.49   478.91  1225.21     0.50
 HUB     14.85   659.44   441.72   489.64  1219.73     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   580.40   341.78     0.47  7459.13
 MEAN   634.62   543.10   256.13     0.44  6629.36     1.69
 HUB    538.32   499.08    96.60     0.41  6562.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.21     1.24    26.51   659.92     1.07   629.74     0.92     0.91
 MEAN    30.49     1.21    25.73   655.10     1.06   624.01     0.92     0.91
 HUB     30.43     1.21    24.94   654.71     1.06   618.42     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.74    36.08    31.50     4.58     0.93     0.43     2.90
 MEAN    38.32    28.14    23.50     4.64     0.93     0.43     3.28     0.91
 HUB     42.05    11.16     6.50     4.66     0.93     0.43     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     616.071     380.970     484.154    1226.065       0.502       0.015

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.658      25.799     624.905      46.000      38.198      31.500      -6.698

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     485.569     380.970     617.184    1237.777       0.392       0.354

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.570      27.490     636.901     471.992       0.028       0.442
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	471.702	0.000	471.702	1238.853	0.381	0.351

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	27.550	638.009	0.000	0.060	0.052	0.366

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.875	30.451	1.213	656.575	40.019	217.465	1.686

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
249567.188	0.484	2615.000	1783892.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 7.000 EfDer = 0.989

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
185.418	4154.000	30.451	656.575	1.000	1.000	0.980

W Kg/sec = 84.28091

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
100.705	3692.177	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
142638.812	145491.297	1.750	513.330	293.341	401.059	1.367

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	442.41	-0.15	442.41	0.36	620.55
MEAN	16.97	0.00	-0.02	442.41	-0.15	442.41	0.36	
HUB	14.32	0.00	-0.02	442.41	-0.15	442.41	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.65	46.36	11.29	698.18	826.68	27.89	640.26	0.67
MEAN	54.29	43.80	10.49	615.20	757.88	27.89	640.26	0.61
HUB	49.57	37.84	11.73	519.11	682.17	27.89	640.26	0.55

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	573.95	375.18	434.34	1269.60	0.45
MEAN	16.57	577.38	370.59	442.75	1264.10	0.46
HUB	13.89	617.23	420.25	452.06	1258.63	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	684.41	533.18	309.23	0.42	7086.35	
MEAN	600.81	499.03	230.22	0.39	6144.71	1.66
HUB	503.52	459.67	83.27	0.37	5839.50	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	36.92	1.21	32.09	697.73	1.06	670.26	0.92	0.91
MEAN	36.01	1.18	31.21	692.26	1.05	664.46	0.92	0.91
HUB	35.72	1.17	30.30	690.49	1.05	658.72	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.82	35.45	31.50	3.95	0.93	0.43	2.90	
MEAN	39.93	27.47	23.50	3.97	0.94	0.41	3.29	0.91
HUB	42.91	10.44	6.50	3.94	0.94	0.40	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.989

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

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    16.481     571.582     372.675     433.382    1265.782       0.452       0.047

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    36.169      31.444     666.252      46.000      40.693      32.400      -8.293

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     441.901     372.675     578.068    1276.150       0.346       0.399

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      36.076      33.202     677.210     456.573       0.029       0.483

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     420.852       0.000     420.852    1277.576       0.329       0.374

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      33.321     678.724       0.000       0.060       0.059       0.422

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.861      35.923       1.180     693.492      36.917     211.868       1.642

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 230468.469       0.492    2414.881 1533052.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.000   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    185.418    4154.000      35.923     693.492       1.000       1.000       0.980
W Kg/sec =   84.28091

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.733    3592.558       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 142638.812  145491.297       1.994     509.668     255.587     390.276       1.527

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   392.58    -0.14   392.58     0.31   574.33
 MEAN    15.91     0.00    -0.02   392.58    -0.14   392.58     0.31
 HUB     13.07     0.00    -0.02   392.58    -0.14   392.58     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.42    47.36    12.06   664.11   771.58    33.65   680.65     0.60
 MEAN    55.77    44.80    10.97   576.85   697.88    33.65   680.65     0.55
 HUB     50.36    38.84    11.52   473.79   615.41    33.65   680.65     0.48

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   538.35   371.36   389.75  1304.61     0.41
 MEAN    15.50   532.43   354.47   397.28  1298.84     0.41
 HUB     12.59   557.02   381.95   405.45  1293.08     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   479.30   278.97     0.37  6664.73
 MEAN   561.80   448.12   207.33     0.35  5495.60     1.73
 HUB    456.39   412.23    74.45     0.32  4810.46

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     42.65     1.19    37.93   732.15     1.06   708.01     0.92     0.90
 MEAN    41.41     1.15    36.88   725.37     1.05   701.76     0.92     0.90
 HUB     40.70     1.13    35.82   721.40     1.04   695.55     0.92     0.90
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         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     43.62    35.59    31.50     4.09     0.93     0.46     2.90
  MEAN    41.74    27.56    23.50     4.06     0.94     0.43     3.34     0.90
  HUB     43.29    10.40     6.50     3.90     0.94     0.41     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.986

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     539.360     360.970     400.761    1299.124       0.415      -0.008

      Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      41.492       36.849     702.072      46.000      42.010      33.000      -9.010

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     414.504     360.970     549.648    1308.271       0.317       0.354

    BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
       0.950       41.322      38.544     711.993     440.827       0.056       0.506

     VANED DIFFUSER EXIT:
    R4           C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
      14.701     388.066       0.000     388.066    1309.894       0.296       0.425

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       38.849     713.761       0.000       0.060       0.063       0.419

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.859       41.290       1.149     726.306      32.813     217.050       1.683

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  205092.562       0.485    2148.989 1555643.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1268978.25  13296.5312     181.1348      2.7331      0.8585      7.0004      1.3892


********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
********************************************************************

    Fan-Core + 4 Stage LPC 110% Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.999

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     182.651     4154.000       15.107     522.810       1.000        1.000        0.980
 W Kg/sec =   83.02301

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     178.431     4137.640        1.402        0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  140509.906  143319.797        1.600     831.557     519.631     619.754       1.193

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   438.22    -0.15   438.22     0.40   744.88
  MEAN    17.06      0.00    -0.02   438.22    -0.15   438.22     0.40
  HUB     12.51      0.00    -0.02   438.22    -0.15   438.22     0.40
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.64    50.47     9.17   747.85   866.91    13.55   506.77     0.79
MEAN    54.69    47.20     7.49   618.44   758.08    13.55   506.77     0.69
HUB     45.99    38.62     7.37   453.49   630.74    13.55   506.77     0.57

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   710.51   446.18   552.94  1134.08     0.63
MEAN    18.04   745.74   478.54   571.95  1126.04     0.66
HUB     15.00   855.86   604.14   606.22  1113.21     0.77

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    747.85   629.88   301.67     0.56  9207.74
MEAN   653.81   598.21   175.28     0.53  8633.46     1.42
HUB    543.76   609.22    60.39     0.55  9064.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.65     1.37    15.85   576.43     1.10   534.28     0.92     0.91
MEAN    20.27     1.34    15.10   573.09     1.10   526.66     0.92     0.91
HUB     20.55     1.36    13.90   575.59     1.10   514.47     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.90    28.62    24.20     4.42     0.93     0.36     2.90
MEAN    39.92    17.04    12.70     4.34     0.93     0.30     3.51     0.91
HUB     44.90    -5.69    -9.30     3.61     0.93     0.14     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     756.498     477.606     586.670    1126.402       0.672       0.001

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.436      15.099     527.236      24.000      39.149      35.400      -3.749

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     594.279     477.606     762.414    1145.785       0.519       0.355

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.326      16.916     545.538     528.796       0.030       0.491

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     544.776       0.000     544.776    1150.720       0.473       0.408

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.364     550.248       0.000       0.060       0.044       0.436

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.877      20.249       1.340     575.036      52.226     207.320       1.607

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 325151.281       0.581    3356.131 1842667.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    182.651    4154.000      20.249     575.036       1.000       1.000       0.980
W Kg/sec =   83.02301

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    139.614    3945.274       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
140509.906	143319.797	1.452	590.487	406.604	474.134	1.166

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	517.20	-0.18	517.20	0.45	707.50
MEAN	18.08	0.00	-0.02	517.20	-0.18	517.20	0.45	
HUB	15.21	0.00	-0.02	517.20	-0.18	517.20	0.45	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.24	46.36	8.88	744.95	907.03	17.64	552.70	0.79
MEAN	51.73	42.30	9.43	655.35	834.99	17.64	552.70	0.72
HUB	46.84	37.84	9.00	551.37	756.11	17.64	552.70	0.66

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	629.64	387.54	496.24	1189.50	0.53
MEAN	18.01	640.33	388.94	508.68	1183.00	0.54
HUB	15.22	693.45	455.98	522.45	1176.62	0.59

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	740.23	608.80	352.69	0.51	7917.29	
MEAN	652.87	573.07	263.93	0.48	7007.95	1.59
HUB	551.84	531.18	95.86	0.45	6944.10	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.88	1.28	21.38	621.10	1.08	588.01	0.92	0.91
MEAN	25.18	1.24	20.63	615.81	1.07	581.58	0.92	0.91
HUB	25.13	1.24	19.86	615.44	1.07	575.30	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.99	35.40	31.50	3.90	0.93	0.40	2.90	
MEAN	37.40	27.42	23.50	3.92	0.94	0.38	3.30	0.91
HUB	41.11	10.40	6.50	3.90	0.94	0.37	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.994

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	714.935	390.028	599.175	1175.996	0.608	-0.185

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.351	19.746	574.779	46.000	33.062	30.600	-2.462

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	588.276	390.028	705.827	1190.010	0.494	0.160

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	25.279	21.386	588.560	455.853	0.025	0.372

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	579.619	0.000	579.619	1190.864	0.487	0.354

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	21.439	589.404	0.000	0.060	0.039	0.171

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	25.214	1.245	617.453	42.418	221.709	1.719

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
264292.094	0.482	2727.958	1623763.250

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    182.651    4154.000      25.214     617.453       1.000       1.000       0.880
W Kg/sec =   83.02301

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    116.182    3807.347       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 140509.906  143319.797       1.447     489.817     338.389     384.470       1.136

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   538.09    -0.19   538.09     0.45   666.81
 MEAN    17.74     0.00    -0.02   538.09    -0.19   538.09     0.45
 HUB     15.05     0.00    -0.02   538.09    -0.19   538.09     0.45

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.52    46.36     7.16   727.55   905.06    21.93   593.29     0.76
 MEAN    50.09    43.40     6.69   643.03   838.61    21.93   593.29     0.70
 HUB     45.41    38.84     6.57   545.57   766.41    21.93   593.29     0.64

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   598.39   384.14   458.81  1232.86     0.49
 MEAN    17.51   606.04   384.28   468.63  1227.10     0.49
 HUB     14.85   653.41   444.03   479.35  1221.45     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   567.49   333.98     0.46  7613.57
 MEAN   634.62   531.30   250.34     0.43  6730.76     1.71
 HUB    538.32   488.54    94.29     0.40  6596.58

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.47     1.25    26.79   661.72     1.07   631.84     0.92     0.91
 MEAN    30.70     1.22    25.98   656.58     1.06   625.94     0.92     0.91
 HUB     30.58     1.21    25.16   655.80     1.06   620.18     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.94    36.05    31.50     4.55     0.93     0.45     2.90
 MEAN    39.35    28.11    23.50     4.61     0.93     0.44     3.28     0.91
 HUB     42.81    11.13     6.50     4.63     0.93     0.44     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     611.608     386.805     473.758    1227.939       0.498       0.015

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    30.867      26.051     626.821      46.000      39.230      31.500      -7.730

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     474.579     386.805     612.244    1240.045       0.383       0.371

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      30.768      27.808     639.241     471.992       0.030       0.458

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     17.121     461.317       0.000     461.317    1241.049       0.372       0.364

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.848     640.276       0.000       0.060       0.056       0.379

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      30.639       1.215     658.034      40.580     212.778       1.649

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 253072.000       0.491    2612.146 1746849.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    182.651    4154.000      30.639     658.034       1.000       1.000       0.980
W Kg/sec =   83.02301

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     98.704    3688.081       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 140509.906  143319.797       1.785     513.330     287.516     401.059       1.395

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   432.87    -0.15   432.87     0.35   619.86
 MEAN    16.97     0.00    -0.02   432.87    -0.15   432.87     0.35
 HUB     14.32     0.00    -0.02   432.87    -0.15   432.87     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.21    46.36    11.85   698.18   821.61    28.17   642.41     0.66
 MEAN    54.88    43.80    11.08   615.20   752.35    28.17   642.41     0.61
 HUB     50.18    37.84    12.34   519.11   676.02    28.17   642.41     0.54

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   571.40   381.83   425.08  1271.89     0.45
 MEAN    16.57   573.45   375.51   433.40  1266.28     0.45
 HUB     13.89   611.58   422.04   442.61  1260.70     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   521.77   302.58     0.41  7211.89
 MEAN   600.81   488.46   225.30     0.39  6226.15     1.69
 HUB    503.52   450.05    81.47     0.36  5864.33

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     37.24     1.22    32.42   699.91     1.06   672.69     0.92     0.90
 MEAN    36.28     1.18    31.52   694.19     1.05   666.77     0.92     0.90
 HUB     35.93     1.17    30.59   692.09     1.05   660.91     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.93    35.44    31.50     3.94     0.93     0.44     2.90
 MEAN    40.91    27.47    23.50     3.97     0.94     0.43     3.29     0.90
 HUB     43.64    10.43     6.50     3.93     0.94     0.41     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     568.018     377.619     424.321    1267.905       0.448       0.046

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     36.434      31.743     668.497      46.000      41.667      32.400      -9.267

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     432.260     377.619     573.973    1278.597       0.338       0.414

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      36.330      33.565     679.820     456.573       0.031       0.498

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     411.944       0.000     411.944    1279.941       0.322       0.385

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      33.658     681.250       0.000       0.060       0.064       0.432

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.856      36.164       1.180     695.398      37.365     207.681       1.610

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 233270.438       0.498    2407.760 1503370.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    182.651    4154.000      36.164     695.398       1.000       1.000       0.980
W Kg/sec =   83.02301

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     85.965    3587.631       1.400       0.250      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 140509.906  143319.797       2.035     509.668     250.440     390.276       1.558

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   384.41    -0.13   384.40     0.30   573.55
 MEAN    15.91     0.00    -0.02   384.41    -0.13   384.40     0.30
 HUB     13.07     0.00    -0.02   384.41    -0.13   384.40     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.94    47.36    12.58   664.11   767.45    33.97   683.09     0.60
 MEAN    56.33    44.80    11.53   576.85   693.31    33.97   683.09     0.54
 HUB     50.95    38.84    12.11   473.79   610.22    33.97   683.09     0.48

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   536.60   377.09   381.76  1307.04     0.41
 MEAN    15.50   529.27   358.73   389.16  1301.19     0.41
 HUB     12.59   552.11   383.48   397.20  1295.36     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   469.47   273.24     0.36  6767.44
 MEAN   561.80   438.95   203.06     0.34  5561.58     1.75
 HUB    456.39   403.84    72.91     0.31  4829.77

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     43.00     1.19    38.29   734.65     1.06   710.67     0.92     0.90
 MEAN    41.72     1.15    37.23   727.66     1.05   704.32     0.92     0.90
 HUB     40.96     1.13    36.15   723.41     1.04   698.02     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.65    35.59    31.50     4.09     0.93     0.47     2.90
 MEAN    42.67    27.56    23.50     4.06     0.94     0.44     3.34     0.90
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 HUB     43.99    10.40     6.50     3.90     0.94     0.41     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.983

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     536.257     365.309     392.583    1301.463       0.412       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     41.802      37.190     704.619      46.000      42.939      33.000      -9.939

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     405.815     365.309     546.018    1310.882       0.310       0.367

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      41.614      38.938     714.855     440.827       0.060       0.521

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     380.091       0.000     380.091    1312.425       0.290       0.436

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      39.225     716.539       0.000       0.060       0.068       0.428

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.853      41.577       1.150     728.573      33.175     213.010       1.651

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 207364.953       0.490    2140.370 1526300.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1283150.75  13244.3633    178.4314      2.7521      0.8558      7.4857      1.3936


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 110% Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 7.965   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.925    4154.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   81.78387

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    175.768    4137.640       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 138412.766  141180.734       1.625     831.557     511.875     619.754       1.211

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   430.49    -0.15   430.49     0.39   744.88
 MEAN    17.06     0.00    -0.02   430.49    -0.15   430.49     0.39
 HUB     12.51     0.00    -0.02   430.49    -0.15   430.49     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.08    50.47     9.61   747.85   863.03    13.60   507.33     0.78
 MEAN    55.16    47.20     7.96   618.44   753.64    13.60   507.33     0.68
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HUB     46.50    38.62     7.88   453.49   625.39    13.60   507.33     0.57

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   705.75   452.25   541.81  1135.42     0.62
MEAN    18.04   739.39   482.01   560.68  1127.23     0.66
HUB     15.00   846.28   602.91   593.88  1114.49     0.76

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    747.85   617.20   295.60     0.54  9333.00
MEAN   653.81   586.41   171.80     0.52  8696.13     1.44
HUB    543.76   596.82    59.15     0.54  9045.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.73     1.37    15.97   577.16     1.10   535.57     0.92     0.91
MEAN    20.31     1.34    15.20   573.45     1.10   527.81     0.92     0.91
HUB     20.54     1.36    14.01   575.48     1.10   515.72     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.85    28.62    24.20     4.42     0.93     0.38     2.90
MEAN    40.69    17.04    12.70     4.34     0.93     0.32     3.51     0.91
HUB     45.43    -5.69    -9.30     3.61     0.93     0.16     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     749.604     481.077     574.866    1127.678       0.665       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.470      15.214     528.432      24.000      39.924      35.400      -4.524

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     581.562     481.077     754.751    1147.441       0.507       0.369

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.355      17.077     547.116     528.796       0.031       0.502

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     533.630       0.000     533.630    1152.113       0.463       0.419

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.505     551.580       0.000       0.060       0.044       0.447

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.877      20.281       1.343     575.365      52.555     204.519       1.585

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 327197.562       0.585    3326.846 1810179.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.965   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.925    4154.000      20.281     575.365       1.000       1.000       0.980
W Kg/sec =   81.78387

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    137.348    3944.147       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 138412.766  141180.734       1.476     590.487     400.006     474.134       1.185
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ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	506.91	-0.17	506.91	0.44	707.29
MEAN	18.08	0.00	-0.02	506.91	-0.17	506.91	0.44	
HUB	15.21	0.00	-0.02	506.91	-0.17	506.91	0.44	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.77	46.36	9.41	744.95	901.20	17.76	553.91	0.78
MEAN	52.29	42.30	9.99	655.35	828.65	17.76	553.91	0.72
HUB	47.41	37.84	9.57	551.37	749.10	17.76	553.91	0.65

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	626.36	394.66	486.38	1191.03	0.53
MEAN	18.01	635.73	394.20	498.76	1184.38	0.54
HUB	15.22	687.27	457.92	512.49	1177.85	0.58

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	740.23	596.64	345.57	0.50	8062.58	
MEAN	652.87	561.84	258.67	0.47	7102.66	1.61
HUB	551.84	521.02	93.92	0.44	6973.63	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.02	1.28	21.54	622.28	1.08	589.53	0.92	0.91
MEAN	25.28	1.25	20.77	616.69	1.07	582.95	0.92	0.91
HUB	25.18	1.24	19.99	615.94	1.07	576.51	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.06	35.39	31.50	3.89	0.93	0.41	2.90	
MEAN	38.32	27.41	23.50	3.91	0.94	0.39	3.30	0.91
HUB	41.78	10.38	6.50	3.88	0.94	0.38	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	707.189	395.305	586.388	1177.805	0.600	-0.177

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.445	19.937	576.550	46.000	33.985	30.600	-3.385

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	574.996	395.305	697.773	1192.172	0.482	0.183

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	25.369	21.632	590.701	455.853	0.026	0.386

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	566.766	0.000	566.766	1192.964	0.475	0.368

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	21.674	591.486	0.000	0.060	0.041	0.192

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	25.301	1.247	618.305	42.940	217.486	1.686

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
267549.281	0.488	2720.360	1592447.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

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 RESET =  0.000BLEED =  0.000 DPInc = 7.965   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.925    4154.000      25.301     618.305       1.000       1.000       0.880
W Kg/sec =   81.78387

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    114.135    3804.726       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 138412.766  141180.734       1.473     489.817     332.430     384.470       1.157

    ROTOR LEADING EDGE CONDITIONS, STAGE             3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   526.66    -0.18   526.66     0.44   666.35
MEAN    17.74     0.00    -0.02   526.66    -0.18   526.66     0.44
HUB     15.05     0.00    -0.02   526.66    -0.18   526.66     0.44

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.11    46.36     7.75   727.55   898.31    22.15   595.16     0.75
MEAN    50.69    43.40     7.29   643.03   831.32    22.15   595.16     0.69
HUB     46.02    38.84     7.18   545.57   758.43    22.15   595.16     0.63

     ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
TIP     19.81   595.84   391.29   449.34  1234.74     0.48
MEAN    17.51   602.16   389.60   459.14  1228.84     0.49
HUB     14.85   647.90   446.13   469.84  1223.05     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    718.12   555.63   326.83     0.45  7755.17
MEAN   634.62   520.43   245.02     0.42  6823.72     1.73
HUB    538.32   478.80    92.19     0.39  6627.69

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     31.70     1.25    27.02   663.39     1.07   633.77     0.92     0.91
MEAN    30.87     1.22    26.19   657.97     1.06   627.72     0.92     0.91
HUB     30.70     1.21    25.36   656.83     1.06   621.81     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.05    36.03    31.50     4.53     0.93     0.46     2.90
MEAN    40.32    28.09    23.50     4.59     0.93     0.44     3.28     0.91
HUB     43.52    11.10     6.50     4.60     0.93     0.44     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     607.650     392.154     464.170    1229.666       0.494       0.015

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    31.041      26.266     628.590      46.000      40.193      31.500      -8.693

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     464.488     392.154     607.893    1242.130       0.374       0.386

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      30.932      28.083     641.397     471.992       0.032       0.473

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     451.782       0.000     451.782    1243.070       0.363       0.375

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      28.103     642.368       0.000       0.060       0.061       0.390

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      30.791       1.217     659.399      41.094     208.525       1.616

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 256282.547       0.497    2605.803 1711476.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.965   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.925    4154.000      30.791     659.399       1.000       1.000       0.980
W Kg/sec =   81.78387

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.850    3684.262       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 138412.766  141180.734       1.820     513.330     282.117     401.059       1.422

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   424.10    -0.15   424.10     0.34   619.21
 MEAN    16.97     0.00    -0.02   424.10    -0.15   424.10     0.34
 HUB     14.32     0.00    -0.02   424.10    -0.15   424.10     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.73    46.36    12.37   698.18   817.02    28.41   644.40     0.66
 MEAN    55.43    43.80    11.63   615.20   747.33    28.41   644.40     0.60
 HUB     50.76    37.84    12.92   519.11   670.43    28.41   644.40     0.54

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   569.23   387.89   416.62  1273.99     0.45
 MEAN    16.57   569.98   380.00   424.82  1268.29     0.45
 HUB     13.89   606.46   423.66   433.94  1262.61     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   511.36   296.52     0.40  7326.13
 MEAN   600.81   478.78   220.81     0.38  6300.62     1.71
 HUB    503.52   441.22    79.86     0.35  5886.78

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     37.50     1.22    32.69   701.94     1.06   674.93     0.92     0.90
 MEAN    36.50     1.19    31.77   695.99     1.06   668.90     0.92     0.90
 HUB     36.10     1.17    30.83   693.58     1.05   662.92     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.95    35.44    31.50     3.94     0.93     0.46     2.90
 MEAN    41.81    27.46    23.50     3.96     0.94     0.44     3.29     0.90
 HUB     44.31    10.43     6.50     3.93     0.94     0.42     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.983

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     564.888     382.141     416.012    1269.856       0.445       0.044

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    36.651      31.992     670.567      46.000      42.570      32.400     -10.170

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	423.445	382.141	570.384	1280.844	0.331	0.427

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	36.537	33.872	682.221	456.573	0.033	0.513

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	403.795	0.000	403.795	1282.116	0.315	0.395

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	33.940	683.577	0.000	0.060	0.069	0.441

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.850	36.357	1.181	697.171	37.772	203.895	1.581

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
235822.203	0.503	2397.769	1474857.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 7.965 EfDer = 0.980

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
179.925	4154.000	36.357	697.171	1.000	1.000	0.980

W Kg/sec = 81.78387

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
84.339	3583.068	1.400	0.250	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
138412.766	141180.734	2.074	509.668	245.704	390.276	1.588

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	376.92	-0.13	376.92	0.29	572.82
MEAN	15.91	0.00	-0.02	376.92	-0.13	376.92	0.29	
HUB	13.07	0.00	-0.02	376.92	-0.13	376.92	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.43	47.36	13.07	664.11	763.73	34.24	685.34	0.60
MEAN	56.85	44.80	12.05	576.85	689.19	34.24	685.34	0.54
HUB	51.50	38.84	12.66	473.79	605.53	34.24	685.34	0.47

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	535.16	382.32	374.47	1309.27	0.41
MEAN	15.50	526.49	362.59	381.73	1303.36	0.40
HUB	12.59	547.67	384.86	389.65	1297.46	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	650.33	460.50	268.02	0.35	6861.13	
MEAN	561.80	430.59	199.20	0.33	5621.36	1.78
HUB	456.39	396.16	71.54	0.31	4847.05	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	43.29	1.19	38.59	736.96	1.06	713.11	0.92	0.90
MEAN	41.97	1.15	37.51	729.77	1.05	706.69	0.92	0.90
HUB	41.17	1.13	36.42	725.28	1.04	700.30	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.59	35.59	31.50	4.09	0.93	0.48	2.90	
MEAN	43.53	27.56	23.50	4.06	0.94	0.45	3.34	0.90
HUB	44.65	10.40	6.50	3.90	0.94	0.42	4.06	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     533.522     369.240     385.108    1303.612       0.409      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     42.052      37.470     706.965      46.000      43.795      33.000     -10.795

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     397.893     369.240     542.823    1313.277       0.303       0.379

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      41.847      39.264     717.487     440.827       0.064       0.535

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     372.814       0.000     372.814    1314.750       0.284       0.445

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      39.534     719.097       0.000       0.060       0.073       0.437

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.848      41.805       1.150     730.674      33.503     209.365       1.623

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  209428.500       0.495    2129.406 1498051.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1296280.12  13180.1855    175.7682      2.7672      0.8524      7.9649      1.3976



**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

   Fan-Core + 4 Stage LPC 110% Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.155    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   80.52497

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    173.063    4137.640       1.402       0.249      53.349      32.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  136282.172  139007.531       1.650     831.557     503.996     619.754       1.230

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   422.71    -0.15   422.71     0.38   744.88
  MEAN    17.06     0.00    -0.02   422.71    -0.15   422.71     0.38
  HUB     12.51     0.00    -0.02   422.71    -0.15   422.71     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.53    50.47    10.06   747.85   859.17    13.66   507.89     0.78
  MEAN    55.65    47.20     8.45   618.44   749.22    13.66   507.89     0.68
  HUB     47.02    38.62     8.40   453.49   620.06    13.66   507.89     0.56
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      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   701.25   458.25   530.81  1136.72     0.62
MEAN    18.04   733.22   485.46   549.50  1128.40     0.65
HUB     15.00   836.88   601.68   581.68  1115.73     0.75

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    747.85   604.67   289.60     0.53  9456.70
MEAN   653.81   574.71   168.36     0.51  8758.19     1.46
HUB    543.76   584.55    57.92     0.52  9026.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.81     1.38    16.09   577.88     1.11   536.82     0.92     0.91
MEAN    20.34     1.35    15.31   573.81     1.10   528.92     0.92     0.91
HUB     20.52     1.36    14.12   575.38     1.10   516.92     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.80    28.62    24.20     4.42     0.93     0.39     2.90
MEAN    41.46    17.03    12.70     4.33     0.93     0.33     3.51     0.91
HUB     45.97    -5.69    -9.30     3.61     0.93     0.17     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     742.938     484.513     563.208    1128.911       0.658       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.501      15.323     529.588      24.000      40.705      35.400      -5.305

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     569.097     484.513     747.412    1149.036       0.495       0.382

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.379      17.230     548.638     528.796       0.033       0.514

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     522.778       0.000     522.778    1153.451       0.453       0.429

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.634     552.863       0.000       0.060       0.046       0.457

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      20.306       1.344     575.689      52.879     201.730       1.564

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 329219.156       0.589    3295.874 1777481.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.989

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    177.155    4154.000      20.306     575.689       1.000       1.000       0.980
W Kg/sec =   80.52497

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    135.106    3943.034       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 136282.172  139007.531       1.501     590.487     393.478     474.134       1.205

     ROTOR LEADING EDGE CONDITIONS, STAGE            2
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   496.87    -0.17   496.87     0.43   707.09
MEAN    18.08     0.00    -0.02   496.87    -0.17   496.87     0.43
HUB     15.21     0.00    -0.02   496.87    -0.17   496.87     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.30    46.36     9.94   744.95   895.59    17.88   555.08     0.77
MEAN    52.84    42.30    10.54   655.35   822.55    17.88   555.08     0.71
HUB     47.99    37.84    10.15   551.37   742.35    17.88   555.08     0.64

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   623.38   401.54   476.83  1192.49     0.52
MEAN    18.01   631.40   399.29   489.12  1185.71     0.53
HUB     15.22   681.33   459.80   502.78  1179.03     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    740.23   584.88   338.70     0.49  8202.94
MEAN   652.87   550.95   253.58     0.46  7194.27     1.63
HUB    551.84   511.14    92.04     0.43  7002.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.14     1.29    21.69   623.42     1.08   590.98     0.92     0.90
MEAN    25.36     1.25    20.90   617.55     1.07   584.27     0.92     0.90
HUB     25.22     1.24    20.10   616.43     1.07   577.68     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.10    35.39    31.50     3.89     0.93     0.42     2.90
MEAN    39.23    27.40    23.50     3.90     0.94     0.40     3.30     0.90
HUB     42.44    10.37     6.50     3.87     0.94     0.39     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     699.924     400.410     574.078    1179.522       0.593      -0.170

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.524      20.109     578.234      46.000      34.895      30.600      -4.295

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     562.290     400.410     690.288    1194.224       0.471       0.205

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      25.444      21.855     592.738     455.853       0.027       0.399

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.823     554.475       0.000     554.475    1194.957       0.464       0.380

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.850      21.886     593.466       0.000       0.060       0.043       0.211

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.873      25.371       1.249     619.134      43.445     213.441       1.655

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 270696.875       0.494    2709.997 1561289.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.999
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
177.155	4154.000	25.371	619.134	1.000	1.000	0.880

W Kg/sec = 80.52497

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
112.143	3802.176	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
136282.172	139007.531	1.500	489.817	326.627	384.470	1.177

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	515.69	-0.18	515.69	0.43	665.91
MEAN	17.74	0.00	-0.02	515.69	-0.18	515.69	0.43	
HUB	15.05	0.00	-0.02	515.69	-0.18	515.69	0.43	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.68	46.36	8.32	727.55	891.92	22.34	596.95	0.74
MEAN	51.28	43.40	7.88	643.03	824.41	22.34	596.95	0.69
HUB	46.62	38.84	7.78	545.57	750.85	22.34	596.95	0.63

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	593.61	398.11	440.32	1236.52	0.48
MEAN	17.51	598.60	394.67	450.06	1230.49	0.49
HUB	14.85	642.70	448.12	460.71	1224.57	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	718.12	544.32	320.01	0.44	7890.09	
MEAN	634.62	510.03	239.95	0.41	6912.48	1.76
HUB	538.32	469.46	90.20	0.38	6657.25	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	31.89	1.26	27.23	665.00	1.07	635.60	0.92	0.91
MEAN	31.02	1.22	26.38	659.32	1.06	629.42	0.92	0.91
HUB	30.80	1.21	25.52	657.84	1.06	623.37	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.12	36.01	31.50	4.51	0.93	0.47	2.90	
MEAN	41.25	28.06	23.50	4.56	0.93	0.45	3.28	0.91
HUB	44.21	11.08	6.50	4.58	0.93	0.45	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	604.022	397.261	455.002	1231.310	0.491	0.014

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
31.189	26.454	630.277	46.000	41.124	31.500	-9.624

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	454.874	397.261	603.926	1244.116	0.366	0.400

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	31.068	28.325	643.454	471.992	0.035	0.488

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	442.698	0.000	442.698	1244.997	0.356	0.385

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	28.326	644.366	0.000	0.060	0.066	0.401

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    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      30.916       1.219     660.719      41.584     204.512       1.585

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 259342.859       0.503    2596.330 1676537.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.155    4154.000      30.916     660.719       1.000       1.000       0.980
W Kg/sec =   80.52497

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.070    3680.580       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
136282.172  139007.531       1.854     513.330     276.931     401.059       1.448

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   415.72    -0.14   415.72     0.33   618.60
MEAN    16.97     0.00    -0.02   415.72    -0.14   415.72     0.33
HUB     14.32     0.00    -0.02   415.72    -0.14   415.72     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.23    46.36    12.87   698.18   812.70    28.62   646.31     0.65
MEAN    55.96    43.80    12.16   615.20   742.61    28.62   646.31     0.60
HUB     51.32    37.84    13.48   519.11   665.17    28.62   646.31     0.53

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   567.33   393.62   408.57  1275.98     0.44
MEAN    16.57   566.79   384.24   416.66  1270.20     0.45
HUB     13.89   601.66   425.21   425.66  1264.43     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    684.41   501.48   290.79     0.39  7434.33
MEAN   600.81   469.59   216.57     0.37  6370.81     1.74
HUB    503.52   432.80    78.31     0.34  5908.22

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     37.72     1.22    32.93   703.89     1.07   677.05     0.92     0.90
MEAN    36.68     1.19    31.99   697.71     1.06   670.93     0.92     0.90
HUB     36.24     1.17    31.03   695.03     1.05   664.85     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.93    35.44    31.50     3.94     0.93     0.47     2.90
MEAN    42.68    27.46    23.50     3.96     0.94     0.45     3.29     0.90
HUB     44.97    10.42     6.50     3.92     0.94     0.43     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.979

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     562.005     386.403     408.097    1271.717       0.442       0.043

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    36.831      32.205     672.544      46.000      43.436      32.400     -11.036

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     415.072     386.403     567.090    1282.983       0.324       0.440
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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      36.706      34.137     684.513     456.573       0.035       0.527

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     396.048       0.000     396.048    1284.188       0.308       0.404

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      34.182     685.799       0.000       0.060       0.075       0.449

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.845      36.514       1.181     698.876      38.157     200.336       1.553

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 238237.062       0.509    2385.036 1446527.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.977

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.155    4154.000      36.514     698.876       1.000       1.000       0.980
W Kg/sec =   80.52497

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     82.785    3578.694       1.400       0.250      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 136282.172  139007.531       2.113     509.668     241.180     390.276       1.618

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   369.79    -0.13   369.79     0.29   572.12
 MEAN    15.91     0.00    -0.02   369.79    -0.13   369.79     0.29
 HUB     13.07     0.00    -0.02   369.79    -0.13   369.79     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.89    47.36    13.53   664.11   760.23    34.47   687.49     0.59
 MEAN    57.34    44.80    12.54   576.85   685.31    34.47   687.49     0.53
 HUB     52.04    38.84    13.20   473.79   601.12    34.47   687.49     0.47

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   533.91   387.25   367.55  1311.39     0.41
 MEAN    15.50   523.95   366.24   374.69  1305.42     0.40
 HUB     12.59   543.51   386.16   382.47  1299.46     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   452.00   263.08     0.34  6949.58
 MEAN   561.80   422.65   195.55     0.32  5677.94     1.81
 HUB    456.39   388.86    70.23     0.30  4863.45

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     43.53     1.19    38.83   739.18     1.06   715.44     0.92     0.89
 MEAN    42.18     1.16    37.75   731.81     1.05   708.94     0.92     0.89
 HUB     41.33     1.13    36.64   727.08     1.04   702.48     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.49    35.59    31.50     4.09     0.93     0.49     2.90
 MEAN    44.35    27.56    23.50     4.06     0.94     0.46     3.34     0.89
 HUB     45.28    10.41     6.50     3.91     0.94     0.43     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.977
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     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     531.026     372.960     378.007    1305.657       0.407      -0.009

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      42.256      37.705     709.203      46.000      44.615      33.000     -11.615

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     390.384     372.960     539.906    1315.555       0.297       0.391

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      42.034      39.542     719.996     440.827       0.068       0.548

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     365.909       0.000     365.909    1316.963       0.278       0.454

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      39.795     721.538       0.000       0.060       0.078       0.446

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.842      41.987       1.150     732.689      33.813     205.939       1.596

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  211379.391       0.500    2116.158 1469926.250

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1308875.38  13103.3945    173.0626      2.7793      0.8484      8.4529      1.4014


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 110% Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     174.323    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   79.23788

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     170.296    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  134103.875  136785.688       1.677     831.557     495.940     619.754       1.250

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   414.84    -0.14   414.84     0.38   744.88
  MEAN    17.06     0.00    -0.02   414.84    -0.14   414.84     0.38
  HUB     12.51     0.00    -0.02   414.84    -0.14   414.84     0.38

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.99    50.47    10.52   747.85   855.32    13.71   508.44     0.77
  MEAN    56.15    47.20     8.95   618.44   744.80    13.71   508.44     0.67
  HUB     47.56    38.62     8.94   453.49   614.72    13.71   508.44     0.56

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   696.96   464.22   519.86  1137.99     0.61
MEAN    18.04   727.20   488.88   538.35  1129.54     0.64
HUB     15.00   827.58   600.45   569.51  1116.95     0.74

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    747.85   592.20   283.63     0.52  9579.73
MEAN   653.81   563.04   164.93     0.50  8819.95     1.49
HUB    543.76   572.33    56.70     0.51  9008.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.88     1.38    16.20   578.60     1.11   538.03     0.92     0.91
MEAN    20.37     1.35    15.41   574.17     1.10   530.02     0.92     0.91
HUB     20.50     1.36    14.23   575.27     1.10   518.10     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.76    28.62    24.20     4.42     0.93     0.40     2.90
MEAN    42.24    17.03    12.70     4.33     0.93     0.34     3.51     0.91
HUB     46.52    -5.69    -9.30     3.61     0.93     0.18     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     736.438     487.934     551.600    1130.110       0.652       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.529      15.428     530.714      24.000      41.495      35.400      -6.095

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     556.772     487.934     740.320    1150.587       0.484       0.395

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.400      17.377     550.120     528.796       0.034       0.526

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     512.171       0.000     512.171    1154.744       0.444       0.438

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.751     554.102       0.000       0.060       0.049       0.466

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      20.322       1.345     576.012      53.202     198.931       1.542

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 331230.094       0.592    3263.004 1744358.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.323    4154.000      20.322     576.012       1.000       1.000       0.980
W Kg/sec =   79.23788

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    132.882    3941.928       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134103.875  136785.688       1.526     590.487     387.000     474.134       1.225

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   487.04    -0.17   487.04     0.42   706.90
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 MEAN    18.08     0.00    -0.02   487.04    -0.17   487.04     0.42
 HUB     15.21     0.00    -0.02   487.04    -0.17   487.04     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.83    46.36    10.47   744.95   890.17    17.99   556.21     0.77
 MEAN    53.39    42.30    11.09   655.35   816.64    17.99   556.21     0.71
 HUB     48.55    37.84    10.71   551.37   735.80    17.99   556.21     0.64

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   620.68   408.21   467.55  1193.89     0.52
 MEAN    18.01   627.34   404.24   479.73  1186.99     0.53
 HUB     15.22   675.59   461.61   493.29  1180.17     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   573.45   332.03     0.48  8339.02
 MEAN   652.87   540.33   248.63     0.46  7283.44     1.65
 HUB    551.84   501.48    90.23     0.42  7029.63

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.24     1.29    21.82   624.53     1.08   592.37     0.92     0.90
 MEAN    25.43     1.25    21.02   618.39     1.07   585.54     0.92     0.90
 HUB     25.24     1.24    20.20   616.92     1.07   578.81     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.12    35.38    31.50     3.88     0.93     0.43     2.90
 MEAN    40.12    27.40    23.50     3.90     0.94     0.41     3.30     0.90
 HUB     43.10    10.37     6.50     3.87     0.94     0.40     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     693.082     405.378     562.167    1181.160       0.587      -0.163

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.589      20.263     579.843      46.000      35.795      30.600      -5.195

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     550.056     405.378     683.296    1196.184       0.460       0.226

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      25.502      22.057     594.687     455.853       0.029       0.413

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     542.652       0.000     542.652    1196.863       0.453       0.392

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      22.076     595.362       0.000       0.060       0.046       0.230

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      25.424       1.251     619.947      43.935     209.548       1.624

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 273751.406       0.500    2696.772 1530070.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.323    4154.000      25.424     619.947       1.000       1.000       0.880
W Kg/sec =   79.23788
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
110.193	3799.682	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
134103.875	136785.688	1.526	489.817	320.949	384.470	1.198

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	505.09	-0.17	505.09	0.42	665.47
MEAN	17.74	0.00	-0.02	505.09	-0.17	505.09	0.42	
HUB	15.05	0.00	-0.02	505.09	-0.17	505.09	0.42	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.24	46.36	8.88	727.55	885.83	22.50	598.66	0.74
MEAN	51.86	43.40	8.46	643.03	817.82	22.50	598.66	0.68
HUB	47.22	38.84	8.38	545.57	743.61	22.50	598.66	0.62

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	591.64	404.63	431.65	1238.22	0.48
MEAN	17.51	595.31	399.53	441.33	1232.08	0.48
HUB	14.85	637.76	450.02	451.91	1226.04	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	718.12	533.48	313.50	0.43	8019.14	
MEAN	634.62	500.03	235.09	0.41	6997.54	1.78
HUB	538.32	460.45	88.30	0.38	6685.39	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	32.05	1.26	27.41	666.56	1.08	637.36	0.92	0.91
MEAN	31.15	1.23	26.54	660.63	1.07	631.06	0.92	0.91
HUB	30.87	1.21	25.67	658.81	1.06	624.88	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.15	35.99	31.50	4.49	0.93	0.48	2.90	
MEAN	42.15	28.04	23.50	4.54	0.93	0.46	3.28	0.91
HUB	44.88	11.06	6.50	4.56	0.93	0.46	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	600.671	402.155	446.181	1232.886	0.487	0.014

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
31.309	26.614	631.896	46.000	42.029	31.500	-10.529

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	445.654	402.155	600.280	1246.018	0.358	0.414

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	31.177	28.537	645.429	471.992	0.037	0.502

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	433.981	0.000	433.981	1246.845	0.348	0.395

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	28.518	646.286	0.000	0.060	0.072	0.410

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.863	31.013	1.220	662.001	42.053	200.703	1.556

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 262270.438       0.509    2583.671 1641748.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.976

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.323    4154.000      31.013     662.001       1.000       1.000       0.980
W Kg/sec =   79.23788

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     93.348    3677.015       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134103.875  136785.688       1.888     513.330     271.918     401.059       1.475

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   407.68    -0.14   407.68     0.33   618.00
 MEAN    16.97     0.00    -0.02   407.68    -0.14   407.68     0.33
 HUB     14.32     0.00    -0.02   407.68    -0.14   407.68     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.72    46.36    13.36   698.18   808.62    28.80   648.14     0.65
 MEAN    56.47    43.80    12.67   615.20   738.14    28.80   648.14     0.59
 HUB     51.86    37.84    14.02   519.11   660.17    28.80   648.14     0.53

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   565.65   399.08   400.86  1277.89     0.44
 MEAN    16.57   563.85   388.29   408.84  1272.03     0.44
 HUB     13.89   597.10   426.66   417.72  1266.18     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   492.04   285.33     0.39  7537.39
 MEAN   600.81   460.78   212.52     0.36  6437.91     1.76
 HUB    503.52   424.73    76.86     0.34  5928.36

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     37.89     1.22    33.12   705.77     1.07   679.09     0.92     0.89
 MEAN    36.83     1.19    32.18   699.38     1.06   672.88     0.92     0.89
 HUB     36.34     1.17    31.21   696.42     1.05   666.70     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.87    35.44    31.50     3.94     0.93     0.48     2.90
 MEAN    43.52    27.47    23.50     3.97     0.94     0.45     3.29     0.89
 HUB     45.61    10.43     6.50     3.93     0.94     0.44     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.976

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     559.355     390.477     400.507    1273.500       0.439       0.042

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.973      32.382     674.441      46.000      44.274      32.400     -11.874

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     407.060     390.477     564.066    1285.032       0.317       0.452

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      36.839      34.363     686.711     456.573       0.038       0.540
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	388.629	0.000	388.629	1286.175	0.302	0.413

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	34.385	687.934	0.000	0.060	0.080	0.457

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.839	36.634	1.181	700.525	38.524	196.964	1.527

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
240536.125	0.514	2369.562	1418164.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.973

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
174.323	4154.000	36.634	700.525	1.000	1.000	0.980

W Kg/sec = 79.23788

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
81.291	3574.480	1.400	0.250	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
134103.875	136785.688	2.152	509.668	236.829	390.276	1.648

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	362.96	-0.12	362.96	0.28	571.44
MEAN	15.91	0.00	-0.02	362.96	-0.12	362.96	0.28	
HUB	13.07	0.00	-0.02	362.96	-0.12	362.96	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.35	47.36	13.99	664.11	756.93	34.67	689.55	0.59
MEAN	57.83	44.80	13.03	576.85	681.65	34.67	689.55	0.53
HUB	52.55	38.84	13.71	473.79	596.94	34.67	689.55	0.46

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	532.82	391.95	360.93	1313.42	0.41
MEAN	15.50	521.62	369.74	367.94	1307.39	0.40
HUB	12.59	539.58	387.40	375.58	1301.37	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	650.33	443.89	258.39	0.34	7033.80	
MEAN	561.80	415.05	192.06	0.32	5732.05	1.83
HUB	456.39	381.87	68.99	0.29	4879.06	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	43.72	1.19	39.04	741.32	1.06	717.67	0.92	0.89
MEAN	42.34	1.16	37.94	733.77	1.05	711.11	0.92	0.89
HUB	41.45	1.13	36.83	728.82	1.04	704.57	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	47.36	35.60	31.50	4.10	0.93	0.50	2.90	
MEAN	45.14	27.56	23.50	4.06	0.94	0.47	3.34	0.89
HUB	45.89	10.41	6.50	3.91	0.94	0.44	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.973

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

```
     15.219     528.738     376.518     371.211    1307.617       0.404      -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     42.415      37.896     711.351      46.000      45.407      33.000     -12.407

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     383.206     376.518     537.227    1317.736       0.291       0.402

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      42.176      39.771     722.404     440.827       0.072       0.561

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     359.304       0.000     359.304    1319.083       0.272       0.462

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      40.008     723.882       0.000       0.060       0.083       0.453

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.837      42.125       1.150     734.634      34.109     202.692       1.571

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 213239.750       0.504    2100.661 1441710.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1321027.75  13013.6699    170.2964      2.7884      0.8437      8.9531      1.4052


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 110% Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 9.519   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    167.175    4137.640       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.708     831.557     486.850     619.754       1.273

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   406.03    -0.14   406.03     0.37   744.88
  MEAN    17.06     0.00    -0.02   406.03    -0.14   406.03     0.37
  HUB     12.51     0.00    -0.02   406.03    -0.14   406.03     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.51    50.47    11.04   747.85   851.09    13.76   509.04     0.77
  MEAN    56.72    47.20     9.52   618.44   739.93    13.76   509.04     0.67
  HUB     48.17    38.62     9.55   453.49   608.81    13.76   509.04     0.55

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   692.48   470.77   507.84  1139.36     0.61
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 MEAN    18.04   720.73   492.66   526.06  1130.77     0.64
 HUB     15.00   817.44   599.11   556.12  1118.27     0.73

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    747.85   578.51   277.08     0.51  9714.89
 MEAN   653.81   550.19   161.15     0.49  8888.04     1.51
 HUB    543.76   558.87    55.35     0.50  8988.38

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.96     1.39    16.32   579.38     1.11   539.34     0.92     0.91
 MEAN    20.40     1.35    15.52   574.57     1.10   531.19     0.92     0.91
 HUB     20.47     1.36    14.34   575.15     1.10   519.37     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.83    28.62    24.20     4.42     0.93     0.42     2.90
 MEAN    43.12    17.03    12.70     4.33     0.94     0.35     3.51     0.91
 HUB     47.13    -5.68    -9.30     3.62     0.94     0.19     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.994

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     729.470     491.704     538.844    1131.396       0.645       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.558      15.539     531.923      24.000      42.381      35.400      -6.981

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     543.311     491.704     732.776    1152.251       0.472       0.410

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.420      17.532     551.713     528.796       0.036       0.539

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     500.543       0.000     500.543    1156.138       0.433       0.448

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.874     555.441       0.000       0.060       0.053       0.475

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.868      20.334       1.346     576.368      53.558     195.828       1.518

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 333442.438       0.596    3224.588 1707338.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.519   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    4154.000      20.334     576.368       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    130.407    3940.713       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.555     590.487     379.791     474.134       1.248

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   476.23    -0.16   476.23     0.41   706.68
 MEAN    18.08     0.00    -0.02   476.23    -0.16   476.23     0.41
 HUB     15.21     0.00    -0.02   476.23    -0.16   476.23     0.41
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.42    46.36    11.06   744.95   884.30    18.10   557.43     0.76
MEAN    54.00    42.30    11.70   655.35   810.24    18.10   557.43     0.70
HUB     49.19    37.84    11.35   551.37   728.69    18.10   557.43     0.63

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   617.94   415.46   457.43  1195.39     0.52
MEAN    18.01   623.03   409.62   469.45  1188.36     0.52
HUB     15.22   669.39   463.58   482.88  1181.41     0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    740.23   561.00   324.78     0.47  8487.03
MEAN   652.87   528.73   243.25     0.44  7380.21     1.68
HUB    551.84   490.88    88.26     0.42  7059.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.34     1.30    21.95   625.75     1.09   593.87     0.92     0.90
MEAN    25.49     1.25    21.14   619.31     1.07   586.91     0.92     0.90
HUB     25.25     1.24    20.31   617.44     1.07   580.04     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.25    35.37    31.50     3.87     0.93     0.45     2.90
MEAN    41.11    27.39    23.50     3.89     0.94     0.42     3.30     0.90
HUB     43.83    10.36     6.50     3.86     0.94     0.41     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.982

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     685.845     410.770     549.228    1182.910       0.580      -0.156

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.650      20.421     581.564      46.000      36.793      30.600      -6.193

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     536.836     410.770     675.963    1198.280       0.448       0.248

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      25.556      22.264     596.775     455.853       0.031       0.428

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     529.883       0.000     529.883    1198.901       0.442       0.405

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.850      22.269     597.394       0.000       0.060       0.049       0.250

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.864      25.470       1.253     620.835      44.468     205.345       1.592

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 277071.781       0.506    2679.450 1495439.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 9.519   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    4154.000      25.470     620.835       1.000       1.000       0.880
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.053    3796.963       1.401       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
131645.797	134278.422	1.556	489.817	314.717	384.470	1.222

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	493.61	-0.17	493.61	0.41	664.99
MEAN	17.74	0.00	-0.02	493.61	-0.17	493.61	0.41	
HUB	15.05	0.00	-0.02	493.61	-0.17	493.61	0.41	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.85	46.36	9.49	727.55	879.33	22.68	600.51	0.73
MEAN	52.50	43.40	9.10	643.03	810.77	22.68	600.51	0.67
HUB	47.87	38.84	9.03	545.57	735.85	22.68	600.51	0.61

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	589.72	411.62	422.30	1240.04	0.48
MEAN	17.51	591.91	404.77	431.88	1233.79	0.48
HUB	14.85	632.50	452.07	442.37	1227.62	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	718.12	521.81	306.50	0.42	8157.63	
MEAN	634.62	489.24	229.85	0.40	7089.15	1.80
HUB	538.32	450.70	86.25	0.37	6715.76	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	32.21	1.26	27.59	668.26	1.08	639.24	0.92	0.91
MEAN	31.26	1.23	26.70	662.05	1.07	632.81	0.92	0.91
HUB	30.94	1.21	25.81	659.88	1.06	626.50	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.27	35.97	31.50	4.47	0.93	0.49	2.90	
MEAN	43.14	28.02	23.50	4.52	0.93	0.47	3.28	0.91
HUB	45.62	11.03	6.50	4.53	0.93	0.47	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	597.209	407.427	436.649	1234.575	0.484	0.014

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
31.422	26.770	633.635	46.000	43.017	31.500	-11.517

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	435.718	407.427	596.529	1248.060	0.349	0.429

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	31.277	28.747	647.553	471.992	0.040	0.518

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	424.584	0.000	424.584	1248.830	0.340	0.406

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	28.706	648.352	0.000	0.060	0.078	0.421

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.859	31.099	1.221	663.393	42.557	196.641	1.524

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
265418.312	0.515	2566.755	1603355.500

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 9.519   EfDer =  0.972

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    4154.000      31.099     663.393       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.479    3673.156       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.926     513.330     266.475     401.059       1.505

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   399.00    -0.14   399.00     0.32   617.35
 MEAN    16.97     0.00    -0.02   399.00    -0.14   399.00     0.32
 HUB     14.32     0.00    -0.02   399.00    -0.14   399.00     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.26    46.36    13.90   698.18   804.27    28.98   650.12     0.64
 MEAN    57.04    43.80    13.24   615.20   733.37    28.98   650.12     0.59
 HUB     52.46    37.84    14.62   519.11   654.84    28.98   650.12     0.52

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   563.99   404.94   392.57  1279.94     0.44
 MEAN    16.57   560.81   392.65   400.41  1274.00     0.44
 HUB     13.89   592.25   428.20   409.14  1268.06     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   481.89   279.47     0.38  7647.89
 MEAN   600.81   451.28   208.16     0.35  6510.10     1.79
 HUB    503.52   416.02    75.32     0.33  5949.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     38.06     1.22    33.31   707.80     1.07   681.28     0.92     0.89
 MEAN    36.96     1.19    32.35   701.19     1.06   674.98     0.92     0.89
 HUB     36.43     1.17    31.37   697.94     1.05   668.70     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.89    35.45    31.50     3.95     0.93     0.49     2.90
 MEAN    44.44    27.47    23.50     3.97     0.94     0.47     3.29     0.89
 HUB     46.30    10.43     6.50     3.93     0.94     0.45     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.972

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     556.627     394.860     392.325    1275.413       0.436       0.041

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    37.103      32.550     676.482      46.000      45.185      32.400     -12.785

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     398.440     394.860     560.954    1287.230       0.310       0.465

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      36.959      34.582     689.076     456.573       0.040       0.555

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     16.096     380.638       0.000     380.638    1288.310       0.295       0.422

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      34.578     690.232       0.000       0.060       0.086       0.465

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.833      36.739       1.181     702.310      38.918     193.370       1.499

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 243002.719       0.519    2349.982 1386706.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 9.519   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    4154.000      36.739     702.310       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     79.674    3569.933       1.400       0.250      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       2.196     509.668     232.122     390.276       1.681

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   355.60    -0.12   355.60     0.28   570.72
 MEAN    15.91     0.00    -0.02   355.60    -0.12   355.60     0.28
 HUB     13.07     0.00    -0.02   355.60    -0.12   355.60     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.84    47.36    14.48   664.11   753.43    34.85   691.78     0.58
 MEAN    58.35    44.80    13.55   576.85   677.75    34.85   691.78     0.53
 HUB     53.12    38.84    14.28   473.79   592.49    34.85   691.78     0.46

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   531.76   396.97   353.82  1315.59     0.40
 MEAN    15.50   519.19   373.46   360.67  1309.52     0.40
 HUB     12.59   535.39   388.71   368.16  1303.44     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   435.18   253.37     0.33  7123.86
 MEAN   561.80   406.88   188.33     0.31  5789.76     1.86
 HUB    456.39   374.33    67.68     0.29  4895.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     43.89     1.19    39.22   743.62     1.06   720.07     0.92     0.89
 MEAN    42.48     1.16    38.12   735.88     1.05   713.44     0.92     0.89
 HUB     41.56     1.13    37.00   730.70     1.04   706.83     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.29    35.61    31.50     4.11     0.93     0.51     2.90
 MEAN    46.00    27.57    23.50     4.07     0.94     0.48     3.34     0.89
 HUB     46.56    10.42     6.50     3.92     0.94     0.45     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.970

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     526.362     380.313     363.894    1309.720       0.402      -0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     42.555      38.073     713.663      46.000      46.264      33.000     -13.264

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     375.490     380.313     534.445    1320.077       0.284       0.413

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      42.298      39.987     724.994     440.827       0.077       0.575

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     352.197       0.000     352.197    1321.361       0.267       0.471

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      40.207     726.405       0.000       0.060       0.089       0.462

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.831      42.242       1.150     736.735      34.425     199.236       1.544

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 215223.922       0.509    2081.344 1410357.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1334159.12  12902.1211    167.1750      2.7962      0.8380      9.5192      1.4092


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 110% Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.973   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    164.680    4137.640       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  129680.953  132274.297       1.734     831.557     479.584     619.754       1.292

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   399.06    -0.14   399.06     0.36   744.88
  MEAN    17.06     0.00    -0.02   399.06    -0.14   399.06     0.36
  HUB     12.51     0.00    -0.02   399.06    -0.14   399.06     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.92    50.47    11.45   747.85   847.78    13.81   509.51     0.77
  MEAN    57.17    47.20     9.97   618.44   736.13    13.81   509.51     0.66
  HUB     48.66    38.62    10.04   453.49   604.18    13.81   509.51     0.55

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   689.14   475.87   498.46  1140.40     0.60
  MEAN    18.04   715.77   495.60   516.44  1131.71     0.63
  HUB     15.00   809.56   598.04   545.66  1119.28     0.72
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    747.85   567.83   271.98     0.50  9819.99
 MEAN   653.81   540.13   158.22     0.48  8940.92     1.54
 HUB    543.76   548.35    54.28     0.49  8972.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.01     1.39    16.41   579.99     1.11   540.34     0.92     0.91
 MEAN    20.43     1.35    15.60   574.88     1.10   532.09     0.92     0.91
 HUB     20.45     1.35    14.43   575.06     1.10   520.34     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.67    28.62    24.20     4.42     0.93     0.43     2.90
 MEAN    43.82    17.03    12.70     4.33     0.94     0.36     3.51     0.91
 HUB     47.62    -5.68    -9.30     3.62     0.94     0.21     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     724.141     494.633     528.883    1132.377       0.639       0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.578      15.622     532.845      24.000      43.083      35.400      -7.683

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     532.860     494.633     727.050    1153.519       0.462       0.421

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.431      17.648     552.927     528.796       0.038       0.549

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     491.484       0.000     491.484    1157.205       0.425       0.455

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.965     556.467       0.000       0.060       0.056       0.483

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      20.340       1.346     576.643      53.833     193.393       1.499

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 335157.344       0.599    3192.798 1678007.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.973   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    4154.000      20.340     576.643       1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    128.452    3939.772       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       1.578     590.487     374.100     474.134       1.267

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   467.80    -0.16   467.80     0.40   706.51
 MEAN    18.08     0.00    -0.02   467.80    -0.16   467.80     0.40
 HUB     15.21     0.00    -0.02   467.80    -0.16   467.80     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.88    46.36    11.52   744.95   879.79    18.18   558.37     0.76
 MEAN    54.49    42.30    12.19   655.35   805.31    18.18   558.37     0.69
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HUB     49.70    37.84    11.86   551.37   723.20    18.18   558.37     0.62

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   615.96   421.07   449.57  1196.54     0.51
MEAN    18.01   619.81   413.80   461.45  1189.42     0.52
HUB     15.22   664.61   465.09   474.76  1182.36     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    740.23   551.35   319.17     0.46  8601.48
MEAN   652.87   519.70   239.07     0.44  7455.42     1.70
HUB    551.84   482.62    86.75     0.41  7082.57

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.41     1.30    22.04   626.69     1.09   595.02     0.92     0.90
MEAN    25.54     1.26    21.22   620.02     1.08   587.95     0.92     0.90
HUB     25.26     1.24    20.38   617.85     1.07   580.98     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.12    35.37    31.50     3.87     0.93     0.46     2.90
MEAN    41.88    27.39    23.50     3.89     0.94     0.43     3.30     0.90
HUB     44.41    10.35     6.50     3.85     0.94     0.41     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.979

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     680.410     414.961     539.227    1184.238       0.575      -0.151

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.692      20.535     582.872      46.000      37.580      30.600      -6.980

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     526.658     414.961     670.493    1199.875       0.439       0.266

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      25.590      22.415     598.366     455.853       0.032       0.440

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.823     520.058       0.000     520.058    1200.453       0.433       0.414

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.850      22.410     598.943       0.000       0.060       0.053       0.265

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.860      25.498       1.254     621.523      44.880     202.115       1.567

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 279641.562       0.510    2663.940 1468180.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 9.973   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    4154.000      25.498     621.523       1.000       1.000       0.880
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.382    3794.862       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       1.581     489.817     309.852     384.470       1.241
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ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	484.75	-0.17	484.75	0.40	664.63
MEAN	17.74	0.00	-0.02	484.75	-0.17	484.75	0.40	
HUB	15.05	0.00	-0.02	484.75	-0.17	484.75	0.40	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.33	46.36	9.97	727.55	874.38	22.80	601.92	0.73
MEAN	53.00	43.40	9.60	643.03	805.41	22.80	601.92	0.67
HUB	48.39	38.84	9.55	545.57	729.94	22.80	601.92	0.61

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	588.39	416.99	415.12	1241.42	0.47
MEAN	17.51	589.40	408.78	424.61	1235.09	0.48
HUB	14.85	628.51	453.64	435.01	1228.83	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	718.12	512.84	301.13	0.41	8264.01	
MEAN	634.62	480.93	225.84	0.39	7159.34	1.83
HUB	538.32	443.17	84.68	0.36	6739.09	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	32.32	1.27	27.71	669.56	1.08	640.68	0.92	0.91
MEAN	31.34	1.23	26.81	663.14	1.07	634.16	0.92	0.91
HUB	30.97	1.21	25.90	660.70	1.06	627.74	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.13	35.96	31.50	4.46	0.93	0.50	2.90	
MEAN	43.91	28.01	23.50	4.51	0.94	0.48	3.28	0.91
HUB	46.20	11.02	6.50	4.52	0.94	0.47	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.993

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	594.649	411.465	429.306	1235.865	0.481	0.014

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
31.496	26.877	634.965	46.000	43.784	31.500	-12.284

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	428.083	411.465	593.767	1249.620	0.343	0.441

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	31.341	28.895	649.178	471.992	0.043	0.530

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	417.357	0.000	417.357	1250.348	0.334	0.414

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	28.837	649.934	0.000	0.060	0.083	0.429

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.854	31.152	1.222	664.467	42.944	193.548	1.500

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
267834.281	0.519	2551.460	1573259.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

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 RESET =  0.000BLEED =  0.000 DPInc = 9.973   EfDer =  0.969

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    4154.000      31.152     664.467       1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     90.033    3670.184       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
129680.953  132274.297       1.957     513.330     262.263     401.059       1.529

    ROTOR LEADING EDGE CONDITIONS, STAGE             4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   392.31    -0.14   392.31     0.31   616.85
MEAN    16.97     0.00    -0.02   392.31    -0.14   392.31     0.31
HUB     14.32     0.00    -0.02   392.31    -0.14   392.31     0.31

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.67    46.36    14.31   698.18   800.97    29.10   651.64     0.64
MEAN    57.48    43.80    13.68   615.20   729.75    29.10   651.64     0.58
HUB     52.93    37.84    15.09   519.11   650.79    29.10   651.64     0.52

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
TIP     18.88   562.84   409.43   386.21  1281.50     0.44
MEAN    16.57   558.54   395.97   393.93  1275.50     0.44
HUB     13.89   588.57   429.39   402.54  1269.50     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    684.41   474.10   274.98     0.37  7732.61
MEAN   600.81   444.00   204.84     0.35  6565.05     1.81
HUB    503.52   409.31    74.13     0.32  5966.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     38.17     1.23    33.43   709.36     1.07   682.96     0.92     0.89
MEAN    37.05     1.19    32.47   702.59     1.06   676.58     0.92     0.89
HUB     36.48     1.17    31.48   699.11     1.05   670.23     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.67    35.45    31.50     3.95     0.93     0.50     2.90
MEAN    45.15    27.47    23.50     3.97     0.94     0.47     3.29     0.89
HUB     46.85    10.43     6.50     3.93     0.94     0.45     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.969

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     554.599     398.197     386.030    1276.877       0.434       0.040

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    37.186      32.662     678.046      46.000      45.889      32.400     -13.489

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     391.822     398.197     558.646    1288.912       0.304       0.476

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      37.033      34.732     690.888     456.573       0.042       0.566

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     374.495       0.000     374.495    1289.944       0.290       0.429

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      34.709     691.995       0.000       0.060       0.090       0.471

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.828      36.802       1.181     703.686      39.219     190.635       1.478

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 244888.797       0.523    2332.876 1361934.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 9.973   EfDer =  0.967

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    4154.000      36.802     703.686       1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     78.428    3566.442       1.400       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       2.231     509.668     228.492     390.276       1.708

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   349.93    -0.12   349.93     0.27   570.16
 MEAN    15.91     0.00    -0.02   349.93    -0.12   349.93     0.27
 HUB     13.07     0.00    -0.02   349.93    -0.12   349.93     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.22    47.36    14.86   664.11   750.77    34.97   693.49     0.58
 MEAN    58.76    44.80    13.96   576.85   674.80    34.97   693.49     0.52
 HUB     53.56    38.84    14.72   473.79   589.11    34.97   693.49     0.46

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   531.03   400.81   348.35  1317.25     0.40
 MEAN    15.50   517.41   376.34   355.09  1311.14     0.39
 HUB     12.59   532.20   389.70   362.46  1305.02     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   428.50   249.52     0.33  7192.76
 MEAN   561.80   400.60   185.46     0.31  5834.21     1.88
 HUB    456.39   368.54    66.69     0.28  4907.89

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     44.00     1.20    39.34   745.39     1.06   721.91     0.92     0.88
 MEAN    42.57     1.16    38.24   737.52     1.05   715.22     0.92     0.88
 HUB     41.62     1.13    37.11   732.15     1.04   708.56     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.01    35.61    31.50     4.11     0.93     0.52     2.90
 MEAN    46.66    27.58    23.50     4.08     0.95     0.49     3.34     0.88
 HUB     47.07    10.43     6.50     3.93     0.95     0.45     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.967

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     524.622     383.236     358.271    1311.329       0.400      -0.011

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    42.641      38.188     715.434      46.000      46.928      33.000     -13.928

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     369.565     383.236     532.399    1321.868       0.280       0.422

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      42.371      40.131     726.979     440.827       0.080       0.586

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     346.736       0.000     346.736    1323.105       0.262       0.478

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      40.338     728.341       0.000       0.060       0.093       0.468

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.826      42.311       1.150     738.352      34.666     196.602       1.524

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 216743.672       0.512    2064.758 1385628.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1344265.50  12805.8311    164.6798      2.8007      0.8332      9.9730      1.4123


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 110% Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.453   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    165.880    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   75.39980

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    162.048    4137.640       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  127608.227  130160.102       1.762     831.557     471.918     619.754       1.313

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   391.76    -0.13   391.76     0.35   744.88
  MEAN    17.06     0.00    -0.02   391.76    -0.13   391.76     0.35
  HUB     12.51     0.00    -0.02   391.76    -0.13   391.76     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.36    50.47    11.89   747.85   844.36    13.85   509.99     0.76
  MEAN    57.65    47.20    10.45   618.44   732.19    13.85   509.99     0.66
  HUB     49.19    38.62    10.57   453.49   599.38    13.85   509.99     0.54

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   685.84   481.14   488.76  1141.45     0.60
  MEAN    18.04   710.74   498.63   506.48  1132.67     0.63
  HUB     15.00   801.47   596.93   534.82  1120.31     0.72

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   556.80   266.71     0.49  9928.61
  MEAN   653.81   529.72   155.19     0.47  8995.55     1.56
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 HUB    543.76   537.46    53.17     0.48  8955.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.07     1.39    16.50   580.63     1.11   541.35     0.92     0.91
 MEAN    20.45     1.35    15.68   575.19     1.10   533.01     0.92     0.91
 HUB     20.42     1.35    14.51   574.96     1.10   521.33     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.55    28.62    24.20     4.42     0.93     0.44     2.90
 MEAN    44.55    17.04    12.70     4.34     0.94     0.38     3.51     0.91
 HUB     48.14    -5.68    -9.30     3.62     0.94     0.22     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     718.743     497.659     518.581    1133.370       0.634       0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.597      15.706     533.780      24.000      43.821      35.400      -8.421

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     522.095     497.659     721.282    1154.804       0.452       0.432

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.441      17.763     554.160     528.796       0.041       0.560

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     482.127       0.000     482.127    1158.292       0.416       0.462

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.054     557.513       0.000       0.060       0.060       0.490

   STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.861      20.344       1.347     576.927      54.117     190.860       1.480

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 336928.125       0.602    3158.365 1647306.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =10.453   EfDer =  0.976

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    165.880    4154.000      20.344     576.927       1.000       1.000       0.980
W Kg/sec =   75.39980

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    126.410    3938.801       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127608.227  130160.102       1.604     590.487     368.152     474.134       1.288

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   459.08    -0.16   459.08     0.40   706.33
 MEAN    18.08     0.00    -0.02   459.08    -0.16   459.08     0.40
 HUB     15.21     0.00    -0.02   459.08    -0.16   459.08     0.40

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.36    46.36    12.00   744.95   875.18    18.26   559.33     0.75
 MEAN    54.99    42.30    12.69   655.35   800.27    18.26   559.33     0.69
 HUB     50.23    37.84    12.39   551.37   717.59    18.26   559.33     0.62

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   614.06   426.81   441.48  1197.70     0.51
MEAN    18.01   616.59   418.08   453.20  1190.49     0.52
HUB     15.22   659.72   466.63   466.36  1183.33     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    740.23   541.42   313.42     0.45  8718.73
MEAN   652.87   510.41   234.78     0.43  7532.54     1.72
HUB    551.84   474.08    85.21     0.40  7105.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.48     1.30    22.13   627.66     1.09   596.18     0.92     0.89
MEAN    25.58     1.26    21.30   620.76     1.08   589.02     0.92     0.89
HUB     25.26     1.24    20.45   618.27     1.07   581.94     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.03    35.37    31.50     3.87     0.93     0.47     2.90
MEAN    42.69    27.39    23.50     3.89     0.94     0.44     3.30     0.89
HUB     45.02    10.35     6.50     3.85     0.94     0.42     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.976

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     674.966     419.258     528.962    1185.579       0.569      -0.146

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.728      20.646     584.195      46.000      38.401      30.600      -7.801

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     516.248     419.258     665.049    1201.489       0.430       0.283

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      25.619      22.562     599.980     455.853       0.035       0.452

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     510.012       0.000     510.012    1202.024       0.424       0.424

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.850      22.545     600.514       0.000       0.060       0.057       0.280

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.855      25.520       1.254     622.230      45.302     198.820       1.541

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 282272.844       0.515    2646.027 1439793.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =10.453   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    165.880    4154.000      25.520     622.230       1.000       1.000       0.880
W Kg/sec =   75.39980

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.654    3792.707       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127608.227  130160.102       1.607     489.817     304.818     384.470       1.261

    ROTOR LEADING EDGE CONDITIONS, STAGE            3
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   475.66    -0.16   475.66     0.39   664.25
MEAN    17.74     0.00    -0.02   475.66    -0.16   475.66     0.39
HUB     15.05     0.00    -0.02   475.66    -0.16   475.66     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.83    46.36    10.47   727.55   869.38    22.92   603.35     0.72
MEAN    53.52    43.40    10.12   643.03   799.97    22.92   603.35     0.66
HUB     48.92    38.84    10.08   545.57   723.93    22.92   603.35     0.60

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   587.15   422.45   407.78  1242.83     0.47
MEAN    17.51   586.92   412.87   417.16  1236.41     0.47
HUB     14.85   624.46   455.23   427.46  1230.06     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    718.12   503.69   295.67     0.41  8371.97
MEAN   634.62   472.44   221.76     0.38  7230.76     1.85
HUB    538.32   435.46    83.09     0.35  6762.58

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     32.42     1.27    27.82   670.90     1.08   642.13     0.92     0.91
MEAN    31.41     1.23    26.91   664.26     1.07   635.52     0.92     0.91
HUB     31.00     1.21    25.99   661.54     1.06   629.01     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.01    35.95     31.50     4.45     0.93     0.50     2.90
MEAN    44.70    27.99     23.50     4.49     0.94     0.49     3.28     0.91
HUB     46.80    11.00      6.50     4.50     0.94     0.48     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     592.123     415.575     421.791    1237.172       0.479       0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.560      26.976     636.315      46.000      44.575      31.500     -13.075

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     420.285     415.575     591.051    1251.203       0.336       0.453

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.395      29.034     650.829     471.992       0.045       0.543

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     409.969       0.000     409.969    1251.889       0.327       0.422

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.959     651.544       0.000       0.060       0.088       0.437

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.850      31.194       1.222     665.566      43.337     190.421       1.476

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 270285.656       0.524    2533.659 1542020.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
  RESET =  0.000BLEED =  0.000 DPInc =10.453   EfDer =  0.965

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
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    165.880    4154.000      31.194     665.566       1.000       1.000       0.980
W Kg/sec =   75.39980

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.546    3667.152       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127608.227  130160.102       1.990     513.330     257.936     401.059       1.555

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   385.47    -0.13   385.47     0.31   616.34
 MEAN    16.97     0.00    -0.02   385.47    -0.13   385.47     0.31
 HUB     14.32     0.00    -0.02   385.47    -0.13   385.47     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.10    46.36    14.74   698.18   797.64    29.21   653.18     0.64
 MEAN    57.94    43.80    14.14   615.20   726.10    29.21   653.18     0.58
 HUB     53.41    37.84    15.57   519.11   646.68    29.21   653.18     0.52

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   561.74   413.96   379.71  1283.08     0.44
 MEAN    16.57   556.31   399.34   387.30  1277.03     0.44
 HUB     13.89   584.84   430.57   395.79  1270.97     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   466.18   270.44     0.36  7818.20
 MEAN   600.81   436.57   201.47     0.34  6620.92     1.83
 HUB    503.52   402.45    72.94     0.32  5982.58

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     38.27     1.23    33.55   710.96     1.07   684.66     0.92     0.88
 MEAN    37.12     1.19    32.58   704.01     1.06   678.21     0.92     0.88
 HUB     36.52     1.17    31.58   700.30     1.05   671.79     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.47    35.46    31.50     3.96     0.93     0.50     2.90
 MEAN    45.88    27.48    23.50     3.98     0.95     0.48     3.29     0.88
 HUB     47.41    10.44     6.50     3.94     0.95     0.46     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.965

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     552.599     401.589     379.595    1278.362       0.432       0.039

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     37.254      32.762     679.636      46.000      46.613      32.400     -14.213

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     385.065     401.589     556.372    1290.618       0.298       0.486

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      37.092      34.869     692.730     456.573       0.044       0.578

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     368.216       0.000     368.216    1291.603       0.285       0.436

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      34.827     693.788       0.000       0.060       0.095       0.477

    STAGE EXIT CONDITIONS, STAGE            4
```

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.822	36.850	1.181	705.090	39.523	187.868	1.456

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
246797.484	0.527	2313.480	1336127.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
RESET = 0.000BLEED = 0.000 DPInc =10.453 EfDer = 0.963

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
165.880	4154.000	36.850	705.090	1.000	1.000	0.980

W Kg/sec = 75.39980

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
77.150	3562.890	1.400	0.250	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
127608.227	130160.102	2.267	509.668	224.772	390.276	1.736

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	344.13	-0.12	344.13	0.27	569.59
MEAN	15.91	0.00	-0.02	344.13	-0.12	344.13	0.27	
HUB	13.07	0.00	-0.02	344.13	-0.12	344.13	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.61	47.36	15.25	664.11	748.08	35.08	695.23	0.58
MEAN	59.19	44.80	14.39	576.85	671.81	35.08	695.23	0.52
HUB	54.01	38.84	15.17	473.79	585.68	35.08	695.23	0.45

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	530.37	404.73	342.77	1318.94	0.40
MEAN	15.50	515.64	379.23	349.38	1312.79	0.39
HUB	12.59	529.01	390.73	356.62	1306.62	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	650.33	421.68	245.61	0.32	7262.99	
MEAN	561.80	394.20	182.57	0.30	5879.04	1.90
HUB	456.39	362.61	65.66	0.28	4920.84	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	44.10	1.20	39.45	747.20	1.06	723.78	0.92	0.88
MEAN	42.64	1.16	38.34	739.18	1.05	717.04	0.92	0.88
HUB	41.66	1.13	37.21	733.62	1.04	710.32	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	49.74	35.62	31.50	4.12	0.93	0.53	2.90	
MEAN	47.35	27.59	23.50	4.09	0.95	0.50	3.34	0.88
HUB	47.61	10.43	6.50	3.93	0.95	0.46	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.963

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	522.887	386.184	352.523	1312.964	0.398	-0.012

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
42.709	38.286	717.236	46.000	47.609	33.000	-14.609

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	363.514	386.184	530.359	1323.686	0.275	0.431

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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      42.425      40.259     728.999     440.827       0.084       0.597

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     341.154       0.000     341.154    1324.877       0.257       0.485

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      40.451     730.311       0.000       0.060       0.098       0.475

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.821      42.361       1.150     740.002      34.912     193.929       1.503

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 218290.734       0.516    2046.258 1359832.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1354574.88  12697.7891    162.0477      2.8040      0.8280     10.4530      1.4154



**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

   Fan-Core + 4 Stage LPC 110% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    205.789    4154.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   93.54043

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    201.035    4137.640       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 158309.812  161475.672       1.420     831.557     585.458     619.754       1.059

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   507.18    -0.17   507.18     0.46   744.88
 MEAN    17.06     0.00    -0.02   507.18    -0.17   507.18     0.46
 HUB     12.51     0.00    -0.02   507.18    -0.17   507.18     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.86    50.47     5.39   747.85   903.75    13.05   501.33     0.82
 MEAN    50.65    47.20     3.45   618.44   799.95    13.05   501.33     0.73
 HUB     41.81    38.62     3.19   453.49   680.47    13.05   501.33     0.62

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   768.72   385.45   665.11  1119.08     0.69
 MEAN    18.04   815.01   444.50   683.13  1113.13     0.73
 HUB     15.00   955.06   616.73   729.23  1099.46     0.87

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    747.85   757.43   362.40     0.68  7955.34
 MEAN   653.81   714.47   209.32     0.64  8019.94     1.23
 HUB    543.76   732.87    72.97     0.67  9253.12
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.77     1.31    14.41   569.14     1.09   519.83     0.92     0.90
MEAN    19.81     1.31    13.86   569.51     1.09   514.12     0.92     0.90
HUB     20.62     1.36    12.60   576.69     1.10   500.75     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.09    28.59    24.20     4.39     0.93     0.24     2.90
MEAN    33.05    17.04    12.70     4.34     0.92     0.19     3.51     0.90
HUB     40.22    -5.71    -9.30     3.59     0.92     0.03     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     834.264     443.634     706.531    1111.793       0.750       -0.016

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.002      13.762      513.649      24.000      32.125      35.400       3.275

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     732.311     443.634     856.207    1126.138       0.650       0.204

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.858      14.941     526.989     528.796       0.032       0.381

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083     664.602       0.000     664.602    1134.551       0.586       0.284

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.589     534.889       0.000       0.060       0.061       0.305

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.840      19.671       1.302     571.781      48.971     234.066       1.814

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 304886.438       0.545    3545.622 2132648.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    205.789    4154.000      19.671     571.781       1.000       1.000       0.980
W Kg/sec =   93.54043

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    161.458    3956.488       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 158309.812  161475.672       1.256     590.487     470.224     474.134       1.008

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   625.70    -0.22   625.70     0.55   709.51
 MEAN    18.08     0.00    -0.02   625.70    -0.22   625.70     0.55
 HUB     15.21     0.00    -0.02   625.70    -0.22   625.70     0.55

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.98    46.36     3.62   744.95   973.02    16.02   539.09     0.85
 MEAN    46.34    42.30     4.04   655.35   906.24    16.02   539.09     0.80
 HUB     41.40    37.84     3.56   551.37   834.12    16.02   539.09     0.73

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	680.71	306.47	607.81	1170.84	0.58
MEAN	18.01	700.90	330.10	618.30	1166.62	0.60
HUB	15.22	765.38	434.23	630.28	1162.57	0.66

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	740.23	746.72	433.76	0.64	6262.61	
MEAN	652.87	697.47	322.77	0.60	5949.00	1.40
HUB	551.84	641.16	117.62	0.55	6613.50	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.94	1.22	19.04	608.22	1.06	569.55	0.92	0.91
MEAN	23.71	1.21	18.57	606.40	1.06	565.40	0.92	0.91
HUB	24.20	1.23	18.08	610.27	1.07	561.39	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	26.76	35.51	31.50	4.01	0.93	0.29	2.90	
MEAN	28.10	27.57	23.50	4.07	0.92	0.29	3.30	0.91
HUB	34.56	10.57	6.50	4.07	0.92	0.30	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.993

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	1106.224	331.027	1055.534	1104.823	1.001	-1.110

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.895	12.597	506.327	46.000	17.412	30.600	13.188

STATOR / VANED DIFFUSER THROAT IS CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	1163.522	331.027	1209.696	1095.942	1.062	-1.312

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	23.438	11.499	495.994	400.556	0.095	-0.251

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	1494.830	0.000	1494.830	1051.248	1.422	-1.088

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	6.738	432.590	0.000	0.060	0.337	-2.196

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.538	22.134	1.125	608.297	36.516	272.875	2.115

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
227502.594	0.415	2645.700	1927383.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 3.453 EfDer = 0.767

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
205.789	4154.000	22.134	608.297	1.000	1.000	0.780

W Kg/sec = 93.54043

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
148.006	3835.896	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
158309.812	161475.672	1.007	434.156	431.090	339.175	0.787

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	1019.39	-0.35	1019.39	0.91	671.81

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MEAN    17.74     0.00    -0.02  1019.39    -0.35  1019.39     0.91
HUB     15.05     0.00    -0.02  1019.39    -0.35  1019.39     0.91

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     35.53    46.36   -10.83   727.55  1252.60    12.94   521.60     1.12
MEAN    32.26    43.40   -11.14   643.03  1205.45    12.94   521.60     1.08
HUB     28.17    38.84   -10.67   545.57  1156.37    12.94   521.60     1.03

     ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   701.51   189.31   675.48  1190.75     0.59
MEAN    17.51   717.33   239.20   676.27  1191.45     0.60
HUB     14.85   779.65   374.16   684.00  1191.75     0.65

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    718.12   857.85   528.81     0.72  3757.36
MEAN   634.62   783.39   395.42     0.66  4193.86     1.60
HUB    538.32   703.42   164.16     0.59  5561.62

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.14     1.09    19.09   630.15     1.04   589.12     0.92     0.70
MEAN    24.39     1.10    19.08   632.69     1.04   589.79     0.92     0.70
HUB     25.15     1.14    18.86   640.64     1.05   589.97     0.92     0.70

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     15.66    38.06    31.50     6.56     0.93     0.34     2.90
MEAN    19.48    30.31    23.50     6.81     0.84     0.38     3.28     0.70
HUB     28.68    13.50     6.50     7.00     0.84     0.43     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.767

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     728.875     240.774     687.958    1191.459       0.612      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.505      19.031     590.171      46.000      19.289      31.500      12.211

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     728.394     240.774     767.157    1191.518       0.611      -0.029

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.262      18.848     590.230     471.992       0.054       0.135

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     711.402       0.000     711.402    1193.582       0.596      -0.038

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.820     592.271       0.000       0.060       0.113      -0.034

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.526      23.935       1.081     634.492      26.196     382.967       2.969

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 163303.406       0.317    1899.108 2981954.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.940

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    205.789    4154.000      23.935     634.492       1.000       1.000       0.980
W Kg/sec =   93.54043
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
139.782	3755.877	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
158309.812	161475.672	1.261	513.330	407.174	401.059	0.985

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	655.31	-0.23	655.31	0.55	631.25
MEAN	16.97	0.00	-0.02	655.31	-0.23	655.31	0.55	
HUB	14.32	0.00	-0.02	655.31	-0.23	655.31	0.55	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.82	46.36	0.46	698.18	957.71	19.54	598.69	0.80
MEAN	43.20	43.80	-0.60	615.20	898.99	19.54	598.69	0.75
HUB	38.40	37.84	0.56	519.11	836.15	19.54	598.69	0.70

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	698.98	205.20	668.18	1217.70	0.57
MEAN	16.57	714.52	248.45	669.93	1217.31	0.59
HUB	13.89	772.16	375.18	674.88	1216.61	0.63

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	684.41	822.26	479.21	0.68	3878.56	
MEAN	600.81	756.95	352.36	0.62	4121.56	1.27
HUB	503.52	686.97	128.33	0.56	5214.54	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.59	1.11	21.26	657.04	1.04	616.32	0.92	0.86
MEAN	26.76	1.12	21.19	658.45	1.04	615.91	0.92	0.86
HUB	27.55	1.15	21.00	664.80	1.05	615.12	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	17.07	35.65	31.50	4.15	0.93	0.18	2.90	
MEAN	20.35	27.74	23.50	4.24	0.90	0.20	3.29	0.86
HUB	29.07	10.77	6.50	4.27	0.90	0.24	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.940

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	698.838	249.844	652.651	1220.427	0.573	0.060

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
26.911	21.543	619.378	46.000	20.948	32.400	11.452

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	696.045	249.844	739.527	1220.747	0.570	0.044

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	26.693	21.409	619.703	456.573	0.047	0.176

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	659.712	0.000	659.712	1224.787	0.539	0.024

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.683	623.810	0.000	0.060	0.095	0.091

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.710	26.418	1.104	660.096	25.603	339.514	2.632

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 159699.969       0.341    1857.202 1895272.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.930

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    205.789    4154.000      26.418     660.096       1.000       1.000       0.980
W Kg/sec =   93.54043

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    129.175    3682.317       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 158309.812  161475.672       1.354     509.668     376.310     390.276       1.037

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   605.90    -0.21   605.90     0.49   588.68
 MEAN    15.91     0.00    -0.02   605.90    -0.21   605.90     0.49
 HUB     13.07     0.00    -0.02   605.90    -0.21   605.90     0.49

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.63    47.36     0.27   664.11   899.13    22.38   629.51     0.73
 MEAN    43.60    44.80    -1.20   576.85   836.73    22.38   629.51     0.68
 HUB     38.04    38.84    -0.80   473.79   769.28    22.38   629.51     0.63

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   653.68   201.15   621.96  1245.86     0.52
 MEAN    15.50   667.10   231.04   625.81  1244.29     0.54
 HUB     12.59   715.92   336.50   631.91  1242.58     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   767.20   449.18     0.62  3612.47
 MEAN   561.80   707.84   330.76     0.57  3583.82     1.27
 HUB    456.39   643.19   119.89     0.52  4239.26

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.00     1.10    24.04   681.08     1.03   645.48     0.92     0.85
 MEAN    28.98     1.10    23.83   680.91     1.03   643.84     0.92     0.85
 HUB     29.47     1.12    23.53   684.72     1.04   642.03     0.92     0.85

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.92    35.84    31.50     4.34     0.93     0.18     2.90
 MEAN    20.26    27.86    23.50     4.36     0.90     0.19     3.34     0.85
 HUB     28.04    10.74     6.50     4.24     0.90     0.22     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.930

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     674.972     235.272     632.641    1244.559       0.542      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.043      23.775     644.277      46.000      20.400      33.000      12.600

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     689.052     235.272     728.111    1243.013       0.554      -0.107

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.623      23.229     642.677     440.827       0.098       0.179
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     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     633.537       0.000     633.537    1248.915       0.507       0.043

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      24.007     648.795       0.000       0.060       0.099       0.039

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.690      28.619       1.083     682.237      22.141     362.560       2.811

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  138199.125       0.327    1607.162 1918080.250

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     993591.50  11554.7939    201.0352      1.8944      0.6593      3.4529      1.3049


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 110% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.603   EfDer =  0.990

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     204.924    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   93.14722

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     200.190    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  157644.344  160796.891       1.426     831.557     582.997     619.754       1.063

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   504.48    -0.17   504.48     0.46   744.88
  MEAN    17.06     0.00    -0.02   504.48    -0.17   504.48     0.46
  HUB     12.51     0.00    -0.02   504.48    -0.17   504.48     0.46

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.00    50.47     5.53   747.85   902.24    13.07   501.55     0.82
  MEAN    50.80    47.20     3.60   618.44   798.23    13.07   501.55     0.73
  HUB     41.96    38.62     3.34   453.49   678.46    13.07   501.55     0.62

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   765.77   388.10   660.15  1119.80     0.68
  MEAN    18.04   811.78   445.95   678.32  1113.73     0.73
  HUB     15.00   950.58   616.17   723.84  1100.09     0.86

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   751.81   359.75     0.67  8010.01
  MEAN   653.81   709.45   207.87     0.64  8046.12     1.24
  HUB    543.76   727.45    72.41     0.66  9244.68

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.81     1.31    14.48   569.45     1.09   520.53     0.92     0.91
  MEAN    19.83     1.31    13.92   569.67     1.09   514.70     0.92     0.91
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 HUB     20.62     1.36    12.66   576.64     1.10   501.40     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.45    28.59    24.20     4.39     0.93     0.24     2.90
 MEAN    33.32    17.04    12.70     4.34     0.92     0.19     3.51     0.91
 HUB     40.41    -5.71    -9.30     3.59     0.92     0.03     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     830.478     445.083     701.138    1112.515       0.746      -0.015

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.023      13.827     514.316      24.000      32.407      35.400       2.993

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     725.591     445.083     851.223    1127.162       0.644       0.212

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.884      15.043     527.948     528.796       0.032       0.386

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     658.746       0.000     658.746    1135.385       0.580       0.290

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.684     535.677       0.000       0.060       0.059       0.312

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.843      19.708       1.305     571.921      49.111     232.940       1.806

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 305761.188       0.547    3540.847 2121278.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.603   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    204.924    4154.000      19.708     571.921       1.000       1.000       0.980
W Kg/sec =   93.14722

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    160.505    3956.001       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 157644.344  160796.891       1.263     590.487     467.446     474.134       1.014

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   620.51    -0.21   620.51     0.54   709.42
 MEAN    18.08     0.00    -0.02   620.51    -0.21   620.51     0.54
 HUB     15.21     0.00    -0.02   620.51    -0.21   620.51     0.54

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.22    46.36     3.86   744.95   969.69    16.11   539.78     0.85
 MEAN    46.57    42.30     4.27   655.35   902.66    16.11   539.78     0.79
 HUB     41.63    37.84     3.79   551.37   830.23    16.11   539.78     0.73

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   677.48   310.64   602.06  1171.86     0.58
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 MEAN    18.01   697.46   333.08   612.78  1167.48     0.60
 HUB     15.22   761.63   435.31   624.96  1163.29     0.65

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   739.61   429.59     0.63  6347.76
 MEAN   652.87   691.21   319.79     0.59  6002.57     1.41
 HUB    551.84   635.74   116.53     0.55  6629.97

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.05     1.22    19.17   608.86     1.06   570.55     0.92     0.91
 MEAN    23.80     1.21    18.69   606.85     1.06   566.26     0.92     0.91
 HUB     24.26     1.23    18.18   610.50     1.07   562.10     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.29    35.51    31.50     4.01     0.93     0.29     2.90
 MEAN    28.53    27.56    23.50     4.06     0.92     0.29     3.30     0.91
 HUB     34.86    10.56     6.50     4.06     0.92     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960    1073.443     334.012    1020.154    1111.229       0.966      -1.031

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.982      13.169     512.642      46.000      18.129      30.600      12.471

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960    1081.485     334.012    1131.890    1110.513       0.974      -1.094

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      23.571      12.827     511.323     400.556       0.087      -0.011

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823    1196.716       0.000    1196.716    1094.329       1.094      -0.468

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      10.663     490.827       0.000       0.060       0.268      -1.498

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.622      22.600       1.147     608.738      36.817     270.072       2.094

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 229377.953       0.419    2656.296 1914082.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 3.603   EfDer =  0.780

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    204.924    4154.000      22.600     608.738       1.000       1.000       0.780
W Kg/sec =   93.14722

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    144.400    3834.505       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 157644.344  160796.891       1.032     434.156     420.583     339.175       0.806

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   926.45    -0.32   926.45     0.82   671.57
 MEAN    17.74     0.00    -0.02   926.45    -0.32   926.45     0.82
 HUB     15.05     0.00    -0.02   926.45    -0.32   926.45     0.82
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     38.15    46.36    -8.21   727.55  1178.18    14.60   537.13     1.04
MEAN    34.78    43.40    -8.62   643.03  1127.92    14.60   537.13     0.99
HUB     30.51    38.84    -8.33   545.57  1075.32    14.60   537.13     0.95

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   682.57   218.31   646.71  1196.66     0.57
MEAN    17.51   700.11   260.79   649.73  1196.06     0.59
HUB     14.85   763.32   385.57   658.78  1195.18     0.64

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    718.12   817.34   499.81     0.68  4331.12
MEAN   634.62   749.60   373.83     0.63  4571.21     1.58
HUB    538.32   676.26   152.75     0.57  5730.47

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.02     1.11    20.06   633.93     1.04   595.07     0.92     0.71
MEAN    25.16     1.11    19.94   635.32     1.04   594.45     0.92     0.71
HUB     25.84     1.14    19.63   642.06     1.05   593.48     0.92     0.71

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     18.65    37.70    31.50     6.20     0.93     0.34     2.90
MEAN    21.87    29.91    23.50     6.41     0.86     0.37     3.28     0.71
HUB     30.34    13.05     6.50     6.55     0.86     0.42     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.780

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     710.327     262.502     660.043    1196.344       0.594      -0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.282      19.914     595.007      46.000      21.688      31.500       9.812

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     690.204     262.502     738.437    1198.706       0.576       0.031

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.103      20.047     597.358     471.992       0.043       0.180

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     670.565       0.000     670.565    1200.943       0.558       0.039

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      20.128     599.588       0.000       0.060       0.084       0.046

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.599      24.879       1.101     637.104      28.365     343.927       2.666

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 176838.281       0.343    2047.864 2763554.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 3.603   EfDer =  0.964

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    204.924    4154.000      24.879     637.104       1.000       1.000       0.980
W Kg/sec =   93.14722

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    134.192    3748.172       1.401       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
157644.344	160796.891	1.313	513.330	390.889	401.059	1.026

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	620.42	-0.21	620.42	0.51	629.96
MEAN	16.97	0.00	-0.02	620.42	-0.21	620.42	0.51	
HUB	14.32	0.00	-0.02	620.42	-0.21	620.42	0.51	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.38	46.36	2.02	698.18	934.17	20.77	605.01	0.77
MEAN	44.77	43.80	0.97	615.20	873.87	20.77	605.01	0.72
HUB	39.93	37.84	2.09	519.11	809.08	20.77	605.01	0.67

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	668.17	236.44	624.94	1226.97	0.54
MEAN	16.57	685.00	270.18	629.47	1225.21	0.56
HUB	13.89	742.55	383.11	636.09	1223.36	0.61

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	684.41	768.91	447.97	0.63	4468.14	
MEAN	600.81	711.02	330.63	0.58	4481.51	1.32
HUB	503.52	647.38	120.41	0.53	5324.52	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	28.15	1.13	23.00	663.07	1.04	625.86	0.92	0.88
MEAN	28.16	1.13	22.77	663.15	1.04	624.04	0.92	0.88
HUB	28.81	1.16	22.46	668.05	1.05	622.09	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.72	35.63	31.50	4.13	0.93	0.22	2.90	
MEAN	23.23	27.71	23.50	4.21	0.91	0.23	3.29	0.88
HUB	31.06	10.72	6.50	4.22	0.91	0.26	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.964

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	671.012	271.697	613.546	1228.135	0.546	0.060

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
28.313	23.109	627.216	46.000	23.885	32.400	8.515

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	646.141	271.697	700.940	1230.806	0.525	0.107

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	28.171	23.345	629.947	456.573	0.035	0.226

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	610.856	0.000	610.856	1234.414	0.495	0.103

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.686	633.645	0.000	0.060	0.065	0.168

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.794	28.004	1.126	664.757	27.653	311.785	2.417

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
172504.000	0.368	1997.671	1851692.375

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 3.603   EfDer =  0.963

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    204.924    4154.000      28.004     664.757       1.000       1.000       0.980
W Kg/sec =   93.14722

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    121.776    3669.385       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 157644.344  160796.891       1.437     509.668     354.751     390.276       1.100

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   563.51    -0.19   563.51     0.45   586.62
 MEAN    15.91     0.00    -0.02   563.51    -0.19   563.51     0.45
 HUB     13.07     0.00    -0.02   563.51    -0.19   563.51     0.45

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.69    47.36     2.33   664.11   871.12    24.30   638.30     0.70
 MEAN    45.68    44.80     0.88   576.85   806.55    24.30   638.30     0.65
 HUB     40.07    38.84     1.23   473.79   736.35    24.30   638.30     0.59

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   618.74   238.47   570.93  1257.56     0.49
 MEAN    15.50   631.83   257.50   576.98  1254.66     0.50
 HUB     12.59   679.24   346.18   584.40  1251.77     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   703.98   411.86     0.56  4281.75
 MEAN   561.80   652.31   304.30     0.52  3993.65     1.34
 HUB    456.39   594.70   110.21     0.48  4360.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.36     1.12    26.58   689.62     1.04   657.73     0.92     0.88
 MEAN    31.13     1.11    26.18   687.95     1.03   654.69     0.92     0.88
 HUB     31.43     1.12    25.72   690.08     1.04   651.65     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.67    35.81    31.50     4.31     0.93     0.24     2.90
 MEAN    24.05    27.81    23.50     4.31     0.91     0.24     3.34     0.88
 HUB     30.64    10.68     6.50     4.18     0.91     0.25     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.963

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     638.864     262.217     582.572    1255.081       0.509      -0.006

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    31.205      26.146     655.210      46.000      24.233      33.000       8.767

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     622.205     262.217     675.201    1256.756       0.495       0.005

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      30.963      26.185     656.961     440.827       0.067       0.239

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     14.701     574.738       0.000     574.738    1261.276       0.456       0.142

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.876     661.695       0.000       0.060       0.062       0.139

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.799      30.991       1.107     689.218      24.461     324.418       2.515

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 152711.500       0.361    1768.466 1867724.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1037192.88  12011.1455    200.1901      2.0514      0.7188      3.6029      1.3183



**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 110% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 3.773   EfDer =  0.991

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    203.945    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   92.70234

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    199.234    4137.640       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 156891.422  160028.906       1.433     831.557     580.213     619.754       1.068

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   501.43    -0.17   501.43     0.46   744.88
  MEAN    17.06     0.00    -0.02   501.43    -0.17   501.43     0.46
  HUB     12.51     0.00    -0.02   501.43    -0.17   501.43     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.16    50.47     5.69   747.85   900.54    13.09   501.81     0.82
  MEAN    50.97    47.20     3.77   618.44   796.31    13.09   501.81     0.72
  HUB     42.14    38.62     3.52   453.49   676.20    13.09   501.81     0.62

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   762.54   391.06   654.62  1120.59     0.68
  MEAN    18.04   808.20   447.57   672.95  1114.39     0.73
  HUB     15.00   945.60   615.53   717.83  1100.80     0.86

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   745.54   356.79     0.67  8071.17
  MEAN   653.81   703.85   206.24     0.63  8075.38     1.24
  HUB    543.76   721.41    71.78     0.66  9235.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.86     1.31    14.56   569.81     1.09   521.29     0.92     0.91
  MEAN    19.86     1.31    13.99   569.84     1.09   515.35     0.92     0.91
  HUB     20.62     1.36    12.73   576.59     1.10   502.12     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.85    28.59    24.20     4.39     0.93     0.25     2.90
 MEAN    33.63    17.04    12.70     4.34     0.92     0.20     3.51     0.91
 HUB     40.61    -5.71    -9.30     3.59     0.92     0.04     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     826.306     446.703     695.153    1113.308       0.742      -0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.047      13.900     515.050      24.000      32.725      35.400       2.675

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     718.210     446.703     845.795    1128.279       0.637       0.220

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.913      15.155     528.995     528.796       0.031       0.391

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     652.327       0.000     652.327    1136.296       0.574       0.297

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.788     536.537       0.000       0.060       0.057       0.320

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.847      19.747       1.307     572.079      49.269     231.680       1.796

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 306739.312       0.548    3535.209 2108469.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 3.773   EfDer =  0.995

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    203.945    4154.000      19.747     572.079       1.000       1.000       0.980
W Kg/sec =   92.70234

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    159.445    3955.458       1.402       0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 156891.422  160028.906       1.272     590.487     464.359     474.134       1.021

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   614.80    -0.21   614.80      0.54   709.32
 MEAN    18.08      0.00    -0.02   614.80    -0.21   614.80      0.54
 HUB     15.21      0.00    -0.02   614.80    -0.21   614.80      0.54

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     50.48    46.36     4.12   744.95   966.05    16.20   540.52     0.85
 MEAN    46.84    42.30     4.54   655.35   898.74    16.20   540.52     0.79
 HUB     41.90    37.84     4.06   551.37   825.97    16.20   540.52     0.72

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     20.42   674.04   315.19   595.80  1172.96      0.57
 MEAN    18.01   693.74   336.31   606.76  1168.42      0.59
 HUB     15.22   757.54   436.50   619.14  1164.07      0.65
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   731.87   425.04     0.62  6440.61
 MEAN   652.87   684.37   316.56     0.59  6060.82     1.42
 HUB    551.84   629.79   115.34     0.54  6648.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.17     1.22    19.32   609.56     1.07   571.64     0.92     0.91
 MEAN    23.89     1.21    18.82   607.35     1.06   567.18     0.92     0.91
 HUB     24.32     1.23    18.29   610.76     1.07   562.88     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.88    35.50    31.50     4.00     0.93     0.30     2.90
 MEAN    29.00    27.55    23.50     4.05     0.92     0.30     3.30     0.91
 HUB     35.18    10.55     6.50     4.05     0.92     0.31     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960    1044.243     337.258     988.281    1117.009       0.935      -0.964

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.076      13.693     518.240      46.000      18.843      30.600      11.757

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960    1024.538     337.258    1078.620    1120.899       0.914      -0.943

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      23.707      13.797     521.672     400.556       0.079       0.074

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823    1080.115       0.000    1080.115    1113.316       0.970      -0.218

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      12.536     512.349       0.000       0.060       0.224      -1.180

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.676      22.938       1.162     609.223      37.145     267.044       2.070

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 231422.641       0.422    2667.175 1899316.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.773   EfDer =  0.803

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     203.945    4154.000      22.938     609.223       1.000       1.000       0.780
W Kg/sec =   92.70234

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     141.645    3832.979       1.401       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 156891.422  160028.906       1.052     434.156     412.557     339.175       0.822

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   880.16    -0.30   880.16     0.77   671.30
 MEAN    17.74     0.00    -0.02   880.16    -0.30   880.16     0.77
 HUB     15.05     0.00    -0.02   880.16    -0.30   880.16     0.77

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     39.59    46.36    -6.77   727.55  1142.12    15.51   544.59     1.00
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 MEAN    36.16    43.40    -7.24   643.03  1090.21    15.51   544.59     0.95
 HUB     31.81    38.84    -7.03   545.57  1035.69    15.51   544.59     0.90

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   668.54   237.56   624.91  1200.90     0.56
 MEAN    17.51   686.55   274.97   629.08  1199.51     0.57
 HUB     14.85   749.28   392.31   638.36  1197.96     0.63

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   788.32   480.56     0.66  4712.19
 MEAN   634.62   724.63   359.65     0.60  4819.20     1.58
 HUB    538.32   654.85   146.01     0.55  5830.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.70     1.12    20.81   636.63     1.04   599.35     0.92     0.73
 MEAN    25.76     1.12    20.63   637.25     1.05   597.94     0.92     0.73
 HUB     26.38     1.15    20.26   643.13     1.06   596.31     0.92     0.73

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.81    37.56    31.50     6.06     0.93     0.35     2.90
 MEAN    23.61    29.76    23.50     6.26     0.87     0.37     3.28     0.73
 HUB     31.57    12.88     6.50     6.38     0.87     0.42     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.803

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     695.841     276.777     638.427    1199.962       0.580      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.893      20.614     598.602      46.000      23.438      31.500       8.062

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     662.608     276.777     718.091    1203.732       0.550       0.072

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.753      20.956     602.369     471.992       0.036       0.210

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     642.290       0.000     642.290    1205.941       0.533       0.088

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.088     604.581       0.000       0.060       0.067       0.097

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.650      25.585       1.115     639.001      29.777     323.222       2.506

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 185647.172       0.360    2139.607 2661075.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 3.773   EfDer =  0.977

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    203.945    4154.000      25.585     639.001       1.000       1.000       0.980
W Kg/sec =   92.70234

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    130.056    3742.604       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 156891.422  160028.906       1.355     513.330     378.837     401.059       1.059

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   595.83    -0.21   595.83     0.49   629.02
MEAN    16.97     0.00    -0.02   595.83    -0.21   595.83     0.49
HUB     14.32     0.00    -0.02   595.83    -0.21   595.83     0.49

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     49.53    46.36     3.17   698.18   918.02    21.68   609.40     0.76
MEAN    45.93    43.80     2.13   615.20   856.58    21.68   609.40     0.71
HUB     41.07    37.84     3.23   519.11   790.38    21.68   609.40     0.65

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   649.12   257.56   595.84  1233.08     0.53
MEAN    16.57   665.91   285.10   601.79  1230.52     0.54
HUB     13.89   722.70   388.58   609.34  1227.96     0.59

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    684.41   732.95   426.85     0.59  4866.74
MEAN   600.81   679.58   315.71     0.55  4728.70     1.35
HUB    503.52   620.09   114.93     0.50  5400.38

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     29.30     1.15    24.26   667.28     1.04   632.16     0.92     0.89
MEAN    29.19     1.14    23.92   666.48     1.04   629.52     0.92     0.89
HUB     29.73     1.16    23.51   670.38     1.05   626.85     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     23.38    35.62    31.50     4.12     0.93     0.25     2.90
MEAN    25.35    27.68    23.50     4.18     0.91     0.26     3.29     0.89
HUB     32.53    10.68     6.50     4.18     0.91     0.28     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.977

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     653.153     286.704     586.864    1233.285       0.530       0.060

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    29.353      24.246     632.479      46.000      26.037      32.400       6.363

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     613.659     286.704     677.331    1237.346       0.496       0.150

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      29.252      24.723     636.651     456.573       0.028       0.260

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     579.950       0.000     579.950    1240.602       0.467       0.151

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      25.079     640.005       0.000       0.060       0.050       0.215

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.833      29.132       1.139     668.049      29.049     294.448       2.283

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 181225.422       0.387    2088.646 1819301.250
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.773   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    203.945    4154.000      29.132     668.050       1.000       1.000       0.980
W Kg/sec =   92.70234

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    116.790    3660.330       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
156891.422  160028.906       1.498     509.668     340.227     390.276       1.147

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   536.28    -0.18   536.28     0.43   585.17
MEAN    15.91     0.00    -0.02   536.28    -0.18   536.28     0.43
HUB     13.07     0.00    -0.02   536.28    -0.18   536.28     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.09    47.36     3.73   664.11   853.75    25.64   644.09     0.69
MEAN    47.10    44.80     2.30   576.85   787.76    25.64   644.09     0.63
HUB     41.47    38.84     2.63   473.79   715.72    25.64   644.09     0.58

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   599.64   261.51   539.61  1264.80     0.47
MEAN    15.50   611.42   273.99   546.60  1261.21     0.48
HUB     12.59   657.03   352.25   554.63  1257.68     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    650.33   665.10   388.83     0.53  4694.82
MEAN   561.80   617.74   287.81     0.49  4249.08     1.39
HUB    456.39   564.32   104.14     0.45  4437.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     33.03     1.13    28.32   695.31     1.04   665.35     0.92     0.90
MEAN    32.64     1.12    27.79   692.72     1.04   661.57     0.92     0.90
HUB     32.81     1.13    27.24   693.81     1.04   657.85     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.86    35.78    31.50     4.28     0.93     0.27     2.90
MEAN    26.62    27.77    23.50     4.27     0.91     0.27     3.34     0.90
HUB     32.42    10.63     6.50     4.13     0.91     0.27     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.979

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     618.183     279.011     551.636    1261.672       0.490      -0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    32.725      27.769     662.107      46.000      26.830      33.000       6.170

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     583.778     279.011     647.027    1264.951       0.462       0.071

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      32.564      28.139     665.552     440.827       0.052       0.277

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     541.148       0.000     541.148    1268.743       0.427       0.193
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   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.745     669.548       0.000       0.060       0.049       0.191

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.838      32.577       1.118     693.949      25.899     303.176       2.350

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 161712.719       0.382    1863.759 1833048.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1066747.25  12294.3945    199.2340      2.1564      0.7530      3.7727      1.3273


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 110% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    202.905    4154.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   92.22959

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    198.218    4137.640       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 156091.328  159212.812       1.441     831.557     577.254     619.754       1.074

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   498.21    -0.17   498.21     0.45   744.88
 MEAN    17.06     0.00    -0.02   498.21    -0.17   498.21     0.45
 HUB     12.51     0.00    -0.02   498.21    -0.17   498.21     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.33    50.47     5.86   747.85   898.75    13.12   502.08     0.82
 MEAN    51.15    47.20     3.95   618.44   794.29    13.12   502.08     0.72
 HUB     42.32    38.62     3.70   453.49   673.81    13.12   502.08     0.61

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   759.20   394.15   648.86  1121.41     0.68
 MEAN    18.04   804.48   449.27   667.34  1115.08     0.72
 HUB     15.00   940.42   614.87   711.56  1101.53     0.85

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    747.85   739.00   353.69     0.66  8134.91
 MEAN   653.81   697.98   204.54     0.63  8105.99     1.25
 HUB    543.76   715.10    71.12     0.65  9225.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.90     1.32    14.64   570.18     1.09   522.09     0.92     0.91
 MEAN    19.88     1.32    14.05   570.01     1.09   516.03     0.92     0.91
 HUB     20.62     1.36    12.80   576.53     1.10   502.86     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.28    28.59    24.20     4.39     0.93     0.25     2.90
 MEAN    33.95    17.04    12.70     4.34     0.92     0.20     3.51     0.91
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HUB     40.83    -5.71    -9.30     3.59     0.92     0.04     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     821.996     448.398     688.924    1114.127       0.738      -0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.072      13.974     515.808      24.000      33.059      35.400       2.341

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     710.612     448.398     840.256    1129.420       0.629       0.228

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.943      15.270     530.066     528.796       0.030       0.396

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083     645.728       0.000     645.728    1137.226       0.568       0.305

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      15.895     537.416       0.000       0.060       0.055       0.327

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
       0.851      19.786       1.310     572.242      49.432     230.360       1.786

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 307759.969       0.550    3528.884 2094922.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    202.905    4154.000      19.786     572.242       1.000       1.000       0.980
W Kg/sec =   92.22959

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    158.340    3954.891       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 156091.328  159212.812       1.280     590.487     461.142     474.134       1.028

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   608.92    -0.21   608.92     0.53   709.22
 MEAN    18.08     0.00    -0.02   608.92    -0.21   608.92     0.53
 HUB     15.21     0.00    -0.02   608.92    -0.21   608.92     0.53

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.75    46.36     4.39   744.95   962.31    16.30   541.29     0.84
 MEAN    47.11    42.30     4.81   655.35   894.73    16.30   541.29     0.78
 HUB     42.17    37.84     4.33   551.37   821.60    16.30   541.29     0.72

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   670.60   319.85   589.40  1174.07     0.57
 MEAN    18.01   689.97   339.63   600.60  1169.37     0.59
 HUB     15.22   753.37   437.72   613.16  1164.88     0.65

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   723.97   420.39     0.62  6535.55
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 MEAN   652.87   677.37   313.24     0.58  6120.49     1.43
 HUB    551.84   623.69   114.12     0.54  6666.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.29     1.23    19.47   610.27     1.07   572.74     0.92     0.91
 MEAN    23.99     1.21    18.95   607.86     1.06   568.13     0.92     0.91
 HUB     24.39     1.23    18.41   611.04     1.07   563.67     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.49    35.50    31.50     4.00     0.93     0.30     2.90
 MEAN    29.49    27.54    23.50     4.04     0.92     0.30     3.30     0.91
 HUB     35.52    10.54     6.50     4.04     0.92     0.31     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960    1019.155     340.582     960.562    1122.017       0.908      -0.907

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.171      14.155     523.036      46.000      19.523      30.600      11.077

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     982.400     340.582    1039.763    1128.633       0.870      -0.833

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      23.838      14.541     529.182     400.556       0.073       0.118

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823    1012.717       0.000    1012.717    1124.697       0.900      -0.085

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      13.707     524.325       0.000       0.060       0.193      -0.991

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.714      23.205       1.173     609.723      37.481     263.974       2.046

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 233515.641       0.426    2677.573 1883930.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.824

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    202.905    4154.000      23.205     609.723       1.000       1.000       0.780
W Kg/sec =   92.22959

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    139.361    3831.407       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 156091.328  159212.812       1.070     434.156     405.904     339.175       0.836

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   848.05    -0.29   848.05     0.74   671.03
 MEAN    17.74     0.00    -0.02   848.05    -0.29   848.05     0.74
 HUB     15.05     0.00    -0.02   848.05    -0.29   848.05     0.74

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     40.64    46.36    -5.72   727.55  1117.56    16.16   549.71     0.97
 MEAN    37.18    43.40    -6.22   643.03  1064.45    16.16   549.72     0.93
 HUB     32.77    38.84    -6.07   545.57  1008.54    16.16   549.71     0.88
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      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   657.80   252.45   607.42  1204.27     0.55
MEAN    17.51   675.85   285.90   612.40  1202.30     0.56
HUB     14.85   737.88   397.31   621.78  1200.26     0.61

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    718.12   765.38   465.67     0.64  5006.94
MEAN   634.62   704.73   348.72     0.59  5010.25     1.59
HUB    538.32   637.57   141.01     0.53  5904.49

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.25     1.13    21.43   638.84     1.05   602.75     0.92     0.75
MEAN    26.25     1.13    21.18   638.86     1.05   600.76     0.92     0.75
HUB     26.83     1.16    20.78   644.06     1.06   598.65     0.92     0.75

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     22.57    37.47    31.50     5.97     0.93     0.35     2.90
MEAN    25.03    29.66    23.50     6.16     0.87     0.38     3.28     0.75
HUB     32.58    12.78     6.50     6.28     0.87     0.42     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.824

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     684.496     287.773     621.065    1202.862       0.569       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.392      21.184     601.492      46.000      24.861      31.500       6.639

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     641.221     287.773     702.835    1207.639       0.531       0.104

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.279      21.685     606.278     471.992       0.031       0.234

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     620.855       0.000     620.855    1209.773       0.513       0.124

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.843     608.423       0.000       0.060       0.056       0.134

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.687      26.146       1.127     640.585      30.862     308.867       2.394

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 192414.031       0.373    2206.287 2590080.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    202.905    4154.000      26.146     640.585       1.000       1.000       0.980
W Kg/sec =   92.22959

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    126.773    3737.974       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 156091.328  159212.812       1.390     513.330     369.275     401.059       1.086

     ROTOR LEADING EDGE CONDITIONS, STAGE            4
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   576.98    -0.20   576.98     0.48   628.24
MEAN    16.97     0.00    -0.02   576.98    -0.20   576.98     0.48
HUB     14.32     0.00    -0.02   576.98    -0.20   576.98     0.48

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.44    46.36     4.08   698.18   905.90    22.40   612.83     0.75
MEAN    46.85    43.80     3.05   615.20   843.58    22.40   612.83     0.69
HUB     41.99    37.84     4.15   519.11   776.27    22.40   612.83     0.64

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   635.97   273.29   574.26  1237.65     0.51
MEAN    16.57   652.25   296.30   581.06  1234.55     0.53
HUB     13.89   708.08   392.72   589.19  1231.50     0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    684.41   706.25   411.12     0.57  5163.45
MEAN   600.81   656.02   304.51     0.53  4914.21     1.39
HUB    503.52   599.52   110.80     0.49  5457.67

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     30.21     1.16    25.23   670.59     1.05   636.87     0.92     0.90
MEAN    30.01     1.15    24.81   669.14     1.04   633.67     0.92     0.90
HUB     30.46     1.16    24.34   672.30     1.05   630.50     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.45    35.60    31.50     4.10     0.93     0.27     2.90
MEAN    27.02    27.66    23.50     4.16     0.91     0.28     3.29     0.90
HUB     33.68    10.65     6.50     4.15     0.91     0.29     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.986

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     640.424     297.966     566.886    1237.184       0.518       0.059

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    30.172      25.130     636.478      46.000      27.727      32.400       4.673

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     590.012     297.966     660.983    1242.200       0.475       0.182

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      30.094      25.784     641.650     456.573       0.024       0.285

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     557.973       0.000     557.973    1245.165       0.448       0.183

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      26.124     644.717       0.000       0.060       0.044       0.245

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.852      29.987       1.147     670.677      30.092     282.174       2.187

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 187745.344       0.401    2152.754 1792596.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 3.953   EfDer =  0.988
```

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
202.905	4154.000	29.987	670.677	1.000	1.000	0.980

W Kg/sec = 92.22959

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
113.102	3653.154	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
156091.328	159212.812	1.547	509.668	329.484	390.276	1.185

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	516.75	-0.18	516.75	0.41	584.02
MEAN	15.91	0.00	-0.02	516.75	-0.18	516.75	0.41	
HUB	13.07	0.00	-0.02	516.75	-0.18	516.75	0.41	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.12	47.36	4.76	664.11	841.61	26.65	648.43	0.67
MEAN	48.15	44.80	3.35	576.85	774.60	26.65	648.43	0.62
HUB	42.53	38.84	3.69	473.79	701.20	26.65	648.43	0.56

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	587.51	277.55	517.82	1270.00	0.46
MEAN	15.50	597.90	285.58	525.29	1265.99	0.47
HUB	12.59	641.80	356.56	533.64	1262.03	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	650.33	638.04	372.78	0.50	4982.57	
MEAN	561.80	593.48	276.22	0.47	4428.60	1.42
HUB	456.39	542.90	99.84	0.43	4491.40	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	34.28	1.14	29.60	699.60	1.04	670.85	0.92	0.90
MEAN	33.78	1.13	28.99	696.39	1.04	666.60	0.92	0.90
HUB	33.84	1.13	28.36	696.75	1.04	662.43	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.19	35.75	31.50	4.25	0.93	0.30	2.90	
MEAN	28.53	27.74	23.50	4.24	0.92	0.29	3.34	0.90
HUB	33.75	10.60	6.50	4.10	0.92	0.29	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.988

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	604.548	290.814	530.005	1266.449	0.477	-0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
33.866	28.973	667.129	46.000	28.754	33.000	4.246

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	557.916	290.814	629.161	1270.729	0.439	0.116

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	33.748	29.561	671.646	440.827	0.044	0.305

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	518.199	0.000	518.199	1274.094	0.407	0.230

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	30.117	675.207	0.000	0.060	0.043	0.227

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    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      33.753       1.126     697.582      26.906     289.195       2.242

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  168013.375       0.397    1926.500 1805643.250

    OVERALL EXIT CONDITIONS; ALL          5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1089448.38  12491.9971    198.2180      2.2343      0.7755      3.9532      1.3343


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 110% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 4.476   EfDer =  0.995

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     199.897    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   90.86214

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     195.279    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  153777.031  156852.234       1.462     831.557     568.695     619.754       1.090

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   488.97    -0.17   488.97     0.44   744.88
  MEAN    17.06     0.00    -0.02   488.97    -0.17   488.97     0.44
  HUB     12.51     0.00    -0.02   488.97    -0.17   488.97     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.83    50.47     6.36   747.85   893.66    13.19   502.84     0.81
  MEAN    51.68    47.20     4.48   618.44   788.52    13.19   502.84     0.72
  HUB     42.85    38.62     4.23   453.49   667.01    13.19   502.84     0.61

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   750.10   402.82   632.76  1123.66     0.67
  MEAN    18.04   794.18   454.08   651.57  1116.99     0.71
  HUB     15.00   925.98   613.05   693.99  1103.56     0.84

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   720.71   345.03     0.64  8313.69
  MEAN   653.81   681.49   199.74     0.61  8192.65     1.28
  HUB    543.76   697.44    69.29     0.63  9197.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.03     1.33    14.85   571.22     1.09   524.27     0.92     0.91
  MEAN    19.95     1.32    14.24   570.52     1.09   517.90     0.92     0.91
  HUB     20.62     1.36    12.99   576.37     1.10   504.92     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     32.48    28.60    24.20     4.40     0.93     0.27     2.90
  MEAN    34.87    17.04    12.70     4.34     0.92     0.22     3.51     0.91
  HUB     41.46    -5.70    -9.30     3.60     0.92     0.06     4.78
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     810.206     453.197     671.600    1116.359       0.726      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.140      14.179     517.877      24.000      34.012      35.400       1.388

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     689.863     453.197     825.408    1132.494       0.609       0.251

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.023      15.580     532.955     528.796       0.029       0.412

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     627.747       0.000     627.747    1139.735       0.551       0.324

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.179     539.791       0.000       0.060       0.051       0.348

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.860      19.888       1.316     572.704      49.894     226.629       1.757

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 310635.781       0.555    3509.049 2056097.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.476   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    199.897    4154.000      19.888     572.704       1.000       1.000       0.980
W Kg/sec =   90.86214

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    155.253    3953.296       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 153777.031  156852.234       1.306     590.487     452.151     474.134       1.049

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   592.81    -0.20   592.81     0.52   708.93
 MEAN    18.08     0.00    -0.02   592.81    -0.20   592.81     0.52
 HUB     15.21     0.00    -0.02   592.81    -0.20   592.81     0.52

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.50    46.36     5.14   744.95   952.19    16.55   543.36     0.83
 MEAN    47.88    42.30     5.58   655.35   883.84    16.55   543.36     0.77
 HUB     42.94    37.84     5.10   551.37   809.72    16.55   543.36     0.71

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   661.71   332.35   572.19  1177.04     0.56
 MEAN    18.01   680.06   348.63   583.89  1171.94     0.58
 HUB     15.22   742.17   441.05   596.90  1167.04     0.64

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   702.69   407.89     0.60  6790.78
 MEAN   652.87   658.40   304.24     0.56  6282.47     1.45
 HUB    551.84   607.10   110.79     0.52  6717.18
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.62     1.24    19.86   612.22     1.07   575.67     0.92     0.91
MEAN    24.24     1.22    19.29   609.26     1.06   570.66     0.92     0.91
HUB     24.56     1.23    18.70   611.79     1.07   565.82     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.15    35.48    31.50     3.98     0.93     0.32     2.90
MEAN    30.84    27.52    23.50     4.02     0.92     0.31     3.30     0.91
HUB     36.46    10.52     6.50     4.02     0.92     0.32     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      965.955     349.607     900.469     1132.711       0.853       -0.793

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     24.420      15.175      533.197      46.000      21.219       30.600       9.381

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     17.960      903.613     349.607     968.886     1142.985       0.791       -0.634

   BlockageThr  PtTh        PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.750      24.164       15.994     542.925      400.556       0.059       0.181

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4        cp 3-4
     17.823     908.105       0.000     908.105     1142.637       0.795       0.092

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.750      15.654      542.285       0.000       0.060       0.140       -0.700

    STAGE EXIT CONDITIONS, STAGE            2
       Eff4       Pt4          PR4        Texit        Del T        Ns         Ns nondim
       0.778      23.748       1.194      611.092      38.387      255.828       1.983

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 239168.406       0.436    2701.729 1840968.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 4.476   EfDer =  0.868

   W act      RPM act        Pt          Tt           POTS         POTH        AeroBl
    199.897    4154.000      23.748      611.092       1.000        1.000       0.780
W Kg/sec =   90.86214

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    134.305    3827.114       1.401       0.249      53.349       56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 153777.031  156852.234       1.110     434.156     391.174     339.175       0.867

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   788.31    -0.27   788.31     0.68   670.28
 MEAN    17.74      0.00    -0.02   788.31    -0.27   788.31     0.68
 HUB     15.05      0.00    -0.02   788.31    -0.27   788.31     0.68

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     42.72    46.36    -3.64   727.55  1072.92     17.43   559.24     0.93
 MEAN    39.22    43.40    -4.18   643.03  1017.48     17.43   559.24     0.88
 HUB     34.70    38.84    -4.14   545.57   958.84     17.43   559.24     0.83

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   637.07   282.75   570.89  1211.28     0.53
MEAN    17.51   654.42   308.13   577.34  1208.24     0.54
HUB     14.85   714.32   407.23   586.87  1205.25     0.59

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    718.12   717.96   435.37     0.59  5606.76
MEAN   634.62   663.26   326.50     0.55  5399.02     1.62
HUB    538.32   601.33   131.09     0.50  6051.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     27.45     1.16    22.73   643.69     1.05   609.83     0.92     0.79
MEAN    27.31     1.15    22.36   642.49     1.05   606.76     0.92     0.79
HUB     27.76     1.17    21.89   646.28     1.06   603.71     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     26.35    37.33    31.50     5.83     0.93     0.38     2.90
MEAN    28.09    29.49    23.50     5.99     0.88     0.39     3.28     0.79
HUB     34.76    12.59     6.50     6.09     0.88     0.43     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.868

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     661.953     310.147     584.800    1208.955       0.548       0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.455      22.388     607.591      46.000      27.939      31.500       3.561

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     598.240     310.147     673.856    1215.602       0.492       0.169

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.382      23.201     614.290     471.992       0.024       0.283

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     578.782       0.000     578.782    1217.491       0.475       0.191

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.378     616.201       0.000       0.060       0.041       0.203

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.752      27.295       1.149     644.153      33.061     282.791       2.192

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 206138.422       0.400    2328.611 2454330.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 4.476   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    199.897    4154.000      27.295     644.153       1.000       1.000       0.980
W Kg/sec =   90.86214

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    119.973    3727.607       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 153777.031  156852.234       1.469     513.330     349.465     401.059       1.148

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   539.57    -0.19   539.57     0.44   626.50
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```
 MEAN    16.97     0.00    -0.02   539.57    -0.19   539.57     0.44
 HUB     14.32     0.00    -0.02   539.57    -0.19   539.57     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.31    46.36     5.95   698.18   882.53    23.87   619.88     0.72
 MEAN    48.76    43.80     4.96   615.20   818.43    23.87   619.88     0.67
 HUB     43.90    37.84     6.06   519.11   748.87    23.87   619.88     0.61

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   613.36   303.34   533.10  1246.54     0.49
 MEAN    16.57   627.54   317.94   541.04  1242.56     0.51
 HUB     13.89   680.52   400.74   550.02  1238.65     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   655.29   381.07     0.53  5730.71
 MEAN   600.81   610.52   282.87     0.49  5272.70     1.45
 HUB    503.52   559.54   102.78     0.45  5568.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.06     1.17    27.17   677.45     1.05   646.08     0.92     0.91
 MEAN    31.66     1.16    26.60   674.79     1.05   641.95     0.92     0.91
 HUB     31.92     1.17    25.99   676.51     1.05   637.90     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.64    35.56    31.50     4.06     0.93     0.32     2.90
 MEAN    30.44    27.60    23.50     4.10     0.92     0.31     3.29     0.91
 HUB     36.08    10.58     6.50     4.08     0.92     0.32     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     617.536     319.731     528.321    1244.914       0.496       0.057

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.826      26.898     644.450      46.000      31.182      32.400       1.218

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     545.705     319.731     632.472    1251.626       0.436       0.245

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.775      27.882     651.418     456.573       0.020       0.337

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     516.832       0.000     516.832    1254.081       0.412       0.243

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.185     653.976       0.000       0.060       0.037       0.302

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.875      31.683       1.161     676.249      32.096     259.965       2.015

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 200277.453       0.428    2262.403 1733023.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 4.476   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    199.897    4154.000      31.683     676.249       1.000       1.000       0.980
W Kg/sec =   90.86214
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
105.899	3638.073	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
153777.031	156852.234	1.652	509.668	308.501	390.276	1.265

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	479.88	-0.17	479.88	0.38	581.61
MEAN	15.91	0.00	-0.02	479.88	-0.17	479.88	0.38	
HUB	13.07	0.00	-0.02	479.88	-0.17	479.88	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.16	47.36	6.80	664.11	819.48	28.65	657.06	0.65
MEAN	50.25	44.80	5.45	576.85	750.49	28.65	657.06	0.60
HUB	44.64	38.84	5.80	473.79	674.48	28.65	657.06	0.54

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	568.07	306.84	478.08	1279.87	0.44
MEAN	15.50	574.83	306.90	486.05	1275.18	0.45
HUB	12.59	614.49	364.45	494.75	1270.55	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	650.33	588.68	343.50	0.46	5507.70	
MEAN	561.80	548.83	254.90	0.43	4758.84	1.50
HUB	456.39	503.22	91.95	0.40	4590.55	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	36.73	1.16	32.08	708.22	1.05	681.33	0.92	0.91
MEAN	36.01	1.14	31.32	703.87	1.04	676.34	0.92	0.91
HUB	35.85	1.13	30.55	702.89	1.04	671.43	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.69	35.70	31.50	4.20	0.93	0.35	2.90	
MEAN	32.27	27.67	23.50	4.17	0.92	0.33	3.34	0.91
HUB	36.38	10.53	6.50	4.03	0.92	0.32	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	581.435	312.527	490.299	1275.615	0.456	-0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
36.100	31.304	676.826	46.000	32.514	33.000	0.486

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	512.171	312.527	599.994	1281.549	0.400	0.195

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	36.023	32.267	683.138	440.827	0.036	0.361

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	477.102	0.000	477.102	1284.258	0.371	0.295

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	32.743	686.028	0.000	0.060	0.037	0.292

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	36.019	1.137	704.995	28.746	265.147	2.055

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 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  179548.672       0.425    2028.244 1745987.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1135768.75  12830.0361    195.2791      2.3842      0.8119      4.4756      1.3485


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 110% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.994   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     196.913    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   89.50601

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     192.365    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  151481.891  154511.203       1.484     831.557     560.207     619.754       1.106

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   479.94    -0.17   479.94     0.44   744.88
  MEAN    17.06     0.00    -0.02   479.94    -0.17   479.94     0.44
  HUB     12.51     0.00    -0.02   479.94    -0.17   479.94     0.44

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.32    50.47     6.85   747.85   888.74    13.26   503.57     0.81
  MEAN    52.19    47.20     4.99   618.44   782.95    13.26   503.57     0.71
  HUB     43.39    38.62     4.77   453.49   660.41    13.26   503.57     0.60

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   741.83   411.04   617.54  1125.75     0.66
  MEAN    18.04   784.60   458.66   636.57  1118.77     0.70
  HUB     15.00   912.42   611.33   677.34  1105.46     0.83

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   703.42   336.81     0.62  8483.07
  MEAN   653.81   665.81   195.15     0.60  8275.29     1.30
  HUB    543.76   680.70    67.57     0.62  9172.02

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.16     1.33    15.05   572.21     1.09   526.28     0.92     0.91
  MEAN    20.02     1.33    14.41   571.00     1.09   519.63     0.92     0.91
  HUB     20.61     1.36    13.18   576.22     1.10   506.82     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     33.65    28.61    24.20     4.41     0.93     0.29     2.90
  MEAN    35.77    17.04    12.70     4.34     0.92     0.24     3.51     0.91
  HUB     42.07    -5.70    -9.30     3.60     0.92     0.07     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.997
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     799.372     457.773     655.317    1118.400       0.715      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.202      14.367     519.772      24.000      34.936      35.400       0.464

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     670.832     457.773     812.140    1135.255       0.591       0.272

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.093      15.860     535.557     528.796       0.028       0.426

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     611.280       0.000     611.280    1141.995       0.535       0.341

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.431     541.934       0.000       0.060       0.048       0.367

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.866      19.975       1.322     573.144      50.334     223.054       1.729

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 313369.875       0.560    3487.100 2018101.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.994   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    196.913    4154.000      19.975     573.144       1.000       1.000       0.980
W Kg/sec =   89.50601

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    152.328    3951.781       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 151481.891  154511.203       1.331     590.487     443.634     474.134       1.069

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   577.95    -0.20   577.95     0.50   708.66
 MEAN    18.08     0.00    -0.02   577.95    -0.20   577.95     0.50
 HUB     15.21     0.00    -0.02   577.95    -0.20   577.95     0.50

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.20    46.36     5.84   744.95   943.01    16.78   545.26     0.82
 MEAN    48.60    42.30     6.30   655.35   873.94    16.78   545.26     0.76
 HUB     43.66    37.84     5.82   551.37   798.91    16.78   545.26     0.70

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   654.21   343.63   556.69  1179.68     0.55
 MEAN    18.01   671.38   356.78   568.74  1174.24     0.57
 HUB     15.22   732.11   444.07   582.06  1169.00     0.63

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   683.52   396.60     0.58  7021.06
 MEAN   652.87   641.20   296.09     0.55  6429.14     1.48
 HUB    551.84   591.95   107.77     0.51  6763.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.90     1.25    20.20   614.00     1.07   578.27     0.92     0.91
 MEAN    24.45     1.22    19.59   610.55     1.07   572.93     0.92     0.91
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 HUB     24.70     1.24    18.96   612.50     1.07   567.76     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.69    35.47    31.50     3.97     0.93     0.34     2.90
 MEAN    32.10    27.50    23.50     4.00     0.93     0.33     3.30     0.91
 HUB     37.34    10.49     6.50     3.99     0.93     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     928.405     357.779     856.697    1140.291       0.814      -0.717

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.635      15.927     540.390      46.000      22.667      30.600       7.933

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     851.966     357.779     924.040    1152.208       0.739      -0.509

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      24.431      16.984     551.751     400.556       0.050       0.216

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     848.058       0.000     848.058    1152.922       0.736       0.178

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      16.835     552.318       0.000       0.060       0.109      -0.539

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.814      24.130       1.208     612.351      39.207     248.629       1.927

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 244279.094       0.446    2718.276 1800285.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 4.994   EfDer =  0.900

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    196.913    4154.000      24.130     612.351       1.000       1.000       0.780
W Kg/sec =   89.50601

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    130.341    3823.178       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 151481.891  154511.203       1.144     434.156     379.628     339.175       0.893

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   748.28    -0.26   748.28     0.64   669.59
 MEAN    17.74     0.00    -0.02   748.28    -0.26   748.28     0.64
 HUB     15.05     0.00    -0.02   748.28    -0.26   748.28     0.64

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.21    46.36    -2.15   727.55  1043.85    18.29   565.63     0.89
 MEAN    40.69    43.40    -2.71   643.03   986.78    18.29   565.63     0.85
 HUB     36.11    38.84    -2.73   545.57   926.20    18.29   565.63     0.79

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   623.66   304.39   544.33  1216.37     0.51
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 MEAN    17.51   639.80   324.01   551.69  1212.63     0.53
 HUB     14.85   697.61   414.15   561.37  1209.02     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   683.72   413.73     0.56  6035.13
 MEAN   634.62   633.12   310.61     0.52  5676.83     1.66
 HUB    538.32   574.94   124.17     0.48  6154.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.34     1.17    23.69   647.44     1.06   614.99     0.92     0.82
 MEAN    28.08     1.16    23.23   645.36     1.05   611.21     0.92     0.82
 HUB     28.43     1.18    22.68   648.13     1.06   607.53     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.21    37.24    31.50     5.74     0.93     0.39     2.90
 MEAN    30.43    29.38    23.50     5.88     0.89     0.41     3.28     0.82
 HUB     36.42    12.47     6.50     5.97     0.89     0.44     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.900

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     646.702     326.134     558.445    1213.417       0.533        0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.235      23.266     612.080      46.000      30.285      31.500       1.215

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     568.137     326.134     655.090    1221.286       0.465        0.215

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.178      24.291     620.044     471.992       0.021        0.319

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     549.999       0.000     549.999    1222.951       0.450        0.233

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      24.452     621.737       0.000       0.060       0.037        0.246

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.788       28.097       1.164     646.978      34.627     266.111        2.063

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 215911.781       0.419    2402.611 2358665.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 4.994   EfDer =  1.000

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    196.913     4154.000       28.097     646.978       1.000        1.000        0.980
W Kg/sec =   89.50601

   W cor       RPM cor         GAMMA        Cp          R           Blades        THK
    115.059     3719.460        1.401        0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 151481.891  154511.203        1.532     513.330     335.152     401.059        1.197

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   513.70    -0.18   513.70     0.42   625.13
 MEAN    16.97      0.00    -0.02   513.70    -0.18   513.70     0.42
 HUB     14.32      0.00    -0.02   513.70    -0.18   513.70     0.42
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.66    46.36     7.30   698.18   866.95    24.90   624.97     0.71
MEAN    50.15    43.80     6.35   615.20   801.61    24.90   624.97     0.65
HUB     45.31    37.84     7.47   519.11   730.44    24.90   624.97     0.60

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   600.29   323.30   505.79  1252.61     0.48
MEAN    16.57   612.28   332.43   514.17  1248.13     0.49
HUB     13.89   662.56   406.13   523.49  1243.73     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    684.41   621.47   361.11     0.50  6107.30
MEAN   600.81   580.00   268.38     0.46  5512.66     1.50
HUB    503.52   532.47    97.39     0.43  5643.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     33.34     1.19    28.48   682.46     1.05   652.41     0.92     0.91
MEAN    32.80     1.17    27.82   679.00     1.05   647.75     0.92     0.91
HUB     32.92     1.17    27.13   679.76     1.05   643.16     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.59    35.52    31.50     4.02     0.93     0.35     2.90
MEAN    32.88    27.56    23.50     4.06     0.93     0.34     3.29     0.91
HUB     37.81    10.54     6.50     4.04     0.93     0.34     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     603.465     334.300     502.407    1250.305       0.483       0.055

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    32.965      28.105     650.043      46.000      33.640      32.400      -1.240

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     516.748     334.300     615.455    1258.071       0.411       0.287

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      32.917      29.305     658.143     456.573       0.019       0.374

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     490.005       0.000     490.005    1260.215       0.389       0.282

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      29.571     660.388       0.000       0.060       0.037       0.338

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.881      32.823       1.168     680.409      33.431     245.998       1.907

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 208632.469       0.445    2321.609 1685438.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 4.994   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    196.913    4154.000      32.823     680.409       1.000       1.000       0.980
W Kg/sec =   89.50601

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.004    3626.934       1.401       0.250      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
151481.891	154511.203	1.732	509.668	294.241	390.276	1.326

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	455.64	-0.16	455.64	0.36	579.83
MEAN	15.91	0.00	-0.02	455.64	-0.16	455.64	0.36	
HUB	13.07	0.00	-0.02	455.64	-0.16	455.64	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.55	47.36	8.19	664.11	805.52	30.00	663.11	0.64
MEAN	51.70	44.80	6.90	576.85	735.22	30.00	663.11	0.58
HUB	46.13	38.84	7.29	473.79	657.45	30.00	663.11	0.52

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	557.63	325.39	452.85	1286.47	0.43
MEAN	15.50	561.39	320.51	460.91	1281.42	0.44
HUB	12.59	597.56	369.49	469.64	1276.42	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	650.33	557.37	324.94	0.43	5840.44	
MEAN	561.80	520.24	241.29	0.41	4969.62	1.55
HUB	456.39	477.62	86.91	0.37	4653.89	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	38.36	1.17	33.71	714.30	1.05	688.40	0.92	0.91
MEAN	37.49	1.14	32.86	709.25	1.04	682.99	0.92	0.91
HUB	37.18	1.13	32.00	707.42	1.04	677.67	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.70	35.66	31.50	4.16	0.93	0.38	2.90	
MEAN	34.81	27.63	23.50	4.13	0.93	0.36	3.34	0.91
HUB	38.19	10.48	6.50	3.98	0.93	0.34	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	568.036	326.386	464.906	1281.823	0.443	-0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
37.581	32.839	683.440	46.000	35.071	33.000	-2.071

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	483.851	326.386	583.643	1288.724	0.375	0.242

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	37.503	34.024	690.818	440.827	0.036	0.399

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	451.422	0.000	451.422	1291.079	0.350	0.335

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	34.453	693.345	0.000	0.060	0.038	0.331

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.882	37.494	1.142	710.324	29.915	250.722	1.944

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
186882.203	0.442	2079.578	1699009.500

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   OVERALL EXIT CONDITIONS; ALL          5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1169075.50  13009.1738    192.3645      2.4819      0.8302      4.9942      1.3587


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

   Fan-Core + 4 Stage LPC 110% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 5.506   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    193.974    4154.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   88.17013

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    189.493    4137.640       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149221.016  152205.109       1.507     831.557     551.846     619.754       1.123

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   471.15    -0.16   471.15     0.43   744.88
 MEAN    17.06     0.00    -0.02   471.15    -0.16   471.15     0.43
 HUB     12.51     0.00    -0.02   471.15    -0.16   471.15     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.79    50.47     7.32   747.85   884.02    13.32   504.27     0.80
 MEAN    52.71    47.20     5.51   618.44   777.59    13.32   504.27     0.71
 HUB     43.92    38.62     5.30   453.49   654.05    13.32   504.27     0.59

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   734.34   418.81   603.21  1127.67     0.65
 MEAN    18.04   775.71   463.02   622.36  1120.42     0.69
 HUB     15.00   899.72   609.72   661.62  1107.23     0.81

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    747.85   687.11   329.04     0.61  8643.35
 MEAN   653.81   650.95   190.79     0.58  8353.89     1.32
 HUB    543.76   664.90    65.96     0.60  9147.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.27     1.34    15.24   573.14     1.10   528.13     0.92     0.91
 MEAN    20.08     1.33    14.57   571.46     1.09   521.24     0.92     0.91
 HUB     20.61     1.36    13.34   576.08     1.10   508.58     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.77    28.61    24.20     4.41     0.93     0.30     2.90
 MEAN    36.65    17.04    12.70     4.34     0.92     0.25     3.51     0.91
 HUB     42.66    -5.69    -9.30     3.61     0.92     0.09     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     789.432     462.125     640.034    1120.266       0.705      -0.005
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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.259      14.539     521.508      24.000      35.830      35.400      -0.430

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     653.324     462.125     800.244    1137.746       0.574       0.291

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.154      16.113     537.910     528.796       0.028       0.440

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     596.127       0.000     596.127    1144.042       0.521       0.357

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.657     543.879       0.000       0.060       0.045       0.383

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      20.049       1.327     573.560      50.750     219.640       1.703

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 315964.094       0.565    3463.492 1981140.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.506   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    193.974    4154.000      20.049     573.560       1.000       1.000       0.980
W Kg/sec =   88.17013

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    149.557    3950.345       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149221.016  152205.109       1.356     590.487     435.561     474.134       1.089

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   564.21    -0.19   564.21     0.49   708.40
 MEAN    18.08     0.00    -0.02   564.21    -0.19   564.21     0.49
 HUB     15.21     0.00    -0.02   564.21    -0.19   564.21     0.49

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.87    46.36     6.51   744.95   934.65    16.99   546.98     0.81
 MEAN    49.28    42.30     6.98   655.35   864.91    16.99   546.98     0.75
 HUB     44.35    37.84     6.51   551.37   789.03    16.99   546.98     0.69

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   647.82   353.87   542.63  1182.03     0.55
 MEAN    18.01   663.75   364.21   554.90  1176.31     0.56
 HUB     15.22   723.03   446.82   568.44  1170.78     0.62

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   666.13   386.37     0.56  7229.98
 MEAN   652.87   625.49   288.66     0.53  6562.96     1.50
 HUB    551.84   578.06   105.02     0.49  6804.96

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.15     1.25    20.50   615.63     1.07   580.60     0.92     0.91
 MEAN    24.64     1.23    19.85   611.75     1.07   574.97     0.92     0.91
 HUB     24.82     1.24    19.19   613.16     1.07   569.52     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     33.11    35.45    31.50     3.95     0.93     0.35     2.90
 MEAN    33.28    27.48    23.50     3.98     0.93     0.34     3.30     0.91
 HUB     38.17    10.47     6.50     3.97     0.93     0.34     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     899.356     365.235     821.855    1146.167       0.785       -0.661

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.821      16.524     545.983      46.000      23.960      30.600       6.640

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     17.960     812.729     365.235     891.024    1159.088       0.701       -0.417

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      24.655      17.749     558.365     400.556       0.043       0.241

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     805.153       0.000     805.153    1160.208       0.694       0.233

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      17.697     559.394       0.000       0.060       0.089      -0.427

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.836      24.424       1.218     613.513      39.953     242.207       1.878

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 248926.688       0.454    2728.650 1761746.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.506   EfDer =  0.924

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    193.974     4154.000       24.424     613.513       1.000        1.000        0.780
W Kg/sec =   88.17013

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    126.967     3819.555        1.401       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 149221.016  152205.109        1.174     434.156     369.802     339.175       0.917

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   717.33    -0.25   717.33      0.61   668.95
 MEAN    17.74      0.00    -0.02   717.33    -0.25   717.33      0.61
 HUB     15.05      0.00    -0.02   717.33    -0.25   717.33      0.61

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     45.41     46.36    -0.95   727.55  1021.88     18.96   570.58      0.87
 MEAN    41.88     43.40    -1.52   643.03   963.52     18.96   570.58      0.82
 HUB     37.27     38.84    -1.57   545.57   901.37     18.96   570.58      0.77

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   614.03    321.58    523.08  1220.43      0.50
 MEAN    17.51   628.78    336.66    531.06  1216.19      0.52
 HUB     14.85   684.57    419.62    540.88  1212.10      0.56
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   656.40   396.55     0.54  6375.37
 MEAN   634.62   608.94   297.96     0.50  5898.16     1.69
 HUB    538.32   553.75   118.70     0.46  6235.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.06     1.19    24.45   650.58     1.06   619.12     0.92     0.85
 MEAN    28.70     1.17    23.91   647.81     1.06   614.82     0.92     0.85
 HUB     28.95     1.19    23.31   649.77     1.06   610.67     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.58    37.17    31.50     5.67     0.93     0.41     2.90
 MEAN    32.37    29.30    23.50     5.80     0.90     0.42     3.28     0.85
 HUB     37.80    12.38     6.50     5.88     0.90     0.45     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.924

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     635.274     338.871     537.345    1217.010       0.522       0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.854      23.960     615.709      46.000      32.237      31.500      -0.737

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     544.575     338.871     641.401    1225.803       0.444       0.251

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.801      25.148     624.638     471.992       0.021       0.349

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     527.543       0.000     527.543    1227.297       0.430       0.266

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.292     626.162       0.000       0.060       0.037       0.279

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.812      28.720       1.176     649.384      35.871     253.735       1.967

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 223677.391       0.434    2451.876 2281131.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.506   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    193.974    4154.000      28.720     649.384       1.000       1.000       0.980
W Kg/sec =   88.17013

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.088    3712.563       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149221.016  152205.109       1.586     513.330     323.585     401.059       1.239

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   493.38    -0.17   493.38     0.40   623.97
 MEAN    16.97     0.00    -0.02   493.38    -0.17   493.38     0.40
 HUB     14.32     0.00    -0.02   493.38    -0.17   493.38     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.76    46.36     8.40   698.18   855.06    25.70   629.09     0.70
 MEAN    51.28    43.80     7.48   615.20   788.73    25.70   629.09     0.64
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HUB     46.47    37.84     8.63   519.11   716.29    25.70   629.09     0.58

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   591.40   338.53   484.92  1257.35     0.47
MEAN    16.57   601.29   343.57   493.47  1252.53     0.48
HUB     13.89   649.04   410.28   502.92  1247.78     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    684.41   595.64   345.88     0.47  6394.69
MEAN   600.81   556.49   257.24     0.44  5697.14     1.54
HUB    503.52   511.49    93.24     0.41  5701.22

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     34.32     1.19    29.49   686.53     1.06   657.37     0.92     0.91
MEAN    33.67     1.17    28.76   682.48     1.05   652.33     0.92     0.91
HUB     33.68     1.17    28.00   682.50     1.05   647.38     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.92    35.50    31.50     4.00     0.93     0.37     2.90
MEAN    34.85    27.53    23.50     4.03     0.93     0.36     3.29     0.91
HUB     39.21    10.50     6.50     4.00     0.93     0.36     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481      593.379     345.501      482.419    1254.561       0.473       0.053

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.838      29.029      654.478      46.000      35.610      32.400      -3.210

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481      494.771     345.501     603.464    1263.108       0.392       0.319

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      33.785      30.391     663.425     456.573       0.020       0.404

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     469.680       0.000     469.680    1265.027       0.371       0.310

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      30.623     665.443       0.000       0.060       0.040       0.364

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      33.684       1.173     683.837      34.453     235.683       1.827

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 215030.031       0.459    2357.087 1643936.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.506   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    193.974    4154.000      33.684     683.837       1.000       1.000       0.980
W Kg/sec =   88.17013

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.199    3617.831       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149221.016  152205.109       1.800     509.668     283.159     390.276       1.378
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ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	437.19	-0.15	437.19	0.35	578.37
MEAN	15.91	0.00	-0.02	437.19	-0.15	437.19	0.35	
HUB	13.07	0.00	-0.02	437.19	-0.15	437.19	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.65	47.36	9.29	664.11	795.22	31.02	667.91	0.63
MEAN	52.85	44.80	8.05	576.85	723.92	31.02	667.91	0.57
HUB	47.31	38.84	8.47	473.79	644.79	31.02	667.91	0.51

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	550.86	339.18	434.05	1291.57	0.43
MEAN	15.50	552.03	330.66	442.05	1286.27	0.43
HUB	12.59	585.19	373.23	450.72	1281.02	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	650.33	534.05	311.15	0.41	6087.72	
MEAN	561.80	498.83	231.14	0.39	5126.78	1.60
HUB	456.39	458.32	83.16	0.36	4700.99	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	39.58	1.17	34.92	719.16	1.05	693.88	0.92	0.91
MEAN	38.60	1.15	34.01	713.59	1.04	688.20	0.92	0.91
HUB	38.17	1.13	33.08	711.12	1.04	682.58	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.01	35.64	31.50	4.14	0.93	0.40	2.90	
MEAN	36.80	27.60	23.50	4.10	0.93	0.38	3.34	0.91
HUB	39.63	10.45	6.50	3.95	0.93	0.36	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	558.742	336.720	445.884	1286.652	0.434	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
38.687	33.984	688.611	46.000	37.059	33.000	-4.059

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	463.008	336.720	572.500	1294.244	0.358	0.277

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	38.595	35.327	696.761	440.827	0.039	0.430

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	432.441	0.000	432.441	1296.360	0.334	0.363

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	35.719	699.041	0.000	0.060	0.042	0.359

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	38.581	1.145	714.622	30.785	240.347	1.863

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
192339.703	0.455	2108.363	1658172.625

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
1195937.88	13109.4688	189.4935	2.5538	0.8407	5.5058	1.3669

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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Fan-Core + 4 Stage LPC 110% Stat 2 20% Ice Block 8-22-2011

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1

RESET = 0.000 BLEED = 0.000 DPInc = 6.011 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
191.079	4154.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 86.85419

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
186.665	4137.640	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
146993.875	149933.438	1.530	831.557	543.610	619.754	1.140

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	462.59	-0.16	462.59	0.42	744.88
MEAN	17.06	0.00	-0.02	462.59	-0.16	462.59	0.42	
HUB	12.51	0.00	-0.02	462.59	-0.16	462.59	0.42	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.27	50.47	7.80	747.85	879.49	13.38	504.94	0.80
MEAN	53.21	47.20	6.01	618.44	772.43	13.38	504.94	0.70
HUB	44.44	38.62	5.82	453.49	647.91	13.38	504.94	0.59

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	727.54	426.16	589.66	1129.45	0.64
MEAN	18.04	767.44	467.17	608.86	1121.97	0.68
HUB	15.00	887.80	608.21	646.73	1108.87	0.80

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	747.85	671.70	321.68	0.59	8795.07	
MEAN	653.81	636.82	186.64	0.57	8428.69	1.35
HUB	543.76	649.94	64.45	0.59	9125.14	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.38	1.35	15.41	574.03	1.10	529.84	0.92	0.91
MEAN	20.13	1.33	14.72	571.89	1.09	522.73	0.92	0.91
HUB	20.60	1.36	13.50	575.95	1.10	510.21	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.86	28.61	24.20	4.41	0.93	0.32	2.90	
MEAN	37.50	17.04	12.70	4.34	0.93	0.26	3.51	0.91
HUB	43.24	-5.69	-9.30	3.61	0.93	0.10	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	780.264	466.267	625.625	1121.981	0.695	-0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.310	14.696	523.106	24.000	36.696	35.400	-1.296

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	637.088	466.267	789.485	1140.013	0.559	0.309

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.207	16.342	540.055	528.796	0.028	0.453

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	582.057	0.000	582.057	1145.912	0.508	0.371

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.860	545.659	0.000	0.060	0.044	0.398

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.874	20.111	1.331	573.956	51.146	216.372	1.677

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
318428.000	0.569	3438.405	1945162.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 6.011 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
191.079	4154.000	20.111	573.956	1.000	1.000	0.980

W Kg/sec = 86.85419

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
146.916	3948.984	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
146993.875	149933.438	1.380	590.487	427.870	474.134	1.108

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	551.40	-0.19	551.40	0.48	708.16
MEAN	18.08	0.00	-0.02	551.40	-0.19	551.40	0.48	
HUB	15.21	0.00	-0.02	551.40	-0.19	551.40	0.48	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.50	46.36	7.14	744.95	926.97	17.18	548.57	0.81
MEAN	49.93	42.30	7.63	655.35	856.60	17.18	548.57	0.75
HUB	45.01	37.84	7.17	551.37	779.91	17.18	548.57	0.68

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	642.32	363.24	529.74	1184.15	0.54
MEAN	18.01	656.96	371.06	542.14	1178.19	0.56
HUB	15.22	714.74	449.36	555.82	1172.41	0.61

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	740.23	650.19	376.99	0.55	7421.33	
MEAN	652.87	611.01	281.81	0.52	6686.23	1.52
HUB	551.84	565.18	102.48	0.48	6843.53	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.36	1.26	20.76	617.14	1.08	582.70	0.92	0.91
MEAN	24.81	1.23	20.08	612.86	1.07	576.83	0.92	0.91
HUB	24.92	1.24	19.39	613.78	1.07	571.14	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.44	35.44	31.50	3.94	0.93	0.37	2.90	
MEAN	34.39	27.47	23.50	3.97	0.93	0.35	3.30	0.91
HUB	38.95	10.45	6.50	3.95	0.93	0.35	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      875.618     372.103     792.620     1150.979       0.761       -0.617

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     24.982      17.020      550.581      46.000      25.148       30.600       5.452

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     17.960      780.693     372.103     864.837     1164.617       0.670       -0.343

   BlockageThr  PtTh        PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.750       24.843      18.376      563.708      400.556       0.038       0.261

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4        cp 3-4
     17.823      771.353       0.000     771.353     1165.896       0.662       0.274

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.750       18.379      564.920       0.000       0.060       0.075       -0.342

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.850       24.661        1.226      614.593       40.637      236.407       1.833

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 253194.625       0.462    2734.010 1725039.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.011   EfDer =  0.942

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    191.079     4154.000       24.661      614.593       1.000        1.000        0.780
W Kg/sec =   86.85419

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
    123.981     3816.197        1.401        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
 146993.875  149933.438        1.202      434.156      361.104      339.175       0.939

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   691.74    -0.24   691.74      0.59   668.36
 MEAN    17.74      0.00    -0.02   691.74    -0.24   691.74      0.59
 HUB     15.05      0.00    -0.02   691.74    -0.24   691.74      0.59

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     46.45     46.36      0.09   727.55  1004.08     19.51   574.67      0.85
 MEAN    42.92     43.40     -0.48   643.03   944.61     19.51   574.67      0.80
 HUB     38.27     38.84     -0.57   545.57   881.14     19.51   574.67      0.75

     ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP      19.81   606.73    335.94    505.24   1223.84      0.50
 MEAN     17.51   620.03    347.25    513.67   1219.21      0.51
 HUB      14.85   673.85    424.17    523.60   1214.75      0.55

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP     718.12    633.51    382.18      0.52   6659.75
 MEAN    634.62    588.59    287.37      0.48   6083.46      1.71
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 HUB    538.32   535.90   114.15     0.44  6302.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.66     1.20    25.07   653.31     1.06   622.60     0.92     0.86
 MEAN    29.20     1.18    24.47   649.96     1.06   617.89     0.92     0.86
 HUB     29.38     1.19    23.83   651.24     1.06   613.35     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.62    37.11    31.50     5.61     0.93     0.43     2.90
 MEAN    34.06    29.22    23.50     5.72     0.90     0.43     3.28     0.86
 HUB     39.01    12.30     6.50     5.80     0.90     0.45     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.942

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     626.225     349.533     519.600    1220.043       0.513       0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.364      24.530     618.781      46.000      33.929      31.500      -2.429

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     525.072     349.533     630.773    1229.585       0.427       0.281

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.309      25.852     628.499     471.992       0.021       0.375

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     509.004       0.000     509.004    1230.941       0.414       0.292

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.975     629.885       0.000       0.060       0.039       0.306

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.829      29.223       1.185     651.504      36.911     243.878       1.891

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 230168.047       0.446    2485.368 2214249.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.011   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    191.079    4154.000      29.223     651.504       1.000       1.000       0.980
W Kg/sec =   86.85419

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    107.724    3706.517       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 146993.875  149933.438       1.636     513.330     313.786     401.059       1.278

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   476.52    -0.16   476.52     0.39   622.96
 MEAN    16.97     0.00    -0.02   476.52    -0.16   476.52     0.39
 HUB     14.32     0.00    -0.02   476.52    -0.16   476.52     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.69    46.36     9.33   698.18   845.44    26.36   632.57     0.69
 MEAN    52.25    43.80     8.45   615.20   778.29    26.36   632.57     0.63
 HUB     47.46    37.84     9.62   519.11   704.78    26.36   632.57     0.57

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   584.88   350.89   467.94  1261.27     0.46
MEAN    16.57   592.82   352.65   476.52  1256.20     0.47
HUB     13.89   638.19   413.63   485.99  1251.18     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    684.41   574.63   333.52     0.46  6627.95
MEAN   600.81   537.26   248.16     0.43  5847.58     1.58
HUB    503.52   494.24    89.89     0.40  5747.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     35.11     1.20    30.29   690.00     1.06   661.48     0.92     0.91
MEAN    34.37     1.18    29.51   685.47     1.05   656.17     0.92     0.91
HUB     34.28     1.17    28.70   684.89     1.05   650.93     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     36.87    35.48    31.50     3.98     0.93     0.39     2.90
MEAN    36.50    27.51    23.50     4.01     0.93     0.38     3.29     0.91
HUB     40.40    10.48     6.50     3.98     0.93     0.37     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950      1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     585.631     354.634     466.045    1258.111       0.465       0.051

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    34.537      29.768     658.191      46.000      37.269      32.400      -4.869

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     476.967     354.634     594.359    1267.279       0.376       0.346

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      34.475      31.261     667.818     456.573       0.022       0.430

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     453.231       0.000     453.231    1269.025       0.357       0.332

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      31.459     669.659       0.000       0.060       0.045       0.385

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.876      34.361       1.176     686.788      35.283     227.509       1.764

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 220228.797       0.470    2378.044 1606342.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.011   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    191.079    4154.000      34.361     686.788       1.000       1.000       0.980
W Kg/sec =   86.85419

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.064    3610.052       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 146993.875  149933.438       1.860     509.668     274.027     390.276       1.424

    ROTOR LEADING EDGE CONDITIONS, STAGE            5
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   422.20    -0.15   422.20     0.33   577.13
MEAN    15.91     0.00    -0.02   422.20    -0.15   422.20     0.33
HUB     13.07     0.00    -0.02   422.20    -0.15   422.20     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.56    47.36    10.20   664.11   787.07    31.83   671.94     0.62
MEAN    53.81    44.80     9.01   576.85   714.97    31.83   671.94     0.56
HUB     48.30    38.84     9.46   473.79   634.72    31.83   671.94     0.50

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   546.06   350.17   419.00  1295.77     0.42
MEAN    15.50   544.97   338.76   426.89  1290.29     0.42
HUB     12.59   575.45   376.21   435.44  1284.85     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    650.33   515.42   300.17     0.40  6284.68
MEAN   561.80   481.65   223.04     0.37  5252.22     1.64
HUB    456.39   442.77    80.18     0.34  4738.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     40.53     1.18    35.87   723.25     1.05   698.41     0.92     0.91
MEAN    39.47     1.15    34.91   717.26     1.04   692.52     0.92     0.91
HUB     38.94     1.13    33.93   714.28     1.04   686.69     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.89    35.62    31.50     4.12     0.93     0.42     2.90
MEAN    38.43    27.59    23.50     4.09     0.93     0.40     3.34     0.91
HUB     40.83    10.43     6.50     3.93     0.93     0.37     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     551.744     344.967     430.603    1290.642       0.427      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     39.552      34.881     692.902      46.000      38.699      33.000      -5.699

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     446.453     344.967     564.201    1298.772       0.344       0.304

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      39.441      36.343     701.659     440.827       0.044       0.455

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     417.323       0.000     417.323    1300.710       0.321       0.385

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      36.707     703.755       0.000       0.060       0.048       0.380

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      39.422       1.147     718.264      31.477     232.265       1.801

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 196687.594       0.465    2123.844 1621175.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1218707.12  13159.6719    186.6652      2.6095      0.8467      6.0106      1.3739
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 110% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.509   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     188.227    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   85.55788

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     183.879    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  144799.969  147695.656       1.553     831.557     535.496     619.754       1.157

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   454.26    -0.16   454.26     0.41   744.88
  MEAN    17.06     0.00    -0.02   454.26    -0.16   454.26     0.41
  HUB     12.51     0.00    -0.02   454.26    -0.16   454.26     0.41

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.73    50.47     8.26   747.85   875.13    13.44   505.57     0.79
  MEAN    53.71    47.20     6.51   618.44   767.47    13.44   505.57     0.70
  HUB     44.96    38.62     6.34   453.49   641.99    13.44   505.57     0.58

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   721.34   433.16   576.81  1131.10     0.64
  MEAN    18.04   759.72   471.13   595.99  1123.41     0.68
  HUB     15.00   876.55   606.78   632.58  1110.41     0.79

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   657.07   314.69     0.58  8939.32
  MEAN   653.81   623.37   182.69     0.55  8499.94     1.37
  HUB    543.76   635.72    63.03     0.57  9103.70

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.47     1.36    15.57   574.87     1.10   531.42     0.92     0.91
  MEAN    20.18     1.34    14.85   572.31     1.09   524.13     0.92     0.91
  HUB     20.58     1.36    13.64   575.82     1.10   511.73     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     36.91    28.62    24.20     4.42     0.93     0.33     2.90
  MEAN    38.33    17.04    12.70     4.34     0.93     0.28     3.51     0.91
  HUB     43.81    -5.69    -9.30     3.61     0.93     0.12     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       1.000

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     771.766     470.213     611.982    1123.565       0.687      -0.002

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      20.357      14.841     524.584      24.000      37.537      35.400      -2.137

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     621.933     470.213     779.680    1142.091       0.545       0.325

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.253      16.550     542.026     528.796       0.028       0.466

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     568.894       0.000     568.894    1147.635       0.496       0.385

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.044     547.301       0.000       0.060       0.044       0.412

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      20.165       1.335     574.333      51.523     213.237       1.653

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 320772.969       0.574    3412.029 1910119.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.509   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    188.227    4154.000      20.165     574.333       1.000       1.000       0.980
W Kg/sec =   85.55788

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    144.387    3947.688       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 144799.969  147695.656       1.404     590.487     420.506     474.134       1.128

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   539.36    -0.19   539.36     0.47   707.93
 MEAN    18.08     0.00    -0.02   539.36    -0.19   539.36     0.47
 HUB     15.21     0.00    -0.02   539.36    -0.19   539.36     0.47

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.10    46.36     7.74   744.95   919.85    17.34   550.04     0.80
 MEAN    50.55    42.30     8.25   655.35   848.90    17.34   550.04     0.74
 HUB     45.64    37.84     7.80   551.37   771.44    17.34   550.04     0.67

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   637.53   371.91   517.81  1186.08     0.54
 MEAN    18.01   650.87   377.42   530.27  1179.92     0.55
 HUB     15.22   707.12   451.72   544.03  1173.92     0.60

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   635.45   368.33     0.54  7598.17
 MEAN   652.87   597.55   275.45     0.51  6800.59     1.54
 HUB    551.84   553.16   100.12     0.47  6879.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.56     1.27    20.99   618.55     1.08   584.61     0.92     0.91
 MEAN    24.95     1.24    20.28   613.90     1.07   578.54     0.92     0.91
 HUB     25.01     1.24    19.56   614.36     1.07   572.62     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.69    35.42    31.50     3.92     0.93     0.38     2.90
 MEAN    35.44    27.45    23.50     3.95     0.93     0.36     3.30     0.91
 HUB     39.70    10.43     6.50     3.93     0.93     0.36     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.750       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     855.528     378.475     767.259    1155.062       0.741      -0.580

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.122      17.444     554.495      46.000      26.256      30.600       4.344

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     753.420     378.475     843.140    1169.260       0.644      -0.281

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      25.004      18.907     568.212     400.556       0.034       0.279

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     743.231       0.000     743.231    1170.584       0.635       0.306

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      18.942     569.486       0.000       0.060       0.064      -0.273

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.860      24.856       1.233     615.604      41.271     231.112       1.792

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 257147.453       0.469    2735.251 1689925.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.509   EfDer =  0.957

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    188.227    4154.000      24.856     615.604       1.000       1.000       0.780
W Kg/sec =   85.55788

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    121.274    3813.062       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 144799.969  147695.656       1.229     434.156     353.221     339.175       0.960

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   669.73    -0.23   669.73     0.57   667.81
 MEAN    17.74     0.00    -0.02   669.73    -0.23   669.73     0.57
 HUB     15.05     0.00    -0.02   669.73    -0.23   669.73     0.57

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.38    46.36     1.02   727.55   989.04    19.97   578.18     0.84
 MEAN    43.84    43.40     0.44   643.03   928.61    19.97   578.18     0.79
 HUB     39.18    38.84     0.34   545.57   863.97    19.97   578.18     0.73

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   601.05   348.35   489.81  1226.78     0.49
 MEAN    17.51   612.86   356.43   498.55  1221.84     0.50
 HUB     14.85   664.78   428.10   508.58  1217.07     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   613.71   369.77     0.50  6905.46
 MEAN   634.62   570.92   278.19     0.47  6243.97     1.74
 HUB    538.32   520.39   110.22     0.43  6360.78

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     30.17     1.21    25.60   655.75     1.07   625.61     0.92     0.88
 MEAN    29.63     1.19    24.95   651.91     1.06   620.57     0.92     0.88
 HUB     29.72     1.20    24.26   652.58     1.06   615.71     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.42    37.05    31.50     5.55     0.93     0.44     2.90
 MEAN    35.56    29.16    23.50     5.66     0.90     0.44     3.28     0.88
 HUB     40.09    12.23     6.50     5.73     0.90     0.46     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.957

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     618.827     358.770     504.213    1222.679       0.506       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.793      25.009     621.460      46.000      35.434      31.500      -3.934

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     508.357     358.770     622.208    1232.858       0.412       0.307

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.731      26.444     631.850     471.992       0.023       0.398

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     493.149       0.000     493.149    1234.097       0.400       0.313

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.546     633.121       0.000       0.060       0.042       0.328

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.842      29.636       1.192     653.414      37.810     235.670       1.827

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 235781.938       0.457    2507.988 2154531.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.509   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    188.227    4154.000      29.636     653.414       1.000       1.000       0.980
W Kg/sec =   85.55788

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.787    3701.096       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 144799.969  147695.656       1.682     513.330     305.233     401.059       1.314

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   462.05    -0.16   462.05     0.37   622.04
 MEAN    16.97     0.00    -0.02   462.05    -0.16   462.05     0.37
 HUB     14.32     0.00    -0.02   462.05    -0.16   462.05     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.51    46.36    10.15   698.18   837.36    26.91   635.61     0.68
 MEAN    53.10    43.80     9.30   615.20   769.51    26.91   635.61     0.62
 HUB     48.34    37.84    10.50   519.11   695.07    26.91   635.61     0.56

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   579.88   361.32   453.56  1264.63      0.46
MEAN    16.57   585.99   360.33   462.11  1259.36      0.47
HUB     13.89   629.13   416.47   471.55  1254.14      0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    684.41   556.87   323.09     0.44  6824.70
MEAN   600.81   520.94   240.48     0.41  5974.79     1.61
HUB    503.52   479.52    87.05     0.38  5787.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     35.76     1.21    30.95   693.05     1.06   665.02     0.92     0.91
MEAN    34.95     1.18    30.13   688.12     1.05   659.49     0.92     0.91
HUB     34.77     1.17    29.28   687.03     1.05   654.02     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.54    35.46    31.50     3.96     0.93     0.41     2.90
MEAN    37.95    27.49    23.50     3.99     0.93     0.39     3.29     0.91
HUB     41.45    10.46     6.50     3.96     0.93     0.39     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.994

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     579.405     362.358     452.113    1261.176       0.459       0.049

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    35.109      30.375     661.407      46.000      38.711      32.400      -6.311

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     461.941     362.358     587.105    1270.863       0.363       0.369

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      35.035      31.976     671.606     456.573       0.025       0.452

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    16.096     439.355       0.000     439.355    1272.468       0.345       0.351

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      32.142     673.303       0.000       0.060       0.050       0.401

   STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      34.907       1.178     689.398      35.984     220.736       1.711

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 224618.438       0.480    2389.243 1571534.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.509   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    188.227    4154.000      34.907     689.398       1.000       1.000       0.980
W Kg/sec =   85.55788

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.382    3603.209       1.401       0.250      53.349      56.000       0.050

  CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 144799.969  147695.656       1.914     509.668     266.217     390.276       1.466

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   409.52    -0.14   409.52     0.32   576.04
 MEAN    15.91     0.00    -0.02   409.52    -0.14   409.52     0.32
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 HUB     13.07     0.00    -0.02   409.52    -0.14   409.52     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.35    47.36    10.99   664.11   780.34    32.50   675.43     0.61
 MEAN    54.63    44.80     9.83   576.85   707.55    32.50   675.43     0.56
 HUB     49.17    38.84    10.33   473.79   626.36    32.50   675.43     0.49

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   542.47   359.32   406.40  1299.35     0.42
 MEAN    15.50   539.38   345.54   414.16  1293.74     0.42
 HUB     12.59   567.45   378.71   422.58  1288.16     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   499.85   291.01     0.38  6448.79
 MEAN   561.80   467.22   216.26     0.36  5357.27     1.68
 HUB    456.39   429.66    77.68     0.33  4769.82

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     41.30     1.18    36.63   726.81     1.05   702.30     0.92     0.91
 MEAN    40.16     1.15    35.63   720.48     1.05   696.24     0.92     0.91
 HUB     39.56     1.13    34.62   717.07     1.04   690.25     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.48    35.61    31.50     4.11     0.93     0.44     2.90
 MEAN    39.84    27.57    23.50     4.07     0.94     0.41     3.34     0.91
 HUB     41.87    10.42     6.50     3.92     0.94     0.39     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.992

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     546.217     351.875     417.776    1294.067       0.422      -0.006

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      40.247      35.604     696.598      46.000      40.106      33.000      -7.106

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     432.663     351.875     557.686    1302.640       0.332       0.325

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      40.114      37.163     705.859     440.827       0.048       0.477

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     404.707       0.000     404.707    1304.438       0.310       0.403

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      37.501     707.809       0.000       0.060       0.053       0.397

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.869      40.090       1.148     721.454      32.055     225.633       1.749

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  200320.469       0.474    2130.788 1586868.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1238641.25  13175.2988    183.8792      2.6537      0.8499      6.5087      1.3800


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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
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*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 110% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 7.000   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     185.418    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   84.28091

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     181.135    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  142638.812  145491.297       1.576     831.557     527.504     619.754       1.175

     ROTOR LEADING EDGE CONDITIONS, STAGE             1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   446.14    -0.15   446.14     0.40   744.88
  MEAN    17.06     0.00    -0.02   446.14    -0.15   446.14     0.40
  HUB     12.51     0.00    -0.02   446.14    -0.15   446.14     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.19    50.47     8.72   747.85   870.94    13.50   506.19     0.79
  MEAN    54.20    47.20     7.00   618.44   762.69    13.50   506.19     0.69
  HUB     45.48    38.62     6.86   453.49   636.27    13.50   506.19     0.58

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   715.69   439.82   564.59  1132.64     0.63
  MEAN    18.04   752.51   474.92   583.71  1124.76     0.67
  HUB     15.00   865.93   605.44   619.10  1111.85     0.78

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    747.85   643.15   308.03     0.57  9076.70
  MEAN   653.81   610.51   178.90     0.54  8568.29     1.39
  HUB    543.76   622.17    61.68     0.56  9083.48

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.57     1.36    15.71   575.67     1.10   532.90     0.92     0.91
  MEAN    20.23     1.34    14.98   572.71     1.10   525.43     0.92     0.91
  HUB     20.57     1.36    13.77   575.71     1.10   513.15     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     37.92    28.62    24.20     4.42     0.93     0.35     2.90
  MEAN    39.13    17.04    12.70     4.34     0.93     0.29     3.51     0.91
  HUB     44.36    -5.69    -9.30     3.61     0.93     0.13     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       1.000

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     763.873     473.997     599.022    1125.034       0.679      -0.001

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      20.399      14.975     525.957      24.000      38.354      35.400      -2.954

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      18.071     607.702     473.997     770.698    1144.008       0.531       0.341

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      20.293      16.741     543.847     528.796       0.029       0.479

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     556.502       0.000     556.502    1149.233       0.484       0.397

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.211     548.826       0.000       0.060       0.043       0.424

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      20.210       1.338     574.693      51.883     210.222       1.630

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 323014.562       0.578    3384.592 1875968.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.000   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    185.418    4154.000      20.210     574.693       1.000       1.000       0.980
W Kg/sec =   84.28091

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    141.957    3946.452       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 142638.812  145491.297       1.428     590.487     413.428     474.134       1.147

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   527.99    -0.18   527.99     0.46   707.71
 MEAN    18.08     0.00    -0.02   527.99    -0.18   527.99     0.46
 HUB     15.21     0.00    -0.02   527.99    -0.18   527.99     0.46

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.68    46.36     8.32   744.95   913.23    17.50   551.42     0.79
 MEAN    51.15    42.30     8.85   655.35   841.72    17.50   551.42     0.73
 HUB     46.25    37.84     8.41   551.37   763.53    17.50   551.42     0.66

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   633.33   379.98   506.68  1187.86     0.53
 MEAN    18.01   645.36   383.36   519.15  1181.52     0.55
 HUB     15.22   700.05   453.93   532.94  1175.32     0.60

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   621.70   360.26     0.52  7762.87
 MEAN   652.87   584.94   269.51     0.50  6907.57     1.57
 HUB    551.84   541.86    97.91     0.46  6912.90

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.73     1.27    21.20   619.86     1.08   586.38     0.92     0.91
 MEAN    25.07     1.24    20.46   614.89     1.07   580.12     0.92     0.91
 HUB     25.08     1.24    19.72   614.92     1.07   574.01     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.87    35.41    31.50     3.91     0.93     0.39     2.90
 MEAN    36.44    27.44    23.50     3.94     0.93     0.37     3.30     0.91
 HUB     40.42    10.41     6.50     3.91     0.93     0.37     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     838.117     384.435     744.748    1158.611       0.723      -0.549

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.244      17.812     557.909      46.000      27.303      30.600       3.297

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     729.549     384.435     824.641    1173.272       0.622      -0.227

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      25.142      19.366     572.119     400.556       0.031       0.296

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     718.999       0.000     718.999    1174.588       0.612       0.333

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      19.421     573.395       0.000       0.060       0.057      -0.215

    STAGE EXIT CONDITIONS, STAGE            2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.866      25.018       1.238     616.556      41.863     226.233       1.754

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 260835.438       0.476    2733.070 1656213.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.000   EfDer =  0.968

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    185.418    4154.000      25.018     616.556       1.000       1.000       0.780
W Kg/sec =   84.28091

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.782    3810.118       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 142638.812  145491.297       1.255     434.156     345.963     339.175       0.980

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   650.31    -0.22   650.31     0.55   667.30
 MEAN    17.74     0.00    -0.02   650.31    -0.22   650.31     0.55
 HUB     15.05     0.00    -0.02   650.31    -0.22   650.31     0.55

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.22    46.36     1.86   727.55   975.99    20.37   581.27     0.83
 MEAN    44.69    43.40     1.29   643.03   914.70    20.37   581.27     0.77
 HUB     40.01    38.84     1.17   545.57   849.00    20.37   581.27     0.72

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   596.51   359.30   476.16  1229.39     0.49
 MEAN    17.51   606.84   364.54   485.14  1224.18     0.50
 HUB     14.85   656.88   431.54   495.24  1219.15     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   596.22   358.82     0.48  7122.22
 MEAN   634.62   555.25   270.08     0.45  6385.85     1.77
 HUB    538.32   506.62   106.78     0.42  6411.80

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.61     1.22    26.05   657.96     1.07   628.27     0.92     0.89
 MEAN    29.99     1.20    25.35   653.68     1.06   622.96     0.92     0.89
 HUB     30.01     1.20    24.63   653.83     1.06   617.83     0.92     0.89
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.04    37.00    31.50     5.50     0.93     0.45     2.90
 MEAN    36.92    29.10    23.50     5.60     0.91     0.45     3.28     0.89
 HUB     41.07    12.17     6.50     5.67     0.91     0.47     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.968

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     612.629     366.934     490.585    1225.018       0.500       0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.157      25.417     623.842      46.000      36.795      31.500      -5.295

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     493.686     366.934     615.115    1235.751       0.400       0.330

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.085      26.949     634.822     471.992       0.025       0.419

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     479.255       0.000     479.255    1236.891       0.387       0.332

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.030     635.993       0.000       0.060       0.046       0.347

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.850      29.982       1.198     655.159      38.603     228.637       1.772

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 240732.734       0.467    2522.431 2100031.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.000   EfDer =  0.991

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    185.418    4154.000       29.982     655.159       1.000       1.000       0.980
W Kg/sec =   84.28091

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
    102.172    3696.165        1.401       0.249      53.349      56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 142638.812  145491.297        1.725     513.330     297.615     401.059       1.348

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   449.33    -0.15   449.33      0.36   621.22
 MEAN    16.97      0.00    -0.02   449.33    -0.15   449.33      0.36
 HUB     14.32      0.00    -0.02   449.33    -0.15   449.33      0.36

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     57.24    46.36    10.88   698.18   830.41    27.38   638.32      0.67
 MEAN    53.86    43.80    10.06   615.20   761.94    27.38   638.32      0.61
 HUB     49.13    37.84    11.29   519.11   686.68    27.38   638.32      0.55

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   575.93   370.35   441.06  1267.57      0.45
 MEAN    16.57   580.32   367.00   449.54  1262.15      0.46
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 HUB     13.89   621.37   418.94   458.91  1256.77     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   541.45   314.06     0.43  6995.13
 MEAN   600.81   506.71   233.81     0.40  6085.26     1.64
 HUB    503.52   466.64    84.58     0.37  5821.28

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     36.30     1.21    31.50   695.79     1.06   668.13     0.92     0.91
 MEAN    35.43     1.18    30.64   690.50     1.05   662.42     0.92     0.91
 HUB     35.18     1.17    29.76   688.97     1.05   656.78     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.02    35.45    31.50     3.95     0.93     0.42     2.90
 MEAN    39.23    27.48    23.50     3.98     0.94     0.41     3.29     0.91
 HUB     42.39    10.44     6.50     3.94     0.94     0.40     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     574.250     369.065     439.947    1263.884       0.454       0.048

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     35.583      30.882     664.256      46.000      39.993      32.400      -7.593

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     448.899     369.065     581.137    1274.016       0.352       0.388

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      35.498      32.576     674.950     456.573       0.027       0.472

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     427.313       0.000     427.313    1275.504       0.335       0.366

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.710     676.527       0.000       0.060       0.056       0.415

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      35.355       1.179     691.751      36.593     214.949       1.666

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 228427.750       0.488    2393.498 1538862.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.000   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    185.418    4154.000      35.355     691.751       1.000       1.000       0.980
W Kg/sec =   84.28091

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.029    3597.076       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 142638.812  145491.297       1.965     509.668     259.365     390.276       1.505

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   398.50    -0.14   398.50     0.31   575.06
 MEAN    15.91     0.00    -0.02   398.50    -0.14   398.50     0.31
 HUB     13.07     0.00    -0.02   398.50    -0.14   398.50     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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 TIP     59.04    47.36    11.68   664.11   774.61    33.05   678.52     0.61
 MEAN    55.37    44.80    10.57   576.85   701.23    33.05   678.52     0.55
 HUB     49.94    38.84    11.10   473.79   619.20    33.05   678.52     0.48

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   539.70   367.19   395.54  1302.50     0.41
 MEAN    15.50   534.79   351.38   403.15  1296.78     0.41
 HUB     12.59   560.61   380.81   411.42  1291.08     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   486.43   283.14     0.37  6589.99
 MEAN   561.80   454.76   210.42     0.35  5447.66     1.71
 HUB    456.39   418.31    75.58     0.32  4796.24

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     41.93     1.19    37.26   729.98     1.06   705.72     0.92     0.90
 MEAN    40.73     1.15    36.23   723.35     1.05   699.53     0.92     0.90
 HUB     40.06     1.13    35.19   719.57     1.04   693.39     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.87    35.60    31.50     4.10     0.93     0.45     2.90
 MEAN    41.07    27.56    23.50     4.06     0.94     0.43     3.34     0.90
 HUB     42.79    10.41     6.50     3.91     0.94     0.40     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.989

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     541.686     357.819     406.681    1297.078       0.418      -0.007

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      40.815      36.198     699.859      46.000      41.343      33.000      -8.343

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     420.802     357.819     552.366    1306.029       0.322       0.344

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      40.660      37.837     709.552     440.827       0.053       0.496

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
      14.701     393.840       0.000     393.840    1307.712       0.301       0.417

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      38.152     711.381       0.000       0.060       0.059       0.411

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.862      40.631       1.149     724.302      32.551     220.013       1.706

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  203438.250       0.481    2131.655 1560857.250

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1256448.75  13165.2461    181.1348      2.6895      0.8511      7.0004      1.3854


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 110% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    182.651    4154.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   83.02301

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    178.431    4137.640       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 140509.906  143319.797       1.600     831.557     519.631     619.754       1.193

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   438.22    -0.15   438.22     0.40   744.88
 MEAN    17.06     0.00    -0.02   438.22    -0.15   438.22     0.40
 HUB     12.51     0.00    -0.02   438.22    -0.15   438.22     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.64    50.47     9.17   747.85   866.91    13.55   506.77     0.79
 MEAN    54.69    47.20     7.49   618.44   758.08    13.55   506.77     0.69
 HUB     45.99    38.62     7.37   453.49   630.74    13.55   506.77     0.57

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   710.51   446.18   552.94  1134.08     0.63
 MEAN    18.04   745.74   478.54   571.95  1126.04     0.66
 HUB     15.00   855.86   604.14   606.22  1113.21     0.77

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    747.85   629.88   301.67     0.56  9207.74
 MEAN   653.81   598.21   175.28     0.53  8633.46     1.42
 HUB    543.76   609.22    60.39     0.55  9064.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.65     1.37    15.85   576.43     1.10   534.28     0.92     0.91
 MEAN    20.27     1.34    15.10   573.09     1.10   526.66     0.92     0.91
 HUB     20.55     1.36    13.90   575.59     1.10   514.47     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.90    28.62    24.20     4.42     0.93     0.36     2.90
 MEAN    39.92    17.04    12.70     4.34     0.93     0.30     3.51     0.91
 HUB     44.90    -5.69    -9.30     3.61     0.93     0.14     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     756.498     477.606     586.670    1126.402       0.672       0.001

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.436      15.099     527.236      24.000      39.149      35.400      -3.749

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     594.279     477.606     762.414    1145.785       0.519       0.355

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.326      16.916     545.538     528.796       0.030       0.491

   VANED DIFFUSER EXIT:
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   R4          C4           Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     544.776       0.000     544.776    1150.720       0.473       0.408

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.364     550.248       0.000       0.060       0.044       0.436

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      20.249       1.340     575.036      52.226     207.320       1.607

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 325151.281       0.581    3356.131 1842667.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    182.651    4154.000      20.249     575.036       1.000       1.000       0.980
W Kg/sec =   83.02301

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    139.614    3945.274       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 140509.906  143319.797       1.452     590.487     406.604     474.134       1.166

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   517.20    -0.18   517.20     0.45   707.50
 MEAN    18.08      0.00    -0.02   517.20    -0.18   517.20     0.45
 HUB     15.21      0.00    -0.02   517.20    -0.18   517.20     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.24    46.36     8.88   744.95   907.03    17.64   552.70     0.79
 MEAN    51.73    42.30     9.43   655.35   834.99    17.64   552.70     0.72
 HUB     46.84    37.84     9.00   551.37   756.11    17.64   552.70     0.66

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   629.64   387.54   496.24  1189.50     0.53
 MEAN    18.01   640.33   388.94   508.68  1183.00     0.54
 HUB     15.22   693.45   455.98   522.45  1176.62     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   608.80   352.69     0.51  7917.29
 MEAN   652.87   573.07   263.93     0.48  7007.95     1.59
 HUB    551.84   531.18    95.86     0.45  6944.10

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.88     1.28    21.38   621.10     1.08   588.01     0.92     0.91
 MEAN    25.18     1.24    20.63   615.81     1.07   581.58     0.92     0.91
 HUB     25.13     1.24    19.86   615.44     1.07   575.30     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.99    35.40    31.50     3.90     0.93     0.40     2.90
 MEAN    37.40    27.42    23.50     3.92     0.94     0.38     3.30     0.91
 HUB     41.11    10.40     6.50     3.90     0.94     0.37     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3           Mach3       cp 2-3
     17.960     822.756     390.028     724.435    1161.749       0.708      -0.522
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Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.351	18.136	560.937	46.000	28.298	30.600	2.302

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	708.251	390.028	808.543	1176.808	0.602	-0.179

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	25.260	19.770	575.573	400.556	0.029	0.311

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	697.615	0.000	697.615	1178.089	0.592	0.356

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	19.836	576.822	0.000	0.060	0.051	-0.165

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.870	25.153	1.242	617.453	42.418	221.709	1.719

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
264292.094	0.482	2727.958	1623763.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 7.486 EfDer = 0.977

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
182.651	4154.000	25.153	617.453	1.000	1.000	0.780

W Kg/sec = 83.02301

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
116.462	3807.347	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
140509.906	143319.797	1.280	434.156	339.206	339.175	1.000

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	632.86	-0.22	632.86	0.53	666.81
MEAN	17.74	0.00	-0.02	632.86	-0.22	632.86	0.53	
HUB	15.05	0.00	-0.02	632.86	-0.22	632.86	0.53	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.99	46.36	2.63	727.55	964.45	20.71	584.03	0.81
MEAN	45.47	43.40	2.07	643.03	902.38	20.71	584.03	0.76
HUB	40.77	38.84	1.93	545.57	835.70	20.71	584.03	0.71

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	592.84	369.11	463.92	1231.72	0.48
MEAN	17.51	601.70	371.83	473.06	1226.29	0.49
HUB	14.85	649.93	434.65	483.21	1221.03	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	718.12	580.54	349.01	0.47	7316.45	
MEAN	634.62	541.15	262.79	0.44	6513.31	1.79
HUB	538.32	494.20	103.67	0.40	6457.78	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.99	1.23	26.44	659.99	1.07	630.66	0.92	0.89
MEAN	30.30	1.20	25.70	655.32	1.06	625.11	0.92	0.89
HUB	30.26	1.20	24.94	655.00	1.06	619.75	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.51	36.95	31.50	5.45	0.93	0.46	2.90	

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 MEAN    38.17    29.05    23.50     5.55     0.91     0.46     3.28     0.89
 HUB     41.97    12.11     6.50     5.61     0.91     0.48     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     607.348     374.269     478.324    1227.122       0.495       0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.468      25.768     625.989      46.000      38.042      31.500      -6.542

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     480.580     374.269     609.126    1238.349       0.388       0.351

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.387      27.386     637.497     471.992       0.027       0.438

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     466.858       0.000     466.858    1239.403       0.377       0.348

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.445     638.581       0.000       0.060       0.051       0.363

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.856      30.271       1.203     656.768      39.314     222.476       1.725

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 245175.750       0.475    2530.643 2049567.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.988

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    182.651    4154.000       30.271     656.768       1.000        1.000        0.980
W Kg/sec =   83.02301

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     99.806    3691.634        1.401       0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 140509.906  143319.797        1.766     513.330     290.724     401.059       1.380

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa     C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   437.96    -0.15   437.96      0.35   620.45
 MEAN    16.97      0.00    -0.02   437.96    -0.15   437.96      0.35
 HUB     14.32      0.00    -0.02   437.96    -0.15   437.96      0.35

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     57.91    46.36    11.55   698.18   824.31    27.77   640.78      0.66
 MEAN    54.56    43.80    10.76   615.20   755.29    27.77   640.78      0.61
 HUB     49.85    37.84    12.01   519.11   679.29    27.77   640.78      0.55

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   572.72   378.32   429.98  1270.21      0.45
 MEAN    16.57   575.50   372.90   438.35  1264.65      0.46
 HUB     13.89   614.56   421.09   447.63  1259.13      0.49

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
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 TIP    684.41   527.80   306.08     0.42  7145.67
 MEAN   600.81   494.06   227.91     0.39  6182.90     1.67
 HUB    503.52   455.15    82.43     0.36  5851.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     36.75     1.21    31.96   698.27     1.06   670.92     0.92     0.90
 MEAN    35.83     1.18    31.08   692.68     1.05   665.06     0.92     0.90
 HUB     35.51     1.17    30.17   690.75     1.05   659.26     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.34    35.45    31.50     3.95     0.93     0.44     2.90
 MEAN    40.39    27.47    23.50     3.97     0.94     0.42     3.29     0.90
 HUB     43.25    10.43     6.50     3.93     0.94     0.41     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     569.878     374.993     429.117    1266.313       0.450       0.046

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     35.981      31.309     666.819      46.000      41.149      32.400      -8.749

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     437.347     374.993     576.101    1276.837       0.343       0.406

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      35.883      33.084     677.949     456.573       0.030       0.490

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     416.643       0.000     416.643    1278.225       0.326       0.379

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      33.189     679.423       0.000       0.060       0.061       0.427

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      35.725       1.180     693.897      37.129     209.899       1.627

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 231787.312       0.495    2392.451 1507903.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    182.651    4154.000      35.725     693.897       1.000       1.000       0.980
W Kg/sec =   83.02301

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.926    3591.511       1.400       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 140509.906  143319.797       2.013     509.668     253.240     390.276       1.541

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   388.72    -0.13   388.72     0.30   574.17
 MEAN    15.91     0.00    -0.02   388.72    -0.13   388.72     0.30
 HUB     13.07     0.00    -0.02   388.72    -0.13   388.72     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.66    47.36    12.30   664.11   769.62    33.51   681.31     0.60
 MEAN    56.03    44.80    11.23   576.85   695.71    33.51   681.31     0.54
 HUB     50.64    38.84    11.80   473.79   612.95    33.51   681.31     0.48
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      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   537.49   374.09   385.94  1305.30     0.41
 MEAN    15.50   530.90   356.49   393.41  1299.49     0.41
 HUB     12.59   554.68   382.68   401.54  1293.70     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   474.62   276.24     0.36  6713.70
 MEAN   561.80   443.76   205.31     0.34  5526.80     1.74
 HUB    456.39   408.25    73.72     0.32  4819.64

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     42.45     1.19    37.78   732.84     1.06   708.78     0.92     0.90
 MEAN    41.20     1.15    36.73   725.96     1.05   702.48     0.92     0.90
 HUB     40.47     1.13    35.67   721.85     1.04   696.22     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.11    35.59    31.50     4.09     0.93     0.47     2.90
 MEAN    42.18    27.56    23.50     4.06     0.94     0.44     3.34     0.90
 HUB     43.62    10.40     6.50     3.90     0.94     0.41     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     537.859     363.022     396.871    1299.772       0.414      -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     41.283      36.692     702.785      46.000      42.449      33.000      -9.449

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     410.360     363.022     547.887    1309.052       0.313       0.360

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      41.107      38.399     712.856     440.827       0.058       0.513

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     384.261       0.000     384.261    1310.637       0.293       0.430

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      38.693     714.583       0.000       0.060       0.065       0.423

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4        Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.856      41.072       1.150     726.883      32.986     215.130       1.668

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  206172.406       0.487    2128.060 1530355.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1272578.88  13135.2432     178.4314      2.7187      0.8509      7.4857      1.3903


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 110% Stat 2 20% Ice Block 8-22-2011
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 7.965   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.925    4154.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   81.78387

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    175.768    4137.640       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 138412.766  141180.734       1.625     831.557     511.875     619.754       1.211

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   430.49    -0.15   430.49     0.39   744.88
MEAN    17.06     0.00    -0.02   430.49    -0.15   430.49     0.39
HUB     12.51     0.00    -0.02   430.49    -0.15   430.49     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.08    50.47     9.61   747.85   863.03    13.60   507.33     0.78
MEAN    55.16    47.20     7.96   618.44   753.64    13.60   507.33     0.68
HUB     46.50    38.62     7.88   453.49   625.39    13.60   507.33     0.57

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   705.75   452.25   541.81  1135.42     0.62
MEAN    18.04   739.39   482.01   560.68  1127.23     0.66
HUB     15.00   846.28   602.91   593.88  1114.49     0.76

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    747.85   617.20   295.60     0.54  9333.00
MEAN   653.81   586.41   171.80     0.52  8696.13     1.44
HUB    543.76   596.82    59.15     0.54  9045.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.73     1.37    15.97   577.16     1.10   535.57     0.92     0.91
MEAN    20.31     1.34    15.20   573.45     1.10   527.81     0.92     0.91
HUB     20.54     1.36    14.01   575.48     1.10   515.72     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.85    28.62    24.20     4.42     0.93     0.38     2.90
MEAN    40.69    17.04    12.70     4.34     0.93     0.32     3.51     0.91
HUB     45.43    -5.69    -9.30     3.61     0.93     0.16     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     749.604     481.077     574.866    1127.678       0.665       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.470      15.214     528.432      24.000      39.924      35.400      -4.524

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     581.562     481.077     754.751    1147.441       0.507       0.369

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.355      17.077     547.116     528.796       0.031       0.502

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     533.630       0.000     533.630    1152.113       0.463       0.419
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.505	551.580	0.000	0.060	0.044	0.447

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	20.281	1.343	575.365	52.555	204.519	1.585

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
327197.562	0.585	3326.846	1810179.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.965 EfDer = 0.992

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
179.925	4154.000	20.281	575.365	1.000	1.000	0.980

W Kg/sec = 81.78387

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
137.348	3944.147	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
138412.766	141180.734	1.476	590.487	400.006	474.134	1.185

ROTOR LEADING EDGE CONDITIONS, STAGE 2

R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP 20.55	0.00	-0.02	506.91	-0.17	506.91	0.44	707.29
MEAN 18.08	0.00	-0.02	506.91	-0.17	506.91	0.44	
HUB 15.21	0.00	-0.02	506.91	-0.17	506.91	0.44	

BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP 55.77	46.36	9.41	744.95	901.20	17.76	553.91	0.78
MEAN 52.29	42.30	9.99	655.35	828.65	17.76	553.91	0.72
HUB 47.41	37.84	9.57	551.37	749.10	17.76	553.91	0.65

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

R2	C2	Cu2	Cm2	Ao2	Mach2
TIP 20.42	626.36	394.66	486.38	1191.03	0.53
MEAN 18.01	635.73	394.20	498.76	1184.38	0.54
HUB 15.22	687.27	457.92	512.49	1177.85	0.58

U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP 740.23	596.64	345.57	0.50	8062.58	
MEAN 652.87	561.84	258.67	0.47	7102.66	1.61
HUB 551.84	521.02	93.92	0.44	6973.63	

Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP 26.02	1.28	21.54	622.28	1.08	589.53	0.92	0.91
MEAN 25.28	1.25	20.77	616.69	1.07	582.95	0.92	0.91
HUB 25.18	1.24	19.99	615.94	1.07	576.51	0.92	0.91

Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP 39.06	35.39	31.50	3.89	0.93	0.41	2.90	
MEAN 38.32	27.41	23.50	3.91	0.94	0.39	3.30	0.91
HUB 41.78	10.38	6.50	3.88	0.94	0.38	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	809.020	395.305	705.866	1164.564	0.695	-0.497

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.445	18.424	563.660	46.000	29.250	30.600	1.350

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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     688.962     395.305     794.314    1179.974       0.584      -0.136

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      25.361      20.128     578.675     400.556       0.028       0.325

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     678.398       0.000     678.398    1181.205       0.574       0.376

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      20.200     579.881       0.000       0.060       0.047      -0.120

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      25.268       1.246     618.305      42.940     217.486       1.686

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 267549.281       0.488    2720.360 1592447.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.965   EfDer =  0.984

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.925    4154.000      25.268     618.305       1.000       1.000       0.780
W Kg/sec =   81.78387

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    114.282    3804.726       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 138412.766  141180.734       1.304     434.156     332.857     339.175       1.019

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   616.96    -0.21   616.96     0.52   666.35
 MEAN    17.74     0.00    -0.02   616.96    -0.21   616.96     0.52
 HUB     15.05     0.00    -0.02   616.96    -0.21   616.96     0.52

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.71    46.36     3.35   727.55   954.08    21.02   586.54     0.80
 MEAN    46.19    43.40     2.79   643.03   891.29    21.02   586.54     0.75
 HUB     41.50    38.84     2.66   545.57   823.72    21.02   586.54     0.69

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   589.83   378.00   452.79  1233.83     0.48
 MEAN    17.51   597.25   378.45   462.04  1228.21     0.49
 HUB     14.85   643.71   437.48   472.21  1222.76     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   566.30   340.12     0.46  7492.52
 MEAN   634.62   528.30   256.17     0.43  6629.15     1.81
 HUB    538.32   482.86   100.84     0.39  6499.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.32     1.24    26.78   661.86     1.07   632.83     0.92     0.90
 MEAN    30.57     1.21    26.00   656.84     1.06   627.08     0.92     0.90
 HUB     30.46     1.21    25.22   656.09     1.06   621.52     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.86    36.91    31.50     5.41     0.93     0.47     2.90
 MEAN    39.32    29.01    23.50     5.51     0.91     0.47     3.28     0.90
 HUB     42.81    12.05     6.50     5.55     0.91     0.48     3.87
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      602.778     380.935     467.150     1229.037       0.490       0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     30.737      26.072      627.948      46.000      39.195       31.500      -7.695

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392      468.707     380.935     603.985     1240.712       0.378       0.369

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       30.644      27.766      639.935      471.992       0.029       0.456

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121      455.633       0.000     455.633     1241.689       0.367       0.362

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       27.803      640.943       0.000       0.060       0.056       0.377

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.859       30.516        1.208      658.265       39.961      216.990       1.682

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 249210.000       0.483    2533.892 2002333.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.965   EfDer =  0.984

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    179.925     4154.000       30.516      658.265       1.000        1.000       0.980
W Kg/sec =   81.78387

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     97.638     3687.433        1.401        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 138412.766  141180.734        1.805      513.330      284.412      401.059       1.410

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00     -0.02   427.64     -0.15   427.64      0.34    619.75
 MEAN    16.97      0.00     -0.02   427.64     -0.15   427.64      0.34
 HUB     14.32      0.00     -0.02   427.64     -0.15   427.64      0.34

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     58.52     46.36     12.16   698.18    818.87     28.12   643.02      0.66
 MEAN    55.20     43.80     11.40   615.20    749.35     28.12   643.02      0.60
 HUB     50.53     37.84     12.69   519.11    672.68     28.12   643.02      0.54

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500       0.050        0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   570.08    385.48    419.99   1272.60      0.45
 MEAN    16.57   571.35    378.20    428.25   1266.93      0.45
 HUB     13.89   608.50    423.02    437.41   1261.29      0.48

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    684.41    515.50    298.92      0.41   7280.79
 MEAN   600.81    482.65    222.61      0.38   6270.82      1.70
 HUB    503.52    444.76     80.50      0.35   5877.82
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     37.14     1.22    32.36   700.55     1.06   673.45     0.92     0.90
 MEAN    36.16     1.19    31.45   694.68     1.06   667.47     0.92     0.90
 HUB     35.79     1.17    30.52   692.40     1.05   661.53     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.55    35.44    31.50     3.94     0.93     0.45     2.90
 MEAN    41.45    27.47    23.50     3.97     0.94     0.43     3.29     0.90
 HUB     44.04    10.43     6.50     3.93     0.94     0.42     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     566.116     380.332     419.327    1268.522       0.446       0.045

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.316      31.673     669.155      46.000      42.208      32.400      -9.808

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     426.944     380.332     571.781    1279.397       0.334       0.422

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      36.207      33.518     680.678     456.573       0.032       0.507

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     407.029       0.000     407.029    1280.698       0.318       0.391

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      33.596     682.063       0.000       0.060       0.067       0.437

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.853      36.034       1.181     695.876      37.611     205.409       1.592

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 234805.750       0.501    2387.434 1478364.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.965   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.925    4154.000      36.034     695.876       1.000       1.000       0.980
W Kg/sec =   81.78387

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     85.017    3586.400       1.400       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 138412.766  141180.734       2.058     509.668     247.681     390.276       1.576

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   379.89    -0.13   379.89     0.30   573.35
 MEAN    15.91     0.00    -0.02   379.89    -0.13   379.89     0.30
 HUB     13.07     0.00    -0.02   379.89    -0.13   379.89     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.23    47.36    12.87   664.11   765.20    33.90   683.86     0.60
 MEAN    56.64    44.80    11.84   576.85   690.82    33.90   683.86     0.54
 HUB     51.29    38.84    12.45   473.79   607.39    33.90   683.86     0.47

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
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      0.500       0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
  TIP     17.94   535.71   380.28   377.33  1307.85     0.41
  MEAN    15.50   527.57   361.07   384.65  1301.96     0.41
  HUB     12.59   549.41   384.31   392.63  1296.08     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    650.33   464.01   270.06     0.35  6824.58
  MEAN   561.80   433.88   200.73     0.33  5597.78     1.77
  HUB    456.39   399.19    72.08     0.31  4840.22

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     42.89     1.19    38.21   735.46     1.06   711.55     0.92     0.90
  MEAN    41.60     1.15    37.15   728.34     1.05   705.16     0.92     0.90
  HUB     40.81     1.13    36.06   723.95     1.04   698.81     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     45.22    35.59    31.50     4.09     0.93     0.48     2.90
  MEAN    43.19    27.56    23.50     4.06     0.94     0.45     3.34     0.90
  HUB     44.39    10.40     6.50     3.90     0.94     0.42     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.981

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     534.580     367.690     388.047    1302.218       0.411      -0.009

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      41.673      37.106     705.447      46.000      43.457      33.000     -10.457

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     400.996     367.690     544.053    1311.791       0.306       0.375

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      41.476      38.872     715.857     440.827       0.063       0.530

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     375.662       0.000     375.662    1313.291       0.286       0.441

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      39.147     717.496       0.000       0.060       0.071       0.434

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.850      41.436       1.150     729.251      33.375     210.799       1.634

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  208619.281       0.493    2121.178 1501178.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1287381.88  13089.7109    175.7682      2.7428      0.8497      7.9649      1.3949


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 110% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.997
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
177.155	4154.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 80.52497

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
173.063	4137.640	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
136282.172	139007.531	1.650	831.557	503.996	619.754	1.230

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	422.71	-0.15	422.71	0.38	744.88
MEAN	17.06	0.00	-0.02	422.71	-0.15	422.71	0.38	
HUB	12.51	0.00	-0.02	422.71	-0.15	422.71	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.53	50.47	10.06	747.85	859.17	13.66	507.89	0.78
MEAN	55.65	47.20	8.45	618.44	749.22	13.66	507.89	0.68
HUB	47.02	38.62	8.40	453.49	620.06	13.66	507.89	0.56

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	701.25	458.25	530.81	1136.72	0.62
MEAN	18.04	733.22	485.46	549.50	1128.40	0.65
HUB	15.00	836.88	601.68	581.68	1115.73	0.75

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	747.85	604.67	289.60	0.53	9456.70	
MEAN	653.81	574.71	168.36	0.51	8758.19	1.46
HUB	543.76	584.55	57.92	0.52	9026.96	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.81	1.38	16.09	577.88	1.11	536.82	0.92	0.91
MEAN	20.34	1.35	15.31	573.81	1.10	528.92	0.92	0.91
HUB	20.52	1.36	14.12	575.38	1.10	516.92	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.80	28.62	24.20	4.42	0.93	0.39	2.90	
MEAN	41.46	17.03	12.70	4.33	0.93	0.33	3.51	0.91
HUB	45.97	-5.69	-9.30	3.61	0.93	0.17	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	742.938	484.513	563.208	1128.911	0.658	0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.501	15.323	529.588	24.000	40.705	35.400	-5.305

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	569.097	484.513	747.412	1149.036	0.495	0.382

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.379	17.230	548.638	528.796	0.033	0.514

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	522.778	0.000	522.778	1153.451	0.453	0.429

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.634	552.863	0.000	0.060	0.046	0.457

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    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      20.306       1.344     575.689      52.879     201.730       1.564

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 329219.156       0.589    3295.874 1777481.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.155    4154.000      20.306     575.689       1.000       1.000       0.980
W Kg/sec =   80.52497

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    135.106    3943.034       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
136282.172  139007.531       1.501     590.487     393.478     474.134       1.205

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   496.87    -0.17   496.87     0.43   707.09
MEAN    18.08     0.00    -0.02   496.87    -0.17   496.87     0.43
HUB     15.21     0.00    -0.02   496.87    -0.17   496.87     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.30    46.36     9.94   744.95   895.59    17.88   555.08     0.77
MEAN    52.84    42.30    10.54   655.35   822.55    17.88   555.08     0.71
HUB     47.99    37.84    10.15   551.37   742.35    17.88   555.08     0.64

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   623.38   401.54   476.83  1192.49     0.52
MEAN    18.01   631.40   399.29   489.12  1185.71     0.53
HUB     15.22   681.33   459.80   502.78  1179.03     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    740.23   584.88   338.70     0.49  8202.94
MEAN   652.87   550.95   253.58     0.46  7194.27     1.63
HUB    551.84   511.14    92.04     0.43  7002.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.14     1.29    21.69   623.42     1.08   590.98     0.92     0.90
MEAN    25.36     1.25    20.90   617.55     1.07   584.27     0.92     0.90
HUB     25.22     1.24    20.10   616.43     1.07   577.68     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.10    35.39     31.50     3.89     0.93     0.42     2.90
MEAN    39.23    27.40     23.50     3.90     0.94     0.40     3.30     0.90
HUB     42.44    10.37      6.50     3.87     0.94     0.39     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     796.360     400.410     688.376    1167.170       0.682      -0.475

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.524      18.685     566.187      46.000      30.185      30.600       0.415

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     670.934     400.410     781.333    1182.901       0.567      -0.096
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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      25.446      20.452     581.552     400.556       0.027       0.339

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     660.539       0.000     660.539    1184.078       0.558       0.394

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      20.527     582.707       0.000       0.060       0.045      -0.080

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      25.363       1.249     619.134      43.445     213.441       1.655

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 270696.875       0.494    2709.997 1561289.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.155    4154.000      25.363     619.134       1.000       1.000       0.780
W Kg/sec =   80.52497

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.177    3802.176       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 136282.172  139007.531       1.329     434.156     326.727     339.175       1.038

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   602.00    -0.21   602.00     0.51   665.91
 MEAN    17.74     0.00    -0.02   602.00    -0.21   602.00     0.51
 HUB     15.05     0.00    -0.02   602.00    -0.21   602.00     0.51

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.40    46.36     4.04   727.55   944.47    21.30   588.90     0.79
 MEAN    46.90    43.40     3.50   643.03   881.00    21.30   588.90     0.74
 HUB     42.20    38.84     3.36   545.57   812.57    21.30   588.90     0.68

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   587.31   386.34   442.36  1235.80     0.48
 MEAN    17.51   593.29   384.68   451.68  1230.02     0.48
 HUB     14.85   637.97   440.11   461.86  1224.39     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   552.96   331.78     0.45  7657.51
 MEAN   634.62   516.22   249.95     0.42  6738.02     1.84
 HUB    538.32   472.19    98.21     0.39  6538.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.61     1.25    27.08   663.65     1.07   634.87     0.92     0.91
 MEAN    30.81     1.21    26.27   658.30     1.06   628.94     0.92     0.91
 HUB     30.63     1.21    25.45   657.15     1.06   623.19     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.13    36.87    31.50     5.37     0.93     0.48     2.90
 MEAN    40.42    28.96    23.50     5.46     0.92     0.48     3.28     0.91
 HUB     43.62    12.00     6.50     5.50     0.92     0.49     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     598.716     387.199     456.659    1230.836       0.486       0.014

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.968      26.337     629.791      46.000      40.295      31.500      -8.795

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     457.610     387.199     599.442    1242.929       0.368       0.387

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.863      28.102     642.228     471.992       0.032       0.474

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     445.146       0.000     445.146    1243.837       0.358       0.375

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.118     643.167       0.000       0.060       0.062       0.390

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.862      30.723       1.211     659.700      40.566     211.936       1.643

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 252991.594       0.491    2532.746 1956540.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.155    4154.000      30.723     659.700       1.000       1.000       0.980
W Kg/sec =   80.52497

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.593    3683.420       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 136282.172  139007.531       1.844     513.330     278.454     401.059       1.440

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   417.98    -0.14   417.98     0.34   619.07
 MEAN    16.97     0.00    -0.02   417.98    -0.14   417.98     0.34
 HUB     14.32     0.00    -0.02   417.98    -0.14   417.98     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.10    46.36    12.74   698.18   813.86    28.42   645.13     0.65
 MEAN    55.81    43.80    12.01   615.20   743.87    28.42   645.13     0.60
 HUB     51.17    37.84    13.33   519.11   666.58    28.42   645.13     0.54

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     18.88   567.82   392.12   410.68  1274.83     0.45
 MEAN    16.57   567.62   383.13   418.82  1269.06     0.45
 HUB     13.89   602.93   424.80   427.86  1263.32     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   504.08   292.29     0.40  7406.00
 MEAN   600.81   472.02   217.68     0.37  6352.32     1.73
 HUB    503.52   435.04    78.72     0.34  5902.54

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     37.47     1.22    32.70   702.71     1.07   675.83     0.92     0.90
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 MEAN    36.45     1.19    31.77   696.59     1.06   669.73     0.92     0.90
 HUB     36.02     1.17    30.82   693.98     1.05   663.67     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.68    35.44    31.50     3.94     0.93     0.46     2.90
 MEAN    42.45    27.46    23.50     3.96     0.94     0.44     3.29     0.90
 HUB     44.79    10.42     6.50     3.92     0.94     0.43     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     562.756     385.280     410.187    1270.596       0.443       0.044

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.599      31.985     671.354      46.000      43.207      32.400     -10.807

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     417.264     385.280     567.935    1281.796       0.326       0.436

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      36.478      33.895     683.242     456.573       0.035       0.523

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     398.075       0.000     398.075    1283.019       0.310       0.401

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      33.946     684.546       0.000       0.060       0.073       0.447

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.846      36.290       1.181     697.757      38.057     201.280       1.560

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 237602.562       0.507    2378.684 1449213.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.978

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.155    4154.000      36.290     697.757       1.000       1.000       0.980
W Kg/sec =   80.52497

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.229    3581.562       1.400       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 136282.172  139007.531       2.102     509.668     242.471     390.276       1.610

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   371.65    -0.13   371.65     0.29   572.58
 MEAN    15.91     0.00    -0.02   371.65    -0.13   371.65     0.29
 HUB     13.07     0.00    -0.02   371.65    -0.13   371.65     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.77    47.36    13.41   664.11   761.14    34.24   686.25     0.59
 MEAN    57.21    44.80    12.41   576.85   686.32    34.24   686.25     0.53
 HUB     51.90    38.84    13.06   473.79   602.27    34.24   686.25     0.47

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     17.94   534.21   385.97   369.33  1310.22     0.41
 MEAN    15.50   524.59   365.30   376.50  1304.27     0.40
 HUB     12.59   544.59   385.84   384.33  1298.32     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   454.19   264.36     0.35  6926.70
 MEAN   561.80   424.69   196.49     0.33  5663.35     1.80
 HUB    456.39   390.75    70.56     0.30  4859.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     43.26     1.19    38.58   737.93     1.06   714.16     0.92     0.89
 MEAN    41.92     1.16    37.50   730.60     1.05   707.68     0.92     0.89
 HUB     41.09     1.13    36.40   725.94     1.04   701.24     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.26    35.59    31.50     4.09     0.93     0.49     2.90
 MEAN    44.14    27.56    23.50     4.06     0.94     0.46     3.34     0.89
 HUB     45.11    10.40     6.50     3.90     0.94     0.43     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     531.659     372.001     379.838    1304.509       0.408       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     41.997      37.457     707.949      46.000      44.403      33.000     -11.403

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     392.307     372.001     540.638    1314.353       0.298       0.388

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      41.780      39.275     718.673     440.827       0.067       0.545

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     367.675       0.000     367.675    1315.777       0.279       0.451

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      39.532     720.232       0.000       0.060       0.077       0.444

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.844      41.736       1.150     731.492      33.734     206.827       1.603

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 210876.641       0.499    2111.125 1472310.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1301386.88  13028.4258    173.0626      2.7627      0.8475      8.4529      1.3992


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 110% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.323    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   79.23788
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
170.296	4137.640	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
134103.875	136785.688	1.677	831.557	495.940	619.754	1.250

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	414.84	-0.14	414.84	0.38	744.88
MEAN	17.06	0.00	-0.02	414.84	-0.14	414.84	0.38	
HUB	12.51	0.00	-0.02	414.84	-0.14	414.84	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.99	50.47	10.52	747.85	855.32	13.71	508.44	0.77
MEAN	56.15	47.20	8.95	618.44	744.80	13.71	508.44	0.67
HUB	47.56	38.62	8.94	453.49	614.72	13.71	508.44	0.56

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	696.96	464.22	519.86	1137.99	0.61
MEAN	18.04	727.20	488.88	538.35	1129.54	0.64
HUB	15.00	827.58	600.45	569.51	1116.95	0.74

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	747.85	592.20	283.63	0.52	9579.73	
MEAN	653.81	563.04	164.93	0.50	8819.95	1.49
HUB	543.76	572.33	56.70	0.51	9008.60	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.88	1.38	16.20	578.60	1.11	538.03	0.92	0.91
MEAN	20.37	1.35	15.41	574.17	1.10	530.02	0.92	0.91
HUB	20.50	1.36	14.23	575.27	1.10	518.10	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.76	28.62	24.20	4.42	0.93	0.40	2.90	
MEAN	42.24	17.03	12.70	4.33	0.93	0.34	3.51	0.91
HUB	46.52	-5.69	-9.30	3.61	0.93	0.18	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	736.438	487.934	551.600	1130.110	0.652	0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.529	15.428	530.714	24.000	41.495	35.400	-6.095

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	556.772	487.934	740.320	1150.587	0.484	0.395

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.400	17.377	550.120	528.796	0.034	0.526

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	512.171	0.000	512.171	1154.744	0.444	0.438

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.751	554.102	0.000	0.060	0.049	0.466

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.872	20.322	1.345	576.012	53.202	198.931	1.542

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 331230.094       0.592    3263.004 1744358.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.323    4154.000      20.322     576.012       1.000       1.000       0.980
W Kg/sec =   79.23788

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    132.882    3941.928       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134103.875  136785.688       1.526     590.487     387.000     474.134       1.225

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   487.04    -0.17   487.04     0.42   706.90
 MEAN    18.08     0.00    -0.02   487.04    -0.17   487.04     0.42
 HUB     15.21     0.00    -0.02   487.04    -0.17   487.04     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.83    46.36    10.47   744.95   890.17    17.99   556.21     0.77
 MEAN    53.39    42.30    11.09   655.35   816.64    17.99   556.21     0.71
 HUB     48.55    37.84    10.71   551.37   735.80    17.99   556.21     0.64

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   620.68   408.21   467.55  1193.89     0.52
 MEAN    18.01   627.34   404.24   479.73  1186.99     0.53
 HUB     15.22   675.59   461.61   493.29  1180.17     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   573.45   332.03     0.48  8339.02
 MEAN   652.87   540.33   248.63     0.46  7283.44     1.65
 HUB    551.84   501.48    90.23     0.42  7029.63

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.24     1.29    21.82   624.53     1.08   592.37     0.92     0.90
 MEAN    25.43     1.25    21.02   618.39     1.07   585.54     0.92     0.90
 HUB     25.24     1.24    20.20   616.92     1.07   578.81     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.12    35.38    31.50     3.88     0.93     0.43     2.90
 MEAN    40.12    27.40    23.50     3.90     0.94     0.41     3.30     0.90
 HUB     43.10    10.37     6.50     3.87     0.94     0.40     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     784.601     405.378     671.764    1169.604       0.671      -0.454

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.589      18.920     568.552      46.000      31.109      30.600      -0.509

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     653.927     405.378     769.385    1185.637       0.552      -0.058

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      25.513      20.744     584.246     400.556       0.026       0.352
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	643.760	0.000	643.760	1186.755	0.542	0.411

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	20.819	585.348	0.000	0.060	0.043	-0.042

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.871	25.438	1.252	619.947	43.935	209.548	1.624

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
273751.406	0.500	2696.772	1530070.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.993

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
174.323	4154.000	25.438	619.947	1.000	1.000	0.780

W Kg/sec = 79.23788

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
110.132	3799.682	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
134103.875	136785.688	1.353	434.156	320.770	339.175	1.057

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	587.80	-0.20	587.80	0.49	665.47
MEAN	17.74	0.00	-0.02	587.80	-0.20	587.80	0.49	
HUB	15.05	0.00	-0.02	587.80	-0.20	587.80	0.49	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.07	46.36	4.71	727.55	935.49	21.54	591.12	0.78
MEAN	47.58	43.40	4.18	643.03	871.35	21.54	591.12	0.73
HUB	42.88	38.84	4.04	545.57	802.11	21.54	591.12	0.67

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	585.19	394.19	432.50	1237.67	0.47
MEAN	17.51	589.72	390.55	441.86	1231.73	0.48
HUB	14.85	632.62	442.59	452.03	1225.95	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	718.12	540.36	323.93	0.44	7812.98	
MEAN	634.62	504.79	244.08	0.41	6840.69	1.86
HUB	538.32	462.05	95.73	0.38	6575.52	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	31.86	1.25	27.33	665.37	1.07	636.79	0.92	0.91
MEAN	31.00	1.22	26.50	659.71	1.06	630.70	0.92	0.91
HUB	30.77	1.21	25.66	658.17	1.06	624.78	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.35	36.83	31.50	5.33	0.93	0.49	2.90	
MEAN	41.47	28.92	23.50	5.42	0.92	0.49	3.28	0.91
HUB	44.40	11.96	6.50	5.46	0.92	0.49	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.993

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

```
     17.392     595.056     393.108     446.719    1232.539       0.483       0.015

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.164      26.567     631.540      46.000      41.347      31.500      -9.847

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     447.142     393.108     595.373    1245.027       0.359       0.403

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.047      28.396     644.402     471.992       0.035       0.490

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     435.252       0.000     435.252    1245.872       0.349       0.387

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.390     645.278       0.000       0.060       0.068       0.402

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      30.893       1.214     661.084      41.137     207.237       1.606

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 256555.938       0.497    2527.376 1911666.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.976

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.323    4154.000      30.893     661.084       1.000       1.000       0.980
W Kg/sec =   79.23788

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.645    3679.563       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134103.875  136785.688       1.882     513.330     272.782     401.059       1.470

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   408.85    -0.14   408.85     0.33   618.43
 MEAN    16.97     0.00    -0.02   408.85    -0.14   408.85     0.33
 HUB     14.32     0.00    -0.02   408.85    -0.14   408.85     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.65    46.36    13.29   698.18   809.21    28.68   647.15     0.65
 MEAN    56.40    43.80    12.60   615.20   738.78    28.68   647.15     0.59
 HUB     51.78    37.84    13.94   519.11   660.89    28.68   647.15     0.53

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   565.88   398.34   401.93  1276.94     0.44
 MEAN    16.57   564.25   387.73   409.94  1271.08     0.44
 HUB     13.89   597.74   426.46   418.84  1265.24     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   493.34   286.07     0.39  7523.30
 MEAN   600.81   462.01   213.08     0.36  6428.51     1.76
 HUB    503.52   425.87    77.06     0.34  5925.50

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     37.75     1.22    32.98   704.77     1.07   678.07     0.92     0.89
 MEAN    36.69     1.19    32.04   698.41     1.06   671.87     0.92     0.89
 HUB     36.21     1.17    31.07   695.49     1.05   665.71     0.92     0.89
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.74    35.44    31.50     3.94     0.93     0.47     2.90
 MEAN    43.40    27.47    23.50     3.97     0.94     0.45     3.29     0.89
 HUB     45.52    10.43     6.50     3.93     0.94     0.44     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.976

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     559.718     389.906     401.569    1272.560       0.440       0.042

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.834      32.249     673.440      46.000      44.156      32.400     -11.756

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     408.162     389.906     564.467    1284.063       0.318       0.450

   BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.950      36.702      34.218     685.670     456.573       0.037       0.538

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     389.648       0.000     389.648    1285.215       0.303       0.411

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      34.243     686.901       0.000       0.060       0.079       0.456

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.840      36.499       1.181     699.559      38.474     197.442       1.531

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 240218.312       0.513    2366.431 1420184.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.974

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    174.323    4154.000      36.499     699.559       1.000       1.000       0.980
W Kg/sec =   79.23788

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     81.535    3576.948       1.400       0.250      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 134103.875  136785.688       2.146     509.668     237.541     390.276       1.643

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   363.90    -0.13   363.90      0.28   571.84
 MEAN    15.91      0.00    -0.02   363.90    -0.13   363.90      0.28
 HUB     13.07      0.00    -0.02   363.90    -0.13   363.90      0.28

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     61.28    47.36    13.92   664.11   757.38    34.53   688.53      0.59
 MEAN    57.76    44.80    12.96   576.85   682.15    34.53   688.53      0.53
 HUB     52.48    38.84    13.64   473.79   597.51    34.53   688.53      0.46

     ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2      Ao2          Mach2
 TIP     17.94   532.96   391.33   361.81  1312.47      0.41
 MEAN    15.50   521.92   369.27   368.84  1306.45      0.40
 HUB     12.59   540.11   387.25   376.51  1300.44      0.42
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       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   444.96   259.00     0.34  7022.76
 MEAN   561.80   416.06   192.52     0.32  5724.87     1.83
 HUB    456.39   382.81    69.15     0.29  4877.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     43.56     1.19    38.88   740.29     1.06   716.63     0.92     0.89
 MEAN    42.19     1.16    37.79   732.76     1.05   710.07     0.92     0.89
 HUB     41.31     1.13    36.68   727.84     1.04   703.55     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.24    35.60    31.50     4.10     0.93     0.50     2.90
 MEAN    45.03    27.56    23.50     4.06     0.94     0.47     3.34     0.89
 HUB     45.81    10.41     6.50     3.91     0.94     0.44     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     529.038     376.046     372.116    1306.676       0.405      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     42.262      37.749     710.320      46.000      45.301      33.000     -12.301

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     384.149     376.046     537.570    1316.773       0.292       0.400

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      42.026      39.615     721.339     440.827       0.072       0.559

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     360.169       0.000     360.169    1318.129       0.273       0.461

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      39.854     722.826       0.000       0.060       0.083       0.452

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.837      41.976       1.150     733.630      34.071     203.128       1.575

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  212995.578       0.504    2098.256 1443494.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1314751.38  12951.8398    170.2964      2.7786      0.8443      8.9531      1.4032


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 110% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.519   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    4154.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    167.175    4137.640       1.402       0.249      53.349      32.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
131645.797	134278.422	1.708	831.557	486.850	619.754	1.273

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	406.03	-0.14	406.03	0.37	744.88
MEAN	17.06	0.00	-0.02	406.03	-0.14	406.03	0.37	
HUB	12.51	0.00	-0.02	406.03	-0.14	406.03	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.51	50.47	11.04	747.85	851.09	13.76	509.04	0.77
MEAN	56.72	47.20	9.52	618.44	739.93	13.76	509.04	0.67
HUB	48.17	38.62	9.55	453.49	608.81	13.76	509.04	0.55

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	692.48	470.77	507.84	1139.36	0.61
MEAN	18.04	720.73	492.66	526.06	1130.77	0.64
HUB	15.00	817.44	599.11	556.12	1118.27	0.73

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	747.85	578.51	277.08	0.51	9714.89	
MEAN	653.81	550.19	161.15	0.49	8888.04	1.51
HUB	543.76	558.87	55.35	0.50	8988.38	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.96	1.39	16.32	579.38	1.11	539.34	0.92	0.91
MEAN	20.40	1.35	15.52	574.57	1.10	531.19	0.92	0.91
HUB	20.47	1.36	14.34	575.15	1.10	519.37	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.83	28.62	24.20	4.42	0.93	0.42	2.90	
MEAN	43.12	17.03	12.70	4.33	0.94	0.35	3.51	0.91
HUB	47.13	-5.68	-9.30	3.62	0.94	0.19	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.994

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	729.470	491.704	538.844	1131.396	0.645	0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.558	15.539	531.923	24.000	42.381	35.400	-6.981

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	543.311	491.704	732.776	1152.251	0.472	0.410

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.420	17.532	551.713	528.796	0.036	0.539

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	500.543	0.000	500.543	1156.138	0.433	0.448

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.874	555.441	0.000	0.060	0.053	0.475

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.868	20.334	1.346	576.368	53.558	195.828	1.518

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
333442.438	0.596	3224.588	1707338.750

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.519   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    4154.000      20.334     576.368       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    130.407    3940.713       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.555     590.487     379.791     474.134       1.248

    ROTOR LEADING EDGE CONDITIONS, STAGE           2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   476.23    -0.16   476.23     0.41   706.68
 MEAN    18.08     0.00    -0.02   476.23    -0.16   476.23     0.41
 HUB     15.21     0.00    -0.02   476.23    -0.16   476.23     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.42    46.36    11.06   744.95   884.30    18.10   557.43     0.76
 MEAN    54.00    42.30    11.70   655.35   810.24    18.10   557.43     0.70
 HUB     49.19    37.84    11.35   551.37   728.69    18.10   557.43     0.63

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   617.94   415.46   457.43  1195.39     0.52
 MEAN    18.01   623.03   409.62   469.45  1188.36     0.52
 HUB     15.22   669.39   463.58   482.88  1181.41     0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   561.00   324.78     0.47  8487.03
 MEAN   652.87   528.73   243.25     0.44  7380.21     1.68
 HUB    551.84   490.88    88.26     0.42  7059.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.34     1.30    21.95   625.75     1.09   593.87     0.92     0.90
 MEAN    25.49     1.25    21.14   619.31     1.07   586.91     0.92     0.90
 HUB     25.25     1.24    20.31   617.44     1.07   580.04     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.25    35.37    31.50     3.87     0.93     0.45     2.90
 MEAN    41.11    27.39    23.50     3.89     0.94     0.42     3.30     0.90
 HUB     43.83    10.36     6.50     3.86     0.94     0.41     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.982

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     772.323     410.770     654.027    1172.155       0.659      -0.433

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.650      19.160     571.036      46.000      32.131      30.600      -1.531

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     635.888     410.770     757.024    1188.504       0.535      -0.019

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      25.575      21.043     587.077     400.556       0.026       0.367

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     17.823     626.017       0.000     626.017    1189.557       0.526       0.428

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      21.116     588.117       0.000       0.060       0.041      -0.003

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      25.507       1.254     620.835      44.468     205.345       1.592

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 277071.781       0.506    2679.450 1495439.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 9.519   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    4154.000      25.507     620.835       1.000       1.000       0.780
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    107.899    3796.963       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.381     434.156     314.267     339.175       1.079

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   572.66    -0.20   572.66     0.48   664.99
 MEAN    17.74     0.00    -0.02   572.66    -0.20   572.66     0.48
 HUB     15.05     0.00    -0.02   572.66    -0.20   572.66     0.48

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.80    46.36     5.44   727.55   926.04    21.79   593.47     0.78
 MEAN    48.32    43.40     4.92   643.03   861.21    21.79   593.47     0.72
 HUB     43.62    38.84     4.78   545.57   791.07    21.79   593.47     0.66

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   583.21   402.52   422.04  1239.64     0.47
 MEAN    17.51   586.12   396.79   431.39  1233.55     0.48
 HUB     14.85   627.03   445.22   441.52  1227.61     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   526.99   315.60     0.43  7977.85
 MEAN   634.62   492.61   237.83     0.40  6949.85     1.89
 HUB    538.32   451.23    93.10     0.37  6614.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.11     1.26    27.59   667.21     1.07   638.83     0.92     0.91
 MEAN    31.19     1.22    26.72   661.24     1.07   632.57     0.92     0.91
 HUB     30.90     1.21    25.86   659.29     1.06   626.48     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.64    36.79    31.50     5.29     0.93     0.51     2.90
 MEAN    42.61    28.87    23.50     5.37     0.92     0.50     3.28     0.91
 HUB     45.24    11.91     6.50     5.41     0.92     0.50     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     591.376     399.390     436.134    1234.346       0.479       0.015

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     31.353      26.791     633.399      46.000      42.482      31.500     -10.982

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     436.033     399.390     591.301    1247.254       0.350       0.420

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.221      28.689     646.715     471.992       0.038       0.508

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     424.750       0.000     424.750    1248.035       0.340       0.399

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.658     647.525       0.000       0.060       0.074       0.414

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      31.052       1.217     662.578      41.743     202.317       1.568

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 260337.953       0.505    2517.625 1862786.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 9.519   EfDer =  0.972

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    4154.000      31.052     662.578       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.560    3675.413       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.925     513.330     266.711     401.059       1.504

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   399.15    -0.14   399.15     0.32   617.73
 MEAN    16.97     0.00    -0.02   399.15    -0.14   399.15     0.32
 HUB     14.32     0.00    -0.02   399.15    -0.14   399.15     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.25    46.36    13.89   698.18   804.35    28.93   649.30     0.64
 MEAN    57.03    43.80    13.23   615.20   733.45    28.93   649.30     0.59
 HUB     52.45    37.84    14.61   519.11   654.93    28.93   649.30     0.52

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   564.01   404.87   392.67  1279.17     0.44
 MEAN    16.57   560.84   392.60   400.51  1273.23     0.44
 HUB     13.89   592.32   428.19   409.26  1267.29     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   482.01   279.54     0.38  7646.61
 MEAN   600.81   451.40   208.21     0.35  6509.17     1.79
 HUB    503.52   416.14    75.32     0.33  5949.59

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     38.01     1.22    33.26   706.98     1.07   680.46     0.92     0.89
 MEAN    36.91     1.19    32.31   700.37     1.06   674.15     0.92     0.89
 HUB     36.38     1.17    31.32   697.12     1.05   667.88     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.88    35.45    31.50     3.95     0.93     0.49     2.90
 MEAN    44.43    27.47    23.50     3.97     0.94     0.46     3.29     0.89
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 HUB     46.30    10.43     6.50     3.93     0.94     0.45     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.972

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     556.657     394.804     392.424    1274.645       0.437       0.041

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     37.055      32.502     675.660      46.000      45.173      32.400     -12.773

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     398.525     394.804     560.974    1286.467       0.310       0.465

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      36.910      34.533     688.252     456.573       0.040       0.555

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096     380.716       0.000     380.716    1287.548       0.296       0.422

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      34.530     689.409       0.000       0.060       0.086       0.465

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
       0.833      36.691       1.182     701.492      38.914     193.423       1.499

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 242974.109       0.519    2349.706 1388127.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 9.519   EfDer =  0.970

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    171.128    4154.000      36.691     701.492       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     79.732    3572.015       1.400       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       2.194     509.668     232.289     390.276       1.680

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   355.66    -0.12   355.66     0.28   571.05
 MEAN    15.91     0.00    -0.02   355.66    -0.12   355.66     0.28
 HUB     13.07     0.00    -0.02   355.66    -0.12   355.66     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.83    47.36    14.47   664.11   753.46    34.80   690.96     0.58
 MEAN    58.35    44.80    13.55   576.85   677.79    34.80   690.96     0.53
 HUB     53.11    38.84    14.27   473.79   592.53    34.80   690.96     0.46

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   531.76   396.94   353.85  1314.85     0.40
 MEAN    15.50   519.21   373.45   360.71  1308.77     0.40
 HUB     12.59   535.42   388.70   368.22  1302.69     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   435.22   253.40     0.33  7123.26
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 MEAN   561.80   406.93   188.35     0.31  5789.53     1.86
 HUB    456.39   374.39    67.69     0.29  4895.33

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     43.85     1.19    39.17   742.80     1.06   719.25     0.92     0.89
 MEAN    42.44     1.16    38.07   735.07     1.05   712.62     0.92     0.89
 HUB     41.51     1.13    36.95   729.88     1.04   706.01     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.28    35.61    31.50     4.11     0.93     0.51     2.90
 MEAN    45.99    27.57    23.50     4.07     0.94     0.48     3.34     0.89
 HUB     46.55    10.42     6.50     3.92     0.94     0.45     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     526.381     380.298     363.938    1308.975       0.402      -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     42.507      38.024     712.841      46.000      46.259      33.000     -13.259

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     375.522     380.298     534.456    1319.337       0.285       0.413

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      42.250      39.938     724.172     440.827       0.077       0.575

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     352.224       0.000     352.224    1320.623       0.267       0.471

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      40.158     725.584       0.000       0.060       0.089       0.462

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.831      42.194       1.150     735.916      34.424     199.264       1.545

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 215212.000       0.509    2081.229 1411600.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1329038.25  12852.5986    167.1750      2.7930      0.8402      9.5192      1.4076



**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 110% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 9.703   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    170.094    4154.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   77.31532

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    166.165    4137.640       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
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130850.102  133466.828       1.718     831.557     483.907     619.754       1.281

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   403.20    -0.14   403.20     0.36   744.88
MEAN    17.06     0.00    -0.02   403.20    -0.14   403.20     0.36
HUB     12.51     0.00    -0.02   403.20    -0.14   403.20     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.67    50.47    11.20   747.85   849.74    13.78   509.23     0.77
MEAN    56.90    47.20     9.70   618.44   738.38    13.78   509.23     0.67
HUB     48.37    38.62     9.75   453.49   606.92    13.78   509.23     0.55

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   691.10   472.85   504.02  1139.78     0.61
MEAN    18.04   718.70   493.86   522.14  1131.15     0.64
HUB     15.00   814.22   598.66   551.86  1118.68     0.73

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    747.85   574.16   275.00     0.50  9757.75
MEAN   653.81   546.09   159.95     0.48  8909.65     1.52
HUB    543.76   554.58    54.91     0.50  8981.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.98     1.39    16.36   579.63     1.11   539.75     0.92     0.91
MEAN    20.41     1.35    15.55   574.69     1.10   531.56     0.92     0.91
HUB     20.46     1.35    14.38   575.11     1.10   519.77     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.17    28.62    24.20     4.42     0.93     0.42     2.90
MEAN    43.41    17.03    12.70     4.33     0.94     0.36     3.51     0.91
HUB     47.33    -5.68    -9.30     3.62     0.94     0.20     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.993

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     727.289     492.901     534.787    1131.798       0.643       0.004

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.566      15.573     532.300      24.000      42.666      35.400      -7.266

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     539.048     492.901     730.428    1152.770       0.468       0.414

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.425      17.580     552.210     528.796       0.037       0.543

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     496.851       0.000     496.851    1156.575       0.430       0.451

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.911     555.861       0.000       0.060       0.054       0.478

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.867      20.337       1.346     576.480      53.670     194.838       1.510

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 334140.875       0.597    3211.812 1695433.375
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 9.703   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    170.094    4154.000      20.337     576.480       1.000       1.000       0.980
W Kg/sec =   77.31532

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    129.613    3940.330       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 130850.102  133466.828       1.564     590.487     377.480     474.134       1.256

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   472.80    -0.16   472.80     0.41   706.61
 MEAN    18.08     0.00    -0.02   472.80    -0.16   472.80     0.41
 HUB     15.21     0.00    -0.02   472.80    -0.16   472.80     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.60    46.36    11.24   744.95   882.46    18.13   557.82     0.76
 MEAN    54.20    42.30    11.90   655.35   808.23    18.13   557.82     0.70
 HUB     49.40    37.84    11.56   551.37   726.45    18.13   557.82     0.63

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   617.11   417.75   454.22  1195.86     0.52
 MEAN    18.01   621.71   411.33   466.19  1188.80     0.52
 HUB     15.22   667.43   464.20   479.57  1181.80     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   557.06   322.49     0.47  8533.74
 MEAN   652.87   525.04   241.53     0.44  7411.05     1.69
 HUB    551.84   487.51    87.65     0.41  7068.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.37     1.30    21.99   626.13     1.09   594.34     0.92     0.90
 MEAN    25.51     1.25    21.17   619.60     1.07   587.33     0.92     0.90
 HUB     25.26     1.24    20.34   617.61     1.07   580.42     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.60    35.37    31.50     3.87     0.93     0.45     2.90
 MEAN    41.42    27.39    23.50     3.89     0.94     0.43     3.30     0.90
 HUB     44.07    10.36     6.50     3.86     0.94     0.41     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.981

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     768.562     412.489     648.491    1172.939       0.655       -0.426

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.668      19.232     571.801      46.000      32.459      30.600      -1.859

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
    17.960     630.277     412.489     753.257    1189.387       0.530       -0.007

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      25.593      21.133     587.951     400.556       0.027       0.372

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.823     620.506       0.000     620.506    1190.419       0.521       0.434
```

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	21.206	588.971	0.000	0.060	0.041	0.009

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.869	25.526	1.255	621.116	44.636	204.024	1.582

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
278122.094	0.508	2673.351	1484358.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 9.703 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
170.094	4154.000	25.526	621.116	1.000	1.000	0.780

W Kg/sec = 77.31532

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
107.191	3796.105	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
130850.102	133466.828	1.391	434.156	312.207	339.175	1.086

ROTOR LEADING EDGE CONDITIONS, STAGE 3

R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP 20.07	0.00	-0.02	567.93	-0.20	567.93	0.48	664.84
MEAN 17.74	0.00	-0.02	567.93	-0.20	567.93	0.48	
HUB 15.05	0.00	-0.02	567.93	-0.20	567.93	0.48	

BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP 52.03	46.36	5.67	727.55	923.12	21.87	594.20	0.77
MEAN 48.56	43.40	5.16	643.03	858.07	21.87	594.20	0.72
HUB 43.86	38.84	5.02	545.57	787.66	21.87	594.20	0.66

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

R2	C2	Cu2	Cm2	Ao2	Mach2
TIP 19.81	582.65	405.10	418.78	1240.25	0.47
MEAN 17.51	585.04	398.73	428.13	1234.12	0.47
HUB 14.85	625.30	446.03	438.24	1228.13	0.51

U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP 718.12	522.84	313.02	0.42	8028.97	
MEAN 634.62	488.81	235.89	0.40	6983.83	1.90
HUB 538.32	447.85	92.29	0.36	6626.53	

Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP 32.18	1.26	27.66	667.79	1.08	639.47	0.92	0.91
MEAN 31.25	1.22	26.79	661.71	1.07	633.16	0.92	0.91
HUB 30.94	1.21	25.92	659.64	1.06	627.01	0.92	0.91

Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP 44.05	36.78	31.50	5.28	0.93	0.51	2.90	
MEAN 42.96	28.85	23.50	5.35	0.92	0.50	3.28	0.91
HUB 45.50	11.89	6.50	5.39	0.92	0.50	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	590.273	401.345	432.834	1234.907	0.478	0.015

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
31.408	26.857	633.976	46.000	42.838	31.500	-11.338

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	432.577	401.345	590.085	1247.945	0.347	0.426

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	31.271	28.775	647.434	471.992	0.039	0.514

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	421.480	0.000	421.480	1248.707	0.338	0.403

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	28.737	648.225	0.000	0.060	0.077	0.418

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.862	31.097	1.218	663.047	41.931	200.801	1.557

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
261512.266	0.507	2513.695	1847318.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 9.703 EfDer = 0.971

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
170.094	4154.000	31.097	663.047	1.000	1.000	0.980

W Kg/sec = 77.31532

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
90.908	3674.114	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
130850.102	133466.828	1.938	513.330	264.811	401.059	1.515

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	396.12	-0.14	396.12	0.32	617.51
MEAN	16.97	0.00	-0.02	396.12	-0.14	396.12	0.32	
HUB	14.32	0.00	-0.02	396.12	-0.14	396.12	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.44	46.36	14.08	698.18	802.85	29.01	649.97	0.64
MEAN	57.23	43.80	13.43	615.20	731.81	29.01	649.97	0.59
HUB	52.66	37.84	14.82	519.11	653.09	29.01	649.97	0.52

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	563.48	406.90	389.79	1279.86	0.44
MEAN	16.57	559.81	394.10	397.58	1273.89	0.44
HUB	13.89	590.65	428.73	406.28	1267.93	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	684.41	478.48	277.50	0.37	7684.98	
MEAN	600.81	448.11	206.71	0.35	6534.14	1.80
HUB	503.52	413.10	74.79	0.33	5956.98	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	38.09	1.22	33.34	707.67	1.07	681.20	0.92	0.89
MEAN	36.98	1.19	32.38	700.99	1.06	674.86	0.92	0.89
HUB	36.43	1.17	31.39	697.64	1.05	668.55	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	46.23	35.45	31.50	3.95	0.93	0.49	2.90	
MEAN	44.75	27.47	23.50	3.97	0.94	0.47	3.29	0.89
HUB	46.54	10.43	6.50	3.93	0.94	0.45	3.90	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481      555.733     396.320     389.577     1275.293       0.436       0.040

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     37.118      32.575      676.351      46.000      45.492      32.400      -13.092

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481      395.530     396.320     559.922     1287.215       0.307       0.470

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       36.969      34.624      689.055     456.573       0.041       0.560

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096      377.937       0.000     377.937     1288.274       0.293       0.425

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       34.613      690.190       0.000       0.060       0.088       0.467

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4           PR4        Texit        Del T        Ns         Ns nondim
      0.831       36.744        1.182      702.097      39.050      192.183       1.490

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 243829.000       0.521    2343.721 1377893.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 9.703   EfDer =  0.968

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    170.094     4154.000       36.744      702.097       1.000        1.000       0.980
W Kg/sec =   77.31532

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     79.169     3570.475        1.400        0.250       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 130850.102  133466.828        2.210      509.668     230.649      390.276       1.692

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00     -0.02    353.10     -0.12    353.10      0.27    570.80
 MEAN    15.91      0.00     -0.02    353.10     -0.12    353.10      0.27
 HUB     13.07      0.00     -0.02    353.10     -0.12    353.10      0.27

       BetaFlo    BetaBlade Incid    U1        W1        Ps1       Ts1      Rel Mach
 TIP     62.01     47.36     14.65    664.11    752.25     34.88    691.71      0.58
 MEAN    58.53     44.80     13.73    576.85    676.45     34.88    691.71      0.52
 HUB     53.31     38.84     14.47    473.79    591.00     34.88    691.71      0.46

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500       0.050        0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94    531.43    398.68    351.38   1315.59      0.40
 MEAN    15.50    518.38    374.73    358.19   1309.49      0.40
 HUB     12.59    533.98    389.16    365.63   1303.39      0.41

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    650.33    432.20    251.65      0.33   7154.60
 MEAN   561.80    404.09    187.06      0.31   5809.38      1.87
 HUB    456.39    371.76     67.24      0.29   4901.08
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         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     43.93     1.20    39.26   743.59     1.06   720.07     0.92     0.89
 MEAN    42.51     1.16    38.15   735.79     1.05   713.41     0.92     0.89
 HUB     41.56     1.13    37.03   730.52     1.04   706.77     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.61    35.61    31.50     4.11     0.93     0.52     2.90
 MEAN    46.29    27.58    23.50     4.08     0.94     0.48     3.34     0.89
 HUB     46.79    10.42     6.50     3.92     0.94     0.45     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.968

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     525.572     381.603     361.392    1309.690       0.401      -0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     42.575      38.103     713.627      46.000      46.558      33.000     -13.558

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     372.841     381.603     533.508    1320.134       0.282       0.417

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      42.312      40.031     725.054     440.827       0.078       0.580

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     349.752       0.000     349.752    1321.399       0.265       0.474

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      40.245     726.443       0.000       0.060       0.091       0.465

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.829      42.254       1.150     736.630      34.533     198.070       1.535

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 215900.062       0.510    2075.264 1401403.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1333504.25  12817.8428    166.1645      2.7970      0.8387      9.7028      1.4090


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 110% Stat 2 27% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 5.506   EfDer =  0.998

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    193.974    4154.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   88.17013

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    189.493    4137.640       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149221.016  152205.109       1.507     831.557     551.846     619.754       1.123
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ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	471.15	-0.16	471.15	0.43	744.88
MEAN	17.06	0.00	-0.02	471.15	-0.16	471.15	0.43	
HUB	12.51	0.00	-0.02	471.15	-0.16	471.15	0.43	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.79	50.47	7.32	747.85	884.02	13.32	504.27	0.80
MEAN	52.71	47.20	5.51	618.44	777.59	13.32	504.27	0.71
HUB	43.92	38.62	5.30	453.49	654.05	13.32	504.27	0.59

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	734.34	418.81	603.21	1127.67	0.65
MEAN	18.04	775.71	463.02	622.36	1120.42	0.69
HUB	15.00	899.72	609.72	661.62	1107.23	0.81

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	747.85	687.11	329.04	0.61	8643.35	
MEAN	653.81	650.95	190.79	0.58	8353.89	1.32
HUB	543.76	664.90	65.96	0.60	9147.82	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.27	1.34	15.24	573.14	1.10	528.13	0.92	0.91
MEAN	20.08	1.33	14.57	571.46	1.09	521.24	0.92	0.91
HUB	20.61	1.36	13.34	576.08	1.10	508.58	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.77	28.61	24.20	4.41	0.93	0.30	2.90	
MEAN	36.65	17.04	12.70	4.34	0.92	0.25	3.51	0.91
HUB	42.66	-5.69	-9.30	3.61	0.92	0.09	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	789.432	462.125	640.034	1120.266	0.705	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.259	14.539	521.508	24.000	35.830	35.400	-0.430

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	653.324	462.125	800.244	1137.746	0.574	0.291

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.154	16.113	537.910	528.796	0.028	0.440

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	596.127	0.000	596.127	1144.042	0.521	0.357

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.657	543.879	0.000	0.060	0.045	0.383

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.871	20.049	1.327	573.560	50.750	219.640	1.703

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
315964.094	0.565	3463.492	1981140.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 5.506 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
193.974	4154.000	20.049	573.560	1.000	1.000	0.980

W Kg/sec = 88.17013

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
149.557	3950.345	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
149221.016	152205.109	1.356	590.487	435.561	474.134	1.089

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	564.21	-0.19	564.21	0.49	708.40
MEAN	18.08	0.00	-0.02	564.21	-0.19	564.21	0.49	
HUB	15.21	0.00	-0.02	564.21	-0.19	564.21	0.49	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.87	46.36	6.51	744.95	934.65	16.99	546.98	0.81
MEAN	49.28	42.30	6.98	655.35	864.91	16.99	546.98	0.75
HUB	44.35	37.84	6.51	551.37	789.03	16.99	546.98	0.69

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	647.82	353.87	542.63	1182.03	0.55
MEAN	18.01	663.75	364.21	554.90	1176.31	0.56
HUB	15.22	723.03	446.82	568.44	1170.78	0.62

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	740.23	666.13	386.37	0.56	7229.98	
MEAN	652.87	625.49	288.66	0.53	6562.96	1.50
HUB	551.84	578.06	105.02	0.49	6804.96	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.15	1.25	20.50	615.63	1.07	580.60	0.92	0.91
MEAN	24.64	1.23	19.85	611.75	1.07	574.97	0.92	0.91
HUB	24.82	1.24	19.19	613.16	1.07	569.52	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.11	35.45	31.50	3.95	0.93	0.35	2.90	
MEAN	33.28	27.48	23.50	3.98	0.93	0.34	3.30	0.91
HUB	38.17	10.47	6.50	3.97	0.93	0.34	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	1280.506	365.235	1227.314	1079.236	1.186	-1.878

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.821	10.410	478.261	46.000	16.572	30.600	14.028

STATOR / VANED DIFFUSER THROAT IS CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	1386.107	365.235	1433.419	1066.051	1.300	-2.207

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	24.270	8.751	457.977	361.848	0.120	-12.012

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	16784.365	0.000	16784.365	656.289	25.575	-2.071

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	0.000	4.634	0.000	0.060	0.549	-3.948

```
    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.409      22.113       1.103     613.513      39.953     242.207       1.878

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 248926.688       0.454    2728.650 1761746.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 5.506   EfDer =  0.803

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    193.974    4154.000      22.113     613.513       1.000       1.000       0.710
W Kg/sec =   88.17013

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    140.242    3819.555       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149221.016  152205.109       1.000     395.194     395.193     307.469       0.778

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02  1107.69    -0.38  1107.69     1.00   668.95
 MEAN    17.74     0.00    -0.02  1107.69    -0.38  1107.69     1.00
 HUB     15.05     0.00    -0.02  1107.69    -0.38  1107.69     1.00

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     33.31    46.36   -13.05   727.55  1325.46    11.69   511.17     1.20
 MEAN    30.15    43.40   -13.25   643.03  1281.00    11.69   511.17     1.16
 HUB     26.24    38.84   -12.60   545.57  1234.92    11.69   511.17     1.11

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   657.47   211.74   622.44  1203.38     0.55
 MEAN    17.51   674.02   252.64   624.88  1202.88     0.56
 HUB     14.85   733.38   372.57   631.70  1202.43     0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   802.40   506.38     0.67  4202.25
 MEAN   634.62   732.38   381.98     0.61  4429.70     1.82
 HUB    538.32   653.08   165.75     0.54  5538.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.46     1.11    19.96   637.95     1.04   601.91     0.92     0.74
 MEAN    24.59     1.11    19.87   639.27     1.04   601.39     0.92     0.74
 HUB     25.24     1.14    19.63   645.72     1.05   600.88     0.92     0.74

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.79    39.13    31.50     7.63     0.93     0.42     2.90
 MEAN    22.01    31.44    23.50     7.94     0.83     0.46     3.28     0.74
 HUB     30.53    14.70     6.50     8.20     0.83     0.51     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.803

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     683.120     254.302     634.022    1203.352       0.568      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.712      19.856     602.057      46.000      21.855      31.500       9.645

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     17.392     662.488     254.302     709.619    1205.665       0.549       0.037

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.562      20.002     604.372     471.992       0.040       0.184

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     642.936       0.000     642.936    1207.787       0.532       0.050

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.101     606.501       0.000       0.060       0.077       0.057

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.634      24.382       1.103     640.981      27.468     367.542       2.849

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 171248.703       0.332    1877.171 3189305.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.506   EfDer =  0.977

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    193.974    4154.000      24.382     640.981       1.000       1.000       0.980
W Kg/sec =   88.17013

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    130.003    3736.819       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149221.016  152205.109       1.356     513.330     378.698     401.059       1.059

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   596.44    -0.21   596.44     0.49   628.05
 MEAN    16.97     0.00    -0.02   596.44    -0.21   596.44     0.49
 HUB     14.32     0.00    -0.02   596.44    -0.21   596.44     0.49

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.50    46.36     3.14   698.18   918.42    20.66   611.33     0.76
 MEAN    45.90    43.80     2.10   615.20   857.01    20.66   611.33     0.71
 HUB     41.05    37.84     3.21   519.11   790.84    20.66   611.33     0.65

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   649.70   256.94   596.74  1234.83     0.53
 MEAN    16.57   666.49   284.67   602.63  1232.30     0.54
 HUB     13.89   723.27   388.42   610.13  1229.77     0.59

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   734.05   427.47     0.59  4854.92
 MEAN   600.81   680.52   316.14     0.55  4721.53     1.35
 HUB    503.52   620.89   115.10     0.50  5398.10

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.90     1.14    23.10   669.20     1.04   634.02     0.92     0.89
 MEAN    27.80     1.14    22.78   668.42     1.04   631.40     0.92     0.89
 HUB     28.32     1.16    22.40   672.35     1.05   628.76     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.30    35.62    31.50     4.12     0.93     0.25     2.90
 MEAN    25.28    27.68    23.50     4.18     0.91     0.26     3.29     0.89
 HUB     32.48    10.68     6.50     4.18     0.91     0.28     3.90


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     653.705     286.268     587.691    1235.064       0.529       0.060

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.956      23.097     634.368      46.000      25.971      32.400       6.429

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     614.670     286.268     678.063    1239.075       0.496       0.149

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.858      23.544     638.495     456.573       0.029       0.259

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     580.916       0.000     580.916    1242.335       0.468       0.150

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.882     641.859       0.000       0.060       0.050       0.213

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.832      27.744       1.138     669.990      29.009     294.914       2.286

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 180967.906       0.386    1983.709 1726241.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.506   EfDer =  0.979

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    193.974    4154.000      27.744     669.990       1.000       1.000       0.980
W Kg/sec =   88.17013

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    116.809    3655.027       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149221.016  152205.109       1.498     509.668     340.293     390.276       1.147

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   537.17    -0.18   537.17     0.43   584.32
 MEAN    15.91     0.00    -0.02   537.17    -0.18   537.17     0.43
 HUB     13.07     0.00    -0.02   537.17    -0.18   537.17     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.04    47.36     3.68   664.11   854.30    24.42   645.95     0.69
 MEAN    47.05    44.80     2.25   576.85   788.37    24.42   645.95     0.63
 HUB     41.42    38.84     2.58   473.79   716.38    24.42   645.95     0.57

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   600.29   260.68   540.74  1266.44     0.47
 MEAN    15.50   612.14   273.42   547.68  1262.89     0.48
 HUB     12.59   657.79   352.04   555.66  1259.38     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   666.51   389.66     0.53  4679.90
 MEAN   561.80   618.96   288.37     0.49  4240.36     1.38
 HUB    456.39   565.37   104.35     0.45  4434.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     31.43     1.13    26.95   697.16     1.04   667.15     0.92     0.90
 MEAN    31.07     1.12    26.46   694.61     1.04   663.40     0.92     0.90
 HUB     31.23     1.13    25.93   695.74     1.04   659.70     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.74    35.78    31.50     4.28     0.93     0.27     2.90
 MEAN    26.53    27.77    23.50     4.27     0.91     0.27     3.34     0.90
 HUB     32.36    10.64     6.50     4.14     0.91     0.27     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     618.901     278.438     552.730    1263.343       0.490      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.147      26.432     663.931      46.000      26.737      33.000       6.263

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     585.111     278.438     647.984    1266.563       0.462       0.069

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.992      26.773     667.320     440.827       0.052       0.276

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     542.363       0.000     542.363    1270.367       0.427       0.192

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.351     671.335       0.000       0.060       0.050       0.189

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.837      31.004       1.118     695.839      25.850     303.876       2.356

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 161394.656       0.382    1769.154 1739801.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1078502.00  11822.1758    189.4935      2.0523      0.6917      5.5058      1.3310



*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 110% Stat 2 27% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 6.011   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    191.079    4154.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   86.85419

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    186.665    4137.640       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 146993.875  149933.438       1.530     831.557     543.610     619.754       1.140

     ROTOR LEADING EDGE CONDITIONS, STAGE            1
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   462.59    -0.16   462.59     0.42   744.88
MEAN    17.06     0.00    -0.02   462.59    -0.16   462.59     0.42
HUB     12.51     0.00    -0.02   462.59    -0.16   462.59     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.27    50.47     7.80   747.85   879.49    13.38   504.94     0.80
MEAN    53.21    47.20     6.01   618.44   772.43    13.38   504.94     0.70
HUB     44.44    38.62     5.82   453.49   647.91    13.38   504.94     0.59

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   727.54   426.16   589.66  1129.45     0.64
MEAN    18.04   767.44   467.17   608.86  1121.97     0.68
HUB     15.00   887.80   608.21   646.73  1108.87     0.80

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    747.85   671.70   321.68     0.59  8795.07
MEAN   653.81   636.82   186.64     0.57  8428.69     1.35
HUB    543.76   649.94    64.45     0.59  9125.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.38     1.35    15.41   574.03     1.10   529.84     0.92     0.91
MEAN    20.13     1.33    14.72   571.89     1.09   522.73     0.92     0.91
HUB     20.60     1.36    13.50   575.95     1.10   510.21     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.86    28.61    24.20     4.41     0.93     0.32     2.90
MEAN    37.50    17.04    12.70     4.34     0.93     0.26     3.51     0.91
HUB     43.24    -5.69    -9.30     3.61     0.93     0.10     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     780.264     466.267     625.625    1121.981       0.695       -0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.310      14.696     523.106      24.000      36.696      35.400      -1.296

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     637.088     466.267     789.485    1140.013       0.559       0.309

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.207      16.342     540.055     528.796       0.028       0.453

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     582.057       0.000     582.057    1145.912       0.508       0.371

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.860     545.659       0.000       0.060       0.044       0.398

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4        Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.874       20.111       1.331     573.956      51.146     216.372       1.677

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 318428.000       0.569    3438.405 1945162.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.011   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
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    191.079    4154.000      20.111     573.956       1.000       1.000       0.980
W Kg/sec =   86.85419

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    146.916    3948.984       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 146993.875  149933.438       1.380     590.487     427.870     474.134       1.108

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   551.40    -0.19   551.40     0.48   708.16
 MEAN    18.08     0.00    -0.02   551.40    -0.19   551.40     0.48
 HUB     15.21     0.00    -0.02   551.40    -0.19   551.40     0.48

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.50    46.36     7.14   744.95   926.97    17.18   548.57     0.81
 MEAN    49.93    42.30     7.63   655.35   856.60    17.18   548.57     0.75
 HUB     45.01    37.84     7.17   551.37   779.91    17.18   548.57     0.68

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   642.32   363.24   529.74  1184.15     0.54
 MEAN    18.01   656.96   371.06   542.14  1178.19     0.56
 HUB     15.22   714.74   449.36   555.82  1172.41     0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    740.23   650.19   376.99     0.55  7421.33
 MEAN   652.87   611.01   281.81     0.52  6686.23     1.52
 HUB    551.84   565.18   102.48     0.48  6843.53

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.36     1.26    20.76   617.14     1.08   582.70     0.92     0.91
 MEAN    24.81     1.23    20.08   612.86     1.07   576.83     0.92     0.91
 HUB     24.92     1.24    19.39   613.78     1.07   571.14     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.44    35.44    31.50     3.94     0.93     0.37     2.90
 MEAN    34.39    27.47    23.50     3.97     0.93     0.35     3.30     0.91
 HUB     38.95    10.45     6.50     3.95     0.93     0.35     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960    1118.906     372.103    1055.220    1109.064       1.009      -1.417

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.982      13.054     510.262      46.000      19.424      30.600      11.176

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960    1042.929     372.103    1107.322    1123.430       0.928      -1.204

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      24.627      14.108     523.893     361.848       0.082       0.150

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823    1075.075       0.000    1075.075    1119.793       0.960       0.037

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      13.235     518.574       0.000       0.060       0.220      -1.380

    STAGE EXIT CONDITIONS, STAGE            2
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      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.723      23.941       1.190     614.593      40.637     236.407       1.833

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 253194.625       0.462    2734.010 1725039.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.011   EfDer =  0.813

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    191.079    4154.000      23.941     614.593       1.000       1.000       0.710
W Kg/sec =   86.85419

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    127.711    3816.197       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 146993.875  149933.438       1.062     395.194     371.973     307.469       0.827

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   864.36    -0.30   864.36     0.75   668.36
 MEAN    17.74     0.00    -0.02   864.36    -0.30   864.36     0.75
 HUB     15.05     0.00    -0.02   864.36    -0.30   864.36     0.75

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     40.10    46.36    -6.26   727.55  1129.99    16.48   552.26     0.98
 MEAN    36.66    43.40    -6.74   643.03  1077.49    16.48   552.26     0.93
 HUB     32.27    38.84    -6.57   545.57  1022.29    16.48   552.26     0.89

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   615.61   289.80   543.14  1217.72     0.51
 MEAN    17.51   631.45   311.54   549.24  1214.45     0.52
 HUB     14.85   688.93   402.98   558.77  1211.26     0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   691.70   428.32     0.57  5746.94
 MEAN   634.62   637.22   323.08     0.52  5459.27     1.78
 HUB    538.32   574.93   135.34     0.47  5988.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.49     1.15    23.09   648.01     1.05   616.39     0.92     0.74
 MEAN    27.31     1.14    22.71   646.34     1.05   613.07     0.92     0.74
 HUB     27.65     1.15    22.20   649.41     1.06   609.82     0.92     0.74

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.08    38.26    31.50     6.76     0.93     0.43     2.90
 MEAN    29.56    30.47    23.50     6.97     0.87     0.45     3.28     0.74
 HUB     35.80    13.62     6.50     7.12     0.87     0.49     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.813

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     638.714     313.584     556.435    1215.175       0.526       0.004

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    27.436      22.725     613.882      46.000      29.404      31.500       2.096

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     568.080     313.584     648.883    1222.194       0.465       0.196
```

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	27.381	23.610	620.994	471.992	0.021	0.304

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	549.990	0.000	549.990	1223.853	0.449	0.216

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.764	622.682	0.000	0.060	0.038	0.228

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.707	27.300	1.140	647.919	33.326	280.820	2.177

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
207802.188	0.403	2243.860	2686066.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.011 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
191.079	4154.000	27.300	647.919	1.000	1.000	0.980

W Kg/sec = 86.85419

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
114.991	3716.757	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
146993.875	149933.438	1.533	513.330	334.959	401.059	1.197

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	513.71	-0.18	513.71	0.42	624.68
MEAN	16.97	0.00	-0.02	513.71	-0.18	513.71	0.42	
HUB	14.32	0.00	-0.02	513.71	-0.18	513.71	0.42	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.66	46.36	7.30	698.18	866.95	24.20	625.92	0.71
MEAN	50.15	43.80	6.35	615.20	801.61	24.20	625.92	0.65
HUB	45.31	37.84	7.47	519.11	730.44	24.20	625.92	0.60

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	600.33	323.25	505.87	1253.47	0.48
MEAN	16.57	612.32	332.42	514.23	1249.00	0.49
HUB	13.89	662.59	406.13	523.53	1244.60	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	684.41	621.56	361.16	0.50	6106.36	
MEAN	600.81	580.06	268.39	0.46	5512.43	1.50
HUB	503.52	532.51	97.39	0.43	5643.70	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	32.38	1.19	27.68	683.40	1.05	653.35	0.92	0.91
MEAN	31.86	1.17	27.03	679.94	1.05	648.69	0.92	0.91
HUB	31.98	1.17	26.36	680.71	1.05	644.11	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.58	35.52	31.50	4.02	0.93	0.35	2.90	
MEAN	32.88	27.56	23.50	4.06	0.93	0.34	3.29	0.91
HUB	37.80	10.54	6.50	4.04	0.93	0.34	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     603.511     334.286     502.472    1251.172       0.482       0.055

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.024      27.308     650.983      46.000      33.635      32.400      -1.235

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     516.841     334.286     615.525    1258.927       0.411       0.287

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.977      28.472     659.079     456.573       0.019       0.374

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     490.097       0.000     490.097    1261.069       0.389       0.282

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.730     661.324       0.000       0.060       0.037       0.338

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      31.887       1.168     681.349      33.430     246.012       1.907

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 208618.172       0.445    2252.671 1633574.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.011   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    191.079    4154.000      31.887     681.349       1.000       1.000       0.980
W Kg/sec =   86.85419

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.960    3624.430       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 146993.875  149933.438       1.733     509.668     294.121     390.276       1.327

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   455.73    -0.16   455.73     0.36   579.43
 MEAN    15.91     0.00    -0.02   455.73    -0.16   455.73     0.36
 HUB     13.07     0.00    -0.02   455.73    -0.16   455.73     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.55    47.36     8.19   664.11   805.57    29.14   664.05     0.64
 MEAN    51.70    44.80     6.90   576.85   735.28    29.14   664.05     0.58
 HUB     46.12    38.84     7.28   473.79   657.51    29.14   664.05     0.52

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   557.69   325.30   452.99  1287.30     0.43
 MEAN    15.50   561.46   320.44   461.04  1282.25     0.44
 HUB     12.59   597.65   369.47   469.76  1277.26     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   557.53   325.03     0.43  5838.79
 MEAN   561.80   520.39   241.36     0.41  4968.48     1.55
 HUB    456.39   477.73    86.92     0.37  4653.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     37.25     1.17    32.74   715.24     1.05   689.33     0.92     0.91
 MEAN    36.42     1.14    31.92   710.18     1.04   683.92     0.92     0.91
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 HUB     36.12     1.13    31.08   708.36     1.04   678.60     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.68    35.66    31.50     4.16     0.93     0.38     2.90
 MEAN    34.80    27.63    23.50     4.13     0.93     0.36     3.34     0.91
 HUB     38.19    10.48     6.50     3.98     0.93     0.34     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     568.099     326.312     465.034    1282.657       0.443      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.502      31.901     684.374      46.000      35.057      33.000      -2.057

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     484.010     326.312     583.734    1289.545       0.375       0.242

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      36.426      33.050     691.744     440.827       0.036       0.399

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     451.575       0.000     451.575    1291.900       0.350       0.334

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      33.466     694.272       0.000       0.060       0.038       0.331

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.882      36.417       1.142     711.260      29.910     250.783       1.944

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 186846.312       0.442    2017.578 1646911.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1174889.25  12686.5244    186.6652      2.4106      0.7961      6.0106      1.3605


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

   Fan-Core + 4 Stage LPC 110% Stat 2 27% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 6.509   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    188.227    4154.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   85.55788

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    183.879    4137.640       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 144799.969  147695.656       1.553     831.557     535.496     619.754       1.157

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   454.26    -0.16   454.26     0.41   744.88
 MEAN    17.06     0.00    -0.02   454.26    -0.16   454.26     0.41
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 HUB     12.51     0.00    -0.02   454.26    -0.16   454.26     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.73    50.47     8.26   747.85   875.13    13.44   505.57     0.79
 MEAN    53.71    47.20     6.51   618.44   767.47    13.44   505.57     0.70
 HUB     44.96    38.62     6.34   453.49   641.99    13.44   505.57     0.58

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   721.34   433.16   576.81  1131.10     0.64
 MEAN    18.04   759.72   471.13   595.99  1123.41     0.68
 HUB     15.00   876.55   606.78   632.58  1110.41     0.79

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    747.85   657.07   314.69     0.58  8939.32
 MEAN   653.81   623.37   182.69     0.55  8499.94     1.37
 HUB    543.76   635.72    63.03     0.57  9103.70

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.47     1.36    15.57   574.87     1.10   531.42     0.92     0.91
 MEAN    20.18     1.34    14.85   572.31     1.09   524.13     0.92     0.91
 HUB     20.58     1.36    13.64   575.82     1.10   511.73     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.91    28.62    24.20     4.42     0.93     0.33     2.90
 MEAN    38.33    17.04    12.70     4.34     0.93     0.28     3.51     0.91
 HUB     43.81    -5.69    -9.30     3.61     0.93     0.12     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     771.766     470.213     611.982    1123.565       0.687      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.357      14.841     524.584      24.000      37.537      35.400      -2.137

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     621.933     470.213     779.680    1142.091       0.545       0.325

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.253      16.550     542.026     528.796       0.028       0.466

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     568.894       0.000     568.894    1147.635       0.496       0.385

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.044     547.301       0.000       0.060       0.044       0.412

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      20.165       1.335     574.333      51.523     213.237       1.653

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 320772.969       0.574    3412.029 1910119.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.509   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    188.227    4154.000      20.165     574.333       1.000       1.000       0.980
W Kg/sec =   85.55788
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
144.387	3947.688	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
144799.969	147695.656	1.404	590.487	420.506	474.134	1.128

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	539.36	-0.19	539.36	0.47	707.93
MEAN	18.08	0.00	-0.02	539.36	-0.19	539.36	0.47	
HUB	15.21	0.00	-0.02	539.36	-0.19	539.36	0.47	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.10	46.36	7.74	744.95	919.85	17.34	550.04	0.80
MEAN	50.55	42.30	8.25	655.35	848.90	17.34	550.04	0.74
HUB	45.64	37.84	7.80	551.37	771.44	17.34	550.04	0.67

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	637.53	371.91	517.81	1186.08	0.54
MEAN	18.01	650.87	377.42	530.27	1179.92	0.55
HUB	15.22	707.12	451.72	544.03	1173.92	0.60

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	740.23	635.45	368.33	0.54	7598.17	
MEAN	652.87	597.55	275.45	0.51	6800.59	1.54
HUB	551.84	553.16	100.12	0.47	6879.42	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.56	1.27	20.99	618.55	1.08	584.61	0.92	0.91
MEAN	24.95	1.24	20.28	613.90	1.07	578.54	0.92	0.91
HUB	25.01	1.24	19.56	614.36	1.07	572.62	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.69	35.42	31.50	3.92	0.93	0.38	2.90	
MEAN	35.44	27.45	23.50	3.95	0.93	0.36	3.30	0.91
HUB	39.70	10.43	6.50	3.93	0.93	0.36	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	1045.890	378.475	975.009	1123.452	0.931	-1.213

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.122	14.350	524.318	46.000	21.215	30.600	9.385

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	952.476	378.475	1024.916	1139.851	0.836	-0.932

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	24.854	15.722	539.877	361.848	0.065	0.208

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	955.472	0.000	955.472	1140.006	0.838	0.215

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	15.404	539.477	0.000	0.060	0.155	-0.997

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.784	24.414	1.211	615.604	41.271	231.112	1.792

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 257147.453       0.469    2735.251 1689925.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.509   EfDer =  0.854

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    188.227    4154.000      24.414     615.604       1.000       1.000       0.710
W Kg/sec =   85.55788

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    123.466    3813.062       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 144799.969  147695.656       1.099     395.194     359.610     307.469       0.855

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   806.16    -0.28   806.16     0.69   667.81
 MEAN    17.74     0.00    -0.02   806.16    -0.28   806.16     0.69
 HUB     15.05     0.00    -0.02   806.16    -0.28   806.16     0.69

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.08    46.36    -4.28   727.55  1086.11    17.69   561.38     0.93
 MEAN    38.59    43.40    -4.81   643.03  1031.38    17.69   561.38     0.89
 HUB     34.10    38.84    -4.74   545.57   973.58    17.69   561.38     0.84

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   603.57   314.67   515.05  1222.73     0.49
 MEAN    17.51   617.64   330.14   522.00  1218.72     0.51
 HUB     14.85   672.39   411.84   531.51  1214.85     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    718.12   654.26   403.45     0.54  6239.21
 MEAN   634.62   604.31   304.48     0.50  5784.52     1.81
 HUB    538.32   546.35   126.48     0.45  6119.96

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.57     1.17    24.18   651.88     1.06   621.49     0.92     0.78
 MEAN    28.25     1.16    23.70   649.24     1.05   617.41     0.92     0.78
 HUB     28.49     1.17    23.13   651.19     1.06   613.47     0.92     0.78

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.42    38.07    31.50     6.57     0.93     0.45     2.90
 MEAN    32.31    30.26    23.50     6.76     0.88     0.46     3.28     0.78
 HUB     37.77    13.39     6.50     6.89     0.88     0.49     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.854

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     624.278     332.306     528.484    1219.500       0.512       0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.389      23.737     618.250      46.000      32.161      31.500      -0.661

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     536.514     332.306     631.090    1227.855       0.437       0.248

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.340      24.854     626.750     471.992       0.020       0.346
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	519.837	0.000	519.837	1229.294	0.423	0.263

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	24.988	628.220	0.000	0.060	0.037	0.276

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.749	28.261	1.158	650.767	35.163	260.496	2.019

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
219267.312	0.425	2332.324	2547426.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.509 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
188.227	4154.000	28.261	650.767	1.000	1.000	0.980

W Kg/sec = 85.55788

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
109.663	3708.616	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
144799.969	147695.656	1.607	513.330	319.439	401.059	1.256

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	486.39	-0.17	486.39	0.39	623.31
MEAN	16.97	0.00	-0.02	486.39	-0.17	486.39	0.39	
HUB	14.32	0.00	-0.02	486.39	-0.17	486.39	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.14	46.36	8.78	698.18	851.04	25.38	631.04	0.69
MEAN	51.68	43.80	7.88	615.20	784.37	25.38	631.04	0.64
HUB	46.87	37.84	9.03	519.11	711.49	25.38	631.04	0.58

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	588.61	343.66	477.87	1259.44	0.47
MEAN	16.57	597.72	347.34	486.44	1254.52	0.48
HUB	13.89	644.50	411.67	495.90	1249.66	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	684.41	586.92	340.75	0.47	6491.45	
MEAN	600.81	548.51	253.47	0.44	5759.63	1.56
HUB	503.52	504.33	91.85	0.40	5720.45	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	33.84	1.20	29.14	688.48	1.06	659.59	0.92	0.91
MEAN	33.18	1.17	28.40	684.22	1.05	654.44	0.92	0.91
HUB	33.14	1.17	27.64	684.00	1.05	649.37	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.72	35.49	31.50	3.99	0.93	0.38	2.90	
MEAN	35.53	27.52	23.50	4.02	0.93	0.37	3.29	0.91
HUB	39.70	10.49	6.50	3.99	0.93	0.36	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	590.113	349.294	475.633	1256.499	0.470	0.052

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.338      28.661     656.532      46.000      36.293      32.400      -3.893

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     487.386     349.294     599.626    1265.299       0.385       0.330

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.283      30.043     665.761     456.573       0.021       0.415

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     462.857       0.000     462.857    1267.144       0.365       0.319

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.256     667.704       0.000       0.060       0.042       0.373

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      33.180       1.174     685.566      34.799     232.262       1.800

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 217187.234       0.464    2310.198 1588861.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.509   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    188.227    4154.000      33.180     685.566       1.000       1.000       0.980
W Kg/sec =   85.55788

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.872    3613.267       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 144799.969  147695.656       1.825     509.668     279.300     390.276       1.397

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   430.98    -0.15   430.98     0.34   577.64
 MEAN    15.91     0.00    -0.02   430.98    -0.15   430.98     0.34
 HUB     13.07     0.00    -0.02   430.98    -0.15   430.98     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.02    47.36     9.66   664.11   791.82    30.63   670.09     0.62
 MEAN    53.24    44.80     8.44   576.85   720.19    30.63   670.09     0.57
 HUB     47.72    38.84     8.88   473.79   640.60    30.63   670.09     0.50

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   548.80   343.74   427.81  1293.76     0.42
 MEAN    15.50   549.06   334.01   435.77  1288.39     0.43
 HUB     12.59   581.13   374.47   444.39  1283.06     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   526.33   306.59     0.41  6169.42
 MEAN   561.80   491.71   227.78     0.38  5178.76     1.62
 HUB    456.39   451.88    81.92     0.35  4716.55

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     39.05     1.18    34.50   721.36     1.05   696.28     0.92     0.91
 MEAN    38.06     1.15    33.59   715.62     1.04   690.50     0.92     0.91
 HUB     37.60     1.13    32.66   712.93     1.04   684.80     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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  TIP     38.78    35.63    31.50     4.13     0.93     0.41     2.90
  MEAN    37.47    27.60    23.50     4.10     0.93     0.39     3.34     0.91
  HUB     40.12    10.44     6.50     3.94     0.93     0.37     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.997

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219      555.788     340.137     439.553     1288.758       0.431       -0.005

      Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      38.142       33.563      690.906      46.000      37.734      33.000      -4.734

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219      456.140     340.137     568.997     1296.568       0.352       0.288

    BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
       0.950       38.045       34.923     699.306      440.827       0.041       0.440

     VANED DIFFUSER EXIT:
    R4           C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701      426.177       0.000     426.177     1298.609       0.328       0.372

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       35.295      701.508       0.000       0.060       0.044       0.368

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.878       38.029       1.146      716.639      31.073     236.970       1.837

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  194143.016       0.459    2065.079 1603084.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1208518.00  12854.8809     183.8792      2.5173      0.8174      6.5087      1.3707


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 110% Stat 2 27% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.000   EfDer =  1.000

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     185.418     4154.000       15.107      522.810       1.000        1.000        0.980
 W Kg/sec =   84.28091

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     181.135     4137.640        1.402        0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  142638.812  145491.297        1.576      831.557      527.504      619.754       1.175

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   446.14    -0.15   446.14      0.40   744.88
  MEAN    17.06      0.00    -0.02   446.14    -0.15   446.14      0.40
  HUB     12.51      0.00    -0.02   446.14    -0.15   446.14      0.40

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
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 TIP     59.19    50.47     8.72   747.85   870.94    13.50   506.19     0.79
 MEAN    54.20    47.20     7.00   618.44   762.69    13.50   506.19     0.69
 HUB     45.48    38.62     6.86   453.49   636.27    13.50   506.19     0.58

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   715.69   439.82   564.59  1132.64     0.63
 MEAN    18.04   752.51   474.92   583.71  1124.76     0.67
 HUB     15.00   865.93   605.44   619.10  1111.85     0.78

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    747.85   643.15   308.03     0.57  9076.70
 MEAN   653.81   610.51   178.90     0.54  8568.29     1.39
 HUB    543.76   622.17    61.68     0.56  9083.48

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.57     1.36    15.71   575.67     1.10   532.90     0.92     0.91
 MEAN    20.23     1.34    14.98   572.71     1.10   525.43     0.92     0.91
 HUB     20.57     1.36    13.77   575.71     1.10   513.15     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.92    28.62    24.20     4.42     0.93     0.35     2.90
 MEAN    39.13    17.04    12.70     4.34     0.93     0.29     3.51     0.91
 HUB     44.36    -5.69    -9.30     3.61     0.93     0.13     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     763.873     473.997     599.022    1125.034       0.679      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.399      14.975     525.957      24.000      38.354      35.400      -2.954

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     607.702     473.997     770.698    1144.008       0.531       0.341

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.293      16.741     543.847     528.796       0.029       0.479

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     556.502       0.000     556.502    1149.233       0.484       0.397

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.211     548.826       0.000       0.060       0.043       0.424

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      20.210       1.338     574.693      51.883     210.222       1.630

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 323014.562       0.578    3384.592 1875968.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
  RESET =  0.000BLEED =  0.000 DPInc = 7.000   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    185.418    4154.000      20.210     574.693       1.000       1.000       0.980
W Kg/sec =   84.28091

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    141.957    3946.452       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
142638.812	145491.297	1.428	590.487	413.428	474.134	1.147

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	527.99	-0.18	527.99	0.46	707.71
MEAN	18.08	0.00	-0.02	527.99	-0.18	527.99	0.46	
HUB	15.21	0.00	-0.02	527.99	-0.18	527.99	0.46	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.68	46.36	8.32	744.95	913.23	17.50	551.42	0.79
MEAN	51.15	42.30	8.85	655.35	841.72	17.50	551.42	0.73
HUB	46.25	37.84	8.41	551.37	763.53	17.50	551.42	0.66

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	633.33	379.98	506.68	1187.86	0.53
MEAN	18.01	645.36	383.36	519.15	1181.52	0.55
HUB	15.22	700.05	453.93	532.94	1175.32	0.60

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	740.23	621.70	360.26	0.52	7762.87	
MEAN	652.87	584.94	269.51	0.50	6907.57	1.57
HUB	551.84	541.86	97.91	0.46	6912.90	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.73	1.27	21.20	619.86	1.08	586.38	0.92	0.91
MEAN	25.07	1.24	20.46	614.89	1.07	580.12	0.92	0.91
HUB	25.08	1.24	19.72	614.92	1.07	574.01	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.87	35.41	31.50	3.91	0.93	0.39	2.90	
MEAN	36.44	27.44	23.50	3.94	0.93	0.37	3.30	0.91
HUB	40.42	10.41	6.50	3.91	0.93	0.37	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	999.230	384.435	922.318	1132.754	0.882	-1.088

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.244	15.209	533.207	46.000	22.627	30.600	7.973

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	897.564	384.435	976.428	1149.664	0.781	-0.773

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	25.030	16.728	549.298	361.848	0.054	0.236

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	892.362	0.000	892.362	1150.744	0.775	0.288

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	16.598	550.103	0.000	0.060	0.121	-0.800

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.814	24.709	1.223	616.556	41.863	226.233	1.754

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
260835.438	0.476	2733.070	1656213.750

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.000   EfDer =  0.884

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    185.418    4154.000      24.709     616.556      1.000       1.000       0.710
W Kg/sec =   84.28091

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.264    3810.118       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
142638.812  145491.297       1.128     395.194     350.281     307.469       0.878

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   768.69    -0.26   768.69     0.66   667.30
MEAN    17.74     0.00    -0.02   768.69    -0.26   768.69     0.66
HUB     15.05     0.00    -0.02   768.69    -0.26   768.69     0.66

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     43.44    46.36    -2.92   727.55  1058.58    18.47   567.25     0.91
MEAN    39.93    43.40    -3.47   643.03  1002.35    18.47   567.25     0.86
HUB     35.38    38.84    -3.46   545.57   942.77    18.47   567.25     0.81

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   595.97   331.99   494.94  1226.36     0.49
MEAN    17.51   608.38   343.08   502.42  1221.88     0.50
HUB     14.85   660.78   417.80   511.94  1217.56     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    718.12   627.74   386.13     0.51  6582.07
MEAN   634.62   580.88   291.54     0.48  6010.81     1.83
HUB    538.32   525.93   120.52     0.43  6208.25

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     29.32     1.19    24.94   654.82     1.06   625.19     0.92     0.81
MEAN    28.89     1.17    24.39   651.50     1.06   620.62     0.92     0.81
HUB     29.04     1.18    23.76   652.65     1.06   616.22     0.92     0.81

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.85    37.96    31.50     6.46     0.93     0.46     2.90
MEAN    34.33    30.13    23.50     6.63     0.89     0.47     3.28     0.81
HUB     39.22    13.25     6.50     6.75     0.89     0.50     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.884

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     614.644     345.329     508.463    1222.675       0.503       0.009

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    29.036      24.430     621.470      46.000      34.183      31.500      -2.683

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     514.406     345.329     619.569    1231.929       0.418       0.284

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      28.984      25.705     630.913     471.992       0.021       0.377

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     498.805       0.000     498.805    1233.216       0.404       0.294
```

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	25.817	632.232	0.000	0.060	0.039	0.308

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.776	28.899	1.170	652.991	36.436	247.668	1.920

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
227212.594	0.441	2380.765	2451735.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 7.000 EfDer = 0.996

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
185.418	4154.000	28.899	652.991	1.000	1.000	0.980

W Kg/sec = 84.28091

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
105.823	3702.294	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
142638.812	145491.297	1.665	513.330	308.253	401.059	1.301

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	467.22	-0.16	467.22	0.38	622.25
MEAN	16.97	0.00	-0.02	467.22	-0.16	467.22	0.38	
HUB	14.32	0.00	-0.02	467.22	-0.16	467.22	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.22	46.36	9.86	698.18	840.23	26.18	634.79	0.68
MEAN	52.79	43.80	8.99	615.20	772.63	26.18	634.79	0.63
HUB	48.02	37.84	10.18	519.11	698.52	26.18	634.79	0.57

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	581.61	357.60	458.69	1263.66	0.46
MEAN	16.57	588.39	357.60	467.25	1258.46	0.47
HUB	13.89	632.34	415.46	476.71	1253.32	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	684.41	563.20	326.81	0.45	6754.60	
MEAN	600.81	526.76	243.21	0.42	5929.61	1.60
HUB	503.52	484.77	88.06	0.39	5773.00	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	34.81	1.20	30.10	692.23	1.06	664.02	0.92	0.91
MEAN	34.05	1.18	29.31	687.43	1.05	658.57	0.92	0.91
HUB	33.90	1.17	28.49	686.52	1.05	653.19	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.94	35.47	31.50	3.97	0.93	0.40	2.90	
MEAN	37.43	27.50	23.50	4.00	0.93	0.39	3.29	0.91
HUB	41.07	10.47	6.50	3.97	0.93	0.38	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	581.595	359.615	457.089	1260.315	0.461	0.050

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
34.206	29.557	660.526	46.000	38.194	32.400	-5.794

```
    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     467.301     359.615     589.655    1269.814       0.368       0.360

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      34.138      31.088     670.521     456.573       0.024       0.444

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     444.305       0.000     444.305    1271.468       0.349       0.344

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      31.261     672.269       0.000       0.060       0.048       0.396

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      34.018       1.177     688.728      35.736     223.133       1.730

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 223056.203       0.476    2337.214 1551381.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.000   EfDer =  0.993

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    185.418    4154.000      34.018     688.728       1.000       1.000       0.980
W Kg/sec =   84.28091

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     92.326    3604.964       1.400       0.250      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 142638.812  145491.297       1.895     509.668     268.970     390.276       1.451

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   414.05    -0.14   414.05     0.33   576.32
 MEAN    15.91     0.00    -0.02   414.05    -0.14   414.05     0.33
 HUB     13.07     0.00    -0.02   414.05    -0.14   414.05     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.06    47.36    10.70   664.11   782.73    31.61   674.45     0.61
 MEAN    54.34    44.80     9.54   576.85   710.19    31.61   674.45     0.56
 HUB     48.86    38.84    10.02   473.79   629.33    31.61   674.45     0.49

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     17.94   543.71   356.06   410.90  1298.30     0.42
 MEAN    15.50   541.34   343.13   418.71  1292.74     0.42
 HUB     12.59   570.28   377.82   427.17  1287.21     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   505.40   294.27     0.39  6390.42
 MEAN   561.80   472.37   218.67     0.37  5319.97     1.66
 HUB    456.39   434.34    78.57     0.34  4758.63

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     40.20     1.18    35.63   725.80     1.05   701.18     0.92     0.91
 MEAN    39.12     1.15    34.67   719.59     1.04   695.18     0.92     0.91
 HUB     38.55     1.13    33.69   716.34     1.04   689.25     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.91    35.61    31.50     4.11     0.93     0.43     2.90
 MEAN    39.33    27.58    23.50     4.08     0.94     0.41     3.34     0.91
 HUB     41.49    10.42     6.50     3.92     0.94     0.38     4.06
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     548.158     349.422     422.352    1293.070       0.424      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     39.199      34.640     695.548      46.000      39.602      33.000      -6.602

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     437.576     349.422     559.972    1301.483       0.336       0.318

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      39.076      36.134     704.628     440.827       0.046       0.469

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     409.206       0.000     409.206    1303.330       0.314       0.396

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      36.474     706.629       0.000       0.060       0.051       0.391

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      39.055       1.148     720.578      31.851     227.981       1.767

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 199028.656       0.471    2085.450 1566270.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1233147.50  12921.0918    181.1348      2.5852      0.8275      7.0004      1.3783


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 110% Stat 2 27% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    182.651    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   83.02301

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    178.431    4137.640       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  140509.906  143319.797       1.600     831.557     519.631     619.754       1.193

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   438.22    -0.15   438.22     0.40   744.88
  MEAN    17.06     0.00    -0.02   438.22    -0.15   438.22     0.40
  HUB     12.51     0.00    -0.02   438.22    -0.15   438.22     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.64    50.47     9.17   747.85   866.91    13.55   506.77     0.79
  MEAN    54.69    47.20     7.49   618.44   758.08    13.55   506.77     0.69
  HUB     45.99    38.62     7.37   453.49   630.74    13.55   506.77     0.57
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     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   710.51   446.18   552.94  1134.08     0.63
MEAN    18.04   745.74   478.54   571.95  1126.04     0.66
HUB     15.00   855.86   604.14   606.22  1113.21     0.77

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    747.85   629.88   301.67     0.56  9207.74
MEAN   653.81   598.21   175.28     0.53  8633.46     1.42
HUB    543.76   609.22    60.39     0.55  9064.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.65     1.37    15.85   576.43     1.10   534.28     0.92     0.91
MEAN    20.27     1.34    15.10   573.09     1.10   526.66     0.92     0.91
HUB     20.55     1.36    13.90   575.59     1.10   514.47     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.90    28.62    24.20     4.42     0.93     0.36     2.90
MEAN    39.92    17.04    12.70     4.34     0.93     0.30     3.51     0.91
HUB     44.90    -5.69    -9.30     3.61     0.93     0.14     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071      756.498     477.606     586.670    1126.402       0.672       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.436      15.099      527.236      24.000      39.149      35.400      -3.749

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071      594.279     477.606     762.414    1145.785       0.519       0.355

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       20.326      16.916     545.538     528.796       0.030       0.491

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083     544.776       0.000     544.776    1150.720       0.473       0.408

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950       17.364     550.248       0.000       0.060       0.044       0.436

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      20.249       1.340     575.036      52.226     207.320       1.607

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 325151.281       0.581    3356.131 1842667.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    182.651    4154.000      20.249     575.036       1.000       1.000       0.980
W Kg/sec =   83.02301

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    139.614    3945.274       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 140509.906  143319.797       1.452     590.487     406.604     474.134       1.166
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    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   517.20    -0.18   517.20     0.45   707.50
MEAN    18.08     0.00    -0.02   517.20    -0.18   517.20     0.45
HUB     15.21     0.00    -0.02   517.20    -0.18   517.20     0.45

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.24    46.36     8.88   744.95   907.03    17.64   552.70     0.79
MEAN    51.73    42.30     9.43   655.35   834.99    17.64   552.70     0.72
HUB     46.84    37.84     9.00   551.37   756.11    17.64   552.70     0.66

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   629.64   387.54   496.24  1189.50     0.53
MEAN    18.01   640.33   388.94   508.68  1183.00     0.54
HUB     15.22   693.45   455.98   522.45  1176.62     0.59

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    740.23   608.80   352.69     0.51  7917.29
MEAN   652.87   573.07   263.93     0.48  7007.95     1.59
HUB    551.84   531.18    95.86     0.45  6944.10

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.88     1.28    21.38   621.10     1.08   588.01     0.92     0.91
MEAN    25.18     1.24    20.63   615.81     1.07   581.58     0.92     0.91
HUB     25.13     1.24    19.86   615.44     1.07   575.30     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.99    35.40    31.50     3.90     0.93     0.40     2.90
MEAN    37.40    27.42    23.50     3.92     0.94     0.38     3.30     0.91
HUB     41.11    10.40     6.50     3.90     0.94     0.37     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     964.632     390.028     882.266    1139.650       0.846      -0.999

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.351      15.858     539.769      46.000      23.849      30.600       6.751

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     856.681     390.028     941.288    1156.823       0.741      -0.658

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680       25.175      17.483     556.181     361.848       0.047       0.256

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     847.953       0.000     847.953    1158.240       0.732       0.333

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.680       17.447     557.435       0.000       0.060       0.099      -0.665

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.832      24.927       1.231     617.453      42.418     221.709       1.719

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  264292.094       0.482    2727.958 1623763.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
  RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.907
```

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
182.651	4154.000	24.927	617.453	1.000	1.000	0.710

W Kg/sec = 83.02301

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
117.521	3807.347	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
140509.906	143319.797	1.155	395.194	342.292	307.469	0.898

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	739.50	-0.25	739.50	0.63	666.81
MEAN	17.74	0.00	-0.02	739.50	-0.25	739.50	0.63	
HUB	15.05	0.00	-0.02	739.50	-0.25	739.50	0.63	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	44.54	46.36	-1.82	727.55	1037.57	19.07	571.82	0.88
MEAN	41.02	43.40	-2.38	643.03	980.14	19.07	571.82	0.84
HUB	36.43	38.84	-2.41	545.57	919.12	19.07	571.82	0.78

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	590.46	346.01	478.47	1229.35	0.48
MEAN	17.51	601.25	353.51	486.34	1224.50	0.49
HUB	14.85	651.52	422.57	495.89	1219.84	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	718.12	606.13	372.12	0.49	6859.48	
MEAN	634.62	561.74	281.11	0.46	6193.30	1.86
HUB	538.32	509.22	115.75	0.42	6279.06	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	29.91	1.20	25.54	657.33	1.06	628.24	0.92	0.83
MEAN	29.40	1.18	24.93	653.46	1.06	623.30	0.92	0.83
HUB	29.46	1.18	24.26	653.96	1.06	618.54	0.92	0.83

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.87	37.87	31.50	6.37	0.93	0.47	2.90	
MEAN	36.01	30.03	23.50	6.53	0.89	0.48	3.28	0.83
HUB	40.44	13.14	6.50	6.64	0.89	0.51	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.907

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	607.236	355.832	492.056	1225.309	0.496	0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
29.544	24.975	624.150	46.000	35.873	31.500	-4.373

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	496.542	355.832	610.877	1235.275	0.402	0.313

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	29.483	26.375	634.345	471.992	0.023	0.403

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	481.857	0.000	481.857	1236.442	0.390	0.318

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	26.464	635.543	0.000	0.060	0.043	0.332

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    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.796      29.389       1.179     654.917      37.463     237.901       1.844

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 233626.000       0.453    2411.429 2373350.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    182.651    4154.000      29.389     654.917       1.000       1.000       0.980
W Kg/sec =   83.02301

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.658    3696.849       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 140509.906  143319.797       1.717     513.330     299.035     401.059       1.341

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   451.72    -0.16   451.72     0.36   621.33
 MEAN    16.97     0.00    -0.02   451.72    -0.16   451.72     0.36
 HUB     14.32     0.00    -0.02   451.72    -0.16   451.72     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.10    46.36    10.74   698.18   831.70    26.81   637.90     0.67
 MEAN    53.72    43.80     9.92   615.20   763.35    26.81   637.90     0.62
 HUB     48.98    37.84    11.14   519.11   688.25    26.81   637.90     0.56

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   576.64   368.66   443.40  1267.09     0.46
 MEAN    16.57   581.36   365.75   451.89  1261.70     0.46
 HUB     13.89   622.81   418.47   461.27  1256.34     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   544.33   315.75     0.43  6963.36
 MEAN   600.81   509.37   235.06     0.40  6064.59     1.64
 HUB    503.52   469.05    85.05     0.37  5814.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     35.56     1.21    30.85   695.36     1.06   667.64     0.92     0.91
 MEAN    34.71     1.18    30.01   690.14     1.05   661.96     0.92     0.91
 HUB     34.48     1.17    29.15   688.69     1.05   656.35     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.74    35.46    31.50     3.96     0.93     0.42     2.90
 MEAN    38.99    27.48    23.50     3.98     0.94     0.40     3.29     0.91
 HUB     42.21    10.45     6.50     3.95     0.94     0.40     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     575.190     367.810     442.221    1263.444       0.455       0.048

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    34.868      30.245     663.813      46.000      39.751      32.400      -7.351

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     16.481     451.334     367.810     582.225    1273.492       0.354       0.385

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      34.786      31.891     674.414     456.573       0.027       0.468

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     429.561       0.000     429.561    1275.001       0.337       0.363

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.029     676.013       0.000       0.060       0.054       0.413

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      34.649       1.179     691.397      36.480     216.023       1.675

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 227716.375       0.486    2350.432 1517447.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    182.651    4154.000      34.649     691.397       1.000       1.000       0.980
W Kg/sec =   83.02301

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     89.465    3597.999       1.400       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 140509.906  143319.797       1.955     509.668     260.637     390.276       1.497

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   400.56    -0.14   400.56     0.31   575.20
 MEAN    15.91     0.00    -0.02   400.56    -0.14   400.56     0.31
 HUB     13.07     0.00    -0.02   400.56    -0.14   400.56     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.91    47.36    11.55   664.11   775.68    32.36   678.03     0.61
 MEAN    55.23    44.80    10.43   576.85   702.40    32.36   678.03     0.55
 HUB     49.80    38.84    10.96   473.79   620.53    32.36   678.03     0.49

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   540.20   365.73   397.56  1301.97     0.41
 MEAN    15.50   535.62   350.28   405.20  1296.27     0.41
 HUB     12.59   561.89   380.44   413.50  1290.60     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   488.93   284.60     0.38  6563.72
 MEAN   561.80   457.09   211.51     0.35  5430.76     1.70
 HUB    456.39   420.42    75.96     0.33  4791.48

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     41.08     1.19    36.48   729.47     1.06   705.17     0.92     0.91
 MEAN    39.91     1.15    35.48   722.90     1.05   699.01     0.92     0.91
 HUB     39.26     1.13    34.47   719.19     1.04   692.90     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.61    35.60    31.50     4.10     0.93     0.45     2.90
 MEAN    40.84    27.56    23.50     4.06     0.94     0.42     3.34     0.91
 HUB     42.62    10.41     6.50     3.91     0.94     0.40     4.06


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.989

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     542.507     356.707     408.747    1296.580       0.418      -0.007

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      39.991      35.451     699.341      46.000      41.111      33.000      -8.111

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     423.008     356.707     553.332    1305.458       0.324       0.341

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      39.843      37.047     708.952     440.827       0.052       0.492

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     395.863       0.000     395.863    1307.162       0.303       0.415

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      37.360     710.804       0.000       0.060       0.058       0.409

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.864      39.815       1.149     723.857      32.460     221.053       1.714

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  202859.406       0.480    2093.865 1538974.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1253645.12  12939.8135     178.4314      2.6355      0.8329      7.4857      1.3846


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 110% Stat 2 27% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.965   EfDer =  0.998

    W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     179.925    4154.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   81.78387

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     175.768    4137.640       1.402       0.249      53.349      32.000       0.050

    CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
  138412.766  141180.734       1.625     831.557     511.875     619.754       1.211

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   430.49    -0.15   430.49     0.39   744.88
  MEAN    17.06     0.00    -0.02   430.49    -0.15   430.49     0.39
  HUB     12.51     0.00    -0.02   430.49    -0.15   430.49     0.39

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
  TIP     60.08    50.47     9.61   747.85   863.03     13.60   507.33     0.78
  MEAN    55.16    47.20     7.96   618.44   753.64     13.60   507.33     0.68
  HUB     46.50    38.62     7.88   453.49   625.39     13.60   507.33     0.57

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK         AeroBl     Blades2
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     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   705.75   452.25   541.81  1135.42     0.62
MEAN    18.04   739.39   482.01   560.68  1127.23     0.66
HUB     15.00   846.28   602.91   593.88  1114.49     0.76

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    747.85   617.20   295.60     0.54  9333.00
MEAN   653.81   586.41   171.80     0.52  8696.13     1.44
HUB    543.76   596.82    59.15     0.54  9045.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.73     1.37    15.97   577.16     1.10   535.57     0.92     0.91
MEAN    20.31     1.34    15.20   573.45     1.10   527.81     0.92     0.91
HUB     20.54     1.36    14.01   575.48     1.10   515.72     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.85    28.62    24.20     4.42     0.93     0.38     2.90
MEAN    40.69    17.04    12.70     4.34     0.93     0.32     3.51     0.91
HUB     45.43    -5.69    -9.30     3.61     0.93     0.16     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     749.604     481.077     574.866    1127.678       0.665       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.470      15.214     528.432      24.000      39.924      35.400      -4.524

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     581.562     481.077     754.751    1147.441       0.507       0.369

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.355      17.077     547.116     528.796       0.031       0.502

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     533.630       0.000     533.630    1152.113       0.463       0.419

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.505     551.580       0.000       0.060       0.044       0.447

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      20.281       1.343     575.365      52.555     204.519       1.585

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 327197.562       0.585    3326.846 1810179.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.965   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.925    4154.000      20.281     575.365       1.000       1.000       0.980
W Kg/sec =   81.78387

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    137.348    3944.147       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 138412.766  141180.734       1.476     590.487     400.006     474.134       1.185

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     20.55     0.00    -0.02   506.91    -0.17   506.91     0.44   707.29
MEAN    18.08     0.00    -0.02   506.91    -0.17   506.91     0.44
HUB     15.21     0.00    -0.02   506.91    -0.17   506.91     0.44

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.77    46.36     9.41   744.95   901.20    17.76   553.91     0.78
MEAN    52.29    42.30     9.99   655.35   828.65    17.76   553.91     0.72
HUB     47.41    37.84     9.57   551.37   749.10    17.76   553.91     0.65

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   626.36   394.66   486.38  1191.03     0.53
MEAN    18.01   635.73   394.20   498.76  1184.38     0.54
HUB     15.22   687.27   457.92   512.49  1177.85     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    740.23   596.64   345.57     0.50  8062.58
MEAN   652.87   561.84   258.67     0.47  7102.66     1.61
HUB    551.84   521.02    93.92     0.44  6973.63

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.02     1.28    21.54   622.28     1.08   589.53     0.92     0.91
MEAN    25.28     1.25    20.77   616.69     1.07   582.95     0.92     0.91
HUB     25.18     1.24    19.99   615.94     1.07   576.51     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.06    35.39    31.50     3.89     0.93     0.41     2.90
MEAN    38.32    27.41    23.50     3.91     0.94     0.39     3.30     0.91
HUB     41.78    10.38     6.50     3.88     0.94     0.38     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     936.911     395.305     849.433    1145.159       0.818      -0.929

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.445      16.384     545.019      46.000      24.956      30.600       5.644

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     823.455     395.305     913.424    1162.534       0.708      -0.566

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      25.296      18.095     561.693     361.848       0.041       0.273

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     813.019       0.000     813.019    1164.073       0.698       0.366

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.680      18.113     563.124       0.000       0.060       0.084      -0.562

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.844      25.098       1.237     618.305      42.940     217.486       1.686

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 267549.281       0.488    2720.360 1592447.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.965   EfDer =  0.926

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.925    4154.000      25.098     618.305       1.000       1.000       0.710
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W Kg/sec = 81.78387

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
115.058	3804.726	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
138412.766	141180.734	1.179	395.194	335.120	307.469	0.917

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	715.03	-0.25	715.03	0.61	666.35
MEAN	17.74	0.00	-0.02	715.03	-0.25	715.03	0.61	
HUB	15.05	0.00	-0.02	715.03	-0.25	715.03	0.61	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.51	46.36	-0.85	727.55	1020.27	19.55	575.65	0.87
MEAN	41.98	43.40	-1.42	643.03	961.81	19.55	575.65	0.82
HUB	37.36	38.84	-1.48	545.57	899.55	19.55	575.65	0.76

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	586.26	357.99	464.26	1231.92	0.48
MEAN	17.51	595.46	362.47	472.43	1226.79	0.49
HUB	14.85	643.71	426.63	482.02	1221.84	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	718.12	587.57	360.13	0.48	7096.80	
MEAN	634.62	545.22	272.15	0.44	6349.95	1.88
HUB	538.32	494.79	111.69	0.40	6339.14	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.41	1.21	26.04	659.56	1.07	630.89	0.92	0.85
MEAN	29.81	1.19	25.37	655.22	1.06	625.64	0.92	0.85
HUB	29.81	1.19	24.67	655.16	1.06	620.59	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.64	37.80	31.50	6.30	0.93	0.48	2.90	
MEAN	37.50	29.94	23.50	6.44	0.90	0.49	3.28	0.85
HUB	41.51	13.05	6.50	6.55	0.90	0.51	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.926

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	601.247	364.847	477.895	1227.597	0.490	0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
29.962	25.426	626.484	46.000	37.360	31.500	-5.860

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	481.272	364.847	603.934	1238.169	0.389	0.338

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	29.891	26.931	637.321	471.992	0.025	0.426

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	467.395	0.000	467.395	1239.235	0.377	0.338

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	26.997	638.419	0.000	0.060	0.048	0.352

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.811      29.785       1.187     656.647      38.342     229.895       1.782

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 239113.469       0.464    2431.234 2304996.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.965   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.925    4154.000      29.785     656.647       1.000       1.000       0.980
W Kg/sec =   81.78387

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     99.912    3691.975       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 138412.766  141180.734       1.764     513.330     291.036     401.059       1.378

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   438.45    -0.15   438.45     0.35   620.51
 MEAN    16.97     0.00    -0.02   438.45    -0.15   438.45     0.35
 HUB     14.32     0.00    -0.02   438.45    -0.15   438.45     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.88    46.36    11.52   698.18   824.57    27.32   640.62     0.66
 MEAN    54.53    43.80    10.73   615.20   755.57    27.32   640.62     0.61
 HUB     49.82    37.84    11.98   519.11   679.61    27.32   640.62     0.55

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   572.84   377.97   430.45  1270.03     0.45
 MEAN    16.57   575.71   372.65   438.83  1264.48     0.46
 HUB     13.89   614.85   420.99   448.11  1258.97     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   528.38   306.44     0.42  7139.02
 MEAN   600.81   494.60   228.16     0.39  6178.86     1.67
 HUB    503.52   455.64    82.53     0.36  5849.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     36.16     1.21    31.45   698.11     1.06   670.75     0.92     0.90
 MEAN    35.25     1.18    30.58   692.53     1.05   664.90     0.92     0.90
 HUB     34.94     1.17    29.68   690.62     1.05   659.10     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.29    35.45    31.50     3.95     0.93     0.44     2.90
 MEAN    40.34    27.47    23.50     3.97     0.94     0.42     3.29     0.90
 HUB     43.21    10.43     6.50     3.93     0.94     0.41     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.988

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     570.064     374.748     429.577    1266.146       0.450       0.046

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    35.401      30.802     666.660      46.000      41.100      32.400      -8.700

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     437.835     374.748     576.312    1276.654       0.343       0.405

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      35.306      32.545     677.771     456.573       0.030       0.490

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     417.093       0.000     417.093    1278.045       0.326       0.379

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.650     679.250       0.000       0.060       0.061       0.427

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      35.151       1.180     693.753      37.107     210.117       1.629

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 231641.844       0.495    2355.264 1485855.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.965   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.925    4154.000      35.151     693.753       1.000       1.000       0.980
W Kg/sec =   81.78387

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.018    3591.882       1.400       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 138412.766  141180.734       2.010     509.668     253.510     390.276       1.539

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   389.13    -0.13   389.13     0.30   574.23
 MEAN    15.91     0.00    -0.02   389.13    -0.13   389.13     0.30
 HUB     13.07     0.00    -0.02   389.13    -0.13   389.13     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.64    47.36    12.28   664.11   769.83    32.97   681.14     0.60
 MEAN    56.00    44.80    11.20   576.85   695.94    32.97   681.14     0.54
 HUB     50.61    38.84    11.77   473.79   613.21    32.97   681.14     0.48

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   537.58   373.80   386.34  1305.12     0.41
 MEAN    15.50   531.06   356.27   393.82  1299.31     0.41
 HUB     12.59   554.93   382.61   401.95  1293.52     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   475.11   276.53     0.36  6708.51
 MEAN   561.80   444.22   205.52     0.34  5523.48     1.74
 HUB    456.39   408.66    73.79     0.32  4818.75

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     41.77     1.19    37.16   732.67     1.06   708.60     0.92     0.90
 MEAN    40.54     1.15    36.13   725.79     1.05   702.30     0.92     0.90
 HUB     39.82     1.13    35.09   721.71     1.04   696.06     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.06    35.59    31.50     4.09     0.93     0.47     2.90
 MEAN    42.13    27.56    23.50     4.06     0.94     0.44     3.34     0.90
 HUB     43.59    10.40     6.50     3.90     0.94     0.41     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.985

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219      538.011     362.804      397.277    1299.596       0.414       -0.008

      Pt3          Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
      40.619       36.098      702.613      46.000       42.403      33.000       -9.403

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
      15.219      410.790     362.804      548.065    1308.862       0.314        0.359

    BlockageThr  PtTh         PsTh        TsTh         AreaTh         w 2-Th  DiffFact4
       0.950       40.447       37.776      712.667      440.827        0.058        0.513

     VANED DIFFUSER EXIT:
    R4           C4           Cu4         Cm4          Ao4            Mach4        cp 3-4
      14.701      384.656       0.000      384.656    1310.451       0.294        0.430

    Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
       0.950       38.066      714.399       0.000        0.060        0.065        0.423

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
       0.856       40.413        1.150      726.723       32.969     215.333        1.669

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  206059.203       0.487    2095.148 1507930.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    1271561.50  12928.8525     175.7682       2.6751       0.8357       7.9649       1.3900


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 110% Stat 2 27% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.997

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     177.155     4154.000       15.107      522.810        1.000        1.000        0.980
 W Kg/sec =   80.52497

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     173.063     4137.640        1.402        0.249       53.349       32.000        0.050

    CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
  136282.172  139007.531        1.650      831.557      503.996      619.754        1.230

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   422.71    -0.15   422.71      0.38   744.88
  MEAN    17.06      0.00    -0.02   422.71    -0.15   422.71      0.38
  HUB     12.51      0.00    -0.02   422.71    -0.15   422.71      0.38

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
  TIP     60.53     50.47    10.06   747.85   859.17     13.66   507.89      0.78
  MEAN    55.65     47.20     8.45   618.44   749.22     13.66   507.89      0.68
  HUB     47.02     38.62     8.40   453.49   620.06     13.66   507.89      0.56

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK         AeroBl     Blades2
       0.700       0.050        0.950       32.000

           R2      C2       Cu2       Cm2      Ao2          Mach2
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 TIP     20.63   701.25   458.25   530.81  1136.72     0.62
 MEAN    18.04   733.22   485.46   549.50  1128.40     0.65
 HUB     15.00   836.88   601.68   581.68  1115.73     0.75

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    747.85   604.67   289.60     0.53  9456.70
 MEAN   653.81   574.71   168.36     0.51  8758.19     1.46
 HUB    543.76   584.55    57.92     0.52  9026.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.81     1.38    16.09   577.88     1.11   536.82     0.92     0.91
 MEAN    20.34     1.35    15.31   573.81     1.10   528.92     0.92     0.91
 HUB     20.52     1.36    14.12   575.38     1.10   516.92     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.80    28.62    24.20     4.42     0.93     0.39     2.90
 MEAN    41.46    17.03    12.70     4.33     0.93     0.33     3.51     0.91
 HUB     45.97    -5.69    -9.30     3.61     0.93     0.17     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     742.938     484.513     563.208    1128.911       0.658       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.501      15.323     529.588      24.000      40.705      35.400      -5.305

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     569.097     484.513     747.412    1149.036       0.495       0.382

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.379      17.230     548.638     528.796       0.033       0.514

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     522.778       0.000     522.778    1153.451       0.453       0.429

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.634     552.863       0.000       0.060       0.046       0.457

    STAGE EXIT CONDITIONS, STAGE             1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.875      20.306       1.344     575.689      52.879     201.730       1.564

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 329219.156       0.589    3295.874 1777481.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.989

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     177.155    4154.000      20.306     575.689       1.000       1.000       0.980
W Kg/sec =   80.52497

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     135.106    3943.034       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 136282.172  139007.531       1.501     590.487     393.478     474.134       1.205

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   496.87    -0.17   496.87     0.43   707.09
 MEAN    18.08     0.00    -0.02   496.87    -0.17   496.87     0.43
 HUB     15.21     0.00    -0.02   496.87    -0.17   496.87     0.43
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.30    46.36     9.94   744.95   895.59    17.88   555.08     0.77
MEAN    52.84    42.30    10.54   655.35   822.55    17.88   555.08     0.71
HUB     47.99    37.84    10.15   551.37   742.35    17.88   555.08     0.64

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   623.38   401.54   476.83  1192.49     0.52
MEAN    18.01   631.40   399.29   489.12  1185.71     0.53
HUB     15.22   681.33   459.80   502.78  1179.03     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    740.23   584.88   338.70     0.49  8202.94
MEAN   652.87   550.95   253.58     0.46  7194.27     1.63
HUB    551.84   511.14    92.04     0.43  7002.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.14     1.29    21.69   623.42     1.08   590.98     0.92     0.90
MEAN    25.36     1.25    20.90   617.55     1.07   584.27     0.92     0.90
HUB     25.22     1.24    20.10   616.43     1.07   577.68     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.10    35.39    31.50     3.89     0.93     0.42     2.90
MEAN    39.23    27.40    23.50     3.90     0.94     0.40     3.30     0.90
HUB     42.44    10.37     6.50     3.87     0.94     0.39     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     913.222     400.410     820.759    1149.856       0.794      -0.871

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.524      16.834     549.507      46.000      26.006      30.600       4.594

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     794.594     400.410     889.779    1167.413       0.681      -0.488

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      25.397      18.619     566.421     361.848       0.037       0.289

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     783.322       0.000     783.322    1168.978       0.670       0.393

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.680      18.670     567.909       0.000       0.060       0.072      -0.477

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.851      25.235       1.243     619.134      43.445     213.441       1.655

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 270696.875       0.494    2709.997 1561289.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.941

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.155    4154.000      25.235     619.134       1.000       1.000       0.710
W Kg/sec =   80.52497

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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   112.748    3802.176       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
136282.172  139007.531       1.203     395.194     328.391     307.469       0.936

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   693.29    -0.24   693.29     0.59   665.91
MEAN    17.74     0.00    -0.02   693.29    -0.24   693.29     0.59
HUB     15.05     0.00    -0.02   693.29    -0.24   693.29     0.59

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     46.39    46.36     0.03   727.55  1005.15    19.97   579.03     0.85
MEAN    42.86    43.40    -0.54   643.03   945.75    19.97   579.03     0.80
HUB     38.21    38.84    -0.63   545.57   882.36    19.97   579.03     0.75

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   582.91   368.77   451.43  1234.25     0.47
MEAN    17.51   590.54   370.53   459.83  1228.88     0.48
HUB     14.85   636.79   430.25   469.45  1223.68     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    718.12   570.82   349.35     0.46  7310.14
MEAN   634.62   530.27   264.09     0.43  6490.94     1.91
HUB    538.32   481.73   108.07     0.39  6392.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     30.84     1.22    26.46   661.63     1.07   633.28     0.92     0.86
MEAN    30.17     1.20    25.76   656.87     1.06   627.77     0.92     0.86
HUB     30.09     1.19    25.01   656.30     1.06   622.47     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.25    37.74    31.50     6.24     0.93     0.49     2.90
MEAN    38.86    29.87    23.50     6.37     0.90     0.50     3.28     0.86
HUB     42.51    12.96     6.50     6.46     0.90     0.52     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.941

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     596.153     372.961     465.078    1229.679       0.485       0.012

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    30.319      25.812     628.613      46.000      38.727      31.500      -7.227

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     467.556     372.961     598.088    1240.792       0.377       0.361

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      30.236      27.410     640.026     471.992       0.028       0.448

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     454.420       0.000     454.420    1241.771       0.366       0.355

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      27.452     641.036       0.000       0.060       0.054       0.370

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.822      30.116       1.193     658.266      39.132     222.934       1.728

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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 244043.641       0.473    2443.166 2241857.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.984

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.155    4154.000      30.116     658.266       1.000       1.000       0.980
W Kg/sec =   80.52497

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.413    3687.431       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 136282.172  139007.531       1.809     513.330     283.758     401.059       1.413

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   426.52    -0.15   426.52     0.34   619.75
 MEAN    16.97     0.00    -0.02   426.52    -0.15   426.52     0.34
 HUB     14.32     0.00    -0.02   426.52    -0.15   426.52     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.58    46.36    12.22   698.18   818.28    27.76   643.10     0.66
 MEAN    55.27    43.80    11.47   615.20   748.71    27.76   643.10     0.60
 HUB     50.60    37.84    12.76   519.11   671.97    27.76   643.10     0.54

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   569.80   386.27   418.89  1272.69     0.45
 MEAN    16.57   570.90   378.78   427.14  1267.01     0.45
 HUB     13.89   607.85   423.23   436.29  1261.35     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    684.41   514.16   298.14     0.40  7295.53
 MEAN   600.81   481.40   222.03     0.38  6280.31     1.71
 HUB    503.52   443.62    80.29     0.35  5880.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     36.66     1.22    31.95   700.63     1.06   673.57     0.92     0.90
 MEAN    35.70     1.19    31.05   694.74     1.06   667.57     0.92     0.90
 HUB     35.32     1.17    30.13   692.42     1.05   661.62     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.68    35.44    31.50     3.94     0.93     0.45     2.90
 MEAN    41.57    27.47    23.50     3.97     0.94     0.43     3.29     0.90
 HUB     44.13    10.43     6.50     3.93     0.94     0.42     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.984

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     565.708     380.908     418.252    1268.598       0.446       0.045

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    35.846      31.270     669.250      46.000      42.325      32.400      -9.925

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     425.800     380.908     571.311    1279.512       0.333       0.423

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      35.737      33.098     680.815     456.573       0.032       0.509

   VANED DIFFUSER EXIT:
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   R4          C4           Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     405.971       0.000     405.971    1280.803       0.317       0.392

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      33.171     682.190       0.000       0.060       0.068       0.439

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.852      35.565       1.181     695.930      37.664     204.925       1.589

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 235134.547       0.502    2353.976 1455179.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.155    4154.000      35.565     695.930       1.000       1.000       0.980
W Kg/sec =   80.52497

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     84.816    3586.260       1.400       0.250      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 136282.172  139007.531       2.063     509.668     247.095     390.276       1.579

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   378.91    -0.13   378.91     0.30   573.33
 MEAN    15.91      0.00    -0.02   378.91    -0.13   378.91     0.30
 HUB     13.07      0.00    -0.02   378.91    -0.13   378.91     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.30    47.36    12.94   664.11   764.72    33.47   683.97     0.60
 MEAN    56.71    44.80    11.91   576.85   690.28    33.47   683.97     0.54
 HUB     51.36    38.84    12.52   473.79   606.78    33.47   683.97     0.47

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   535.53   380.97   376.37  1307.96     0.41
 MEAN    15.50   527.21   361.58   383.68  1302.06     0.40
 HUB     12.59   548.84   384.51   391.64  1296.18     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    650.33   462.83   269.37     0.35  6836.92
 MEAN   561.80   432.78   200.22     0.33  5605.68     1.77
 HUB    456.39   398.18    71.89     0.31  4842.63

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     42.34     1.19    37.73   735.59     1.06   711.70     0.92     0.90
 MEAN    41.06     1.15    36.67   728.44     1.05   705.29     0.92     0.90
 HUB     40.28     1.13    35.60   724.02     1.04   698.93     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.35    35.59    31.50     4.09     0.93     0.48     2.90
 MEAN    43.30    27.56    23.50     4.06     0.94     0.45     3.34     0.90
 HUB     44.47    10.40     6.50     3.90     0.94     0.42     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3           Mach3       cp 2-3
     15.219     534.225     368.209     387.065    1302.324       0.410      -0.009
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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     41.136      36.635     705.580      46.000      43.570      33.000     -10.570

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     399.952     368.209     543.635    1311.930       0.305       0.376

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      40.939      38.383     716.027     440.827       0.063       0.531

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     374.702       0.000     374.702    1313.422       0.285       0.442

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      38.652     717.656       0.000       0.060       0.072       0.435

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.849      40.900       1.150     729.350      33.420     210.322       1.630

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 208892.984       0.494    2091.267 1477679.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1287987.12  12894.2793    173.0626      2.7073      0.8366      8.4529      1.3951



********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 105% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 2.462   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    203.945    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   92.70234

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    199.234    3949.384       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 156891.422  160028.906       1.433     831.557     580.213     619.754       1.068

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   501.43    -0.17   501.43     0.46   710.99
  MEAN    17.06     0.00    -0.02   501.43    -0.17   501.43     0.46
  HUB     12.51     0.00    -0.02   501.43    -0.17   501.43     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     54.92    50.47     4.45   713.82   872.48    13.09   501.81     0.79
  MEAN    49.66    47.20     2.46   590.30   774.65    13.09   501.81     0.70
  HUB     40.81    38.62     2.19   432.86   662.53    13.09   501.81     0.60

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   758.71   347.30   674.56  1113.52     0.68
  MEAN    18.04   802.98   413.71   688.20  1109.27     0.72
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 HUB     15.00   940.57   592.33   730.63  1097.02     0.86

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    713.82   767.71   366.53     0.69  7168.28
 MEAN   624.07   719.63   210.35     0.65  7464.68     1.18
 HUB    519.02   734.30    73.31     0.67  8887.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.03     1.26    13.94   562.65     1.08   514.63     0.92     0.90
 MEAN    19.20     1.27    13.54   564.30     1.08   510.53     0.92     0.90
 HUB     20.07     1.33    12.41   572.21     1.09   498.55     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.24    28.52    24.20     4.32     0.93     0.19     2.90
 MEAN    31.01    17.00    12.70     4.30     0.91     0.15     3.51     0.90
 HUB     39.03    -5.73    -9.30     3.57     0.91    -0.01     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     824.082     412.909     713.174    1107.474       0.744      -0.022

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.371      13.407     509.666      24.000      30.070      35.400       5.330

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     754.792     412.909     860.352    1117.358       0.676       0.138

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.206      14.143     518.804     528.796       0.037       0.336

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     684.940       0.000     684.940    1126.374       0.608       0.223

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      14.775     527.204       0.000       0.060       0.075       0.241

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.810      18.972       1.256     566.388      43.578     242.462       1.880

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 271308.438       0.532    3126.864 2108469.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 2.462   EfDer =  0.975

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    203.945    3965.000      18.972     566.388       1.000       1.000       0.980
W Kg/sec =   92.70234

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    165.127    3794.412       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 156891.422  160028.906       1.228     590.487     480.908     474.134       0.986

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   643.43    -0.22   643.43     0.57   680.44
 MEAN    18.08     0.00    -0.02   643.43    -0.22   643.43     0.57
 HUB     15.21     0.00    -0.02   643.43    -0.22   643.43     0.57

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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 TIP     47.87    46.36     1.51   711.05   959.12    15.23   531.82     0.85
 MEAN    44.20    42.30     1.90   625.53   897.53    15.23   531.82     0.79
 HUB     39.29    37.84     1.45   526.28   831.39    15.23   531.82     0.73

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   689.81   247.64   643.82  1155.70     0.60
 MEAN    18.01   708.74   284.23   649.26  1153.80     0.61
 HUB     15.22   771.18   403.77   657.03  1151.84     0.67

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   790.64   458.91     0.68  5061.45
 MEAN   623.16   732.40   338.94     0.63  5122.93     1.31
 HUB    526.73   668.44   122.96     0.58  6149.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.07     1.16    17.34   594.50     1.05   554.80     0.92     0.89
 MEAN    22.11     1.17    17.13   594.85     1.05   552.93     0.92     0.89
 HUB     22.78     1.20    16.86   600.55     1.06   550.94     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.04    35.48    31.50     3.98     0.93     0.22     2.90
 MEAN    23.64    27.57    23.50     4.07     0.91     0.23     3.30     0.89
 HUB     31.57    10.60     6.50     4.10     0.91     0.26     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.975

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     854.054     285.025     805.089    1135.360       0.752      -0.353

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.267      15.294     535.735      46.000      19.495      30.600      11.105

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     836.240     285.025     883.480    1138.025       0.735      -0.336

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      22.004      15.362     538.249     455.853       0.061       0.122

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     845.176       0.000     845.176    1136.855       0.743      -0.067

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      14.948     537.010       0.000       0.060       0.141      -0.416

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.705      21.583       1.138     596.634      30.246     304.231       2.358

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188419.578       0.377    2171.559 1943348.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 2.462   EfDer =  0.866

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    203.945    3965.000      21.583     596.634       1.000       1.000       0.880
W Kg/sec =   92.70234

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    148.977    3696.983       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
156891.422	160028.906	1.129	489.817	433.902	384.470	0.886

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	755.42	-0.26	755.42	0.66	647.48
MEAN	17.74	0.00	-0.02	755.42	-0.26	755.42	0.66	
HUB	15.05	0.00	-0.02	755.42	-0.26	755.42	0.66	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	42.60	46.36	-3.76	694.45	1026.29	16.14	549.01	0.89
MEAN	39.11	43.40	-4.29	613.77	973.49	16.14	549.01	0.85
HUB	34.59	38.84	-4.25	520.75	917.66	16.14	549.01	0.80

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	693.49	195.53	665.36	1179.58	0.59
MEAN	17.51	709.15	243.72	665.95	1179.96	0.60
HUB	14.85	769.48	375.60	671.58	1179.89	0.65

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	685.45	826.27	489.92	0.70	3878.72	
MEAN	605.75	757.99	362.03	0.64	4271.30	1.36
HUB	513.83	685.66	138.23	0.58	5581.58	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.81	1.10	18.84	618.17	1.04	578.06	0.92	0.79
MEAN	24.05	1.11	18.84	620.35	1.04	578.41	0.92	0.79
HUB	24.84	1.15	18.66	627.62	1.05	578.25	0.92	0.79

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	16.38	36.36	31.50	4.86	0.93	0.23	2.90	
MEAN	20.10	28.53	23.50	5.03	0.88	0.26	3.28	0.79
HUB	29.22	11.63	6.50	5.13	0.88	0.31	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.866

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	719.773	245.318	676.677	1180.008	0.610	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.182	18.805	578.813	46.000	19.927	31.500	11.573

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	714.022	245.318	754.990	1180.709	0.605	-0.013

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.958	18.709	579.501	471.992	0.051	0.147

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	696.352	0.000	696.352	1182.830	0.589	-0.017

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.711	581.581	0.000	0.060	0.105	-0.013

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.627	23.663	1.096	622.047	25.413	341.973	2.651

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
158396.703	0.337	1825.542	2228626.500

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 2.462   EfDer =  0.927

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    203.945    3965.000      23.663     622.047      1.000       1.000       0.980
W Kg/sec =   92.70234

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    138.747    3620.677       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
156891.422  160028.906       1.270     513.330     404.135     401.059       0.992

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   642.03    -0.22   642.03     0.54   608.53
MEAN    16.97     0.00    -0.02   642.03    -0.22   642.03     0.54
HUB     14.32     0.00    -0.02   642.03    -0.22   642.03     0.54

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     46.08    46.36    -0.28   666.42   925.53    19.40   587.67     0.78
MEAN    42.46    43.80    -1.34   587.21   870.21    19.40   587.67     0.73
HUB     37.67    37.84    -0.17   495.49   811.13    19.40   587.67     0.68

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   687.07   177.72   663.68  1202.91     0.57
MEAN    16.57   700.39   224.76   663.35  1203.43     0.58
HUB     13.89   754.71   353.90   666.59  1203.52     0.63

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    653.27   816.47   475.55     0.68  3359.61
MEAN   573.48   749.42   348.72     0.62  3728.87     1.24
HUB    480.61   678.53   126.71     0.56  4918.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.83     1.09    20.70   640.69     1.03   601.34     0.92     0.85
MEAN    26.08     1.10    20.73   642.74     1.03   601.84     0.92     0.85
HUB     26.88     1.14    20.62   649.34     1.04   601.86     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     14.99    35.62    31.50     4.12     0.93     0.15     2.90
MEAN    18.72    27.73    23.50     4.23     0.90     0.18     3.29     0.85
HUB     27.96    10.76     6.50     4.26     0.90     0.22     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.927

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     684.864     226.022     646.492    1206.413       0.568       0.059

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.208      21.058     605.136      46.000      19.270      32.400      13.130

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     694.323     226.022     730.185    1205.328       0.576       0.009

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.965      20.732     604.048     456.573       0.054       0.148

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     659.441       0.000     659.441    1209.253       0.545      -0.019
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.952	607.987	0.000	0.060	0.110	0.048

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.655	25.652	1.084	644.258	22.211	356.914	2.767

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
138506.406	0.325	1596.304	1900211.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 2.462 EfDer = 0.905

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
203.945	3965.000	25.652	644.258	1.000	1.000	0.980

W Kg/sec = 92.70234

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
130.253	3557.718	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
156891.422	160028.906	1.343	509.668	379.423	390.276	1.029

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	605.20	-0.21	605.20	0.50	568.76
MEAN	15.91	0.00	-0.02	605.20	-0.21	605.20	0.50	
HUB	13.07	0.00	-0.02	605.20	-0.21	605.20	0.50	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.34	47.36	-1.02	633.89	876.55	21.65	613.72	0.72
MEAN	42.31	44.80	-2.49	550.61	818.33	21.65	613.72	0.67
HUB	36.78	38.84	-2.06	452.24	755.62	21.65	613.72	0.62

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	651.74	165.67	630.33	1226.44	0.53
MEAN	15.50	663.33	202.24	631.75	1226.09	0.54
HUB	12.59	709.60	314.72	635.99	1225.44	0.58

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.74	777.44	455.07	0.63	2975.96	
MEAN	536.24	714.60	334.00	0.58	3137.55	1.23
HUB	435.63	647.38	120.90	0.53	3965.10	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.60	1.08	22.77	660.76	1.03	625.36	0.92	0.83
MEAN	27.71	1.08	22.71	661.66	1.03	624.99	0.92	0.83
HUB	28.27	1.10	22.53	666.25	1.03	624.29	0.92	0.83

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	14.73	35.83	31.50	4.33	0.93	0.15	2.90	
MEAN	17.75	27.86	23.50	4.36	0.89	0.16	3.34	0.83
HUB	26.33	10.76	6.50	4.26	0.89	0.19	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.905

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	671.434	205.948	639.069	1226.228	0.548	-0.013

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
27.759	22.638	625.309	46.000	17.862	33.000	15.138

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     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     705.655     205.948     735.094    1222.370       0.577      -0.180

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      27.244      21.734     621.380     440.827       0.119       0.138

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
      14.701     648.212       0.000     648.212    1228.730       0.528      -0.026

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      22.503     627.863       0.000       0.060       0.127      -0.032

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.586      27.204       1.061     662.891      18.633     393.743       3.052

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  116258.734       0.302    1339.896 1940975.250

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     872889.88  10060.1650     199.2340      1.8007      0.6856      2.4621      1.2679


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 105% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 2.704   EfDer =  0.983

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     202.565    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   92.07522

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     197.886    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  155830.062  158946.328       1.443     831.557     576.288     619.754       1.075

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   497.16    -0.17   497.16     0.45   710.99
  MEAN    17.06     0.00    -0.02   497.16    -0.17   497.16     0.45
  HUB     12.51     0.00    -0.02   497.16    -0.17   497.16     0.45

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.15    50.47     4.68   713.82   870.03    13.13   502.17     0.79
  MEAN    49.90    47.20     2.70   590.30   771.90    13.13   502.17     0.70
  HUB     41.06    38.62     2.44   432.86   659.31    13.13   502.17     0.60

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   753.37   351.72   666.23  1114.73     0.68
  MEAN    18.04   797.42   416.11   680.24  1110.26     0.72
  HUB     15.00   933.10   591.37   721.77  1098.07     0.85

        U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
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 TIP    713.82   758.28   362.10     0.68  7259.51
 MEAN   624.07   711.32   207.96     0.64  7507.81     1.19
 HUB    519.02   725.39    72.35     0.66  8872.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.09     1.26    14.05   563.16     1.08   515.81     0.92     0.90
 MEAN    19.24     1.27    13.64   564.54     1.08   511.51     0.92     0.90
 HUB     20.07     1.33    12.51   572.13     1.09   499.61     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.83    28.52    24.20     4.32     0.93     0.20     2.90
 MEAN    31.45    17.00    12.70     4.30     0.91     0.16     3.51     0.90
 HUB     39.33    -5.72    -9.30     3.58     0.91     0.00     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.983

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     817.515     415.298     704.172    1108.693       0.737      -0.020

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.406      13.516     510.789      24.000      30.531      35.400       4.869

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     742.718     415.298     850.942    1119.222       0.664       0.152

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.253      14.323     520.536     528.796       0.035       0.345

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     674.214       0.000     674.214    1127.909       0.598       0.236

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      14.949     528.643       0.000       0.060       0.070       0.255

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.819      19.040       1.260     566.610      43.800     240.508       1.864

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 272692.375       0.535    3121.553 2090512.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 2.704   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    202.565    3965.000      19.040     566.610       1.000       1.000       0.980
W Kg/sec =   92.07522

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    163.455    3793.667       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 155830.062  158946.328       1.240     590.487     476.037     474.134       0.996

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   634.02    -0.22   634.02     0.56   680.31
 MEAN    18.08     0.00    -0.02   634.02    -0.22   634.02     0.56
 HUB     15.21     0.00    -0.02   634.02    -0.22   634.02     0.56

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.29    46.36     1.93   711.05   952.83    15.39   533.05     0.84
 MEAN    44.62    42.30     2.32   625.53   890.81    15.39   533.05     0.79
 HUB     39.71    37.84     1.87   526.28   824.13    15.39   533.05     0.73
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     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   682.12   255.92   632.29  1157.78     0.59
MEAN    18.01   701.27   289.95   638.53  1155.50     0.61
HUB     15.22   763.61   405.83   646.85  1153.21     0.66

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    706.56   776.45   450.64     0.67  5230.32
MEAN   623.16   720.24   333.21     0.62  5225.94     1.33
HUB    526.73   658.05   120.91     0.57  6181.22

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.27     1.17    17.60   595.66     1.05   556.84     0.92     0.90
MEAN    22.27     1.17    17.36   595.64     1.05   554.60     0.92     0.90
HUB     22.90     1.20    17.06   600.95     1.06   552.30     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     22.04    35.48    31.50     3.98     0.93     0.23     2.90
MEAN    24.42    27.56    23.50     4.06     0.91     0.24     3.30     0.90
HUB     32.10    10.59     6.50     4.09     0.91     0.26     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.979

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      838.728     290.764     786.715    1138.480       0.737      -0.336

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.428      15.631      538.684      46.000      20.284      30.600      10.316

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960      811.387     290.764     861.912    1142.455       0.710      -0.290

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      22.194      15.849     542.451     455.853       0.055       0.145

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.823     814.588       0.000     814.588    1142.085       0.713      -0.015

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.850      15.552     542.024       0.000       0.060       0.125      -0.348

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.737      21.839       1.147     597.417      30.807     297.860       2.309

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 191916.531       0.384    2196.899 1920480.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 2.704   EfDer =  0.884

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    202.565    3965.000      21.839     597.417       1.000       1.000       0.880
W Kg/sec =   92.07522

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    146.328    3694.558       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 155830.062  158946.328       1.149     489.817     426.185     384.470       0.902
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    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   732.97    -0.25   732.97     0.64   647.06
MEAN    17.74     0.00    -0.02   732.97    -0.25   732.97     0.64
HUB     15.05     0.00    -0.02   732.97    -0.25   732.97     0.64

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     43.46    46.36    -2.90   694.45  1009.87    16.63   552.58     0.88
MEAN    39.95    43.40    -3.45   613.77   956.17    16.63   552.58     0.83
HUB     35.41    38.84    -3.43   520.75   899.27    16.63   552.58     0.78

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   677.94   211.58   644.08  1183.90     0.57
MEAN    17.51   694.62   254.98   646.13  1183.52     0.59
HUB     14.85   754.96   380.06   652.32  1182.85     0.64

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    685.45   799.62   473.87     0.68  4196.44
MEAN   605.75   735.20   350.77     0.62  4468.33     1.38
HUB    513.83   665.89   133.77     0.56  5647.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.34     1.11    19.48   620.72     1.04   582.38     0.92     0.81
MEAN    24.51     1.12    19.41   622.23     1.04   581.98     0.92     0.81
HUB     25.25     1.16    19.19   628.77     1.05   581.24     0.92     0.81

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     18.19    36.34    31.50     4.84     0.93     0.24     2.90
MEAN    21.54    28.50    23.50     5.00     0.89     0.27     3.28     0.81
HUB     30.23    11.59     6.50     5.09     0.89     0.31     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.884

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     704.227     256.655     655.792    1183.782       0.595      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.647      19.396      582.517      46.000      21.374      31.500      10.126

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     686.770     256.655     733.161    1185.839       0.579       0.024

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.465      19.488     584.544     471.992       0.044       0.174

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     667.549       0.000     667.549    1188.043       0.562       0.030

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      19.557     586.716       0.000       0.060       0.087       0.037

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.683      24.237       1.110     623.905      26.488     326.547       2.531

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 165096.766       0.351    1889.889 2183072.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 2.704   EfDer =  0.946
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
202.565	3965.000	24.237	623.905	1.000	1.000	0.980

W Kg/sec = 92.07522

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
134.744	3615.282	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
155830.062	158946.328	1.308	513.330	392.475	401.059	1.022

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	617.39	-0.21	617.39	0.52	607.62
MEAN	16.97	0.00	-0.02	617.39	-0.21	617.39	0.52	
HUB	14.32	0.00	-0.02	617.39	-0.21	617.39	0.52	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.20	46.36	0.84	666.42	908.60	20.19	592.11	0.76
MEAN	43.58	43.80	-0.22	587.21	852.19	20.19	592.11	0.71
HUB	38.76	37.84	0.92	495.49	791.76	20.19	592.11	0.66

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	663.20	200.39	632.20	1209.71	0.55
MEAN	16.57	678.15	240.42	634.10	1209.17	0.56
HUB	13.89	732.89	359.56	638.63	1208.39	0.61

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	653.27	777.68	452.88	0.64	3787.41	
MEAN	573.48	716.25	333.05	0.59	3988.36	1.27
HUB	480.61	650.00	121.05	0.54	4997.35	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.80	1.11	21.84	644.92	1.03	608.25	0.92	0.87
MEAN	26.94	1.11	21.75	646.04	1.04	607.69	0.92	0.87
HUB	27.65	1.14	21.57	651.63	1.04	606.85	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	17.59	35.62	31.50	4.12	0.93	0.18	2.90	
MEAN	20.76	27.71	23.50	4.21	0.90	0.20	3.29	0.87
HUB	29.38	10.73	6.50	4.23	0.90	0.24	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.946

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	663.780	241.776	618.182	1212.031	0.548	0.060

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
27.075	22.078	610.780	46.000	21.361	32.400	11.039

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	657.370	241.776	700.422	1212.732	0.542	0.055

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	26.892	22.017	611.486	456.573	0.044	0.185

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	622.587	0.000	622.587	1216.409	0.512	0.042

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.304	615.200	0.000	0.060	0.084	0.108

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    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.734      26.672       1.100     647.530      23.626     334.138       2.590

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 147340.469       0.345    1686.630 1861882.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 2.704   EfDer =  0.934

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    202.565    3965.000      26.672     647.530       1.000       1.000       0.980
W Kg/sec =   92.07522

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    124.737    3548.716       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 155830.062  158946.328       1.403     509.668     363.352     390.276       1.074

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   573.40    -0.20   573.40     0.47   567.32
 MEAN    15.91     0.00    -0.02   573.40    -0.20   573.40     0.47
 HUB     13.07     0.00    -0.02   573.40    -0.20   573.40     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.88    47.36     0.52   633.89   854.90    22.93   620.12     0.70
 MEAN    43.85    44.80    -0.95   550.61   795.09    22.93   620.12     0.65
 HUB     38.27    38.84    -0.57   452.24   730.40    22.93   620.12     0.60

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   621.90   194.52   590.69  1235.47     0.50
 MEAN    15.50   634.47   222.50   594.18  1233.97     0.51
 HUB     12.59   680.61   322.09   599.58  1232.35     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   728.41   426.22     0.59  3493.32
 MEAN   536.24   671.92   313.73     0.54  3451.41     1.28
 HUB    435.63   610.23   113.54     0.50  4057.68

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.13     1.09    24.50   666.90     1.03   634.67     0.92     0.85
 MEAN    29.10     1.09    24.30   666.67     1.03   633.12     0.92     0.85
 HUB     29.54     1.11    24.01   670.03     1.03   631.42     0.92     0.85

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.23    35.81    31.50     4.31     0.93     0.19     2.90
 MEAN    20.53    27.83    23.50     4.33     0.90     0.20     3.34     0.85
 HUB     28.24    10.72     6.50     4.22     0.90     0.22     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.934

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     641.681     226.583     600.345    1234.279       0.520      -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.160      24.250     633.543      46.000      20.678      33.000      12.322

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     15.219     651.055     226.583     689.357    1233.295       0.528      -0.091

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.799      23.817     632.532     440.827       0.092       0.184

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     599.881       0.000     599.881    1238.487       0.484       0.057

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.537     637.869       0.000       0.060       0.090       0.053

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.711      28.811       1.080     667.869      20.338     358.863       2.782

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 126914.891       0.329    1452.815 1895266.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    903961.00  10347.7861    197.8862      1.9071      0.7329      2.7037      1.2775

*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 105% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 2.995   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    200.901    3965.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   91.31874

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    196.260    3949.384       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 154549.781  157640.453       1.455     831.557     571.553     619.754       1.084

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   492.04    -0.17   492.04     0.45   710.99
 MEAN    17.06     0.00    -0.02   492.04    -0.17   492.04     0.45
 HUB     12.51     0.00    -0.02   492.04    -0.17   492.04     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.43    50.47     4.96   713.82   867.12    13.17   502.59     0.79
 MEAN    50.20    47.20     3.00   590.30   768.61    13.17   502.59     0.70
 HUB     41.35    38.62     2.73   432.86   655.46    13.17   502.59     0.60

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   747.22   356.92   656.46  1116.14     0.67
 MEAN    18.04   790.93   418.93   670.87  1111.42     0.71
 HUB     15.00   924.36   590.26   711.36  1099.29     0.84

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    713.82   747.21   356.90     0.67  7366.80
 MEAN   624.07   701.53   205.14     0.63  7558.72     1.20
 HUB    519.02   714.92    71.24     0.65  8856.06
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.17     1.27    14.19   563.76     1.08   517.17     0.92     0.90
MEAN    19.28     1.28    13.75   564.82     1.08   512.64     0.92     0.90
HUB     20.07     1.33    12.63   572.04     1.09   500.85     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     28.53    28.53    24.20     4.33     0.93     0.21     2.90
MEAN    31.98    17.00    12.70     4.30     0.91     0.17     3.51     0.90
HUB     39.68    -5.72    -9.30     3.58     0.91     0.01     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     809.937     418.116     693.669    1110.095       0.730       -0.018

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.447      13.642      512.081      24.000      31.080      35.400       4.320

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     728.949     418.116     840.350    1121.321       0.650       0.168

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.306      14.528     522.491     528.796       0.034       0.355

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083     662.050       0.000     662.050    1129.634       0.586       0.251

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.145     530.263       0.000       0.060       0.065       0.271

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.828      19.116       1.265     566.872      44.062     238.199       1.847

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 274325.219       0.538    3114.444 2069002.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 2.995   EfDer =  0.984

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    200.901    3965.000      19.116     566.872       1.000       1.000       0.980
W Kg/sec =   91.31874

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    161.508    3792.790       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 154549.781  157640.453       1.255     590.487     470.365     474.134       1.008

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   623.28    -0.21   623.28     0.55   680.15
 MEAN    18.08     0.00    -0.02   623.28    -0.21   623.28     0.55
 HUB     15.21     0.00    -0.02   623.28    -0.21   623.28     0.55

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.77    46.36     2.41   711.05   945.72    15.56   534.44     0.83
 MEAN    45.11    42.30     2.81   625.53   883.19    15.56   534.44     0.78
 HUB     40.19    37.84     2.35   526.28   815.89    15.56   534.44     0.72

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
```

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	673.78	265.19	619.40	1160.08	0.58
MEAN	18.01	693.02	296.41	626.43	1157.40	0.60
HUB	15.22	755.13	408.16	635.32	1154.75	0.65

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	706.56	760.56	441.36	0.66	5419.63	
MEAN	623.16	706.53	326.75	0.61	5342.25	1.34
HUB	526.73	646.29	118.58	0.56	6216.64	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.50	1.18	17.90	596.98	1.05	559.09	0.92	0.90
MEAN	22.45	1.17	17.61	596.55	1.05	556.47	0.92	0.90
HUB	23.03	1.20	17.28	601.41	1.06	553.83	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	23.18	35.47	31.50	3.97	0.93	0.24	2.90	
MEAN	25.32	27.55	23.50	4.05	0.91	0.25	3.30	0.90
HUB	32.72	10.57	6.50	4.07	0.91	0.27	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.984

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	822.467	297.244	766.875	1141.803	0.720	-0.319

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.608	15.997	541.832	46.000	21.187	30.600	9.413

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	785.665	297.244	840.014	1146.998	0.685	-0.243

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	22.405	16.363	546.773	455.853	0.050	0.167

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	784.479	0.000	784.479	1147.208	0.684	0.033

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	16.164	546.933	0.000	0.060	0.108	-0.282

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.768	22.111	1.157	598.311	31.438	290.866	2.255

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
195850.609	0.392	2223.514	1893928.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 2.995 EfDer = 0.903

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
200.901	3965.000	22.111	598.311	1.000	1.000	0.880

W Kg/sec = 91.31874

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
143.452	3691.799	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
154549.781	157640.453	1.172	489.817	417.806	384.470	0.920

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	710.01	-0.24	710.01	0.61	646.58

```
 MEAN    17.74     0.00    -0.02   710.01    -0.24   710.01     0.61
 HUB     15.05     0.00    -0.02   710.01    -0.24   710.01     0.61

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.38    46.36    -1.98   694.45   993.33    17.14   556.24     0.86
 MEAN    40.85    43.40    -2.55   613.77   938.69    17.14   556.24     0.81
 HUB     36.27    38.84    -2.57   520.75   880.65    17.14   556.24     0.76

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   662.71   228.07   622.23  1188.31     0.56
 MEAN    17.51   680.06   266.64   625.61  1187.20     0.57
 HUB     14.85   740.13   384.64   632.33  1185.94     0.62

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   772.25   457.38     0.65  4522.98
 MEAN   605.75   711.61   339.11     0.60  4672.22     1.40
 HUB    513.83   645.39   129.18     0.54  5715.62

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.91     1.13    20.16   623.42     1.04   586.78     0.92     0.83
 MEAN    25.00     1.13    20.01   624.25     1.04   585.67     0.92     0.83
 HUB     25.68     1.16    19.75   630.04     1.05   584.35     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.13    36.32    31.50     4.82     0.93     0.26     2.90
 MEAN    23.08    28.46    23.50     4.96     0.89     0.28     3.28     0.83
 HUB     31.31    11.55     6.50     5.05     0.89     0.32     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.903

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     688.802     268.386     634.364    1187.633       0.580       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.145      20.016     586.310      46.000      22.932      31.500       8.568

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     659.801     268.386     712.298    1190.935       0.554       0.061

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.001      20.291     589.574     471.992       0.038       0.202

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     639.863       0.000     639.863    1193.118       0.536       0.075

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.409     591.736       0.000       0.060       0.071       0.084

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.732      24.827       1.123     625.905      27.594     311.670       2.416

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 171999.297       0.366    1952.727 2135407.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 2.995   EfDer =  0.963

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    200.901    3965.000      24.827     625.905       1.000       1.000       0.980
W Kg/sec =   91.31874
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
130.669	3609.502	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
154549.781	157640.453	1.349	513.330	380.604	401.059	1.054

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	593.36	-0.20	593.36	0.50	606.65
MEAN	16.97	0.00	-0.02	593.36	-0.20	593.36	0.50	
HUB	14.32	0.00	-0.02	593.36	-0.20	593.36	0.50	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.33	46.36	1.97	666.42	892.44	20.99	596.54	0.75
MEAN	44.71	43.80	0.91	587.21	834.94	20.99	596.54	0.70
HUB	39.88	37.84	2.04	495.49	773.16	20.99	596.54	0.65

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	642.16	221.74	602.66	1216.11	0.53
MEAN	16.57	657.86	255.38	606.27	1214.70	0.54
HUB	13.89	712.44	365.01	611.84	1213.16	0.59

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	653.27	741.23	431.53	0.61	4190.42	
MEAN	573.48	684.65	318.09	0.56	4236.14	1.31
HUB	480.61	622.66	115.60	0.51	5072.88	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.78	1.12	22.97	649.16	1.04	614.77	0.92	0.88
MEAN	27.82	1.12	22.78	649.41	1.04	613.32	0.92	0.88
HUB	28.44	1.15	22.51	654.05	1.04	611.73	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.20	35.60	31.50	4.10	0.93	0.21	2.90	
MEAN	22.84	27.68	23.50	4.18	0.91	0.23	3.29	0.88
HUB	30.82	10.70	6.50	4.20	0.91	0.25	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.963

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	644.667	256.818	591.304	1217.408	0.530	0.060

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
27.959	23.095	616.206	46.000	23.477	32.400	8.923

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	623.750	256.818	674.551	1219.592	0.511	0.099

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	27.826	23.274	618.420	456.573	0.035	0.219

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	589.945	0.000	589.945	1222.962	0.482	0.095

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.596	621.842	0.000	0.060	0.065	0.160

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.791	27.672	1.115	650.872	24.967	314.262	2.436

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 155718.422       0.365    1767.888 1822760.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 2.995   EfDer =  0.958

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    200.901    3965.000      27.672     650.872       1.000       1.000       0.980
W Kg/sec =   91.31874

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    119.548    3539.595       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 154549.781  157640.453       1.464     509.668     348.237     390.276       1.121

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   544.83    -0.19   544.83     0.44   565.87
 MEAN    15.91     0.00    -0.02   544.83    -0.19   544.83     0.44
 HUB     13.07     0.00    -0.02   544.83    -0.19   544.83     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.33    47.36     1.97   633.89   836.00    24.17   626.13     0.68
 MEAN    45.31    44.80     0.51   550.61   774.73    24.17   626.13     0.63
 HUB     39.71    38.84     0.87   452.24   708.19    24.17   626.13     0.58

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   598.18   219.63   556.40  1243.43     0.48
 MEAN    15.50   610.57   240.35   561.28  1241.07     0.49
 HUB     12.59   655.80   328.63   567.51  1238.68     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   685.91   401.12     0.55  3943.53
 MEAN   536.24   634.49   295.89     0.51  3727.77     1.32
 HUB    435.63   577.51   106.99     0.47  4139.96

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.62     1.11    26.14   672.74     1.03   642.91     0.92     0.88
 MEAN    30.46     1.10    25.81   671.54     1.03   640.47     0.92     0.88
 HUB     30.78     1.11    25.43   673.83     1.04   637.98     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.54    35.79    31.50     4.29     0.93     0.22     2.90
 MEAN    23.18    27.80    23.50     4.30     0.90     0.23     3.34     0.88
 HUB     30.07    10.68     6.50     4.18     0.90     0.24     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.958

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     617.287     244.753     566.691    1241.463       0.497      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.523      25.777     640.936      46.000      23.359      33.000       9.641

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     606.943     244.753     654.434    1242.485       0.488      -0.015

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.279      25.717     641.992     440.827       0.071       0.225
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     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     561.138       0.000     561.138    1246.794       0.450       0.122

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      26.365     646.453       0.000       0.060       0.066       0.119

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.784      30.300       1.095     672.703      21.831     331.682       2.571

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  136245.641       0.354    1546.812 1851558.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     934139.19  10605.3848    196.2604      2.0056      0.7703      2.9953      1.2867


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 105% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.521   EfDer =  0.989

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     197.903    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   89.95580

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     193.331    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  152243.109  155287.641       1.477     831.557     563.022     619.754       1.101

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   482.92    -0.17   482.92     0.44   710.99
  MEAN    17.06     0.00    -0.02   482.92    -0.17   482.92     0.44
  HUB     12.51     0.00    -0.02   482.92    -0.17   482.92     0.44

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.93    50.47     5.46   713.82   861.97    13.23   503.33     0.78
  MEAN    50.72    47.20     3.52   590.30   762.80    13.23   503.33     0.69
  HUB     41.88    38.62     3.26   432.86   648.63    13.23   503.33     0.59

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   736.87   365.96   639.58  1118.54     0.66
  MEAN    18.04   779.81   423.86   654.57  1113.41     0.70
  HUB     15.00   909.33   588.37   693.33  1101.39     0.83

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   728.06   347.86     0.65  7553.20
  MEAN   624.07   684.50   200.21     0.61  7647.53     1.23
  HUB    519.02   696.79    69.35     0.63  8827.64

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.30     1.28    14.41   564.79     1.08   519.48     0.92     0.91
  MEAN    19.35     1.28    13.94   565.32     1.08   514.58     0.92     0.91
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 HUB     20.08     1.33    12.83   571.88     1.09   502.97     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.78    28.54    24.20     4.34     0.93     0.23     2.90
 MEAN    32.92    17.01    12.70     4.31     0.92     0.18     3.51     0.91
 HUB     40.32    -5.71    -9.30     3.59     0.92     0.03     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     797.127     423.034     675.614    1112.451       0.717      -0.015

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.517      13.856     514.258      24.000      32.053      35.400       3.347

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     705.981     423.034     823.023    1124.760       0.628       0.195

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.394      14.868     525.701     528.796       0.031       0.372

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     641.887       0.000     641.887    1132.455       0.567       0.275

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.465     532.916       0.000       0.060       0.058       0.297

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.843      19.236       1.273     567.329      44.519     234.161       1.815

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 277171.781       0.544    3099.796 2030649.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.521   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    197.903    3965.000      19.236     567.329       1.000       1.000       0.980
W Kg/sec =   89.95580

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    158.162    3791.261       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 152243.109  155287.641       1.282     590.487     460.622     474.134       1.029

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   605.35    -0.21   605.35     0.53   679.88
 MEAN    18.08     0.00    -0.02   605.35    -0.21   605.35     0.53
 HUB     15.21     0.00    -0.02   605.35    -0.21   605.35     0.53

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.60    46.36     3.24   711.05   933.99    15.85   536.73     0.82
 MEAN    45.95    42.30     3.65   625.53   870.63    15.85   536.73     0.77
 HUB     41.01    37.84     3.17   526.28   802.27    15.85   536.73     0.71

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   660.83   280.31   598.43  1163.77     0.57
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 MEAN    18.01   679.86   307.05   606.58  1160.48     0.59
 HUB     15.22   741.34   412.03   616.29  1157.28     0.64

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   734.72   426.25     0.63  5728.21
 MEAN   623.16   684.01   316.12     0.59  5533.64     1.37
 HUB    526.73   626.88   114.70     0.54  6275.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.87     1.19    18.37   599.15     1.06   562.70     0.92     0.91
 MEAN    22.74     1.18    18.02   598.07     1.05   559.49     0.92     0.91
 HUB     23.24     1.21    17.63   602.19     1.06   556.33     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.10    35.46    31.50     3.96     0.93     0.26     2.90
 MEAN    26.85    27.53    23.50     4.03     0.92     0.27     3.30     0.91
 HUB     33.77    10.54     6.50     4.04     0.92     0.28     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.990

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     797.697     307.907     735.876    1146.894       0.696      -0.293

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.899      16.569     546.674      46.000      22.706      30.600       7.894

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     747.261     307.907     808.212    1153.698       0.648      -0.174

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      22.738      17.145     553.179     455.853       0.043       0.199

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     741.740       0.000     741.740    1154.432       0.643       0.099

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.850      17.056     553.867       0.000       0.060       0.086      -0.192

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.808      22.522       1.171     599.802      32.473     279.773       2.169

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 202296.953       0.405    2262.421 1848451.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 3.521   EfDer =  0.930

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    197.903    3965.000      22.522     599.802       1.000       1.000       0.880
W Kg/sec =   89.95580

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    138.903    3687.205       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 152243.109  155287.641       1.211     489.817     404.557     384.470       0.950

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   676.14    -0.23   676.14     0.58   645.77
 MEAN    17.74     0.00    -0.02   676.14    -0.23   676.14     0.58
 HUB     15.05     0.00    -0.02   676.14    -0.23   676.14     0.58
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     45.77    46.36    -0.59   694.45   969.40    17.91   561.65     0.83
MEAN    42.24    43.40    -1.16   613.77   913.33    17.91   561.65     0.79
HUB     37.62    38.84    -1.22   520.75   853.57    17.91   561.65     0.73

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   641.77   252.33   590.08  1194.74     0.54
MEAN    17.51   659.38   283.92   595.12  1192.67     0.55
HUB     14.85   718.56   391.47   602.57  1190.58     0.60

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    685.45   731.97   433.12     0.61  5003.35
MEAN   605.75   676.56   321.83     0.57  4974.58     1.44
HUB    513.83   614.86   122.36     0.52  5816.78

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.78     1.14    21.18   627.58     1.05   593.21     0.92     0.85
MEAN    25.76     1.14    20.92   627.42     1.05   591.14     0.92     0.85
HUB     26.34     1.17    20.58   632.09     1.05   589.02     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     23.15    36.28    31.50     4.78     0.93     0.29     2.90
MEAN    25.50    28.40    23.50     4.90     0.90     0.31     3.28     0.85
HUB     33.01    11.48     6.50     4.98     0.90     0.34     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.930

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     667.108     285.782     602.795    1193.276       0.559       0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.905      20.948     591.889      46.000      25.365      31.500       6.135

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     621.581     285.782     684.130    1198.201       0.519       0.115

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.807      21.477     596.786     471.992       0.029       0.242

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     601.661       0.000     601.661    1200.241       0.501       0.136

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      21.637     598.819       0.000       0.060       0.052       0.147

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.789      25.693       1.141     629.030      29.228     291.288       2.258

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 182195.094       0.388    2037.609 2062374.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 3.521   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    197.903    3965.000      25.693     629.030       1.000       1.000       0.980
W Kg/sec =   89.95580

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    124.692    3600.522       1.401       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
152243.109	155287.641	1.413	513.330	363.193	401.059	1.104

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	559.72	-0.19	559.72	0.46	605.14
MEAN	16.97	0.00	-0.02	559.72	-0.19	559.72	0.46	
HUB	14.32	0.00	-0.02	559.72	-0.19	559.72	0.46	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.98	46.36	3.62	666.42	870.44	22.15	602.90	0.72
MEAN	46.38	43.80	2.58	587.21	811.37	22.15	602.90	0.67
HUB	41.53	37.84	3.69	495.49	747.66	22.15	602.90	0.62

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	616.28	250.50	563.07	1224.78	0.50
MEAN	16.57	631.81	275.77	568.45	1222.33	0.52
HUB	13.89	685.27	372.52	575.18	1219.88	0.56

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	653.27	692.30	402.77	0.57	4733.24	
MEAN	573.48	641.69	297.70	0.52	4573.89	1.36
HUB	480.61	585.25	108.09	0.48	5177.03	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	29.22	1.14	24.58	655.29	1.04	623.61	0.92	0.90
MEAN	29.09	1.13	24.24	654.41	1.04	621.11	0.92	0.90
HUB	29.57	1.15	23.86	657.75	1.05	618.59	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	23.98	35.58	31.50	4.08	0.93	0.25	2.90	
MEAN	25.88	27.64	23.50	4.14	0.91	0.26	3.29	0.90
HUB	32.93	10.64	6.50	4.14	0.91	0.28	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.982

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	620.266	277.323	554.817	1224.816	0.506	0.059

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
29.242	24.542	623.725	46.000	26.558	32.400	5.842

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	579.933	277.323	642.830	1228.774	0.472	0.159

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	29.160	25.032	627.762	456.573	0.026	0.266

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	548.737	0.000	548.737	1231.645	0.446	0.159

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	25.346	630.699	0.000	0.060	0.048	0.221

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.840	29.049	1.131	655.816	26.785	289.526	2.244

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
167077.703	0.392	1868.541	1763962.750

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.521   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    197.903    3965.000      29.049     655.816       1.000       1.000       0.980
W Kg/sec =   89.95580

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.608    3526.228       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 152243.109  155287.641       1.554     509.668     328.022     390.276       1.190

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   508.30    -0.18   508.30     0.41   563.73
 MEAN    15.91     0.00    -0.02   508.30    -0.18   508.30     0.41
 HUB     13.07     0.00    -0.02   508.30    -0.18   508.30     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.28    47.36     3.92   633.89   812.66    25.85   634.28     0.66
 MEAN    47.30    44.80     2.50   550.61   749.49    25.85   634.28     0.61
 HUB     41.67    38.84     2.83   452.24   680.47    25.85   634.28     0.55

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   572.11   250.55   514.33  1253.57     0.46
 MEAN    15.50   582.89   262.51   520.44  1250.30     0.47
 HUB     12.59   625.82   336.80   527.46  1247.07     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   633.70   370.19     0.51  4498.14
 MEAN   536.24   588.03   273.73     0.47  4071.03     1.39
 HUB    435.63   536.64    98.83     0.43  4242.63

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.66     1.12    28.31   680.75     1.04   653.47     0.92     0.90
 MEAN    32.31     1.11    27.83   678.38     1.03   650.06     0.92     0.90
 HUB     32.45     1.12    27.32   679.34     1.04   646.69     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.97    35.74    31.50     4.24     0.93     0.27     2.90
 MEAN    26.77    27.74    23.50     4.24     0.91     0.27     3.34     0.90
 HUB     32.56    10.61     6.50     4.11     0.91     0.27     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.981

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     589.271     267.322     525.147    1250.731       0.471      -0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    32.381      27.811     650.543      46.000      26.978      33.000       6.022

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     555.750     267.322     616.700    1253.803       0.443       0.075

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      32.245      28.174     653.743     440.827       0.049       0.277

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     14.701     516.077       0.000     516.077    1257.198       0.410       0.194

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.713     657.288       0.000       0.060       0.049       0.191

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.840      32.247       1.110     679.491      23.676     301.416       2.337

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 147786.781       0.384    1652.798 1789419.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    976528.38  10921.1650    193.3312      2.1346      0.8104      3.5215      1.2997


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 105% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 4.041   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    194.949    3965.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   88.61320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    190.446    3949.384       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149970.859  152969.953       1.499     831.557     554.619     619.754       1.117

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   474.05    -0.16   474.05     0.43   710.99
 MEAN    17.06     0.00    -0.02   474.05    -0.16   474.05     0.43
 HUB     12.51     0.00    -0.02   474.05    -0.16   474.05     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.42    50.47     5.95   713.82   857.03    13.30   504.04     0.78
 MEAN    51.24    47.20     4.04   590.30   757.21    13.30   504.04     0.69
 HUB     42.41    38.62     3.79   432.86   642.05    13.30   504.04     0.58

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   727.52   374.46   623.75  1120.74     0.65
 MEAN    18.04   769.54   428.54   639.18  1115.25     0.69
 HUB     15.00   895.31   586.60   676.37  1103.33     0.81

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    713.82   710.09   339.36     0.63  7728.42
 MEAN   624.07   668.41   195.53     0.60  7731.90     1.25
 HUB    519.02   679.74    67.59     0.62  8801.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.42     1.29    14.62   565.77     1.08   521.59     0.92     0.91
 MEAN    19.42     1.29    14.12   565.79     1.08   516.37     0.92     0.91
 HUB     20.08     1.33    13.02   571.73     1.09   504.90     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     30.98    28.55    24.20     4.35     0.93     0.25     2.90
 MEAN    33.84    17.01    12.70     4.31     0.92     0.20     3.51     0.91
 HUB     40.93    -5.71    -9.30     3.59     0.92     0.05     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     785.460     427.705     658.799    1114.584       0.705       -0.012

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.581      14.052     516.232      24.000      32.992      35.400       2.408

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     18.071     685.258     427.705     807.781    1127.794       0.608       0.219

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.472      15.170     528.540     528.796       0.029       0.388

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083     623.790       0.000     623.790    1134.943       0.550       0.296

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      15.745     535.261       0.000       0.060       0.052       0.319

    STAGE EXIT CONDITIONS, STAGE             1
       Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.853       19.339       1.280     567.761      44.951     230.326       1.785

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 279860.250       0.549    3083.149 1993349.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 4.041   EfDer =  0.995

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    194.949     3965.000       19.339     567.761       1.000        1.000        0.980
W Kg/sec =   88.61320

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
    155.038     3789.819        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 149970.859  152969.953        1.308     590.487     451.521     474.134       1.050

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   589.12    -0.20   589.12      0.52   679.62
 MEAN    18.08      0.00    -0.02   589.12    -0.20   589.12      0.52
 HUB     15.21      0.00    -0.02   589.12    -0.20   589.12      0.52

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     50.37     46.36     4.01   711.05   923.55     16.11   538.78      0.81
 MEAN    46.73     42.30     4.43   625.53   859.42     16.11   538.78      0.75
 HUB     41.79     37.84     3.95   526.28   790.10     16.11   538.78      0.69

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     20.42   650.11    293.62    580.03  1166.94      0.56
 MEAN    18.01   668.62    316.48    588.97  1163.17      0.57
 HUB     15.22   729.23    415.47    599.30  1159.51      0.63
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   712.01   412.94     0.61  5999.81
 MEAN   623.16   664.03   306.68     0.57  5703.53     1.40
 HUB    526.73   609.55   111.27     0.53  6327.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.19     1.20    18.78   601.09     1.06   565.81     0.92     0.91
 MEAN    22.99     1.19    18.37   599.44     1.06   562.13     0.92     0.91
 HUB     23.41     1.21    17.93   602.91     1.06   558.53     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.85    35.45    31.50     3.95     0.93     0.28     2.90
 MEAN    28.25    27.51    23.50     4.01     0.92     0.28     3.30     0.91
 HUB     34.73    10.52     6.50     4.02     0.92     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     777.403     317.372     709.669    1151.098       0.675      -0.273

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.148      17.048     550.688      46.000      24.095      30.600       6.505

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     716.118     317.372     783.294    1159.058       0.618      -0.118

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      23.019      17.788     558.330     455.853       0.037       0.225

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     708.522       0.000     708.522    1160.004       0.611       0.147

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      17.760     559.234       0.000       0.060       0.071      -0.124

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.834      22.854       1.182     601.148      33.386     270.311       2.095

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 207992.125       0.417    2291.396 1806066.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 4.041   EfDer =  0.950

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    194.949    3965.000      22.854     601.148       1.000       1.000       0.880
W Kg/sec =   88.61320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    134.993    3683.077       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149970.859  152969.953       1.246     489.817     393.167     384.470       0.978

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   648.91    -0.22   648.91     0.56   645.05
 MEAN    17.74     0.00    -0.02   648.91    -0.22   648.91     0.56
 HUB     15.05     0.00    -0.02   648.91    -0.22   648.91     0.56

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.95    46.36     0.59   694.45   950.61    18.52   566.00     0.81
 MEAN    43.42    43.40     0.02   613.77   893.35    18.52   566.00     0.77
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HUB     38.76    38.84    -0.08   520.75   832.17    18.52   566.00     0.71

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   626.46   271.68   564.49  1199.82     0.52
MEAN    17.51   643.65   297.79   570.62  1197.06     0.54
HUB     14.85   701.67   396.95   578.59  1194.36     0.59

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    685.45   699.90   413.77     0.58  5386.43
MEAN   605.75   648.41   307.95     0.54  5217.33     1.47
HUB    513.83   590.28   116.87     0.49  5898.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.49     1.16    22.00   631.05     1.05   598.30     0.92     0.87
MEAN    26.37     1.15    21.66   630.11     1.05   595.54     0.92     0.87
HUB     26.86     1.18    21.26   633.89     1.05   592.81     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.70    36.24    31.50     4.74     0.93     0.31     2.90
MEAN    27.56    28.35    23.50     4.85     0.90     0.32     3.28     0.87
HUB     34.45    11.42     6.50     4.92     0.90     0.35     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.950

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     650.755     299.749     577.609    1197.757       0.543       0.008

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.526      21.697     596.341      46.000      27.427      31.500       4.073

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     592.144     299.749     663.689    1203.847       0.492       0.158

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.454      22.418     602.420     471.992       0.025       0.274

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.121     572.961       0.000     572.961    1205.709       0.475       0.180

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      22.586     604.285       0.000       0.060       0.042       0.192

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.823      26.367       1.154     631.683      30.536     276.142       2.141

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 190352.516       0.405    2097.065 2000684.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 4.041   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    194.949    3965.000      26.367     631.683       1.000       1.000       0.980
W Kg/sec =   88.61320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    119.943    3592.954       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149970.859  152969.953       1.469     513.330     349.360     401.059       1.148
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    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   534.15    -0.18   534.15     0.44   603.87
MEAN    16.97     0.00    -0.02   534.15    -0.18   534.15     0.44
HUB     14.32     0.00    -0.02   534.15    -0.18   534.15     0.44

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.29    46.36     4.93   666.42   854.21    23.06   607.88     0.71
MEAN    47.72    43.80     3.92   587.21   793.94    23.06   607.88     0.66
HUB     42.86    37.84     5.02   495.49   728.70    23.06   607.88     0.60

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   599.28   271.52   534.24  1231.19     0.49
MEAN    16.57   613.82   290.83   540.55  1228.10     0.50
HUB     13.89   665.71   378.07   547.93  1225.04     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    653.27   656.61   381.75     0.53  5129.85
MEAN   573.48   609.98   282.65     0.50  4823.28     1.40
HUB    480.61   557.44   102.54     0.46  5254.06

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     30.33     1.15    25.79   660.14     1.05   630.19     0.92     0.91
MEAN    30.08     1.14    25.36   658.44     1.04   627.02     0.92     0.91
HUB     30.43     1.15    24.89   660.83     1.05   623.87     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     26.94    35.55    31.50     4.05     0.93     0.29     2.90
MEAN    28.28    27.60    23.50     4.10     0.92     0.29     3.29     0.91
HUB     34.61    10.60     6.50     4.10     0.92     0.30     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     603.498     292.464     527.897    1230.399       0.490       0.057

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    30.229      25.641     629.423      46.000      28.987      32.400       3.413

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     548.700     292.464     621.777    1235.536       0.444       0.204

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      30.173      26.349     634.690     456.573       0.021       0.302

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     519.598       0.000     519.598    1238.058       0.420       0.203

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      26.643     637.283       0.000       0.060       0.041       0.263

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.863      30.078       1.141     659.803      28.120     272.688       2.114

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 175417.938       0.411    1932.535 1714861.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
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 RESET =  0.000BLEED =  0.000 DPInc = 4.041   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    194.949    3965.000      30.078     659.803       1.000       1.000       0.980
W Kg/sec =   88.61320

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    107.457    3515.557       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149970.859  152969.953       1.628     509.668     313.019     390.276       1.247

    ROTOR LEADING EDGE CONDITIONS, STAGE             5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   482.20    -0.17   482.20     0.39   562.02
MEAN    15.91     0.00    -0.02   482.20    -0.17   482.20     0.39
HUB     13.07     0.00    -0.02   482.20    -0.17   482.20     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     52.75    47.36     5.39   633.89   796.59    27.10   640.42     0.64
MEAN    48.80    44.80     4.00   550.61   732.03    27.10   640.42     0.59
HUB     43.17    38.84     4.33   452.24   661.20    27.10   640.42     0.53

     ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   556.35   271.83   485.42  1260.80     0.44
MEAN    15.50   565.15   277.93   492.08  1257.00     0.45
HUB     12.59   605.64   342.51   499.48  1253.25     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.74   597.81   348.91     0.47  4879.72
MEAN   536.24   555.76   258.30     0.44  4309.91     1.44
HUB    435.63   508.09    93.11     0.41  4314.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     34.18     1.14    29.90   686.85     1.04   661.05     0.92     0.91
MEAN    33.68     1.12    29.31   683.69     1.04   657.07     0.92     0.91
HUB     33.68     1.12    28.71   683.72     1.04   653.14     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     29.25    35.71    31.50     4.21     0.93     0.31     2.90
MEAN    29.46    27.70    23.50     4.20     0.92     0.30     3.34     0.91
HUB     34.44    10.56     6.50     4.06     0.92     0.29     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     571.431     283.028     496.415    1257.426       0.454      -0.004

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    33.754      29.293     657.533      46.000      29.689      33.000       3.311

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     521.987     283.028     593.781    1261.728       0.414       0.136

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      33.667      29.923     662.040     440.827       0.039       0.317

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    14.701     485.831       0.000     485.831    1264.620       0.384       0.244

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      30.401     665.078       0.000       0.060       0.040       0.242

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.866      33.662       1.119     684.754      24.951     282.216       2.188

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  155771.672       0.404    1716.097 1739081.250

    OVERALL EXIT CONDITIONS; ALL          5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1009394.50  11120.2432    190.4457      2.2282      0.8337      4.0409      1.3098


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 105% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 4.453   EfDer =  0.995

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     192.609    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   87.54964

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     188.160    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  148170.891  151133.984       1.518     831.557     547.963     619.754       1.131

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   467.10    -0.16   467.10     0.42   710.99
  MEAN    17.06     0.00    -0.02   467.10    -0.16   467.10     0.42
  HUB     12.51     0.00    -0.02   467.10    -0.16   467.10     0.42

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.81    50.47     6.34   713.82   853.20    13.35   504.59     0.77
  MEAN    51.65    47.20     4.45   590.30   752.88    13.35   504.59     0.68
  HUB     42.83    38.62     4.21   432.86   636.94    13.35   504.59     0.58

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   720.64   380.94   611.72  1122.37     0.64
  MEAN    18.04   761.83   432.12   627.41  1116.63     0.68
  HUB     15.00   884.72   585.28   663.46  1104.78     0.80

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   696.43   332.88     0.62  7862.08
  MEAN   624.07   656.12   191.94     0.59  7796.52     1.27
  HUB    519.02   666.76    66.26     0.60  8781.17

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.51     1.29    14.78   566.51     1.08   523.16     0.92     0.91
  MEAN    19.47     1.29    14.25   566.15     1.08   517.71     0.92     0.91
  HUB     20.08     1.33    13.15   571.62     1.09   506.35     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     31.91    28.55    24.20     4.35     0.93     0.26     2.90
  MEAN    34.56    17.01    12.70     4.31     0.92     0.21     3.51     0.91
  HUB     41.42    -5.70    -9.30     3.60     0.92     0.06     4.78
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     776.795     431.283     646.069    1116.161       0.696      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.629      14.197     517.693      24.000      33.725      35.400       1.675

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     669.936     431.283     796.756    1129.995       0.593       0.236

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.528      15.391     530.605     528.796       0.028       0.399

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     610.447       0.000     610.447    1136.749       0.537       0.311

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.947     536.967       0.000       0.060       0.049       0.335

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.860      19.410       1.285     568.092      45.282     227.379       1.763

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 281917.562       0.553    3068.538 1964124.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 4.453   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    192.609    3965.000      19.410     568.092       1.000       1.000       0.980
W Kg/sec =   87.54964

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    152.661    3788.716       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 148170.891  151133.984       1.328     590.487     444.600     474.134       1.066

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   577.09    -0.20   577.09     0.51   679.42
 MEAN    18.08     0.00    -0.02   577.09    -0.20   577.09     0.51
 HUB     15.21     0.00    -0.02   577.09    -0.20   577.09     0.51

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.95    46.36     4.59   711.05   915.92    16.29   540.29     0.80
 MEAN    47.32    42.30     5.02   625.53   851.21    16.29   540.29     0.75
 HUB     42.37    37.84     4.53   526.28   781.16    16.29   540.29     0.69

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   642.74   303.27   566.70  1169.20     0.55
 MEAN    18.01   660.67   323.38   576.12  1165.11     0.57
 HUB     15.22   720.49   418.00   586.83  1161.14     0.62

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   695.55   403.28     0.59  6196.88
 MEAN   623.16   649.45   299.79     0.56  5827.61     1.42
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 HUB    526.73   596.82   108.73     0.51  6366.28

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.42     1.21    19.06   602.51     1.06   568.03     0.92     0.91
 MEAN    23.16     1.19    18.62   600.46     1.06   564.03     0.92     0.91
 HUB     23.53     1.21    18.15   603.45     1.06   560.13     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.15    35.44    31.50     3.94     0.93     0.30     2.90
 MEAN    29.31    27.49    23.50     3.99     0.92     0.29     3.30     0.91
 HUB     35.46    10.50     6.50     4.00     0.92     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     763.438     324.285     691.141    1154.014       0.662      -0.260

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.324      17.383     553.480      46.000      25.136      30.600       5.464

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     694.687     324.285     766.649    1162.707       0.597      -0.080

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      23.214      18.231     561.850     455.853       0.033       0.243

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     686.221       0.000     686.221    1163.721       0.590       0.179

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      18.234     562.827       0.000       0.060       0.062      -0.079

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.849      23.078       1.189     602.144      34.052     263.602       2.043

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 212141.344       0.425    2309.057 1773866.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.453   EfDer =  0.962

    W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     192.609    3965.000      23.078     602.144       1.000       1.000       0.880
W Kg/sec =   87.54964

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     132.187    3680.029       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 148170.891  151133.984       1.272     489.817     384.994     384.470       0.999

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   630.26    -0.22   630.26     0.54   644.52
 MEAN    17.74     0.00    -0.02   630.26    -0.22   630.26     0.54
 HUB     15.05     0.00    -0.02   630.26    -0.22   630.26     0.54

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.78    46.36     1.42   694.45   937.97    18.94   568.99     0.80
 MEAN    44.25    43.40     0.85   613.77   879.89    18.94   568.99     0.75
 HUB     39.58    38.84     0.74   520.75   817.70    18.94   568.99     0.70

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
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B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	616.84	284.80	547.15	1203.24	0.51
MEAN	17.51	633.42	307.26	553.91	1200.05	0.53
HUB	14.85	690.37	400.68	562.20	1196.96	0.58

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	685.45	678.15	400.64	0.56	5646.34	
MEAN	605.75	629.21	298.48	0.52	5382.97	1.50
HUB	513.83	573.48	113.15	0.48	5953.31	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.99	1.17	22.55	633.49	1.05	601.74	0.92	0.88
MEAN	26.79	1.16	22.16	632.03	1.05	598.55	0.92	0.88
HUB	27.21	1.18	21.71	635.19	1.05	595.42	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.50	36.21	31.50	4.71	0.93	0.33	2.90	
MEAN	29.02	28.32	23.50	4.82	0.91	0.34	3.28	0.88
HUB	35.48	11.38	6.50	4.88	0.91	0.36	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.962

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	640.172	309.280	560.505	1200.792	0.533	0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
26.948	22.203	599.365	46.000	28.889	31.500	2.611

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	572.596	309.280	650.784	1207.624	0.474	0.187

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	26.888	23.049	606.205	471.992	0.022	0.296

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	554.231	0.000	554.231	1209.343	0.458	0.207

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.208	607.932	0.000	0.060	0.039	0.220

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.840	26.807	1.162	633.568	31.424	266.346	2.065

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
195897.891	0.417	2132.255	1956572.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 4.453 EfDer = 0.996

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
192.609	3965.000	26.807	633.568	1.000	1.000	0.980

W Kg/sec = 87.54964

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
116.729	3587.606	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
148170.891	151133.984	1.510	513.330	339.999	401.059	1.180

ROTOR LEADING EDGE CONDITIONS, STAGE 4

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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   517.34    -0.18   517.34     0.43   602.97
MEAN    16.97     0.00    -0.02   517.34    -0.18   517.34     0.43
HUB     14.32     0.00    -0.02   517.34    -0.18   517.34     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     52.19    46.36     5.83   666.42   843.80    23.65   611.24     0.70
MEAN    48.63    43.80     4.83   587.21   782.73    23.65   611.24     0.65
HUB     43.77    37.84     5.93   495.49   716.47    23.65   611.24     0.59

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   589.30   284.97   515.82  1235.35     0.48
MEAN    16.57   602.83   300.53   522.57  1231.89     0.49
HUB     13.89   653.37   381.68   530.29  1228.47     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    653.27   633.81   368.29     0.51  5383.76
MEAN   573.48   589.56   272.94     0.48  4984.04     1.44
HUB    480.61   539.44    98.93     0.44  5304.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     31.05     1.16    26.57   663.43     1.05   634.47     0.92     0.91
MEAN    30.72     1.15    26.08   661.21     1.04   630.90     0.92     0.91
HUB     30.98     1.16    25.55   662.99     1.05   627.39     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     28.92    35.53    31.50     4.03     0.93     0.31     2.90
MEAN    29.90    27.58    23.50     4.08     0.92     0.30     3.29     0.91
HUB     35.74    10.57     6.50     4.07     0.92     0.31     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     593.298     302.224     510.552    1234.068       0.481       0.056

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.870      26.350     633.184      46.000      30.624      32.400       1.776

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     528.982     302.224     609.230    1239.922       0.427       0.233

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.824      27.195     639.205     456.573       0.019       0.327

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     501.230       0.000     501.230    1242.232       0.403       0.231

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.472     641.590       0.000       0.060       0.038       0.290

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      30.735       1.147     662.545      28.977     262.371       2.034

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 180778.547       0.424    1967.688 1679867.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 4.453   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
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    192.609    3965.000      30.735     662.545       1.000       1.000       0.980
W Kg/sec =   87.54964

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.113    3508.274       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
148170.891  151133.984       1.681     509.668     303.279     390.276       1.287

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   465.65    -0.16   465.65     0.37   560.86
MEAN    15.91     0.00    -0.02   465.65    -0.16   465.65     0.37
HUB     13.07     0.00    -0.02   465.65    -0.16   465.65     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.71    47.36     6.35   633.89   786.67    27.90   644.47     0.63
MEAN    49.79    44.80     4.99   550.61   721.23    27.90   644.47     0.58
HUB     44.17    38.84     5.33   452.24   649.23    27.90   644.47     0.52

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   547.57   284.98   467.56  1265.41     0.43
MEAN    15.50   554.76   287.51   474.44  1261.32     0.44
HUB     12.59   593.34   346.04   481.99  1257.27     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.74   575.63   335.76     0.45  5115.57
MEAN   536.24   535.68   248.72     0.42  4458.33     1.47
HUB    435.63   490.24    89.59     0.39  4358.75

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     35.14     1.14    30.89   690.90     1.04   665.90     0.92     0.91
MEAN    34.55     1.12    30.25   687.26     1.04   661.60     0.92     0.91
HUB     34.46     1.12    29.58   686.70     1.04   657.36     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.36    35.68    31.50     4.18     0.93     0.33     2.90
MEAN    31.22    27.67    23.50     4.17     0.92     0.32     3.34     0.91
HUB     35.68    10.53     6.50     4.03     0.92     0.31     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     561.028     292.786     478.570    1261.729       0.445      -0.004

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    34.624      30.227     662.047      46.000      31.458      33.000       1.542

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     501.563     292.786     580.766    1266.738       0.396       0.173

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      34.554      31.013     667.315     440.827       0.036       0.343

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    14.701     467.385       0.000     467.385    1269.356       0.368       0.275

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      31.456     670.076       0.000       0.060       0.037       0.272

   STAGE EXIT CONDITIONS, STAGE            5
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      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      34.546       1.124     688.286      25.740     270.907       2.100

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  160715.938       0.417    1749.316 1703643.625

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1031451.31  11226.8545    188.1599      2.2868      0.8456      4.4532      1.3165


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
******************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 105% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     189.777    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   86.26234

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     185.393    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  145992.219  148911.750       1.540     831.557     539.905     619.754       1.148

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   458.78    -0.16   458.78     0.42   710.99
  MEAN    17.06     0.00    -0.02   458.78    -0.16   458.78     0.42
  HUB     12.51     0.00    -0.02   458.78    -0.16   458.78     0.42

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.28    50.47     6.81   713.82   848.67    13.41   505.23     0.77
  MEAN    52.15    47.20     4.95   590.30   747.74    13.41   505.23     0.68
  HUB     43.35    38.62     4.73   432.86   630.86    13.41   505.23     0.57

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   712.89   388.52   597.71  1124.25     0.63
  MEAN    18.04   752.96   436.34   613.64  1118.23     0.67
  HUB     15.00   872.45   583.74   648.39  1106.46     0.79

        U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   680.50   325.31     0.61  8018.33
  MEAN   624.07   641.72   187.72     0.57  7872.61     1.29
  HUB    519.02   651.62    64.72     0.59  8758.10

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.62     1.30    14.96   567.38     1.09   524.95     0.92     0.91
  MEAN    19.53     1.29    14.40   566.57     1.08   519.25     0.92     0.91
  HUB     20.07     1.33    13.31   571.49     1.09   508.01     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     33.02    28.56    24.20     4.36     0.93     0.28     2.90
  MEAN    35.42    17.01    12.70     4.31     0.92     0.23     3.51     0.91
  HUB     42.00    -5.70    -9.30     3.60     0.92     0.07     4.78


    blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     766.925     435.497     631.282    1117.949       0.686      -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.683      14.362     519.353      24.000      34.600      35.400       0.800

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     652.478     435.497     784.465    1132.458       0.576       0.256

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.589      15.638     532.921     528.796       0.027       0.413

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     595.259       0.000     595.259    1138.777       0.523       0.328

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.171     538.884       0.000       0.060       0.046       0.353

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      19.485       1.290     568.479      45.669     223.907       1.736

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 284331.688       0.558    3049.309 1929115.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    189.777    3965.000      19.485     568.479       1.000       1.000       0.980
W Kg/sec =   86.26234

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    149.883    3787.424       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 145992.219  148911.750       1.353     590.487     436.508     474.134       1.086

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   563.33    -0.19   563.32     0.49   679.19
 MEAN    18.08     0.00    -0.02   563.33    -0.19   563.32     0.49
 HUB     15.21     0.00    -0.02   563.33    -0.19   563.32     0.49

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.62    46.36     5.26   711.05   907.31    16.50   541.98     0.79
 MEAN    48.00    42.30     5.70   625.53   841.94    16.50   541.98     0.74
 HUB     43.06    37.84     5.22   526.28   771.05    16.50   541.98     0.68

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   634.90   314.10   551.76  1171.70     0.54
 MEAN    18.01   651.98   331.17   561.61  1167.27     0.56
 HUB     15.22   710.71   420.86   572.70  1162.96     0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   677.10   392.46     0.58  6417.82
 MEAN   623.16   632.99   292.00     0.54  5967.79     1.44
 HUB    526.73   582.40   105.87     0.50  6409.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     23.67     1.21    19.38   604.13     1.06   570.48     0.92     0.91
 MEAN    23.36     1.20    18.89   601.63     1.06   566.14     0.92     0.91
 HUB     23.66     1.21    18.38   604.08     1.06   561.92     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.65    35.42    31.50     3.92     0.93     0.31     2.90
 MEAN    30.53    27.47    23.50     3.97     0.92     0.31     3.30     0.91
 HUB     36.31    10.47     6.50     3.97     0.92     0.31     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     748.464     332.095     670.754    1157.166       0.647      -0.245

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.515      17.744     556.507      46.000      26.340      30.600       4.260

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     671.577     332.095     749.201    1166.605       0.576      -0.038

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      23.423      18.706     565.623     455.853       0.030       0.263

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     662.566       0.000     662.566    1167.642       0.567       0.211

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      18.733     566.627       0.000       0.060       0.053      -0.032

    STAGE EXIT CONDITIONS, STAGE            2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.862      23.312       1.196     603.280      34.801     256.223       1.986

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 216807.922       0.434    2325.152 1736252.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.974

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    189.777    3965.000      23.312     603.280       1.000       1.000       0.880
W Kg/sec =   86.26234

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    129.055    3676.561       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 145992.219  148911.750       1.303     489.817     375.874     384.470       1.023

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   610.19    -0.21   610.19     0.52   643.91
 MEAN    17.74     0.00    -0.02   610.19    -0.21   610.19     0.52
 HUB     15.05     0.00    -0.02   610.19    -0.21   610.19     0.52

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.70    46.36     2.34   694.45   924.60    19.38   572.21     0.79
 MEAN    45.18    43.40     1.78   613.77   865.62    19.38   572.21     0.74
 HUB     40.49    38.84     1.65   520.75   802.33    19.38   572.21     0.68

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   607.29   298.76   528.72  1206.86      0.50
MEAN    17.51   622.95   317.40   536.03  1203.26      0.52
HUB     14.85   678.53   404.69   544.64  1199.76      0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    685.45   655.03   386.69     0.54  5922.69
MEAN   605.75   608.66   288.34     0.51  5560.36     1.52
HUB    513.83   555.47   109.14     0.46  6012.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     27.51     1.18    23.14   636.16     1.05   605.38     0.92     0.89
MEAN    27.24     1.17    22.68   634.15     1.05   601.76     0.92     0.89
HUB     27.58     1.18    22.19   636.66     1.06   598.24     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     29.47    36.18    31.50     4.68     0.93     0.35     2.90
MEAN    30.63    28.28    23.50     4.78     0.91     0.35     3.28     0.89
HUB     36.61    11.33     6.50     4.83     0.91     0.37     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      629.383     319.486     542.265     1204.021       0.523       0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     27.392      22.734      602.594      46.000      30.505       31.500       0.995

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392      552.090     319.486     637.867     1211.611       0.456       0.218

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.341       23.709     610.215      471.992       0.021       0.321

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     534.621       0.000     534.621     1213.183       0.441       0.235

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.857      611.799       0.000       0.060       0.037       0.249

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.855      27.264       1.170     635.653      32.373     256.283       1.987

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 201818.172       0.430    2164.395 1907212.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    189.777    3965.000      27.264     635.653       1.000       1.000       0.980
W Kg/sec =   86.26234

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    113.273    3581.717       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 145992.219  148911.750       1.556     513.330     329.933     401.059       1.216

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   499.64    -0.17   499.64     0.41   601.98
 MEAN    16.97     0.00    -0.02   499.64    -0.17   499.64     0.41
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 HUB     14.32     0.00    -0.02   499.64    -0.17   499.64     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.15    46.36     6.79   666.42   833.06    24.27   614.83     0.69
 MEAN    49.61    43.80     5.81   587.21   771.14    24.27   614.83     0.63
 HUB     44.77    37.84     6.93   495.49   703.79    24.27   614.83     0.58

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   579.79   298.81   496.86  1239.67     0.47
 MEAN    16.57   591.97   310.57   503.96  1235.86     0.48
 HUB     13.89   640.79   385.41   511.94  1232.09     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   610.34   354.46     0.49  5644.80
 MEAN   573.48   568.41   262.90     0.46  5150.32     1.47
 HUB    480.61   520.71    95.20     0.42  5355.74

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.80     1.17    27.37   666.96     1.05   638.92     0.92     0.91
 MEAN    31.38     1.15    26.82   664.22     1.04   634.99     0.92     0.91
 HUB     31.55     1.16    26.24   665.36     1.05   631.11     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.02    35.50    31.50     4.00     0.93     0.33     2.90
 MEAN    31.64    27.55    23.50     4.05     0.92     0.32     3.29     0.91
 HUB     36.97    10.53     6.50     4.03     0.92     0.33     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     583.243     312.320     492.574    1237.914       0.471       0.055

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.529      27.079     637.140      46.000      32.377      32.400       0.023

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     508.833     312.320     597.039    1244.481       0.409       0.263

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.488      28.062     643.918     456.573       0.018       0.353

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     482.493       0.000     482.493    1246.584       0.387       0.260

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.317     646.096       0.000       0.060       0.037       0.317

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      31.402       1.152     665.514      29.861     252.089       1.954

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 186303.312       0.437    1998.006 1640577.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     189.777    3965.000      31.402     665.514       1.000       1.000       0.980
 W Kg/sec =   86.26234
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
100.629	3500.441	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
145992.219	148911.750	1.739	509.668	293.132	390.276	1.331

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	448.70	-0.15	448.70	0.36	559.61
MEAN	15.91	0.00	-0.02	448.70	-0.15	448.70	0.36	
HUB	13.07	0.00	-0.02	448.70	-0.15	448.70	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.71	47.36	7.35	633.89	776.75	28.72	648.73	0.62
MEAN	50.83	44.80	6.03	550.61	710.40	28.72	648.73	0.57
HUB	45.23	38.84	6.39	452.24	637.17	28.72	648.73	0.51

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	539.51	298.20	449.60	1270.15	0.42
MEAN	15.50	544.79	297.16	456.61	1265.79	0.43
HUB	12.59	581.17	349.63	464.24	1261.47	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.74	553.33	322.55	0.44	5352.53	
MEAN	536.24	515.41	239.08	0.41	4607.65	1.51
HUB	435.63	472.14	86.00	0.37	4403.88	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	36.11	1.15	31.89	695.18	1.04	670.91	0.92	0.91
MEAN	35.42	1.13	31.19	691.05	1.04	666.31	0.92	0.91
HUB	35.24	1.12	30.46	689.92	1.04	661.77	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.55	35.66	31.50	4.16	0.93	0.35	2.90	
MEAN	33.06	27.64	23.50	4.14	0.93	0.34	3.34	0.91
HUB	36.98	10.49	6.50	3.99	0.93	0.33	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	551.073	302.604	460.556	1266.178	0.435	-0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
35.501	31.167	666.734	46.000	33.307	33.000	-0.307

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	481.305	302.604	568.528	1271.866	0.378	0.209

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	35.439	32.102	672.738	440.827	0.034	0.371

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	449.004	0.000	449.004	1274.232	0.352	0.305

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	32.512	675.243	0.000	0.060	0.037	0.302

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.881	35.428	1.128	692.049	26.535	259.918	2.015

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 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  165692.266       0.430    1776.963 1664110.625

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1054953.38  11313.8242    185.3932      2.3451      0.8552      4.9534      1.3237


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 105% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     186.954    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   84.97911

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     182.635    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  143820.469  146696.562       1.563     831.557     531.874     619.754       1.165

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   450.57    -0.16   450.57     0.41   710.99
  MEAN    17.06     0.00    -0.02   450.57    -0.16   450.57     0.41
  HUB     12.51     0.00    -0.02   450.57    -0.16   450.57     0.41

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.75    50.47     7.28   713.82   844.26    13.47   505.85     0.77
  MEAN    52.65    47.20     5.45   590.30   742.73    13.47   505.85     0.67
  HUB     43.86    38.62     5.24   432.86   624.91    13.47   505.85     0.57

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   705.72   395.79   584.29  1126.00     0.63
  MEAN    18.04   744.60   440.41   600.38  1119.73     0.66
  HUB     15.00   860.76   582.27   633.93  1108.04     0.78

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   665.24   318.04     0.59  8168.25
  MEAN   624.07   627.85   183.66     0.56  7945.93     1.31
  HUB    519.02   637.07    63.26     0.57  8736.06

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.72     1.31    15.13   568.21     1.09   526.63     0.92     0.91
  MEAN    19.58     1.30    14.55   566.98     1.08   520.70     0.92     0.91
  HUB     20.07     1.33    13.46   571.37     1.09   509.56     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     34.11    28.56    24.20     4.36     0.93     0.29     2.90
  MEAN    36.26    17.01    12.70     4.31     0.92     0.24     3.51     0.91
  HUB     42.57    -5.70    -9.30     3.60     0.92     0.09     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.998

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     757.678     439.556     617.144    1119.616       0.677      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.733      14.515     520.903      24.000      35.460      35.400      -0.060

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     636.091     439.556     773.189    1134.726       0.561       0.275

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.644      15.866     535.058     528.796       0.027       0.427

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     18.083     581.002       0.000     581.002    1140.649       0.509       0.344

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.375     540.658       0.000       0.060       0.044       0.369

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.871      19.551       1.294     568.852      46.042     220.546       1.710

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 286652.688       0.563    3028.469 1894596.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    186.954    3965.000      19.551     568.852       1.000       1.000       0.980
W Kg/sec =   84.97911

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    147.205    3786.183       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 143820.469  146696.562       1.377     590.487     428.709     474.134       1.106

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   550.34    -0.19   550.34     0.48   678.97
 MEAN    18.08     0.00    -0.02   550.34    -0.19   550.34     0.48
 HUB     15.21     0.00    -0.02   550.34    -0.19   550.34     0.48

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.27    46.36     5.91   711.05   899.30    16.68   543.56     0.79
 MEAN    48.67    42.30     6.37   625.53   833.31    16.68   543.56     0.73
 HUB     43.73    37.84     5.89   526.28   761.61    16.68   543.56     0.67

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   628.04   324.10   537.95  1173.97     0.53
 MEAN    18.01   644.16   338.39   548.12  1169.24     0.55
 HUB     15.22   701.71   423.53   559.49  1164.64     0.60

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   660.05   382.45     0.56  6622.08
 MEAN   623.16   617.69   284.77     0.53  6097.83     1.46
 HUB    526.73   568.93   103.21     0.49  6450.22

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.89     1.22    19.66   605.64     1.06   572.71     0.92     0.91
 MEAN    23.52     1.20    19.14   602.72     1.06   568.08     0.92     0.91
 HUB     23.77     1.22    18.59   604.68     1.06   563.58     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.07    35.41    31.50     3.91     0.93     0.33     2.90
 MEAN    31.69    27.45    23.50     3.95     0.93     0.32     3.30     0.91
 HUB     37.13    10.45     6.50     3.95     0.93     0.32     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     735.200     339.341     652.202    1159.979       0.634      -0.233

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.683      18.065     559.216      46.000      27.488      30.600       3.112

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     650.928     339.341     734.071    1170.051       0.556      -0.001

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      23.604      19.125     568.969     455.853       0.027       0.282

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     641.705       0.000     641.705    1171.075       0.548       0.240

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      19.167     569.965       0.000       0.060       0.047       0.008

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      23.513       1.203     604.347      35.495     249.531       1.934

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 221131.391       0.443    2336.241 1700022.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.982

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    186.954    3965.000      23.513     604.347       1.000       1.000       0.880
W Kg/sec =   84.97911

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    126.164    3673.315       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 143820.469  146696.562       1.333     489.817     367.454     384.470       1.046

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   592.27    -0.20   592.27     0.50   643.34
 MEAN    17.74     0.00    -0.02   592.27    -0.20   592.27     0.50
 HUB     15.05     0.00    -0.02   592.27    -0.20   592.27     0.50

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.55    46.36     3.19   694.45   912.86    19.77   575.07     0.78
 MEAN    46.03    43.40     2.63   613.77   853.08    19.77   575.07     0.73
 HUB     41.33    38.84     2.49   520.75   788.78    19.77   575.07     0.67

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   599.49   311.08   512.46  1210.03     0.50
 MEAN    17.51   614.09   326.36   520.19  1206.09     0.51
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 HUB     14.85   668.23   408.23   529.04  1202.26     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   634.64   374.36     0.52  6166.68
 MEAN   605.75   590.47   279.39     0.49  5716.99     1.55
 HUB    513.83   539.47   105.60     0.45  6065.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.96     1.19    23.64   638.58     1.06   608.58     0.92     0.90
 MEAN    27.62     1.17    23.14   636.08     1.05   604.61     0.92     0.90
 HUB     27.88     1.19    22.60   638.01     1.06   600.75     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.26    36.15    31.50     4.65     0.93     0.36     2.90
 MEAN    32.10    28.24    23.50     4.74     0.91     0.37     3.28     0.90
 HUB     37.66    11.29     6.50     4.79     0.91     0.38     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     620.268     328.497     526.138    1206.869       0.514       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.775      23.191     605.448      46.000      31.979      31.500      -0.479

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     534.222     328.497     627.139    1215.104       0.440       0.245

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.727      24.277     613.739     471.992       0.020       0.343

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     517.573       0.000     517.573    1216.549       0.425       0.260

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.411     615.200       0.000       0.060       0.037       0.274

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      27.650       1.176     637.557      33.210     247.696       1.920

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 207044.406       0.441    2187.412 1861347.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    186.954    3965.000      27.650     637.557       1.000       1.000       0.980
W Kg/sec =   84.97911

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    110.195    3576.365       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 143820.469  146696.562       1.599     513.330     320.969     401.059       1.250

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   484.19    -0.17   484.19     0.40   601.08
 MEAN    16.97     0.00    -0.02   484.19    -0.17   484.19     0.40
 HUB     14.32     0.00    -0.02   484.19    -0.17   484.19     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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 TIP     54.01    46.36     7.65   666.42   823.88    24.80   618.00     0.68
 MEAN    50.50    43.80     6.70   587.21   761.21    24.80   618.00     0.62
 HUB     45.67    37.84     7.83   495.49   692.90    24.80   618.00     0.57

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   572.28   310.66   480.62  1243.41     0.46
 MEAN    16.57   583.06   319.20   487.92  1239.31     0.47
 HUB     13.89   630.15   388.60   496.06  1235.27     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   590.24   342.61     0.47  5868.40
 MEAN   573.48   550.20   254.27     0.44  5293.25     1.50
 HUB    480.61   504.52    92.01     0.41  5400.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.43     1.17    28.04   670.10     1.05   642.79     0.92     0.91
 MEAN    31.94     1.16    27.44   666.91     1.05   638.56     0.92     0.91
 HUB     32.03     1.16    26.81   667.51     1.05   634.39     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.88    35.48    31.50     3.98     0.93     0.35     2.90
 MEAN    33.19    27.53    23.50     4.03     0.93     0.34     3.29     0.91
 HUB     38.07    10.51     6.50     4.01     0.93     0.34     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     575.017     320.998     477.080    1241.264       0.463       0.054

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.083      27.692     640.597      46.000      33.934      32.400      -1.534

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     491.678     320.998     587.185    1248.427       0.394       0.289

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      32.043      28.791     648.012     456.573       0.019       0.376

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     466.563       0.000     466.563    1250.359       0.373       0.283

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.023     650.019       0.000       0.060       0.037       0.339

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      31.954       1.156     668.176      30.619     243.527       1.888

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 191043.250       0.448    2018.361 1603914.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    186.954    3965.000      31.954     668.176       1.000       1.000       0.980
W Kg/sec =   84.97911

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.613    3493.462       1.401       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
143820.469	146696.562	1.792	509.668	284.347	390.276	1.373

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	434.24	-0.15	434.24	0.35	558.49
MEAN	15.91	0.00	-0.02	434.24	-0.15	434.24	0.35	
HUB	13.07	0.00	-0.02	434.24	-0.15	434.24	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.59	47.36	8.23	633.89	768.49	29.40	652.46	0.61
MEAN	51.75	44.80	6.95	550.61	701.35	29.40	652.46	0.56
HUB	46.17	38.84	7.33	452.24	627.07	29.40	652.46	0.50

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	533.35	309.27	434.53	1274.21	0.42
MEAN	15.50	536.83	305.29	441.58	1269.64	0.42
HUB	12.59	571.10	352.63	449.23	1265.10	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.74	534.64	311.47	0.42	5551.04	
MEAN	536.24	498.32	230.95	0.39	4733.62	1.55
HUB	435.63	456.83	82.99	0.36	4441.62	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	36.91	1.16	32.72	698.94	1.05	675.22	0.92	0.91
MEAN	36.15	1.13	31.96	694.41	1.04	670.38	0.92	0.91
HUB	35.88	1.12	31.19	692.79	1.04	665.60	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.44	35.63	31.50	4.13	0.93	0.37	2.90	
MEAN	34.66	27.61	23.50	4.11	0.93	0.35	3.34	0.91
HUB	38.13	10.47	6.50	3.97	0.93	0.34	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	543.156	310.887	445.385	1270.009	0.428	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
36.225	31.942	670.786	46.000	34.916	33.000	-1.916

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	464.481	310.887	558.922	1276.249	0.364	0.239

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	36.161	32.997	677.394	440.827	0.035	0.395

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	433.686	0.000	433.686	1278.419	0.339	0.330

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	33.378	679.699	0.000	0.060	0.038	0.326

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.882	36.147	1.131	695.377	27.201	250.963	1.945

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
169870.781	0.441	1794.675	1627352.125

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   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1075742.50  11365.1582    182.6354      2.3927      0.8611      5.4534      1.3301


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 105% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    184.141    3965.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   83.70042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    179.887    3949.384       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141656.391  144489.219       1.587     831.557     523.871     619.754       1.183

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   442.47    -0.15   442.47     0.40   710.99
 MEAN    17.06     0.00    -0.02   442.47    -0.15   442.47     0.40
 HUB     12.51     0.00    -0.02   442.47    -0.15   442.47     0.40

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.21    50.47     7.74   713.82   839.96    13.52   506.46     0.76
 MEAN    53.15    47.20     5.95   590.30   737.85    13.52   506.46     0.67
 HUB     44.38    38.62     5.76   432.86   619.10    13.52   506.46     0.56

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   699.10   402.78   571.41  1127.65     0.62
 MEAN    18.04   736.69   444.34   587.60  1121.15     0.66
 HUB     15.00   849.60   580.88   620.01  1109.54     0.77

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    713.82   650.58   311.04     0.58  8312.49
 MEAN   624.07   614.47   179.73     0.55  8016.70     1.33
 HUB    519.02   623.08    61.86     0.56  8715.04

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.81     1.31    15.28   569.01     1.09   528.21     0.92     0.91
 MEAN    19.63     1.30    14.68   567.37     1.09   522.06     0.92     0.91
 HUB     20.06     1.33    13.60   571.25     1.09   511.03     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.18    28.56    24.20     4.36     0.93     0.31     2.90
 MEAN    37.10    17.01    12.70     4.31     0.92     0.26     3.51     0.91
 HUB     43.13    -5.70    -9.30     3.60     0.92     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     748.991     443.475     603.587    1121.176       0.668      -0.004
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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.779      14.659     522.356      24.000      36.306      35.400      -0.906

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     620.622     443.475     762.786    1136.827       0.546       0.293

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.692      16.076     537.041     528.796       0.026       0.440

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     567.531       0.000     567.531    1142.390       0.497       0.358

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.562     542.309       0.000       0.060       0.042       0.384

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      19.608       1.298     569.212      46.402     217.285       1.684

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 288890.125       0.567    3006.182 1860559.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    184.141    3965.000      19.608     569.212       1.000       1.000       0.980
W Kg/sec =   83.70042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    144.614    3784.988       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141656.391  144489.219       1.402     590.487     421.163     474.134       1.126

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   538.03    -0.19   538.03     0.47   678.75
 MEAN    18.08     0.00    -0.02   538.03    -0.19   538.03     0.47
 HUB     15.21     0.00    -0.02   538.03    -0.19   538.03     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.89    46.36     6.53   711.05   891.82    16.85   545.04     0.78
 MEAN    49.31    42.30     7.01   625.53   825.22    16.85   545.04     0.72
 HUB     44.38    37.84     6.54   526.28   752.76    16.85   545.04     0.66

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   622.01   333.45   525.08  1176.05     0.53
 MEAN    18.01   637.08   345.17   535.48  1171.07     0.54
 HUB     15.22   693.37   426.03   547.05  1166.21     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   644.14   373.11     0.55  6812.78
 MEAN   623.16   603.34   278.00     0.52  6219.77     1.48
 HUB    526.73   556.24   100.70     0.48  6488.27

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.09     1.23    19.91   607.05     1.07   574.75     0.92     0.91
 MEAN    23.68     1.21    19.36   603.76     1.06   569.88     0.92     0.91
 HUB     23.86     1.22    18.78   605.25     1.06   565.12     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.42    35.40    31.50     3.90     0.93     0.34     2.90
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 MEAN    32.81    27.44    23.50     3.94     0.93     0.33     3.30     0.91
 HUB     37.91    10.43     6.50     3.93     0.93     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     723.320     346.135     635.124    1162.523       0.622       -0.222

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.832      18.352     561.672      46.000      28.590      30.600       2.010

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     632.199     346.135     720.753    1173.147       0.539       0.033

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      23.763      19.498     571.984     455.853       0.025       0.299

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     622.958       0.000     622.958    1174.141       0.531       0.264

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      19.549     572.953       0.000       0.060       0.043       0.044

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.876      23.685       1.208     605.355      36.144     243.392       1.887

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 225176.828       0.451    2343.184 1664995.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.989

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    184.141    3965.000       23.685     605.355       1.000        1.000        0.880
W Kg/sec =   83.70042

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    123.465    3670.255        1.402       0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 141656.391  144489.219        1.362     489.817     359.594     384.470       1.069

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa     C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   576.00    -0.20   576.00      0.49   642.80
 MEAN    17.74      0.00    -0.02   576.00    -0.20   576.00      0.49
 HUB     15.05      0.00    -0.02   576.00    -0.20   576.00      0.49

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     50.33     46.36     3.97   694.45   902.39     20.11   577.67      0.77
 MEAN    46.83     43.40     3.43   613.77   841.87     20.11   577.67      0.71
 HUB     42.13     38.84     3.29   520.75   776.64     20.11   577.67      0.66

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   593.02    322.12    497.90   1212.87      0.49
 MEAN    17.51   606.46    334.43    505.92   1208.63      0.50
 HUB     14.85   659.12    411.42    514.95   1204.52      0.55

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
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 TIP    685.45   616.37   363.33     0.51  6385.20
 MEAN   605.75   574.08   271.32     0.47  5858.18     1.58
 HUB    513.83   525.03   102.41     0.44  6112.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.36     1.20    24.08   640.80     1.06   611.45     0.92     0.90
 MEAN    27.95     1.18    23.53   637.87     1.05   607.18     0.92     0.90
 HUB     28.15     1.19    22.96   639.28     1.06   603.03     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.90    36.12    31.50     4.62     0.93     0.38     2.90
 MEAN    33.47    28.20    23.50     4.70     0.92     0.38     3.28     0.90
 HUB     38.62    11.25     6.50     4.75     0.92     0.39     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     612.447     336.622     511.642    1209.421       0.506       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.107      23.589     608.014      46.000      33.342      31.500      -1.842

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     518.341     336.622     618.055    1218.222       0.425       0.269

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.058      24.771     616.895     471.992       0.020       0.364

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     502.449       0.000     502.449    1219.558       0.412       0.281

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.890     618.248       0.000       0.060       0.038       0.295

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      27.978       1.181     639.318      33.962     240.197       1.862

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 211739.891       0.451    2203.359 1818189.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    184.141    3965.000      27.978     639.318       1.000       1.000       0.980
W Kg/sec =   83.70042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    107.410    3571.437       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141656.391  144489.219       1.641     513.330     312.859     401.059       1.282

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   470.42    -0.16   470.42     0.38   600.25
 MEAN    16.97     0.00    -0.02   470.42    -0.16   470.42     0.38
 HUB     14.32     0.00    -0.02   470.42    -0.16   470.42     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.79    46.36     8.43   666.42   815.86    25.26   620.86     0.67
 MEAN    51.31    43.80     7.51   587.21   752.53    25.26   620.86     0.62
 HUB     46.50    37.84     8.66   495.49   683.35    25.26   620.86     0.56
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      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   566.19   321.02   466.39  1246.70     0.45
 MEAN    16.57   575.57   326.79   473.80  1242.39     0.46
 HUB     13.89   620.93   391.41   482.03  1238.11     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   572.64   332.25     0.46  6063.94
 MEAN   573.48   534.18   246.69     0.43  5418.86     1.53
 HUB    480.61   490.22    89.20     0.40  5439.04

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.97     1.18    28.61   672.95     1.05   646.21     0.92     0.91
 MEAN    32.41     1.16    27.97   669.37     1.05   641.74     0.92     0.91
 HUB     32.43     1.16    27.30   669.48     1.05   637.33     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.54    35.47    31.50     3.97     0.93     0.37     2.90
 MEAN    34.59    27.50    23.50     4.00     0.93     0.36     3.29     0.91
 HUB     39.08    10.48     6.50     3.98     0.93     0.35     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481      568.122     328.623     463.432    1244.241       0.457       0.052

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.553      28.213      643.679      46.000      35.341      32.400      -2.941

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481      476.707     328.623     579.002    1251.918       0.381       0.313

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      32.510      29.412     651.646     456.573       0.019       0.398

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096     452.681       0.000     452.681    1253.705       0.361       0.304

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.621     653.508       0.000       0.060       0.040       0.358

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      32.416       1.159     670.600      31.283     236.200       1.831

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 195196.750       0.457    2031.212 1569252.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    184.141    3965.000      32.416     670.600       1.000       1.000       0.980
W Kg/sec =   83.70042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.946    3487.140       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141656.391  144489.219       1.843     509.668     276.580     390.276       1.411
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ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	421.60	-0.15	421.60	0.34	557.48
MEAN	15.91	0.00	-0.02	421.60	-0.15	421.60	0.34	
HUB	13.07	0.00	-0.02	421.60	-0.15	421.60	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.38	47.36	9.02	633.89	761.41	29.98	655.79	0.61
MEAN	52.57	44.80	7.77	550.61	693.59	29.98	655.79	0.55
HUB	47.02	38.84	8.18	452.24	618.38	29.98	655.79	0.49

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	528.51	318.79	421.53	1277.78	0.41
MEAN	15.50	530.26	312.27	428.56	1273.04	0.42
HUB	12.59	562.51	355.20	436.18	1268.33	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.74	518.52	301.95	0.41	5721.78	
MEAN	536.24	483.55	223.96	0.38	4841.78	1.58
HUB	435.63	443.53	80.43	0.35	4473.87	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	37.58	1.16	33.40	702.30	1.05	679.02	0.92	0.91
MEAN	36.75	1.13	32.61	697.43	1.04	673.99	0.92	0.91
HUB	36.41	1.12	31.81	695.39	1.04	669.02	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.10	35.61	31.50	4.11	0.93	0.39	2.90	
MEAN	36.08	27.59	23.50	4.09	0.93	0.37	3.34	0.91
HUB	39.16	10.45	6.50	3.95	0.93	0.35	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	536.626	317.998	432.255	1273.387	0.421	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
36.827	32.590	674.371	46.000	36.341	33.000	-3.341

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	450.078	317.998	551.084	1280.090	0.352	0.264

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	36.756	33.743	681.489	440.827	0.037	0.416

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	420.540	0.000	420.540	1282.102	0.328	0.351

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	34.100	683.633	0.000	0.060	0.040	0.347

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.881	36.739	1.133	698.374	27.773	243.436	1.887

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
173459.312	0.450	1805.013	1592653.500

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR

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   1094462.88  11388.9502    179.8873      2.4319      0.8642      5.9529      1.3358


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 105% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 6.543   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    180.829    3965.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   82.19485

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    176.651    3949.384       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
139108.312  141890.188       1.616     831.557     514.448     619.754       1.205

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   433.05    -0.15   433.05     0.39   710.99
MEAN    17.06     0.00    -0.02   433.05    -0.15   433.05     0.39
HUB     12.51     0.00    -0.02   433.05    -0.15   433.05     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.76    50.47     8.29   713.82   835.03    13.59   507.15     0.76
MEAN    53.74    47.20     6.54   590.30   732.23    13.59   507.15     0.66
HUB     45.00    38.62     6.38   432.86   612.39    13.59   507.15     0.55

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   691.90   410.72   556.80  1129.47     0.61
MEAN    18.04   727.88   448.82   573.03  1122.74     0.65
HUB     15.00   837.04   579.29   604.19  1111.21     0.75

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    713.82   633.95   303.10     0.56  8476.32
MEAN   624.07   599.23   175.25     0.53  8097.52     1.36
HUB    519.02   607.19    60.28     0.55  8691.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.91     1.32    15.45   569.92     1.09   529.95     0.92     0.91
MEAN    19.68     1.30    14.83   567.82     1.09   523.59     0.92     0.91
HUB     20.05     1.33    13.76   571.12     1.09   512.65     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     36.41    28.56    24.20     4.36     0.93     0.33     2.90
MEAN    38.07    17.00    12.70     4.30     0.93     0.27     3.51     0.91
HUB     43.79    -5.70    -9.30     3.60     0.93     0.12     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     739.373     447.951     588.229    1122.897       0.658      -0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.829      14.816     523.961      24.000      37.290      35.400      -1.890
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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     603.352     447.951     751.461    1139.126       0.530       0.312

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.742      16.304     539.216     528.796       0.027       0.455

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     552.461       0.000     552.461    1144.304       0.483       0.374

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.763     544.128       0.000       0.060       0.041       0.401

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      19.666       1.302     569.621      46.811     213.547       1.655

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 291438.375       0.572    2978.148 1820920.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.543   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    180.829    3965.000      19.666     569.621       1.000       1.000       0.980
W Kg/sec =   82.19485

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    141.647    3783.627       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 139108.312  141890.188       1.431     590.487     412.522     474.134       1.149

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   524.20    -0.18   524.20     0.46   678.51
 MEAN    18.08     0.00    -0.02   524.20    -0.18   524.20     0.46
 HUB     15.21     0.00    -0.02   524.20    -0.18   524.20     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.61    46.36     7.25   711.05   883.54    17.04   546.68     0.77
 MEAN    50.04    42.30     7.74   625.53   816.27    17.04   546.68     0.71
 HUB     45.12    37.84     7.28   526.28   742.93    17.04   546.68     0.65

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   615.75   343.75   510.87  1178.31     0.52
 MEAN    18.01   629.50   352.66   521.44  1173.07     0.54
 HUB     15.22   684.20   428.78   533.18  1167.94     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   626.59   362.81     0.53  7022.99
 MEAN   623.16   587.43   270.50     0.50  6354.66     1.51
 HUB    526.73   542.10    97.95     0.46  6530.11

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.31     1.24    20.17   608.63     1.07   576.98     0.92     0.91
 MEAN    23.83     1.21    19.59   604.92     1.06   571.84     0.92     0.91
 HUB     23.96     1.22    18.98   605.89     1.06   566.81     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.94    35.38    31.50     3.88     0.93     0.36     2.90
 MEAN    34.07    27.42    23.50     3.92     0.93     0.35     3.30     0.91
 HUB     38.81    10.41     6.50     3.91     0.93     0.34     3.92
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   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      710.715     353.650     616.479     1165.246       0.610       -0.210

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     23.987      18.654      564.306      46.000      29.841      30.600       0.759

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960      612.024     353.650     706.853     1176.446       0.520       0.069

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850       23.925      19.890      575.206      455.853       0.024       0.318

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823      602.906       0.000     602.906     1177.391       0.512       0.290

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850       19.946      576.131       0.000       0.060       0.039       0.082

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4           PR4       Texit        Del T       Ns        Ns nondim
      0.880       23.858        1.213     606.481      36.860     236.733       1.835

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 229639.906       0.460    2346.643 1624934.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.543   EfDer =  0.994

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    180.829     3965.000       23.858      606.481       1.000        1.000        0.880
W Kg/sec =   82.19485

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
    120.477     3666.848        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 139108.312  141890.188        1.396      489.817     350.891      384.470       1.096

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00     -0.02    558.46     -0.19    558.46      0.47    642.21
 MEAN    17.74      0.00     -0.02    558.46     -0.19    558.46      0.47
 HUB     15.05      0.00     -0.02    558.46     -0.19    558.46      0.47

       BetaFlo    BetaBlade Incid    U1        W1        Ps1       Ts1      Rel Mach
 TIP     51.20     46.36      4.84    694.45    891.29     20.47    580.45      0.75
 MEAN    47.71     43.40      4.31    613.77    829.96     20.47    580.45      0.70
 HUB     43.01     38.84      4.17    520.75    763.71     20.47    580.45      0.65

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500       0.050        0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP      19.81   586.66    333.87    482.39   1215.87      0.48
 MEAN     17.51   598.68    343.05    490.65   1211.35      0.49
 HUB      14.85   649.55    414.84    499.83   1206.95      0.54

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP     685.45    596.91    351.58      0.49   6617.85
 MEAN    605.75    556.55    262.70      0.46   6009.01      1.61
 HUB     513.83    509.54     98.99      0.42   6163.20
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    28.77     1.21    24.53   643.21     1.06   614.49     0.92     0.91
 MEAN   28.29     1.19    23.94   639.83     1.05   609.92     0.92     0.91
 HUB    28.41     1.19    23.32   640.69     1.06   605.48     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    34.69    36.09    31.50     4.59     0.93     0.39     2.90
 MEAN   34.96    28.16    23.50     4.66     0.92     0.39     3.28     0.91
 HUB    39.69    11.20     6.50     4.70     0.92     0.40     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     604.481     345.300     496.151    1212.138       0.499       0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.444      23.996     610.750      46.000      34.836      31.500      -3.336

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     501.541     345.300     608.913    1221.530       0.411       0.296

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.391      25.277     620.252     471.992       0.022       0.387

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     486.481       0.000     486.481    1222.752       0.398       0.303

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.377     621.494       0.000       0.060       0.040       0.317

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      28.305       1.186     641.245      34.765     232.401       1.802

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 216747.234       0.461    2214.895 1769946.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.543   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    180.829    3965.000      28.305     641.245       1.000       1.000       0.980
W Kg/sec =   82.19485

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.417    3566.065       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 139108.312  141890.188       1.688     513.330     304.142     401.059       1.319

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   455.85    -0.16   455.85     0.37   599.35
 MEAN    16.97     0.00    -0.02   455.85    -0.16   455.85     0.37
 HUB     14.32     0.00    -0.02   455.85    -0.16   455.85     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.63    46.36     9.27   666.42   807.54    25.72   623.91     0.66
 MEAN    52.19    43.80     8.39   587.21   743.50    25.72   623.91     0.61
 HUB     47.40    37.84     9.56   495.49   673.39    25.72   623.91     0.55

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
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     0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   560.34   331.81   451.54  1250.16     0.45
 MEAN    16.57   568.07   334.71   459.00  1245.63     0.46
 HUB     13.89   611.43   394.35   467.26  1241.14     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   554.28   321.46     0.44  6267.53
 MEAN   573.48   517.39   238.77     0.42  5550.03     1.57
 HUB    480.61   475.16    86.26     0.38  5479.80

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     33.50     1.18    29.19   676.00     1.05   649.82     0.92     0.91
 MEAN    32.88     1.16    28.50   672.02     1.05   645.11     0.92     0.91
 HUB     32.82     1.16    27.80   671.63     1.05   640.45     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.31    35.45    31.50     3.95     0.93     0.38     2.90
 MEAN    36.10    27.48    23.50     3.98     0.93     0.37     3.29     0.91
 HUB     40.16    10.46     6.50     3.96     0.93     0.37     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     561.238     336.587     449.106    1247.390       0.450       0.051

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.020      28.735     646.949      46.000      36.850      32.400      -4.450

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     461.121     336.587     570.897    1255.593       0.367       0.337

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      32.971      30.036     655.486     456.573       0.021       0.421

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     438.242       0.000     438.242    1257.236       0.349       0.324

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.217     657.202       0.000       0.060       0.043       0.377

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      32.868       1.161     673.220      31.975     228.715       1.773

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 199528.859       0.468    2038.944 1530302.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.543   EfDer =  0.997

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    180.829    3965.000      32.868     673.220       1.000       1.000       0.980
W Kg/sec =   82.19485

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.136    3480.348       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 139108.312  141890.188       1.899     509.668     268.397     390.276       1.454

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     18.32     0.00    -0.02   408.42    -0.14   408.42     0.32   556.39
MEAN    15.91     0.00    -0.02   408.42    -0.14   408.42     0.32
HUB     13.07     0.00    -0.02   408.42    -0.14   408.42     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.21    47.36     9.85   633.89   754.19    30.56   659.32     0.60
MEAN    53.44    44.80     8.64   550.61   685.66    30.56   659.32     0.54
HUB     47.92    38.84     9.08   452.24   609.47    30.56   659.32     0.48

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   523.96   328.57   408.13  1281.51     0.41
MEAN    15.50   523.81   319.49   415.10  1276.61     0.41
HUB     12.59   553.80   357.87   422.65  1271.74     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.74   501.93   292.17     0.39  5897.20
MEAN   536.24   468.28   216.75     0.37  4953.50     1.62
HUB    435.63   429.74    77.76     0.34  4507.37

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     38.24     1.16    34.08   705.89     1.05   683.01     0.92     0.91
MEAN    37.34     1.14    33.25   700.66     1.04   677.80     0.92     0.91
HUB     36.92     1.12    32.41   698.19     1.04   672.63     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.84    35.60    31.50     4.10     0.93     0.41     2.90
MEAN    37.58    27.57    23.50     4.07     0.93     0.39     3.34     0.91
HUB     40.26    10.43     6.50     3.93     0.93     0.37     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     530.227     325.344     418.678    1276.937       0.415      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     37.415      33.227     678.152      46.000      37.850      33.000      -4.850

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     435.313     325.344     543.458    1284.108       0.339       0.289

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      37.332      34.476     685.790     440.827       0.040       0.439

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     407.039       0.000     407.039    1285.966       0.317       0.371

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      34.807     687.775       0.000       0.060       0.045       0.367

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      37.311       1.135     701.584      28.363     235.838       1.828

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 177158.672       0.460    1810.348 1553680.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1114513.00  11388.9775    176.6515      2.4698      0.8655      6.5431      1.3419
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 105% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.026   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     178.130    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   80.96808

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     174.015    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  137032.094  139772.453       1.641     831.557     506.769     619.754       1.223

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   425.44    -0.15   425.44     0.38   710.99
  MEAN    17.06     0.00    -0.02   425.44    -0.15   425.44     0.38
  HUB     12.51     0.00    -0.02   425.44    -0.15   425.44     0.38

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.21    50.47     8.74   713.82   831.12    13.64   507.69     0.75
  MEAN    54.23    47.20     7.03   590.30   727.76    13.64   507.69     0.66
  HUB     45.50    38.62     6.88   432.86   607.04    13.64   507.69     0.55

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   686.46   416.98   545.31  1130.88     0.61
  MEAN    18.04   721.07   452.38   561.52  1123.97     0.64
  HUB     15.00   827.22   578.06   591.72  1112.50     0.74

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   620.86   296.84     0.55  8605.39
  MEAN   624.07   587.18   171.69     0.52  8161.56     1.38
  HUB    519.02   594.66    59.05     0.53  8672.79

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.99     1.32    15.58   570.64     1.09   531.29     0.92     0.91
  MEAN    19.72     1.31    14.94   568.17     1.09   524.76     0.92     0.91
  HUB     20.04     1.33    13.87   571.02     1.09   513.91     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     37.40    28.56    24.20     4.36     0.93     0.34     2.90
  MEAN    38.86    17.00    12.70     4.30     0.93     0.28     3.51     0.91
  HUB     44.33    -5.70    -9.30     3.60     0.93     0.13     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       1.000

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     731.981     451.497     576.148    1124.217       0.651       -0.002

      Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      19.865       14.936      525.193      24.000      38.084      35.400      -2.684

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      18.071     589.932     451.497     742.879    1140.879       0.517       0.328
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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.777      16.477     540.877     528.796       0.027       0.467

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     540.721       0.000     540.721    1145.770       0.472       0.387

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.915     545.524       0.000       0.060       0.041       0.413

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      19.706       1.304     569.944      47.134     210.574       1.632

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 293452.344       0.576    2953.972 1788956.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.026   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    178.130    3965.000      19.706     569.944       1.000       1.000       0.980
W Kg/sec =   80.96808

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    139.286    3782.554       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 137032.094  139772.453       1.456     590.487     405.648     474.134       1.169

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   513.39    -0.18   513.39     0.45   678.32
 MEAN    18.08     0.00    -0.02   513.39    -0.18   513.39     0.45
 HUB     15.21     0.00    -0.02   513.39    -0.18   513.39     0.45

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.18    46.36     7.82   711.05   877.16    17.18   547.94     0.76
 MEAN    50.63    42.30     8.33   625.53   809.37    17.18   547.94     0.70
 HUB     45.72    37.84     7.88   526.28   735.34    17.18   547.94     0.64

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   611.22   351.66   499.93  1180.02     0.52
 MEAN    18.01   623.84   358.45   510.58  1174.59     0.53
 HUB     15.22   677.20   430.93   522.40  1169.26     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   613.09   354.90     0.52  7184.50
 MEAN   623.16   575.12   264.71     0.49  6458.95     1.53
 HUB    526.73   531.12    95.81     0.45  6562.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.46     1.24    20.37   609.85     1.07   578.66     0.92     0.91
 MEAN    23.95     1.22    19.76   605.82     1.06   573.33     0.92     0.91
 HUB     24.02     1.22    19.13   606.40     1.06   568.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.12    35.37    31.50     3.87     0.93     0.37     2.90
 MEAN    35.07    27.40    23.50     3.90     0.93     0.36     3.30     0.91
 HUB     39.52    10.39     6.50     3.89     0.93     0.35     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.998
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     701.367     359.461     602.249    1167.286       0.601      -0.201

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.099      18.876     566.284      46.000      30.831      30.600      -0.231

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     596.795     359.461     696.689    1178.910       0.506       0.097

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      24.039      20.177     577.619     455.853       0.024       0.333

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     587.845       0.000     587.845    1179.813       0.498       0.309

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      20.234     578.504       0.000       0.060       0.037       0.110

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.881      23.979       1.217     607.356      37.412     231.680       1.796

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 233081.891       0.467    2346.266 1593116.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.026   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    178.130    3965.000      23.979     607.356       1.000       1.000       0.880
W Kg/sec =   80.96808

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.164    3664.203       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 137032.094  139772.453       1.423     489.817     344.156     384.470       1.117

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   545.19    -0.19   545.19     0.46   641.74
 MEAN    17.74     0.00    -0.02   545.19    -0.19   545.19     0.46
 HUB     15.05     0.00    -0.02   545.19    -0.19   545.19     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.87    46.36     5.51   694.45   883.03    20.73   582.55     0.75
 MEAN    48.40    43.40     5.00   613.77   821.08    20.73   582.55     0.69
 HUB     43.70    38.84     4.86   520.75   754.06    20.73   582.55     0.64

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   582.28   342.65   470.79  1218.11     0.48
 MEAN    17.51   593.11   349.52   479.18  1213.38     0.49
 HUB     14.85   642.50   417.39   488.45  1208.77     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   582.37   342.80     0.48  6791.70
 MEAN   605.75   543.39   256.23     0.45  6122.15     1.63
 HUB    513.83   497.88    96.43     0.41  6201.13

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.06     1.21    24.85   645.05     1.06   616.76     0.92     0.91
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 MEAN    28.53     1.19    24.22   641.34     1.06   611.98     0.92     0.91
 HUB     28.59     1.19    23.58   641.77     1.06   607.33     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.05    36.06    31.50     4.56     0.93     0.41     2.90
 MEAN    36.11    28.13    23.50     4.63     0.92     0.40     3.28     0.91
 HUB     40.51    11.17     6.50     4.67     0.92     0.41     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     598.784     351.809     484.533    1214.166       0.493       0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.682      24.285     612.799      46.000      35.983      31.500      -4.483

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     489.044     351.809     602.440    1223.996       0.400       0.315

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.624      25.639     622.762     471.992       0.023       0.405

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     474.620       0.000     474.620    1225.136       0.387       0.319

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.723     623.922       0.000       0.060       0.043       0.334

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      28.531       1.190     642.721      35.365     226.689       1.757

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 220495.203       0.469    2219.565 1732292.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.026   EfDer =  0.995

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    178.130    3965.000      28.531     642.721       1.000       1.000       0.980
W Kg/sec =   80.96808

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    102.160    3561.968       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 137032.094  139772.453       1.725     513.330     297.570     401.059       1.348

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   444.99    -0.15   444.99     0.36   598.66
 MEAN    16.97     0.00    -0.02   444.99    -0.15   444.99     0.36
 HUB     14.32     0.00    -0.02   444.99    -0.15   444.99     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.27    46.36     9.91   666.42   801.46    26.05   626.21     0.65
 MEAN    52.85    43.80     9.05   587.21   736.89    26.05   626.21     0.60
 HUB     48.08    37.84    10.24   495.49   666.09    26.05   626.21     0.54

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     18.88   556.37   339.73   440.60  1252.73     0.44
 MEAN    16.57   562.77   340.52   448.06  1248.04     0.45
 HUB     13.89   604.52   396.50   456.32  1243.39     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   540.77   313.54     0.43  6417.12
 MEAN   573.48   505.00   232.95     0.40  5646.36     1.59
 HUB    480.61   464.00    84.11     0.37  5509.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     33.88     1.19    29.59   678.31     1.06   652.49     0.92     0.91
 MEAN    33.20     1.16    28.88   674.03     1.05   647.62     0.92     0.91
 HUB     33.08     1.16    28.14   673.27     1.05   642.80     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.64    35.44    31.50     3.94     0.93     0.40     2.90
 MEAN    37.23    27.47    23.50     3.97     0.93     0.38     3.29     0.91
 HUB     40.99    10.44     6.50     3.94     0.93     0.38     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     556.377     342.436     438.512    1249.732       0.445       0.049

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.344      29.099     649.387      46.000      37.986      32.400      -5.586

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     449.671     342.436     565.213    1258.318       0.357       0.355

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.287      30.473     658.340     456.573       0.022       0.439

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     427.641       0.000     427.641    1259.858       0.339       0.339

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.631     659.952       0.000       0.060       0.047       0.390

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.873       33.176       1.163     675.205      32.484     223.310       1.731

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 202709.266       0.475    2040.527 1499746.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.026   EfDer =  0.994

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    178.130     3965.000       33.176     675.205       1.000        1.000       0.980
W Kg/sec =   80.96808

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     90.051     3475.230        1.401        0.250       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 137032.094  139772.453        1.943     509.668     262.326     390.276       1.488

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   398.72    -0.14   398.72     0.32   555.58
 MEAN    15.91      0.00    -0.02   398.72    -0.14   398.72     0.32
 HUB     13.07      0.00    -0.02   398.72    -0.14   398.72     0.32
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       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.84    47.36    10.48   633.89   748.98    30.96   661.96     0.59
 MEAN    54.10    44.80     9.30   550.61   679.93    30.96   661.96     0.54
 HUB     48.61    38.84     9.77   452.24   603.01    30.96   661.96     0.48

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   520.94   335.70   398.36  1284.26     0.41
 MEAN    15.50   519.31   324.74   405.25  1279.25     0.41
 HUB     12.59   547.53   359.78   412.73  1274.27     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   489.84   285.05     0.38  6024.91
 MEAN   536.24   457.12   211.50     0.36  5034.87     1.64
 HUB    435.63   419.64    75.85     0.33  4531.42

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     38.69     1.17    34.54   708.58     1.05   685.97     0.92     0.91
 MEAN    37.74     1.14    33.69   703.10     1.04   680.62     0.92     0.91
 HUB     37.27     1.12    32.82   700.31     1.04   675.32     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.12    35.59    31.50     4.09     0.93     0.42     2.90
 MEAN    38.71    27.56    23.50     4.06     0.93     0.40     3.34     0.91
 HUB     41.08    10.41     6.50     3.91     0.93     0.38     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.994

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     525.776     330.694     408.756    1279.564       0.411      -0.006

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      37.816      33.664     680.957      46.000      38.974      33.000      -5.974

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     424.594     330.694     538.181    1287.072       0.330       0.307

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      37.720      34.980     688.972     440.827       0.043       0.457

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     397.223       0.000     397.223    1288.822       0.308       0.386

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      35.291     690.846       0.000       0.060       0.049       0.381

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.873      37.696       1.136     703.997      28.792     230.404       1.786

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  179847.625       0.467    1810.396 1523097.625

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1129586.25  11370.7266    174.0149      2.4952      0.8650      7.0256      1.3466


****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
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****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 105% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.502   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     175.471    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   79.75962

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     171.418    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  134986.875  137686.328       1.666     831.557     499.206     619.754       1.241

     ROTOR LEADING EDGE CONDITIONS, STAGE             1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   418.02    -0.14   418.02     0.38   710.99
  MEAN    17.06     0.00    -0.02   418.02    -0.14   418.02     0.38
  HUB     12.51     0.00    -0.02   418.02    -0.14   418.02     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.65    50.47     9.18   713.82   827.34    13.69   508.21     0.75
  MEAN    54.70    47.20     7.50   590.30   723.44    13.69   508.21     0.65
  HUB     46.01    38.62     7.39   432.86   601.86    13.69   508.21     0.54

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   681.46   422.97   534.31  1132.20     0.60
  MEAN    18.04   714.67   455.78   550.47  1125.13     0.64
  HUB     15.00   817.86   576.87   579.76  1113.72     0.73

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   608.34   290.85     0.54  8728.91
  MEAN   624.07   575.62   168.29     0.51  8222.93     1.40
  HUB    519.02   582.64    57.85     0.52  8654.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.07     1.33    15.71   571.33     1.09   532.55     0.92     0.91
  MEAN    19.75     1.31    15.05   568.52     1.09   525.87     0.92     0.91
  HUB     20.02     1.33    13.98   570.92     1.09   515.09     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     38.37    28.56    24.20     4.36     0.93     0.35     2.90
  MEAN    39.62    17.00    12.70     4.30     0.93     0.30     3.51     0.91
  HUB     44.86    -5.70    -9.30     3.60     0.93     0.14     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     725.046     454.895     564.590    1125.450       0.644      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.898      15.047     526.346      24.000      38.859      35.400      -3.459

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     577.218     454.895     734.922    1142.511       0.505       0.342

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.807      16.636     542.425     528.796       0.028       0.479
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	529.568	0.000	529.568	1147.141	0.462	0.399

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.054	546.830	0.000	0.060	0.041	0.425

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	19.741	1.307	570.254	47.444	207.708	1.610

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
295377.781	0.580	2928.976	1757749.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.502 EfDer = 0.996

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
175.471	3965.000	19.741	570.254	1.000	1.000	0.980

W Kg/sec = 79.75962

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
137.005	3781.528	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
134986.875	137686.328	1.480	590.487	399.004	474.134	1.188

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	503.09	-0.17	503.09	0.44	678.13
MEAN	18.08	0.00	-0.02	503.09	-0.17	503.09	0.44	
HUB	15.21	0.00	-0.02	503.09	-0.17	503.09	0.44	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.73	46.36	8.37	711.05	871.18	17.30	549.12	0.76
MEAN	51.20	42.30	8.90	625.53	802.87	17.30	549.12	0.70
HUB	46.30	37.84	8.46	526.28	728.19	17.30	549.12	0.63

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	607.20	359.11	489.62	1181.61	0.51
MEAN	18.01	618.67	363.92	500.31	1176.00	0.53
HUB	15.22	670.65	432.94	512.18	1170.50	0.57

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	706.56	600.37	347.44	0.51	7336.63	
MEAN	623.16	563.49	259.24	0.48	6557.32	1.55
HUB	526.73	520.70	93.79	0.44	6593.26	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.60	1.25	20.54	611.00	1.07	580.22	0.92	0.91
MEAN	24.05	1.22	19.91	606.68	1.06	574.72	0.92	0.91
HUB	24.07	1.22	19.26	606.88	1.06	569.33	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.26	35.36	31.50	3.86	0.93	0.38	2.90	
MEAN	36.03	27.39	23.50	3.89	0.93	0.37	3.30	0.91
HUB	40.21	10.38	6.50	3.88	0.93	0.36	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

```
     17.960     692.844     364.942     588.941    1169.161       0.593      -0.193

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.197      19.075     568.106      46.000      31.785      30.600      -1.185

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     582.673     364.942     687.525    1181.173       0.493       0.122

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      24.139      20.436     579.839     455.853       0.024       0.348

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     574.022       0.000     574.022    1182.023       0.486       0.326

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      20.489     580.674       0.000       0.060       0.037       0.135

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.881      24.080       1.220     608.186      37.932     226.981       1.760

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 236324.156       0.473    2343.398 1562416.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.502   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    175.471    3965.000      24.080     608.186       1.000       1.000       0.880
W Kg/sec =   79.75962

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    115.992    3661.704       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134986.875  137686.328       1.450     489.817     337.830     384.470       1.138

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   532.94    -0.18   532.94     0.45   641.31
 MEAN    17.74     0.00    -0.02   532.94    -0.18   532.94     0.45
 HUB     15.05     0.00    -0.02   532.94    -0.18   532.94     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.50    46.36     6.14   694.45   875.52    20.96   584.48     0.74
 MEAN    49.04    43.40     5.64   613.77   813.00    20.96   584.48     0.69
 HUB     44.35    38.84     5.51   520.75   745.25    20.96   584.48     0.63

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   578.57   350.66   460.19  1220.14     0.47
 MEAN    17.51   588.20   355.43   468.67  1215.24     0.48
 HUB     14.85   636.11   419.72   477.98  1210.46     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   569.09   334.78     0.47  6950.35
 MEAN   605.75   531.33   250.32     0.44  6225.61     1.65
 HUB    513.83   487.16    94.11     0.40  6235.62

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.31     1.22    25.13   646.76     1.06   618.83     0.92     0.91
 MEAN    28.73     1.19    24.47   642.74     1.06   613.87     0.92     0.91
 HUB     28.74     1.19    23.81   642.79     1.06   609.03     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.31    36.04    31.50     4.54     0.93     0.42     2.90
 MEAN    37.18    28.11    23.50     4.61     0.92     0.41     3.28     0.91
 HUB     41.29    11.14     6.50     4.64     0.92     0.42     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     593.771     357.762     473.888    1216.021       0.488       0.014

     Pt3          Ps3         Ts3          Vane No.     Alpha3     Vane A3      Incid3
     28.885      24.535     614.676       46.000      37.051      31.500      -5.551

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     477.662     357.762     596.787    1226.247       0.390       0.333

   BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.950      28.820       25.954     625.058     471.992       0.025       0.421

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     463.829       0.000     463.829    1227.313       0.378       0.333

   Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.021     626.145        0.000       0.060       0.047       0.348

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.877      28.720       1.193     644.099      35.913     221.556       1.717

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 223916.312       0.477    2220.362 1696471.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.502   EfDer =  0.993

   W act       RPM act         Pt          Tt           POTS         POTH       AeroBl
    175.471    3965.000       28.720     644.099       1.000        1.000       0.980
W Kg/sec =   79.75962

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    100.083    3558.157        1.401       0.249      53.349       56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 134986.875  137686.328        1.761     513.330     291.519     401.059       1.376

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02    435.09    -0.15    435.09     0.35    598.02
 MEAN    16.97      0.00    -0.02    435.09    -0.15    435.09     0.35
 HUB     14.32      0.00    -0.02    435.09    -0.15    435.09     0.35

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     56.87     46.36     10.51   666.42    796.00     26.34    628.31     0.65
 MEAN    53.47     43.80      9.67   587.21    730.95     26.34    628.31     0.59
 HUB     48.72     37.84     10.88   495.49    659.51     26.34    628.31     0.54

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88    553.02    346.88    430.70   1255.05      0.44
 MEAN    16.57    558.15    345.79    438.14   1250.24      0.45
 HUB     13.89    598.33    398.43    446.37   1245.46      0.48
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   528.56   306.39     0.42  6552.01
 MEAN   573.48   493.77   227.69     0.39  5733.57     1.62
 HUB    480.61   453.87    82.18     0.36  5536.38

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.20     1.19    29.93   680.43     1.06   654.92     0.92     0.91
 MEAN    33.48     1.17    29.19   675.89     1.05   649.91     0.92     0.91
 HUB     33.30     1.16    28.43   674.80     1.05   644.94     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.85    35.43    31.50     3.93     0.93     0.41     2.90
 MEAN    38.28    27.46    23.50     3.96     0.94     0.40     3.29     0.91
 HUB     41.75    10.43     6.50     3.93     0.94     0.39     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     552.156     347.731     428.904    1251.867       0.441       0.048

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.614      29.407     651.614      46.000      39.033      32.400      -6.633

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     439.335     347.731     560.297    1260.796       0.348       0.371

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.550      30.846     660.943     456.573       0.024       0.455

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     418.075       0.000     418.075    1262.246       0.331       0.352

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.982     662.464       0.000       0.060       0.051       0.402

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      33.429       1.164     677.041      32.942     218.495       1.694

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 205580.203       0.482    2038.540 1470539.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.502   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    175.471    3965.000      33.429     677.041       1.000       1.000       0.980
W Kg/sec =   79.75962

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.155    3470.514       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134986.875  137686.328       1.985     509.668     256.802     390.276       1.520

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   389.95    -0.13   389.95     0.31   554.82
 MEAN    15.91     0.00    -0.02   389.95    -0.13   389.95     0.31
 HUB     13.07     0.00    -0.02   389.95    -0.13   389.95     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.41    47.36    11.05   633.89   744.35    31.29   664.37     0.59
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MEAN    54.70    44.80     9.90   550.61   674.82    31.29   664.37     0.53
HUB     49.24    38.84    10.40   452.24   597.25    31.29   664.37     0.47

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   518.44   342.06   389.58  1286.76     0.40
MEAN    15.50   515.42   329.44   396.39  1281.66     0.40
HUB     12.59   541.96   361.49   403.78  1276.57     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.74   479.00   278.68     0.37  6139.04
MEAN   536.24   447.09   206.80     0.35  5107.63     1.67
HUB    435.63   410.53    74.14     0.32  4552.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     39.07     1.17    34.93   711.05     1.05   688.65     0.92     0.91
MEAN    38.07     1.14    34.06   705.34     1.04   683.20     0.92     0.91
HUB     37.55     1.12    33.17   702.26     1.04   677.79     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.28    35.58    31.50     4.08     0.93     0.43     2.90
MEAN    39.73    27.55    23.50     4.05     0.94     0.41     3.34     0.91
HUB     41.84    10.40     6.50     3.90     0.94     0.39     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     521.927     335.479     399.828    1281.951       0.407      -0.007

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    38.147      34.030     683.514      46.000      39.999      33.000      -6.999

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     414.997     335.479     533.637    1289.757       0.322       0.323

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      38.037      35.403     691.863     440.827       0.046       0.473

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     388.424       0.000     388.424    1291.415       0.301       0.399

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      35.696     693.643       0.000       0.060       0.053       0.393

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.868      38.009       1.137     706.216      29.175     225.600       1.749

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 182251.406       0.473    1807.211 1493842.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1143449.88  11338.4883     171.4177      2.5160      0.8633      7.5023      1.3508


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 105% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 7.973   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    172.852    3965.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   78.56920

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    168.859    3949.384       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132972.188  135631.328       1.691     831.557     491.755     619.754       1.260

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   410.77    -0.14   410.77     0.37   710.99
 MEAN    17.06     0.00    -0.02   410.77    -0.14   410.77     0.37
 HUB     12.51     0.00    -0.02   410.77    -0.14   410.77     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.09    50.47     9.62   713.82   823.70    13.73   508.72     0.74
 MEAN    55.17    47.20     7.97   590.30   719.28    13.73   508.72     0.65
 HUB     46.51    38.62     7.89   432.86   596.85    13.73   508.72     0.54

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   676.85   428.71   523.77  1133.43     0.60
 MEAN    18.04   708.63   459.05   539.84  1126.22     0.63
 HUB     15.00   808.94   575.71   568.28  1114.88     0.73

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    713.82   596.34   285.11     0.53  8847.18
 MEAN   624.07   564.50   165.02     0.50  8281.86     1.43
 HUB    519.02   571.10    56.69     0.51  8637.45

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.14     1.33    15.82   571.99     1.09   533.73     0.92     0.91
 MEAN    19.79     1.31    15.15   568.84     1.09   526.91     0.92     0.91
 HUB     20.01     1.32    14.09   570.82     1.09   516.20     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.30    28.56    24.20     4.36     0.93     0.37     2.90
 MEAN    40.38    17.00    12.70     4.30     0.93     0.31     3.51     0.91
 HUB     45.37    -5.70    -9.30     3.60     0.93     0.15     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     718.524     458.159     553.504    1126.607       0.638       0.000

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.928      15.151     527.429      24.000      39.616      35.400      -4.216

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     565.127     458.159     727.515    1144.037       0.494       0.356

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.833      16.783     543.875     528.796       0.029       0.490

   VANED DIFFUSER EXIT:
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   R4          C4           Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     519.057       0.000     519.057    1148.417       0.452       0.409

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.178     548.047       0.000       0.060       0.043       0.435

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      19.766       1.308     570.550      47.740     204.941       1.589

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 297221.531       0.583    2903.271 1727269.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 7.973   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    172.852    3965.000      19.766     570.550       1.000       1.000       0.980
W Kg/sec =   78.56920

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    134.821    3780.546       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132972.188  135631.328       1.504     590.487     392.644     474.134       1.208

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   493.37    -0.17   493.37     0.43   677.96
 MEAN    18.08      0.00    -0.02   493.37    -0.17   493.37     0.43
 HUB     15.21      0.00    -0.02   493.37    -0.17   493.37     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.25    46.36     8.89   711.05   865.59    17.42   550.23     0.75
 MEAN    51.74    42.30     9.44   625.53   796.81    17.42   550.23     0.69
 HUB     46.86    37.84     9.02   526.28   721.50    17.42   550.23     0.63

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   603.64   366.05   479.99  1183.07     0.51
 MEAN    18.01   613.96   369.03   490.68  1177.31     0.52
 HUB     15.22   664.55   434.81   502.56  1171.65     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   588.50   340.50     0.50  7478.29
 MEAN   623.16   552.59   254.14     0.47  6649.25     1.57
 HUB    526.73   510.90    91.92     0.44  6621.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.72     1.25    20.69   612.09     1.07   581.67     0.92     0.91
 MEAN    24.13     1.22    20.04   607.48     1.06   576.01     0.92     0.91
 HUB     24.11     1.22    19.38   607.33     1.06   570.46     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.33    35.35    31.50     3.85     0.93     0.39     2.90
 MEAN    36.95    27.38    23.50     3.88     0.94     0.38     3.30     0.91
 HUB     40.87    10.37     6.50     3.87     0.94     0.37     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3           Mach3       cp 2-3
     17.960     685.112     370.064     576.569    1170.878       0.585      -0.185
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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.279      19.250     569.777      46.000      32.694      30.600      -2.094

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     569.643     370.064     679.294    1183.242       0.481       0.146

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      24.219      20.664     581.874     455.853       0.024       0.361

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     561.369       0.000     561.369    1184.037       0.474       0.340

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      20.708     582.655       0.000       0.060       0.038       0.156

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      24.158       1.222     608.967      38.417     222.644       1.726

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 239346.094       0.479    2337.941 1532803.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.973   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    172.852    3965.000      24.158     608.967       1.000       1.000       0.880
W Kg/sec =   78.56920

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    113.963    3659.355       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132972.188  135631.328       1.476     489.817     331.919     384.470       1.158

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   521.68    -0.18   521.68     0.44   640.89
 MEAN    17.74     0.00    -0.02   521.68    -0.18   521.68     0.44
 HUB     15.05     0.00    -0.02   521.68    -0.18   521.68     0.44

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.09    46.36     6.73   694.45   868.71    21.16   586.25     0.73
 MEAN    49.64    43.40     6.24   613.77   805.66    21.16   586.25     0.68
 HUB     44.96    38.84     6.12   520.75   737.24    21.16   586.25     0.62

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   575.43   357.97   450.53  1221.99     0.47
 MEAN    17.51   583.88   360.82   459.05  1216.95     0.48
 HUB     14.85   630.36   421.85   468.39  1212.00     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   556.97   327.48     0.46  7095.00
 MEAN   605.75   520.30   244.92     0.43  6319.96     1.68
 HUB    513.83   477.34    91.97     0.39  6267.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.52     1.22    25.36   648.35     1.06   620.71     0.92     0.91
 MEAN    28.90     1.20    24.68   644.04     1.06   615.59     0.92     0.91
 HUB     28.86     1.19    23.99   643.75     1.06   610.59     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.47    36.01    31.50     4.51     0.93     0.43     2.90
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 MEAN    38.17    28.08    23.50     4.58     0.93     0.42     3.28     0.91
 HUB     42.01    11.11     6.50     4.61     0.93     0.43     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     589.362     363.191     464.155    1217.714       0.484        0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.050      24.745     616.393      46.000      38.042      31.500      -6.542

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     467.310     363.191     591.850    1228.300       0.380        0.349

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.978      26.220     627.156     471.992       0.026        0.437

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     454.022       0.000     454.022    1229.300       0.369        0.346

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      26.271     628.177       0.000       0.060       0.051        0.361

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.876       28.870       1.195     645.380       36.413     216.939        1.682

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 227037.922       0.483    2217.715 1662323.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.973   EfDer =  0.990

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    172.852     3965.000       28.870     645.380       1.000        1.000        0.980
W Kg/sec =   78.56920

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     98.175     3554.624        1.401       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 132972.188  135631.328        1.795     513.330     285.964     401.059        1.402

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa     C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00     -0.02   426.07     -0.15   426.07      0.35    597.43
 MEAN    16.97      0.00     -0.02   426.07     -0.15   426.07      0.35
 HUB     14.32      0.00     -0.02   426.07     -0.15   426.07      0.35

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     57.41     46.36     11.05   666.42    791.10     26.57   630.24      0.64
 MEAN    54.04     43.80     10.24   587.21    725.62     26.57   630.24      0.59
 HUB     49.32     37.84     11.48   495.49    653.60     26.57   630.24      0.53

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88    550.20    353.32    421.76   1257.16      0.44
 MEAN    16.57    554.12    350.55    429.15   1252.24      0.44
 HUB     13.89    592.79    400.17    437.33   1247.34      0.48

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
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 TIP    653.27   517.55   299.95     0.41  6673.48
 MEAN   573.48   483.60   222.93     0.39  5812.40     1.64
 HUB    480.61   444.67    80.44     0.36  5560.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.46     1.19    30.21   682.38     1.06   657.14     0.92     0.91
 MEAN    33.70     1.17    29.45   677.61     1.05   652.00     0.92     0.91
 HUB     33.48     1.16    28.68   676.21     1.05   646.91     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.95    35.42    31.50     3.92     0.93     0.42     2.90
 MEAN    39.24    27.45    23.50     3.95     0.94     0.41     3.29     0.91
 HUB     42.46    10.42     6.50     3.92     0.94     0.40     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     548.481     352.518     420.193    1253.810       0.437       0.047

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.832      29.661     653.647      46.000      39.995      32.400      -7.595

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     430.001     352.518     556.030    1263.049       0.340       0.386

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.760      31.156     663.315     456.573       0.026       0.470

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     409.436       0.000     409.436    1264.419       0.324       0.363

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      31.271     664.755       0.000       0.060       0.056       0.412

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864      33.629       1.165     678.736      33.356     214.200       1.660

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 208168.609       0.488    2033.398 1442557.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.973   EfDer =  0.989

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    172.852    3965.000      33.629     678.736       1.000       1.000       0.980
W Kg/sec =   78.56920

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.430    3466.179       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132972.188  135631.328       2.024     509.668     251.780     390.276       1.550

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   382.03    -0.13   382.03     0.30   554.13
 MEAN    15.91     0.00    -0.02   382.03    -0.13   382.03     0.30
 HUB     13.07     0.00    -0.02   382.03    -0.13   382.03     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.93    47.36    11.57   633.89   740.23    31.57   666.57     0.58
 MEAN    55.25    44.80    10.45   550.61   670.27    31.57   666.57     0.53
 HUB     49.82    38.84    10.98   452.24   592.10    31.57   666.57     0.47
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      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   516.35   347.75   381.69  1289.03     0.40
 MEAN    15.50   512.05   333.66   388.41  1283.84     0.40
 HUB     12.59   537.00   363.01   395.71  1278.67     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   469.27   272.99     0.36  6241.05
 MEAN   536.24   438.06   202.57     0.34  5173.09     1.70
 HUB    435.63   402.32    72.62     0.31  4572.02

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     39.37     1.17    35.25   713.31     1.05   691.09     0.92     0.91
 MEAN    38.34     1.14    34.36   707.39     1.04   685.54     0.92     0.91
 HUB     37.77     1.12    33.45   704.06     1.04   680.03     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.34    35.57    31.50     4.07     0.93     0.45     2.90
 MEAN    40.66    27.54    23.50     4.04     0.94     0.42     3.34     0.91
 HUB     42.53    10.40     6.50     3.90     0.94     0.39     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      518.603     339.783     391.786    1284.119       0.404      -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     38.410      34.326      685.841      46.000      40.934      33.000      -7.934

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      406.385     339.783     529.718    1292.192       0.314       0.337

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      38.287      35.749     694.491     440.827       0.050       0.487

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     380.521       0.000     380.521    1293.769       0.294       0.410

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      36.025     696.187       0.000       0.060       0.057       0.404

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864      38.255       1.138     708.254      29.518     221.338       1.716

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 184403.781       0.479    1801.263 1465787.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1156178.00  11293.5879    168.8593      2.5323      0.8606      7.9735      1.3547


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 105% Stat 2 10% Ice Block 8-2-2011
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    170.196    3965.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   77.36173

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    166.264    3949.384       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 130928.648  133546.938       1.717     831.557     484.198     619.754       1.280

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   403.48    -0.14   403.48     0.36   710.99
 MEAN    17.06     0.00    -0.02   403.48    -0.14   403.48     0.36
 HUB     12.51     0.00    -0.02   403.48    -0.14   403.48     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.53    50.47    10.06   713.82   820.08    13.78   509.21     0.74
 MEAN    55.65    47.20     8.45   590.30   715.13    13.78   509.21     0.65
 HUB     47.02    38.62     8.40   432.86   591.85    13.78   509.21     0.53

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   672.47   434.39   513.34  1134.63     0.59
 MEAN    18.04   702.76   462.29   529.30  1127.28     0.62
 HUB     15.00   800.18   574.58   556.90  1116.00     0.72

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    713.82   584.47   279.44     0.52  8964.26
 MEAN   624.07   553.48   161.78     0.49  8340.16     1.45
 HUB    519.02   559.67    55.56     0.50  8620.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.21     1.34    15.93   572.64     1.10   534.87     0.92     0.91
 MEAN    19.82     1.31    15.24   569.17     1.09   527.93     0.92     0.91
 HUB     19.99     1.32    14.19   570.73     1.09   517.27     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.24    28.56    24.20     4.36     0.93     0.38     2.90
 MEAN    41.13    17.00    12.70     4.30     0.93     0.32     3.51     0.91
 HUB     45.90    -5.70    -9.30     3.60     0.93     0.17     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    18.071     712.196     461.387     542.535    1127.727       0.632       0.001

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.956      15.250     528.478      24.000      40.379      35.400      -4.979

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     553.251     461.387     720.393    1145.512       0.483       0.369

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.856      16.923     545.278     528.796       0.030       0.502

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     508.806       0.000     508.806    1149.646       0.443       0.418
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.292	549.220	0.000	0.060	0.045	0.445

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.875	19.785	1.310	570.843	48.033	202.182	1.567

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
299048.938	0.587	2876.229	1696606.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 8.453 EfDer = 0.992

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
170.196	3965.000	19.785	570.843	1.000	1.000	0.980

W Kg/sec = 77.36173

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
132.659	3779.574	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
130928.648	133546.938	1.528	590.487	386.349	474.134	1.227

ROTOR LEADING EDGE CONDITIONS, STAGE 2

R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP 20.55	0.00	-0.02	483.86	-0.17	483.86	0.42	677.78
MEAN 18.08	0.00	-0.02	483.86	-0.17	483.86	0.42	
HUB 15.21	0.00	-0.02	483.86	-0.17	483.86	0.42	

BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP 55.77	46.36	9.41	711.05	860.21	17.52	551.30	0.75
MEAN 52.28	42.30	9.98	625.53	790.96	17.52	551.30	0.69
HUB 47.41	37.84	9.57	526.28	715.03	17.52	551.30	0.62

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

R2	C2	Cu2	Cm2	Ao2	Mach2
TIP 20.42	600.40	372.77	470.66	1184.47	0.51
MEAN 18.01	609.53	373.98	481.32	1178.57	0.52
HUB 15.22	658.69	436.62	493.19	1172.76	0.56

U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP 706.56	577.01	333.79	0.49	7615.30	
MEAN 623.16	542.00	249.19	0.46	6738.30	1.59
HUB 526.73	501.35	90.11	0.43	6649.24	

Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP 24.83	1.25	20.83	613.14	1.07	583.05	0.92	0.91
MEAN 24.20	1.22	20.16	608.27	1.07	577.25	0.92	0.91
HUB 24.14	1.22	19.48	607.78	1.06	571.55	0.92	0.91

Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP 38.38	35.34	31.50	3.84	0.93	0.40	2.90	
MEAN 37.85	27.37	23.50	3.87	0.94	0.39	3.30	0.91
HUB 41.52	10.35	6.50	3.85	0.94	0.38	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	677.841	375.026	564.645	1172.510	0.578	-0.178

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.348	19.409	571.367	46.000	33.591	30.600	-2.991

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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     557.165     375.026     671.622    1185.209       0.470       0.168

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      24.286      20.871     583.811     455.853       0.025       0.375

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     549.263       0.000     549.263    1185.950       0.463       0.354

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      20.907     584.541       0.000       0.060       0.040       0.177

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      24.222       1.224     609.730      38.886     218.488       1.694

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 242272.000       0.485    2330.153 1503323.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    170.196    3965.000      24.222     609.730       1.000       1.000       0.880
W Kg/sec =   77.36173

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.985    3657.065       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 130928.648  133546.938       1.502     489.817     326.161     384.470       1.179

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   510.87    -0.18   510.87     0.43   640.49
 MEAN    17.74     0.00    -0.02   510.87    -0.18   510.87     0.43
 HUB     15.05     0.00    -0.02   510.87    -0.18   510.87     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.67    46.36     7.31   694.45   862.26    21.33   587.95     0.73
 MEAN    50.24    43.40     6.84   613.77   798.70    21.33   587.95     0.67
 HUB     45.56    38.84     6.72   520.75   729.62    21.33   587.95     0.61

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   572.65   364.92   441.32  1223.75     0.47
 MEAN    17.51   579.91   365.97   449.85  1218.57     0.48
 HUB     14.85   624.92   423.86   459.20  1213.48     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   545.44   320.53     0.45  7232.57
 MEAN   605.75   509.76   239.78     0.42  6409.99     1.70
 HUB    513.83   467.93    89.97     0.39  6296.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.71     1.23    25.57   649.87     1.07   622.51     0.92     0.91
 MEAN    29.04     1.20    24.87   645.31     1.06   617.24     0.92     0.91
 HUB     28.95     1.20    24.16   644.68     1.06   612.09     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.59    35.99    31.50     4.49     0.93     0.44     2.90
 MEAN    39.13    28.06    23.50     4.56     0.93     0.43     3.28     0.91
 HUB     42.71    11.09     6.50     4.59     0.93     0.43     3.87
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      585.314     368.371     454.857     1219.325       0.480       0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     29.191      24.929      618.029      46.000      39.003       31.500      -7.503

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392      457.462     368.371     587.340     1230.251       0.372       0.365

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       29.111      26.457      629.154     471.992       0.028       0.452

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121      444.696       0.000     444.696     1231.191       0.361       0.358

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       26.492      630.115       0.000       0.060       0.055       0.372

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.874       28.994        1.197      646.618       36.889      212.597       1.648

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 230006.672       0.490    2212.186 1628610.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.987

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    170.196     3965.000       28.994      646.618       1.000        1.000       0.980
W Kg/sec =   77.36173

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     96.345     3551.218        1.401        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 130928.648  133546.938        1.829      513.330      280.635      401.059       1.429

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00     -0.02   417.49     -0.14   417.49      0.34    596.85
 MEAN    16.97      0.00     -0.02   417.49     -0.14   417.49      0.34
 HUB     14.32      0.00     -0.02   417.49     -0.14   417.49      0.34

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     57.94     46.36     11.58   666.42    786.51     26.78    632.08      0.64
 MEAN    54.59     43.80     10.79   587.21    720.61     26.78    632.08      0.58
 HUB     49.89     37.84     12.05   495.49    648.03     26.78    632.08      0.53

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88    547.70    359.39    413.30   1259.16      0.43
 MEAN    16.57    550.41    355.01    420.62   1254.14      0.44
 HUB     13.89    587.58    401.79    428.74   1249.14      0.47

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    653.27    507.13    293.88      0.40   6788.01
 MEAN   573.48    473.97    218.46      0.38   5886.39      1.67
 HUB    480.61    435.93     78.82      0.35   5582.93
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.68     1.20    30.45   684.26     1.06   659.24     0.92     0.90
 MEAN    33.88     1.17    29.68   679.26     1.05   653.99     0.92     0.90
 HUB     33.62     1.16    28.88   677.58     1.05   648.78     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.01    35.42    31.50     3.92     0.93     0.43     2.90
 MEAN    40.17    27.45    23.50     3.95     0.94     0.42     3.29     0.90
 HUB     43.14    10.42     6.50     3.92     0.94     0.41     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     545.103     357.010     411.924    1255.658       0.434       0.046

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.014      29.880     655.583      46.000      40.915      32.400      -8.515

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     421.172     357.010     552.125    1265.186       0.333       0.400

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.935      31.427     665.570     456.573       0.028       0.484

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     401.263       0.000     401.263    1266.483       0.317       0.374

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      31.521     666.935       0.000       0.060       0.060       0.422

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      33.794       1.166     680.363      33.745     210.191       1.629

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 210602.031       0.493    2025.553 1414811.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    170.196    3965.000      33.794     680.363       1.000       1.000       0.980
W Kg/sec =   77.36173

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     84.789    3462.031       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 130928.648  133546.938       2.063     509.668     247.002     390.276       1.580

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   374.52    -0.13   374.52     0.30   553.47
 MEAN    15.91     0.00    -0.02   374.52    -0.13   374.52     0.30
 HUB     13.07     0.00    -0.02   374.52    -0.13   374.52     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.43    47.36    12.07   633.89   736.38    31.81   668.67     0.58
 MEAN    55.78    44.80    10.98   550.61   666.02    31.81   668.67     0.53
 HUB     50.38    38.84    11.54   452.24   587.28    31.81   668.67     0.46

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
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      0.500       0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
  TIP     17.94   514.54   353.12   374.24  1291.17     0.40
  MEAN    15.50   508.97   337.63   380.87  1285.91     0.40
  HUB     12.59   532.37   364.44   388.08  1280.67     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    620.74   460.09   267.62     0.36  6337.33
  MEAN   536.24   429.54   198.61     0.33  5234.43     1.72
  HUB    435.63   394.55    71.18     0.31  4590.03

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     39.62     1.17    35.51   715.47     1.05   693.41     0.92     0.90
  MEAN    38.56     1.14    34.61   709.36     1.04   687.77     0.92     0.90
  HUB     37.95     1.12    33.69   705.79     1.04   682.17     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     43.34    35.57    31.50     4.07     0.93     0.46     2.90
  MEAN    41.56    27.54    23.50     4.04     0.94     0.43     3.34     0.90
  HUB     43.20    10.39     6.50     3.89     0.94     0.40     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.986

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     515.569     343.816     384.190    1286.176       0.401      -0.008

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      38.628      34.578     688.054      46.000      41.826      33.000      -8.826

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     398.276     343.816     526.150    1294.497       0.308       0.351

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      38.492      36.045     696.986     440.827       0.053       0.502

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     373.074       0.000     373.074    1296.000       0.288       0.421

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      36.305     698.606       0.000       0.060       0.062       0.414

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.859      38.456       1.138     710.204      29.841     217.364       1.685

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  186429.562       0.484    1793.065 1437946.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1168359.25  11237.1846    166.2643      2.5456      0.8571      8.4529      1.3584


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

    Fan-Core + 4 Stage LPC 105% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996
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   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    167.434    3965.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   76.10618

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    163.566    3949.384       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 128803.711  131379.516       1.746     831.557     476.339     619.754       1.301

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   395.96    -0.14   395.96     0.36   710.99
MEAN    17.06     0.00    -0.02   395.96    -0.14   395.96     0.36
HUB     12.51     0.00    -0.02   395.96    -0.14   395.96     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.99    50.47    10.52   713.82   816.41    13.83   509.71     0.74
MEAN    56.15    47.20     8.95   590.30   710.92    13.83   509.71     0.64
HUB     47.56    38.62     8.94   432.86   586.75    13.83   509.71     0.53

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   668.21   440.14   502.77  1135.82     0.59
MEAN    18.04   696.91   465.57   518.58  1128.34     0.62
HUB     15.00   791.33   573.41   545.34  1117.12     0.71

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    713.82   572.43   273.68     0.50  9083.00
MEAN   624.07   542.26   158.50     0.48  8399.40     1.47
HUB    519.02   548.04    54.40     0.49  8602.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.27     1.34    16.03   573.30     1.10   536.01     0.92     0.91
MEAN    19.84     1.31    15.34   569.50     1.09   528.94     0.92     0.91
HUB     19.97     1.32    14.28   570.63     1.09   518.35     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.20    28.56    24.20     4.36     0.93     0.39     2.90
MEAN    41.92    16.99    12.70     4.29     0.93     0.33     3.51     0.91
HUB     46.44    -5.70    -9.30     3.60     0.93     0.18     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     705.905     464.668     531.400    1128.839       0.625       0.002

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.981      15.347     529.521      24.000      41.167      35.400      -5.767

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     541.278     464.668     713.371    1146.973       0.472       0.383

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.875      17.060     546.670     528.796       0.032       0.514

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     498.435       0.000     498.435    1150.869       0.433       0.427

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.402     550.390       0.000       0.060       0.048       0.454
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    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      19.800       1.311     571.141      48.331     199.364       1.545

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 300899.531       0.591    2847.058 1664984.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    167.434    3965.000      19.800     571.141       1.000       1.000       0.980
W Kg/sec =   76.10618

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    130.442    3778.590       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 128803.711  131379.516       1.554     590.487     379.892     474.134       1.248

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   474.22    -0.16   474.22     0.41   677.60
 MEAN    18.08     0.00    -0.02   474.22    -0.16   474.22     0.41
 HUB     15.21     0.00    -0.02   474.22    -0.16   474.22     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.31    46.36     9.95   711.05   854.82    17.62   552.36     0.74
 MEAN    52.84    42.30    10.54   625.53   785.10    17.62   552.36     0.68
 HUB     47.99    37.84    10.15   526.28   708.54    17.62   552.36     0.61

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   597.33   379.50   461.28  1185.85     0.50
 MEAN    18.01   605.20   378.94   471.88  1179.82     0.51
 HUB     15.22   652.85   438.45   483.71  1173.87     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   565.46   327.05     0.48  7752.80
 MEAN   623.16   531.34   244.23     0.45  6827.61     1.61
 HUB    526.73   491.70    88.28     0.42  6677.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.93     1.26    20.96   614.20     1.08   584.41     0.92     0.90
 MEAN    24.27     1.23    20.28   609.06     1.07   578.49     0.92     0.90
 HUB     24.16     1.22    19.58   608.23     1.06   572.65     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.44    35.34    31.50     3.84     0.93     0.41     2.90
 MEAN    38.77    27.36    23.50     3.86     0.94     0.40     3.30     0.90
 HUB     42.19    10.34     6.50     3.84     0.94     0.39     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     670.736     380.002     552.708    1174.117       0.571      -0.172

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.411      19.560     572.936      46.000      34.510      30.600      -3.910

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     544.747     380.002     664.192    1187.146       0.459       0.191
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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      24.346      21.069     585.722     455.853       0.026       0.389

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     537.226       0.000     537.226    1187.834       0.452       0.367

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      21.095     586.401       0.000       0.060       0.042       0.197

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      24.278       1.226     610.498      39.358     214.356       1.662

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 245208.984       0.491    2320.124 1473157.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.999

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    167.434    3965.000      24.278     610.498       1.000       1.000       0.880
W Kg/sec =   76.10618

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    109.986    3654.762       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 128803.711  131379.516       1.529     489.817     320.339     384.470       1.200

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   500.08    -0.17   500.08     0.42   640.09
 MEAN    17.74     0.00    -0.02   500.08    -0.17   500.08     0.42
 HUB     15.05     0.00    -0.02   500.08    -0.17   500.08     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.25    46.36     7.89   694.45   855.90    21.50   589.63     0.72
 MEAN    50.84    43.40     7.44   613.77   791.84    21.50   589.63     0.66
 HUB     46.17    38.84     7.33   520.75   722.11    21.50   589.63     0.61

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   570.10   371.79   432.19  1225.48     0.47
 MEAN    17.51   576.12   371.06   440.71  1220.17     0.47
 HUB     14.85   619.60   425.88   450.04  1214.94     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   534.01   313.66     0.44  7368.57
 MEAN   605.75   499.30   234.68     0.41  6499.09     1.72
 HUB    513.83   458.55    87.95     0.38  6326.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.88     1.23    25.76   651.39     1.07   624.27     0.92     0.91
 MEAN    29.17     1.20    25.04   646.57     1.06   618.87     0.92     0.91
 HUB     29.03     1.20    24.31   645.61     1.06   613.58     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.70    35.97    31.50     4.47     0.93     0.45     2.90
 MEAN    40.10    28.04    23.50     4.54     0.93     0.44     3.28     0.91
 HUB     43.42    11.06     6.50     4.56     0.93     0.44     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     581.443     373.498     445.619    1220.915       0.476       0.014

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.318      25.098     619.646      46.000      39.968      31.500      -8.468

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     447.717     373.498     583.053    1232.178       0.363       0.380

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.229      26.678     631.130     471.992       0.031       0.467

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     435.470       0.000     435.470    1233.058       0.353       0.369

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.695     632.033       0.000       0.060       0.060       0.384

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.871      29.102       1.199     647.858      37.360     208.345       1.615

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 232948.094       0.496    2204.114 1594347.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.984

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    167.434    3965.000      29.102     647.858       1.000       1.000       0.980
W Kg/sec =   76.10618

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.520    3547.819       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 128803.711  131379.516       1.864     513.330     275.320     401.059       1.457

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   408.98    -0.14   408.98     0.33   596.28
 MEAN    16.97     0.00    -0.02   408.98    -0.14   408.98     0.33
 HUB     14.32     0.00    -0.02   408.98    -0.14   408.98     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.47    46.36    12.11   666.42   782.03    26.97   633.91     0.63
 MEAN    55.15    43.80    11.35   587.21   715.71    26.97   633.91     0.58
 HUB     50.47    37.84    12.63   495.49   642.58    26.97   633.91     0.52

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   545.42   365.37   404.95  1261.13     0.43
 MEAN    16.57   546.90   359.44   412.20  1256.02     0.44
 HUB     13.89   582.53   403.41   420.24  1250.92     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   496.86   287.90     0.39  6900.81
 MEAN   573.48   464.46   214.04     0.37  5959.66     1.69
 HUB    480.61   427.28    77.20     0.34  5605.39

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.88     1.20    30.67   686.12     1.06   661.31     0.92     0.90
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 MEAN    34.04     1.17    29.88   680.90     1.05   655.96     0.92     0.90
 HUB     33.74     1.16    29.07   678.94     1.05   650.64     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.06    35.41    31.50     3.91     0.93     0.44     2.90
 MEAN    41.09    27.44    23.50     3.94     0.94     0.43     3.29     0.90
 HUB     43.83    10.41     6.50     3.91     0.94     0.41     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     541.912     361.459     403.753    1257.481       0.431       0.045

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.176      30.077     657.497      46.000      41.836      32.400      -9.436

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     412.473     361.459     548.440    1267.294       0.325       0.414

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      34.088      31.675     667.799     456.573       0.030       0.499

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     393.208       0.000     393.208    1268.522       0.310       0.384

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      31.747     669.094       0.000       0.060       0.065       0.431

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854      33.936       1.166     681.987      34.129     206.274       1.599

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 213007.250       0.499    2015.437 1386500.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    167.434    3965.000      33.936     681.987       1.000       1.000       0.980
W Kg/sec =   76.10618

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.163    3457.906       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 128803.711  131379.516       2.104     509.668     242.267     390.276       1.611

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   367.11    -0.13   367.11     0.29   552.81
 MEAN    15.91     0.00    -0.02   367.11    -0.13   367.11     0.29
 HUB     13.07     0.00    -0.02   367.11    -0.13   367.11     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.93    47.36    12.57   633.89   732.63    32.02   670.76     0.58
 MEAN    56.31    44.80    11.51   550.61   661.88    32.02   670.76     0.52
 HUB     50.94    38.84    12.10   452.24   582.58    32.02   670.76     0.46

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
```

```
 TIP     17.94   512.89   358.36   366.92  1293.28     0.40
 MEAN    15.50   506.06   341.51   373.45  1287.96     0.39
 HUB     12.59   527.89   365.85   380.55  1282.64     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   451.08   262.38     0.35  6431.33
 MEAN   536.24   421.17   194.72     0.33  5294.65     1.75
 HUB    435.63   386.89    69.78     0.30  4607.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     39.85     1.17    35.75   717.61     1.05   695.69     0.92     0.90
 MEAN    38.75     1.14    34.84   711.31     1.04   689.97     0.92     0.90
 HUB     38.10     1.12    33.91   707.51     1.04   684.29     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    44.32    35.57    31.50     4.07     0.93     0.47     2.90
 MEAN   42.44    27.54    23.50     4.04     0.94     0.44     3.34     0.90
 HUB    43.87    10.39     6.50     3.89     0.94     0.41     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.983

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     512.700     347.776     376.714    1288.204       0.398      -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     38.818      34.802     690.241      46.000      42.713      33.000      -9.713

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     390.317     347.776     522.776    1296.769       0.301       0.364

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      38.668      36.311     699.450     440.827       0.057       0.516

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     365.758       0.000     365.758    1298.202       0.282       0.431

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      36.555     700.997       0.000       0.060       0.067       0.424

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.853      38.628       1.138     712.144      30.157     213.502       1.655

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188412.984       0.489    1782.731 1409506.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1180476.88  11169.4639    163.5658      2.5569      0.8530      8.9533      1.3621


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*******************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 105% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 9.505   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    164.402    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   74.72796
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
160.604	3949.384	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
126471.203	129000.344	1.778	831.557	467.713	619.754	1.325

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	387.78	-0.13	387.78	0.35	710.99
MEAN	17.06	0.00	-0.02	387.78	-0.13	387.78	0.35	
HUB	12.51	0.00	-0.02	387.78	-0.13	387.78	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.49	50.47	11.02	713.82	812.47	13.88	510.25	0.73
MEAN	56.70	47.20	9.50	590.30	706.39	13.88	510.25	0.64
HUB	48.15	38.62	9.53	432.86	581.25	13.88	510.25	0.52

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	663.85	446.30	491.44	1137.07	0.58
MEAN	18.04	690.77	469.10	507.06	1129.46	0.61
HUB	15.00	781.92	572.17	532.93	1118.30	0.70

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	713.82	559.54	267.52	0.49	9209.86	
MEAN	624.07	530.21	154.97	0.47	8463.00	1.50
HUB	519.02	535.57	53.15	0.48	8584.24	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.34	1.35	16.14	574.00	1.10	537.20	0.92	0.91
MEAN	19.87	1.32	15.43	569.85	1.09	530.00	0.92	0.91
HUB	19.95	1.32	14.39	570.52	1.09	519.48	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.24	28.56	24.20	4.36	0.93	0.41	2.90	
MEAN	42.77	16.99	12.70	4.29	0.94	0.35	3.51	0.91
HUB	47.03	-5.70	-9.30	3.60	0.94	0.19	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.994

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	699.317	468.190	519.464	1130.002	0.619	0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.007	15.447	530.612	24.000	42.028	35.400	-6.628

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	528.523	468.190	706.073	1148.501	0.460	0.397

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.893	17.201	548.128	528.796	0.034	0.527

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	487.354	0.000	487.354	1152.155	0.423	0.437

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.515	551.621	0.000	0.060	0.051	0.463

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.869	19.811	1.311	571.459	48.649	196.324	1.522

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 302880.812       0.594    2813.908 1630565.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 9.505   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    164.402    3965.000      19.811     571.459       1.000       1.000       0.980
W Kg/sec =   74.72796

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    128.039    3777.538       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 126471.203  129000.344       1.584     590.487     372.895     474.134       1.271

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   463.91    -0.16   463.91     0.40   677.42
 MEAN    18.08     0.00    -0.02   463.91    -0.16   463.91     0.40
 HUB     15.21     0.00    -0.02   463.91    -0.16   463.91     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.88    46.36    10.52   711.05   849.14    17.72   553.49     0.74
 MEAN    53.45    42.30    11.15   625.53   778.91    17.72   553.49     0.67
 HUB     48.61    37.84    10.77   526.28   701.68    17.72   553.49     0.61

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   594.29   386.64   451.32  1187.29     0.50
 MEAN    18.01   600.76   384.22   461.83  1181.14     0.51
 HUB     15.22   646.68   440.37   473.58  1175.04     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   553.20   319.91     0.47  7898.49
 MEAN   623.16   519.98   238.94     0.44  6922.73     1.64
 HUB    526.73   481.39    86.36     0.41  6706.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.02     1.26    21.08   615.33     1.08   585.84     0.92     0.90
 MEAN    24.33     1.23    20.39   609.91     1.07   579.78     0.92     0.90
 HUB     24.18     1.22    19.68   608.71     1.07   573.79     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.59    35.33    31.50     3.83     0.93     0.43     2.90
 MEAN    39.76    27.36    23.50     3.86     0.94     0.41     3.30     0.90
 HUB     42.92    10.34     6.50     3.84     0.94     0.39     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.985

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     663.436     385.302     540.083    1175.786       0.564      -0.164

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.470      19.710     574.567      46.000      35.504      30.600      -4.904

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     531.683     385.302     656.616    1189.161       0.447       0.214

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      24.400      21.268     587.714     455.853       0.027       0.404
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	524.573	0.000	524.573	1189.795	0.441	0.381

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	21.283	588.341	0.000	0.060	0.045	0.218

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.869	24.327	1.228	611.316	39.857	210.014	1.628

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
248322.688	0.497	2307.037	1440566.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 9.505 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
164.402	3965.000	24.327	611.316	1.000	1.000	0.880

W Kg/sec = 74.72796

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
107.849	3652.316	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
126471.203	129000.344	1.559	489.817	314.117	384.470	1.224

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	488.70	-0.17	488.70	0.41	639.66
MEAN	17.74	0.00	-0.02	488.70	-0.17	488.70	0.41	
HUB	15.05	0.00	-0.02	488.70	-0.17	488.70	0.41	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.87	46.36	8.51	694.45	849.30	21.67	591.39	0.71
MEAN	51.48	43.40	8.08	613.77	784.70	21.67	591.39	0.66
HUB	46.83	38.84	7.99	520.75	714.27	21.67	591.39	0.60

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	567.64	378.95	422.62	1227.27	0.46
MEAN	17.51	572.30	376.40	431.11	1221.84	0.47
HUB	14.85	614.08	427.96	440.40	1216.48	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	685.45	522.06	306.50	0.43	7510.43	
MEAN	605.75	488.32	229.35	0.40	6592.47	1.75
HUB	513.83	448.69	85.87	0.37	6357.72	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.04	1.23	25.94	653.00	1.07	626.11	0.92	0.91
MEAN	29.29	1.20	25.20	647.90	1.06	620.57	0.92	0.91
HUB	29.11	1.20	24.45	646.60	1.06	615.13	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.88	35.95	31.50	4.45	0.93	0.46	2.90	
MEAN	41.12	28.01	23.50	4.51	0.93	0.45	3.28	0.91
HUB	44.18	11.03	6.50	4.53	0.93	0.45	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

```
     17.392     577.553     378.871     435.918    1222.570       0.472       0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.436      25.260     621.332      46.000      40.995      31.500      -9.495

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     437.519     378.871     578.762    1234.185       0.355       0.396

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.337      26.893     633.194     471.992       0.033       0.483

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     425.815       0.000     425.815    1235.006       0.345       0.381

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.891     634.037       0.000       0.060       0.066       0.396

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4           PR4       Texit        Del T       Ns        Ns nondim
      0.867      29.198        1.200     649.168      37.852     203.948       1.581

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 236017.438       0.502    2192.715 1557556.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 9.505   EfDer =  0.981

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    164.402    3965.000      29.198     649.168       1.000       1.000       0.980
W Kg/sec =   74.72796

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     92.595    3544.238       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 126471.203  129000.344       1.903     513.330     269.714     401.059       1.487

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   400.07    -0.14   400.07     0.32   595.68
 MEAN    16.97     0.00    -0.02   400.07    -0.14   400.07     0.32
 HUB     14.32     0.00    -0.02   400.07    -0.14   400.07     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.03    46.36    12.67   666.42   777.40    27.15   635.82     0.63
 MEAN    55.74    43.80    11.94   587.21   710.65    27.15   635.82     0.57
 HUB     51.09    37.84    13.25   495.49   636.95    27.15   635.82     0.52

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   543.20   371.55   396.25  1263.18     0.43
 MEAN    16.57   543.36   364.03   403.40  1257.97     0.43
 HUB     13.89   577.30   405.05   411.35  1252.77     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   486.19   281.72     0.38  7017.55
 MEAN   573.48   454.53   209.45     0.36  6035.65     1.72
 HUB    480.61   418.23    75.56     0.33  5628.16

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     35.06     1.20    30.87   688.08     1.06   663.47     0.92     0.90
 MEAN    34.19     1.17    30.08   682.63     1.05   658.01     0.92     0.90
 HUB     33.84     1.16    29.25   680.37     1.05   652.58     0.92     0.90
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.16    35.41    31.50     3.91     0.93     0.46     2.90
 MEAN    42.06    27.44    23.50     3.94     0.94     0.44     3.29     0.90
 HUB     44.56    10.41     6.50     3.91     0.94     0.42     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     538.704     366.073     395.212    1259.379       0.428       0.043

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.322      30.263     659.494      46.000      42.808      32.400     -10.408

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     403.406     366.073     544.744    1269.488       0.318       0.429

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      34.226      31.911     670.123     456.573       0.032       0.514

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     384.807       0.000     384.807    1270.645       0.303       0.395

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      31.960     671.346       0.000       0.060       0.071       0.440

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.848      34.061       1.167     683.694      34.526     202.246       1.568

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 215493.562       0.505    2002.038 1355981.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 9.505   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    164.402    3965.000      34.061     683.694       1.000       1.000       0.980
W Kg/sec =   74.72796

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.459    3453.587       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 126471.203  129000.344       2.148     509.668     237.305     390.276       1.645

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   359.38    -0.12   359.38     0.28   552.12
 MEAN    15.91     0.00    -0.02   359.38    -0.12   359.38     0.28
 HUB     13.07     0.00    -0.02   359.38    -0.12   359.38     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.45    47.36    13.09   633.89   728.79    32.22   672.93     0.57
 MEAN    56.87    44.80    12.07   550.61   657.62    32.22   672.93     0.52
 HUB     51.53    38.84    12.69   452.24   577.74    32.22   672.93     0.45

     ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   511.33   363.80   359.31  1295.48     0.39
 MEAN    15.50   503.14   345.55   365.72  1290.08     0.39
 HUB     12.59   523.26   367.29   372.70  1284.70     0.41
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       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   441.73   256.94     0.34  6528.91
 MEAN   536.24   412.45   190.69     0.32  5357.13     1.77
 HUB    435.63   378.91    68.34     0.29  4625.78

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     40.05     1.18    35.97   719.86     1.05   698.07     0.92     0.90
 MEAN    38.92     1.14    35.05   713.37     1.04   692.27     0.92     0.90
 HUB     38.23     1.12    34.10   709.31     1.04   686.50     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.36    35.57    31.50     4.07     0.93     0.48     2.90
 MEAN    43.38    27.54    23.50     4.04     0.94     0.45     3.34     0.90
 HUB     44.58    10.39     6.50     3.89     0.94     0.42     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     509.833     351.884     368.927    1290.314       0.395      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     38.988      35.009     692.521      46.000      43.646      33.000     -10.646

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     382.045     351.884     519.404    1299.130       0.294       0.377

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      38.822      36.560     702.017     440.827       0.061       0.531

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     358.149       0.000     358.149    1300.493       0.275       0.441

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      36.786     703.491       0.000       0.060       0.072       0.433

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.848      38.777       1.138     714.178      30.484     209.530       1.624

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 190467.453       0.494    1769.534 1378821.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1193182.00  11085.2314    160.6038      2.5668      0.8479      9.5045      1.3660


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 105% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.944    3965.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   73.61079

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    158.203    3949.384       1.402       0.249      53.349      32.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
124580.477	127071.820	1.805	831.557	460.721	619.754	1.345

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	381.19	-0.13	381.19	0.34	710.99
MEAN	17.06	0.00	-0.02	381.19	-0.13	381.19	0.34	
HUB	12.51	0.00	-0.02	381.19	-0.13	381.19	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.90	50.47	11.43	713.82	809.34	13.92	510.67	0.73
MEAN	57.15	47.20	9.95	590.30	702.79	13.92	510.67	0.63
HUB	48.64	38.62	10.02	432.86	576.88	13.92	510.67	0.52

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	660.55	451.18	482.46	1138.04	0.58
MEAN	18.04	686.00	471.90	497.90	1130.33	0.61
HUB	15.00	774.49	571.17	523.07	1119.22	0.69

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	713.82	549.31	262.64	0.48	9310.54	
MEAN	624.07	520.64	152.17	0.46	8513.47	1.52
HUB	519.02	525.66	52.15	0.47	8569.20	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.39	1.35	16.23	574.56	1.10	538.12	0.92	0.91
MEAN	19.89	1.32	15.51	570.13	1.09	530.83	0.92	0.91
HUB	19.93	1.32	14.46	570.44	1.09	520.36	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.08	28.56	24.20	4.36	0.93	0.42	2.90	
MEAN	43.46	16.99	12.70	4.29	0.94	0.36	3.51	0.91
HUB	47.52	-5.69	-9.30	3.61	0.94	0.20	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	694.202	470.985	509.990	1130.904	0.614	0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.025	15.524	531.460	24.000	42.723	35.400	-7.323

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	518.453	470.985	700.443	1149.687	0.451	0.409

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.905	17.309	549.260	528.796	0.036	0.537

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	478.580	0.000	478.580	1153.157	0.415	0.444

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.600	552.581	0.000	0.060	0.054	0.471

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.865	19.818	1.312	571.711	48.901	193.897	1.503

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
304450.594	0.597	2786.207	1602882.250

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.944    3965.000      19.818     571.711       1.000       1.000       0.980
W Kg/sec =   73.61079

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    126.113    3776.705       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 124580.477  127071.820       1.608     590.487     367.284     474.134       1.291

    ROTOR LEADING EDGE CONDITIONS, STAGE           2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   455.72    -0.16   455.72     0.39   677.27
 MEAN    18.08     0.00    -0.02   455.72    -0.16   455.72     0.39
 HUB     15.21     0.00    -0.02   455.72    -0.16   455.72     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.35    46.36    10.99   711.05   844.69    17.80   554.37     0.73
 MEAN    53.93    42.30    11.63   625.53   774.06    17.80   554.37     0.67
 HUB     49.12    37.84    11.28   526.28   696.29    17.80   554.37     0.60

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   592.04   392.24   443.46  1188.41     0.50
 MEAN    18.01   597.36   388.37   453.89  1182.15     0.51
 HUB     15.22   641.87   441.87   465.56  1175.95     0.55

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   543.55   314.31     0.46  8012.84
 MEAN   623.16   511.02   234.80     0.43  6997.31     1.66
 HUB    526.73   473.23    84.86     0.40  6728.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.09     1.27    21.18   616.22     1.08   586.95     0.92     0.90
 MEAN    24.38     1.23    20.47   610.58     1.07   580.78     0.92     0.90
 HUB     24.19     1.22    19.75   609.09     1.07   574.69     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.49    35.33    31.50     3.83     0.93     0.44     2.90
 MEAN    40.55    27.35    23.50     3.85     0.94     0.42     3.30     0.90
 HUB     43.50    10.33     6.50     3.83     0.94     0.40     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.983

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     657.843     389.457     530.170    1177.074       0.559      -0.159

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.511      19.822     575.829      46.000      36.301      30.600      -5.701

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     521.474     389.457     650.855    1190.719       0.438       0.233

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      24.436      21.416     589.256     455.853       0.028       0.416

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     17.823     514.693       0.000     514.693    1191.311       0.432       0.391

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850     21.422     589.843       0.000       0.060       0.048       0.234

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865     24.358       1.229     611.960      40.249     206.631       1.602

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 250765.062       0.502    2294.899 1414517.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.944    3965.000      24.358     611.960       1.000       1.000       0.880
W Kg/sec =   73.61079

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    106.157    3650.394       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 124580.477  127071.820       1.584     489.817     309.188     384.470       1.243

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   479.78    -0.17   479.78     0.40   639.33
 MEAN    17.74     0.00    -0.02   479.78    -0.17   479.78     0.40
 HUB     15.05     0.00    -0.02   479.78    -0.17   479.78     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.37    46.36     9.01   694.45   844.20    21.79   592.75     0.71
 MEAN    51.99    43.40     8.59   613.77   779.17    21.79   592.75     0.65
 HUB     47.35    38.84     8.51   520.75   708.20    21.79   592.75     0.59

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   565.89   384.53   415.17  1228.66     0.46
 MEAN    17.51   569.44   380.55   423.61  1223.13     0.47
 HUB     14.85   609.82   429.56   432.85  1217.67     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   512.76   300.92     0.42  7620.82
 MEAN   605.75   479.75   225.20     0.39  6665.02     1.77
 HUB    513.83   440.98    84.26     0.36  6381.49

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.15     1.24    26.07   654.25     1.07   627.53     0.92     0.91
 MEAN    29.38     1.21    25.32   648.95     1.06   621.89     0.92     0.91
 HUB     29.15     1.20    24.56   647.38     1.06   616.34     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.81    35.94    31.50     4.44     0.93     0.47     2.90
 MEAN    41.93    28.00    23.50     4.50     0.93     0.46     3.28     0.91
 HUB     44.78    11.02     6.50     4.52     0.93     0.46     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     574.633     383.046     428.345    1223.851       0.470       0.014

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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    29.517      25.376     622.639      46.000      41.805      31.500     -10.305

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     429.582     383.046     575.556    1235.739       0.348       0.409

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.409      27.049     634.794     471.992       0.035       0.496

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     418.300       0.000     418.300    1236.516       0.338       0.390

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.031     635.593       0.000       0.060       0.070       0.404

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.863      29.261       1.201     650.194      38.234     200.562       1.555

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 238401.781       0.507    2181.755 1528301.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.978

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.944    3965.000      29.261     650.194       1.000       1.000       0.980
W Kg/sec =   73.61079

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.086    3541.440       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 124580.477  127071.820       1.935     513.330     265.321     401.059       1.512

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   393.12    -0.14   393.12     0.32   595.21
 MEAN    16.97     0.00    -0.02   393.12    -0.14   393.12     0.32
 HUB     14.32     0.00    -0.02   393.12    -0.14   393.12     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.47    46.36    13.11   666.42   773.85    27.28   637.31     0.63
 MEAN    56.20    43.80    12.40   587.21   706.76    27.28   637.31     0.57
 HUB     51.58    37.84    13.74   495.49   632.60    27.28   637.31     0.51

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   541.61   376.36   389.49  1264.76     0.43
 MEAN    16.57   540.70   367.57   396.56  1259.48     0.43
 HUB     13.89   573.29   406.33   404.42  1254.21     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   477.89   276.91     0.38  7108.23
 MEAN   573.48   446.83   205.91     0.35  6094.29     1.74
 HUB    480.61   411.18    74.28     0.33  5645.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     35.19     1.20    31.02   689.60     1.06   665.14     0.92     0.89
 MEAN    34.30     1.17    30.21   683.98     1.05   659.60     0.92     0.89
 HUB     33.91     1.16    29.38   681.50     1.05   654.09     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.02    35.41    31.50     3.91     0.93     0.47     2.90
 MEAN    42.83    27.44    23.50     3.94     0.94     0.45     3.29     0.89
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 HUB     45.14    10.41     6.50     3.91     0.94     0.43     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     536.295     369.633     388.566    1260.851       0.425       0.042

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.420      30.391     661.045      46.000      43.570      32.400     -11.170

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     396.368     369.633     541.974    1271.187       0.312       0.440

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      34.316      32.078     671.927     456.573       0.034       0.527

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096     378.281       0.000     378.281    1272.291       0.297       0.403

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      32.109     673.096       0.000       0.060       0.075       0.447

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
       0.843      34.141       1.167     685.028      34.834     199.148       1.544

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 217420.656       0.509    1989.744 1331625.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.977

   W act       RPM act        Pt          Tt           POTS        POTH       AeroBl
    161.944    3965.000       34.141     685.028       1.000       1.000       0.980
W Kg/sec =   73.61079

   W cor       RPM cor        GAMMA       Cp          R           Blades       THK
     80.130    3450.223       1.401       0.250      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 124580.477  127071.820       2.183     509.668     233.435     390.276       1.672

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   353.37    -0.12   353.37     0.28   551.58
 MEAN    15.91      0.00    -0.02   353.37    -0.12   353.37     0.28
 HUB     13.07      0.00    -0.02   353.37    -0.12   353.37     0.28

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     60.87    47.36    13.51   633.89   725.84    32.36   674.62     0.57
 MEAN    57.31    44.80    12.51   550.61   654.35    32.36   674.62     0.51
 HUB     52.00    38.84    13.16   452.24   574.02    32.36   674.62     0.45

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     17.94   510.22   368.01   353.41  1297.17      0.39
 MEAN    15.50   500.96   348.66   359.72  1291.73      0.39
 HUB     12.59   519.72   368.40   366.60  1286.29      0.40

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   434.48   252.74     0.33  6604.31
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  MEAN   536.24   405.68   187.57     0.31  5405.37     1.80
  HUB    435.63   372.71    67.23     0.29  4639.70

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     40.19     1.18    36.12   721.61     1.05   699.92     0.92     0.89
  MEAN    39.04     1.14    35.19   714.97     1.04   694.06     0.92     0.89
  HUB     38.31     1.12    34.24   710.72     1.04   688.22     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     46.16    35.57    31.50     4.07     0.93     0.49     2.90
  MEAN    44.11    27.54    23.50     4.04     0.94     0.46     3.34     0.89
  HUB     45.14    10.39     6.50     3.89     0.94     0.43     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.977

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     507.690     355.056     362.883    1291.948       0.393      -0.010

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      39.099      35.149     694.290      46.000      44.375      33.000     -11.375

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     375.637     355.056     516.883    1300.959       0.289       0.388

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      38.921      36.731     704.009     440.827       0.065       0.542

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
      14.701     352.250       0.000     352.250    1302.269       0.270       0.449

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      36.945     705.427       0.000       0.060       0.077       0.441

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.843      38.872       1.139     715.765      30.737     206.481       1.601

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  192053.891       0.498    1757.598 1354307.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1203091.88  11010.2031    158.2028      2.5731      0.8434      9.9531      1.3691


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 105% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =10.541   EfDer =  0.989

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     158.733    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   72.15138

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     155.066    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  122110.539  124552.492       1.841     831.557     451.587     619.754       1.372
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ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	372.66	-0.13	372.66	0.34	710.99
MEAN	17.06	0.00	-0.02	372.66	-0.13	372.66	0.34	
HUB	12.51	0.00	-0.02	372.66	-0.13	372.66	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.44	50.47	11.97	713.82	805.36	13.97	511.21	0.73
MEAN	57.74	47.20	10.54	590.30	698.20	13.97	511.21	0.63
HUB	49.28	38.62	10.66	432.86	571.27	13.97	511.21	0.52

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	656.52	457.40	470.97	1139.25	0.58
MEAN	18.04	680.01	475.47	486.16	1131.42	0.60
HUB	15.00	765.04	569.86	510.44	1120.38	0.68

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	713.82	536.25	256.42	0.47	9438.77	
MEAN	624.07	508.36	148.60	0.45	8577.74	1.55
HUB	519.02	512.96	50.85	0.46	8549.55	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.46	1.35	16.33	575.27	1.10	539.28	0.92	0.90
MEAN	19.92	1.32	15.60	570.49	1.09	531.87	0.92	0.90
HUB	19.90	1.32	14.56	570.33	1.09	521.46	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.16	28.57	24.20	4.37	0.93	0.43	2.90	
MEAN	44.36	17.00	12.70	4.30	0.94	0.37	3.51	0.90
HUB	48.15	-5.69	-9.30	3.61	0.94	0.22	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.989

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	687.791	474.544	497.860	1132.031	0.608	0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.046	15.618	532.520	24.000	43.626	35.400	-8.226

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	505.624	474.544	693.432	1151.170	0.439	0.423

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.916	17.441	550.678	528.796	0.038	0.551

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	467.370	0.000	467.370	1154.415	0.405	0.454

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.703	553.787	0.000	0.060	0.059	0.480

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.860	19.822	1.312	572.031	49.221	190.778	1.479

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
306444.812	0.601	2748.855	1566999.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

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 RESET =  0.000BLEED =  0.000 DPInc =10.541   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.733    3965.000      19.822     572.031       1.000       1.000       0.980
W Kg/sec =   72.15138

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    123.622    3775.647       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 122110.539  124552.492       1.640     590.487     360.029     474.134       1.317

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   445.25    -0.15   445.25     0.39   677.08
 MEAN    18.08     0.00    -0.02   445.25    -0.15   445.25     0.39
 HUB     15.21     0.00    -0.02   445.25    -0.15   445.25     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.95    46.36    11.59   711.05   839.08    17.89   555.48     0.73
 MEAN    54.56    42.30    12.26   625.53   767.94    17.89   555.48     0.66
 HUB     49.78    37.84    11.94   526.28   689.48    17.89   555.48     0.60

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   589.38   399.34   433.47  1189.81     0.50
 MEAN    18.01   593.19   393.63   443.76  1183.43     0.50
 HUB     15.22   635.79   443.77   455.30  1177.10     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   531.30   307.21     0.45  8157.77
 MEAN   623.16   499.61   229.53     0.42  7092.04     1.69
 HUB    526.73   462.80    82.96     0.39  6757.84

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.18     1.27    21.28   617.34     1.08   588.34     0.92     0.90
 MEAN    24.42     1.23    20.57   611.42     1.07   582.05     0.92     0.90
 HUB     24.19     1.22    19.83   609.57     1.07   575.82     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.65    35.33    31.50     3.83     0.93     0.45     2.90
 MEAN    41.57    27.35    23.50     3.85     0.94     0.43     3.30     0.90
 HUB     44.27    10.33     6.50     3.83     0.94     0.41     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     650.944     394.735     517.602    1178.677       0.552      -0.152

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.556      19.955     577.400      46.000      37.330      30.600      -6.730

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     508.586     394.735     643.798    1192.661       0.426       0.256

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      24.473      21.594     591.182     455.853       0.031       0.431

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     502.228       0.000     502.228    1193.202       0.421       0.404

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.850      21.587     591.718       0.000       0.060       0.052       0.254

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      24.388       1.230     612.778      40.746     202.371       1.569

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 253862.719       0.509    2277.186 1380952.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =10.541   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.733    3965.000      24.388     612.778       1.000       1.000       0.880
W Kg/sec =   72.15138

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.992    3647.958       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 122110.539  124552.492       1.617     489.817     302.884     384.470       1.269

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   468.51    -0.16   468.51     0.39   638.90
 MEAN    17.74     0.00    -0.02   468.51    -0.16   468.51     0.39
 HUB     15.05     0.00    -0.02   468.51    -0.16   468.51     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.00    46.36     9.64   694.45   837.84    21.94   594.46     0.70
 MEAN    52.65    43.40     9.25   613.77   772.28    21.94   594.46     0.65
 HUB     48.03    38.84     9.19   520.75   700.60    21.94   594.46     0.59

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   563.88   391.53   405.79  1230.39     0.46
 MEAN    17.51   565.99   385.78   414.15  1224.74     0.46
 HUB     14.85   604.54   431.60   423.31  1219.16     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   501.05   293.92     0.41  7759.51
 MEAN   605.75   468.94   219.97     0.38  6756.47     1.79
 HUB    513.83   431.22    82.22     0.35  6411.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.28     1.24    26.22   655.84     1.07   629.31     0.92     0.91
 MEAN    29.47     1.21    25.45   650.27     1.06   623.54     0.92     0.91
 HUB     29.19     1.20    24.67   648.36     1.06   617.86     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.98    35.92    31.50     4.42     0.93     0.48     2.90
 MEAN    42.97    27.97    23.50     4.47     0.93     0.47     3.28     0.91
 HUB     45.56    10.99     6.50     4.49     0.93     0.46     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     571.111     388.307     418.790    1225.452       0.466       0.013

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    29.605      25.507     624.275      46.000      42.837      31.500     -11.337

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	419.594	388.307	571.701	1237.685	0.339	0.425

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	29.486	27.229	636.801	471.992	0.038	0.512

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	408.838	0.000	408.838	1238.407	0.330	0.401

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	27.191	637.544	0.000	0.060	0.077	0.415

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.858	29.325	1.202	651.492	38.715	196.338	1.522

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
241405.094	0.514	2165.440	1490767.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =10.541 EfDer = 0.974

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
158.733	3965.000	29.325	651.492	1.000	1.000	0.980

W Kg/sec = 72.15138

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
89.175	3537.909	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
122110.539	124552.492	1.976	513.330	259.754	401.059	1.544

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	384.36	-0.13	384.36	0.31	594.62
MEAN	16.97	0.00	-0.02	384.36	-0.13	384.36	0.31	
HUB	14.32	0.00	-0.02	384.36	-0.13	384.36	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.03	46.36	13.67	666.42	769.43	27.43	639.17	0.62
MEAN	56.80	43.80	13.00	587.21	701.93	27.43	639.17	0.57
HUB	52.21	37.84	14.37	495.49	627.20	27.43	639.17	0.51

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	539.78	382.36	381.00	1266.73	0.43
MEAN	16.57	537.49	372.01	387.95	1261.37	0.43
HUB	13.89	568.29	407.90	395.69	1256.01	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	653.27	467.50	270.91	0.37	7221.49	
MEAN	573.48	437.14	201.47	0.35	6167.87	1.77
HUB	480.61	402.31	72.71	0.32	5667.69	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	35.33	1.20	31.18	691.53	1.06	667.24	0.92	0.89
MEAN	34.40	1.17	30.36	685.69	1.05	661.60	0.92	0.89
HUB	33.97	1.16	29.51	682.92	1.05	655.99	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.10	35.41	31.50	3.91	0.93	0.48	2.90	
MEAN	43.80	27.44	23.50	3.94	0.94	0.46	3.29	0.89
HUB	45.87	10.41	6.50	3.91	0.94	0.44	3.90	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     533.391     374.101     380.203    1262.691       0.422       0.041

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.524      30.533     662.988      46.000      44.536      32.400     -12.136

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     387.530     374.101     538.638    1273.313       0.304       0.455

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      34.410      32.267     674.188     456.573       0.037       0.542

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     370.079       0.000     370.079    1274.353       0.290       0.413

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.274     675.291       0.000       0.060       0.082       0.456

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.836      34.222       1.167     686.711      35.219     195.299       1.514

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 219826.797       0.515    1971.879 1300260.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.541   EfDer =  0.973

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.733    3965.000      34.222     686.711       1.000       1.000       0.980
W Kg/sec =   72.15138

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     78.453    3445.992       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 122110.539  124552.492       2.230     509.668     228.551     390.276       1.708

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   345.80    -0.12   345.80     0.27   550.90
 MEAN    15.91     0.00    -0.02   345.80    -0.12   345.80     0.27
 HUB     13.07     0.00    -0.02   345.80    -0.12   345.80     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.39    47.36    14.03   633.89   722.18    32.52   676.75     0.57
 MEAN    57.88    44.80    13.08   550.61   650.29    32.52   676.75     0.51
 HUB     52.60    38.84    13.76   452.24   569.39    32.52   676.75     0.45

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   508.96   373.26   346.00  1299.30     0.39
 MEAN    15.50   498.31   352.54   352.18  1293.79     0.39
 HUB     12.59   515.32   369.77   358.93  1288.29     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   425.40   247.49     0.33  6698.44
 MEAN   536.24   397.21   183.70     0.31  5465.37     1.82
 HUB    435.63   364.92    65.86     0.28  4656.96
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    40.33     1.18    36.28   723.81     1.05   702.23     0.92     0.89
 MEAN   39.15     1.14    35.34   716.98     1.04   696.29     0.92     0.89
 HUB    38.39     1.12    34.38   712.50     1.04   690.38     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    47.17    35.58    31.50     4.08     0.93     0.50     2.90
 MEAN   45.03    27.55    23.50     4.05     0.94     0.47     3.34     0.89
 HUB    45.85    10.40     6.50     3.90     0.94     0.44     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     505.087     359.001     355.290    1293.994       0.390       -0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     39.213      35.301     696.509      46.000      45.298      33.000     -12.298

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     367.602     359.001     513.822    1303.246       0.282       0.401

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      39.019      36.920     706.505     440.827       0.069       0.557

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     344.846       0.000     344.846    1304.491       0.264       0.459

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      37.117     707.856       0.000       0.060       0.083       0.450

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.836      38.965       1.139     717.763      31.052     202.696       1.571

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 194030.812       0.504    1740.485 1322713.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1215570.25  10903.8457    155.0663      2.5793      0.8371     10.5413      1.3729


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 105% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =10.977   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    156.364    3965.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   71.07451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    152.752    3949.384       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 120288.016  122693.516       1.869     831.557     444.847     619.754       1.393

     ROTOR LEADING EDGE CONDITIONS, STAGE            1
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   366.41    -0.13   366.41     0.33   710.99
MEAN    17.06     0.00    -0.02   366.41    -0.13   366.41     0.33
HUB     12.51     0.00    -0.02   366.41    -0.13   366.41     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     62.83    50.47    12.36   713.82   802.48    14.01   511.60     0.72
MEAN    58.18    47.20    10.98   590.30   694.88    14.01   511.60     0.63
HUB     49.76    38.62    11.14   432.86   567.21    14.01   511.60     0.51

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   653.75   461.88   462.65  1140.11     0.57
MEAN    18.04   675.77   478.04   477.64  1132.20     0.60
HUB     15.00   758.26   568.92   501.28  1121.20     0.68

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    713.82   526.80   251.94     0.46  9531.28
MEAN   624.07   499.46   146.02     0.44  8624.14     1.57
HUB    519.02   503.76    49.91     0.45  8535.43

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.50     1.36    16.40   575.79     1.10   540.09     0.92     0.90
MEAN    19.93     1.32    15.66   570.75     1.09   532.61     0.92     0.90
HUB     19.88     1.32    14.63   570.25     1.09   522.24     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.95    28.57    24.20     4.37     0.93     0.44     2.90
MEAN    45.02    17.00    12.70     4.30     0.94     0.38     3.51     0.90
HUB     48.62    -5.69    -9.30     3.61     0.94     0.23     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.986

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     683.249     477.114     489.072    1132.830       0.603       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.059      15.683     533.271      24.000      44.291      35.400      -8.891

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     496.369     477.114     688.491    1152.221       0.431       0.434

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.922      17.533     551.684     528.796       0.040       0.561

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     459.262       0.000     459.262    1155.310       0.398       0.460

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.774     554.646       0.000       0.060       0.062       0.487

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4        Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.856      19.822       1.312     572.262      49.452     188.508       1.461

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 307884.250       0.604    2720.547 1540716.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.977   EfDer =  0.976

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
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    156.364    3965.000      19.822     572.262       1.000       1.000       0.980
W Kg/sec =   71.07451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    121.799    3774.885       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 120288.016  122693.516       1.665     590.487     354.721     474.134       1.337

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   437.66    -0.15   437.66     0.38   676.94
 MEAN    18.08     0.00    -0.02   437.66    -0.15   437.66     0.38
 HUB     15.21     0.00    -0.02   437.66    -0.15   437.66     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.39    46.36    12.03   711.05   835.08    17.96   556.27     0.72
 MEAN    55.03    42.30    12.73   625.53   763.56    17.96   556.27     0.66
 HUB     50.26    37.84    12.42   526.28   684.60    17.96   556.27     0.59

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   587.61   404.44   426.27  1190.80     0.49
 MEAN    18.01   590.28   397.42   436.45  1184.34     0.50
 HUB     15.22   631.46   445.13   447.88  1177.91     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   522.48   302.12     0.44  8261.76
 MEAN   623.16   491.37   225.75     0.41  7160.21     1.71
 HUB    526.73   455.25    81.60     0.39  6778.58

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.23     1.27    21.36   618.15     1.08   589.32     0.92     0.89
 MEAN    24.45     1.23    20.63   612.03     1.07   582.94     0.92     0.89
 HUB     24.19     1.22    19.89   609.91     1.07   576.62     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.49    35.33    31.50     3.83     0.93     0.46     2.90
 MEAN    42.32    27.35    23.50     3.85     0.94     0.44     3.30     0.89
 HUB     44.82    10.33     6.50     3.83     0.94     0.42     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.976

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     646.124     398.534     508.573    1179.808       0.548      -0.147

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.584      20.045     578.511      46.000      38.083      30.600      -7.483

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     499.361     398.534     638.898    1194.035       0.418       0.272

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      24.495      21.714     592.547     455.853       0.032       0.443

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     493.311       0.000     493.311    1194.540       0.413       0.413

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      21.698     593.048       0.000       0.060       0.055       0.268

    STAGE EXIT CONDITIONS, STAGE            2
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      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.855      24.404       1.231     613.366      41.103     199.331       1.545

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 256087.750       0.513    2262.860 1356493.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.977   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    156.364    3965.000      24.404     613.366       1.000       1.000       0.880
W Kg/sec =   71.07451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.423    3646.209       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 120288.016  122693.516       1.642     489.817     298.316     384.470       1.289

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   460.42    -0.16   460.42     0.38   638.59
 MEAN    17.74     0.00    -0.02   460.42    -0.16   460.42     0.38
 HUB     15.05     0.00    -0.02   460.42    -0.16   460.42     0.38

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.46    46.36    10.10   694.45   833.34    22.03   595.68     0.70
 MEAN    53.13    43.40     9.73   613.77   767.39    22.03   595.68     0.64
 HUB     48.53    38.84     9.69   520.75   695.22    22.03   595.68     0.58

     ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   562.58   396.52   399.08  1231.62     0.46
 MEAN    17.51   563.61   389.49   407.37  1225.89     0.46
 HUB     14.85   600.81   433.04   416.47  1220.22     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   492.70   288.93     0.40  7858.19
 MEAN   605.75   461.22   216.26     0.38  6821.42     1.81
 HUB    513.83   424.23    80.79     0.35  6432.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.36     1.24    26.31   656.98     1.07   630.57     0.92     0.91
 MEAN    29.52     1.21    25.54   651.22     1.06   624.72     0.92     0.91
 HUB     29.21     1.20    24.75   649.07     1.06   618.95     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.82    35.90    31.50     4.40     0.93     0.49     2.90
 MEAN    43.71    27.96    23.50     4.46     0.94     0.48     3.28     0.91
 HUB     46.12    10.98     6.50     4.48     0.94     0.47     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.993

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     568.686     392.045     411.952    1226.586       0.464       0.013

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    29.657      25.591     625.436      46.000      43.582      31.500     -12.082

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     412.464     392.045     569.057    1239.065       0.333       0.436
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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.531      27.348     638.226     471.992       0.040       0.524

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     402.079       0.000     402.079    1239.750       0.324       0.409

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.295     638.932       0.000       0.060       0.081       0.423

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854      29.360       1.203     652.422      39.056     193.357       1.499

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 243537.938       0.518    2151.966 1463521.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.977   EfDer =  0.971

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    156.364    3965.000      29.360     652.422       1.000       1.000       0.980
W Kg/sec =   71.07451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.801    3535.387       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 120288.016  122693.516       2.007     513.330     255.754     401.059       1.568

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   378.10    -0.13   378.10     0.30   594.19
 MEAN    16.97     0.00    -0.02   378.10    -0.13   378.10     0.30
 HUB     14.32     0.00    -0.02   378.10    -0.13   378.10     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.44    46.36    14.08   666.42   766.32    27.53   640.50     0.62
 MEAN    57.23    43.80    13.43   587.21   698.52    27.53   640.50     0.56
 HUB     52.66    37.84    14.82   495.49   623.38    27.53   640.50     0.50

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   538.57   386.61   374.95  1268.13     0.42
 MEAN    16.57   535.28   375.17   381.80  1262.71     0.42
 HUB     13.89   564.77   409.01   389.45  1257.29     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   460.10   266.66     0.36  7301.76
 MEAN   573.48   430.23   198.31     0.34  6220.17     1.79
 HUB    480.61   395.98    71.60     0.31  5683.04

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     35.41     1.21    31.28   692.90     1.06   668.72     0.92     0.89
 MEAN    34.46     1.17    30.45   686.91     1.05   663.02     0.92     0.89
 HUB     34.00     1.16    29.60   683.93     1.05   657.33     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.88    35.42    31.50     3.92     0.93     0.49     2.90
 MEAN    44.50    27.45    23.50     3.95     0.94     0.46     3.29     0.89
 HUB     46.40    10.42     6.50     3.92     0.94     0.45     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.971
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     531.401     377.276     374.231    1263.997       0.420       0.040

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.583      30.621     664.368      46.000      45.232      32.400     -12.832

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     381.230     377.276     536.352    1274.821       0.299       0.465

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      34.463      32.388     675.795     456.573       0.039       0.554

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     364.227       0.000     364.227    1275.817       0.285       0.420

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.378     676.852       0.000       0.060       0.086       0.463

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.831      34.265       1.167     687.914      35.491     192.581       1.493

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 221533.172       0.519    1957.526 1277417.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.977   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    156.364    3965.000      34.265     687.914       1.000       1.000       0.980
W Kg/sec =   71.07451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.253    3442.979       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 120288.016  122693.516       2.265     509.668     225.055     390.276       1.734

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   340.40    -0.12   340.40     0.27   550.42
 MEAN    15.91     0.00    -0.02   340.40    -0.12   340.40     0.27
 HUB     13.07     0.00    -0.02   340.40    -0.12   340.40     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.77    47.36    14.41   633.89   719.61    32.61   678.26     0.56
 MEAN    58.28    44.80    13.48   550.61   647.43    32.61   678.26     0.51
 HUB     53.04    38.84    14.20   452.24   566.12    32.61   678.26     0.44

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   508.13   376.97   340.72  1300.80     0.39
 MEAN    15.50   496.49   355.29   346.80  1295.26     0.38
 HUB     12.59   512.22   370.73   353.45  1289.71     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   418.94   243.77     0.32  6765.05
 MEAN   536.24   391.17   180.95     0.30  5507.99     1.85
 HUB    435.63   359.36    64.90     0.28  4669.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     40.42     1.18    36.38   725.38     1.05   703.87     0.92     0.89
 MEAN    39.22     1.14    35.44   718.42     1.04   697.88     0.92     0.89
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 HUB     38.43     1.12    34.47   713.77     1.04   691.91     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.89    35.58    31.50     4.08     0.93     0.51     2.90
 MEAN    45.69    27.55    23.50     4.05     0.94     0.48     3.34     0.89
 HUB     46.37    10.40     6.50     3.90     0.94     0.44     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     503.304     361.804     349.876    1295.444       0.389      -0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     39.277      35.392     698.086      46.000      45.960      33.000     -12.960

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     361.879     361.804     511.721    1304.868       0.277       0.410

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      39.071      37.037     708.279     440.827       0.072       0.568

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     339.569       0.000     339.569    1306.068       0.260       0.466

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      37.222     709.583       0.000       0.060       0.087       0.457

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.832      39.014       1.139     719.188      31.275     200.025       1.551

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 195430.047       0.507    1726.872 1299683.000

   OVERALL EXIT CONDITIONS; ALL          5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1224473.12  10819.7715    152.7519      2.5825      0.8323     10.9770      1.3756


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 105% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =11.453   EfDer =  0.984

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    153.784    3965.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   69.90177

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    150.231    3949.384       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 118303.250  120669.062       1.901     831.557     437.507     619.754       1.417

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   359.64    -0.12   359.64     0.32   710.99
 MEAN    17.06     0.00    -0.02   359.64    -0.12   359.64     0.32
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 HUB     12.51     0.00    -0.02   359.64    -0.12   359.64     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.26    50.47    12.79   713.82   799.41    14.05   512.01     0.72
 MEAN    58.65    47.20    11.45   590.30   691.34    14.05   512.01     0.62
 HUB     50.29    38.62    11.67   432.86   562.87    14.05   512.01     0.51

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   650.90   466.68   453.74  1141.01     0.57
 MEAN    18.04   671.30   480.78   468.50  1133.01     0.59
 HUB     15.00   751.02   567.90   491.45  1122.07     0.67

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    713.82   516.68   247.14     0.45  9630.20
 MEAN   624.07   489.92   143.28     0.43  8673.56     1.60
 HUB    519.02   493.88    48.88     0.44  8520.00

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.54     1.36    16.47   576.34     1.10   540.95     0.92     0.90
 MEAN    19.95     1.32    15.73   571.02     1.09   533.39     0.92     0.90
 HUB     19.86     1.31    14.70   570.17     1.09   523.07     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.81    28.58    24.20     4.38     0.93     0.45     2.90
 MEAN    45.74    17.01    12.70     4.31     0.94     0.39     3.51     0.90
 HUB     49.13    -5.68    -9.30     3.62     0.94     0.24     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     678.466     479.851     479.646    1133.669       0.598       0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.072      15.751     534.062      24.000      45.012      35.400      -9.612

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     486.476     479.851     683.312    1153.325       0.422       0.445

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.927      17.628     552.742     528.796       0.042       0.572

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     450.574       0.000     450.574    1156.253       0.390       0.468

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.847     555.552       0.000       0.060       0.066       0.494

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.852      19.820       1.312     572.509      49.699     186.065       1.442

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 309417.531       0.607    2688.983 1512277.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.453   EfDer =  0.972

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.784    3965.000      19.820     572.509       1.000       1.000       0.980
W Kg/sec =   69.90177
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
119.827	3774.073	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
118303.250	120669.062	1.692	590.487	348.979	474.134	1.359

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	429.53	-0.15	429.53	0.37	676.79
MEAN	18.08	0.00	-0.02	429.53	-0.15	429.53	0.37	
HUB	15.21	0.00	-0.02	429.53	-0.15	429.53	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.87	46.36	12.51	711.05	830.84	18.02	557.11	0.72
MEAN	55.53	42.30	13.23	625.53	758.92	18.02	557.11	0.66
HUB	50.79	37.84	12.95	526.28	679.43	18.02	557.11	0.59

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	585.83	409.86	418.58	1191.84	0.49
MEAN	18.01	587.26	401.44	428.62	1185.30	0.50
HUB	15.22	626.86	446.56	439.92	1178.78	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	706.56	513.07	296.69	0.43	8372.42	
MEAN	623.16	482.57	221.72	0.41	7232.67	1.73
HUB	526.73	447.17	80.17	0.38	6800.22	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.28	1.28	21.43	619.01	1.08	590.36	0.92	0.89
MEAN	24.48	1.24	20.70	612.68	1.07	583.89	0.92	0.89
HUB	24.18	1.22	19.94	610.28	1.07	577.47	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.40	35.33	31.50	3.83	0.93	0.47	2.90	
MEAN	43.12	27.35	23.50	3.85	0.94	0.44	3.30	0.89
HUB	45.43	10.33	6.50	3.83	0.94	0.43	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.972

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	641.106	402.571	498.952	1180.994	0.543	-0.142

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.609	20.135	579.676	46.000	38.898	30.600	-8.298

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	489.561	402.571	633.825	1195.478	0.410	0.290

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	24.512	21.836	593.981	455.853	0.034	0.456

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	483.841	0.000	483.841	1195.945	0.405	0.423

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	21.809	594.446	0.000	0.060	0.059	0.283

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.850	24.415	1.232	613.991	41.482	196.114	1.520

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 258450.094       0.518    2246.052 1330137.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.453   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.784    3965.000      24.415     613.991       1.000       1.000       0.880
W Kg/sec =   69.90177

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.740    3644.352       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 118303.250  120669.062       1.669     489.817     293.415     384.470       1.310

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   451.81    -0.16   451.81     0.38   638.27
 MEAN    17.74     0.00    -0.02   451.81    -0.16   451.81     0.38
 HUB     15.05     0.00    -0.02   451.81    -0.16   451.81     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.96    46.36    10.60   694.45   828.62    22.13   596.96     0.69
 MEAN    53.65    43.40    10.25   613.77   762.26    22.13   596.96     0.64
 HUB     49.06    38.84    10.22   520.75   689.55    22.13   596.96     0.58

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   561.30   401.77   391.97  1232.90     0.46
 MEAN    17.51   561.17   393.41   400.17  1227.10     0.46
 HUB     14.85   596.88   434.55   409.19  1221.34     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   483.86   283.68     0.39  7962.15
 MEAN   605.75   453.02   212.33     0.37  6890.07     1.84
 HUB    513.83   416.80    79.28     0.34  6455.40

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.44     1.25    26.40   658.18     1.07   631.89     0.92     0.91
 MEAN    29.57     1.21    25.62   652.23     1.06   625.95     0.92     0.91
 HUB     29.23     1.20    24.82   649.82     1.06   620.09     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.71    35.89    31.50     4.39     0.93     0.50     2.90
 MEAN    44.51    27.95    23.50     4.45     0.94     0.48     3.28     0.91
 HUB     46.72    10.96     6.50     4.46     0.94     0.48     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     566.201     395.995     404.687    1227.779       0.461       0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.704      25.671     626.658      46.000      44.378      31.500     -12.878

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     404.902     395.995     566.355    1240.516       0.326       0.448

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.569      27.463     639.728     471.992       0.043       0.537
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    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     394.906       0.000     394.906    1241.163       0.318       0.417

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950     27.395     640.395       0.000       0.060       0.086       0.431

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.850     29.388        1.204     653.408      39.417     190.224       1.475

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 245787.672       0.523    2136.010 1434248.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.453   EfDer =  0.967

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.784    3965.000      29.388     653.408       1.000       1.000       0.980
W Kg/sec =   69.90177

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.337    3532.719       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 118303.250  120669.062       2.041     513.330     251.489     401.059       1.595

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   371.45    -0.13   371.45     0.30   593.74
 MEAN    16.97     0.00    -0.02   371.45    -0.13   371.45     0.30
 HUB     14.32     0.00    -0.02   371.45    -0.13   371.45     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.87    46.36    14.51   666.42   763.06    27.62   641.90     0.61
 MEAN    57.69    43.80    13.89   587.21   694.94    27.62   641.90     0.56
 HUB     53.15    37.84    15.31   495.49   619.36    27.62   641.90     0.50

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   537.38   391.11   368.53  1269.60     0.42
 MEAN    16.57   533.01   378.49   375.28  1264.13     0.42
 HUB     13.89   561.07   410.18   382.82  1258.64     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   452.27   262.16     0.36  7386.56
 MEAN   573.48   422.91   194.98     0.33  6275.29     1.81
 HUB    480.61   389.25    70.43     0.31  5699.26

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     35.49     1.21    31.37   694.36     1.06   670.28     0.92     0.88
 MEAN    34.52     1.17    30.54   688.20     1.05   664.51     0.92     0.88
 HUB     34.02     1.16    29.68   685.00     1.05   658.76     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.70    35.43    31.50     3.93     0.93     0.49     2.90
 MEAN    45.24    27.45    23.50     3.95     0.95     0.47     3.29     0.88
 HUB     46.98    10.42     6.50     3.92     0.95     0.46     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3       cp 2-3
     16.481     529.357     380.623     367.893    1265.371       0.418       0.039
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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.633      30.702     665.823      46.000      45.974      32.400     -13.574

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     374.554     380.623     534.008    1276.409       0.293       0.476

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      34.506      32.503     677.490     456.573       0.041       0.566

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     358.019       0.000     358.019    1277.360       0.280       0.428

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.475     678.500       0.000       0.060       0.091       0.469

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.826      34.298       1.167     689.187      35.779     189.723       1.471

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 223334.641       0.523    1940.882 1252806.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =11.453   EfDer =  0.967

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.784    3965.000      34.298     689.187       1.000       1.000       0.980
W Kg/sec =   69.90177

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     75.976    3439.796       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 118303.250  120669.062       2.303     509.668     221.337     390.276       1.763

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   334.66    -0.12   334.66     0.26   549.91
 MEAN    15.91     0.00    -0.02   334.66    -0.12   334.66     0.26
 HUB     13.07     0.00    -0.02   334.66    -0.12   334.66     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.17    47.36    14.81   633.89   716.91    32.70   679.86     0.56
 MEAN    58.71    44.80    13.91   550.61   644.43    32.70   679.86     0.50
 HUB     53.50    38.84    14.66   452.24   562.69    32.70   679.86     0.44

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   507.34   380.90   335.13  1302.38     0.39
 MEAN    15.50   494.64   358.21   341.10  1296.80     0.38
 HUB     12.59   508.98   371.76   347.64  1291.20     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   412.11   239.84     0.32  6835.45
 MEAN   536.24   384.76   178.02     0.30  5553.28     1.87
 HUB    435.63   353.46    63.86     0.27  4682.02

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     40.49     1.18    36.46   727.04     1.05   705.60     0.92     0.88
 MEAN    39.27     1.15    35.52   719.94     1.04   699.56     0.92     0.88
 HUB     38.46     1.12    34.55   715.12     1.04   693.53     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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  TIP     48.66    35.59    31.50     4.09     0.93     0.52     2.90
  MEAN    46.40    27.56    23.50     4.06     0.95     0.49     3.34     0.88
  HUB     46.92    10.41     6.50     3.91     0.95     0.45     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.967

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
       R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
       15.219     501.492     364.782     344.135    1296.972       0.387      -0.012

       Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
       39.328      35.473     699.748      46.000      46.668      33.000     -13.668

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
       RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
       15.219     355.815     364.782     509.578    1306.578       0.272       0.419

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      39.110      37.145     710.152     440.827       0.076       0.580

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     333.973       0.000     333.973    1307.732       0.255       0.473

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      37.317     711.407       0.000       0.060       0.092       0.464

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.827       39.049       1.139     720.699      31.511     197.210       1.529

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  196914.328       0.511    1711.278 1274851.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1233904.25  10723.2051     150.2315      2.5848      0.8269     11.4532      1.3785


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 105% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.974   EfDer =  0.980

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     150.973     3965.000       15.107     522.810       1.000        1.000        0.980
 W Kg/sec =   68.62391

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     147.485     3949.384        1.402        0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  116140.570  118463.133        1.936     831.557     429.509     619.754       1.443

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   352.32    -0.12   352.32     0.32   710.99
  MEAN    17.06      0.00    -0.02   352.32    -0.12   352.32     0.32
  HUB     12.51      0.00    -0.02   352.32    -0.12   352.32     0.32

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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 TIP     63.73    50.47    13.26   713.82   796.15    14.09   512.44     0.72
 MEAN    59.17    47.20    11.97   590.30   687.55    14.09   512.44     0.62
 HUB     50.86    38.62    12.24   432.86   558.22    14.09   512.44     0.50

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   648.00   471.80   444.19  1141.95     0.57
 MEAN    18.04   666.61   483.73   458.68  1133.87     0.59
 HUB     15.00   743.31   566.78   480.90  1122.98     0.66

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    713.82   505.84   242.02     0.44  9735.80
 MEAN   624.07   479.67   140.34     0.42  8726.55     1.63
 HUB    519.02   483.27    47.76     0.43  8503.21

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.59     1.36    16.55   576.93     1.10   541.86     0.92     0.90
 MEAN    19.97     1.32    15.80   571.32     1.09   534.20     0.92     0.90
 HUB     19.83     1.31    14.77   570.07     1.09   523.94     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.73    28.58    24.20     4.38     0.93     0.47     2.90
 MEAN    46.52    17.01    12.70     4.31     0.94     0.41     3.51     0.90
 HUB     49.69    -5.67    -9.30     3.63     0.94     0.25     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     673.457     482.786     469.535    1134.548       0.594       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.084      15.820     534.890      24.000      45.797      35.400     -10.397

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     475.895     482.786     677.907    1154.486       0.412       0.457

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.929      17.727     553.855     528.796       0.045       0.584

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     441.260       0.000     441.260    1157.248       0.381       0.475

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.921     556.509       0.000       0.060       0.071       0.501

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.847      19.815       1.312     572.771      49.961     183.435       1.422

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 311053.031       0.610    2653.780 1481496.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
  RESET =  0.000BLEED =  0.000 DPInc =11.974   EfDer =  0.968

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.973    3965.000      19.815     572.771       1.000       1.000       0.980
W Kg/sec =   68.62391

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    117.692    3773.207       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
116140.570	118463.133	1.723	590.487	342.761	474.134	1.383

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	420.79	-0.14	420.79	0.36	676.64
MEAN	18.08	0.00	-0.02	420.79	-0.14	420.79	0.36	
HUB	15.21	0.00	-0.02	420.79	-0.14	420.79	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.39	46.36	13.03	711.05	826.36	18.09	557.99	0.71
MEAN	56.08	42.30	13.78	625.53	754.01	18.09	557.99	0.65
HUB	51.36	37.84	13.52	526.28	673.94	18.09	557.99	0.58

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	584.08	415.64	410.36	1192.94	0.49
MEAN	18.01	584.14	405.73	420.24	1186.30	0.49
HUB	15.22	622.00	448.10	431.39	1179.69	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	706.56	503.02	290.92	0.42	8490.25	
MEAN	623.16	473.16	217.43	0.40	7309.80	1.75
HUB	526.73	438.49	78.64	0.37	6823.60	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.33	1.28	21.50	619.93	1.08	591.45	0.92	0.89
MEAN	24.51	1.24	20.76	613.37	1.07	584.89	0.92	0.89
HUB	24.17	1.22	20.00	610.67	1.07	578.37	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.37	35.33	31.50	3.83	0.93	0.48	2.90	
MEAN	43.99	27.36	23.50	3.86	0.94	0.45	3.30	0.89
HUB	46.09	10.33	6.50	3.83	0.94	0.43	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.968

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	635.894	406.869	488.691	1182.237	0.538	-0.136

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.630	20.224	580.898	46.000	39.780	30.600	-9.180

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	479.139	406.869	628.583	1196.994	0.400	0.308

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	24.526	21.959	595.491	455.853	0.037	0.469

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	473.772	0.000	473.772	1197.423	0.396	0.433

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	21.919	595.918	0.000	0.060	0.064	0.298

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.844	24.420	1.232	614.658	41.887	192.702	1.494

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
260968.266	0.523	2226.477	1301728.625

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.974   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.973    3965.000      24.420     614.658       1.000       1.000       0.880
W Kg/sec =   68.62391

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     98.931    3642.375       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 116140.570  118463.133       1.700     489.817     288.147     384.470       1.334

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   442.64    -0.15   442.64     0.37   637.92
 MEAN    17.74     0.00    -0.02   442.64    -0.15   442.64     0.37
 HUB     15.05     0.00    -0.02   442.64    -0.15   442.64     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.49    46.36    11.13   694.45   823.65    22.23   598.31     0.69
 MEAN    54.21    43.40    10.81   613.77   756.86    22.23   598.31     0.63
 HUB     49.64    38.84    10.80   520.75   683.57    22.23   598.31     0.57

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   560.10   407.35   384.42  1234.25     0.45
 MEAN    17.51   558.69   397.58   392.51  1228.37     0.45
 HUB     14.85   592.74   436.12   401.42  1222.52     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   474.47   278.10     0.38  8072.65
 MEAN   605.75   444.30   208.16     0.36  6963.02     1.86
 HUB    513.83   408.87    77.70     0.33  6478.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.51     1.25    26.49   659.46     1.07   633.28     0.92     0.90
 MEAN    29.61     1.21    25.69   653.30     1.06   627.26     0.92     0.90
 HUB     29.23     1.20    24.88   650.61     1.06   621.30     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.66    35.88    31.50     4.38     0.93     0.51     2.90
 MEAN    45.37    27.94    23.50     4.44     0.94     0.49     3.28     0.90
 HUB     47.37    10.96     6.50     4.46     0.94     0.48     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.987

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     563.674     400.192     396.956    1229.034       0.459       0.013

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    29.743      25.745     627.946      46.000      45.233      31.500     -13.733

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     396.869     400.192     563.612    1242.048       0.320       0.461

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      29.599      27.575     641.315     471.992       0.045       0.551

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     387.277       0.000     387.277    1242.656       0.312       0.426
```

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	27.490	641.942	0.000	0.060	0.092	0.440

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.844	29.407	1.204	654.457	39.799	186.925	1.449

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
248172.969	0.528	2117.312	1402782.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =11.974 EfDer = 0.963

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
150.973	3965.000	29.407	654.457	1.000	1.000	0.980

W Kg/sec = 68.62391

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
84.771	3529.887	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
116140.570	118463.133	2.079	513.330	246.931	401.059	1.624

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	364.37	-0.13	364.37	0.29	593.27
MEAN	16.97	0.00	-0.02	364.37	-0.13	364.37	0.29	
HUB	14.32	0.00	-0.02	364.37	-0.13	364.37	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.34	46.36	14.98	666.42	759.63	27.71	643.39	0.61
MEAN	58.19	43.80	14.39	587.21	691.17	27.71	643.39	0.56
HUB	53.68	37.84	15.84	495.49	615.14	27.71	643.39	0.49

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	536.23	395.86	361.72	1271.15	0.42
MEAN	16.57	530.67	382.00	368.35	1265.62	0.42
HUB	13.89	557.20	411.42	375.77	1260.07	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	653.27	443.96	257.41	0.35	7476.22	
MEAN	573.48	415.15	191.47	0.33	6333.42	1.84
HUB	480.61	382.09	69.19	0.30	5716.40	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	35.55	1.21	31.45	695.90	1.06	671.93	0.92	0.88
MEAN	34.56	1.18	30.62	689.57	1.05	666.09	0.92	0.88
HUB	34.03	1.16	29.75	686.15	1.05	660.26	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	47.58	35.44	31.50	3.94	0.93	0.50	2.90	
MEAN	46.04	27.47	23.50	3.97	0.95	0.48	3.29	0.88
HUB	47.59	10.43	6.50	3.93	0.95	0.46	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.963

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	527.261	384.153	361.152	1266.822	0.416	0.038

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
34.673	30.774	667.362	46.000	46.768	32.400	-14.368

```
    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     367.465     384.153     531.605    1278.085       0.288       0.488

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      34.538      32.610     679.282     456.573       0.043       0.579

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     351.418       0.000     351.418    1278.990       0.275       0.436

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.564     680.244       0.000       0.060       0.096       0.476

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.820      34.319       1.167     690.540      36.083     186.715       1.447

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 225236.906       0.528    1921.631 1226273.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =11.974   EfDer =  0.963

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    150.973    3965.000      34.319     690.540       1.000       1.000       0.980
W Kg/sec =   68.62391

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     74.614    3436.425       1.400       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 116140.570  118463.133       2.345     509.668     217.373     390.276       1.795

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   328.56    -0.11   328.56     0.26   549.37
 MEAN    15.91     0.00    -0.02   328.56    -0.11   328.56     0.26
 HUB     13.07     0.00    -0.02   328.56    -0.11   328.56     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.61    47.36    15.25   633.89   714.08    32.78   681.55     0.56
 MEAN    59.18    44.80    14.38   550.61   641.28    32.78   681.55     0.50
 HUB     54.01    38.84    15.17   452.24   559.08    32.78   681.55     0.44

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   506.60   385.07   329.18  1304.06     0.39
 MEAN    15.50   492.73   361.29   335.04  1298.43     0.38
 HUB     12.59   505.55   372.81   341.46  1292.78     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   404.85   235.68     0.31  6910.18
 MEAN   536.24   377.97   174.94     0.29  5600.94     1.90
 HUB    435.63   347.19    62.82     0.27  4695.13

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     40.55     1.18    36.54   728.81     1.06   707.43     0.92     0.88
 MEAN    39.31     1.15    35.59   721.56     1.04   701.33     0.92     0.88
 HUB     38.47     1.12    34.62   716.54     1.04   695.25     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.47    35.60    31.50     4.10     0.93     0.53     2.90
 MEAN    47.16    27.57    23.50     4.07     0.95     0.49     3.34     0.88
 HUB     47.51    10.42     6.50     3.92     0.95     0.46     4.06
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.963

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      499.627     367.916     338.032     1298.586       0.385       -0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     39.365      35.543      701.507      46.000      47.424       33.000      -14.424

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      349.375     367.916     507.371     1308.383       0.267       0.430

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       39.134      37.242      712.133      440.827       0.080       0.592

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701      328.027       0.000     328.027     1309.490       0.251       0.481

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       37.400      713.337       0.000       0.060       0.097       0.471

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4        Pt4           PR4        Texit        Del T        Ns         Ns nondim
      0.821       39.069        1.138      722.300      31.760      194.249       1.506

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 198477.266       0.515    1693.328 1248060.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
   1243908.38  10612.5273     147.4851      2.5861       0.8207      11.9740       1.3816


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

   Fan-Core + 4 Stage LPC 105% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.521   EfDer =  0.989

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    197.903     3965.000       15.107      522.810       1.000        1.000        0.980
 W Kg/sec =   89.95580

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
    193.331     3949.384        1.402        0.249       53.349       32.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  152243.109  155287.641        1.477      831.557      563.022      619.754       1.101

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   482.92    -0.17   482.92      0.44   710.99
  MEAN    17.06      0.00    -0.02   482.92    -0.17   482.92      0.44
  HUB     12.51      0.00    -0.02   482.92    -0.17   482.92      0.44

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
  TIP     55.93     50.47     5.46   713.82   861.97     13.23   503.33      0.78
  MEAN    50.72     47.20     3.52   590.30   762.80     13.23   503.33      0.69
  HUB     41.88     38.62     3.26   432.86   648.63     13.23   503.33      0.59
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     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   736.87   365.96   639.58  1118.54     0.66
MEAN    18.04   779.81   423.86   654.57  1113.41     0.70
HUB     15.00   909.33   588.37   693.33  1101.39     0.83

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    713.82   728.06   347.86     0.65  7553.20
MEAN   624.07   684.50   200.21     0.61  7647.53     1.23
HUB    519.02   696.79    69.35     0.63  8827.64

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.30     1.28    14.41   564.79     1.08   519.48     0.92     0.91
MEAN    19.35     1.28    13.94   565.32     1.08   514.58     0.92     0.91
HUB     20.08     1.33    12.83   571.88     1.09   502.97     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     29.78    28.54    24.20     4.34     0.93     0.23     2.90
MEAN    32.92    17.01    12.70     4.31     0.92     0.18     3.51     0.91
HUB     40.32    -5.71    -9.30     3.59     0.92     0.03     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    18.071     797.127     423.034     675.614    1112.451       0.717      -0.015

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.517      13.856     514.258      24.000      32.053      35.400       3.347

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     705.981     423.034     823.023    1124.760       0.628       0.195

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.394      14.868     525.701     528.796       0.031       0.372

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083     641.887       0.000     641.887    1132.455       0.567       0.275

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.465     532.916       0.000       0.060       0.058       0.297

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.843      19.236       1.273     567.329      44.519     234.161       1.815

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 277171.781       0.544    3099.796 2030649.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.521   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    197.903    3965.000      19.236     567.329       1.000       1.000       0.980
W Kg/sec =   89.95580

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    158.162    3791.261       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 152243.109  155287.641       1.282     590.487     460.622     474.134       1.029
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ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	605.35	-0.21	605.35	0.53	679.88
MEAN	18.08	0.00	-0.02	605.35	-0.21	605.35	0.53	
HUB	15.21	0.00	-0.02	605.35	-0.21	605.35	0.53	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.60	46.36	3.24	711.05	933.99	15.85	536.73	0.82
MEAN	45.95	42.30	3.65	625.53	870.63	15.85	536.73	0.77
HUB	41.01	37.84	3.17	526.28	802.27	15.85	536.73	0.71

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	660.83	280.31	598.43	1163.77	0.57
MEAN	18.01	679.86	307.05	606.58	1160.48	0.59
HUB	15.22	741.34	412.03	616.29	1157.28	0.64

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	706.56	734.72	426.25	0.63	5728.21	
MEAN	623.16	684.01	316.12	0.59	5533.64	1.37
HUB	526.73	626.88	114.70	0.54	6275.51	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.87	1.19	18.37	599.15	1.06	562.70	0.92	0.91
MEAN	22.74	1.18	18.02	598.07	1.05	559.49	0.92	0.91
HUB	23.24	1.21	17.63	602.19	1.06	556.33	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.10	35.46	31.50	3.96	0.93	0.26	2.90	
MEAN	26.85	27.53	23.50	4.03	0.92	0.27	3.30	0.91
HUB	33.77	10.54	6.50	4.04	0.92	0.28	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.990

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	1048.879	307.907	1002.667	1106.119	0.948	-1.050

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.899	12.829	508.031	46.000	17.071	30.600	13.529

STATOR / VANED DIFFUSER THROAT IS CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	1107.814	307.907	1149.808	1096.402	1.010	-1.269

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	22.493	11.732	497.720	400.556	0.092	-0.142

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	1300.771	0.000	1300.771	1069.248	1.217	-0.849

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	8.631	462.341	0.000	0.060	0.313	-1.897

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.543	21.403	1.113	599.802	32.473	279.773	2.169

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
202296.953	0.405	2262.421	1848451.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 3.521 EfDer = 0.765

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   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    197.903    3965.000      21.403     599.802       1.000       1.000       0.780
W Kg/sec =   89.95580

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    146.165    3687.205       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 152243.109  155287.641       1.020     434.156     425.719     339.175       0.797

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   957.01    -0.33   957.01     0.85   645.77
MEAN    17.74     0.00    -0.02   957.01    -0.33   957.01     0.85
HUB     15.05     0.00    -0.02   957.01    -0.33   957.01     0.85

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     35.98    46.36   -10.38   694.45  1182.62    13.30   523.38     1.05
MEAN    32.69    43.40   -10.71   613.77  1137.10    13.30   523.38     1.01
HUB     28.57    38.84   -10.27   520.75  1089.68    13.30   523.38     0.97

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   685.30   171.01   663.62  1180.98     0.58
MEAN    17.51   699.63   222.21   663.41  1182.15     0.59
HUB     14.85   758.89   356.62   669.88  1182.85     0.64

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    685.45   839.67   514.44     0.71  3394.25
MEAN   605.75   766.30   383.54     0.65  3896.00     1.55
HUB    513.83   688.08   157.21     0.58  5300.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.09     1.08    18.38   618.65     1.03   579.48     0.92     0.70
MEAN    23.35     1.09    18.42   621.43     1.04   580.61     0.92     0.70
HUB     24.08     1.13    18.25   629.23     1.05   581.21     0.92     0.70

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     14.45    37.78    31.50     6.28     0.93     0.31     2.90
MEAN    18.52    30.03    23.50     6.53     0.84     0.36     3.28     0.70
HUB     28.03    13.21     6.50     6.71     0.84     0.41     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.765

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     710.888     223.669     674.784    1182.139       0.601      -0.010

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.457      18.367     580.936      46.000      18.339      31.500      13.161

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     717.225     223.669     751.292    1181.370       0.607      -0.050

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      23.215      18.095     580.181     471.992       0.057       0.119

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     701.192       0.000     701.192    1183.305       0.593      -0.062

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.046     582.079       0.000       0.060       0.120      -0.059
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    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.500      22.890       1.069     623.104      23.302     386.732       2.998

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 145239.109       0.309    1624.305 2774162.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 3.521   EfDer =  0.924

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    197.903    3965.000      22.890     623.104       1.000       1.000       0.980
W Kg/sec =   89.95580

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    139.296    3617.604       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 152243.109  155287.641       1.265     513.330     405.744     401.059       0.988

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   646.18    -0.22   646.18     0.54   608.01
 MEAN    16.97     0.00    -0.02   646.18    -0.22   646.18     0.54
 HUB     14.32     0.00    -0.02   646.18    -0.22   646.18     0.54

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.89    46.36    -0.47   666.42   928.42    18.72   588.28     0.78
 MEAN    42.27    43.80    -1.53   587.21   873.28    18.72   588.28     0.73
 HUB     37.49    37.84    -0.35   495.49   814.42    18.72   588.28     0.68

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   691.41   173.77   669.22  1203.04     0.57
 MEAN    16.57   704.36   222.05   668.44  1203.76     0.59
 HUB     13.89   758.54   352.94   671.43  1204.00     0.63

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   823.27   479.50     0.68  3285.14
 MEAN   573.48   755.19   351.43     0.63  3683.97     1.23
 HUB    480.61   683.46   127.67     0.57  4905.52

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.93     1.09    19.93   641.33     1.03   601.49     0.92     0.85
 MEAN    25.19     1.10    19.97   643.55     1.03   602.20     0.92     0.85
 HUB     25.98     1.14    19.88   650.33     1.04   602.37     0.92     0.85

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     14.56    35.62    31.50     4.12     0.93     0.15     2.90
 MEAN    18.38    27.73    23.50     4.23     0.89     0.17     3.29     0.85
 HUB     27.73    10.77     6.50     4.27     0.89     0.22     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.924

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     688.650     223.296     651.442    1206.759       0.571       0.059

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.311      20.292     605.521      46.000      18.920      32.400      13.480

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     16.481     700.922     223.296     735.631    1205.341       0.582       0.001

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.064      19.930     604.099     456.573       0.055       0.142

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     666.139       0.000     666.139    1209.292       0.551      -0.030

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.129     608.065       0.000       0.060       0.114       0.037

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.639      24.743       1.081     645.070      21.966     361.063       2.799

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 136976.109       0.321    1531.895 1844678.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 3.521   EfDer =  0.899

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    197.903    3965.000      24.743     645.070       1.000       1.000       0.980
W Kg/sec =   89.95580

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    131.119    3555.477       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 152243.109  155287.641       1.334     509.668     381.952     390.276       1.022

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   610.96    -0.21   610.96     0.50   568.40
 MEAN    15.91     0.00    -0.02   610.96    -0.21   610.96     0.50
 HUB     13.07     0.00    -0.02   610.96    -0.21   610.96     0.50

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.07    47.36    -1.29   633.89   880.54    20.82   613.96     0.72
 MEAN    42.04    44.80    -2.76   550.61   822.60    20.82   613.96     0.68
 HUB     36.52    38.84    -2.32   452.24   760.25    20.82   613.96     0.63

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   657.58   160.29   637.75  1226.07     0.54
 MEAN    15.50   668.85   198.49   638.72  1225.95     0.55
 HUB     12.59   715.04   313.38   642.71  1225.50     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   786.60   460.45     0.64  2879.46
 MEAN   536.24   722.52   337.75     0.59  3079.44     1.22
 HUB    435.63   654.23   122.25     0.53  3948.20

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.55     1.07    21.83   661.04     1.02   625.01     0.92     0.82
 MEAN    26.68     1.08    21.79   662.15     1.03   624.87     0.92     0.82
 HUB     27.24     1.10    21.63   666.97     1.03   624.37     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     14.11    35.83    31.50     4.33     0.93     0.14     2.90
 MEAN    17.26    27.87    23.50     4.37     0.89     0.16     3.34     0.82
 HUB     25.99    10.77     6.50     4.27     0.89     0.19     4.06


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.899

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     677.151     202.128     646.280    1226.050       0.552      -0.014

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      26.722      21.717     625.168      46.000      17.367      33.000      15.633

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     716.272     202.128     744.246    1221.587       0.586      -0.196

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      26.194      20.752     620.625     440.827       0.124       0.130

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     657.687       0.000     657.687    1228.173       0.536      -0.042

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      21.504     627.334       0.000       0.060       0.134      -0.048

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.558      26.141       1.057     663.387      18.317     400.739       3.107

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  114280.414       0.297    1278.074 1885944.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     875964.44   9796.4902     193.3312      1.7304      0.6332      3.5215      1.2689


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 105% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.695   EfDer =  0.991

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     196.913     3965.000       15.107     522.810       1.000        1.000        0.980
 W Kg/sec =   89.50601

    W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     192.365     3949.384        1.402       0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  151481.891  154511.203        1.484     831.557     560.207     619.754       1.106

     ROTOR LEADING EDGE CONDITIONS, STAGE             1

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   479.94    -0.17   479.94      0.44    710.99
  MEAN    17.06      0.00    -0.02   479.94    -0.17   479.94      0.44
  HUB     12.51      0.00    -0.02   479.94    -0.17   479.94      0.44

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
  TIP     56.09     50.47     5.62   713.82   860.30     13.26   503.57      0.78
  MEAN    50.90     47.20     3.70   590.30   760.91     13.26   503.57      0.69
  HUB     42.06     38.62     3.44   432.86   646.41     13.26   503.57      0.59

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
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     0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   733.65   368.86   634.19  1119.29     0.66
 MEAN    18.04   776.30   425.44   649.34  1114.04     0.70
 HUB     15.00   904.55   587.77   687.56  1102.05     0.82

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    713.82   721.94   344.97     0.64  7612.91
 MEAN   624.07   679.04   198.63     0.61  7676.08     1.23
 HUB    519.02   690.99    68.75     0.63  8818.57

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.34     1.28    14.49   565.13     1.08   520.20     0.92     0.91
 MEAN    19.38     1.28    14.00   565.48     1.08   515.19     0.92     0.91
 HUB     20.08     1.33    12.89   571.83     1.09   503.63     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.18    28.54    24.20     4.34     0.93     0.23     2.90
 MEAN    33.23    17.01    12.70     4.31     0.92     0.19     3.51     0.91
 HUB     40.53    -5.71    -9.30     3.59     0.92     0.03     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     793.118     424.615     669.879    1113.186       0.712      -0.014

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.539      13.924     514.937      24.000      32.369      35.400       3.031

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     698.849     424.615     817.733    1125.812       0.621       0.203

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.421      14.972     526.684     528.796       0.030       0.377

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     635.650       0.000     635.650    1133.317       0.561       0.282

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.562     533.728       0.000       0.060       0.056       0.305

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.846      19.272       1.276     567.476      44.666     232.861       1.805

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 278085.281       0.546    3094.462 2018101.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.695   EfDer =  0.992

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    196.913    3965.000      19.272     567.476       1.000       1.000       0.980
W Kg/sec =   89.50601

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    157.099    3790.771       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 151481.891  154511.203       1.291     590.487     457.523     474.134       1.036

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     20.55     0.00    -0.02   599.77    -0.21   599.77     0.53   679.79
MEAN    18.08     0.00    -0.02   599.77    -0.21   599.77     0.53
HUB     15.21     0.00    -0.02   599.77    -0.21   599.77     0.53

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     49.86    46.36     3.50   711.05   930.38    15.94   537.44     0.82
MEAN    46.21    42.30     3.91   625.53   866.76    15.94   537.44     0.76
HUB     41.28    37.84     3.44   526.28   798.07    15.94   537.44     0.70

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   657.04   284.92   592.05  1164.88     0.56
MEAN    18.01   675.93   310.31   600.49  1161.41     0.58
HUB     15.22   737.14   413.22   610.43  1158.05     0.64

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    706.56   726.84   421.64     0.62  5822.32
MEAN   623.16   677.10   312.86     0.58  5592.39     1.38
HUB    526.73   620.89   113.52     0.54  6293.56

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.98     1.19    18.51   599.82     1.06   563.78     0.92     0.91
MEAN    22.82     1.18    18.14   598.54     1.05   560.41     0.92     0.91
HUB     23.30     1.21    17.73   602.44     1.06   557.09     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.70    35.46    31.50     3.96     0.93     0.27     2.90
MEAN    27.33    27.52    23.50     4.02     0.92     0.27     3.30     0.91
HUB     34.10    10.53     6.50     4.03     0.92     0.29     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960    1020.771     311.180     972.183    1111.633       0.918      -0.984

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.986      13.316     513.312      46.000      17.749      30.600      12.851

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960    1039.699     311.180    1085.268    1108.704       0.938      -1.082

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      22.619      12.823     510.140     400.556       0.085       0.003

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     17.823    1122.326       0.000    1122.326    1097.073       1.023      -0.433

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750      11.191     495.984       0.000       0.060       0.256      -1.414

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.617      21.778       1.130     600.265      32.789     276.463       2.143

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 204268.625       0.409    2273.049 1834012.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 3.695   EfDer =  0.776

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     196.913    3965.000      21.778     600.265       1.000       1.000       0.780
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W Kg/sec =   89.50601

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    142.987    3685.783       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
151481.891  154511.203       1.042     434.156     416.459     339.175       0.814

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   894.88    -0.31   894.88     0.79   645.52
MEAN    17.74     0.00    -0.02   894.88    -0.31   894.88     0.79
HUB     15.05     0.00    -0.02   894.88    -0.31   894.88     0.79

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     37.82    46.36    -8.54   694.45  1132.92    14.42   533.44     1.00
MEAN    34.46    43.40    -8.94   613.77  1085.32    14.42   533.44     0.96
HUB     30.21    38.84    -8.63   520.75  1035.53    14.42   533.44     0.91

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

        R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   667.93   193.56   639.27  1185.88     0.56
MEAN    17.51   683.87   238.75   640.84  1186.02     0.58
HUB     14.85   743.89   364.79   648.30  1185.82     0.63

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    685.45   806.61   491.89     0.68  3840.57
MEAN   605.75   738.48   366.99     0.62  4185.22     1.54
HUB    513.83   665.21   149.04     0.56  5421.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.76     1.09    19.15   621.59     1.04   584.38     0.92     0.71
MEAN    23.94     1.10    19.11   623.50     1.04   584.49     0.92     0.71
HUB     24.61     1.13    18.87   630.37     1.05   584.22     0.92     0.71

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     16.85    37.58    31.50     6.08     0.93     0.32     2.90
MEAN    20.43    29.80    23.50     6.30     0.85     0.35     3.28     0.71
HUB     29.37    12.95     6.50     6.45     0.85     0.40     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.776

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     694.021     240.320     651.085    1186.236       0.585      -0.007

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.050      19.071     584.959      46.000      20.259      31.500      11.241

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     685.138     240.320     726.063    1187.272       0.577      -0.001

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      23.860      19.036     585.981     471.992       0.048       0.156

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     666.685       0.000     666.685    1189.381       0.561       0.002

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      19.080     588.063       0.000       0.060       0.095       0.007

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
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      0.568      23.621       1.085     625.151      24.886     355.956       2.759

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 155119.938       0.330    1726.135 2635908.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.695   EfDer =  0.947

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    196.913    3965.000      23.621     625.151       1.000       1.000       0.980
W Kg/sec =   89.50601

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    134.532    3611.676       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 151481.891  154511.203       1.310     513.330     391.865     401.059       1.023

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   616.68    -0.21   616.68     0.52   607.02
 MEAN    16.97     0.00    -0.02   616.68    -0.21   616.68     0.52
 HUB     14.32     0.00    -0.02   616.68    -0.21   616.68     0.52

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.23    46.36     0.87   666.42   908.12    19.69   593.44     0.76
 MEAN    43.61    43.80    -0.19   587.21   851.68    19.69   593.44     0.71
 HUB     38.79    37.84     0.95   495.49   791.21    19.69   593.44     0.66

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   662.62   200.96   631.41  1211.04     0.55
 MEAN    16.57   677.60   240.84   633.36  1210.48     0.56
 HUB     13.89   732.34   359.73   637.90  1209.68     0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   776.71   452.31     0.64  3798.14
 MEAN   573.48   715.40   332.64     0.59  3995.18     1.27
 HUB    480.61   649.25   120.88     0.54  4999.65

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.12      1.11    21.31   646.23     1.03   609.62     0.92     0.87
 MEAN    26.25      1.11    21.22   647.32     1.04   609.04     0.92     0.87
 HUB     26.95      1.14    21.03   652.89     1.04   608.19     0.92     0.87

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.65    35.62    31.50     4.12     0.93     0.18     2.90
 MEAN    20.82    27.71    23.50     4.21     0.90     0.20     3.29     0.87
 HUB     29.42    10.73     6.50     4.23     0.90     0.24     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.947

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     663.270     242.190     617.471    1213.332       0.547       0.060

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.389      21.534     612.125      46.000      21.417      32.400      10.983

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     656.448     242.190     699.700    1214.075       0.541       0.056

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      26.212      21.482     612.876     456.573       0.044       0.186

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     621.679       0.000     621.679    1217.741       0.511       0.043

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.762     616.582       0.000       0.060       0.084       0.109

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.736      26.001       1.101     648.814      23.663     333.558       2.586

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 147569.297       0.346    1642.114 1806260.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 3.695   EfDer =  0.935

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    196.913    3965.000      26.001     648.814       1.000       1.000       0.980
W Kg/sec =   89.50601

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    124.510    3545.203       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 151481.891  154511.203       1.405     509.668     362.700     390.276       1.076

    ROTOR LEADING EDGE CONDITIONS, STAGE           5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   572.64    -0.20   572.64     0.47   566.76
 MEAN    15.91     0.00    -0.02   572.64    -0.20   572.64     0.47
 HUB     13.07     0.00    -0.02   572.64    -0.20   572.64     0.47

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.92    47.36     0.56   633.89   854.39    22.37   621.48     0.70
 MEAN    43.89    44.80    -0.91   550.61   794.54    22.37   621.48     0.65
 HUB     38.31    38.84    -0.53   452.24   729.80    22.37   621.48     0.60

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   621.27   195.17   589.82  1236.81     0.50
 MEAN    15.50   633.85   222.96   593.34  1235.29     0.51
 HUB     12.59   679.97   322.27   598.75  1233.65     0.55

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   727.33   425.58     0.59  3504.89
 MEAN   536.24   670.96   313.27     0.54  3458.50     1.28
 HUB    435.63   609.39   113.36     0.49  4059.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.40     1.09    23.91   668.25     1.03   636.08     0.92     0.86
 MEAN    28.37     1.09    23.70   667.99     1.03   634.51     0.92     0.86
 HUB     28.80     1.11    23.42   671.33     1.03   632.80     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.31    35.81    31.50     4.31     0.93     0.19     2.90
 MEAN    20.59    27.83    23.50     4.33     0.90     0.20     3.34     0.86
 HUB     28.29    10.72     6.50     4.22     0.90     0.22     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.935

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     641.035     227.050     599.479    1235.603       0.519      -0.009

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      28.428      23.660     634.940      46.000      20.744      33.000      12.256

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     649.846     227.050     688.369    1234.681       0.526      -0.089

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      28.081      23.249     633.992     440.827       0.092       0.185

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     598.838       0.000     598.838    1239.840       0.483       0.059

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      23.947     639.301       0.000       0.060       0.089       0.055

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.713      28.094       1.080     669.192      20.378     358.114       2.776

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  127156.492       0.330    1414.965 1838770.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     912199.69  10150.7256    192.3645      1.8596      0.6953      3.6953      1.2800


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 105% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 4.041   EfDer =  0.993

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     194.949    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   88.61320

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     190.446    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  149970.859  152969.953       1.499     831.557     554.619     619.754       1.117

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   474.05    -0.16   474.05     0.43   710.99
  MEAN    17.06     0.00    -0.02   474.05    -0.16   474.05     0.43
  HUB     12.51     0.00    -0.02   474.05    -0.16   474.05     0.43

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.42    50.47     5.95   713.82   857.03    13.30   504.04     0.78
  MEAN    51.24    47.20     4.04   590.30   757.21    13.30   504.04     0.69
  HUB     42.41    38.62     3.79   432.86   642.05    13.30   504.04     0.58

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

           R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     20.63   727.52   374.46   623.75  1120.74     0.65
 MEAN    18.04   769.54   428.54   639.18  1115.25     0.69
 HUB     15.00   895.31   586.60   676.37  1103.33     0.81

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    713.82   710.09   339.36     0.63  7728.42
 MEAN   624.07   668.41   195.53     0.60  7731.90     1.25
 HUB    519.02   679.74    67.59     0.62  8801.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.42     1.29    14.62   565.77     1.08   521.59     0.92     0.91
 MEAN    19.42     1.29    14.12   565.79     1.08   516.37     0.92     0.91
 HUB     20.08     1.33    13.02   571.73     1.09   504.90     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.98    28.55    24.20     4.35     0.93     0.25     2.90
 MEAN    33.84    17.01    12.70     4.31     0.92     0.20     3.51     0.91
 HUB     40.93    -5.71    -9.30     3.59     0.92     0.05     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     785.460     427.705     658.799    1114.584       0.705      -0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.581      14.052     516.232      24.000      32.992      35.400       2.408

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     685.258     427.705     807.781    1127.794       0.608       0.219

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.472      15.170     528.540     528.796       0.029       0.388

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     623.790       0.000     623.790    1134.943       0.550       0.296

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.745     535.261       0.000       0.060       0.052       0.319

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.853      19.339       1.280     567.761      44.951     230.326       1.785

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 279860.250       0.549    3083.149 1993349.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.041   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    194.949    3965.000      19.339     567.761       1.000       1.000       0.980
W Kg/sec =   88.61320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    155.038    3789.819       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149970.859  152969.953       1.308     590.487     451.521     474.134       1.050

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   589.12    -0.20   589.12     0.52   679.62
 MEAN    18.08     0.00    -0.02   589.12    -0.20   589.12     0.52
 HUB     15.21     0.00    -0.02   589.12    -0.20   589.12     0.52
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.37    46.36     4.01   711.05   923.55    16.11   538.78     0.81
MEAN    46.73    42.30     4.43   625.53   859.42    16.11   538.78     0.75
HUB     41.79    37.84     3.95   526.28   790.10    16.11   538.78     0.69

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   650.11   293.62   580.03  1166.94     0.56
MEAN    18.01   668.62   316.48   588.97  1163.17     0.57
HUB     15.22   729.23   415.47   599.30  1159.51     0.63

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    706.56   712.01   412.94     0.61  5999.81
MEAN   623.16   664.03   306.68     0.57  5703.53     1.40
HUB    526.73   609.55   111.27     0.53  6327.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.19     1.20    18.78   601.09     1.06   565.81     0.92     0.91
MEAN    22.99     1.19    18.37   599.44     1.06   562.13     0.92     0.91
HUB     23.41     1.21    17.93   602.91     1.06   558.53     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     26.85    35.45    31.50     3.95     0.93     0.28     2.90
MEAN    28.25    27.51    23.50     4.01     0.92     0.28     3.30     0.91
HUB     34.73    10.52     6.50     4.02     0.92     0.30     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     978.300     317.372     925.390    1120.017       0.873      -0.888

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.148      14.075     521.253      46.000      18.930      30.600      11.670

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     960.311     317.372    1011.396    1123.225       0.855      -0.868

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      22.841      14.161     524.174     400.556       0.074       0.099

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     987.923       0.000     987.923    1119.597       0.882      -0.139

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750      13.401     519.834       0.000       0.060       0.196      -1.025

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.698      22.251       1.151     601.148      33.386     270.311       2.095

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 207992.125       0.417    2291.396 1806066.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 4.041   EfDer =  0.808

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    194.949    3965.000      22.251     601.148       1.000       1.000       0.780
W Kg/sec =   88.61320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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   138.652    3683.077       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
149970.859  152969.953       1.075     434.156     403.832     339.175       0.840

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   832.82    -0.29   832.82     0.73   645.05
MEAN    17.74     0.00    -0.02   832.82    -0.29   832.82     0.73
HUB     15.05     0.00    -0.02   832.82    -0.29   832.82     0.73

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     39.83    46.36    -6.53   694.45  1084.54    15.63   543.27     0.95
MEAN    36.40    43.40    -7.00   613.77  1034.72    15.63   543.27     0.91
HUB     32.03    38.84    -6.81   520.75   982.38    15.63   543.27     0.86

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   645.91   221.35   606.80  1192.23     0.54
MEAN    17.51   662.81   259.11   610.06  1191.23     0.56
HUB     14.85   722.40   374.18   617.94  1190.06     0.61

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    685.45   763.93   464.10     0.64  4390.70
MEAN   605.75   701.66   346.63     0.59  4541.27     1.55
HUB    513.83   633.52   139.65     0.53  5560.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.67     1.11    20.20   625.52     1.04   590.72     0.92     0.74
MEAN    24.75     1.11    20.05   626.36     1.04   589.71     0.92     0.74
HUB     25.34     1.14    19.75   632.02     1.05   588.49     0.92     0.74

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     20.04    37.41    31.50     5.91     0.93     0.33     2.90
MEAN    23.01    29.60    23.50     6.10     0.87     0.36     3.28     0.74
HUB     31.20    12.73     6.50     6.23     0.87     0.40     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.808

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     671.672     260.813     618.966    1191.671       0.564      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.870      20.043     590.319      46.000      22.849      31.500       8.651

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     644.246     260.813     695.037    1194.707       0.539       0.059

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.738      20.294     593.331     471.992       0.037       0.200

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     624.615       0.000     624.615    1196.798       0.522       0.076

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      20.414     595.410       0.000       0.060       0.068       0.084

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.649      24.583       1.105     627.967      26.819     324.643       2.517

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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 167177.234       0.356    1841.749 2499951.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 4.041   EfDer =  0.971

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    194.949    3965.000      24.583     627.967       1.000       1.000       0.980
W Kg/sec =   88.61320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    128.267    3603.570       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 149970.859  152969.953       1.374     513.330     373.612     401.059       1.073

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   580.02    -0.20   580.02     0.48   605.65
 MEAN    16.97     0.00    -0.02   580.02    -0.20   580.02     0.48
 HUB     14.32     0.00    -0.02   580.02    -0.20   580.02     0.48

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.97    46.36     2.61   666.42   883.63    20.96   599.91     0.74
 MEAN    45.36    43.80     1.56   587.21   825.51    20.96   599.91     0.69
 HUB     40.52    37.84     2.68   495.49   762.97    20.96   599.91     0.64

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   631.45   233.26   586.79  1220.41     0.52
 MEAN    16.57   647.24   263.52   591.17  1218.56     0.53
 HUB     13.89   701.50   368.01   597.22  1216.65     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   721.61   420.01     0.59  4407.87
 MEAN   573.48   667.50   309.95     0.55  4370.96     1.33
 HUB    480.61   607.74   112.60     0.50  5114.56

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.69     1.13    23.06   652.42     1.04   619.17     0.92     0.89
 MEAN    27.66     1.13    22.82   652.22     1.04   617.29     0.92     0.89
 HUB     28.21     1.15    22.51   656.34     1.05   615.31     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.68    35.59    31.50     4.09     0.93     0.23     2.90
 MEAN    24.03    27.67    23.50     4.17     0.91     0.24     3.29     0.89
 HUB     31.64    10.68     6.50     4.18     0.91     0.26     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     634.706     265.003     576.737    1221.185       0.520       0.059

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.800      23.121     620.064      46.000      24.678      32.400       7.722

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     606.034     265.003     661.440    1224.103       0.495       0.123

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.692      23.418     623.031     456.573       0.031       0.238

    VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	573.113	0.000	573.113	1227.279	0.467	0.122

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.738	626.268	0.000	0.060	0.056	0.186

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.815	27.566	1.121	653.662	25.695	304.077	2.357

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
160263.125	0.376	1765.578	1754195.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 4.041 EfDer = 0.968

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
194.949	3965.000	27.566	653.662	1.000	1.000	0.980

W Kg/sec = 88.61320

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
116.703	3532.032	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
149970.859	152969.953	1.499	509.668	339.955	390.276	1.148

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	529.98	-0.18	529.98	0.43	564.66
MEAN	15.91	0.00	-0.02	529.98	-0.18	529.98	0.43	
HUB	13.07	0.00	-0.02	529.98	-0.18	529.98	0.43	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.11	47.36	2.75	633.89	826.39	24.27	630.25	0.67
MEAN	46.10	44.80	1.30	550.61	764.36	24.27	630.25	0.62
HUB	40.49	38.84	1.65	452.24	696.82	24.27	630.25	0.57

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	587.04	232.33	539.11	1248.36	0.47
MEAN	15.50	598.95	249.42	544.54	1245.61	0.48
HUB	12.59	643.39	331.98	551.13	1242.86	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.74	664.46	388.41	0.53	4171.39	
MEAN	536.24	615.46	286.82	0.49	3868.31	1.35
HUB	435.63	560.79	103.65	0.45	4181.97	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.71	1.11	26.39	676.79	1.04	648.07	0.92	0.89
MEAN	30.47	1.11	26.01	675.11	1.03	645.21	0.92	0.89
HUB	30.71	1.11	25.58	676.85	1.04	642.35	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	23.31	35.77	31.50	4.27	0.93	0.24	2.90	
MEAN	24.61	27.78	23.50	4.28	0.91	0.24	3.34	0.89
HUB	31.06	10.65	6.50	4.15	0.91	0.25	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.968

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	605.490	253.993	549.642	1246.028	0.486	-0.006

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.537      25.980     645.691      46.000      24.802      33.000       8.198

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     585.547     253.993     638.261    1247.936       0.469       0.022

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.347      26.096     647.671     440.827       0.061       0.246

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     542.460       0.000     542.460    1251.833       0.433       0.151

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.681     651.722       0.000       0.060       0.059       0.148

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.810      30.358       1.101     676.250      22.588     318.857       2.472

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 140979.422       0.366    1553.135 1780808.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    956272.19  10535.0078    190.4457      2.0095      0.7548      4.0409      1.2935


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 105% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.453   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    192.609    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   87.54964

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    188.160    3949.384       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  148170.891  151133.984       1.518     831.557     547.963     619.754       1.131

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   467.10    -0.16   467.10     0.42   710.99
  MEAN    17.06     0.00    -0.02   467.10    -0.16   467.10     0.42
  HUB     12.51     0.00    -0.02   467.10    -0.16   467.10     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.81    50.47     6.34   713.82   853.20    13.35   504.59     0.77
  MEAN    51.65    47.20     4.45   590.30   752.88    13.35   504.59     0.68
  HUB     42.83    38.62     4.21   432.86   636.94    13.35   504.59     0.58

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   720.64   380.94   611.72  1122.37     0.64
  MEAN    18.04   761.83   432.12   627.41  1116.63     0.68
  HUB     15.00   884.72   585.28   663.46  1104.78     0.80
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    713.82   696.43   332.88     0.62  7862.08
 MEAN   624.07   656.12   191.94     0.59  7796.52     1.27
 HUB    519.02   666.76    66.26     0.60  8781.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.51     1.29    14.78   566.51     1.08   523.16     0.92     0.91
 MEAN    19.47     1.29    14.25   566.15     1.08   517.71     0.92     0.91
 HUB     20.08     1.33    13.15   571.62     1.09   506.35     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.91    28.55    24.20     4.35     0.93     0.26     2.90
 MEAN    34.56    17.01    12.70     4.31     0.92     0.21     3.51     0.91
 HUB     41.42    -5.70    -9.30     3.60     0.92     0.06     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     776.795     431.283     646.069    1116.161       0.696      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.629      14.197     517.693      24.000      33.725      35.400       1.675

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     669.936     431.283     796.756    1129.995       0.593       0.236

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.528      15.391     530.605     528.796       0.028       0.399

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     610.447       0.000     610.447    1136.749       0.537       0.311

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.947     536.967       0.000       0.060       0.049       0.335

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.860      19.410       1.285     568.092      45.282     227.379       1.763

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 281917.562       0.553    3068.538 1964124.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.453   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    192.609    3965.000      19.410     568.092       1.000       1.000       0.980
W Kg/sec =   87.54964

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    152.661    3788.716       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 148170.891  151133.984       1.328     590.487     444.600     474.134       1.066

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   577.09    -0.20   577.09     0.51   679.42
 MEAN    18.08     0.00    -0.02   577.09    -0.20   577.09     0.51
 HUB     15.21     0.00    -0.02   577.09    -0.20   577.09     0.51

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.95    46.36     4.59   711.05   915.92    16.29   540.29     0.80
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 MEAN    47.32    42.30     5.02   625.53   851.21    16.29   540.29     0.75
 HUB     42.37    37.84     4.53   526.28   781.16    16.29   540.29     0.69

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   642.74   303.27   566.70  1169.20     0.55
 MEAN    18.01   660.67   323.38   576.12  1165.11     0.57
 HUB     15.22   720.49   418.00   586.83  1161.14     0.62

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   695.55   403.28     0.59  6196.88
 MEAN   623.16   649.45   299.79     0.56  5827.61     1.42
 HUB    526.73   596.82   108.73     0.51  6366.28

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.42     1.21    19.06   602.51     1.06   568.03     0.92     0.91
 MEAN    23.16     1.19    18.62   600.46     1.06   564.03     0.92     0.91
 HUB     23.53     1.21    18.15   603.45     1.06   560.13     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.15    35.44    31.50     3.94     0.93     0.30     2.90
 MEAN    29.31    27.49    23.50     3.99     0.92     0.29     3.30     0.91
 HUB     35.46    10.50     6.50     4.00     0.92     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     940.772     324.285     883.114    1127.444       0.834      -0.808

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.324      14.772     528.252      46.000      20.164      30.600      10.436

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     901.375     324.285     957.934    1133.898       0.795      -0.716

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      23.070      15.204     534.312     400.556       0.063       0.149

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     909.270       0.000     909.270    1133.044       0.803       0.007

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      14.807     533.163       0.000       0.060       0.154      -0.799

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.752      22.638       1.166     602.144      34.052     263.602       2.043

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 212141.344       0.425    2309.057 1773866.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 4.453   EfDer =  0.840

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    192.609    3965.000      22.638     602.144       1.000       1.000       0.780
W Kg/sec =   87.54964

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    134.758    3680.029       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
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148170.891  151133.984       1.106     434.156     392.489     339.175       0.864

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   787.45    -0.27   787.45     0.68   644.52
MEAN    17.74     0.00    -0.02   787.45    -0.27   787.45     0.68
HUB     15.05     0.00    -0.02   787.45    -0.27   787.45     0.68

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     41.42    46.36    -4.94   694.45  1050.10    16.54   550.40     0.91
MEAN    37.95    43.40    -5.45   613.77   998.56    16.54   550.40     0.87
HUB     33.49    38.84    -5.35   520.75   944.21    16.54   550.40     0.82

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   628.46   244.32   579.02  1197.60     0.52
MEAN    17.51   645.41   275.90   583.47  1195.74     0.54
HUB     14.85   703.94   381.64   591.51  1193.83     0.59

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    685.45   727.92   441.13     0.61  4845.38
MEAN   605.75   670.25   329.84     0.56  4834.95     1.57
HUB    513.83   606.10   132.19     0.51  5671.38

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.47     1.13    21.11   629.04     1.04   596.09     0.92     0.77
MEAN    25.46     1.12    20.88   628.98     1.04   594.23     0.92     0.77
HUB     25.98     1.15    20.52   633.63     1.05   592.29     0.92     0.77

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     22.88    37.30    31.50     5.80     0.93     0.35     2.90
MEAN    25.31    29.48    23.50     5.98     0.88     0.37     3.28     0.77
HUB     32.83    12.60     6.50     6.10     0.88     0.41     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.840

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     653.369     277.715     591.409    1196.319       0.546       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.588      20.887     594.927      46.000      25.154      31.500       6.346

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     610.822     277.715     670.991    1200.824       0.509       0.110

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.495      21.364     599.415     471.992       0.029       0.238

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     591.291       0.000     591.291    1202.785       0.492       0.132

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.519     601.374       0.000       0.060       0.051       0.142

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.708      25.389       1.122     630.551      28.407     302.336       2.344

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 177084.969       0.377    1927.485 2397922.000
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 4.453   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    192.609    3965.000      25.389     630.551       1.000       1.000       0.980
W Kg/sec =   87.54964

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    122.957    3596.177       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 148170.891  151133.984       1.433     513.330     358.144     401.059       1.120

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   550.52    -0.19   550.52     0.46   604.41
 MEAN    16.97     0.00    -0.02   550.52    -0.19   550.52     0.46
 HUB     14.32     0.00    -0.02   550.52    -0.19   550.52     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.45    46.36     4.09   666.42   864.55    22.01   605.27     0.72
 MEAN    46.86    43.80     3.06   587.21   805.05    22.01   605.27     0.67
 HUB     42.00    37.84     4.16   495.49   740.79    22.01   605.27     0.61

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   609.93   258.12   552.62  1227.66     0.50
 MEAN    16.57   625.18   281.21   558.36  1224.97     0.51
 HUB     13.89   678.14   374.53   565.34  1222.29     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   679.36   395.15     0.55  4877.02
 MEAN   573.48   630.23   292.26     0.51  4663.99     1.38
 HUB    480.61   575.21   106.08     0.47  5204.90

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.99     1.14    24.49   657.61     1.04   626.58     0.92     0.90
 MEAN    28.83     1.14    24.13   656.43     1.04   623.83     0.92     0.90
 HUB     29.24     1.15    23.72   659.43     1.05   621.08     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.04    35.57    31.50     4.07     0.93     0.27     2.90
 MEAN    26.73    27.63    23.50     4.13     0.91     0.27     3.29     0.90
 HUB     33.52    10.63     6.50     4.13     0.91     0.29     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.986

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     614.081     282.793     545.090    1227.385       0.500       0.058

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    28.971      24.415     626.369      46.000      27.420      32.400       4.980

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     568.562     282.793     635.007    1231.776       0.462       0.175

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      28.902      24.972     630.859     456.573       0.024       0.279

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    16.096     538.129       0.000     538.129    1234.515       0.436       0.175
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	25.273	633.668	0.000	0.060	0.045	0.236

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.850	28.800	1.134	657.821	27.269	283.306	2.196

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
170096.938	0.399	1851.424	1707271.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 4.453 EfDer = 0.986

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
192.609	3965.000	28.800	657.821	1.000	1.000	0.980

W Kg/sec = 87.54964

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
110.714	3520.851	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
148170.891	151133.984	1.580	509.668	322.510	390.276	1.210

ROTOR LEADING EDGE CONDITIONS, STAGE 5

R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP 18.32	0.00	-0.02	498.83	-0.17	498.83	0.40	562.87
MEAN 15.91	0.00	-0.02	498.83	-0.17	498.83	0.40	
HUB 13.07	0.00	-0.02	498.83	-0.17	498.83	0.40	

BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP 51.81	47.36	4.45	633.89	806.76	25.75	637.08	0.65
MEAN 47.83	44.80	3.03	550.61	743.09	25.75	637.08	0.60
HUB 42.21	38.84	3.37	452.24	673.43	25.75	637.08	0.54

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

R2	C2	Cu2	Cm2	Ao2	Mach2
TIP 17.94	566.14	258.33	503.76	1256.74	0.45
MEAN 15.50	576.28	268.15	510.09	1253.27	0.46
HUB 12.59	618.39	338.89	517.27	1249.84	0.49

U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP 620.74	620.58	362.41	0.49	4637.60	
MEAN 536.24	576.25	268.09	0.46	4158.37	1.40
HUB 435.63	526.24	96.74	0.42	4268.84	

Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP 32.51	1.13	28.28	683.53	1.04	656.81	0.92	0.90
MEAN 32.11	1.11	27.77	680.87	1.04	653.19	0.92	0.90
HUB 32.20	1.12	27.24	681.49	1.04	649.61	0.92	0.90

Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP 27.15	35.73	31.50	4.23	0.93	0.29	2.90	
MEAN 27.73	27.73	23.50	4.23	0.91	0.28	3.34	0.90
HUB 33.23	10.59	6.50	4.09	0.91	0.28	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.986

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	582.610	273.064	514.656	1253.703	0.465	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
32.181	27.752	653.669	46.000	27.949	33.000	5.051

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     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     543.288     273.064     608.051    1257.237       0.432       0.098

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      32.068      28.204     657.360     440.827       0.045       0.292

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     504.962       0.000     504.962    1260.435       0.401       0.212

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      28.709     660.708       0.000       0.060       0.045       0.210

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4         PR4       Texit        Del T       Ns        Ns nondim
       0.851      32.068       1.113     681.963      24.142     294.248       2.281

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  150705.188       0.391    1640.354 1731749.000

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     991946.00  10796.8574    188.1599      2.1227      0.7913      4.4532      1.3044


*********************************************************************
**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 105% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     189.777    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   86.26234

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     185.393    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  145992.219  148911.750       1.540     831.557     539.905     619.754       1.148

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   458.78    -0.16   458.78     0.42   710.99
  MEAN    17.06     0.00    -0.02   458.78    -0.16   458.78     0.42
  HUB     12.51     0.00    -0.02   458.78    -0.16   458.78     0.42

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.28    50.47     6.81   713.82   848.67    13.41   505.23     0.77
  MEAN    52.15    47.20     4.95   590.30   747.74    13.41   505.23     0.68
  HUB     43.35    38.62     4.73   432.86   630.86    13.41   505.23     0.57

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   712.89   388.52   597.71  1124.25     0.63
  MEAN    18.04   752.96   436.34   613.64  1118.23     0.67
  HUB     15.00   872.45   583.74   648.39  1106.46     0.79

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   680.50   325.31     0.61  8018.33
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 MEAN   624.07   641.72   187.72     0.57  7872.61     1.29
 HUB    519.02   651.62    64.72     0.59  8758.10

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.62     1.30    14.96   567.38     1.09   524.95     0.92     0.91
 MEAN    19.53     1.29    14.40   566.57     1.08   519.25     0.92     0.91
 HUB     20.07     1.33    13.31   571.49     1.09   508.01     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.02    28.56    24.20     4.36     0.93     0.28     2.90
 MEAN    35.42    17.01    12.70     4.31     0.92     0.23     3.51     0.91
 HUB     42.00    -5.70    -9.30     3.60     0.92     0.07     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     766.925     435.497     631.282    1117.949       0.686      -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.683      14.362     519.353      24.000      34.600      35.400       0.800

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     652.478     435.497     784.465    1132.458       0.576       0.256

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.589      15.638     532.921     528.796       0.027       0.413

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     595.259       0.000     595.259    1138.777       0.523       0.328

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.171     538.884       0.000       0.060       0.046       0.353

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      19.485       1.290     568.479      45.669     223.907       1.736

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 284331.688       0.558    3049.309 1929115.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    189.777    3965.000      19.485     568.479       1.000       1.000       0.980
W Kg/sec =   86.26234

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    149.883    3787.424       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 145992.219  148911.750       1.353     590.487     436.508     474.134       1.086

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   563.33    -0.19   563.32     0.49   679.19
 MEAN    18.08     0.00    -0.02   563.33    -0.19   563.32     0.49
 HUB     15.21     0.00    -0.02   563.33    -0.19   563.32     0.49

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.62    46.36     5.26   711.05   907.31    16.50   541.98     0.79
 MEAN    48.00    42.30     5.70   625.53   841.94    16.50   541.98     0.74
 HUB     43.06    37.84     5.22   526.28   771.05    16.50   541.98     0.68
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      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   634.90   314.10   551.76  1171.70     0.54
MEAN    18.01   651.98   331.17   561.61  1167.27     0.56
HUB     15.22   710.71   420.86   572.70  1162.96     0.61

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    706.56   677.10   392.46     0.58  6417.82
MEAN   623.16   632.99   292.00     0.54  5967.79     1.44
HUB    526.73   582.40   105.87     0.50  6409.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.67     1.21    19.38   604.13     1.06   570.48     0.92     0.91
MEAN    23.36     1.20    18.89   601.63     1.06   566.14     0.92     0.91
HUB     23.66     1.21    18.38   604.08     1.06   561.92     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     29.65    35.42    31.50     3.92     0.93     0.31     2.90
MEAN    30.53    27.47    23.50     3.97     0.92     0.31     3.30     0.91
HUB     36.31    10.47     6.50     3.97     0.92     0.31     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     905.801     332.095     842.726    1134.361       0.799      -0.738

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.515      15.442     534.777      46.000      21.508      30.600       9.092

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     850.685     332.095     913.210    1142.899       0.744      -0.589

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      23.308      16.129     542.859     400.556       0.054       0.185

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     848.980       0.000     848.980    1143.307       0.743       0.106

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      15.936     543.116       0.000       0.060       0.122      -0.630

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.793      22.991       1.180     603.280      34.801     256.223       1.986

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 216807.922       0.434    2325.152 1736252.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.872

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    189.777    3965.000      22.991     603.280       1.000       1.000       0.780
W Kg/sec =   86.26234

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    130.859    3676.561       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 145992.219  148911.750       1.139     434.156     381.132     339.175       0.890

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   747.76    -0.26   747.76     0.65   643.91
MEAN    17.74     0.00    -0.02   747.76    -0.26   747.76     0.65
HUB     15.05     0.00    -0.02   747.76    -0.26   747.76     0.65

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     42.89    46.36    -3.47   694.45  1020.67    17.36   556.62     0.88
MEAN    39.39    43.40    -4.01   613.77   967.56    17.36   556.62     0.84
HUB     34.87    38.84    -3.97   520.75   911.37    17.36   556.62     0.79

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   613.24   265.75   552.66  1202.64     0.51
MEAN    17.51   629.67   291.61   558.08  1200.06     0.52
HUB     14.85   686.70   388.47   566.26  1197.51     0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    685.45   693.96   419.70     0.58  5269.75
MEAN   605.75   640.42   314.14     0.53  5109.57     1.60
HUB    513.83   579.97   125.36     0.48  5772.61

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.25     1.14    21.98   632.53     1.05   601.15     0.92     0.80
MEAN    26.15     1.14    21.67   631.64     1.05   598.56     0.92     0.80
HUB     26.58     1.16    21.26   635.32     1.05   595.98     0.92     0.80

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.68    37.21    31.50     5.71     0.93     0.36     2.90
MEAN    27.59    29.37    23.50     5.87     0.88     0.38     3.28     0.80
HUB     34.45    12.48     6.50     5.98     0.88     0.42     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.872

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     636.922     293.519     565.258    1200.726       0.530       0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.276      21.690     599.313      46.000      27.441      31.500       4.059

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     580.179     293.519     650.201    1206.486       0.481       0.157

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.211      22.371     605.076     471.992       0.024       0.273

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.121     561.601       0.000     561.601    1208.249       0.465       0.178

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      22.527     606.846       0.000       0.060       0.042       0.190

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.753      26.125       1.136     633.167      29.887     283.601       2.198

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 186315.766       0.397    1998.140 2305002.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.995
```

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
189.777	3965.000	26.125	633.167	1.000	1.000	0.980

W Kg/sec = 86.26234

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
117.978	3588.741	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
145992.219	148911.750	1.494	513.330	343.641	401.059	1.167

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	523.97	-0.18	523.97	0.43	603.16
MEAN	16.97	0.00	-0.02	523.97	-0.18	523.97	0.43	
HUB	14.32	0.00	-0.02	523.97	-0.18	523.97	0.43	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.83	46.36	5.47	666.42	847.88	22.97	610.27	0.70
MEAN	48.27	43.80	4.47	587.21	787.13	22.97	610.27	0.65
HUB	43.41	37.84	5.57	495.49	721.27	22.97	610.27	0.60

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	593.14	279.70	523.06	1234.04	0.48
MEAN	16.57	607.10	296.72	529.65	1230.72	0.49
HUB	13.89	658.20	380.26	537.24	1227.44	0.54

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	653.27	642.76	373.57	0.52	5284.13	
MEAN	573.48	597.59	276.75	0.49	4920.88	1.42
HUB	480.61	546.53	100.35	0.45	5284.45	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.18	1.16	25.76	662.48	1.05	633.14	0.92	0.91
MEAN	29.88	1.14	25.30	660.46	1.04	629.73	0.92	0.91
HUB	30.18	1.16	24.81	662.48	1.05	626.35	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.13	35.53	31.50	4.03	0.93	0.30	2.90	
MEAN	29.26	27.59	23.50	4.09	0.92	0.30	3.29	0.91
HUB	35.29	10.58	6.50	4.08	0.92	0.31	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	597.259	298.390	517.380	1232.948	0.484	0.057

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
30.032	25.575	632.057	46.000	29.973	32.400	2.427

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	536.715	298.390	614.084	1238.520	0.433	0.221

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	29.983	26.351	637.783	456.573	0.020	0.317

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	508.433	0.000	508.433	1240.912	0.410	0.220

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	26.629	640.248	0.000	0.060	0.039	0.279

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    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.870      29.895       1.144     661.809      28.642     266.377       2.065

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 178673.984       0.419    1916.185 1659984.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    189.777    3965.000      29.895     661.809       1.000       1.000       0.980
W Kg/sec =   86.26234

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    105.409    3510.226       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
145992.219  148911.750       1.660     509.668     307.057     390.276       1.271

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   472.15    -0.16   472.15     0.38   561.17
MEAN    15.91     0.00    -0.02   472.15    -0.16   472.15     0.38
HUB     13.07     0.00    -0.02   472.15    -0.16   472.15     0.38

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.33    47.36     5.97   633.89   790.54    27.06   643.23     0.64
MEAN    49.39    44.80     4.59   550.61   725.45    27.06   643.23     0.58
HUB     43.78    38.84     4.94   452.24   653.91    27.06   643.23     0.53

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   550.92   279.84   474.55  1263.92     0.44
MEAN    15.50   558.76   283.75   481.35  1259.94     0.44
HUB     12.59   598.14   344.67   488.85  1256.01     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.74   584.31   340.91     0.46  5023.29
MEAN   536.24   543.55   252.49     0.43  4400.03     1.46
HUB    435.63   497.24    90.96     0.40  4341.54

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     34.09     1.14    29.92   689.65     1.04   664.35     0.92     0.91
MEAN    33.55     1.12    29.31   686.20     1.04   660.17     0.92     0.91
HUB     33.50     1.12    28.68   685.87     1.04   656.05     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.53    35.69     31.50     4.19     0.93     0.32     2.90
MEAN    30.52    27.68     23.50     4.18     0.92     0.31     3.34     0.91
HUB     35.19    10.54      6.50     4.04     0.92     0.30     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     565.031     288.953     485.557    1260.356       0.448      -0.004

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    33.626      29.291     660.629      46.000      30.757      33.000       2.243

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     509.521     288.953     585.752    1265.090       0.403       0.159
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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.552      30.002     665.601     440.827       0.037       0.333

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     474.588       0.000     474.588    1267.810       0.374       0.263

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.450     668.467       0.000       0.060       0.038       0.260

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      33.545       1.122     687.241      25.432     275.282       2.134

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 158780.781       0.412    1702.841 1683493.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1024910.12  10991.6270    185.3932      2.2205      0.8172      4.9534      1.3145


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 105% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    186.954    3965.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   84.97911

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    182.635    3949.384       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 143820.469  146696.562       1.563     831.557     531.874     619.754       1.165

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   450.57    -0.16   450.57     0.41   710.99
 MEAN    17.06     0.00    -0.02   450.57    -0.16   450.57     0.41
 HUB     12.51     0.00    -0.02   450.57    -0.16   450.57     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.75    50.47     7.28   713.82   844.26    13.47   505.85     0.77
 MEAN    52.65    47.20     5.45   590.30   742.73    13.47   505.85     0.67
 HUB     43.86    38.62     5.24   432.86   624.91    13.47   505.85     0.57

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   705.72   395.79   584.29  1126.00     0.63
 MEAN    18.04   744.60   440.41   600.38  1119.73     0.66
 HUB     15.00   860.76   582.27   633.93  1108.04     0.78

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    713.82   665.24   318.04     0.59  8168.25
 MEAN   624.07   627.85   183.66     0.56  7945.93     1.31
 HUB    519.02   637.07    63.26     0.57  8736.06
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.72     1.31    15.13   568.21     1.09   526.63     0.92     0.91
MEAN    19.58     1.30    14.55   566.98     1.08   520.70     0.92     0.91
HUB     20.07     1.33    13.46   571.37     1.09   509.56     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.11    28.56    24.20     4.36     0.93     0.29     2.90
MEAN    36.26    17.01    12.70     4.31     0.92     0.24     3.51     0.91
HUB     42.57    -5.70    -9.30     3.60     0.92     0.09     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     757.678     439.556     617.144    1119.616       0.677       -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.733      14.515      520.903      24.000      35.460      35.400      -0.060

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     636.091     439.556     773.189    1134.726       0.561       0.275

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.644      15.866     535.058     528.796       0.027       0.427

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     581.002       0.000     581.002    1140.649       0.509       0.344

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.375     540.658       0.000       0.060       0.044       0.369

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.871      19.551       1.294     568.852      46.042     220.546       1.710

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 286652.688       0.563    3028.469 1894596.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    186.954    3965.000      19.551     568.852       1.000       1.000       0.980
W Kg/sec =   84.97911

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    147.205    3786.183       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 143820.469  146696.562       1.377     590.487     428.709     474.134       1.106

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   550.34    -0.19   550.34     0.48   678.97
 MEAN    18.08     0.00    -0.02   550.34    -0.19   550.34     0.48
 HUB     15.21     0.00    -0.02   550.34    -0.19   550.34     0.48

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.27    46.36     5.91   711.05   899.30    16.68   543.56     0.79
 MEAN    48.67    42.30     6.37   625.53   833.31    16.68   543.56     0.73
 HUB     43.73    37.84     5.89   526.28   761.61    16.68   543.56     0.67

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   628.04   324.10   537.95  1173.97     0.53
MEAN    18.01   644.16   338.39   548.12  1169.24     0.55
HUB     15.22   701.71   423.53   559.49  1164.64     0.60

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    706.56   660.05   382.45     0.56  6622.08
MEAN   623.16   617.69   284.77     0.53  6097.83     1.46
HUB    526.73   568.93   103.21     0.49  6450.22

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.89     1.22    19.66   605.64     1.06   572.71     0.92     0.91
MEAN    23.52     1.20    19.14   602.72     1.06   568.08     0.92     0.91
HUB     23.77     1.22    18.59   604.68     1.06   563.58     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.07    35.41    31.50     3.91     0.93     0.33     2.90
MEAN    31.69    27.45    23.50     3.95     0.93     0.32     3.30     0.91
HUB     37.13    10.45     6.50     3.95     0.93     0.32     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     877.775     339.341     809.529    1139.896       0.770      -0.683

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.683      15.992     540.016      46.000      22.743      30.600       7.857

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     811.447     339.341     879.545    1149.725       0.706      -0.494

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      23.513      16.858     549.370     400.556       0.047       0.212

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.823     805.318       0.000     805.318    1150.657       0.700       0.170

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750      16.772     550.203       0.000       0.060       0.100      -0.513

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.820      23.270       1.190     604.347      35.495     249.531       1.934

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 221131.391       0.443    2336.241 1700022.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.898

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   186.954    3965.000      23.270     604.347       1.000       1.000       0.780
W Kg/sec =   84.97911

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
   127.478    3673.315       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
143820.469  146696.562       1.169     434.156     371.283     339.175       0.914

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   716.55    -0.25   716.55     0.62   643.34
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```
 MEAN    17.74     0.00    -0.02   716.55    -0.25   716.55     0.62
 HUB     15.05     0.00    -0.02   716.55    -0.25   716.55     0.62

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.11    46.36    -2.25   694.45   998.02    18.00   561.50     0.86
 MEAN    40.59    43.40    -2.81   613.77   943.64    18.00   561.50     0.81
 HUB     36.02    38.84    -2.82   520.75   885.93    18.00   561.50     0.76

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   601.78   283.22   530.97  1206.77     0.50
 MEAN    17.51   617.37   304.42   537.10  1203.63     0.51
 HUB     14.85   672.83   393.98   545.42  1200.58     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   666.12   402.23     0.55  5615.52
 MEAN   605.75   615.85   301.33     0.51  5333.73     1.63
 HUB    513.83   558.43   119.85     0.47  5854.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.90     1.16    22.69   635.52     1.05   605.30     0.92     0.82
 MEAN    26.71     1.15    22.32   633.95     1.05   602.15     0.92     0.82
 HUB     27.06     1.16    21.86   636.84     1.05   599.07     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.08    37.15    31.50     5.65     0.93     0.38     2.90
 MEAN    29.54    29.29    23.50     5.79     0.89     0.40     3.28     0.82
 HUB     35.84    12.39     6.50     5.89     0.89     0.43     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.898

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     624.137     306.418     543.742    1204.346       0.518       0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.843      22.347     602.929      46.000      29.403      31.500       2.097

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     555.610     306.418     634.503    1211.065       0.459       0.195

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.792      23.188     609.676     471.992       0.021       0.303

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     538.021       0.000     538.021    1212.658       0.444       0.214

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.334     611.281       0.000       0.060       0.038       0.227

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.784      26.714       1.148     635.438      31.091     269.505       2.089

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 193831.797       0.413    2047.822 2228727.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    186.954    3965.000      26.714     635.438       1.000       1.000       0.980
W Kg/sec =   84.97911
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
113.867	3582.322	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
143820.469	146696.562	1.548	513.330	331.667	401.059	1.209

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	502.72	-0.17	502.72	0.41	602.08
MEAN	16.97	0.00	-0.02	502.72	-0.17	502.72	0.41	
HUB	14.32	0.00	-0.02	502.72	-0.17	502.72	0.41	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.98	46.36	6.62	666.42	834.91	23.74	614.36	0.69
MEAN	49.44	43.80	5.64	587.21	773.14	23.74	614.36	0.64
HUB	44.59	37.84	6.75	495.49	705.98	23.74	614.36	0.58

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	581.37	296.41	500.13	1239.06	0.47
MEAN	16.57	593.81	308.85	507.17	1235.30	0.48
HUB	13.89	642.96	384.77	515.11	1231.60	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	653.27	614.39	356.86	0.50	5599.63	
MEAN	573.48	572.06	264.63	0.46	5121.71	1.46
HUB	480.61	523.95	95.84	0.43	5346.96	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	31.12	1.16	26.76	666.50	1.05	638.31	0.92	0.91
MEAN	30.72	1.15	26.23	663.85	1.04	634.44	0.92	0.91
HUB	30.91	1.16	25.67	665.10	1.05	630.62	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.65	35.51	31.50	4.01	0.93	0.32	2.90	
MEAN	31.34	27.55	23.50	4.05	0.92	0.32	3.29	0.91
HUB	36.76	10.54	6.50	4.04	0.92	0.33	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	584.948	310.583	495.684	1237.381	0.473	0.055

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
30.870	26.486	636.610	46.000	32.070	32.400	0.330

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	512.302	310.583	599.095	1243.825	0.412	0.258

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	30.830	27.429	643.258	456.573	0.019	0.348

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	485.716	0.000	485.716	1245.963	0.390	0.255

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	27.684	645.471	0.000	0.060	0.037	0.312

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	30.745	1.151	665.148	29.710	253.838	1.968

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 185351.016       0.434    1958.223 1618347.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    186.954    3965.000      30.745     665.148       1.000       1.000       0.980
W Kg/sec =   84.97911

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    101.223    3501.404       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 143820.469  146696.562       1.728     509.668     294.865     390.276       1.324

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   451.62    -0.16   451.62     0.36   559.76
 MEAN    15.91     0.00    -0.02   451.62    -0.16   451.62     0.36
 HUB     13.07     0.00    -0.02   451.62    -0.16   451.62     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.54    47.36     7.18   633.89   778.45    28.09   648.15     0.62
 MEAN    50.65    44.80     5.85   550.61   712.25    28.09   648.15     0.57
 HUB     45.05    38.84     6.21   452.24   639.24    28.09   648.15     0.51

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   540.83   295.93   452.68  1269.46     0.43
 MEAN    15.50   546.46   295.52   459.67  1265.14     0.43
 HUB     12.59   583.24   349.02   467.29  1260.87     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   557.15   324.81     0.44  5311.87
 MEAN   536.24   518.88   240.72     0.41  4582.30     1.51
 HUB    435.63   475.25    86.61     0.38  4396.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     35.32     1.15    31.17   694.59     1.04   670.21     0.92     0.91
 MEAN    34.66     1.13    30.49   690.54     1.04   665.65     0.92     0.91
 HUB     34.50     1.12    29.79   689.51     1.04   661.16     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.17    35.66    31.50     4.16     0.93     0.35     2.90
 MEAN    32.74    27.64    23.50     4.14     0.92     0.33     3.34     0.91
 HUB     36.76    10.50     6.50     4.00     0.92     0.32     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     552.748     300.937     463.646    1265.539       0.437      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.738      30.469     666.081      46.000      32.986      33.000       0.014

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     484.757     300.937     570.572    1271.112       0.381       0.203

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      34.676      31.363     671.961     440.827       0.034       0.366
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     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     452.142       0.000     452.142    1273.519       0.355       0.300

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      31.771     674.508       0.000       0.060       0.037       0.297

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.880      34.665       1.128     691.548      26.400     261.770       2.029

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  164842.578       0.428    1741.552 1641518.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1051809.50  11112.3076    182.6354      2.2946      0.8332      5.4534      1.3228


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 105% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     184.141    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   83.70042

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     179.887    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  141656.391  144489.219       1.587     831.557     523.871     619.754       1.183

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   442.47    -0.15   442.47     0.40   710.99
  MEAN    17.06     0.00    -0.02   442.47    -0.15   442.47     0.40
  HUB     12.51     0.00    -0.02   442.47    -0.15   442.47     0.40

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.21    50.47     7.74   713.82   839.96    13.52   506.46     0.76
  MEAN    53.15    47.20     5.95   590.30   737.85    13.52   506.46     0.67
  HUB     44.38    38.62     5.76   432.86   619.10    13.52   506.46     0.56

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   699.10   402.78   571.41  1127.65     0.62
  MEAN    18.04   736.69   444.34   587.60  1121.15     0.66
  HUB     15.00   849.60   580.88   620.01  1109.54     0.77

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   650.58   311.04     0.58  8312.49
  MEAN   624.07   614.47   179.73     0.55  8016.70     1.33
  HUB    519.02   623.08    61.86     0.56  8715.04

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.81     1.31    15.28   569.01     1.09   528.21     0.92     0.91
  MEAN    19.63     1.30    14.68   567.37     1.09   522.06     0.92     0.91
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 HUB     20.06     1.33    13.60   571.25     1.09   511.03     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.18    28.56    24.20     4.36     0.93     0.31     2.90
 MEAN    37.10    17.01    12.70     4.31     0.92     0.26     3.51     0.91
 HUB     43.13    -5.70    -9.30     3.60     0.92     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     748.991     443.475     603.587    1121.176       0.668      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.779      14.659     522.356      24.000      36.306      35.400      -0.906

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     620.622     443.475     762.786    1136.827       0.546       0.293

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.692      16.076     537.041     528.796       0.026       0.440

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     567.531       0.000     567.531    1142.390       0.497       0.358

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.562     542.309       0.000       0.060       0.042       0.384

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      19.608       1.298     569.212      46.402     217.285       1.684

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 288890.125       0.567    3006.182 1860559.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    184.141    3965.000      19.608     569.212       1.000       1.000       0.980
W Kg/sec =   83.70042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    144.614    3784.988       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141656.391  144489.219       1.402     590.487     421.163     474.134       1.126

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   538.03    -0.19   538.03     0.47   678.75
 MEAN    18.08     0.00    -0.02   538.03    -0.19   538.03     0.47
 HUB     15.21     0.00    -0.02   538.03    -0.19   538.03     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.89    46.36     6.53   711.05   891.82    16.85   545.04     0.78
 MEAN    49.31    42.30     7.01   625.53   825.22    16.85   545.04     0.72
 HUB     44.38    37.84     6.54   526.28   752.76    16.85   545.04     0.66

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   622.01   333.45   525.08  1176.05     0.53
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 MEAN    18.01   637.08   345.17   535.48  1171.07     0.54
 HUB     15.22   693.37   426.03   547.05  1166.21     0.59

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   644.14   373.11     0.55  6812.78
 MEAN   623.16   603.34   278.00     0.52  6219.77     1.48
 HUB    526.73   556.24   100.70     0.48  6488.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.09     1.23    19.91   607.05     1.07   574.75     0.92     0.91
 MEAN    23.68     1.21    19.36   603.76     1.06   569.88     0.92     0.91
 HUB     23.86     1.22    18.78   605.25     1.06   565.12     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.42    35.40    31.50     3.90     0.93     0.34     2.90
 MEAN    32.81    27.44    23.50     3.94     0.93     0.33     3.30     0.91
 HUB     37.91    10.43     6.50     3.93     0.93     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     854.301     346.135     781.038    1144.531       0.746      -0.640

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.832      16.459     544.419      46.000      23.902      30.600       6.698

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     778.951     346.135     852.393    1155.280       0.674      -0.416

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      23.691      17.465     554.694     400.556       0.041       0.234

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     770.564       0.000     770.564    1156.442       0.666       0.217

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      17.442     555.781       0.000       0.060       0.083      -0.421

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.839      23.500       1.198     605.355      36.144     243.392       1.887

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 225176.828       0.451    2343.184 1664995.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.919

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    184.141    3965.000      23.500     605.355       1.000       1.000       0.780
W Kg/sec =   83.70042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    124.438    3670.255       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141656.391  144489.219       1.198     434.156     362.429     339.175       0.936

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   690.40    -0.24   690.40     0.59   642.80
 MEAN    17.74     0.00    -0.02   690.40    -0.24   690.40     0.59
 HUB     15.05     0.00    -0.02   690.40    -0.24   690.40     0.59
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     45.18    46.36    -1.18   694.45   979.40    18.54   565.58     0.84
MEAN    41.65    43.40    -1.75   613.77   923.93    18.54   565.58     0.79
HUB     37.04    38.84    -1.80   520.75   864.91    18.54   565.58     0.74

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   592.80   298.14   512.37  1210.28     0.49
MEAN    17.51   607.35   315.39   519.04  1206.71     0.50
HUB     14.85   661.19   398.66   527.49  1203.25     0.55

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    685.45   642.28   387.30     0.53  5911.01
MEAN   605.75   594.74   290.36     0.49  5525.54     1.65
HUB    513.83   539.91   115.17     0.45  5923.67

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     27.46     1.17    23.30   638.17     1.05   608.84     0.92     0.84
MEAN    27.19     1.16    22.86   636.03     1.05   605.24     0.92     0.84
HUB     27.47     1.17    22.37   638.24     1.05   601.76     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.19    37.09    31.50     5.59     0.93     0.40     2.90
MEAN    31.28    29.22    23.50     5.72     0.89     0.41     3.28     0.84
HUB     37.08    12.32     6.50     5.82     0.89     0.43     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.919

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     613.750     317.455     525.273    1207.449       0.508       0.009

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    27.324      22.902     606.039      46.000      31.147      31.500       0.353

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     534.907     317.455     622.016    1214.954       0.440       0.228

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.279      23.875     613.597     471.992       0.020       0.329

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     518.211       0.000     518.211    1216.406       0.426       0.244

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      24.009     615.065       0.000       0.060       0.037       0.258

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.807      27.203       1.158     637.476      32.120     258.154       2.001

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 200253.391       0.426    2083.831 2162254.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    184.141    3965.000      27.203     637.476       1.000       1.000       0.980
W Kg/sec =   83.70042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    110.312    3576.593       1.401       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
141656.391	144489.219	1.598	513.330	321.312	401.059	1.248

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	484.77	-0.17	484.77	0.40	601.12
MEAN	16.97	0.00	-0.02	484.77	-0.17	484.77	0.40	
HUB	14.32	0.00	-0.02	484.77	-0.17	484.77	0.40	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.97	46.36	7.61	666.42	824.22	24.39	617.88	0.68
MEAN	50.47	43.80	6.67	587.21	761.58	24.39	617.88	0.62
HUB	45.64	37.84	7.80	495.49	693.31	24.39	617.88	0.57

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	572.54	310.21	481.22	1243.25	0.46
MEAN	16.57	583.38	318.90	488.51	1239.16	0.47
HUB	13.89	630.54	388.49	496.65	1235.13	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	653.27	590.98	343.06	0.48	5860.01	
MEAN	573.48	550.87	254.58	0.44	5288.17	1.50
HUB	480.61	505.12	92.12	0.41	5398.57	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	31.90	1.17	27.58	669.98	1.05	642.64	0.92	0.91
MEAN	31.42	1.15	26.99	666.81	1.05	638.42	0.92	0.91
HUB	31.51	1.16	26.37	667.42	1.05	634.26	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.81	35.48	31.50	3.98	0.93	0.35	2.90	
MEAN	33.14	27.53	23.50	4.03	0.93	0.34	3.29	0.91
HUB	38.03	10.51	6.50	4.01	0.93	0.34	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	575.320	320.689	477.652	1241.117	0.464	0.054

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
31.562	27.236	640.461	46.000	33.877	32.400	-1.477

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	492.306	320.689	587.543	1248.259	0.394	0.288

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	31.522	28.315	647.853	456.573	0.019	0.376

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	467.146	0.000	467.146	1250.197	0.374	0.283

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	28.544	649.867	0.000	0.060	0.037	0.338

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.881	31.435	1.156	668.068	30.592	243.838	1.890

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
190870.172	0.447	1986.189	1580272.125

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    184.141    3965.000      31.435     668.068       1.000       1.000       0.980
W Kg/sec =   83.70042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.725    3493.744       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141656.391  144489.219       1.790     509.668     284.675     390.276       1.371

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   434.77    -0.15   434.77     0.35   558.54
 MEAN    15.91     0.00    -0.02   434.77    -0.15   434.77     0.35
 HUB     13.07     0.00    -0.02   434.77    -0.15   434.77     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.56    47.36     8.20   633.89   768.79    28.92   652.31     0.61
 MEAN    51.71    44.80     6.91   550.61   701.68    28.92   652.31     0.56
 HUB     46.14    38.84     7.30   452.24   627.44    28.92   652.31     0.50

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   533.56   308.86   435.08  1274.04     0.42
 MEAN    15.50   537.11   304.98   442.12  1269.47     0.42
 HUB     12.59   571.45   352.51   449.77  1264.95     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   535.31   311.88     0.42  5543.71
 MEAN   536.24   498.95   231.25     0.39  4728.86     1.55
 HUB    435.63   457.38    83.12     0.36  4440.04

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     36.30     1.15    32.18   698.79     1.05   675.06     0.92     0.91
 MEAN    35.56     1.13    31.44   694.27     1.04   670.23     0.92     0.91
 HUB     35.29     1.12    30.68   692.67     1.04   665.45     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.37    35.63    31.50     4.13     0.93     0.37     2.90
 MEAN    34.60    27.61    23.50     4.11     0.93     0.35     3.34     0.91
 HUB     38.09    10.47     6.50     3.97     0.93     0.34     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     543.425     310.573     445.932    1269.845       0.428      -0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    35.633      31.415     670.630      46.000      34.856      33.000      -1.856

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     465.086     310.573     559.250    1276.065       0.364       0.238

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      35.570      32.449     677.216     440.827       0.035       0.394

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     14.701     434.237       0.000     434.237    1278.242       0.340       0.329

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.826     679.528       0.000       0.060       0.038       0.325

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.882      35.557       1.131     695.245      27.177     251.290       1.948

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 169713.156       0.440    1766.030 1603342.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1074903.62  11185.4170    179.8873      2.3536      0.8434      5.9529      1.3298


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 105% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.543   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    180.829    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   82.19485

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    176.651    3949.384       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 139108.312  141890.188       1.616     831.557     514.448     619.754       1.205

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   433.05    -0.15   433.05     0.39   710.99
  MEAN    17.06     0.00    -0.02   433.05    -0.15   433.05     0.39
  HUB     12.51     0.00    -0.02   433.05    -0.15   433.05     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.76    50.47     8.29   713.82   835.03    13.59   507.15     0.76
  MEAN    53.74    47.20     6.54   590.30   732.23    13.59   507.15     0.66
  HUB     45.00    38.62     6.38   432.86   612.39    13.59   507.15     0.55

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   691.90   410.72   556.80  1129.47     0.61
  MEAN    18.04   727.88   448.82   573.03  1122.74     0.65
  HUB     15.00   837.04   579.29   604.19  1111.21     0.75

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   633.95   303.10     0.56  8476.32
  MEAN   624.07   599.23   175.25     0.53  8097.52     1.36
  HUB    519.02   607.19    60.28     0.55  8691.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.91     1.32    15.45   569.92     1.09   529.95     0.92     0.91
  MEAN    19.68     1.30    14.83   567.82     1.09   523.59     0.92     0.91
  HUB     20.05     1.33    13.76   571.12     1.09   512.65     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     36.41    28.56    24.20     4.36     0.93     0.33     2.90
 MEAN    38.07    17.00    12.70     4.30     0.93     0.27     3.51     0.91
 HUB     43.79    -5.70    -9.30     3.60     0.93     0.12     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     739.373     447.951     588.229    1122.897       0.658       -0.003

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.829      14.816     523.961      24.000      37.290      35.400      -1.890

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     603.352     447.951     751.461    1139.126       0.530       0.312

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.742      16.304     539.216     528.796       0.027       0.455

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     552.461       0.000     552.461    1144.304       0.483       0.374

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.763     544.128       0.000       0.060       0.041       0.401

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      19.666       1.302     569.621      46.811     213.547       1.655

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 291438.375       0.572    2978.148 1820920.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.543   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    180.829    3965.000      19.666     569.621       1.000       1.000       0.980
W Kg/sec =   82.19485

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    141.647    3783.627       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 139108.312  141890.188       1.431     590.487     412.522     474.134       1.149

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   524.20    -0.18   524.20     0.46   678.51
 MEAN    18.08     0.00    -0.02   524.20    -0.18   524.20     0.46
 HUB     15.21     0.00    -0.02   524.20    -0.18   524.20     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.61    46.36     7.25   711.05   883.54    17.04   546.68     0.77
 MEAN    50.04    42.30     7.74   625.53   816.27    17.04   546.68     0.71
 HUB     45.12    37.84     7.28   526.28   742.93    17.04   546.68     0.65

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   615.75   343.75   510.87  1178.31     0.52
 MEAN    18.01   629.50   352.66   521.44  1173.07     0.54
 HUB     15.22   684.20   428.78   533.18  1167.94     0.59
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   626.59   362.81     0.53  7022.99
 MEAN   623.16   587.43   270.50     0.50  6354.66     1.51
 HUB    526.73   542.10    97.95     0.46  6530.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.31     1.24    20.17   608.63     1.07   576.98     0.92     0.91
 MEAN    23.83     1.21    19.59   604.92     1.06   571.84     0.92     0.91
 HUB     23.96     1.22    18.98   605.89     1.06   566.81     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.94    35.38    31.50     3.88     0.93     0.36     2.90
 MEAN    34.07    27.42    23.50     3.92     0.93     0.35     3.30     0.91
 HUB     38.81    10.41     6.50     3.91     0.93     0.34     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     830.646     353.650     751.602    1149.201       0.723      -0.596

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.987      16.934     548.872      46.000      25.198      30.600       5.402

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     746.249     353.650     825.806    1160.775       0.643      -0.339

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      23.872      18.073     559.984     400.556       0.036       0.256

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     736.546       0.000     736.546    1162.034       0.634       0.261

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      18.095     561.186       0.000       0.060       0.069      -0.334

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854      23.723       1.206     606.481      36.860     236.733       1.835

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 229639.906       0.460    2346.643 1624934.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.543   EfDer =  0.940

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    180.829    3965.000      23.723     606.481       1.000       1.000       0.780
W Kg/sec =   82.19485

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    121.161    3666.848       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 139108.312  141890.188       1.230     434.156     352.884     339.175       0.961

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   663.82    -0.23   663.82     0.57   642.21
 MEAN    17.74     0.00    -0.02   663.82    -0.23   663.82     0.57
 HUB     15.05     0.00    -0.02   663.82    -0.23   663.82     0.57

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.30    46.36    -0.06   694.45   960.85    19.07   569.71     0.82
 MEAN    42.77    43.40    -0.63   613.77   904.25    19.07   569.71     0.77
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HUB     38.13    38.84    -0.71   520.75   843.85    19.07   569.71     0.72

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   584.40   313.45   493.22  1213.87     0.48
MEAN    17.51   597.55   326.64   500.38  1209.88     0.49
HUB     14.85   649.48   403.46   508.96  1206.02     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    685.45   617.78   372.00     0.51  6214.04
MEAN   605.75   572.96   279.11     0.47  5722.32     1.68
HUB    513.83   520.79   110.37     0.43  5994.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     28.02     1.18    23.91   640.97     1.06   612.47     0.92     0.86
MEAN    27.67     1.17    23.41   638.24     1.05   608.45     0.92     0.86
HUB     27.86     1.17    22.87   639.75     1.05   604.56     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.44    37.02    31.50     5.52     0.93     0.41     2.90
MEAN    33.14    29.15    23.50     5.65     0.90     0.42     3.28     0.86
HUB     38.40    12.24     6.50     5.74     0.90     0.44     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.940

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     603.634     328.779     506.240    1210.640       0.499        0.010

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    27.807      23.459     609.248      46.000      33.002      31.500      -1.502

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     513.896     328.779     610.069    1218.927       0.422        0.262

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.762      24.564     617.617     471.992       0.020        0.358

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
    17.121     498.165       0.000     498.165    1220.237       0.408        0.274

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950      24.680     618.946       0.000       0.060       0.037        0.288

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
     0.827      27.685       1.167     639.656      33.176     247.068        1.915

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 206838.891       0.440    2113.644 2092018.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.543   EfDer =  0.999

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    180.829     3965.000       27.685     639.656       1.000        1.000        0.980
W Kg/sec =   82.19485

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
    106.624     3570.491        1.401       0.249      53.349      56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 139108.312  141890.188        1.653     513.330     310.572     401.059        1.291
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ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	466.52	-0.16	466.52	0.38	600.09
MEAN	16.97	0.00	-0.02	466.52	-0.16	466.52	0.38	
HUB	14.32	0.00	-0.02	466.52	-0.16	466.52	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.01	46.36	8.65	666.42	813.61	25.04	621.50	0.67
MEAN	51.54	43.80	7.74	587.21	750.09	25.04	621.50	0.61
HUB	46.73	37.84	8.89	495.49	680.67	25.04	621.50	0.56

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	564.55	323.92	462.37	1247.46	0.45
MEAN	16.57	573.50	328.92	469.80	1243.08	0.46
HUB	13.89	618.35	392.20	478.05	1238.75	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	653.27	567.68	329.35	0.46	6118.79	
MEAN	573.48	529.64	244.55	0.43	5454.24	1.54
HUB	480.61	486.16	88.41	0.39	5450.01	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	32.66	1.18	28.38	673.59	1.05	647.01	0.92	0.91
MEAN	32.09	1.16	27.73	669.91	1.05	642.47	0.92	0.91
HUB	32.09	1.16	27.06	669.88	1.05	637.99	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.01	35.46	31.50	3.96	0.93	0.37	2.90	
MEAN	35.00	27.50	23.50	4.00	0.93	0.36	3.29	0.91
HUB	39.37	10.48	6.50	3.98	0.93	0.36	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	566.223	330.772	459.563	1244.911	0.455	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
32.237	27.970	644.387	46.000	35.745	32.400	-3.345

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	472.482	330.772	576.757	1252.731	0.377	0.319

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	32.193	29.180	652.508	456.573	0.020	0.404

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	448.764	0.000	448.764	1254.479	0.358	0.309

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	29.379	654.330	0.000	0.060	0.040	0.363

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	32.099	1.159	671.127	31.470	234.167	1.815

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
196363.906	0.460	2006.602	1538487.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

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 RESET =  0.000BLEED =  0.000 DPInc = 6.543   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    180.829    3965.000      32.099     671.127       1.000       1.000       0.980
W Kg/sec =   82.19485

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.198    3485.773       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
139108.312  141890.188       1.857     509.668     274.403     390.276       1.422

    ROTOR LEADING EDGE CONDITIONS, STAGE             5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   418.02    -0.14   418.02     0.33   557.26
MEAN    15.91     0.00    -0.02   418.02    -0.14   418.02     0.33
HUB     13.07     0.00    -0.02   418.02    -0.14   418.02     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.60    47.36     9.24   633.89   759.44    29.73   656.56     0.60
MEAN    52.80    44.80     8.00   550.61   691.43    29.73   656.56     0.55
HUB     47.26    38.84     8.42   452.24   615.95    29.73   656.56     0.49

     ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   527.22   321.47   417.87  1278.61     0.41
MEAN    15.50   528.47   314.25   424.89  1273.83     0.41
HUB     12.59   560.12   355.92   432.50  1269.07     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.74   513.98   299.27     0.40  5769.84
MEAN   536.24   479.38   221.98     0.38  4872.47     1.59
HUB    435.63   439.78    79.71     0.35  4482.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     37.25     1.16    33.14   703.10     1.05   679.93     0.92     0.91
MEAN    36.41     1.13    32.34   698.12     1.04   674.85     0.92     0.91
HUB     36.05     1.12    31.54   695.97     1.04   669.82     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.57    35.61    31.50     4.11     0.93     0.40     2.90
MEAN    36.49    27.58    23.50     4.08     0.93     0.37     3.34     0.91
HUB     39.45    10.44     6.50     3.94     0.93     0.36     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     534.852     320.016     428.552    1274.172       0.420      -0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    36.489      32.321     675.220      46.000      36.750      33.000      -3.750

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     446.035     320.016     548.960    1281.005       0.348       0.271

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      36.416      33.485     682.481     440.827       0.037       0.423

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     416.844       0.000     416.844    1282.973       0.325       0.356

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      33.830     684.580       0.000       0.060       0.041       0.352

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      36.398       1.134     699.062      27.936     241.346       1.871

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  174472.719       0.453    1782.900 1561548.875

   OVERALL EXIT CONDITIONS; ALL          5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1098753.88  11227.9365    176.6515      2.4093      0.8506      6.5431      1.3371


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 105% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 7.026   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    178.130    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   80.96808

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    174.015    3949.384       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  137032.094  139772.453       1.641     831.557     506.769     619.754       1.223

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   425.44    -0.15   425.44     0.38   710.99
  MEAN    17.06     0.00    -0.02   425.44    -0.15   425.44     0.38
  HUB     12.51     0.00    -0.02   425.44    -0.15   425.44     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.21    50.47     8.74   713.82   831.12    13.64   507.69     0.75
  MEAN    54.23    47.20     7.03   590.30   727.76    13.64   507.69     0.66
  HUB     45.50    38.62     6.88   432.86   607.04    13.64   507.69     0.55

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   686.46   416.98   545.31  1130.88     0.61
  MEAN    18.04   721.07   452.38   561.52  1123.97     0.64
  HUB     15.00   827.22   578.06   591.72  1112.50     0.74

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   620.86   296.84     0.55  8605.39
  MEAN   624.07   587.18   171.69     0.52  8161.56     1.38
  HUB    519.02   594.66    59.05     0.53  8672.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.99     1.32    15.58   570.64     1.09   531.29     0.92     0.91
  MEAN    19.72     1.31    14.94   568.17     1.09   524.76     0.92     0.91
  HUB     20.04     1.33    13.87   571.02     1.09   513.91     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     37.40    28.56    24.20     4.36     0.93     0.34     2.90
  MEAN    38.86    17.00    12.70     4.30     0.93     0.28     3.51     0.91
  HUB     44.33    -5.70    -9.30     3.60     0.93     0.13     4.78
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     731.981     451.497     576.148    1124.217       0.651      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.865      14.936     525.193      24.000      38.084      35.400      -2.684

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     589.932     451.497     742.879    1140.879       0.517       0.328

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.777      16.477     540.877     528.796       0.027       0.467

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     540.721       0.000     540.721    1145.770       0.472       0.387

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.915     545.524       0.000       0.060       0.041       0.413

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      19.706       1.304     569.944      47.134     210.574       1.632

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 293452.344       0.576    2953.972 1788956.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 7.026   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    178.130    3965.000      19.706     569.944       1.000       1.000       0.980
W Kg/sec =   80.96808

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    139.286    3782.554       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 137032.094  139772.453       1.456     590.487     405.648     474.134       1.169

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   513.39    -0.18   513.39     0.45   678.32
 MEAN    18.08     0.00    -0.02   513.39    -0.18   513.39     0.45
 HUB     15.21     0.00    -0.02   513.39    -0.18   513.39     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.18    46.36     7.82   711.05   877.16    17.18   547.94     0.76
 MEAN    50.63    42.30     8.33   625.53   809.37    17.18   547.94     0.70
 HUB     45.72    37.84     7.88   526.28   735.34    17.18   547.94     0.64

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   611.22   351.66   499.93  1180.02     0.52
 MEAN    18.01   623.84   358.45   510.58  1174.59     0.53
 HUB     15.22   677.20   430.93   522.40  1169.26     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   613.09   354.90     0.52  7184.50
 MEAN   623.16   575.12   264.71     0.49  6458.95     1.53
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 HUB    526.73   531.12    95.81     0.45  6562.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.46     1.24    20.37   609.85     1.07   578.66     0.92     0.91
 MEAN    23.95     1.22    19.76   605.82     1.06   573.33     0.92     0.91
 HUB     24.02     1.22    19.13   606.40     1.06   568.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.12    35.37    31.50     3.87     0.93     0.37     2.90
 MEAN    35.07    27.40    23.50     3.90     0.93     0.36     3.30     0.91
 HUB     39.52    10.39     6.50     3.89     0.93     0.35     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     813.747     359.461     730.049    1152.541       0.706      -0.566

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.099      17.274     552.068      46.000      26.215      30.600       4.385

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     722.758     359.461     807.212    1164.662       0.621      -0.284

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      23.999      18.505     563.741     400.556       0.033       0.272

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     712.563       0.000     712.563    1165.931       0.611       0.291

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      18.550     564.963       0.000       0.060       0.061      -0.274

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      23.876       1.212     607.356      37.412     231.680       1.796

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 233081.891       0.467    2346.266 1593116.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.026   EfDer =  0.953

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    178.130    3965.000      23.876     607.356       1.000       1.000       0.780
W Kg/sec =   80.96808

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.673    3664.203       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 137032.094  139772.453       1.256     434.156     345.638     339.175       0.981

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   644.58    -0.22   644.58     0.55   641.74
 MEAN    17.74     0.00    -0.02   644.58    -0.22   644.58     0.55
 HUB     15.05     0.00    -0.02   644.58    -0.22   644.58     0.55

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.14    46.36     0.78   694.45   947.66    19.45   572.68     0.81
 MEAN    43.61    43.40     0.21   613.77   890.21    19.45   572.68     0.76
 HUB     38.95    38.84     0.11   520.75   828.79    19.45   572.68     0.71

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   578.84   324.56   479.29  1216.47     0.48
MEAN    17.51   590.80   334.85   486.75  1212.20     0.49
HUB     14.85   641.13   406.95   495.43  1208.07     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    685.45   599.96   360.88     0.49  6434.07
MEAN   605.75   557.05   270.90     0.46  5865.97     1.71
HUB    513.83   506.82   106.88     0.42  6046.52

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     28.43     1.19    24.34   643.07     1.06   615.11     0.92     0.87
MEAN    28.00     1.17    23.80   639.91     1.05   610.79     0.92     0.87
HUB     28.14     1.18    23.22   640.92     1.06   606.62     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.11    36.98    31.50     5.48     0.93     0.43     2.90
MEAN    34.53    29.10    23.50     5.60     0.90     0.43     3.28     0.87
HUB     39.40    12.17     6.50     5.67     0.90     0.45     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.953

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     596.674     337.045     492.362    1212.962       0.492       0.011

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    28.147      23.852     611.589      46.000      34.393      31.500      -2.893

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     498.751     337.045     601.957    1221.807       0.408       0.286

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      28.100      25.051     620.541     471.992       0.021       0.379

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     483.751       0.000     483.751    1223.017       0.396       0.295

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      25.151     621.770       0.000       0.060       0.039       0.309

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.839      28.017       1.173     641.300      33.944     239.315       1.855

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 211630.938       0.450    2130.335 2039351.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.026   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    178.130    3965.000      28.017     641.300       1.000       1.000       0.980
W Kg/sec =   80.96808

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.920    3565.913       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 137032.094  139772.453       1.696     513.330     302.694     401.059       1.325

    ROTOR LEADING EDGE CONDITIONS, STAGE            4
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   453.35    -0.16   453.35     0.37   599.32
MEAN    16.97     0.00    -0.02   453.35    -0.16   453.35     0.37
HUB     14.32     0.00    -0.02   453.35    -0.16   453.35     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.78    46.36     9.42   666.42   806.13    25.49   624.16     0.66
MEAN    52.34    43.80     8.54   587.21   741.97    25.49   624.16     0.61
HUB     47.55    37.84     9.71   495.49   671.70    25.49   624.16     0.55

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   559.38   333.65   448.98  1250.48     0.45
MEAN    16.57   566.82   336.06   456.45  1245.91     0.45
HUB     13.89   609.81   394.84   464.73  1241.38     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    653.27   551.13   319.62     0.44  6302.25
MEAN   573.48   514.50   237.42     0.41  5572.43     1.57
HUB    480.61   472.57    85.77     0.38  5486.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     33.19     1.18    28.93   676.25     1.05   650.15     0.92     0.91
MEAN    32.56     1.16    28.25   672.20     1.05   645.41     0.92     0.91
HUB     32.49     1.16    27.54   671.73     1.05   640.71     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     36.62    35.45    31.50     3.95     0.93     0.39     2.90
MEAN    36.36    27.48    23.50     3.98     0.93     0.37     3.29     0.91
HUB     40.35    10.46     6.50     3.96     0.93     0.37     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     560.087     337.947     446.642    1247.651       0.449       0.050

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.701      28.474     647.231      46.000      37.113      32.400      -4.713

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     458.445     337.947     569.544    1255.945       0.365       0.341

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      32.651      29.777     655.865     456.573       0.021       0.425

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     435.763       0.000     435.763    1257.564       0.347       0.328

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      29.951     657.556       0.000       0.060       0.044       0.380

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.876      32.547       1.162     673.394      32.094     227.458       1.763

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 200264.688       0.469    2015.919 1506233.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.026   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
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   178.130    3965.000      32.547     673.394       1.000       1.000       0.980
W Kg/sec =   80.96808

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.667    3479.901       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 137032.094  139772.453       1.909     509.668     267.033     390.276       1.462

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   406.15    -0.14   406.15     0.32   556.32
 MEAN    15.91     0.00    -0.02   406.15    -0.14   406.15     0.32
 HUB     13.07     0.00    -0.02   406.15    -0.14   406.15     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.36    47.36    10.00   633.89   752.96    30.28   659.65     0.60
 MEAN    53.59    44.80     8.79   550.61   684.31    30.28   659.65     0.54
 HUB     48.08    38.84     9.24   452.24   607.95    30.28   659.65     0.48

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   523.23   330.27   405.82  1281.88     0.41
 MEAN    15.50   522.74   320.74   412.77  1276.95     0.41
 HUB     12.59   552.31   358.30   420.31  1272.05     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   499.06   290.48     0.39  5927.55
 MEAN   536.24   465.64   215.50     0.36  4972.87     1.62
 HUB    435.63   427.37    77.33     0.34  4512.85

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     37.89     1.16    33.78   706.24     1.05   683.42     0.92     0.91
 MEAN    36.99     1.14    32.96   700.95     1.04   678.17     0.92     0.91
 HUB     36.56     1.12    32.12   698.40     1.04   672.97     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.14    35.59    31.50     4.09     0.93     0.41     2.90
 MEAN    37.85    27.57    23.50     4.07     0.93     0.39     3.34     0.91
 HUB     40.45    10.42     6.50     3.92     0.93     0.37     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     529.166     326.617     416.338    1277.273       0.414      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     37.065      32.933     678.522      46.000      38.114      33.000      -5.114

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     432.775     326.617     542.193    1284.526       0.337       0.293

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      36.979      34.184     686.250     440.827       0.040       0.444

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     404.713       0.000     404.713    1286.358       0.315       0.375

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      34.506     688.208       0.000       0.060       0.045       0.370

    STAGE EXIT CONDITIONS, STAGE            5
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      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      36.958       1.136     701.859      28.466     234.551       1.818

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  177795.188       0.461    1789.735 1529303.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1116225.00  11236.2275    174.0149      2.4464      0.8538      7.0256      1.3425


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 105% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.502   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     175.471    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   79.75962

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     171.418    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  134986.875  137686.328       1.666     831.557     499.206     619.754       1.241

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   418.02    -0.14   418.02     0.38   710.99
  MEAN    17.06     0.00    -0.02   418.02    -0.14   418.02     0.38
  HUB     12.51     0.00    -0.02   418.02    -0.14   418.02     0.38

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.65    50.47     9.18   713.82   827.34    13.69   508.21     0.75
  MEAN    54.70    47.20     7.50   590.30   723.44    13.69   508.21     0.65
  HUB     46.01    38.62     7.39   432.86   601.86    13.69   508.21     0.54

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   681.46   422.97   534.31  1132.20     0.60
  MEAN    18.04   714.67   455.78   550.47  1125.13     0.64
  HUB     15.00   817.86   576.87   579.76  1113.72     0.73

        U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   608.34   290.85     0.54  8728.91
  MEAN   624.07   575.62   168.29     0.51  8222.93     1.40
  HUB    519.02   582.64    57.85     0.52  8654.80

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.07     1.33    15.71   571.33     1.09   532.55     0.92     0.91
  MEAN    19.75     1.31    15.05   568.52     1.09   525.87     0.92     0.91
  HUB     20.02     1.33    13.98   570.92     1.09   515.09     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     38.37    28.56    24.20     4.36     0.93     0.35     2.90
  MEAN    39.62    17.00    12.70     4.30     0.93     0.30     3.51     0.91
  HUB     44.86    -5.70    -9.30     3.60     0.93     0.14     4.78


    blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     725.046     454.895     564.590    1125.450       0.644      -0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.898      15.047     526.346      24.000      38.859      35.400      -3.459

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     577.218     454.895     734.922    1142.511       0.505       0.342

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.807      16.636     542.425     528.796       0.028       0.479

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     529.568       0.000     529.568    1147.141       0.462       0.399

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.054     546.830       0.000       0.060       0.041       0.425

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      19.741       1.307     570.254      47.444     207.708       1.610

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 295377.781       0.580    2928.976 1757749.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 7.502   EfDer =  0.996

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    175.471    3965.000      19.741     570.254       1.000       1.000       0.980
W Kg/sec =   79.75962

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    137.005    3781.528       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 134986.875  137686.328       1.480     590.487     399.004     474.134       1.188

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   503.09    -0.17   503.09     0.44   678.13
 MEAN    18.08     0.00    -0.02   503.09    -0.17   503.09     0.44
 HUB     15.21     0.00    -0.02   503.09    -0.17   503.09     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.73    46.36     8.37   711.05   871.18    17.30   549.12     0.76
 MEAN    51.20    42.30     8.90   625.53   802.87    17.30   549.12     0.70
 HUB     46.30    37.84     8.46   526.28   728.19    17.30   549.12     0.63

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   607.20   359.11   489.62  1181.61     0.51
 MEAN    18.01   618.67   363.92   500.31  1176.00     0.53
 HUB     15.22   670.65   432.94   512.18  1170.50     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   600.37   347.44     0.51  7336.63
 MEAN   623.16   563.49   259.24     0.48  6557.32     1.55
 HUB    526.73   520.70    93.79     0.44  6593.26

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     24.60     1.25    20.54   611.00     1.07   580.22     0.92     0.91
 MEAN    24.05     1.22    19.91   606.68     1.06   574.72     0.92     0.91
 HUB     24.07     1.22    19.26   606.88     1.06   569.33     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.26    35.36    31.50     3.86     0.93     0.38     2.90
 MEAN    36.03    27.39    23.50     3.89     0.93     0.37     3.30     0.91
 HUB     40.21    10.38     6.50     3.88     0.93     0.36     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     798.724     364.942     710.477    1155.513       0.691      -0.539

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.197      17.575     554.920      46.000      27.188      30.600       3.412

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     701.709     364.942     790.935    1168.099       0.601      -0.235

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      24.110      18.887     567.074     400.556       0.030       0.287

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     691.323       0.000     691.323    1169.347       0.591       0.316

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      18.945     568.282       0.000       0.060       0.054      -0.222

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      24.006       1.216     608.186      37.932     226.981       1.760

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 236324.156       0.473    2343.398 1562416.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.502   EfDer =  0.964

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    175.471    3965.000      24.006     608.186       1.000       1.000       0.780
W Kg/sec =   79.75962

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    116.349    3661.704       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134986.875  137686.328       1.281     434.156     338.870     339.175       1.001

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   627.24    -0.22   627.24     0.53   641.31
 MEAN    17.74     0.00    -0.02   627.24    -0.22   627.24     0.53
 HUB     15.05     0.00    -0.02   627.24    -0.22   627.24     0.53

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.92    46.36     1.56   694.45   935.94    19.78   575.35     0.80
 MEAN    44.39    43.40     0.99   613.77   877.73    19.78   575.35     0.75
 HUB     39.71    38.84     0.87   520.75   815.37    19.78   575.35     0.69

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   574.26   334.59   466.71  1218.81     0.47
MEAN    17.51   584.97   342.25   474.40  1214.29     0.48
HUB     14.85   633.72   410.06   483.16  1209.92     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    685.45   583.88   350.86     0.48  6632.62
MEAN   605.75   542.67   263.49     0.45  5995.50     1.73
HUB    513.83   494.18   103.76     0.41  6092.69

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     28.79     1.20    24.72   645.00     1.06   617.48     0.92     0.88
MEAN    28.30     1.18    24.14   641.46     1.05   612.91     0.92     0.88
HUB     28.37     1.18    23.53   642.00     1.06   608.49     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.64    36.93    31.50     5.43     0.93     0.44     2.90
MEAN    35.81    29.05    23.50     5.55     0.91     0.44     3.28     0.88
HUB     40.32    12.12     6.50     5.62     0.91     0.46     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.964

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     590.679     344.499     479.815    1215.056       0.486       0.012

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    28.443      24.194     613.704      46.000      35.678      31.500      -4.178

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     485.174     344.499     595.041    1224.398       0.396       0.309

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      28.390      25.475     623.177     471.992       0.022       0.399

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    17.121     470.852       0.000     470.852    1225.520       0.384       0.313

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      25.558     624.319       0.000       0.060       0.043       0.328

   STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.848      28.301       1.179     642.821      34.635     232.524       1.803

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 215948.578       0.460    2141.354 1990508.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.502   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    175.471    3965.000      28.301     642.821       1.000       1.000       0.980
W Kg/sec =   79.75962

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.463    3561.691       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134986.875  137686.328       1.737     513.330     295.540     401.059       1.357

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   441.53    -0.15   441.53     0.36   598.61
MEAN    16.97     0.00    -0.02   441.53    -0.15   441.53     0.36
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 HUB     14.32     0.00    -0.02   441.53    -0.15   441.53     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.48    46.36    10.12   666.42   799.54    25.88   626.56     0.65
 MEAN    53.07    43.80     9.27   587.21   734.80    25.88   626.56     0.60
 HUB     48.30    37.84    10.46   495.49   663.78    25.88   626.56     0.54

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   555.15   342.25   437.10  1253.17     0.44
 MEAN    16.57   561.12   342.37   444.56  1248.44     0.45
 HUB     13.89   602.32   397.17   452.82  1243.74     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   536.46   311.02     0.43  6464.58
 MEAN   573.48   501.04   231.10     0.40  5677.02     1.60
 HUB    480.61   460.44    83.44     0.37  5518.90

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     33.64     1.19    29.40   678.67     1.06   652.97     0.92     0.91
 MEAN    32.96     1.16    28.69   674.30     1.05   648.04     0.92     0.91
 HUB     32.82     1.16    27.95   673.43     1.05   643.17     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.06    35.43    31.50     3.93     0.93     0.40     2.90
 MEAN    37.60    27.47    23.50     3.97     0.93     0.39     3.29     0.91
 HUB     41.25    10.44     6.50     3.94     0.93     0.38     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     554.866     344.298     435.127    1250.110       0.444       0.049

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.095      28.906     649.789      46.000      38.353      32.400      -5.953

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     446.015     344.298     563.445    1258.820       0.354       0.361

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.037      30.289     658.876     456.573       0.023       0.444

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     424.256       0.000     424.256    1260.328       0.337       0.344

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.438     660.455       0.000       0.060       0.049       0.394

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      32.924       1.163     675.466      32.646     221.615       1.718

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 203717.281       0.477    2020.068 1475688.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.502   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    175.471    3965.000      32.924     675.466       1.000       1.000       0.980
W Kg/sec =   79.75962
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
89.404	3474.557	1.401	0.250	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
134986.875	137686.328	1.957	509.668	260.442	390.276	1.499

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	395.62	-0.14	395.62	0.31	555.47
MEAN	15.91	0.00	-0.02	395.62	-0.14	395.62	0.31	
HUB	13.07	0.00	-0.02	395.62	-0.14	395.62	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.04	47.36	10.68	633.89	747.33	30.75	662.42	0.59
MEAN	54.31	44.80	9.51	550.61	678.11	30.75	662.42	0.54
HUB	48.83	38.84	9.99	452.24	600.96	30.75	662.42	0.48

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	520.02	337.96	395.22	1284.78	0.40
MEAN	15.50	517.91	326.42	402.09	1279.74	0.40
HUB	12.59	545.53	360.38	409.55	1274.71	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.74	485.97	282.79	0.38	6065.46	
MEAN	536.24	453.55	209.82	0.35	5060.83	1.65
HUB	435.63	416.40	75.25	0.33	4538.92	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	38.43	1.17	34.33	709.07	1.05	686.53	0.92	0.91
MEAN	37.47	1.14	33.48	703.50	1.04	681.15	0.92	0.91
HUB	36.99	1.12	32.61	700.61	1.04	675.81	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.53	35.58	31.50	4.08	0.93	0.43	2.90	
MEAN	39.07	27.56	23.50	4.06	0.94	0.40	3.34	0.91
HUB	41.35	10.41	6.50	3.91	0.94	0.38	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.994

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	524.387	332.401	405.575	1280.042	0.410	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
37.547	33.447	681.479	46.000	39.337	33.000	-6.337

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	421.164	332.401	536.534	1287.659	0.327	0.313

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	37.447	34.771	689.613	440.827	0.044	0.463

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	394.076	0.000	394.076	1289.376	0.306	0.391

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	35.073	691.453	0.000	0.060	0.050	0.385

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.871	37.422	1.137	704.395	28.929	228.692	1.773

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 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  180701.109       0.469    1791.838 1498753.000

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1132068.88  11225.6348    171.4177      2.4771      0.8552      7.5023      1.3473


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 105% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.973   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     172.852    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   78.56920

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     168.859    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  132972.188  135631.328       1.691     831.557     491.755     619.754       1.260

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   410.77    -0.14   410.77     0.37   710.99
  MEAN    17.06     0.00    -0.02   410.77    -0.14   410.77     0.37
  HUB     12.51     0.00    -0.02   410.77    -0.14   410.77     0.37

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.09    50.47     9.62   713.82   823.70    13.73   508.72     0.74
  MEAN    55.17    47.20     7.97   590.30   719.28    13.73   508.72     0.65
  HUB     46.51    38.62     7.89   432.86   596.85    13.73   508.72     0.54

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   676.85   428.71   523.77  1133.43     0.60
  MEAN    18.04   708.63   459.05   539.84  1126.22     0.63
  HUB     15.00   808.94   575.71   568.28  1114.88     0.73

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   596.34   285.11     0.53  8847.18
  MEAN   624.07   564.50   165.02     0.50  8281.86     1.43
  HUB    519.02   571.10    56.69     0.51  8637.45

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.14     1.33    15.82   571.99     1.09   533.73     0.92     0.91
  MEAN    19.79     1.31    15.15   568.84     1.09   526.91     0.92     0.91
  HUB     20.01     1.32    14.09   570.82     1.09   516.20     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     39.30    28.56    24.20     4.36     0.93     0.37     2.90
  MEAN    40.38    17.00    12.70     4.30     0.93     0.31     3.51     0.91
  HUB     45.37    -5.70    -9.30     3.60     0.93     0.15     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.998

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     718.524     458.159     553.504    1126.607       0.638       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.928      15.151     527.429      24.000      39.616      35.400      -4.216

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     565.127     458.159     727.515    1144.037       0.494       0.356

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.833      16.783     543.875     528.796       0.029       0.490

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     18.083     519.057       0.000     519.057    1148.417       0.452       0.409

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      17.178     548.047       0.000       0.060       0.043       0.435

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.877      19.766       1.308     570.550      47.740     204.941       1.589

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 297221.531       0.583    2903.271 1727269.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.973   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    172.852    3965.000      19.766     570.550       1.000       1.000       0.980
W Kg/sec =   78.56920

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    134.821    3780.546       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132972.188  135631.328       1.504     590.487     392.644     474.134       1.208

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   493.37    -0.17   493.37     0.43   677.96
 MEAN    18.08     0.00    -0.02   493.37    -0.17   493.37     0.43
 HUB     15.21     0.00    -0.02   493.37    -0.17   493.37     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.25    46.36     8.89   711.05   865.59    17.42   550.23     0.75
 MEAN    51.74    42.30     9.44   625.53   796.81    17.42   550.23     0.69
 HUB     46.86    37.84     9.02   526.28   721.50    17.42   550.23     0.63

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   603.64   366.05   479.99  1183.07     0.51
 MEAN    18.01   613.96   369.03   490.68  1177.31     0.52
 HUB     15.22   664.55   434.81   502.56  1171.65     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   588.50   340.50     0.50  7478.29
 MEAN   623.16   552.59   254.14     0.47  6649.25     1.57
 HUB    526.73   510.90    91.92     0.44  6621.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.72     1.25    20.69   612.09     1.07   581.67     0.92     0.91
 MEAN    24.13     1.22    20.04   607.48     1.06   576.01     0.92     0.91
 HUB     24.11     1.22    19.38   607.33     1.06   570.46     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.33    35.35    31.50     3.85     0.93     0.39     2.90
 MEAN    36.95    27.38    23.50     3.88     0.94     0.38     3.30     0.91
 HUB     40.87    10.37     6.50     3.87     0.94     0.37     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     785.362     370.064     692.710    1158.163       0.678      -0.515

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.279      17.838     557.468      46.000      28.112      30.600       2.488

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     682.812     370.064     776.646    1171.148       0.583      -0.191

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      24.201      19.220     570.039     400.556       0.028       0.302

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     672.418       0.000     672.418    1172.359       0.574       0.338

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      19.286     571.216       0.000       0.060       0.049      -0.176

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      24.111       1.220     608.967      38.417     222.644       1.726

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 239346.094       0.479    2337.941 1532803.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.973   EfDer =  0.973

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    172.852    3965.000      24.111     608.967       1.000       1.000       0.780
W Kg/sec =   78.56920

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    114.187    3659.355       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 132972.188  135631.328       1.305     434.156     332.573     339.175       1.020

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   611.58    -0.21   611.58     0.52   640.89
 MEAN    17.74     0.00    -0.02   611.58    -0.21   611.58     0.52
 HUB     15.05     0.00    -0.02   611.58    -0.21   611.58     0.52

       BetaFlo   BetaBlade Incid   U1        W1       Ps1      Ts1     Rel Mach
 TIP     48.64    46.36     2.28   694.45   925.51    20.07   577.75     0.79
 MEAN    45.11    43.40     1.71   613.77   866.60    20.07   577.75     0.74
 HUB     40.43    38.84     1.59   520.75   803.38    20.07   577.75     0.68

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   570.47   343.61   455.37  1220.91     0.47
 MEAN    17.51   579.96   348.95   463.24  1216.18     0.48
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 HUB     14.85   627.15   412.89   472.05  1211.61     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   569.40   341.84     0.47  6811.21
 MEAN   605.75   529.65   256.79     0.44  6112.69     1.76
 HUB    513.83   482.72   100.93     0.40  6134.63

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.09     1.21    25.05   646.77     1.06   619.61     0.92     0.89
 MEAN    28.55     1.18    24.43   642.89     1.06   614.82     0.92     0.89
 HUB     28.57     1.18    23.79   643.02     1.06   610.19     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.04    36.89    31.50     5.39     0.93     0.45     2.90
 MEAN    36.99    29.00    23.50     5.50     0.91     0.45     3.28     0.89
 HUB     41.18    12.07     6.50     5.57     0.91     0.47     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     585.530     351.242     468.481    1216.944       0.481       0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.693      24.485     615.615      46.000      36.861      31.500      -5.361

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     472.992     351.242     589.145    1226.730       0.386       0.328

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.633      25.839     625.556     471.992       0.024       0.417

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     459.293       0.000     459.293    1227.775       0.374       0.329

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.906     626.622       0.000       0.060       0.046       0.344

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854      28.536       1.184     644.226      35.259     226.544       1.756

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 219843.781       0.468    2147.442 1944930.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.973   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    172.852    3965.000      28.536     644.226       1.000       1.000       0.980
W Kg/sec =   78.56920

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     99.234    3557.805       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132972.188  135631.328       1.776     513.330     289.047     401.059       1.388

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   430.92    -0.15   430.92     0.35   597.96
 MEAN    16.97     0.00    -0.02   430.92    -0.15   430.92     0.35
 HUB     14.32     0.00    -0.02   430.92    -0.15   430.92     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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 TIP     57.12    46.36    10.76   666.42   793.73    26.21   628.74     0.65
 MEAN    53.73    43.80     9.93   587.21   728.47    26.21   628.74     0.59
 HUB     49.00    37.84    11.16   495.49   656.77    26.21   628.74     0.53

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   551.67   349.89   426.53  1255.59     0.44
 MEAN    16.57   556.25   348.00   433.95  1250.72     0.44
 HUB     13.89   595.73   399.23   442.17  1245.88     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   523.42   303.38     0.42  6608.70
 MEAN   573.48   489.03   225.48     0.39  5770.16     1.63
 HUB    480.61   449.59    81.38     0.36  5547.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.02     1.19    29.79   680.87     1.06   655.49     0.92     0.91
 MEAN    33.29     1.17    29.06   676.22     1.05   650.42     0.92     0.91
 HUB     33.09     1.16    28.30   674.99     1.05   645.39     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.36    35.42    31.50     3.92     0.93     0.42     2.90
 MEAN    38.73    27.46    23.50     3.96     0.94     0.40     3.29     0.91
 HUB     42.08    10.43     6.50     3.93     0.94     0.39     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     550.416     349.953     424.842    1252.321       0.440       0.048

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.423      29.267     652.095      46.000      39.479      32.400      -7.079

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     434.967     349.953     558.269    1261.398       0.345       0.378

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.356      30.720     661.583     456.573       0.025       0.462

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     414.031       0.000     414.031    1262.811       0.328       0.357

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.846     663.065       0.000       0.060       0.053       0.407

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      33.232       1.165     677.362      33.135     216.496       1.678

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 206783.250       0.485    2019.866 1446641.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.973   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    172.852    3965.000      33.232     677.362       1.000       1.000       0.980
W Kg/sec =   78.56920

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.376    3469.693       1.401       0.250      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
132972.188	135631.328	2.002	509.668	254.535	390.276	1.533

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	386.24	-0.13	386.24	0.31	554.69
MEAN	15.91	0.00	-0.02	386.24	-0.13	386.24	0.31	
HUB	13.07	0.00	-0.02	386.24	-0.13	386.24	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.65	47.36	11.29	633.89	742.41	31.15	664.93	0.59
MEAN	54.96	44.80	10.16	550.61	672.68	31.15	664.93	0.53
HUB	49.51	38.84	10.67	452.24	594.83	31.15	664.93	0.47

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	517.43	344.75	385.85	1287.38	0.40
MEAN	15.50	513.82	331.44	392.63	1282.24	0.40
HUB	12.59	539.61	362.20	399.99	1277.11	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.74	474.40	276.00	0.37	6187.17	
MEAN	536.24	442.83	204.80	0.35	5138.57	1.68
HUB	435.63	406.67	73.43	0.32	4561.87	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	38.87	1.17	34.78	711.64	1.05	689.33	0.92	0.91
MEAN	37.87	1.14	33.90	705.83	1.04	683.83	0.92	0.91
HUB	37.33	1.12	33.01	702.63	1.04	678.37	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.78	35.58	31.50	4.08	0.93	0.44	2.90	
MEAN	40.17	27.55	23.50	4.05	0.94	0.41	3.34	0.91
HUB	42.16	10.40	6.50	3.90	0.94	0.39	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.991

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	520.349	337.513	396.040	1282.524	0.406	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
37.941	33.873	684.135	46.000	40.438	33.000	-7.438

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	410.929	337.513	531.768	1290.459	0.318	0.330

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	37.827	35.259	692.627	440.827	0.048	0.480

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	384.689	0.000	384.689	1292.079	0.298	0.404

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	35.542	694.367	0.000	0.060	0.055	0.398

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.866	37.798	1.137	706.699	29.338	223.590	1.733

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
183266.688	0.476	1790.156	1469675.250

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   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1146461.25  11198.6758    168.8593      2.5020      0.8551      7.9735      1.3517


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 105% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    170.196    3965.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   77.36173

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    166.264    3949.384       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 130928.648  133546.938       1.717     831.557     484.198     619.754       1.280

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   403.48    -0.14   403.48     0.36   710.99
 MEAN    17.06     0.00    -0.02   403.48    -0.14   403.48     0.36
 HUB     12.51     0.00    -0.02   403.48    -0.14   403.48     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.53    50.47    10.06   713.82   820.08    13.78   509.21     0.74
 MEAN    55.65    47.20     8.45   590.30   715.13    13.78   509.21     0.65
 HUB     47.02    38.62     8.40   432.86   591.85    13.78   509.21     0.53

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   672.47   434.39   513.34  1134.63     0.59
 MEAN    18.04   702.76   462.29   529.30  1127.28     0.62
 HUB     15.00   800.18   574.58   556.90  1116.00     0.72

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    713.82   584.47   279.44     0.52  8964.26
 MEAN   624.07   553.48   161.78     0.49  8340.16     1.45
 HUB    519.02   559.67    55.56     0.50  8620.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.21     1.34    15.93   572.64     1.10   534.87     0.92     0.91
 MEAN    19.82     1.31    15.24   569.17     1.09   527.93     0.92     0.91
 HUB     19.99     1.32    14.19   570.73     1.09   517.27     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.24    28.56    24.20     4.36     0.93     0.38     2.90
 MEAN    41.13    17.00    12.70     4.30     0.93     0.32     3.51     0.91
 HUB     45.90    -5.70    -9.30     3.60     0.93     0.17     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     712.196     461.387     542.535    1127.727       0.632       0.001
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Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.956	15.250	528.478	24.000	40.379	35.400	-4.979

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	553.251	461.387	720.393	1145.512	0.483	0.369

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.856	16.923	545.278	528.796	0.030	0.502

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	508.806	0.000	508.806	1149.646	0.443	0.418

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.292	549.220	0.000	0.060	0.045	0.445

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.875	19.785	1.310	570.843	48.033	202.182	1.567

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
299048.938	0.587	2876.229	1696606.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 8.453 EfDer = 0.992

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
170.196	3965.000	19.785	570.843	1.000	1.000	0.980

W Kg/sec = 77.36173

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
132.659	3779.574	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
130928.648	133546.938	1.528	590.487	386.349	474.134	1.227

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	483.86	-0.17	483.86	0.42	677.78
MEAN	18.08	0.00	-0.02	483.86	-0.17	483.86	0.42	
HUB	15.21	0.00	-0.02	483.86	-0.17	483.86	0.42	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.77	46.36	9.41	711.05	860.21	17.52	551.30	0.75
MEAN	52.28	42.30	9.98	625.53	790.96	17.52	551.30	0.69
HUB	47.41	37.84	9.57	526.28	715.03	17.52	551.30	0.62

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	600.40	372.77	470.66	1184.47	0.51
MEAN	18.01	609.53	373.98	481.32	1178.57	0.52
HUB	15.22	658.69	436.62	493.19	1172.76	0.56

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	706.56	577.01	333.79	0.49	7615.30	
MEAN	623.16	542.00	249.19	0.46	6738.30	1.59
HUB	526.73	501.35	90.11	0.43	6649.24	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.83	1.25	20.83	613.14	1.07	583.05	0.92	0.91
MEAN	24.20	1.22	20.16	608.27	1.07	577.25	0.92	0.91
HUB	24.14	1.22	19.48	607.78	1.06	571.55	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.38	35.34	31.50	3.84	0.93	0.40	2.90	

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 MEAN    37.85    27.37    23.50     3.87     0.94     0.39     3.30     0.91
 HUB     41.52    10.35     6.50     3.85     0.94     0.38     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     772.994     375.026     675.925    1160.623       0.666       -0.493

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.348      18.077     559.841      46.000      29.023      30.600       1.577

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     665.123     375.026     763.566    1173.972       0.567       -0.150

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      24.277      19.521     572.793     400.556       0.027       0.315

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     654.832       0.000     654.832    1175.136       0.557       0.358

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      19.592     573.928       0.000       0.060       0.045       -0.134

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.872      24.198       1.223     609.730      38.886     218.488       1.694

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 242272.000       0.485    2330.153 1503323.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.980

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    170.196    3965.000       24.198     609.730       1.000        1.000        0.780
W Kg/sec =   77.36173

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    112.098    3657.065        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 130928.648  133546.938        1.330     434.156     326.491     339.175       1.039

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa     C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   596.84    -0.21   596.84      0.51   640.49
 MEAN    17.74      0.00    -0.02   596.84    -0.21   596.84      0.51
 HUB     15.05      0.00    -0.02   596.84    -0.21   596.84      0.51

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     49.33     46.36     2.97   694.45   915.84     20.32   580.00      0.78
 MEAN    45.81     43.40     2.41   613.77   856.26     20.32   580.00      0.72
 HUB     41.12     38.84     2.28   520.75   792.22     20.32   580.00      0.67

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   567.22    352.07    444.73   1222.87      0.46
 MEAN    17.51   575.46    355.23    452.73   1217.96      0.47
 HUB     14.85   621.08    415.55    461.59   1213.20      0.51

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
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 TIP    685.45   555.81   333.38     0.45  6978.71
 MEAN   605.75   517.42   250.52     0.42  6222.48     1.78
 HUB    513.83   471.93    98.28     0.39  6174.01

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.36     1.21    25.33   648.46     1.06   621.61     0.92     0.90
 MEAN    28.77     1.19    24.69   644.27     1.06   616.63     0.92     0.90
 HUB     28.73     1.19    24.02   644.00     1.06   611.81     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.37    36.86    31.50     5.36     0.93     0.46     2.90
 MEAN    38.12    28.96    23.50     5.46     0.91     0.46     3.28     0.90
 HUB     42.00    12.02     6.50     5.52     0.91     0.47     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     580.904     357.560     457.822    1218.718       0.477       0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.910      24.742     617.414      46.000      37.990      31.500      -6.490

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     461.601     357.560     583.887    1228.919       0.376       0.347

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.843      26.163     627.793     471.992       0.026       0.435

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     448.497       0.000     448.497    1229.892       0.365       0.344

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.212     628.788       0.000       0.060       0.051       0.358

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      28.737       1.188     645.574      35.845     221.049       1.714

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 223496.719       0.476    2149.573 1900752.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    170.196    3965.000      28.737     645.574       1.000       1.000       0.980
W Kg/sec =   77.36173

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.128    3554.088       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 130928.648  133546.938       1.814     513.330     282.915     401.059       1.418

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   420.99    -0.14   420.99     0.34   597.34
 MEAN    16.97     0.00    -0.02   420.99    -0.14   420.99     0.34
 HUB     14.32     0.00    -0.02   420.99    -0.14   420.99     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.72    46.36    11.36   666.42   788.38    26.50   630.79     0.64
 MEAN    54.37    43.80    10.57   587.21   722.64    26.50   630.79     0.59
 HUB     49.66    37.84    11.82   495.49   650.29    26.50   630.79     0.53
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      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   548.68   356.95   416.70  1257.84     0.44
 MEAN    16.57   551.90   353.22   424.06  1252.85     0.44
 HUB     13.89   589.68   401.14   432.22  1247.89     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   511.32   296.32     0.41  6742.00
 MEAN   573.48   477.85   220.25     0.38  5856.69     1.66
 HUB    480.61   439.46    79.47     0.35  5573.95

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.35     1.20    30.14   682.96     1.06   657.85     0.92     0.90
 MEAN    33.57     1.17    29.38   678.05     1.05   652.65     0.92     0.90
 HUB     33.32     1.16    28.60   676.48     1.05   647.48     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.58    35.42    31.50     3.92     0.93     0.43     2.90
 MEAN    39.79    27.45    23.50     3.95     0.94     0.41     3.29     0.90
 HUB     42.86    10.42     6.50     3.92     0.94     0.40     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481      546.453     355.207     415.258    1254.392       0.436       0.046

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.703      29.580      654.261      46.000      40.543      32.400      -8.143

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481      424.715     355.207     553.674    1263.809       0.336       0.395

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       33.628      31.097     664.121     456.573       0.027       0.478

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096      404.542       0.000     404.542    1265.136       0.320       0.370

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       31.199      665.516       0.000       0.060       0.058       0.418

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4           PR4       Texit         Del T       Ns         Ns nondim
      0.861       33.491        1.165     679.164       33.589     211.807       1.642

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 209624.859       0.491    2016.155 1418033.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.988

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    170.196     3965.000       33.491      679.164       1.000       1.000       0.980
W Kg/sec =   77.36173

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     85.479     3465.086        1.401       0.250       53.349      56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 130928.648  133546.938        2.047     509.668     249.011     390.276       1.567
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    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   377.53    -0.13   377.53     0.30   553.95
MEAN    15.91     0.00    -0.02   377.53    -0.13   377.53     0.30
HUB     13.07     0.00    -0.02   377.53    -0.13   377.53     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.23    47.36    11.87   633.89   737.91    31.49   667.29     0.58
MEAN    55.57    44.80    10.77   550.61   667.72    31.49   667.29     0.53
HUB     50.15    38.84    11.31   452.24   589.21    31.49   667.29     0.47

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   515.23   350.98   377.20  1289.80     0.40
MEAN    15.50   510.18   336.05   383.87  1284.57     0.40
HUB     12.59   534.23   363.90   391.12  1279.36     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.74   463.73   269.76     0.36  6299.02
MEAN   536.24   432.93   200.19     0.34  5210.00     1.71
HUB    435.63   397.65    71.73     0.31  4583.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     39.25     1.17    35.16   714.06     1.05   691.94     0.92     0.90
MEAN    38.21     1.14    34.27   708.02     1.04   686.33     0.92     0.90
HUB     37.62     1.12    33.36   704.55     1.04   680.77     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.94    35.57    31.50     4.07     0.93     0.45     2.90
MEAN    41.20    27.54    23.50     4.04     0.94     0.43     3.34     0.90
HUB     42.93    10.39     6.50     3.89     0.94     0.40     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.988

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     516.760     342.210     387.212    1284.843       0.402      -0.008

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    38.275      34.237     686.625      46.000      41.470      33.000      -8.470

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     401.490     342.210     527.543    1293.069       0.310       0.346

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      38.145      35.678     695.445     440.827       0.052       0.496

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     376.024       0.000     376.024    1294.602       0.290       0.417

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      35.943     697.095       0.000       0.060       0.060       0.410

   STAGE EXIT CONDITIONS, STAGE             5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.861      38.111       1.138     708.878      29.714     218.943       1.697

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 185626.562       0.482    1785.341 1441006.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
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   1160069.00  11157.4512    166.2643      2.5227      0.8538      8.4529      1.3559


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 105% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    167.434    3965.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   76.10618

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    163.566    3949.384       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 128803.711  131379.516       1.746     831.557     476.339     619.754       1.301

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   395.96    -0.14   395.96     0.36   710.99
 MEAN    17.06     0.00    -0.02   395.96    -0.14   395.96     0.36
 HUB     12.51     0.00    -0.02   395.96    -0.14   395.96     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.99    50.47    10.52   713.82   816.41    13.83   509.71     0.74
 MEAN    56.15    47.20     8.95   590.30   710.92    13.83   509.71     0.64
 HUB     47.56    38.62     8.94   432.86   586.75    13.83   509.71     0.53

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   668.21   440.14   502.77  1135.82     0.59
 MEAN    18.04   696.91   465.57   518.58  1128.34     0.62
 HUB     15.00   791.33   573.41   545.34  1117.12     0.71

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    713.82   572.43   273.68     0.50  9083.00
 MEAN   624.07   542.26   158.50     0.48  8399.40     1.47
 HUB    519.02   548.04    54.40     0.49  8602.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.27     1.34    16.03   573.30     1.10   536.01     0.92     0.91
 MEAN    19.84     1.31    15.34   569.50     1.09   528.94     0.92     0.91
 HUB     19.97     1.32    14.28   570.63     1.09   518.35     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.20    28.56    24.20     4.36     0.93     0.39     2.90
 MEAN    41.92    16.99    12.70     4.29     0.93     0.33     3.51     0.91
 HUB     46.44    -5.70    -9.30     3.60     0.93     0.18     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     705.905     464.668     531.400    1128.839       0.625       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.981      15.347     529.521      24.000      41.167      35.400      -5.767
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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     541.278     464.668     713.371    1146.973       0.472       0.383

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.875      17.060     546.670     528.796       0.032       0.514

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     498.435       0.000     498.435    1150.869       0.433       0.427

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.402     550.390       0.000       0.060       0.048       0.454

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      19.800       1.311     571.141      48.331     199.364       1.545

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 300899.531       0.591    2847.058 1664984.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    167.434    3965.000      19.800     571.141       1.000       1.000       0.980
W Kg/sec =   76.10618

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    130.442    3778.590       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 128803.711  131379.516       1.554     590.487     379.892     474.134       1.248

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   474.22    -0.16   474.22     0.41   677.60
 MEAN    18.08     0.00    -0.02   474.22    -0.16   474.22     0.41
 HUB     15.21     0.00    -0.02   474.22    -0.16   474.22     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.31    46.36     9.95   711.05   854.82    17.62   552.36     0.74
 MEAN    52.84    42.30    10.54   625.53   785.10    17.62   552.36     0.68
 HUB     47.99    37.84    10.15   526.28   708.54    17.62   552.36     0.61

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   597.33   379.50   461.28  1185.85     0.50
 MEAN    18.01   605.20   378.94   471.88  1179.82     0.51
 HUB     15.22   652.85   438.45   483.71  1173.87     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   565.46   327.05     0.48  7752.80
 MEAN   623.16   531.34   244.23     0.45  6827.61     1.61
 HUB    526.73   491.70    88.28     0.42  6677.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.93     1.26    20.96   614.20     1.08   584.41     0.92     0.90
 MEAN    24.27     1.23    20.28   609.06     1.07   578.49     0.92     0.90
 HUB     24.16     1.22    19.58   608.23     1.06   572.65     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.44    35.34    31.50     3.84     0.93     0.41     2.90
 MEAN    38.77    27.36    23.50     3.86     0.94     0.40     3.30     0.90
 HUB     42.19    10.34     6.50     3.84     0.94     0.39     3.92
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   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      761.072     380.002     659.416     1162.999       0.654       -0.472

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     24.411      18.303      562.137      46.000      29.954      30.600        0.646

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960      647.869     380.002     751.089     1176.694       0.551      -0.111

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      24.345      19.808      575.454      400.556       0.026       0.329

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823      637.759       0.000     637.759     1177.804       0.541       0.377

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      19.881      576.539       0.000       0.060       0.043      -0.093

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      24.274       1.226     610.498      39.358     214.356       1.662

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 245208.984       0.491    2320.124 1473157.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.986

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    167.434    3965.000      24.274     610.498       1.000       1.000       0.780
W Kg/sec =   76.10618

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    110.001    3654.762       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 128803.711  131379.516       1.355     434.156     320.382     339.175       1.059

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   582.39    -0.20   582.39     0.49   640.09
 MEAN    17.74     0.00    -0.02   582.39    -0.20   582.39     0.49
 HUB     15.05     0.00    -0.02   582.39    -0.20   582.39     0.49

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.02    46.36     3.66   694.45   906.48    20.57   582.19     0.77
 MEAN    46.51    43.40     3.11   613.77   846.25    20.57   582.19     0.72
 HUB     41.81    38.84     2.97   520.75   781.38    20.57   582.19     0.66

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   564.35   360.33   434.34  1224.78     0.46
 MEAN    17.51   571.25   361.36   442.43  1219.70     0.47
 HUB     14.85   615.24   418.12   451.32  1214.76     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   542.54   325.12     0.44  7142.12
 MEAN   605.75   505.44   244.39     0.41  6329.69     1.80
 HUB    513.83   461.35    95.70     0.38  6212.14
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.61     1.22    25.60   650.14     1.06   623.56     0.92     0.90
 MEAN    28.97     1.19    24.92   645.63     1.06   618.40     0.92     0.90
 HUB     28.87     1.19    24.23   644.98     1.06   613.39     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.68    36.82    31.50     5.32     0.93     0.47     2.90
 MEAN    39.24    28.92    23.50     5.42     0.91     0.47     3.28     0.90
 HUB     42.81    11.97     6.50     5.47     0.91     0.48     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     576.588     363.729     447.387    1220.446       0.472       0.014

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.109      24.979     619.170      46.000      39.111      31.500      -7.611

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     450.505     363.729     579.011    1231.051       0.366       0.365

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.032      26.464     629.977     471.992       0.028       0.452

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     437.987       0.000     437.987    1231.957       0.356       0.358

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.494     630.905       0.000       0.060       0.056       0.372

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      28.916       1.191     646.914      36.415     215.783       1.673

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 227058.312       0.483    2148.386 1856510.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    167.434    3965.000      28.916     646.914       1.000       1.000       0.980
W Kg/sec =   76.10618

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.058    3550.407       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 128803.711  131379.516       1.854     513.330     276.887     401.059       1.448

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   411.30    -0.14   411.30     0.33   596.72
 MEAN    16.97     0.00    -0.02   411.30    -0.14   411.30     0.33
 HUB     14.32     0.00    -0.02   411.30    -0.14   411.30     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.32    46.36    11.96   666.42   783.24    26.77   632.81     0.63
 MEAN    55.00    43.80    11.20   587.21   717.04    26.77   632.81     0.58
 HUB     50.31    37.84    12.47   495.49   644.06    26.77   632.81     0.52

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
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     0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   546.00   363.75   407.18  1260.02     0.43
 MEAN    16.57   547.83   358.24   414.46  1254.93     0.44
 HUB     13.89   583.88   402.96   422.54  1249.85     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   499.62   289.51     0.40  6870.42
 MEAN   573.48   467.01   215.23     0.37  5939.89     1.68
 HUB    480.61   429.61    77.65     0.34  5599.09

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.64     1.20    30.45   685.01     1.06   660.15     0.92     0.90
 MEAN    33.82     1.17    29.67   679.85     1.05   654.82     0.92     0.90
 HUB     33.53     1.16    28.87   677.96     1.05   649.53     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.78    35.41    31.50     3.91     0.93     0.44     2.90
 MEAN    40.84    27.44    23.50     3.94     0.94     0.42     3.29     0.90
 HUB     43.64    10.41     6.50     3.91     0.94     0.41     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     542.750     360.258     405.946    1256.409       0.432       0.045

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.953      29.864     656.373      46.000      41.588      32.400      -9.188

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     414.791     360.258     549.397    1266.150       0.328       0.411

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.869      31.441     666.591     456.573       0.030       0.495

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     395.353       0.000     395.353    1267.397       0.312       0.382

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      31.519     667.905       0.000       0.060       0.064       0.429

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.855      33.720       1.166     680.939      34.026     207.334       1.607

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 212356.266       0.498    2009.278 1389000.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.984

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    167.434    3965.000      33.720     680.939       1.000       1.000       0.980
W Kg/sec =   76.10618

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.631    3460.565       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 128803.711  131379.516       2.092     509.668     243.629     390.276       1.602

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP	18.32	0.00	-0.02	369.09	-0.13	369.09	0.29	553.23	
MEAN	15.91	0.00	-0.02	369.09	-0.13	369.09	0.29		
HUB	13.07	0.00	-0.02	369.09	-0.13	369.09	0.29		

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.79	47.36	12.43	633.89	733.63	31.80	669.59	0.58
MEAN	56.17	44.80	11.37	550.61	662.97	31.80	669.59	0.52
HUB	50.79	38.84	11.95	452.24	583.83	31.80	669.59	0.46

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	513.31	356.99	368.84	1292.15	0.40
MEAN	15.50	506.81	340.48	375.40	1286.84	0.39
HUB	12.59	529.07	365.48	382.54	1281.54	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.74	453.44	263.75	0.35	6406.76	
MEAN	536.24	423.37	195.75	0.33	5278.68	1.74
HUB	435.63	388.91	70.15	0.30	4603.10	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	39.58	1.17	35.50	716.43	1.05	694.47	0.92	0.90
MEAN	38.50	1.14	34.60	710.18	1.04	688.78	0.92	0.90
HUB	37.86	1.12	33.67	706.44	1.04	683.11	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.06	35.57	31.50	4.07	0.93	0.46	2.90	
MEAN	42.21	27.54	23.50	4.04	0.94	0.44	3.34	0.90
HUB	43.69	10.39	6.50	3.89	0.94	0.41	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.984

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	513.436	346.725	378.679	1287.095	0.399	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
38.569	34.562	689.047	46.000	42.478	33.000	-9.478

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	392.398	346.725	523.636	1295.599	0.303	0.360

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	38.423	36.054	698.184	440.827	0.056	0.512

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	367.669	0.000	367.669	1297.052	0.283	0.428

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	36.301	699.750	0.000	0.060	0.065	0.421

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.855	38.385	1.138	711.014	30.075	214.520	1.663

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
187890.984	0.488	1777.791	1411882.625

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
1173414.00	11102.6367	163.5658	2.5408	0.8515	8.9533	1.3600

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 105% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.505   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    164.402    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   74.72796

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    160.604    3949.384       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 126471.203  129000.344       1.778     831.557     467.713     619.754       1.325

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   387.78    -0.13   387.78     0.35   710.99
 MEAN    17.06     0.00    -0.02   387.78    -0.13   387.78     0.35
 HUB     12.51     0.00    -0.02   387.78    -0.13   387.78     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.49    50.47    11.02   713.82   812.47    13.88   510.25     0.73
 MEAN    56.70    47.20     9.50   590.30   706.39    13.88   510.25     0.64
 HUB     48.15    38.62     9.53   432.86   581.25    13.88   510.25     0.52

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   663.85   446.30   491.44  1137.07     0.58
 MEAN    18.04   690.77   469.10   507.06  1129.46     0.61
 HUB     15.00   781.92   572.17   532.93  1118.30     0.70

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    713.82   559.54   267.52     0.49  9209.86
 MEAN   624.07   530.21   154.97     0.47  8463.00     1.50
 HUB    519.02   535.57    53.15     0.48  8584.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.34     1.35    16.14   574.00     1.10   537.20     0.92     0.91
 MEAN    19.87     1.32    15.43   569.85     1.09   530.00     0.92     0.91
 HUB     19.95     1.32    14.39   570.52     1.09   519.48     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.24    28.56    24.20     4.36     0.93     0.41     2.90
 MEAN    42.77    16.99    12.70     4.29     0.94     0.35     3.51     0.91
 HUB     47.03    -5.70    -9.30     3.60     0.94     0.19     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.994

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     699.317     468.190     519.464    1130.002       0.619       0.003

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.007      15.447     530.612      24.000      42.028      35.400      -6.628

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     528.523     468.190     706.073    1148.501       0.460       0.397
```

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.893	17.201	548.128	528.796	0.034	0.527

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	487.354	0.000	487.354	1152.155	0.423	0.437

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.515	551.621	0.000	0.060	0.051	0.463

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.869	19.811	1.311	571.459	48.649	196.324	1.522

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
302880.812	0.594	2813.908	1630565.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 9.505 EfDer = 0.985

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
164.402	3965.000	19.811	571.459	1.000	1.000	0.980

W Kg/sec = 74.72796

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
128.039	3777.538	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
126471.203	129000.344	1.584	590.487	372.895	474.134	1.271

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	463.91	-0.16	463.91	0.40	677.42
MEAN	18.08	0.00	-0.02	463.91	-0.16	463.91	0.40	
HUB	15.21	0.00	-0.02	463.91	-0.16	463.91	0.40	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.88	46.36	10.52	711.05	849.14	17.72	553.49	0.74
MEAN	53.45	42.30	11.15	625.53	778.91	17.72	553.49	0.67
HUB	48.61	37.84	10.77	526.28	701.68	17.72	553.49	0.61

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	594.29	386.64	451.32	1187.29	0.50
MEAN	18.01	600.76	384.22	461.83	1181.14	0.51
HUB	15.22	646.68	440.37	473.58	1175.04	0.55

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	706.56	553.20	319.91	0.47	7898.49	
MEAN	623.16	519.98	238.94	0.44	6922.73	1.64
HUB	526.73	481.39	86.36	0.41	6706.16	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.02	1.26	21.08	615.33	1.08	585.84	0.92	0.90
MEAN	24.33	1.23	20.39	609.91	1.07	579.78	0.92	0.90
HUB	24.18	1.22	19.68	608.71	1.07	573.79	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.59	35.33	31.50	3.83	0.93	0.43	2.90	
MEAN	39.76	27.36	23.50	3.86	0.94	0.41	3.30	0.90
HUB	42.92	10.34	6.50	3.84	0.94	0.39	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.985

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     748.949     385.302     642.236    1165.422       0.643      -0.450

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.470      18.530     564.483      46.000      30.961      30.600      -0.361

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     630.045     385.302     738.522    1179.469       0.534      -0.070

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      24.407      20.094     578.173     400.556       0.025       0.344

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     620.189       0.000     620.189    1180.519       0.525       0.396

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      20.166     579.202       0.000       0.060       0.041      -0.052

    STAGE EXIT CONDITIONS, STAGE            2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.872      24.344       1.229     611.316      39.857     210.014       1.628

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 248322.688       0.497    2307.037 1440566.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 9.505   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    164.402    3965.000      24.344     611.316       1.000       1.000       0.780
W Kg/sec =   74.72796

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    107.772    3652.316       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 126471.203  129000.344       1.383     434.156     313.891     339.175       1.081

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   567.38    -0.20   567.38     0.48   639.66
 MEAN    17.74     0.00    -0.02   567.38    -0.20   567.38     0.48
 HUB     15.05     0.00    -0.02   567.38    -0.20   567.38     0.48

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.76    46.36     4.40   694.45   896.91    20.81   584.45     0.76
 MEAN    47.26    43.40     3.86   613.77   835.99    20.81   584.45     0.71
 HUB     42.56    38.84     3.72   520.75   770.26    20.81   584.45     0.65

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   561.67   368.85   423.59  1226.74     0.46
 MEAN    17.51   567.12   367.72   431.75  1221.49     0.46
 HUB     14.85   609.29   420.79   440.65  1216.38     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   528.84   316.60     0.43  7310.74
 MEAN   605.75   493.02   238.03     0.40  6440.93     1.83
 HUB    513.83   450.36    93.04     0.37  6251.66

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.86     1.23    25.86   651.89     1.07   625.56     0.92     0.91
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 MEAN    29.16     1.20    25.15   647.06     1.06   620.22     0.92     0.91
 HUB     29.01     1.19    24.44   646.01     1.06   615.03     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.05    36.78    31.50     5.28     0.93     0.48     2.90
 MEAN    40.42    28.87    23.50     5.37     0.92     0.48     3.28     0.91
 HUB     43.68    11.92     6.50     5.42     0.92     0.49     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     572.357     370.130     436.573    1222.229       0.468       0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.299      25.208      620.985      46.000      40.292      31.500      -8.792

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     439.057     370.130     574.254    1233.251       0.356       0.384

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.211      26.758     632.235     471.992       0.031       0.471

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     427.148       0.000     427.148    1234.090       0.346       0.372

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.767     633.096       0.000       0.060       0.062       0.386

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.863      29.082       1.195     648.322      37.005     210.429       1.631

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 230742.219       0.491    2143.706 1809631.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 9.505   EfDer =  0.981

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    164.402    3965.000      29.082     648.322       1.000       1.000       0.980
W Kg/sec =   74.72796

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     92.903    3546.550       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 126471.203  129000.344       1.897     513.330     270.612     401.059       1.482

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   401.30    -0.14   401.30     0.32   596.07
 MEAN    16.97     0.00    -0.02   401.30    -0.14   401.30     0.32
 HUB     14.32     0.00    -0.02   401.30    -0.14   401.30     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.95    46.36    12.59   666.42   778.03    27.03   634.89     0.63
 MEAN    55.66    43.80    11.86   587.21   711.34    27.03   634.89     0.58
 HUB     51.00    37.84    13.16   495.49   637.72    27.03   634.89     0.52

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     18.88   543.48   370.73   397.40  1262.27     0.43
 MEAN    16.57   543.82   363.40   404.58  1257.07     0.43
 HUB     13.89   577.99   404.82   412.55  1251.88     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   487.60   282.54     0.39  7002.07
 MEAN   573.48   455.87   210.08     0.36  6025.27     1.71
 HUB    480.61   419.45    75.79     0.34  5624.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.92     1.20    30.74   687.15     1.06   662.51     0.92     0.90
 MEAN    34.06     1.17    29.95   681.73     1.05   657.07     0.92     0.90
 HUB     33.71     1.16    29.13   679.51     1.05   651.65     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.01    35.41    31.50     3.91     0.93     0.45     2.90
 MEAN    41.93    27.44    23.50     3.94     0.94     0.44     3.29     0.90
 HUB     44.46    10.41     6.50     3.91     0.94     0.42     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     539.114     365.442     396.353    1258.490       0.428       0.043

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.187      30.133     658.558      46.000      42.676      32.400     -10.276

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     404.601     365.442     545.207    1268.564       0.319       0.427

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      34.092      31.770     669.144     456.573       0.032       0.512

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     385.913       0.000     385.913    1269.731       0.304       0.394

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      31.822     670.376       0.000       0.060       0.070       0.439

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.849      33.930       1.167     682.795      34.473     202.794       1.572

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 215157.359       0.504    1998.915 1357839.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 9.505   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    164.402    3965.000      33.930     682.795       1.000       1.000       0.980
W Kg/sec =   74.72796

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.721    3455.860       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 126471.203  129000.344       2.141     509.668     238.066     390.276       1.639

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   360.40    -0.12   360.40     0.28   552.48
 MEAN    15.91     0.00    -0.02   360.40    -0.12   360.40     0.28
 HUB     13.07     0.00    -0.02   360.40    -0.12   360.40     0.28
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       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.38    47.36    13.02   633.89   729.29    32.09   671.97     0.57
 MEAN    56.80    44.80    12.00   550.61   658.17    32.09   671.97     0.52
 HUB     51.46    38.84    12.62   452.24   578.37    32.09   671.97     0.46

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   511.52   363.11   360.28  1294.57     0.40
 MEAN    15.50   503.50   345.02   366.71  1289.18     0.39
 HUB     12.59   523.87   367.12   373.71  1283.80     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   442.92   257.64     0.34  6516.44
 MEAN   536.24   413.57   191.22     0.32  5348.93     1.77
 HUB    435.63   379.94    68.51     0.30  4623.61

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     39.89     1.18    35.82   718.89     1.05   697.09     0.92     0.90
 MEAN    38.77     1.14    34.90   712.42     1.04   691.30     0.92     0.90
 HUB     38.09     1.12    33.96   708.40     1.04   685.54     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.22    35.57    31.50     4.07     0.93     0.48     2.90
 MEAN    43.25    27.54    23.50     4.04     0.94     0.45     3.34     0.90
 HUB     44.49    10.39     6.50     3.89     0.94     0.42     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.980

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     510.185     351.344     369.926    1289.415       0.396      -0.009

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      38.840      34.865     691.550      46.000      43.524      33.000     -10.524

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     383.095     351.344     519.812    1298.204       0.295       0.376

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      38.676      36.407     701.009     440.827       0.061       0.529

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     359.113       0.000     359.113    1299.576       0.276       0.440

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      36.635     702.492       0.000       0.060       0.072       0.432

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.848      38.632       1.139     713.238      30.443     210.044       1.628

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  190203.578       0.494    1767.082 1380585.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1187306.75  11030.6475    160.6038      2.5572      0.8482      9.5045      1.3642


****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
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****************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 105% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     161.944    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   73.61079

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     158.203    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  124580.477  127071.820       1.805     831.557     460.721     619.754       1.345

     ROTOR LEADING EDGE CONDITIONS, STAGE             1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   381.19    -0.13   381.19     0.34   710.99
  MEAN    17.06     0.00    -0.02   381.19    -0.13   381.19     0.34
  HUB     12.51     0.00    -0.02   381.19    -0.13   381.19     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.90    50.47    11.43   713.82   809.34    13.92   510.67     0.73
  MEAN    57.15    47.20     9.95   590.30   702.79    13.92   510.67     0.63
  HUB     48.64    38.62    10.02   432.86   576.88    13.92   510.67     0.52

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   660.55   451.18   482.46  1138.04     0.58
  MEAN    18.04   686.00   471.90   497.90  1130.33     0.61
  HUB     15.00   774.49   571.17   523.07  1119.22     0.69

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    713.82   549.31   262.64     0.48  9310.54
  MEAN   624.07   520.64   152.17     0.46  8513.47     1.52
  HUB    519.02   525.66    52.15     0.47  8569.20

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.39     1.35    16.23   574.56     1.10   538.12     0.92     0.91
  MEAN    19.89     1.32    15.51   570.13     1.09   530.83     0.92     0.91
  HUB     19.93     1.32    14.46   570.44     1.09   520.36     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     43.08    28.56    24.20     4.36     0.93     0.42     2.90
  MEAN    43.46    16.99    12.70     4.29     0.94     0.36     3.51     0.91
  HUB     47.52    -5.69    -9.30     3.61     0.94     0.20     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     694.202     470.985     509.990    1130.904       0.614       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.025      15.524     531.460      24.000      42.723      35.400      -7.323

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     518.453     470.985     700.443    1149.687       0.451       0.409

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.905      17.309     549.260     528.796       0.036       0.537
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    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     478.580       0.000     478.580    1153.157       0.415       0.444

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.600     552.581       0.000       0.060       0.054       0.471

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      19.818       1.312     571.711      48.901     193.897       1.503

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 304450.594       0.597    2786.207 1602882.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.944    3965.000      19.818     571.711       1.000       1.000       0.980
W Kg/sec =   73.61079

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    126.113    3776.705       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 124580.477  127071.820       1.608     590.487     367.284     474.134       1.291

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   455.72    -0.16   455.72     0.39   677.27
 MEAN    18.08     0.00    -0.02   455.72    -0.16   455.72     0.39
 HUB     15.21     0.00    -0.02   455.72    -0.16   455.72     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.35    46.36    10.99   711.05   844.69    17.80   554.37     0.73
 MEAN    53.93    42.30    11.63   625.53   774.06    17.80   554.37     0.67
 HUB     49.12    37.84    11.28   526.28   696.29    17.80   554.37     0.60

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   592.04   392.24   443.46  1188.41     0.50
 MEAN    18.01   597.36   388.37   453.89  1182.15     0.51
 HUB     15.22   641.87   441.87   465.56  1175.95     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   543.55   314.31     0.46  8012.84
 MEAN   623.16   511.02   234.80     0.43  6997.31     1.66
 HUB    526.73   473.23    84.86     0.40  6728.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.09     1.27    21.18   616.22     1.08   586.95     0.92     0.90
 MEAN    24.38     1.23    20.47   610.58     1.07   580.78     0.92     0.90
 HUB     24.19     1.22    19.75   609.09     1.07   574.69     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.49    35.33    31.50     3.83     0.93     0.44     2.90
 MEAN    40.55    27.35    23.50     3.85     0.94     0.42     3.30     0.90
 HUB     43.50    10.33     6.50     3.83     0.94     0.40     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.983

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3       cp 2-3
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     17.960     739.749     389.457     628.929    1167.265       0.634      -0.434

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.511      18.698     566.271      46.000      31.767      30.600      -1.167

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     616.329     389.457     729.067    1181.579       0.522      -0.039

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      24.449      20.306     580.245     400.556       0.025       0.356

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     606.702       0.000     606.702    1182.580       0.513       0.411

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      20.378     581.228       0.000       0.060       0.040      -0.021

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      24.391       1.231     611.960      40.249     206.631       1.602

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 250765.062       0.502    2294.899 1414517.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.944    3965.000      24.391     611.960       1.000       1.000       0.780
W Kg/sec =   73.61079

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.014    3650.394       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 124580.477  127071.820       1.406     434.156     308.772     339.175       1.098

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   555.78    -0.19   555.78     0.47   639.33
 MEAN    17.74     0.00    -0.02   555.78    -0.19   555.78     0.47
 HUB     15.05     0.00    -0.02   555.78    -0.19   555.78     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.34    46.36     4.98   694.45   889.61    20.99   586.18     0.75
 MEAN    47.85    43.40     4.45   613.77   828.15    20.99   586.18     0.70
 HUB     43.15    38.84     4.31   520.75   761.75    20.99   586.18     0.64

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   559.83   375.40   415.32  1228.24     0.46
 MEAN    17.51   564.08   372.61   423.50  1222.87     0.46
 HUB     14.85   604.78   422.83   432.40  1217.63     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   518.29   310.05     0.42  7440.44
 MEAN   605.75   483.43   233.14     0.40  6526.48     1.85
 HUB    513.83   441.87    91.00     0.36  6281.94

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.03     1.23    26.04   653.25     1.07   627.10     0.92     0.91
 MEAN    29.29     1.20    25.31   648.18     1.06   621.63     0.92     0.91
 HUB     29.10     1.19    24.58   646.82     1.06   616.30     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.11    36.74    31.50     5.24     0.93     0.49     2.90
 MEAN    41.34    28.83    23.50     5.33     0.92     0.48     3.28     0.91
 HUB     44.36    11.88     6.50     5.38     0.92     0.49     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     569.250     375.053     428.229    1223.596       0.465       0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.433      25.372     622.379      46.000      41.213      31.500      -9.713

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     430.257     375.053     570.776    1234.940       0.348       0.399

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.336      26.971     633.972     471.992       0.033       0.485

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     418.815       0.000     418.815    1235.729       0.339       0.382

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.963     634.782       0.000       0.060       0.067       0.397

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.864      29.196       1.197     649.419      37.459     206.369       1.600

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 233574.688       0.497    2137.580 1772750.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.978

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    161.944    3965.000       29.196     649.419       1.000        1.000       0.980
W Kg/sec =   73.61079

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     91.234    3543.551        1.401       0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 124580.477  127071.820        1.932     513.330     265.749     401.059       1.509

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   393.59    -0.14   393.59      0.32   595.57
 MEAN    16.97      0.00    -0.02   393.59    -0.14   393.59      0.32
 HUB     14.32      0.00    -0.02   393.59    -0.14   393.59      0.32

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     59.44    46.36    13.08   666.42   774.09    27.22   636.50      0.63
 MEAN    56.17    43.80    12.37   587.21   707.03    27.22   636.50      0.57
 HUB     51.55    37.84    13.71   495.49   632.90    27.22   636.50      0.51

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   541.71   376.06   389.91   1263.99      0.43
 MEAN    16.57   540.86   367.33   396.99   1258.71      0.43
 HUB     13.89   573.55   406.25   404.87   1253.44      0.46
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   478.41   277.21     0.38  7102.53
 MEAN   573.48   447.32   206.14     0.36  6090.44     1.74
 HUB    480.61   411.64    74.36     0.33  5644.75

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     35.11     1.20    30.95   688.80     1.06   664.33     0.92     0.89
 MEAN    34.22     1.17    30.14   683.19     1.05   658.79     0.92     0.89
 HUB     33.84     1.16    29.31   680.72     1.05   653.29     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.96    35.41    31.50     3.91     0.93     0.46     2.90
 MEAN    42.78    27.44    23.50     3.94     0.94     0.45     3.29     0.89
 HUB     45.10    10.41     6.50     3.91     0.94     0.43     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     536.436     369.399     388.984    1260.087       0.426       0.042

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.349      30.322     660.238      46.000      43.521      32.400     -11.121

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     396.795     369.399     542.127    1270.415       0.312       0.440

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      34.245      32.004     671.105     456.573       0.034       0.526

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     378.676       0.000     378.676    1271.523       0.298       0.403

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.036     672.277       0.000       0.060       0.075       0.447

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.843      34.071       1.167     684.235      34.815     199.353       1.545

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 217296.797       0.509    1988.611 1333056.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.977

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.944    3965.000      34.071     684.235       1.000       1.000       0.980
W Kg/sec =   73.61079

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.249    3452.222       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 124580.477  127071.820       2.180     509.668     233.779     390.276       1.669

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   353.73    -0.12   353.73     0.28   551.90
 MEAN    15.91     0.00    -0.02   353.73    -0.12   353.73     0.28
 HUB     13.07     0.00    -0.02   353.73    -0.12   353.73     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.84    47.36    13.48   633.89   726.01    32.29   673.81     0.57
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 MEAN    57.29    44.80    12.49   550.61   654.54    32.29   673.81     0.51
 HUB     51.98    38.84    13.14   452.24   574.24    32.29   673.81     0.45

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   510.28   367.77   353.73  1296.42     0.39
 MEAN    15.50   501.07   348.47   360.05  1290.98     0.39
 HUB     12.59   519.93   368.34   366.95  1285.54     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   434.88   252.97     0.34  6600.06
 MEAN   536.24   406.07   187.76     0.31  5402.47     1.79
 HUB    435.63   373.07    67.29     0.29  4638.97

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     40.11     1.18    36.04   720.79     1.05   699.09     0.92     0.89
 MEAN    38.96     1.14    35.11   714.16     1.04   693.24     0.92     0.89
 HUB     38.24     1.12    34.16   709.93     1.04   687.40     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.11    35.57    31.50     4.07     0.93     0.49     2.90
 MEAN    44.06    27.54    23.50     4.04     0.94     0.46     3.34     0.89
 HUB     45.11    10.39     6.50     3.89     0.94     0.43     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     507.799     354.865     363.222    1291.195       0.393      -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     39.023      35.075     693.473      46.000      44.333      33.000     -11.333

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     375.987     354.865     517.006    1300.199       0.289       0.387

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      38.846      36.654     703.179     440.827       0.064       0.542

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     352.568       0.000     352.568    1301.513       0.271       0.449

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      36.868     704.601       0.000       0.060       0.077       0.441

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.843      38.798       1.139     714.958      30.723     206.660       1.602

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  191962.750       0.498    1756.764 1355666.250

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1198049.88  10964.0596    158.2028      2.5682      0.8449      9.9531      1.3675


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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  Fan-Core + 4 Stage LPC 105% Stat 2 20% Ice Block 8-22-2011

    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =10.541   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.733    3965.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   72.15138

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    155.066    3949.384       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 122110.539  124552.492       1.841     831.557     451.587     619.754       1.372

    ROTOR LEADING EDGE CONDITIONS, STAGE           1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   372.66    -0.13   372.66     0.34   710.99
MEAN    17.06     0.00    -0.02   372.66    -0.13   372.66     0.34
HUB     12.51     0.00    -0.02   372.66    -0.13   372.66     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     62.44    50.47    11.97   713.82   805.36    13.97   511.21     0.73
MEAN    57.74    47.20    10.54   590.30   698.20    13.97   511.21     0.63
HUB     49.28    38.62    10.66   432.86   571.27    13.97   511.21     0.52

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   656.52   457.40   470.97  1139.25     0.58
MEAN    18.04   680.01   475.47   486.16  1131.42     0.60
HUB     15.00   765.04   569.86   510.44  1120.38     0.68

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    713.82   536.25   256.42     0.47  9438.77
MEAN   624.07   508.36   148.60     0.45  8577.74     1.55
HUB    519.02   512.96    50.85     0.46  8549.55

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.46     1.35    16.33   575.27     1.10   539.28     0.92     0.90
MEAN    19.92     1.32    15.60   570.49     1.09   531.87     0.92     0.90
HUB     19.90     1.32    14.56   570.33     1.09   521.46     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.16    28.57    24.20     4.37     0.93     0.43     2.90
MEAN    44.36    17.00    12.70     4.30     0.94     0.37     3.51     0.90
HUB     48.15    -5.69    -9.30     3.61     0.94     0.22     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     687.791     474.544     497.860    1132.031       0.608       0.004

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.046      15.618     532.520      24.000      43.626      35.400      -8.226

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     505.624     474.544     693.432    1151.170       0.439       0.423

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.916      17.441     550.678     528.796       0.038       0.551

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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    18.083     467.370       0.000     467.370    1154.415       0.405       0.454

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950     17.703      553.787       0.000       0.060       0.059       0.480

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.860     19.822       1.312     572.031      49.221     190.778       1.479

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 306444.812       0.601    2748.855 1566999.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =10.541   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.733    3965.000      19.822     572.031       1.000       1.000       0.980
W Kg/sec =   72.15138

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    123.622    3775.647       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 122110.539  124552.492       1.640     590.487     360.029     474.134       1.317

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   445.25    -0.15   445.25     0.39   677.08
 MEAN    18.08     0.00    -0.02   445.25    -0.15   445.25     0.39
 HUB     15.21     0.00    -0.02   445.25    -0.15   445.25     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.95    46.36    11.59   711.05   839.08    17.89   555.48     0.73
 MEAN    54.56    42.30    12.26   625.53   767.94    17.89   555.48     0.66
 HUB     49.78    37.84    11.94   526.28   689.48    17.89   555.48     0.60

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   589.38   399.34   433.47  1189.81     0.50
 MEAN    18.01   593.19   393.63   443.76  1183.43     0.50
 HUB     15.22   635.79   443.77   455.30  1177.10     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   531.30   307.21     0.45  8157.77
 MEAN   623.16   499.61   229.53     0.42  7092.04     1.69
 HUB    526.73   462.80    82.96     0.39  6757.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.18     1.27    21.28   617.34     1.08   588.34     0.92     0.90
 MEAN    24.42     1.23    20.57   611.42     1.07   582.05     0.92     0.90
 HUB     24.19     1.22    19.83   609.57     1.07   575.82     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.65    35.33    31.50     3.83     0.93     0.45     2.90
 MEAN    41.57    27.35    23.50     3.85     0.94     0.43     3.30     0.90
 HUB     44.27    10.33     6.50     3.83     0.94     0.41     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     728.480     394.735     612.264    1169.527       0.623      -0.414

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     24.556      18.899     568.470      46.000      32.810      30.600      -2.210

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     599.252     394.735     717.578    1184.171       0.506       0.000

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      24.494      20.561     582.796     400.556       0.026       0.372

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     589.939       0.000     589.939    1185.111       0.498       0.429

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      20.629     583.720       0.000       0.060       0.039       0.017

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.868      24.439       1.233     612.778      40.746     202.371       1.569

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 253862.719       0.509    2277.186 1380952.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =10.541   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.733    3965.000      24.439     612.778       1.000       1.000       0.780
W Kg/sec =   72.15138

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.774    3647.958       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 122110.539  124552.492       1.436     434.156     302.247     339.175       1.122

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   541.26    -0.19   541.26     0.45   638.90
 MEAN    17.74     0.00    -0.02   541.26    -0.19   541.26     0.45
 HUB     15.05     0.00    -0.02   541.26    -0.19   541.26     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.07    46.36     5.71   694.45   880.61    21.20   588.33     0.74
 MEAN    48.60    43.40     5.20   613.77   818.48    21.20   588.33     0.69
 HUB     43.90    38.84     5.06   520.75   751.22    21.20   588.33     0.63

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   557.79   383.53   405.02  1230.09     0.45
 MEAN    17.51   560.48   378.69   413.20  1224.58     0.46
 HUB     14.85   599.25   425.39   422.07  1219.18     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   505.17   301.92     0.41  7601.44
 MEAN   605.75   471.48   227.06     0.39  6632.79     1.88
 HUB    513.83   431.24    88.44     0.35  6319.86

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.23     1.24    26.25   654.96     1.07   629.00     0.92     0.91
 MEAN    29.45     1.20    25.50   649.59     1.06   623.37     0.92     0.91
 HUB     29.19     1.19    24.75   647.85     1.06   617.89     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.44    36.70    31.50     5.20     0.93     0.50     2.90
 MEAN    42.50    28.79    23.50     5.29     0.92     0.49     3.28     0.91
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 HUB     45.22    11.83     6.50     5.33     0.92     0.50     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     565.560     381.171     417.812    1225.292       0.462       0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.583      25.560     624.110      46.000      42.374      31.500     -10.874

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     419.306     381.171     566.664    1237.035       0.339       0.417

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.474      27.219     636.130     471.992       0.036       0.504

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     408.444       0.000     408.444    1237.764       0.330       0.395

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      27.189     636.880       0.000       0.060       0.074       0.409

    STAGE EXIT CONDITIONS, STAGE            3
       Eff4        Pt4          PR4        Texit        Del T        Ns         Ns nondim
       0.863      29.321       1.200     650.801      38.023     201.383       1.561

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 237095.562       0.505    2126.782 1725878.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.541   EfDer =  0.973

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    158.733     3965.000       29.321     650.801       1.000        1.000       0.980
W Kg/sec =   72.15138

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     89.140     3539.788        1.401       0.249      53.349      56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 122110.539  124552.492        1.977     513.330     259.652     401.059       1.545

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00     -0.02   383.99     -0.13   383.99      0.31   594.93
 MEAN    16.97      0.00     -0.02   383.99     -0.13   383.99      0.31
 HUB     14.32      0.00     -0.02   383.99     -0.13   383.99      0.31

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     60.05     46.36    13.69   666.42   769.25     27.43   638.51      0.62
 MEAN    56.82     43.80    13.02   587.21   701.73     27.43   638.51      0.57
 HUB     52.23     37.84    14.39   495.49   626.97     27.43   638.51      0.51

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   539.68    382.62    380.60   1266.12      0.43
 MEAN    16.57   537.35    372.22    387.55   1260.75      0.43
 HUB     13.89   568.07    407.97    395.30   1255.38      0.45

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    653.27    467.02    270.65      0.37   7226.49
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 MEAN   573.48   436.69   201.26     0.35  6171.30     1.77
 HUB    480.61   401.92    72.64     0.32  5668.56

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     35.33     1.21    31.18   690.87     1.06   666.58     0.92     0.89
 MEAN    34.40     1.17    30.36   685.02     1.05   660.94     0.92     0.89
 HUB     33.97     1.16    29.51   682.23     1.05   655.32     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.15    35.42    31.50     3.92     0.93     0.48     2.90
 MEAN    43.84    27.44    23.50     3.94     0.94     0.46     3.29     0.89
 HUB     45.90    10.41     6.50     3.91     0.94     0.44     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     533.263     374.309     379.819    1262.067       0.423       0.041

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.526      30.534     662.325      46.000      44.581      32.400     -12.181

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     387.107     374.309     538.478    1272.709       0.304       0.455

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      34.412      32.272     673.542     456.573       0.037       0.543

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     369.686       0.000     369.686    1273.747       0.290       0.414

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.278     674.641       0.000       0.060       0.082       0.457

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.836      34.223       1.167     686.037      35.237     195.134       1.513

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 219934.234       0.515    1972.843 1301239.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =10.541   EfDer =  0.973

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    158.733    3965.000      34.223     686.037       1.000       1.000       0.980
W Kg/sec =   72.15138

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     78.412    3447.684       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 122110.539  124552.492       2.231     509.668     228.430     390.276       1.709

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   345.43    -0.12   345.43     0.27   551.17
 MEAN    15.91     0.00    -0.02   345.43    -0.12   345.43     0.27
 HUB     13.07     0.00    -0.02   345.43    -0.12   345.43     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.42    47.36    14.06   633.89   722.01    32.52   676.10     0.57
 MEAN    57.90    44.80    13.10   550.61   650.10    32.52   676.10     0.51
 HUB     52.63    38.84    13.79   452.24   569.17    32.52   676.10     0.45
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      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   508.89   373.52   345.61  1298.71     0.39
MEAN    15.50   498.18   352.73   351.79  1293.20     0.39
HUB     12.59   515.10   369.83   358.54  1287.69     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.74   424.93   247.22     0.33  6703.20
MEAN   536.24   396.78   183.50     0.31  5468.41     1.83
HUB    435.63   364.53    65.79     0.28  4657.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     40.34     1.18    36.29   723.16     1.05   701.59     0.92     0.89
MEAN    39.16     1.14    35.35   716.32     1.04   695.65     0.92     0.89
HUB     38.40     1.12    34.39   711.83     1.04   689.73     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     47.22    35.58    31.50     4.08     0.93     0.50     2.90
MEAN    45.08    27.55    23.50     4.05     0.94     0.47     3.34     0.89
HUB     45.89    10.40     6.50     3.90     0.94     0.44     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     504.956     359.201     354.901    1293.401       0.390      -0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     39.221      35.307     695.863      46.000      45.345      33.000     -12.345

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     367.179     359.201     513.659    1302.671       0.282       0.401

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      39.026      36.930     705.873     440.827       0.069       0.558

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     344.453       0.000     344.453    1303.914       0.264       0.459

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      37.126     707.221       0.000       0.060       0.083       0.451

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.836      38.972       1.139     717.106      31.068     202.510       1.570

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  194130.516       0.504    1741.380 1323640.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1211467.88  10867.0469    155.0663      2.5797      0.8401     10.5413      1.3716


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 105% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
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 RESET =  0.000BLEED =  0.000 DPInc =10.977   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    156.364    3965.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   71.07451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    152.752    3949.384       1.402       0.249      53.349      32.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
120288.016  122693.516       1.869     831.557     444.847     619.754       1.393

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   366.41    -0.13   366.41     0.33   710.99
MEAN    17.06     0.00    -0.02   366.41    -0.13   366.41     0.33
HUB     12.51     0.00    -0.02   366.41    -0.13   366.41     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     62.83    50.47    12.36   713.82   802.48    14.01   511.60     0.72
MEAN    58.18    47.20    10.98   590.30   694.88    14.01   511.60     0.63
HUB     49.76    38.62    11.14   432.86   567.21    14.01   511.60     0.51

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   653.75   461.88   462.65  1140.11     0.57
MEAN    18.04   675.77   478.04   477.64  1132.20     0.60
HUB     15.00   758.26   568.92   501.28  1121.20     0.68

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    713.82   526.80   251.94     0.46  9531.28
MEAN   624.07   499.46   146.02     0.44  8624.14     1.57
HUB    519.02   503.76    49.91     0.45  8535.43

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.50     1.36    16.40   575.79     1.10   540.09     0.92     0.90
MEAN    19.93     1.32    15.66   570.75     1.09   532.61     0.92     0.90
HUB     19.88     1.32    14.63   570.25     1.09   522.24     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.95    28.57    24.20     4.37     0.93     0.44     2.90
MEAN    45.02    17.00    12.70     4.30     0.94     0.38     3.51     0.90
HUB     48.62    -5.69    -9.30     3.61     0.94     0.23     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.986

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     683.249     477.114     489.072    1132.830       0.603       0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.059      15.683     533.271      24.000      44.291      35.400      -8.891

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     496.369     477.114     688.491    1152.221       0.431       0.434

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.922      17.533     551.684     528.796       0.040       0.561

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     459.262       0.000     459.262    1155.310       0.398       0.460

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      17.774     554.646       0.000       0.060       0.062       0.487

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.856      19.822       1.312     572.262      49.452     188.508       1.461

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 307884.250       0.604    2720.547 1540716.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.977   EfDer =  0.976

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    156.364    3965.000      19.822     572.262       1.000       1.000       0.980
W Kg/sec =   71.07451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    121.799    3774.885       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 120288.016  122693.516       1.665     590.487     354.721     474.134       1.337

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   437.66    -0.15   437.66     0.38   676.94
 MEAN    18.08     0.00    -0.02   437.66    -0.15   437.66     0.38
 HUB     15.21     0.00    -0.02   437.66    -0.15   437.66     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.39    46.36    12.03   711.05   835.08    17.96   556.27     0.72
 MEAN    55.03    42.30    12.73   625.53   763.56    17.96   556.27     0.66
 HUB     50.26    37.84    12.42   526.28   684.60    17.96   556.27     0.59

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   587.61   404.44   426.27  1190.80     0.49
 MEAN    18.01   590.28   397.42   436.45  1184.34     0.50
 HUB     15.22   631.46   445.13   447.88  1177.91     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   522.48   302.12     0.44  8261.76
 MEAN   623.16   491.37   225.75     0.41  7160.21     1.71
 HUB    526.73   455.25    81.60     0.39  6778.58

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.23     1.27    21.36   618.15     1.08   589.32     0.92     0.89
 MEAN    24.45     1.23    20.63   612.03     1.07   582.94     0.92     0.89
 HUB     24.19     1.22    19.89   609.91     1.07   576.62     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.49    35.33    31.50     3.83     0.93     0.46     2.90
 MEAN    42.32    27.35    23.50     3.85     0.94     0.44     3.30     0.89
 HUB     44.82    10.33     6.50     3.83     0.94     0.42     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.976

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     720.650     398.534     600.423    1171.104       0.615      -0.400

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.584      19.036     570.006      46.000      33.574      30.600      -2.974

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	587.176	398.534	709.651	1185.981	0.495	0.027

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	24.520	20.734	584.580	400.556	0.026	0.383

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	578.171	0.000	578.171	1186.870	0.487	0.440

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	20.797	585.457	0.000	0.060	0.040	0.043

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.866	24.466	1.234	613.366	41.103	199.331	1.545

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
256087.750	0.513	2262.860	1356493.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =10.977 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
156.364	3965.000	24.466	613.366	1.000	1.000	0.780

W Kg/sec = 71.07451

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
102.165	3646.209	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
120288.016	122693.516	1.459	434.156	297.562	339.175	1.140

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	531.00	-0.18	531.00	0.45	638.59
MEAN	17.74	0.00	-0.02	531.00	-0.18	531.00	0.45	
HUB	15.05	0.00	-0.02	531.00	-0.18	531.00	0.45	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.60	46.36	6.24	694.45	874.34	21.34	589.84	0.73
MEAN	49.14	43.40	5.74	613.77	811.73	21.34	589.84	0.68
HUB	44.45	38.84	5.61	520.75	743.86	21.34	589.84	0.62

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	556.53	389.24	397.77	1231.39	0.45
MEAN	17.51	558.08	382.97	405.94	1225.78	0.46
HUB	14.85	595.41	427.17	414.78	1220.28	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	685.45	495.95	296.21	0.40	7714.47	
MEAN	605.75	463.05	222.78	0.38	6707.76	1.90
HUB	513.83	423.73	86.65	0.35	6346.28	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.36	1.24	26.39	656.18	1.07	630.33	0.92	0.91
MEAN	29.54	1.21	25.62	650.59	1.06	624.60	0.92	0.91
HUB	29.25	1.20	24.85	648.59	1.06	619.00	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.38	36.67	31.50	5.17	0.93	0.51	2.90	
MEAN	43.33	28.76	23.50	5.26	0.92	0.50	3.28	0.91
HUB	45.84	11.80	6.50	5.30	0.92	0.50	3.87	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     563.105     385.485     410.474    1226.481       0.459       0.014

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.676      25.679     625.326      46.000      43.202      31.500     -11.702

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     411.611     385.485     563.935    1238.506       0.332       0.430

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.558      27.380     637.648     471.992       0.039       0.517

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     401.153       0.000     401.153    1239.194       0.324       0.404

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.333     638.357       0.000       0.060       0.079       0.418

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      29.394       1.201     651.785      38.420     197.920       1.534

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 239568.781       0.510    2116.894 1692168.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.977   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    156.364    3965.000      29.394     651.785       1.000       1.000       0.980
W Kg/sec =   71.07451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.658    3537.114       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 120288.016  122693.516       2.010     513.330     255.337     401.059       1.571

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   377.24    -0.13   377.24     0.30   594.48
 MEAN    16.97     0.00    -0.02   377.24    -0.13   377.24     0.30
 HUB     14.32     0.00    -0.02   377.24    -0.13   377.24     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.49    46.36    14.13   666.42   765.90    27.57   639.92     0.62
 MEAN    57.29    43.80    13.49   587.21   698.05    27.57   639.92     0.56
 HUB     52.72    37.84    14.88   495.49   622.85    27.57   639.92     0.50

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   538.40   387.23   374.07  1267.61     0.42
 MEAN    16.57   534.96   375.61   380.93  1262.18     0.42
 HUB     13.89   564.28   409.17   388.57  1256.75     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   459.03   266.04     0.36  7313.31
 MEAN   573.48   429.25   197.87     0.34  6227.50     1.79
 HUB    480.61   395.08    71.44     0.31  5685.27
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     35.47     1.21    31.32   692.33     1.06   668.16     0.92     0.89
MEAN    34.51     1.17    30.50   686.31     1.05   662.45     0.92     0.89
HUB     34.04     1.16    29.64   683.31     1.05   656.76     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     45.99    35.42    31.50     3.92     0.93     0.49     2.90
MEAN    44.60    27.45    23.50     3.95     0.94     0.47     3.29     0.89
HUB     46.48    10.42     6.50     3.92     0.94     0.45     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     531.115     377.721     373.376    1263.459       0.420       0.040

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.632      30.665     663.795      46.000      45.331      32.400     -12.931

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     380.312     377.721     536.013    1274.320       0.298       0.466

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      34.510      32.440     675.256     456.573       0.039       0.555

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     16.096     363.373       0.000     363.373    1275.311       0.285       0.421

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.428     676.306       0.000       0.060       0.087       0.464

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.830      34.310       1.167     687.316      35.531     192.203       1.490

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 221776.609       0.520    1959.677 1278135.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.977   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    156.364    3965.000      34.310     687.316       1.000       1.000       0.980
W Kg/sec =   71.07451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.117    3444.475       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 120288.016  122693.516       2.269     509.668     224.659     390.276       1.737

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   339.61    -0.12   339.61     0.27   550.66
 MEAN    15.91     0.00    -0.02   339.61    -0.12   339.61     0.27
 HUB     13.07     0.00    -0.02   339.61    -0.12   339.61     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.82    47.36    14.46   633.89   719.24    32.66   677.71     0.56
 MEAN    58.34    44.80    13.54   550.61   647.02    32.66   677.71     0.51
 HUB     53.10    38.84    14.26   452.24   565.65    32.66   677.71     0.44

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   508.01   377.54   339.92  1300.32     0.39
 MEAN    15.50   496.23   355.71   346.00  1294.76     0.38
 HUB     12.59   511.76   370.88   352.63  1289.20     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   417.96   243.21     0.32  6775.17
 MEAN   536.24   390.26   180.53     0.30  5514.51     1.85
 HUB    435.63   358.53    64.75     0.28  4670.85

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     40.48     1.18    36.44   724.84     1.05   703.34     0.92     0.89
 MEAN    39.28     1.14    35.49   717.86     1.04   697.34     0.92     0.89
 HUB     38.49     1.12    34.52   713.18     1.04   691.36     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.00    35.58    31.50     4.08     0.93     0.51     2.90
 MEAN    45.79    27.55    23.50     4.05     0.94     0.48     3.34     0.89
 HUB     46.44    10.41     6.50     3.91     0.94     0.45     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     503.048     362.232     349.062    1294.950       0.388      -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     39.337      35.447     697.544      46.000      46.061      33.000     -13.061

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     361.007     362.232     511.408    1304.406       0.277       0.411

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      39.128      37.100     707.768     440.827       0.073       0.570

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     338.762       0.000     338.762    1305.601       0.259       0.467

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      37.283     709.065       0.000       0.060       0.088       0.458

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.831      39.071       1.139     718.626      31.309     199.629       1.548

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  195643.469       0.508    1728.758 1300360.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1220960.88  10788.7363    152.7519      2.5862      0.8362     10.9770      1.3745



********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
********************************************************************

    Fan-Core + 4 Stage LPC 105% Stat 2 27% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.998
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   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    186.954    3965.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   84.97911

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    182.635    3949.384       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
143820.469  146696.562       1.563     831.557     531.874     619.754       1.165

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   450.57    -0.16   450.57     0.41   710.99
MEAN    17.06     0.00    -0.02   450.57    -0.16   450.57     0.41
HUB     12.51     0.00    -0.02   450.57    -0.16   450.57     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.75    50.47     7.28   713.82   844.26    13.47   505.85     0.77
MEAN    52.65    47.20     5.45   590.30   742.73    13.47   505.85     0.67
HUB     43.86    38.62     5.24   432.86   624.91    13.47   505.85     0.57

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   705.72   395.79   584.29  1126.00     0.63
MEAN    18.04   744.60   440.41   600.38  1119.73     0.66
HUB     15.00   860.76   582.27   633.93  1108.04     0.78

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    713.82   665.24   318.04     0.59  8168.25
MEAN   624.07   627.85   183.66     0.56  7945.93     1.31
HUB    519.02   637.07    63.26     0.57  8736.06

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.72     1.31    15.13   568.21     1.09   526.63     0.92     0.91
MEAN    19.58     1.30    14.55   566.98     1.08   520.70     0.92     0.91
HUB     20.07     1.33    13.46   571.37     1.09   509.56     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.11    28.56    24.20     4.36     0.93     0.29     2.90
MEAN    36.26    17.01    12.70     4.31     0.92     0.24     3.51     0.91
HUB     42.57    -5.70    -9.30     3.60     0.92     0.09     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     757.678     439.556     617.144    1119.616       0.677      -0.006

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.733      14.515     520.903      24.000      35.460      35.400      -0.060

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     636.091     439.556     773.189    1134.726       0.561       0.275

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.644      15.866     535.058     528.796       0.027       0.427

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    18.083     581.002       0.000     581.002    1140.649       0.509       0.344

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.375     540.658       0.000       0.060       0.044       0.369
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    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      19.551       1.294     568.852      46.042     220.546       1.710

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 286652.688       0.563    3028.469 1894596.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    186.954    3965.000      19.551     568.852       1.000       1.000       0.980
W Kg/sec =   84.97911

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    147.205    3786.183       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 143820.469  146696.562       1.377     590.487     428.709     474.134       1.106

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   550.34    -0.19   550.34     0.48   678.97
 MEAN    18.08     0.00    -0.02   550.34    -0.19   550.34     0.48
 HUB     15.21     0.00    -0.02   550.34    -0.19   550.34     0.48

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.27    46.36     5.91   711.05   899.30    16.68   543.56     0.79
 MEAN    48.67    42.30     6.37   625.53   833.31    16.68   543.56     0.73
 HUB     43.73    37.84     5.89   526.28   761.61    16.68   543.56     0.67

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   628.04   324.10   537.95  1173.97     0.53
 MEAN    18.01   644.16   338.39   548.12  1169.24     0.55
 HUB     15.22   701.71   423.53   559.49  1164.64     0.60

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   660.05   382.45     0.56  6622.08
 MEAN   623.16   617.69   284.77     0.53  6097.83     1.46
 HUB    526.73   568.93   103.21     0.49  6450.22

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.89     1.22    19.66   605.64     1.06   572.71     0.92     0.91
 MEAN    23.52     1.20    19.14   602.72     1.06   568.08     0.92     0.91
 HUB     23.77     1.22    18.59   604.68     1.06   563.58     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.07    35.41    31.50     3.91     0.93     0.33     2.90
 MEAN    31.69    27.45    23.50     3.95     0.93     0.32     3.30     0.91
 HUB     37.13    10.45     6.50     3.95     0.93     0.32     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960    1212.454     339.341    1163.999    1081.520       1.121      -1.813

     Pt3         Ps3         Ts3          Vane No.     Alpha3     Vane A3      Incid3
     23.683      10.798      482.517       46.000      16.253      30.600      14.347

    STATOR / VANED DIFFUSER THROAT IS CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     17.960    1401.480     339.341    1441.977    1054.294       1.329      -2.411

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      23.197       8.038     446.012     361.848       0.116     -46.066

    VANED DIFFUSER EXIT:
   R4          C4           Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823   57178.773       0.000   57178.773     509.048     112.325      -2.347

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680       0.000       0.238       0.000       0.060       0.589      -4.159

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.336      21.020       1.075     604.347      35.495     249.531       1.934

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 221131.391       0.443    2336.241 1700022.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.841

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    186.954    3965.000      21.020     604.347       1.000       1.000       0.710
W Kg/sec =   84.97911

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    141.126    3673.315       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 143820.469  146696.562       1.000     395.194     395.193     307.469       0.778

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02  1099.39    -0.38  1099.39     1.00   643.34
 MEAN    17.74     0.00    -0.02  1099.39    -0.38  1099.39     1.00
 HUB     15.05     0.00    -0.02  1099.39    -0.38  1099.39     1.00

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     32.29    46.36   -14.07   694.45  1300.56    11.11   503.52     1.18
 MEAN    29.19    43.40   -14.21   613.77  1259.31    11.11   503.52     1.14
 HUB     25.36    38.84   -13.48   520.75  1216.65    11.11   503.52     1.11

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   651.34   177.52   626.68  1189.99     0.55
 MEAN    17.51   665.39   223.95   626.57  1190.70     0.56
 HUB     14.85   720.34   349.05   630.12  1191.42     0.60

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   806.68   507.93     0.68  3524.18
 MEAN   605.75   733.73   381.79     0.62  3927.36     1.78
 HUB    513.83   651.31   164.78     0.55  5189.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.91     1.09    18.68   623.91     1.03   588.53     0.92     0.77
 MEAN    23.13     1.10    18.71   626.15     1.04   589.23     0.92     0.77
 HUB     23.84     1.13    18.62   633.16     1.05   589.89     0.92     0.77

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.82    39.03    31.50     7.53     0.93     0.40     2.90
 MEAN    19.67    31.36    23.50     7.86     0.82     0.44     3.28     0.77
 HUB     28.98    14.65     6.50     8.15     0.82     0.50     3.87


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.841

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     674.515     225.422     635.732    1191.057       0.566      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.246      18.697     589.785      46.000      19.524      31.500      11.976

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     670.506     225.422     707.385    1191.511       0.563      -0.015

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.066      18.602     590.235     471.992       0.049       0.145

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     652.440       0.000     652.440    1193.523       0.547      -0.012

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.642     592.229       0.000       0.060       0.097      -0.006

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.623      22.845       1.087     627.740      23.393     394.300       3.057

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 145812.234       0.310    1540.498 3089049.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.956

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    186.954    3965.000      22.845     627.740       1.000       1.000       0.980
W Kg/sec =   84.97911

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    132.340    3604.221       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 143820.469  146696.562       1.332     513.330     385.490     401.059       1.040

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   604.39    -0.21   604.39     0.50   605.76
 MEAN    16.97     0.00    -0.02   604.39    -0.21   604.39     0.50
 HUB     14.32     0.00    -0.02   604.39    -0.21   604.39     0.50

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.80    46.36     1.44   666.42   899.82    19.20   597.28     0.75
 MEAN    44.18    43.80     0.38   587.21   842.82    19.20   597.28     0.70
 HUB     39.36    37.84     1.52   495.49   781.66    19.20   597.28     0.65

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   651.71   211.88   616.30  1215.84     0.54
 MEAN    16.57   667.15   248.48   619.15  1214.82     0.55
 HUB     13.89   721.85   362.51   624.22  1213.64     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   758.06   441.39     0.62  4004.37
 MEAN   573.48   699.26   325.00     0.58  4121.78     1.29
 HUB    480.61   635.29   118.10     0.52  5038.29

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     25.41     1.11    20.90   649.96     1.04   614.56     0.92     0.87
 MEAN    25.49     1.12    20.76   650.61     1.04   613.51     0.92     0.87
 HUB     26.11     1.14    20.55   655.70     1.04   612.27     0.92     0.87

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.97    35.61    31.50     4.11     0.93     0.20     2.90
 MEAN    21.87    27.70    23.50     4.20     0.90     0.21     3.29     0.87
 HUB     30.15    10.71     6.50     4.21     0.90     0.25     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.956

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     653.423     249.875     603.758    1217.598       0.537       0.060

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.621      21.058     616.490      46.000      22.483      32.400       9.917

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     639.152     249.875     686.260    1219.116       0.524       0.078

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.478      21.123     618.028     456.573       0.039       0.203

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     604.814       0.000     604.814    1222.624       0.495       0.071

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.410     621.590       0.000       0.060       0.073       0.137

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.767      25.310       1.108     652.090      24.350     323.204       2.505

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 151854.266       0.356    1604.332 1699853.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.947

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    186.954    3965.000      25.310     652.090       1.000       1.000       0.980
W Kg/sec =   84.97911

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    121.746    3536.287       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 143820.469  146696.562       1.437     509.668     354.659     390.276       1.100

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   557.94    -0.19   557.94     0.45   565.34
 MEAN    15.91     0.00    -0.02   557.94    -0.19   557.94     0.45
 HUB     13.07     0.00    -0.02   557.94    -0.19   557.94     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.65    47.36     1.29   633.89   844.61    21.96   626.15     0.69
 MEAN    44.63    44.80    -0.17   550.61   784.02    21.96   626.15     0.64
 HUB     39.04    38.84     0.20   452.24   718.33    21.96   626.15     0.59

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   608.81   208.12   572.13  1242.40      0.49
MEAN    15.50   621.39   232.15   576.39  1240.43      0.50
HUB     12.59   667.11   325.64   582.23  1238.39      0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.74   705.40   412.63     0.57  3737.15
MEAN   536.24   651.69   304.09     0.53  3600.80     1.30
HUB    435.63   592.53   109.99     0.48  4102.36

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     27.83     1.10    23.62   672.82     1.03   641.93     0.92     0.87
MEAN    27.74     1.10    23.37   672.06     1.03   639.89     0.92     0.87
HUB     28.09     1.11    23.05   674.84     1.03   637.76     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     19.99    35.80    31.50     4.30     0.93     0.21     2.90
MEAN    21.94    27.81    23.50     4.31     0.90     0.21     3.34     0.87
HUB     29.22    10.70     6.50     4.20     0.90     0.23     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.947

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     628.288     236.405     582.115    1240.793       0.506      -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.795      23.330     640.342      46.000      22.103      33.000      10.897

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     626.772     236.405     669.873    1240.947       0.505      -0.049

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.522      23.121     640.501     440.827       0.080       0.206

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     578.478       0.000     578.478    1245.637       0.464       0.094

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.759     645.351       0.000       0.060       0.075       0.091

    STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.756      27.545       1.088     673.238      21.148     343.782       2.665

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  131966.078       0.342    1394.214 1728733.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     937416.62   9903.7539    182.6354      1.8233      0.6532      5.4534      1.2877


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 105% Stat 2 27% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.561   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     186.350    3965.000      15.107     522.810       1.000       1.000       0.980
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W Kg/sec = 84.70444

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
182.045	3949.384	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
143355.594	146222.406	1.569	831.557	530.155	619.754	1.169

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	448.82	-0.15	448.82	0.41	710.99
MEAN	17.06	0.00	-0.02	448.82	-0.15	448.82	0.41	
HUB	12.51	0.00	-0.02	448.82	-0.15	448.82	0.41	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.85	50.47	7.38	713.82	843.33	13.48	505.98	0.76
MEAN	52.76	47.20	5.56	590.30	741.67	13.48	505.99	0.67
HUB	43.97	38.62	5.35	432.86	623.65	13.48	505.98	0.57

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	704.26	397.31	581.48	1126.36	0.63
MEAN	18.04	742.86	441.27	597.60	1120.04	0.66
HUB	15.00	858.32	581.97	630.90	1108.37	0.77

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	713.82	662.05	316.51	0.59	8199.67	
MEAN	624.07	624.94	182.80	0.56	7961.36	1.32
HUB	519.02	634.03	62.95	0.57	8731.45	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.74	1.31	15.16	568.39	1.09	526.98	0.92	0.91
MEAN	19.59	1.30	14.58	567.06	1.08	521.00	0.92	0.91
HUB	20.07	1.33	13.49	571.34	1.09	509.88	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.34	28.56	24.20	4.36	0.93	0.30	2.90	
MEAN	36.44	17.01	12.70	4.31	0.92	0.24	3.51	0.91
HUB	42.69	-5.70	-9.30	3.60	0.92	0.09	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	755.772	440.411	614.189	1119.959	0.675	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.743	14.547	521.223	24.000	35.643	35.400	-0.243

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	632.700	440.411	770.890	1135.190	0.557	0.279

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.655	15.912	535.495	528.796	0.026	0.430

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	578.051	0.000	578.051	1141.033	0.507	0.347

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.416	541.022	0.000	0.060	0.043	0.372

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.872      19.564       1.295     568.930      46.120     219.838       1.704

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 287139.844       0.564    3023.811 1887255.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 5.561   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    186.350    3965.000      19.564     568.930       1.000       1.000       0.980
W Kg/sec =   84.70444

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    146.642    3785.922       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 143355.594  146222.406       1.383     590.487     427.070     474.134       1.110

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   547.65    -0.19   547.65     0.48   678.92
 MEAN    18.08     0.00    -0.02   547.65    -0.19   547.65     0.48
 HUB     15.21     0.00    -0.02   547.65    -0.19   547.65     0.48

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.40    46.36     6.04   711.05   897.66    16.72   543.89     0.78
 MEAN    48.81    42.30     6.51   625.53   831.53    16.72   543.89     0.73
 HUB     43.87    37.84     6.03   526.28   759.67    16.72   543.89     0.66

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   626.68   326.16   535.12  1174.43     0.53
 MEAN    18.01   642.59   339.89   545.34  1169.65     0.55
 HUB     15.22   699.87   424.07   556.76  1164.99     0.60

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   656.54   380.40     0.56  6664.05
 MEAN   623.16   614.53   283.28     0.53  6124.73     1.47
 HUB    526.73   566.15   102.66     0.49  6458.49

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.94      1.22    19.71   605.95     1.07   573.16     0.92     0.91
 MEAN    23.56      1.20    19.18   602.95     1.06   568.48     0.92     0.91
 HUB     23.79      1.22    18.64   604.81     1.06   563.92     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.36    35.41    31.50     3.91     0.93     0.33     2.90
 MEAN    31.93    27.45    23.50     3.95     0.93     0.32     3.30     0.91
 HUB     37.30    10.45     6.50     3.95     0.93     0.33     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960    1173.183     340.839    1122.580    1088.682       1.078      -1.696

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.717      11.411     490.205      46.000      16.889      30.600      13.711

   STATOR / VANED DIFFUSER THROAT IS CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960    1246.696     340.839    1292.448    1078.220       1.156      -1.970

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.680      23.276      10.149     476.568     361.848       0.106      -0.448

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823    1812.702       0.000    1812.702    1010.064       1.795      -1.654

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680       3.831     367.062       0.000       0.060       0.418      -3.348

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.513      21.847       1.117     604.568      35.637     248.171       1.924

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 222021.234       0.445    2338.060 1692412.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.561   EfDer =  0.800

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    186.350    3965.000      21.847     604.568       1.000       1.000       0.710
W Kg/sec =   84.70444

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    135.367    3672.644       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 143355.594  146222.406       1.002     395.194     394.272     307.469       0.780

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02  1052.09    -0.36  1052.09     0.95   643.22
 MEAN    17.74     0.00    -0.02  1052.09    -0.36  1052.09     0.95
 HUB     15.05     0.00    -0.02  1052.09    -0.36  1052.09     0.95

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     33.44    46.36   -12.92   694.45  1260.82    12.25   512.21     1.14
 MEAN    30.27    43.40   -13.13   613.77  1218.22    12.25   512.21     1.10
 HUB     26.35    38.84   -12.49   520.75  1174.08    12.25   512.21     1.06

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   626.59   203.64   592.57  1195.72     0.52
 MEAN    17.51   642.28   242.37   594.80  1195.22     0.54
 HUB     14.85   698.59   356.30   600.90  1194.78     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   763.73   481.81     0.64  4041.36
 MEAN   605.75   697.01   363.38     0.58  4249.47     1.82
 HUB    513.83   621.20   157.53     0.52  5296.49

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.99     1.10    19.89   627.00     1.04   594.25     0.92     0.73
 MEAN    24.10     1.10    19.80   628.16     1.04   593.75     0.92     0.73
 HUB     24.68     1.13    19.58   633.97     1.05   593.27     0.92     0.73

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.97    39.11    31.50     7.61     0.93     0.42     2.90
 MEAN    22.17    31.42    23.50     7.92     0.83     0.46     3.28     0.73
 HUB     30.67    14.69     6.50     8.19     0.83     0.51     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.800

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     650.703     243.959     603.240    1195.723       0.544      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.214      19.793     594.384      46.000      22.019      31.500       9.481

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     629.986     243.959     675.572    1197.947       0.526       0.042

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.087      19.947     596.598     471.992       0.038       0.187

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     17.121     610.971       0.000     610.971    1199.922       0.509       0.058

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.055     598.567       0.000       0.060       0.071       0.066

    STAGE EXIT CONDITIONS, STAGE            3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.638      23.941       1.096     629.711      25.143     365.387       2.832

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 156732.594       0.334    1650.519 3070480.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.561   EfDer =  0.978

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    186.350    3965.000      23.941     629.711       1.000       1.000       0.980
W Kg/sec =   84.70444

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    126.074    3598.576       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 143355.594  146222.406       1.398     513.330     367.233     401.059       1.092

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   568.00    -0.20   568.00     0.47   604.81
 MEAN    16.97     0.00    -0.02   568.00    -0.20   568.00     0.47
 HUB     14.32     0.00    -0.02   568.00    -0.20   568.00     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.57    46.36     3.21   666.42   875.78    20.55   602.81     0.73
 MEAN    45.96    43.80     2.16   587.21   817.11    20.55   602.81     0.68
 HUB     41.11    37.84     3.27   495.49   753.87    20.55   602.81     0.63

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   622.34   243.50   572.73  1224.07     0.51
 MEAN    16.57   638.03   270.77   577.72  1221.86     0.52
 HUB     13.89   691.84   370.67   584.17  1219.62     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   704.23   409.77     0.58  4600.97
 MEAN   573.48   652.22   302.70     0.53  4491.05     1.35
 HUB    480.61   594.42   109.94     0.49  5151.35

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.11     1.13    22.73   655.24     1.04   622.95     0.92     0.89
 MEAN    27.03     1.13    22.45   654.63     1.04   620.69     0.92     0.89
 HUB     27.51     1.15    22.11   658.29     1.05   618.39     0.92     0.89
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.03    35.58    31.50     4.08     0.93     0.24     2.90
 MEAN    25.11    27.65    23.50     4.15     0.91     0.25     3.29     0.89
 HUB     32.40    10.66     6.50     4.16     0.91     0.27     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     626.080     272.294     563.766    1224.395       0.511       0.059

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.172      22.730     623.368      46.000      25.780      32.400       6.620

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     590.524     272.294     650.279    1227.932       0.481       0.144

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.086      23.119     626.975     456.573       0.028       0.254

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     558.641       0.000     558.641    1230.920       0.454       0.144

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.418     630.030       0.000       0.060       0.051       0.207

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.831      26.975       1.127     656.054      26.343     295.348       2.290

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 164300.031       0.385    1730.210 1664918.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.561   EfDer =  0.976

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    186.350    3965.000      26.975     656.054       1.000       1.000       0.980
W Kg/sec =   84.70444

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    114.209    3525.587       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 143355.594  146222.406       1.532     509.668     332.698     390.276       1.173

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   517.14    -0.18   517.14     0.42   563.63
 MEAN    15.91     0.00    -0.02   517.14    -0.18   517.14     0.42
 HUB     13.07     0.00    -0.02   517.14    -0.18   517.14     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.80    47.36     3.44   633.89   818.22    23.91   633.77     0.66
 MEAN    46.80    44.80     2.00   550.61   755.51    23.91   633.77     0.61
 HUB     41.18    38.84     2.34   452.24   687.11    23.91   633.77     0.56

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   578.03   243.15   524.40  1252.49     0.46
 MEAN    15.50   589.34   257.20   530.25  1249.43     0.47
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 HUB     12.59   632.93   334.85   537.10  1246.39     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   646.20   377.60     0.52  4365.31
 MEAN   536.24   599.19   279.04     0.48  3988.80     1.37
 HUB    435.63   546.47   100.78     0.44  4218.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.21     1.12    26.11   680.26     1.04   652.41     0.92     0.89
 MEAN    29.92     1.11    25.69   678.17     1.03   649.23     0.92     0.89
 HUB     30.10     1.12    25.24   679.44     1.04   646.06     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.88    35.76    31.50     4.26     0.93     0.26     2.90
 MEAN    25.88    27.75    23.50     4.25     0.91     0.26     3.34     0.89
 HUB     31.94    10.63     6.50     4.13     0.91     0.26     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.976

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     595.769     261.915     535.108    1249.854       0.477      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.989      25.667     649.709      46.000      26.080      33.000       6.920

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     567.745     261.915     625.247    1252.465       0.453       0.054

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.841      25.916     652.426     440.827       0.054       0.264

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     526.759       0.000     526.759    1256.048       0.419       0.176

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.443     656.165       0.000       0.060       0.053       0.174

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.829      29.846       1.106     679.290      23.236     308.362       2.390

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 145023.156       0.376    1527.209 1689604.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    975216.75  10269.8076    182.0450      1.9756      0.7203      5.5606      1.2993



*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 105% Stat 2 27% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    184.141    3965.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   83.70042
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
179.887	3949.384	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
141656.391	144489.219	1.587	831.557	523.871	619.754	1.183

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	442.47	-0.15	442.47	0.40	710.99
MEAN	17.06	0.00	-0.02	442.47	-0.15	442.47	0.40	
HUB	12.51	0.00	-0.02	442.47	-0.15	442.47	0.40	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.21	50.47	7.74	713.82	839.96	13.52	506.46	0.76
MEAN	53.15	47.20	5.95	590.30	737.85	13.52	506.46	0.67
HUB	44.38	38.62	5.76	432.86	619.10	13.52	506.46	0.56

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	699.10	402.78	571.41	1127.65	0.62
MEAN	18.04	736.69	444.34	587.60	1121.15	0.66
HUB	15.00	849.60	580.88	620.01	1109.54	0.77

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	713.82	650.58	311.04	0.58	8312.49	
MEAN	624.07	614.47	179.73	0.55	8016.70	1.33
HUB	519.02	623.08	61.86	0.56	8715.04	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.81	1.31	15.28	569.01	1.09	528.21	0.92	0.91
MEAN	19.63	1.30	14.68	567.37	1.09	522.06	0.92	0.91
HUB	20.06	1.33	13.60	571.25	1.09	511.03	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.18	28.56	24.20	4.36	0.93	0.31	2.90	
MEAN	37.10	17.01	12.70	4.31	0.92	0.26	3.51	0.91
HUB	43.13	-5.70	-9.30	3.60	0.92	0.10	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	748.991	443.475	603.587	1121.176	0.668	-0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.779	14.659	522.356	24.000	36.306	35.400	-0.906

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	620.622	443.475	762.786	1136.827	0.546	0.293

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.692	16.076	537.041	528.796	0.026	0.440

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	567.531	0.000	567.531	1142.390	0.497	0.358

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.562	542.309	0.000	0.060	0.042	0.384

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.875	19.608	1.298	569.212	46.402	217.285	1.684

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 288890.125       0.567    3006.182 1860559.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    184.141    3965.000      19.608     569.212       1.000       1.000       0.980
W Kg/sec =   83.70042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    144.614    3784.988       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141656.391  144489.219       1.402     590.487     421.163     474.134       1.126

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   538.03    -0.19   538.03     0.47   678.75
 MEAN    18.08     0.00    -0.02   538.03    -0.19   538.03     0.47
 HUB     15.21     0.00    -0.02   538.03    -0.19   538.03     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.89    46.36     6.53   711.05   891.82    16.85   545.04     0.78
 MEAN    49.31    42.30     7.01   625.53   825.22    16.85   545.04     0.72
 HUB     44.38    37.84     6.54   526.28   752.76    16.85   545.04     0.66

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   622.01   333.45   525.08  1176.05     0.53
 MEAN    18.01   637.08   345.17   535.48  1171.07     0.54
 HUB     15.22   693.37   426.03   547.05  1166.21     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   644.14   373.11     0.55  6812.78
 MEAN   623.16   603.34   278.00     0.52  6219.77     1.48
 HUB    526.73   556.24   100.70     0.48  6488.27

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.09     1.23    19.91   607.05     1.07   574.75     0.92     0.91
 MEAN    23.68     1.21    19.36   603.76     1.06   569.88     0.92     0.91
 HUB     23.86     1.22    18.78   605.25     1.06   565.12     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.42    35.40    31.50     3.90     0.93     0.34     2.90
 MEAN    32.81    27.44    23.50     3.94     0.93     0.33     3.30     0.91
 HUB     37.91    10.43     6.50     3.93     0.93     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960    1081.879     346.135    1025.013    1106.026       0.978      -1.424

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.832      12.905     507.753      46.000      18.659      30.600      11.941

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960    1048.149     346.135    1103.824    1112.694       0.942      -1.345

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      23.496      13.257     513.767     361.848       0.084       0.099
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    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823    1090.481       0.000    1090.481    1107.571       0.985      -0.145

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      12.248     506.681       0.000       0.060       0.241      -1.568

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.693      22.787       1.162     605.355      36.144     243.392       1.887

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 225176.828       0.451    2343.184 1664995.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.788

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    184.141    3965.000      22.787     605.355       1.000       1.000       0.710
W Kg/sec =   83.70042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    128.331    3670.255       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141656.391  144489.219       1.057     395.194     373.773     307.469       0.823

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   867.52    -0.30   867.52     0.76   642.80
 MEAN    17.74     0.00    -0.02   867.52    -0.30   867.52     0.76
 HUB     15.05     0.00    -0.02   867.52    -0.30   867.52     0.76

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     38.69    46.36    -7.67   694.45  1111.42    15.55   542.56     0.97
 MEAN    35.29    43.40    -8.11   613.77  1062.86    15.55   542.56     0.93
 HUB     30.99    38.84    -7.85   520.75  1011.97    15.55   542.56     0.89

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   604.91   251.80   550.01  1204.01     0.50
 MEAN    17.51   620.93   279.39   554.53  1201.84     0.52
 HUB     14.85   677.52   377.20   562.80  1199.68     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   700.40   433.65     0.58  4994.13
 MEAN   605.75   643.44   326.36     0.54  4896.39     1.73
 HUB    513.83   579.15   136.63     0.48  5605.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.52     1.12    21.48   633.08     1.05   602.55     0.92     0.72
 MEAN    25.47     1.12    21.22   632.54     1.04   600.37     0.92     0.72
 HUB     25.87     1.14    20.83   636.47     1.05   598.18     0.92     0.72

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.60    38.25    31.50     6.75     0.93     0.41     2.90
 MEAN    26.74    30.48    23.50     6.98     0.86     0.43     3.28     0.72
 HUB     33.83    13.65     6.50     7.15     0.86     0.48     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.788

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3       cp 2-3
     17.392     628.498     281.220     562.073    1202.457       0.523       0.001
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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.576      21.227     601.068      46.000      26.580      31.500       4.920

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     578.821     281.220     643.520    1207.453       0.479       0.138

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.509      21.793     606.072     471.992       0.025       0.258

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     560.443       0.000     560.443    1209.192       0.463       0.160

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.938     607.819       0.000       0.060       0.045       0.171

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.672      25.421       1.116     634.029      28.674     300.638       2.331

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 178754.469       0.380    1860.114 2634631.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    184.141    3965.000      25.421     634.029       1.000       1.000       0.980
W Kg/sec =   83.70042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    117.724    3586.302       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141656.391  144489.219       1.497     513.330     342.907     401.059       1.170

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   522.94    -0.18   522.94     0.43   602.75
 MEAN    16.97     0.00    -0.02   522.94    -0.18   522.94     0.43
 HUB     14.32     0.00    -0.02   522.94    -0.18   522.94     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.89    46.36     5.53   666.42   847.24    22.37   611.22     0.70
 MEAN    48.32    43.80     4.52   587.21   786.44    22.37   611.22     0.65
 HUB     43.47    37.84     5.63   495.49   720.52    22.37   611.22     0.59

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   592.56   280.47   521.98  1234.99     0.48
 MEAN    16.57   606.46   297.29   528.59  1231.65     0.49
 HUB     13.89   657.46   380.48   536.19  1228.35     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   641.44   372.80     0.52  5298.77
 MEAN   573.48   596.39   276.18     0.48  4930.35     1.43
 HUB    480.61   545.46   100.13     0.44  5287.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.37     1.16    25.09   663.42     1.05   634.14     0.92     0.91
 MEAN    29.08     1.14    24.64   661.38     1.04   630.71     0.92     0.91
 HUB     29.36     1.16    24.16   663.36     1.05   627.32     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     28.25    35.53    31.50     4.03     0.93     0.30     2.90
 MEAN    29.35    27.59    23.50     4.09     0.92     0.30     3.29     0.91
 HUB     35.36    10.58     6.50     4.08     0.92     0.31     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     596.667     298.965     516.364    1233.865       0.484       0.057

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.226      24.902     633.033      46.000      30.070      32.400       2.330

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     535.577     298.965     613.370    1239.474       0.432       0.223

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.180      25.663     638.801     456.573       0.020       0.318

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     507.379       0.000     507.379    1241.851       0.409       0.222

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.932     641.253       0.000       0.060       0.038       0.281

    STAGE EXIT CONDITIONS, STAGE             4
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.870       29.094       1.144     662.722      28.693     265.767       2.060

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 178986.297       0.419    1862.526 1608304.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.996

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    184.141     3965.000       29.094     662.722       1.000        1.000        0.980
W Kg/sec =   83.70042

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    105.166     3507.807        1.401       0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 141656.391  144489.219        1.664     509.668     306.356     390.276       1.274

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   471.21    -0.16   471.21     0.38   560.78
 MEAN    15.91      0.00    -0.02   471.21    -0.16   471.21     0.38
 HUB     13.07      0.00    -0.02   471.21    -0.16   471.21     0.38

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     53.38     47.36     6.02   633.89   789.98     26.35   644.22      0.63
 MEAN    49.45     44.80     4.65   550.61   724.84     26.35   644.22      0.58
 HUB     43.83     38.84     4.99   452.24   653.23     26.35   644.22      0.52

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   550.44    280.56    473.57   1264.86      0.44
 MEAN    15.50   558.19    284.29    480.37   1260.87      0.44
 HUB     12.59   597.45    344.86    487.87   1256.93      0.48
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   583.09   340.18     0.46  5036.30
 MEAN   536.24   542.43   251.95     0.43  4408.40     1.46
 HUB    435.63   496.24    90.76     0.39  4343.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     33.19     1.14    29.14   690.64     1.04   665.39     0.92     0.91
 MEAN    32.66     1.12    28.54   687.16     1.04   661.19     0.92     0.91
 HUB     32.60     1.12    27.93   686.80     1.04   657.05     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.64    35.69    31.50     4.19     0.93     0.32     2.90
 MEAN    30.62    27.68    23.50     4.18     0.92     0.31     3.34     0.91
 HUB     35.26    10.54     6.50     4.04     0.92     0.30     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     564.462     289.503     484.568    1261.286       0.448      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.729      28.523     661.644      46.000      30.856      33.000       2.144

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     508.400     289.503     585.049    1266.055       0.402       0.161

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      32.657      29.222     666.657     440.827       0.037       0.334

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     473.582       0.000     473.582    1268.758       0.373       0.264

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.655     669.506       0.000       0.060       0.038       0.262

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      32.651       1.122     688.198      25.477     274.651       2.129

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  159054.703       0.413    1655.119 1631229.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1030862.38  10727.1250    179.8873      2.1613      0.7817      5.9529      1.3163


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 105% Stat 2 27% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 6.543   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    180.829    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   82.19485

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    176.651    3949.384       1.402       0.249      53.349      32.000       0.050
```

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
139108.312	141890.188	1.616	831.557	514.448	619.754	1.205

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	433.05	-0.15	433.05	0.39	710.99
MEAN	17.06	0.00	-0.02	433.05	-0.15	433.05	0.39	
HUB	12.51	0.00	-0.02	433.05	-0.15	433.05	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.76	50.47	8.29	713.82	835.03	13.59	507.15	0.76
MEAN	53.74	47.20	6.54	590.30	732.23	13.59	507.15	0.66
HUB	45.00	38.62	6.38	432.86	612.39	13.59	507.15	0.55

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	691.90	410.72	556.80	1129.47	0.61
MEAN	18.04	727.88	448.82	573.03	1122.74	0.65
HUB	15.00	837.04	579.29	604.19	1111.21	0.75

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	713.82	633.95	303.10	0.56	8476.32	
MEAN	624.07	599.23	175.25	0.53	8097.52	1.36
HUB	519.02	607.19	60.28	0.55	8691.29	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.91	1.32	15.45	569.92	1.09	529.95	0.92	0.91
MEAN	19.68	1.30	14.83	567.82	1.09	523.59	0.92	0.91
HUB	20.05	1.33	13.76	571.12	1.09	512.65	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.41	28.56	24.20	4.36	0.93	0.33	2.90	
MEAN	38.07	17.00	12.70	4.30	0.93	0.27	3.51	0.91
HUB	43.79	-5.70	-9.30	3.60	0.93	0.12	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	739.373	447.951	588.229	1122.897	0.658	-0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.829	14.816	523.961	24.000	37.290	35.400	-1.890

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	603.352	447.951	751.461	1139.126	0.530	0.312

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.742	16.304	539.216	528.796	0.027	0.455

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	552.461	0.000	552.461	1144.304	0.483	0.374

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.763	544.128	0.000	0.060	0.041	0.401

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	19.666	1.302	569.621	46.811	213.547	1.655

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
291438.375	0.572	2978.148	1820920.000

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 6.543   EfDer =  0.999

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    180.829    3965.000      19.666     569.621      1.000       1.000       0.980
W Kg/sec =   82.19485

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    141.647    3783.627       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 139108.312  141890.188       1.431     590.487     412.522     474.134       1.149

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   524.20    -0.18   524.20     0.46   678.51
 MEAN    18.08     0.00    -0.02   524.20    -0.18   524.20     0.46
 HUB     15.21     0.00    -0.02   524.20    -0.18   524.20     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.61    46.36     7.25   711.05   883.54    17.04   546.68     0.77
 MEAN    50.04    42.30     7.74   625.53   816.27    17.04   546.68     0.71
 HUB     45.12    37.84     7.28   526.28   742.93    17.04   546.68     0.65

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   615.75   343.75   510.87  1178.31     0.52
 MEAN    18.01   629.50   352.66   521.44  1173.07     0.54
 HUB     15.22   684.20   428.78   533.18  1167.94     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   626.59   362.81     0.53  7022.99
 MEAN   623.16   587.43   270.50     0.50  6354.66     1.51
 HUB    526.73   542.10    97.95     0.46  6530.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.31     1.24    20.17   608.63     1.07   576.98     0.92     0.91
 MEAN    23.83     1.21    19.59   604.92     1.06   571.84     0.92     0.91
 HUB     23.96     1.22    18.98   605.89     1.06   566.81     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.94    35.38    31.50     3.88     0.93     0.36     2.90
 MEAN    34.07    27.42    23.50     3.92     0.93     0.35     3.30     0.91
 HUB     38.81    10.41     6.50     3.91     0.93     0.34     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960    1006.534     353.650     942.360    1120.771       0.898      -1.209

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.987      14.205     521.914      46.000      20.570      30.600      10.030

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     940.580     353.650    1004.868    1132.172       0.831      -1.009

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      23.738      15.090     532.628     361.848       0.066       0.179

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     944.585       0.000     944.585    1132.129       0.834       0.126
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	14.766	532.070	0.000	0.060	0.162	-1.082

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.772	23.312	1.185	606.481	36.860	236.733	1.835

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
229639.906	0.460	2346.643	1624934.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 6.543 EfDer = 0.832

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
180.829	3965.000	23.312	606.481	1.000	1.000	0.710

W Kg/sec = 82.19485

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
123.297	3666.848	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
139108.312	141890.188	1.100	395.194	359.109	307.469	0.856

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	798.04	-0.27	798.04	0.69	642.21
MEAN	17.74	0.00	-0.02	798.04	-0.27	798.04	0.69	
HUB	15.05	0.00	-0.02	798.04	-0.27	798.04	0.69	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	41.04	46.36	-5.32	694.45	1058.07	16.93	553.33	0.92
MEAN	37.58	43.40	-5.82	613.77	1006.94	16.93	553.34	0.87
HUB	33.14	38.84	-5.70	520.75	953.06	16.93	553.33	0.83

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	588.72	280.72	517.48	1209.88	0.49
MEAN	17.51	603.43	301.03	522.98	1206.82	0.50
HUB	14.85	657.58	387.52	531.26	1203.84	0.55

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	685.45	656.95	404.73	0.54	5566.65	
MEAN	605.75	605.27	304.71	0.50	5274.95	1.76
HUB	513.83	546.06	126.30	0.45	5758.86	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.62	1.14	22.64	637.38	1.05	608.46	0.92	0.76
MEAN	26.44	1.13	22.29	635.76	1.05	605.38	0.92	0.76
HUB	26.74	1.15	21.83	638.45	1.05	602.37	0.92	0.76

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.48	38.03	31.50	6.53	0.93	0.42	2.90	
MEAN	29.93	30.23	23.50	6.73	0.87	0.44	3.28	0.76
HUB	36.11	13.37	6.50	6.87	0.87	0.48	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.832

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	610.226	303.010	529.680	1207.513	0.505	0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
26.560	22.306	606.121	46.000	29.772	31.500	1.728

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	541.518	303.010	620.529	1214.073	0.446	0.201

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	26.514	23.127	612.725	471.992	0.020	0.307

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	524.555	0.000	524.555	1215.567	0.432	0.219

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.260	614.234	0.000	0.060	0.038	0.232

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.725	26.439	1.134	637.195	30.715	273.841	2.123

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
191489.547	0.408	1956.792	2471449.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.543 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
180.829	3965.000	26.439	637.195	1.000	1.000	0.980

W Kg/sec = 82.19485

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
111.432	3577.380	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
139108.312	141890.188	1.582	513.330	324.581	401.059	1.236

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	490.53	-0.17	490.53	0.40	601.25
MEAN	16.97	0.00	-0.02	490.53	-0.17	490.53	0.40	
HUB	14.32	0.00	-0.02	490.53	-0.17	490.53	0.40	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.65	46.36	7.29	666.42	827.62	23.64	617.13	0.68
MEAN	50.13	43.80	6.33	587.21	765.26	23.64	617.13	0.63
HUB	45.30	37.84	7.46	495.49	697.35	23.64	617.13	0.57

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	575.28	305.80	487.27	1242.26	0.46
MEAN	16.57	586.66	315.68	494.49	1238.28	0.47
HUB	13.89	634.49	387.30	502.56	1234.35	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	653.27	598.47	347.47	0.48	5776.83	
MEAN	573.48	557.65	257.79	0.45	5234.95	1.49
HUB	480.61	511.15	93.31	0.41	5382.06	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.94	1.17	26.70	669.24	1.05	641.64	0.92	0.91
MEAN	30.49	1.15	26.15	666.23	1.05	637.53	0.92	0.91
HUB	30.61	1.16	25.56	667.05	1.05	633.48	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.11	35.49	31.50	3.99	0.93	0.34	2.90	
MEAN	32.55	27.53	23.50	4.03	0.93	0.33	3.29	0.91
HUB	37.62	10.52	6.50	4.02	0.93	0.34	3.90	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     578.346     317.458     483.429    1240.268       0.466       0.054

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.635      26.392     639.612      46.000      33.292      32.400      -0.892

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     498.694     317.458     591.164    1247.185       0.400       0.279

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.597      27.403     646.766     456.573       0.018       0.367

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     473.077       0.000     473.077    1249.185       0.379       0.274

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.636     648.842       0.000       0.060       0.037       0.330

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      30.513       1.154     667.506      30.311     246.998       1.915

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 189106.188       0.443    1932.437 1555395.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.543   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    180.829    3965.000      30.513     667.506       1.000       1.000       0.980
W Kg/sec =   82.19485

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     98.824    3495.213       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 139108.312  141890.188       1.770     509.668     287.882     390.276       1.356

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   440.16    -0.15   440.16     0.35   558.77
 MEAN    15.91     0.00    -0.02   440.16    -0.15   440.16     0.35
 HUB     13.07     0.00    -0.02   440.16    -0.15   440.16     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.23    47.36     7.87   633.89   771.85    28.01   651.36     0.62
 MEAN    51.37    44.80     6.57   550.61   705.04    28.01   651.36     0.56
 HUB     45.78    38.84     6.94   452.24   631.19    28.01   651.36     0.50

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   535.79   304.74   440.69  1272.92     0.42
 MEAN    15.50   540.03   301.97   447.72  1268.43     0.43
 HUB     12.59   575.18   351.40   455.36  1263.98     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   542.28   316.00     0.43  5469.89
 MEAN   536.24   505.31   234.27     0.40  4682.18     1.53
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  HUB    435.63   463.09    84.23     0.37  4426.10

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     35.18     1.15    31.14   697.82     1.05   673.90     0.92     0.91
  MEAN    34.48     1.13    30.44   693.45     1.04   669.15     0.92     0.91
  HUB     34.25     1.12    29.71   692.04     1.04   664.46     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     34.66    35.64    31.50     4.14     0.93     0.36     2.90
  MEAN    34.00    27.62    23.50     4.12     0.93     0.35     3.34     0.91
  HUB     37.66    10.48     6.50     3.98     0.93     0.33     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       1.000

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     546.339     307.504     451.584    1268.807       0.431      -0.005

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      34.552      30.416     669.560      46.000      34.253      33.000      -1.253

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     471.337     307.504     562.777    1274.820       0.370       0.227

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      34.492      31.383     675.922     440.827       0.034       0.385

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     439.936       0.000     439.936    1277.067       0.344       0.320

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      31.761     678.306       0.000       0.060       0.037       0.316

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
       0.882       34.480       1.130      694.437      26.930     254.592       1.974

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  168161.875       0.436    1718.411 1578008.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc    TR
    1069835.88  10932.4307     176.6515      2.2823      0.8132      6.5431      1.3283


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 105% Stat 2 27% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.026   EfDer =  1.000

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     178.130     3965.000       15.107      522.810       1.000        1.000        0.980
 W Kg/sec =   80.96808

    W cor       RPM cor         GAMMA        Cp          R           Blades       THK
     174.015     3949.384        1.402        0.249      53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  137032.094  139772.453        1.641      831.557      506.769      619.754       1.223
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ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	425.44	-0.15	425.44	0.38	710.99
MEAN	17.06	0.00	-0.02	425.44	-0.15	425.44	0.38	
HUB	12.51	0.00	-0.02	425.44	-0.15	425.44	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.21	50.47	8.74	713.82	831.12	13.64	507.69	0.75
MEAN	54.23	47.20	7.03	590.30	727.76	13.64	507.69	0.66
HUB	45.50	38.62	6.88	432.86	607.04	13.64	507.69	0.55

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	686.46	416.98	545.31	1130.88	0.61
MEAN	18.04	721.07	452.38	561.52	1123.97	0.64
HUB	15.00	827.22	578.06	591.72	1112.50	0.74

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	713.82	620.86	296.84	0.55	8605.39	
MEAN	624.07	587.18	171.69	0.52	8161.56	1.38
HUB	519.02	594.66	59.05	0.53	8672.79	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.99	1.32	15.58	570.64	1.09	531.29	0.92	0.91
MEAN	19.72	1.31	14.94	568.17	1.09	524.76	0.92	0.91
HUB	20.04	1.33	13.87	571.02	1.09	513.91	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.40	28.56	24.20	4.36	0.93	0.34	2.90	
MEAN	38.86	17.00	12.70	4.30	0.93	0.28	3.51	0.91
HUB	44.33	-5.70	-9.30	3.60	0.93	0.13	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	731.981	451.497	576.148	1124.217	0.651	-0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.865	14.936	525.193	24.000	38.084	35.400	-2.684

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	589.932	451.497	742.879	1140.879	0.517	0.328

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.777	16.477	540.877	528.796	0.027	0.467

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	540.721	0.000	540.721	1145.770	0.472	0.387

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.915	545.524	0.000	0.060	0.041	0.413

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	19.706	1.304	569.944	47.134	210.574	1.632

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
293452.344	0.576	2953.972	1788956.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.026 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
178.130	3965.000	19.706	569.944	1.000	1.000	0.980

W Kg/sec = 80.96808

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
139.286	3782.554	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
137032.094	139772.453	1.456	590.487	405.648	474.134	1.169

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	513.39	-0.18	513.39	0.45	678.32
MEAN	18.08	0.00	-0.02	513.39	-0.18	513.39	0.45	
HUB	15.21	0.00	-0.02	513.39	-0.18	513.39	0.45	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.18	46.36	7.82	711.05	877.16	17.18	547.94	0.76
MEAN	50.63	42.30	8.33	625.53	809.37	17.18	547.94	0.70
HUB	45.72	37.84	7.88	526.28	735.34	17.18	547.94	0.64

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	611.22	351.66	499.93	1180.02	0.52
MEAN	18.01	623.84	358.45	510.58	1174.59	0.53
HUB	15.22	677.20	430.93	522.40	1169.26	0.58

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	706.56	613.09	354.90	0.52	7184.50	
MEAN	623.16	575.12	264.71	0.49	6458.95	1.53
HUB	526.73	531.12	95.81	0.45	6562.70	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.46	1.24	20.37	609.85	1.07	578.66	0.92	0.91
MEAN	23.95	1.22	19.76	605.82	1.06	573.33	0.92	0.91
HUB	24.02	1.22	19.13	606.40	1.06	568.11	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.12	35.37	31.50	3.87	0.93	0.37	2.90	
MEAN	35.07	27.40	23.50	3.90	0.93	0.36	3.30	0.91
HUB	39.52	10.39	6.50	3.89	0.93	0.35	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	965.672	359.461	896.276	1128.791	0.855	-1.099

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.099	14.933	529.503	46.000	21.854	30.600	8.746

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	888.083	359.461	958.073	1141.493	0.778	-0.852

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	23.896	16.012	541.508	361.848	0.056	0.209

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	883.939	0.000	883.939	1142.397	0.774	0.212

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	15.865	542.148	0.000	0.060	0.128	-0.885

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    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.804      23.580       1.197     607.356      37.412     231.680       1.796

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 233081.891       0.467    2346.266 1593116.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.026   EfDer =  0.861

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    178.130    3965.000      23.580     607.356       1.000       1.000       0.710
W Kg/sec =   80.96808

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    120.165    3664.203       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 137032.094  139772.453       1.129     395.194     349.987     307.469       0.879

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   761.82    -0.26   761.82     0.66   641.74
 MEAN    17.74     0.00    -0.02   761.82    -0.26   761.82     0.66
 HUB     15.05     0.00    -0.02   761.82    -0.26   761.82     0.66

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.36    46.36    -4.00   694.45  1031.01    17.64   558.92     0.89
 MEAN    38.87    43.40    -4.53   613.77   978.47    17.64   558.92     0.84
 HUB     34.37    38.84    -4.47   520.75   922.94    17.64   558.92     0.80

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   580.07   297.43   498.01  1213.40     0.48
 MEAN    17.51   593.58   313.51   504.04  1209.87     0.49
 HUB     14.85   645.86   393.28   512.32  1206.44     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   631.32   388.02     0.52  5897.41
 MEAN   605.75   582.63   292.24     0.48  5493.07     1.78
 HUB    513.83   526.31   120.54     0.44  5844.20

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.26     1.16    23.31   640.09     1.05   612.01     0.92     0.79
 MEAN    27.00     1.14    22.90   637.85     1.05   608.45     0.92     0.79
 HUB     27.23     1.15    22.40   639.79     1.05   604.99     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.85    37.92    31.50     6.42     0.93     0.44     2.90
 MEAN    31.88    30.11    23.50     6.61     0.88     0.45     3.28     0.79
 HUB     37.51    13.24     6.50     6.74     0.88     0.48     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.861

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     599.983     315.563     510.293    1210.583       0.496       0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.118      22.924     609.203      46.000      31.732      31.500      -0.232

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     17.392     519.789     315.563     608.080    1218.006       0.427       0.238

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.078      23.888     616.697     471.992       0.019       0.337

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     503.755       0.000     503.755    1219.357       0.413       0.252

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.008     618.067       0.000       0.060       0.037       0.266

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.754      27.004       1.145     639.243      31.887     260.136       2.017

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 198805.469       0.423    2001.230 2380338.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.026   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    178.130    3965.000      27.004     639.243       1.000       1.000       0.980
W Kg/sec =   80.96808

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    107.647    3571.644       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 137032.094  139772.453       1.637     513.330     313.554     401.059       1.279

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   471.62    -0.16   471.62     0.39   600.29
 MEAN    16.97     0.00    -0.02   471.62    -0.16   471.62     0.39
 HUB     14.32     0.00    -0.02   471.62    -0.16   471.62     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.72    46.36     8.36   666.42   816.55    24.36   620.69     0.67
 MEAN    51.24    43.80     7.44   587.21   753.28    24.36   620.69     0.62
 HUB     46.42    37.84     8.58   495.49   684.17    24.36   620.69     0.56

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   566.69   320.13   467.61  1246.47     0.45
 MEAN    16.57   576.20   326.14   475.01  1242.17     0.46
 HUB     13.89   621.72   391.18   483.23  1237.92     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   574.14   333.14     0.46  6047.24
 MEAN   573.48   535.55   247.34     0.43  5408.12     1.53
 HUB    480.61   491.44    89.43     0.40  5435.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.81     1.18    27.60   672.78     1.05   646.00     0.92     0.91
 MEAN    31.27     1.16    26.98   669.24     1.05   641.55     0.92     0.91
 HUB     31.30     1.16    26.34   669.39     1.05   637.16     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.40    35.47    31.50     3.97     0.93     0.36     2.90
 MEAN    34.47    27.51    23.50     4.01     0.93     0.35     3.29     0.91
 HUB     38.99    10.49     6.50     3.99     0.93     0.35     3.90


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     568.699     327.972     464.599    1244.033       0.457       0.052

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.413      27.216     643.500      46.000      35.219      32.400      -2.819

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     477.984     327.972     579.685    1251.664       0.382       0.311

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.372      28.366     651.418     456.573       0.019       0.396

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     453.864       0.000     453.864    1253.463       0.362       0.302

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.570     653.293       0.000       0.060       0.039       0.356

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      31.282       1.158     670.472      31.228     236.821       1.836

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 194842.781       0.457    1961.341 1518796.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.026   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    178.130    3965.000      31.282     670.472       1.000       1.000       0.980
W Kg/sec =   80.96808

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     95.169    3487.475       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 137032.094  139772.453       1.838     509.668     277.236     390.276       1.408

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   422.68    -0.15   422.68     0.34   557.53
 MEAN    15.91     0.00    -0.02   422.68    -0.15   422.68     0.34
 HUB     13.07     0.00    -0.02   422.68    -0.15   422.68     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.31    47.36     8.95   633.89   762.01    28.92   655.58     0.61
 MEAN    52.50    44.80     7.70   550.61   694.25    28.92   655.58     0.55
 HUB     46.94    38.84     8.10   452.24   619.12    28.92   655.58     0.49

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   528.90   317.99   422.63  1277.52     0.41
 MEAN    15.50   530.80   311.68   429.66  1272.79     0.42
 HUB     12.59   563.23   354.98   437.29  1268.10     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   519.88   302.75     0.41  5707.46
 MEAN   536.24   484.80   224.55     0.38  4832.61     1.58
 HUB    435.63   444.66    80.65     0.35  4471.13

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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  TIP     36.25     1.16    32.22   702.10     1.05   678.79     0.92     0.91
  MEAN    35.46     1.13    31.46   697.25     1.04   673.77     0.92     0.91
  HUB     35.13     1.12    30.68   695.25     1.04   668.81     0.92     0.91

          Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     36.96    35.62    31.50     4.12     0.93     0.39     2.90
  MEAN    35.96    27.59    23.50     4.09     0.93     0.37     3.34     0.91
  HUB     39.07    10.45     6.50     3.95     0.93     0.35     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.999

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     537.162     317.396     433.363    1273.143       0.422      -0.005

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      35.532      31.435     674.152      46.000      36.219      33.000      -3.219

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     451.290     317.396     551.727    1279.806       0.353       0.262

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      35.464      32.541     681.226     440.827       0.036       0.415

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     421.647       0.000     421.647    1281.830       0.329       0.349

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      32.888     683.382       0.000       0.060       0.040       0.345

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.881      35.448       1.133     698.199      27.727     244.067       1.892

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  173156.953       0.449    1743.046 1541415.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1093339.50  11005.8555    174.0149      2.3465      0.8259      7.0256      1.3355


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 105% Stat 2 27% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.502   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     175.471    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   79.75962

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     171.418    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  134986.875  137686.328       1.666     831.557     499.206     619.754       1.241

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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```
TIP     20.63     0.00    -0.02   418.02    -0.14   418.02     0.38   710.99
MEAN    17.06     0.00    -0.02   418.02    -0.14   418.02     0.38
HUB     12.51     0.00    -0.02   418.02    -0.14   418.02     0.38

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.65    50.47     9.18   713.82   827.34    13.69   508.21     0.75
MEAN    54.70    47.20     7.50   590.30   723.44    13.69   508.21     0.65
HUB     46.01    38.62     7.39   432.86   601.86    13.69   508.21     0.54

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   681.46   422.97   534.31  1132.20     0.60
MEAN    18.04   714.67   455.78   550.47  1125.13     0.64
HUB     15.00   817.86   576.87   579.76  1113.72     0.73

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    713.82   608.34   290.85     0.54  8728.91
MEAN   624.07   575.62   168.29     0.51  8222.93     1.40
HUB    519.02   582.64    57.85     0.52  8654.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.07     1.33    15.71   571.33     1.09   532.55     0.92     0.91
MEAN    19.75     1.31    15.05   568.52     1.09   525.87     0.92     0.91
HUB     20.02     1.33    13.98   570.92     1.09   515.09     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.37    28.56    24.20     4.36     0.93     0.35     2.90
MEAN    39.62    17.00    12.70     4.30     0.93     0.30     3.51     0.91
HUB     44.86    -5.70    -9.30     3.60     0.93     0.14     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     725.046     454.895     564.590    1125.450       0.644      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.898      15.047     526.346      24.000      38.859      35.400      -3.459

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     577.218     454.895     734.922    1142.511       0.505       0.342

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.807      16.636     542.425     528.796       0.028       0.479

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     529.568       0.000     529.568    1147.141       0.462       0.399

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.054     546.830       0.000       0.060       0.041       0.425

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      19.741       1.307     570.254      47.444     207.708       1.610

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 295377.781       0.580    2928.976 1757749.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
  RESET =  0.000BLEED =  0.000 DPInc = 7.502   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     175.471    3965.000      19.741     570.254       1.000       1.000       0.980
```

W Kg/sec = 79.75962

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
137.005	3781.528	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
134986.875	137686.328	1.480	590.487	399.004	474.134	1.188

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	503.09	-0.17	503.09	0.44	678.13
MEAN	18.08	0.00	-0.02	503.09	-0.17	503.09	0.44	
HUB	15.21	0.00	-0.02	503.09	-0.17	503.09	0.44	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.73	46.36	8.37	711.05	871.18	17.30	549.12	0.76
MEAN	51.20	42.30	8.90	625.53	802.87	17.30	549.12	0.70
HUB	46.30	37.84	8.46	526.28	728.19	17.30	549.12	0.63

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	607.20	359.11	489.62	1181.61	0.51
MEAN	18.01	618.67	363.92	500.31	1176.00	0.53
HUB	15.22	670.65	432.94	512.18	1170.50	0.57

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	706.56	600.37	347.44	0.51	7336.63	
MEAN	623.16	563.49	259.24	0.48	6557.32	1.55
HUB	526.73	520.70	93.79	0.44	6593.26	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.60	1.25	20.54	611.00	1.07	580.22	0.92	0.91
MEAN	24.05	1.22	19.91	606.68	1.06	574.72	0.92	0.91
HUB	24.07	1.22	19.26	606.88	1.06	569.33	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.26	35.36	31.50	3.86	0.93	0.38	2.90	
MEAN	36.03	27.39	23.50	3.89	0.93	0.37	3.30	0.91
HUB	40.21	10.38	6.50	3.88	0.93	0.36	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	934.092	364.942	859.853	1134.961	0.823	-1.017

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.197	15.504	535.337	46.000	22.998	30.600	7.602

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	848.275	364.942	923.446	1148.407	0.739	-0.736

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	24.028	16.716	548.107	361.848	0.049	0.231

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	840.402	0.000	840.402	1149.692	0.731	0.267

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	16.663	549.228	0.000	0.060	0.106	-0.748

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.824      23.782       1.205     608.186      37.932     226.981       1.760

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 236324.156       0.473    2343.398 1562416.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.502   EfDer =  0.884

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    175.471    3965.000      23.782     608.186       1.000       1.000       0.710
W Kg/sec =   79.75962

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    117.445    3661.704       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134986.875  137686.328       1.155     395.194     342.063     307.469       0.899

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   733.12    -0.25   733.12     0.63   641.31
 MEAN    17.74     0.00    -0.02   733.12    -0.25   733.12     0.63
 HUB     15.05     0.00    -0.02   733.12    -0.25   733.12     0.63

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.46    46.36    -2.90   694.45  1009.99    18.20   563.33     0.87
 MEAN    39.95    43.40    -3.45   613.77   956.29    18.20   563.33     0.82
 HUB     35.40    38.84    -3.44   520.75   899.40    18.20   563.33     0.77

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   573.50   311.28   481.67  1216.35     0.47
 MEAN    17.51   585.75   323.81   488.11  1212.44     0.48
 HUB     14.85   636.25   397.97   496.41  1208.67     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   609.93   374.17     0.50  6171.55
 MEAN   605.75   563.68   281.94     0.46  5673.24     1.80
 HUB    513.83   509.75   115.85     0.42  5913.70

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.78     1.17     23.86   642.44     1.06   614.99     0.92     0.81
 MEAN    27.45     1.15     23.39   639.67     1.05   611.04     0.92     0.81
 HUB     27.61     1.16     22.85   641.01     1.05   607.23     0.92     0.81

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.87    37.84    31.50     6.34     0.93     0.45     2.90
 MEAN    33.56    30.01    23.50     6.51     0.89     0.46     3.28     0.81
 HUB     38.72    13.14     6.50     6.64     0.89     0.49     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.884

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     591.854     325.933     494.023    1213.171       0.488       0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.570      23.425     611.810      46.000      33.415      31.500      -1.915

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     501.827     325.933     598.383    1221.290       0.411       0.268

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      27.529      24.505     620.026     471.992       0.020       0.363

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     486.617       0.000     486.617    1222.525       0.398       0.279

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.610     621.281       0.000       0.060       0.038       0.293

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.777      27.452       1.154     641.041      32.856     249.523       1.934

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 204848.109       0.436    2031.281 2304849.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.502   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    175.471    3965.000      27.452     641.041       1.000       1.000       0.980
W Kg/sec =   79.75962

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.456    3566.633       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134986.875  137686.328       1.687     513.330     304.259     401.059       1.318

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   455.97    -0.16   455.97     0.37   599.44
 MEAN    16.97     0.00    -0.02   455.97    -0.16   455.97     0.37
 HUB     14.32     0.00    -0.02   455.97    -0.16   455.97     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.63    46.36     9.27   666.42   807.61    24.94   623.70     0.66
 MEAN    52.18    43.80     8.38   587.21   743.57    24.94   623.70     0.61
 HUB     47.39    37.84     9.55   495.49   673.48    24.94   623.70     0.55

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   560.38   331.74   451.63  1249.93     0.45
 MEAN    16.57   568.12   334.65   459.10  1245.40     0.46
 HUB     13.89   611.50   394.34   467.37  1240.91     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   554.40   321.53     0.44  6266.22
 MEAN   573.48   517.50   238.83     0.42  5549.09     1.57
 HUB    480.61   475.27    86.27     0.38  5479.56

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.50     1.18    28.31   675.79     1.05   649.61     0.92     0.91
 MEAN    31.89     1.16    27.64   671.82     1.05   644.90     0.92     0.91
 HUB     31.83     1.16    26.96   671.43     1.05   640.25     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.30    35.45    31.50     3.95     0.93     0.38     2.90
 MEAN    36.09    27.48    23.50     3.98     0.93     0.37     3.29     0.91
 HUB     40.16    10.46     6.50     3.96     0.93     0.37     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     561.280     336.531     449.202    1247.161       0.450       0.051

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.027      27.868     646.741      46.000      36.840      32.400      -4.440

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     461.220     336.531     570.943    1255.361       0.367       0.337

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.979      29.130     655.273     456.573       0.021       0.421

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     16.096     438.332       0.000     438.332    1257.005       0.349       0.324

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      29.306     656.990       0.000       0.060       0.043       0.376

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      31.879       1.161     673.014      31.973     228.771       1.773

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 199499.547       0.467    1978.244 1485452.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.502   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    175.471    3965.000      31.879     673.014       1.000       1.000       0.980
W Kg/sec =   79.75962

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.165    3480.882       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134986.875  137686.328       1.898     509.668     268.486     390.276       1.454

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   408.50    -0.14   408.50     0.32   556.48
 MEAN    15.91     0.00    -0.02   408.50    -0.14   408.50     0.32
 HUB     13.07     0.00    -0.02   408.50    -0.14   408.50     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.21    47.36     9.85   633.89   754.23    29.64   659.11     0.60
 MEAN    53.44    44.80     8.64   550.61   685.71    29.64   659.11     0.54
 HUB     47.92    38.84     9.08   452.24   609.52    29.64   659.11     0.48

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   523.98   328.54   408.19  1281.28     0.41
 MEAN    15.50   523.84   319.46   415.16  1276.38     0.41
 HUB     12.59   553.85   357.85   422.72  1271.51     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   502.00   292.20     0.39  5896.58
 MEAN   536.24   468.35   216.78     0.37  4953.07     1.62
 HUB    435.63   429.81    77.78     0.34  4507.18

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     37.09     1.16    33.06   705.69     1.05   682.80     0.92     0.91
 MEAN    36.22     1.14    32.25   700.46     1.04   677.59     0.92     0.91
 HUB     35.81     1.12    31.43   697.99     1.04   672.42     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.83    35.60    31.50     4.10     0.93     0.41     2.90
 MEAN    37.58    27.57    23.50     4.07     0.93     0.39     3.34     0.91
 HUB     40.25    10.43     6.50     3.93     0.93     0.37     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     530.261     325.315     418.744    1276.711       0.415      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.292      32.228     677.944      46.000      37.843      33.000      -4.843

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     435.380     325.315     543.495    1283.881       0.339       0.289

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      36.211      33.439     685.580     440.827       0.040       0.439

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     407.099       0.000     407.099    1285.739       0.317       0.371

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      33.760     687.565       0.000       0.060       0.045       0.367

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      36.191       1.135     701.377      28.363     235.876       1.828

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 177144.391       0.460    1756.570 1508111.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1113194.00  11038.4707    171.4177      2.3956      0.8334      7.5023      1.3416


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 105% Stat 2 27% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 7.973   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    172.852    3965.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   78.56920

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    168.859    3949.384       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132972.188  135631.328       1.691     831.557     491.755     619.754       1.260

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   410.77    -0.14   410.77     0.37   710.99
 MEAN    17.06     0.00    -0.02   410.77    -0.14   410.77     0.37
 HUB     12.51     0.00    -0.02   410.77    -0.14   410.77     0.37
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.09    50.47     9.62   713.82   823.70    13.73   508.72     0.74
MEAN    55.17    47.20     7.97   590.30   719.28    13.73   508.72     0.65
HUB     46.51    38.62     7.89   432.86   596.85    13.73   508.72     0.54

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   676.85   428.71   523.77  1133.43     0.60
MEAN    18.04   708.63   459.05   539.84  1126.22     0.63
HUB     15.00   808.94   575.71   568.28  1114.88     0.73

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    713.82   596.34   285.11     0.53  8847.18
MEAN   624.07   564.50   165.02     0.50  8281.86     1.43
HUB    519.02   571.10    56.69     0.51  8637.45

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.14     1.33    15.82   571.99     1.09   533.73     0.92     0.91
MEAN    19.79     1.31    15.15   568.84     1.09   526.91     0.92     0.91
HUB     20.01     1.32    14.09   570.82     1.09   516.20     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.30    28.56    24.20     4.36     0.93     0.37     2.90
MEAN    40.38    17.00    12.70     4.30     0.93     0.31     3.51     0.91
HUB     45.37    -5.70    -9.30     3.60     0.93     0.15     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     718.524     458.159     553.504    1126.607       0.638       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.928      15.151     527.429      24.000      39.616      35.400      -4.216

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     565.127     458.159     727.515    1144.037       0.494       0.356

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.833      16.783     543.875     528.796       0.029       0.490

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     519.057       0.000     519.057    1148.417       0.452       0.409

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.178     548.047       0.000       0.060       0.043       0.435

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      19.766       1.308     570.550      47.740     204.941       1.589

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 297221.531       0.583    2903.271 1727269.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.973   EfDer =  0.994

    W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     172.852    3965.000      19.766     570.550       1.000       1.000       0.980
W Kg/sec =   78.56920

    W cor      RPM cor        GAMMA       Cp         R          Blades       THK
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   134.821    3780.546       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
132972.188  135631.328       1.504     590.487     392.644     474.134       1.208

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   493.37    -0.17   493.37     0.43   677.96
MEAN    18.08     0.00    -0.02   493.37    -0.17   493.37     0.43
HUB     15.21     0.00    -0.02   493.37    -0.17   493.37     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.25    46.36     8.89   711.05   865.59    17.42   550.23     0.75
MEAN    51.74    42.30     9.44   625.53   796.81    17.42   550.23     0.69
HUB     46.86    37.84     9.02   526.28   721.50    17.42   550.23     0.63

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   603.64   366.05   479.99  1183.07     0.51
MEAN    18.01   613.96   369.03   490.68  1177.31     0.52
HUB     15.22   664.55   434.81   502.56  1171.65     0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    706.56   588.50   340.50     0.50  7478.29
MEAN   623.16   552.59   254.14     0.47  6649.25     1.57
HUB    526.73   510.90    91.92     0.44  6621.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.72     1.25    20.69   612.09     1.07   581.67     0.92     0.91
MEAN    24.13     1.22    20.04   607.48     1.06   576.01     0.92     0.91
HUB     24.11     1.22    19.38   607.33     1.06   570.46     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.33    35.35    31.50     3.85     0.93     0.39     2.90
MEAN    36.95    27.38    23.50     3.88     0.94     0.38     3.30     0.91
HUB     40.87    10.37     6.50     3.87     0.94     0.37     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.994

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     908.459     370.064     829.669    1139.945       0.797      -0.952

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.279      15.969     540.061      46.000      24.039      30.600       6.561

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     816.005     370.064     895.997    1153.902       0.707      -0.644

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      24.135      17.282     553.372     361.848       0.044       0.249

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     806.246       0.000     806.246    1155.343       0.698       0.307

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.680      17.284     554.699       0.000       0.060       0.090      -0.643

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.838      23.938       1.211     608.967      38.417     222.644       1.726

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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239346.094       0.479    2337.941 1532803.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.973   EfDer =  0.904

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    172.852    3965.000      23.938     608.967       1.000       1.000       0.710
W Kg/sec =   78.56920

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    115.014    3659.355       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132972.188  135631.328       1.180     395.194     334.983     307.469       0.918

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   709.17    -0.24   709.17     0.61   640.89
 MEAN    17.74     0.00    -0.02   709.17    -0.24   709.17     0.61
 HUB     15.05     0.00    -0.02   709.17    -0.24   709.17     0.61

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.41    46.36    -1.95   694.45   992.73    18.66   567.00     0.85
 MEAN    40.89    43.40    -2.51   613.77   938.05    18.66   567.00     0.80
 HUB     36.30    38.84    -2.54   520.75   879.97    18.66   567.00     0.75

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   568.36   323.16   467.55  1218.89     0.47
 MEAN    17.51   579.34   332.65   474.31  1214.68     0.48
 HUB     14.85   628.10   401.95   482.65  1210.61     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   591.49   362.29     0.49  6406.62
 MEAN   605.75   547.32   273.10     0.45  5827.90     1.82
 HUB    513.83   495.45   111.88     0.41  5972.63

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.22     1.18    24.31   644.53     1.06   617.57     0.92     0.83
 MEAN    27.81     1.16    23.80   641.31     1.05   613.31     0.92     0.83
 HUB     27.92     1.17    23.23   642.12     1.05   609.20     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.65    37.77    31.50     6.27     0.93     0.46     2.90
 MEAN    35.04    29.93    23.50     6.43     0.89     0.47     3.28     0.83
 HUB     39.79    13.05     6.50     6.55     0.89     0.50     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.904

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     585.210     334.833     479.956    1215.412       0.481       0.009

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    27.943      23.840     614.072      46.000      34.901      31.500      -3.401

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     486.466     334.833     590.561    1224.120       0.397       0.294

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.897      25.017     622.903     471.992       0.021       0.386

   VANED DIFFUSER EXIT:
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   R4          C4           Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     471.997       0.000     471.997    1225.256       0.385       0.301

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.105     624.060       0.000       0.060       0.041       0.315

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.794      27.814       1.162     642.652      33.685     240.862       1.867

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 210023.281       0.447    2051.515 2239085.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.973   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    172.852    3965.000      27.814     642.652       1.000       1.000       0.980
W Kg/sec =   78.56920

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.684    3562.161       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132972.188  135631.328       1.733     513.330     296.187     401.059       1.354

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   442.58    -0.15   442.58     0.36   598.69
 MEAN    16.97      0.00    -0.02   442.58    -0.15   442.58     0.36
 HUB     14.32      0.00    -0.02   442.58    -0.15   442.58     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.42    46.36    10.06   666.42   800.12    25.42   626.32     0.65
 MEAN    53.00    43.80     9.20   587.21   735.44    25.42   626.32     0.60
 HUB     48.24    37.84    10.40   495.49   664.48    25.42   626.32     0.54

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   555.51   341.49   438.14  1252.89     0.44
 MEAN    16.57   561.61   341.83   445.61  1248.17     0.45
 HUB     13.89   602.98   396.97   453.87  1243.49     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   537.75   311.78     0.43  6450.28
 MEAN   573.48   502.22   231.65     0.40  5667.96     1.60
 HUB    480.61   461.51    83.64     0.37  5516.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     33.06     1.19    28.88   678.42     1.06   652.69     0.92     0.91
 MEAN    32.39     1.16    28.18   674.08     1.05   647.78     0.92     0.91
 HUB     32.26     1.16    27.46   673.24     1.05   642.92     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.93    35.44    31.50     3.94     0.93     0.40     2.90
 MEAN    37.49    27.47    23.50     3.97     0.93     0.39     3.29     0.91
 HUB     41.17    10.44     6.50     3.94     0.93     0.38     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3           Mach3       cp 2-3
     16.481     555.320     343.748     436.139    1249.847       0.444       0.049
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Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
32.522	28.397	649.533	46.000	38.244	32.400	-5.844

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	447.103	343.748	563.971	1258.521	0.355	0.359

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	32.465	29.751	658.579	456.573	0.023	0.443

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	425.263	0.000	425.263	1260.038	0.337	0.342

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	29.900	660.168	0.000	0.060	0.048	0.393

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.872	32.354	1.163	675.250	32.599	222.124	1.722

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
203416.578	0.477	1986.980	1454448.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 7.973 EfDer = 0.994

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
172.852	3965.000	32.354	675.250	1.000	1.000	0.980

W Kg/sec = 78.56920

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
89.605	3475.114	1.401	0.250	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
132972.188	135631.328	1.953	509.668	261.029	390.276	1.495

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	396.54	-0.14	396.54	0.31	555.56
MEAN	15.91	0.00	-0.02	396.54	-0.14	396.54	0.31	
HUB	13.07	0.00	-0.02	396.54	-0.14	396.54	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.98	47.36	10.62	633.89	747.82	30.21	662.15	0.59
MEAN	54.25	44.80	9.45	550.61	678.65	30.21	662.15	0.54
HUB	48.76	38.84	9.92	452.24	601.57	30.21	662.15	0.48

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	520.29	337.30	396.14	1284.49	0.41
MEAN	15.50	518.31	325.92	403.02	1279.45	0.41
HUB	12.59	546.12	360.21	410.48	1274.43	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.74	487.10	283.44	0.38	6053.72	
MEAN	536.24	454.60	210.32	0.36	5053.15	1.65
HUB	435.63	417.35	75.41	0.33	4536.88	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	37.76	1.17	33.72	708.79	1.05	686.23	0.92	0.91
MEAN	36.82	1.14	32.89	703.25	1.04	680.86	0.92	0.91
HUB	36.35	1.12	32.03	700.39	1.04	675.53	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.41	35.58	31.50	4.08	0.93	0.43	2.90	

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 MEAN    38.96    27.56    23.50     4.06     0.94     0.40     3.34     0.91
 HUB     41.27    10.41     6.50     3.91     0.94     0.38     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     524.789     331.896     406.507    1279.755       0.410       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.894      32.859     681.190      46.000      39.230      33.000      -6.230

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     422.167     331.896     537.010    1287.339       0.328       0.311

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      36.797      34.155     689.288     440.827       0.044       0.461

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     394.995       0.000     394.995    1289.066       0.306       0.389

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      34.453     691.139       0.000       0.060       0.050       0.384

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.872      36.773       1.137     704.140      28.890     229.194       1.777

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 180453.391       0.468    1762.675 1477135.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1130460.88  11042.3828     168.8593      2.4341      0.8377      7.9735      1.3468


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 105% Stat 2 27% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    170.196    3965.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   77.36173

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    166.264    3949.384       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 130928.648  133546.938       1.717     831.557     484.198     619.754       1.280

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   403.48    -0.14   403.48     0.36   710.99
 MEAN    17.06     0.00    -0.02   403.48    -0.14   403.48     0.36
 HUB     12.51     0.00    -0.02   403.48    -0.14   403.48     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.53    50.47    10.06   713.82   820.08    13.78   509.21     0.74
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 MEAN    55.65    47.20     8.45   590.30   715.13    13.78   509.21     0.65
 HUB     47.02    38.62     8.40   432.86   591.85    13.78   509.21     0.53

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   672.47   434.39   513.34  1134.63     0.59
 MEAN    18.04   702.76   462.29   529.30  1127.28     0.62
 HUB     15.00   800.18   574.58   556.90  1116.00     0.72

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    713.82   584.47   279.44     0.52  8964.26
 MEAN   624.07   553.48   161.78     0.49  8340.16     1.45
 HUB    519.02   559.67    55.56     0.50  8620.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.21     1.34    15.93   572.64     1.10   534.87     0.92     0.91
 MEAN    19.82     1.31    15.24   569.17     1.09   527.93     0.92     0.91
 HUB     19.99     1.32    14.19   570.73     1.09   517.27     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.24    28.56    24.20     4.36     0.93     0.38     2.90
 MEAN    41.13    17.00    12.70     4.30     0.93     0.32     3.51     0.91
 HUB     45.90    -5.70    -9.30     3.60     0.93     0.17     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     712.196     461.387     542.535    1127.727       0.632       0.001

     Pt3          Ps3         Ts3          Vane No.     Alpha3     Vane A3      Incid3
     19.956      15.250     528.478       24.000      40.379      35.400      -4.979

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth         Cmth          Aoth          Machth      cp 2-Th
     18.071     553.251     461.387     720.393    1145.512       0.483       0.369

   BlockageThr  PtTh        PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.950      19.856      16.923     545.278     528.796       0.030       0.502

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     508.806       0.000     508.806    1149.646       0.443       0.418

   Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.292     549.220        0.000       0.060       0.045       0.445

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      19.785       1.310     570.843      48.033     202.182       1.567

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 299048.938       0.587    2876.229 1696606.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.992

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    170.196    3965.000      19.785     570.843       1.000       1.000       0.980
W Kg/sec =   77.36173

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    132.659    3779.574       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 130928.648  133546.938       1.528     590.487     386.349     474.134       1.227

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   483.86    -0.17   483.86     0.42   677.78
MEAN    18.08     0.00    -0.02   483.86    -0.17   483.86     0.42
HUB     15.21     0.00    -0.02   483.86    -0.17   483.86     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.77    46.36     9.41   711.05   860.21    17.52   551.30     0.75
MEAN    52.28    42.30     9.98   625.53   790.96    17.52   551.30     0.69
HUB     47.41    37.84     9.57   526.28   715.03    17.52   551.30     0.62

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   600.40   372.77   470.66  1184.47     0.51
MEAN    18.01   609.53   373.98   481.32  1178.57     0.52
HUB     15.22   658.69   436.62   493.19  1172.76     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    706.56   577.01   333.79     0.49  7615.30
MEAN   623.16   542.00   249.19     0.46  6738.30     1.59
HUB    526.73   501.35    90.11     0.43  6649.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.83     1.25    20.83   613.14     1.07   583.05     0.92     0.91
MEAN    24.20     1.22    20.16   608.27     1.07   577.25     0.92     0.91
HUB     24.14     1.22    19.48   607.78     1.06   571.55     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.38    35.34    31.50     3.84     0.93     0.40     2.90
MEAN    37.85    27.37    23.50     3.87     0.94     0.39     3.30     0.91
HUB     41.52    10.35     6.50     3.85     0.94     0.38     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     886.197     375.026     802.933    1144.256       0.774      -0.896

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.348      16.371     544.159      46.000      25.036      30.600       5.564

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     787.826     375.026     872.533    1158.619       0.680      -0.564

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      24.225      17.770     557.908     361.848       0.039       0.265

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     777.069       0.000     777.069    1160.112       0.670       0.339

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.680      17.807     559.316       0.000       0.060       0.077      -0.556

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.847      24.063       1.216     609.730      38.886     218.488       1.694

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 242272.000       0.485    2330.153 1503323.000
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.453   EfDer =  0.921

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    170.196    3965.000      24.063     609.730       1.000       1.000       0.710
W Kg/sec =   77.36173

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.726    3657.065       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 130928.648  133546.938       1.204     395.194     328.319     307.469       0.936

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   687.79    -0.24   687.79     0.59   640.49
 MEAN    17.74     0.00    -0.02   687.79    -0.24   687.79     0.59
 HUB     15.05     0.00    -0.02   687.79    -0.24   687.79     0.59

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.29    46.36    -1.07   694.45   977.57    19.05   570.25     0.83
 MEAN    41.76    43.40    -1.64   613.77   921.99    19.05   570.25     0.79
 HUB     37.14    38.84    -1.70   520.75   862.83    19.05   570.25     0.74

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   564.12   333.91   454.68  1221.19     0.46
 MEAN    17.51   573.78   340.66   461.71  1216.72     0.47
 HUB     14.85   620.82   405.52   470.08  1212.41     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    685.45   574.73   351.54     0.47  6619.50
 MEAN   605.75   532.39   265.08     0.44  5968.06     1.85
 HUB    513.83   482.39   108.31     0.40  6025.54

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.61     1.19    24.71   646.47     1.06   619.91     0.92     0.84
 MEAN    28.13     1.17    24.16   642.85     1.05   615.38     0.92     0.84
 HUB     28.18     1.17    23.56   643.17     1.05   611.01     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.29    37.71    31.50     6.21     0.93     0.47     2.90
 MEAN    36.42    29.86    23.50     6.36     0.89     0.48     3.28     0.84
 HUB     40.78    12.97     6.50     6.47     0.89     0.50     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.921

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     579.465     342.900     467.119    1217.459       0.476       0.011

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    28.264      24.200     616.144      46.000      36.281      31.500      -4.781

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     472.570     342.900     583.869    1226.695       0.385       0.318

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      28.212      25.464     625.529     471.992       0.023       0.407

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     458.797       0.000     458.797    1227.744       0.374       0.320
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	25.534	626.599	0.000	0.060	0.044	0.334

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.808	28.121	1.169	644.165	34.435	233.314	1.809

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
214705.734	0.457	2065.022	2178224.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 8.453 EfDer = 0.992

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
170.196	3965.000	28.121	644.165	1.000	1.000	0.980

W Kg/sec = 77.36173

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
99.145	3557.974	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
130928.648	133546.938	1.778	513.330	288.792	401.059	1.389

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	430.46	-0.15	430.46	0.35	597.99
MEAN	16.97	0.00	-0.02	430.46	-0.15	430.46	0.35	
HUB	14.32	0.00	-0.02	430.46	-0.15	430.46	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.15	46.36	10.79	666.42	793.48	25.83	628.71	0.65
MEAN	53.76	43.80	9.96	587.21	728.20	25.83	628.71	0.59
HUB	49.03	37.84	11.19	495.49	656.47	25.83	628.71	0.53

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	551.52	350.21	426.06	1255.56	0.44
MEAN	16.57	556.03	348.24	433.48	1250.69	0.44
HUB	13.89	595.45	399.33	441.70	1245.84	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	653.27	522.85	303.06	0.42	6614.85	
MEAN	573.48	488.50	225.24	0.39	5774.16	1.63
HUB	480.61	449.11	81.28	0.36	5548.81	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	33.53	1.19	29.37	680.85	1.06	655.48	0.92	0.91
MEAN	32.81	1.17	28.64	676.19	1.05	650.40	0.92	0.91
HUB	32.61	1.16	27.89	674.94	1.05	645.37	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.42	35.42	31.50	3.92	0.93	0.42	2.90	
MEAN	38.78	27.46	23.50	3.96	0.94	0.40	3.29	0.91
HUB	42.12	10.43	6.50	3.93	0.94	0.39	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	550.220	350.196	424.387	1252.288	0.439	0.047

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
32.940	28.847	652.076	46.000	39.529	32.400	-7.129

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	434.477	350.196	558.039	1261.381	0.344	0.379

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	32.874	30.282	661.580	456.573	0.025	0.463

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	413.577	0.000	413.577	1262.790	0.328	0.358

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	30.405	663.058	0.000	0.060	0.053	0.407

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.866	32.751	1.165	677.323	33.158	216.277	1.677

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
206916.172	0.485	1990.103	1424355.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 8.453 EfDer = 0.991

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
170.196	3965.000	32.751	677.323	1.000	1.000	0.980

W Kg/sec = 77.36173

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
87.293	3469.793	1.401	0.250	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
130928.648	133546.938	2.004	509.668	254.294	390.276	1.535

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	385.83	-0.13	385.83	0.31	554.71
MEAN	15.91	0.00	-0.02	385.83	-0.13	385.83	0.31	
HUB	13.07	0.00	-0.02	385.83	-0.13	385.83	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.68	47.36	11.32	633.89	742.19	30.70	664.92	0.59
MEAN	54.99	44.80	10.19	550.61	672.44	30.70	664.92	0.53
HUB	49.54	38.84	10.70	452.24	594.56	30.70	664.92	0.47

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	517.31	345.05	385.43	1287.37	0.40
MEAN	15.50	513.64	331.66	392.20	1282.22	0.40
HUB	12.59	539.35	362.29	399.56	1277.09	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.74	473.88	275.69	0.37	6192.64	
MEAN	536.24	442.35	204.58	0.34	5142.05	1.68
HUB	435.63	406.23	73.34	0.32	4562.91	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	38.32	1.17	34.28	711.63	1.05	689.33	0.92	0.91
MEAN	37.33	1.14	33.42	705.81	1.04	683.82	0.92	0.91
HUB	36.79	1.12	32.54	702.60	1.04	678.36	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.84	35.58	31.50	4.08	0.93	0.44	2.90	
MEAN	40.22	27.55	23.50	4.05	0.94	0.42	3.34	0.91
HUB	42.20	10.40	6.50	3.90	0.94	0.39	4.06	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      520.168     337.742     395.608     1282.506       0.406       -0.007

     Pt3          Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     37.396       33.389      684.133      46.000      40.488       33.000      -7.488

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      410.463     337.742     531.554     1290.455       0.318        0.331

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       37.283      34.757     692.640     440.827        0.048        0.480

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      384.261       0.000     384.261     1292.071       0.297        0.405

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       35.035      694.375       0.000       0.060       0.055        0.399

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.866       37.253        1.137      706.680       29.357      223.364        1.732

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  183382.062       0.476    1763.754 1447037.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
   1146325.00  11025.2607     166.2643      2.4660       0.8398       8.4529       1.3517


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

   Fan-Core + 4 Stage LPC 105% Stat 2 27% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    167.434     3965.000       15.107      522.810        1.000        1.000        0.980
 W Kg/sec =   76.10618

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
    163.566     3949.384        1.402        0.249       53.349       32.000        0.050

   CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
  128803.711  131379.516        1.746      831.557      476.339      619.754        1.301

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   395.96    -0.14   395.96      0.36   710.99
  MEAN    17.06      0.00    -0.02   395.96    -0.14   395.96      0.36
  HUB     12.51      0.00    -0.02   395.96    -0.14   395.96      0.36

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
  TIP     60.99     50.47    10.52   713.82   816.41     13.83   509.71      0.74
  MEAN    56.15     47.20     8.95   590.30   710.92     13.83   509.71      0.64
  HUB     47.56     38.62     8.94   432.86   586.75     13.83   509.71      0.53
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      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   668.21   440.14   502.77  1135.82     0.59
MEAN    18.04   696.91   465.57   518.58  1128.34     0.62
HUB     15.00   791.33   573.41   545.34  1117.12     0.71

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    713.82   572.43   273.68     0.50  9083.00
MEAN   624.07   542.26   158.50     0.48  8399.40     1.47
HUB    519.02   548.04    54.40     0.49  8602.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.27     1.34    16.03   573.30     1.10   536.01     0.92     0.91
MEAN    19.84     1.31    15.34   569.50     1.09   528.94     0.92     0.91
HUB     19.97     1.32    14.28   570.63     1.09   518.35     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.20    28.56    24.20     4.36     0.93     0.39     2.90
MEAN    41.92    16.99    12.70     4.29     0.93     0.33     3.51     0.91
HUB     46.44    -5.70    -9.30     3.60     0.93     0.18     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     705.905     464.668     531.400    1128.839       0.625       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.981      15.347     529.521      24.000      41.167      35.400      -5.767

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     541.278     464.668     713.371    1146.973       0.472       0.383

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.875      17.060     546.670     528.796       0.032       0.514

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     498.435       0.000     498.435    1150.869       0.433       0.427

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.402     550.390       0.000       0.060       0.048       0.454

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      19.800       1.311     571.141      48.331     199.364       1.545

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 300899.531       0.591    2847.058 1664984.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    167.434    3965.000      19.800     571.141       1.000       1.000       0.980
W Kg/sec =   76.10618

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    130.442    3778.590       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 128803.711  131379.516       1.554     590.487     379.892     474.134       1.248

     ROTOR LEADING EDGE CONDITIONS, STAGE            2
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   474.22    -0.16   474.22     0.41   677.60
MEAN    18.08     0.00    -0.02   474.22    -0.16   474.22     0.41
HUB     15.21     0.00    -0.02   474.22    -0.16   474.22     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.31    46.36     9.95   711.05   854.82    17.62   552.36     0.74
MEAN    52.84    42.30    10.54   625.53   785.10    17.62   552.36     0.68
HUB     47.99    37.84    10.15   526.28   708.54    17.62   552.36     0.61

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   597.33   379.50   461.28  1185.85     0.50
MEAN    18.01   605.20   378.94   471.88  1179.82     0.51
HUB     15.22   652.85   438.45   483.71  1173.87     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    706.56   565.46   327.05     0.48  7752.80
MEAN   623.16   531.34   244.23     0.45  6827.61     1.61
HUB    526.73   491.70    88.28     0.42  6677.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.93     1.26    20.96   614.20     1.08   584.41     0.92     0.90
MEAN    24.27     1.23    20.28   609.06     1.07   578.49     0.92     0.90
HUB     24.16     1.22    19.58   608.23     1.06   572.65     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.44    35.34    31.50     3.84     0.93     0.41     2.90
MEAN    38.77    27.36    23.50     3.86     0.94     0.40     3.30     0.90
HUB     42.19    10.34     6.50     3.84     0.94     0.39     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     865.762     380.002     777.909    1148.197       0.754      -0.846

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.411      16.738     547.917      46.000      26.035      30.600       4.565

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     761.737     380.002     851.261    1162.912       0.655      -0.492

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      24.305      18.215     562.052     361.848       0.035       0.280

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     750.485       0.000     750.485    1164.400       0.645       0.367

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.680      18.275     563.474       0.000       0.060       0.067      -0.477

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.854      24.171       1.221     610.498      39.358     214.356       1.662

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 245208.984       0.491    2320.124 1473157.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.937
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
167.434	3965.000	24.171	610.498	1.000	1.000	0.710

W Kg/sec = 76.10618

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
110.471	3654.762	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
128803.711	131379.516	1.228	395.194	321.752	307.469	0.956

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	667.66	-0.23	667.66	0.57	640.09
MEAN	17.74	0.00	-0.02	667.66	-0.23	667.66	0.57	
HUB	15.05	0.00	-0.02	667.66	-0.23	667.66	0.57	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.14	46.36	-0.22	694.45	963.51	19.41	573.30	0.82
MEAN	42.60	43.40	-0.80	613.77	907.07	19.41	573.30	0.77
HUB	37.97	38.84	-0.87	520.75	846.87	19.41	573.30	0.72

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	560.49	344.16	442.38	1223.39	0.46
MEAN	17.51	568.75	348.30	449.63	1218.68	0.47
HUB	14.85	614.02	408.93	458.04	1214.13	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	685.45	558.73	341.29	0.46	6822.45	
MEAN	605.75	518.12	257.44	0.43	6101.65	1.87
HUB	513.83	469.90	104.90	0.39	6076.05	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	28.96	1.20	25.08	648.36	1.06	622.15	0.92	0.86
MEAN	28.43	1.18	24.48	644.36	1.06	617.37	0.92	0.86
HUB	28.41	1.18	23.85	644.22	1.06	612.76	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.88	37.65	31.50	6.15	0.93	0.48	2.90	
MEAN	37.76	29.79	23.50	6.29	0.90	0.49	3.28	0.86
HUB	41.76	12.90	6.50	6.40	0.90	0.51	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.937

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	574.272	350.587	454.837	1219.415	0.471	0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
28.557	24.529	618.128	46.000	37.625	31.500	-6.125

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	459.370	350.587	577.869	1229.152	0.374	0.340

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	28.496	25.874	628.039	471.992	0.025	0.428

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	446.275	0.000	446.275	1230.120	0.363	0.338

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	25.925	629.029	0.000	0.060	0.049	0.352

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    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.820      28.395       1.175     645.649      35.151     226.353       1.755

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 219170.391       0.466    2073.752 2119288.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    167.434    3965.000      28.395     645.649       1.000       1.000       0.980
W Kg/sec =   76.10618

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.706    3553.884       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
128803.711  131379.516       1.822     513.330     281.686     401.059       1.424

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   418.94    -0.14   418.94     0.34   597.30
MEAN    16.97     0.00    -0.02   418.94    -0.14   418.94     0.34
HUB     14.32     0.00    -0.02   418.94    -0.14   418.94     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.85    46.36    11.49   666.42   787.28    26.21   631.01     0.64
MEAN    54.50    43.80    10.70   587.21   721.45    26.21   631.01     0.59
HUB     49.79    37.84    11.95   495.49   648.97    26.21   631.01     0.53

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   548.09   358.40   414.67  1258.10     0.44
MEAN    16.57   551.01   354.28   422.01  1253.09     0.44
HUB     13.89   588.45   401.54   430.16  1248.10     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    653.27   508.82   294.87     0.40  6769.43
MEAN   573.48   475.54   219.19     0.38  5874.26     1.66
HUB    480.61   437.36    79.07     0.35  5579.43

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     33.96     1.20    29.80   683.19     1.06   658.14     0.92     0.90
MEAN    33.18     1.17    29.05   678.22     1.05   652.90     0.92     0.90
HUB     32.93     1.16    28.28   676.59     1.05   647.71     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.84    35.42    31.50     3.92     0.93     0.43     2.90
MEAN    40.01    27.45    23.50     3.95     0.94     0.41     3.29     0.90
HUB     43.03    10.42     6.50     3.92     0.94     0.40     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.988

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     545.641     356.274     413.271    1254.613       0.435       0.046

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    33.314      29.251     654.505      46.000      40.764      32.400      -8.364

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     422.590     356.274     552.733    1264.100       0.334       0.398
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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.237      30.761     664.440     456.573       0.028       0.482

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     402.574       0.000     402.574    1265.409       0.318       0.372

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.857     665.817       0.000       0.060       0.059       0.420

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.860      33.100       1.166     679.332      33.684     210.852       1.635

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 210207.578       0.493    1988.947 1394118.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    167.434    3965.000      33.100     679.332       1.000       1.000       0.980
W Kg/sec =   76.10618

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     85.096    3464.656       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 128803.711  131379.516       2.056     509.668     247.897     390.276       1.574

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   375.72    -0.13   375.72     0.30   553.89
 MEAN    15.91     0.00    -0.02   375.72    -0.13   375.72     0.30
 HUB     13.07     0.00    -0.02   375.72    -0.13   375.72     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.35    47.36    11.99   633.89   736.99    31.14   667.57     0.58
 MEAN    55.70    44.80    10.90   550.61   666.69    31.14   667.57     0.53
 HUB     50.29    38.84    11.45   452.24   588.05    31.14   667.57     0.46

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   514.81   352.30   375.39  1290.10     0.40
 MEAN    15.50   509.44   337.01   382.04  1284.85     0.40
 HUB     12.59   533.09   364.22   389.27  1279.62     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.74   461.50   268.45     0.36  6322.61
 MEAN   536.24   430.87   199.23     0.34  5224.84     1.72
 HUB    435.63   395.77    71.41     0.31  4587.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     38.81     1.17    34.77   714.36     1.05   692.27     0.92     0.90
 MEAN    37.77     1.14    33.89   708.28     1.04   686.65     0.92     0.90
 HUB     37.18     1.12    32.99   704.74     1.04   681.06     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.18    35.57    31.50     4.07     0.93     0.46     2.90
 MEAN    41.42    27.54    23.50     4.04     0.94     0.43     3.34     0.90
 HUB     43.10    10.40     6.50     3.90     0.94     0.40     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987
```

```
     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     516.030     343.185     385.371    1285.120       0.402      -0.008

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      37.837      33.858     686.936      46.000      41.686      33.000      -8.686

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     399.523     343.185     526.683    1293.407       0.309       0.349

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      37.706      35.291     695.825     440.827       0.053       0.499

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     374.216       0.000     374.216    1294.922       0.289       0.419

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      35.549     697.456       0.000       0.060       0.061       0.413

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.860      37.671       1.138     709.125      29.793     217.987       1.690

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  186115.969       0.483    1760.997 1416758.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1161602.38  10990.8789    163.5658      2.4936      0.8405      8.9533      1.3564


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 105% Stat 2 27% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.505   EfDer =  0.994

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     164.402    3965.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   74.72796

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     160.604    3949.384       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  126471.203  129000.344       1.778     831.557     467.713     619.754       1.325

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   387.78    -0.13   387.78     0.35   710.99
  MEAN    17.06     0.00    -0.02   387.78    -0.13   387.78     0.35
  HUB     12.51     0.00    -0.02   387.78    -0.13   387.78     0.35

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.49    50.47    11.02   713.82   812.47    13.88   510.25     0.73
  MEAN    56.70    47.20     9.50   590.30   706.39    13.88   510.25     0.64
  HUB     48.15    38.62     9.53   432.86   581.25    13.88   510.25     0.52

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000
```

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	663.85	446.30	491.44	1137.07	0.58
MEAN	18.04	690.77	469.10	507.06	1129.46	0.61
HUB	15.00	781.92	572.17	532.93	1118.30	0.70

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	713.82	559.54	267.52	0.49	9209.86	
MEAN	624.07	530.21	154.97	0.47	8463.00	1.50
HUB	519.02	535.57	53.15	0.48	8584.24	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.34	1.35	16.14	574.00	1.10	537.20	0.92	0.91
MEAN	19.87	1.32	15.43	569.85	1.09	530.00	0.92	0.91
HUB	19.95	1.32	14.39	570.52	1.09	519.48	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.24	28.56	24.20	4.36	0.93	0.41	2.90	
MEAN	42.77	16.99	12.70	4.29	0.94	0.35	3.51	0.91
HUB	47.03	-5.70	-9.30	3.60	0.94	0.19	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.994

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	699.317	468.190	519.464	1130.002	0.619	0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.007	15.447	530.612	24.000	42.028	35.400	-6.628

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	528.523	468.190	706.073	1148.501	0.460	0.397

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.893	17.201	548.128	528.796	0.034	0.527

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	487.354	0.000	487.354	1152.155	0.423	0.437

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.515	551.621	0.000	0.060	0.051	0.463

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.869	19.811	1.311	571.459	48.649	196.324	1.522

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
302880.812	0.594	2813.908	1630565.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 9.505 EfDer = 0.985

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
164.402	3965.000	19.811	571.459	1.000	1.000	0.980

W Kg/sec = 74.72796

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
128.039	3777.538	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
126471.203	129000.344	1.584	590.487	372.895	474.134	1.271

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	463.91	-0.16	463.91	0.40	677.42

```
 MEAN    18.08     0.00    -0.02   463.91    -0.16   463.91     0.40
 HUB     15.21     0.00    -0.02   463.91    -0.16   463.91     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.88    46.36    10.52   711.05   849.14    17.72   553.49     0.74
 MEAN    53.45    42.30    11.15   625.53   778.91    17.72   553.49     0.67
 HUB     48.61    37.84    10.77   526.28   701.68    17.72   553.49     0.61

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   594.29   386.64   451.32  1187.29     0.50
 MEAN    18.01   600.76   384.22   461.83  1181.14     0.51
 HUB     15.22   646.68   440.37   473.58  1175.04     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    706.56   553.20   319.91     0.47  7898.49
 MEAN   623.16   519.98   238.94     0.44  6922.73     1.64
 HUB    526.73   481.39    86.36     0.41  6706.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.02     1.26    21.08   615.33     1.08   585.84     0.92     0.90
 MEAN    24.33     1.23    20.39   609.91     1.07   579.78     0.92     0.90
 HUB     24.18     1.22    19.68   608.71     1.07   573.79     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.59    35.33    31.50     3.83     0.93     0.43     2.90
 MEAN    39.76    27.36    23.50     3.86     0.94     0.41     3.30     0.90
 HUB     42.92    10.34     6.50     3.84     0.94     0.39     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     845.775     385.302     752.913    1152.038       0.734      -0.798

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.470      17.095     551.591      46.000      27.101      30.600       3.499

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     735.907     385.302     830.672    1167.090       0.631      -0.421

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      24.379      18.646     566.100     361.848       0.032       0.296

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     724.486       0.000     724.486    1168.535       0.620       0.394

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      18.721     567.494       0.000       0.060       0.059      -0.403

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.859      24.268       1.225     611.316      39.857     210.014       1.628

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 248322.688       0.497    2307.037 1440566.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 9.505   EfDer =  0.951

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    164.402    3965.000      24.268     611.316       1.000       1.000       0.710
W Kg/sec =   74.72796
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
108.110	3652.316	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
126471.203	129000.344	1.255	395.194	314.875	307.469	0.976

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	647.43	-0.22	647.43	0.55	639.66
MEAN	17.74	0.00	-0.02	647.43	-0.22	647.43	0.55	
HUB	15.05	0.00	-0.02	647.43	-0.22	647.43	0.55	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.02	46.36	0.66	694.45	949.60	19.76	576.34	0.81
MEAN	43.48	43.40	0.08	613.77	892.28	19.76	576.34	0.76
HUB	38.82	38.84	-0.02	520.75	831.01	19.76	576.34	0.71

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	557.22	354.52	429.90	1225.60	0.45
MEAN	17.51	563.94	356.04	437.35	1220.67	0.46
HUB	14.85	607.27	412.36	445.79	1215.90	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	685.45	542.52	330.93	0.44	7027.43	
MEAN	605.75	503.61	249.71	0.41	6236.91	1.89
HUB	513.83	457.19	101.46	0.38	6126.96	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	29.31	1.21	25.43	650.32	1.06	624.41	0.92	0.87
MEAN	28.71	1.18	24.79	645.93	1.06	619.39	0.92	0.87
HUB	28.62	1.18	24.13	645.32	1.06	614.55	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.51	37.59	31.50	6.09	0.93	0.49	2.90	
MEAN	39.15	29.73	23.50	6.23	0.90	0.50	3.28	0.87
HUB	42.77	12.82	6.50	6.32	0.90	0.51	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.951

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	569.308	358.372	442.359	1221.398	0.466	0.012

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
28.837	24.845	620.143	46.000	39.012	31.500	-7.512

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	446.042	358.372	572.175	1231.640	0.362	0.363

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	28.765	26.271	630.587	471.992	0.028	0.450

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	433.646	0.000	433.646	1232.528	0.352	0.355

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	26.299	631.497	0.000	0.060	0.055	0.370

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.830	28.652	1.181	647.190	35.874	219.517	1.702

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 223682.734       0.476    2078.120 2058508.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 9.505   EfDer =  0.984

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    164.402    3965.000      28.652     647.190       1.000       1.000       0.980
W Kg/sec =   74.72796

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     94.216    3549.650       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 126471.203  129000.344       1.870     513.330     274.435     401.059       1.461

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   407.29    -0.14   407.29     0.33   596.59
 MEAN    16.97     0.00    -0.02   407.29    -0.14   407.29     0.33
 HUB     14.32     0.00    -0.02   407.29    -0.14   407.29     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.57    46.36    12.21   666.42   781.15    26.57   633.36     0.63
 MEAN    55.26    43.80    11.46   587.21   714.75    26.57   633.36     0.58
 HUB     50.59    37.84    12.75   495.49   641.51    26.57   633.36     0.52

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   544.95   366.57   403.24  1260.65     0.43
 MEAN    16.57   546.19   360.32   410.48  1255.51     0.44
 HUB     13.89   581.50   403.71   418.52  1250.38     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    653.27   494.77   286.70     0.39  6923.53
 MEAN   573.48   462.52   213.15     0.37  5974.29     1.69
 HUB    480.61   425.53    76.90     0.34  5609.58

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.36     1.20    30.22   685.58     1.06   660.82     0.92     0.90
 MEAN    33.53     1.17    29.44   680.32     1.05   655.44     0.92     0.90
 HUB     33.22     1.16    28.64   678.29     1.05   650.10     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.27    35.41    31.50     3.91     0.93     0.45     2.90
 MEAN    41.28    27.44    23.50     3.94     0.94     0.43     3.29     0.90
 HUB     43.97    10.41     6.50     3.91     0.94     0.42     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     541.263     362.347     402.083    1256.964       0.431       0.044

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.662      29.631     656.967      46.000      42.024      32.400      -9.624

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     410.677     362.347     547.678    1266.842       0.324       0.417

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.574      31.215     667.333     456.573       0.031       0.502
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	391.542	0.000	391.542	1268.057	0.309	0.386

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	31.282	668.613	0.000	0.060	0.066	0.433

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.853	33.422	1.166	681.397	34.207	205.502	1.593

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
213486.438	0.500	1983.391	1361926.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 9.505 EfDer = 0.983

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
164.402	3965.000	33.422	681.397	1.000	1.000	0.980

W Kg/sec = 74.72796

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
82.877	3459.403	1.401	0.250	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
126471.203	129000.344	2.111	509.668	241.434	390.276	1.616

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	365.58	-0.13	365.58	0.29	553.05
MEAN	15.91	0.00	-0.02	365.58	-0.13	365.58	0.29	
HUB	13.07	0.00	-0.02	365.58	-0.13	365.58	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.03	47.36	12.67	633.89	731.87	31.55	670.26	0.58
MEAN	56.42	44.80	11.62	550.61	661.03	31.55	670.26	0.52
HUB	51.06	38.84	12.22	452.24	581.62	31.55	670.26	0.46

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	512.55	359.47	365.36	1292.85	0.40
MEAN	15.50	505.46	342.34	371.88	1287.51	0.39
HUB	12.59	526.94	366.13	378.96	1282.18	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.74	449.17	261.27	0.35	6451.25	
MEAN	536.24	419.39	193.89	0.33	5307.47	1.75
HUB	435.63	385.29	69.50	0.30	4611.18	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	39.26	1.17	35.23	717.13	1.05	695.24	0.92	0.90
MEAN	38.18	1.14	34.33	710.80	1.04	689.51	0.92	0.90
HUB	37.53	1.12	33.41	706.94	1.04	683.80	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.53	35.57	31.50	4.07	0.93	0.47	2.90	
MEAN	42.63	27.54	23.50	4.04	0.94	0.44	3.34	0.90
HUB	44.01	10.39	6.50	3.89	0.94	0.41	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.983

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

```
     15.219     512.112     348.619     375.132    1287.754       0.398      -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     38.243      34.293     689.770      46.000      42.902      33.000      -9.902

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     388.619     348.619     522.072    1296.377       0.300       0.367

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      38.092      35.789     699.038     440.827       0.058       0.519

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     364.192       0.000     364.192    1297.797       0.281       0.433

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      36.026     700.570       0.000       0.060       0.068       0.426

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.852      38.052       1.139     711.622      30.225     212.702       1.649

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188829.703       0.490    1754.318 1384480.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1177202.38  10936.7734    160.6038      2.5188      0.8397      9.5045      1.3611


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 100% Stat 2 10%  Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 3.014   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    193.004    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   87.72928

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    188.546    3761.129       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  148474.906  151444.094       1.514     831.557     549.087     619.754       1.129

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   468.27    -0.16   468.27     0.42   677.10
  MEAN    17.06     0.00    -0.02   468.27    -0.16   468.27     0.42
  HUB     12.51     0.00    -0.02   468.27    -0.16   468.27     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.45    50.47     4.98   679.80   825.60    13.34   504.50     0.75
  MEAN    50.21    47.20     3.01   562.16   731.77    13.34   504.50     0.66
  HUB     41.37    38.62     2.75   412.23   623.97    13.34   504.50     0.57

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   714.76   337.85   629.87  1115.90     0.64
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 MEAN    18.04   755.31   398.36   641.71  1111.88     0.68
 HUB     15.00   878.65   561.86   675.53  1101.28     0.80

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    679.80   716.70   341.94     0.64  6973.21
 MEAN   594.32   670.97   195.96     0.60  7187.65     1.20
 HUB    494.28   678.90    67.58     0.62  8429.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.74     1.24    14.21   559.72     1.07   517.08     0.92     0.90
 MEAN    18.86     1.25    13.84   560.86     1.07   513.25     0.92     0.90
 HUB     19.57     1.30    12.86   567.43     1.09   503.07     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.21    28.50    24.20     4.30     0.93     0.20     2.90
 MEAN    31.83    16.98    12.70     4.28     0.91     0.16     3.51     0.90
 HUB     39.75    -5.71    -9.30     3.59     0.91     0.01     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.986

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     772.404     397.590     662.216    1110.917       0.695      -0.017

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.999      13.749     512.840      24.000      30.980      35.400       4.420

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     700.498     397.590     805.466    1120.457       0.625       0.160

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.878      14.501     521.686     528.796       0.032       0.346

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     637.444       0.000     637.444    1128.000       0.565       0.244

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.068     528.732       0.000       0.060       0.062       0.264

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.832      18.719       1.239     562.671      39.861     238.570       1.849

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 248166.641       0.537    2706.718 1969041.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.014   EfDer =  0.981

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   193.004    3776.000      18.719     562.671       1.000       1.000       0.980
W Kg/sec =   87.72928

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
   157.859    3625.459       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 148474.906  151444.094       1.284     590.487     459.736     474.134       1.031

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   601.24    -0.21   601.24     0.53   650.14
 MEAN    18.08     0.00    -0.02   601.24    -0.21   601.24     0.53
 HUB     15.21     0.00    -0.02   601.24    -0.21   601.24     0.53
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     48.41    46.36     2.05   677.16   905.71    15.44   532.49     0.80
MEAN    44.75    42.30     2.45   595.71   846.53    15.44   532.49     0.75
HUB     39.83    37.84     1.99   501.20   782.88    15.44   532.49     0.69

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   653.29   240.92   607.24  1153.83     0.57
MEAN    18.01   670.98   274.62   612.21  1151.96     0.58
HUB     15.22   729.78   386.36   619.12  1150.03     0.63

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    672.88   745.21   431.96     0.65  4923.75
MEAN   593.46   690.27   318.84     0.60  4949.56     1.32
HUB    501.63   629.76   115.27     0.55  5884.67

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.58     1.15    17.35   588.72     1.05   553.10     0.92     0.90
MEAN    21.59     1.15    17.15   588.86     1.05   551.28     0.92     0.90
HUB     22.17     1.18    16.90   593.80     1.06   549.36     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     21.64    35.43    31.50     3.93     0.93     0.22     2.90
MEAN    24.16    27.51    23.50     4.01     0.91     0.23     3.30     0.90
HUB     31.97    10.55     6.50     4.05     0.91     0.26     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.981

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     795.472     275.386     746.283    1137.372       0.699      -0.320

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.731      15.669     537.625      46.000      20.255      30.600      10.345

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     770.403     275.386     818.143    1140.834       0.675      -0.275

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      21.532      15.859     540.903     455.853       0.053       0.148

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     769.548       0.000     769.548    1140.989       0.674      -0.002

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.850      15.660     541.016       0.000       0.060       0.114      -0.318

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.749      21.246       1.135     590.460      27.789     298.451       2.314

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 173106.938       0.382    1888.052 1812389.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 3.014   EfDer =  0.885

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    193.004    3776.000      21.246     590.460       1.000       1.000       0.880
W Kg/sec =   87.72928

   W cor      RPM cor        GAMMA       Cp         R          Blades       THK
    142.475    3539.117       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
148474.906	151444.094	1.180	489.817	414.954	384.470	0.927

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	697.69	-0.24	697.69	0.61	619.84
MEAN	17.74	0.00	-0.02	697.69	-0.24	697.69	0.61	
HUB	15.05	0.00	-0.02	697.69	-0.24	697.69	0.61	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	43.48	46.36	-2.88	661.34	961.49	16.57	549.83	0.84
MEAN	39.97	43.40	-3.43	584.52	910.34	16.57	549.83	0.79
HUB	35.42	38.84	-3.42	495.92	856.13	16.57	549.83	0.74

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	652.33	196.18	622.13	1176.90	0.55
MEAN	17.51	667.78	239.36	623.40	1176.82	0.57
HUB	14.85	724.81	361.15	628.43	1176.44	0.62

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	652.78	771.71	456.60	0.66	3891.07	
MEAN	576.87	708.91	337.52	0.60	4194.55	1.36
HUB	489.33	641.38	128.19	0.55	5366.64	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.41	1.10	19.00	611.04	1.03	575.53	0.92	0.81
MEAN	23.59	1.11	18.96	612.64	1.04	575.44	0.92	0.81
HUB	24.27	1.14	18.78	618.84	1.05	575.01	0.92	0.81

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	17.50	36.28	31.50	4.78	0.93	0.23	2.90	
MEAN	21.00	28.43	23.50	4.93	0.89	0.26	3.28	0.81
HUB	29.88	11.53	6.50	5.03	0.89	0.31	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.885

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	676.823	240.926	632.490	1177.108	0.575	-0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.710	18.945	575.938	46.000	20.853	31.500	10.647

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	663.669	240.926	706.046	1178.611	0.563	0.014

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.542	18.980	577.410	471.992	0.045	0.167

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	644.965	0.000	644.965	1180.695	0.546	0.021

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.048	579.453	0.000	0.060	0.087	0.028

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.679	23.337	1.098	614.172	23.712	329.702	2.556

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
147777.625	0.347	1611.789	2063288.375

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 3.014   EfDer =  0.939

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    193.004    3776.000      23.337     614.172       1.000       1.000       0.980
W Kg/sec =   87.72928

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    132.288    3470.125       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 148474.906  151444.094       1.332     513.330     385.309     401.059       1.041

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   597.49    -0.21   597.49     0.50   583.22
 MEAN    16.97     0.00    -0.02   597.49    -0.21   597.49     0.50
 HUB     14.32     0.00    -0.02   597.49    -0.21   597.49     0.50

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.74    46.36     0.38   634.65   871.80    19.62   584.39     0.74
 MEAN    43.12    43.80    -0.68   559.22   818.50    19.62   584.39     0.69
 HUB     38.31    37.84     0.47   471.87   761.48    19.62   584.39     0.64

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   643.73   179.67   618.15  1199.06     0.54
 MEAN    16.57   657.21   221.32   618.82  1199.06     0.55
 HUB     13.89   708.93   339.88   622.15  1198.78     0.59

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   760.19   442.46     0.63  3396.16
 MEAN   546.14   698.89   324.82     0.58  3671.57     1.25
 HUB    457.70   633.21   117.82     0.53  4723.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.45     1.09    20.91   632.12     1.03   597.56     0.92     0.86
 MEAN    25.62     1.10    20.89   633.58     1.03   597.55     0.92     0.86
 HUB     26.31     1.13    20.76   639.14     1.04   597.23     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.21    35.59    31.50     4.09     0.93     0.16     2.90
 MEAN    19.68    27.70    23.50     4.20     0.90     0.19     3.29     0.86
 HUB     28.65    10.72     6.50     4.22     0.90     0.22     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.939

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     643.316     222.562     603.590    1201.758       0.535       0.059

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.744      21.179     600.420      46.000      20.240      32.400      12.160

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     644.157     222.562     681.522    1201.668       0.536       0.033

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.562      21.018     600.330     456.573       0.047       0.167

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     16.096     610.616       0.000     610.616    1205.177       0.507       0.018

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.268     603.841       0.000       0.060       0.091       0.084

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.707      25.345       1.086     634.947      20.775     344.788       2.673

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 129534.609       0.335    1412.815 1783255.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 3.014   EfDer =  0.918

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    193.004    3776.000      25.345     634.947       1.000       1.000       0.980
W Kg/sec =   87.72928

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    123.854    3412.883       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 148474.906  151444.094       1.413     509.668     360.765     390.276       1.082

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   562.66    -0.19   562.66     0.47   545.61
 MEAN    15.91     0.00    -0.02   562.66    -0.19   562.66     0.47
 HUB     13.07     0.00    -0.02   562.66    -0.19   562.66     0.47

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.02    47.36    -0.34   603.68   825.37    21.85   608.55     0.68
 MEAN    42.99    44.80    -1.81   524.36   769.25    21.85   608.55     0.64
 HUB     37.44    38.84    -1.40   430.68   708.69    21.85   608.55     0.59

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   609.49   168.69   585.68  1221.16     0.50
 MEAN    15.50   620.87   200.38   587.64  1220.43     0.51
 HUB     12.59   664.64   302.70   591.71  1219.50     0.55

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   722.15   422.46     0.59  3029.90
 MEAN   510.67   664.54   310.30     0.54  3108.46     1.24
 HUB    414.86   602.24   112.17     0.49  3813.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.27     1.08    23.00   650.95     1.03   619.98     0.92     0.84
 MEAN    27.32     1.08    22.89   651.37     1.03   619.23     0.92     0.84
 HUB     27.78     1.10    22.70   655.09     1.03   618.26     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.07    35.80    31.50     4.30     0.93     0.16     2.90
 MEAN    18.83    27.84    23.50     4.34     0.89     0.17     3.34     0.84
 HUB     27.09    10.73     6.50     4.23     0.89     0.20     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.918

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     627.919     204.052     593.839    1220.686       0.514      -0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     27.367      22.844     619.593      46.000      18.964      33.000      14.036

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     648.144     204.052     679.506    1218.564       0.532      -0.134

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.982      22.251     617.441     440.827       0.104       0.159

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     597.221       0.000     597.221    1223.772       0.488       0.018

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.925     622.729       0.000       0.060       0.103       0.013

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.656      26.983       1.065     652.472      17.525     378.622       2.935

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 109324.617       0.313    1192.388 1828861.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    807910.44   8811.7617    188.5460      1.7861      0.7296      3.0144      1.2480



**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

   Fan-Core + 4 Stage LPC 100% Stat 2 10%  Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.528   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    190.124    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   86.41991

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    185.732    3761.129       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 146258.906  149183.766       1.537     831.557     540.892     619.754       1.146

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   459.79    -0.16   459.79     0.42   677.10
  MEAN    17.06     0.00    -0.02   459.79    -0.16   459.79     0.42
  HUB     12.51     0.00    -0.02   459.79    -0.16   459.79     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.93    50.47     5.46   679.80   820.82    13.40   505.15     0.74
  MEAN    50.73    47.20     3.53   562.16   726.37    13.40   505.15     0.66
  HUB     41.89    38.62     3.27   412.23   617.63    13.40   505.15     0.56

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   705.23   346.12   614.45  1118.02     0.63
  MEAN    18.04   745.12   402.90   626.80  1113.64     0.67
  HUB     15.00   865.12   560.17   659.27  1103.12     0.78
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    679.80   699.20   333.67     0.63  7143.79
 MEAN   594.32   655.38   191.42     0.59  7269.34     1.22
 HUB    494.28   662.55    65.89     0.60  8404.52

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.85     1.25    14.41   560.62     1.07   519.11     0.92     0.91
 MEAN    18.92     1.25    14.01   561.29     1.07   514.95     0.92     0.91
 HUB     19.57     1.30    13.03   567.30     1.09   504.88     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.39    28.50    24.20     4.30     0.93     0.22     2.90
 MEAN    32.73    16.98    12.70     4.28     0.92     0.18     3.51     0.91
 HUB     40.35    -5.71    -9.30     3.59     0.92     0.03     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     760.931     402.113     646.003    1112.940       0.684      -0.014

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.059      13.934     514.710      24.000      31.901      35.400       3.499

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     680.004     402.113     790.000    1123.421       0.605       0.184

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.954      14.793     524.449     528.796       0.030       0.362

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     619.392       0.000     619.392    1130.445       0.548       0.266

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.342     531.028       0.000       0.060       0.055       0.288

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.845      18.820       1.246     563.071      40.261     234.635       1.819

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 250659.797       0.542    2693.106 1933379.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.528   EfDer =  0.987

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     190.124    3776.000      18.820     563.071       1.000       1.000       0.980
W Kg/sec =   86.41991

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     154.721    3624.170       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 146258.906  149183.766       1.310     590.487     450.596     474.134       1.052

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   585.05    -0.20   585.05     0.52   649.91
 MEAN    18.08     0.00    -0.02   585.05    -0.20   585.05     0.52
 HUB     15.21     0.00    -0.02   585.05    -0.20   585.05     0.52

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.18    46.36     2.82   677.16   895.04    15.69   534.49     0.79
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 MEAN    45.53    42.30     3.23   595.71   835.10    15.69   534.49     0.74
 HUB     40.60    37.84     2.76   501.20   770.51    15.69   534.49     0.68

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   640.69   254.89   587.80  1157.19     0.55
 MEAN    18.01   658.46   284.42   593.86  1154.75     0.57
 HUB     15.22   716.86   389.92   601.54  1152.31     0.62

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   721.26   417.98     0.62  5209.05
 MEAN   593.46   669.46   309.04     0.58  5126.09     1.34
 HUB    501.63   611.82   111.71     0.53  5938.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.89     1.16    17.77   590.63     1.05   556.36     0.92     0.90
 MEAN    21.84     1.16    17.51   590.19     1.05   554.00     0.92     0.90
 HUB     22.34     1.19    17.21   594.49     1.06   551.60     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.44    35.42    31.50     3.92     0.93     0.24     2.90
 MEAN    25.59    27.49    23.50     3.99     0.92     0.25     3.30     0.90
 HUB     32.95    10.52     6.50     4.02     0.92     0.27     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     772.847     285.221     718.290    1141.884       0.677      -0.297

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.976      16.165     541.898      46.000      21.657      30.600       8.943

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     735.333     285.221     788.712    1146.850       0.641      -0.211

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      21.816      16.540     546.622     455.853       0.045       0.178

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     730.432       0.000     730.432    1147.495       0.637       0.061

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      16.440     547.223       0.000       0.060       0.093      -0.233

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.791      21.601       1.148     591.770      28.699     287.377       2.228

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 178774.188       0.395    1920.762 1770916.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.528   EfDer =  0.912

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    190.124    3776.000      21.601     591.770       1.000       1.000       0.880
W Kg/sec =   86.41991

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    138.196    3535.198       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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146258.906  149183.766       1.217     489.817     402.491     384.470       0.955

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   666.45    -0.23   666.45     0.58   619.15
MEAN    17.74     0.00    -0.02   666.45    -0.23   666.45     0.58
HUB     15.05     0.00    -0.02   666.45    -0.23   666.45     0.58

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     44.79    46.36    -1.57   661.34   939.06    17.24   554.70     0.81
MEAN    41.26    43.40    -2.14   584.52   886.61    17.24   554.70     0.77
HUB     36.67    38.84    -2.17   495.92   830.86    17.24   554.70     0.72

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   630.95   219.02   591.72  1182.94     0.53
MEAN    17.51   647.26   255.55   594.68  1181.91     0.55
HUB     14.85   703.94   367.48   600.41  1180.74     0.60

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    652.78   733.67   433.76     0.62  4343.37
MEAN   576.87   675.93   321.32     0.57  4477.94     1.39
HUB    489.33   612.65   121.86     0.52  5460.52

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.14     1.12    19.89   614.74     1.04   581.52     0.92     0.83
MEAN    24.22     1.12    19.75   615.45     1.04   580.49     0.92     0.83
HUB     24.83     1.15    19.52   620.64     1.05   579.30     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     20.31    36.24    31.50     4.74     0.93     0.26     2.90
MEAN    23.25    28.38    23.50     4.88     0.89     0.28     3.28     0.83
HUB     31.47    11.47     6.50     4.97     0.89     0.32     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.912

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     655.280     257.231     602.681    1182.379       0.554       0.002

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.352      19.761     581.104      46.000      23.113      31.500       8.387

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     626.811     257.231     677.540    1185.474       0.529       0.066

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.233      20.027     584.150     471.992       0.035       0.205

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     607.500       0.000     607.500    1187.492       0.512       0.083

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      20.151     586.140       0.000       0.060       0.065       0.092

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.748      24.095       1.115     616.943      25.173     308.093       2.388

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 156890.953       0.368    1685.647 1996077.000
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.528   EfDer =  0.963

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    190.124    3776.000      24.095     616.943       1.000       1.000       0.980
W Kg/sec =   86.41991

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    126.501    3462.323       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 146258.906  149183.766       1.393     513.330     368.451     401.059       1.088

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   564.65    -0.19   564.65     0.47   581.91
 MEAN    16.97     0.00    -0.02   564.65    -0.19   564.65     0.47
 HUB     14.32     0.00    -0.02   564.65    -0.19   564.65     0.47

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.35    46.36     1.99   634.65   849.62    20.66   590.34     0.71
 MEAN    44.73    43.80     0.93   559.22   794.84    20.66   590.34     0.67
 HUB     39.90    37.84     2.06   471.87   735.98    20.66   590.34     0.62

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   614.30   208.93   577.67  1207.76     0.51
 MEAN    16.57   628.96   241.86   580.59  1206.59     0.52
 HUB     13.89   680.59   347.36   585.28  1205.30     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   710.24   413.20     0.59  3948.35
 MEAN   546.14   655.50   304.28     0.54  4011.86     1.30
 HUB    457.70   595.59   110.34     0.49  4827.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.70     1.11    22.37   637.81     1.03   606.33     0.92     0.88
 MEAN    26.74     1.11    22.22   638.15     1.03   605.15     0.92     0.88
 HUB     27.30     1.13    21.99   642.46     1.04   603.82     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.88    35.58    31.50     4.08     0.93     0.21     2.90
 MEAN    22.62    27.66    23.50     4.16     0.91     0.22     3.29     0.88
 HUB     30.69    10.68     6.50     4.18     0.91     0.25     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.963

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3         Ao3          Mach3        cp 2-3
    16.481     616.639     243.220     566.646    1209.074       0.510       0.059

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.867      22.494     607.748      46.000      23.230      32.400       9.170

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     598.279     243.220     645.828    1210.924       0.494       0.094

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.750      22.636     609.609     456.573       0.035       0.214

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4         Ao4          Mach4       cp 3-4
     16.096     566.223       0.000     566.223    1214.013       0.466       0.091
```

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.925	612.723	0.000	0.060	0.064	0.155

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.791	26.613	1.105	639.471	22.528	315.398	2.445

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
140478.516	0.363	1509.311	1726320.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 3.528 EfDer = 0.954

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
190.124	3776.000	26.613	639.471	1.000	1.000	0.980

W Kg/sec = 86.41991

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
116.602	3400.789	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
146258.906	149183.766	1.501	509.668	339.642	390.276	1.149

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	523.63	-0.18	523.63	0.43	543.68
MEAN	15.91	0.00	-0.02	523.63	-0.18	523.63	0.43	
HUB	13.07	0.00	-0.02	523.63	-0.18	523.63	0.43	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.07	47.36	1.71	603.68	799.27	23.43	616.61	0.66
MEAN	45.05	44.80	0.25	524.36	741.17	23.43	616.61	0.61
HUB	39.45	38.84	0.61	430.68	678.11	23.43	616.61	0.56

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	575.55	203.21	538.49	1232.04	0.47
MEAN	15.50	587.16	224.86	542.40	1230.11	0.48
HUB	12.59	630.09	311.67	547.61	1228.13	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	591.16	663.68	387.95	0.54	3648.86	
MEAN	510.67	613.10	285.82	0.50	3487.60	1.31
HUB	414.86	557.25	103.20	0.45	3926.25	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	29.14	1.09	25.09	658.74	1.03	631.12	0.92	0.87
MEAN	29.02	1.09	24.83	657.89	1.03	629.15	0.92	0.87
HUB	29.34	1.10	24.51	660.21	1.03	627.11	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.67	35.77	31.50	4.27	0.93	0.21	2.90	
MEAN	22.52	27.79	23.50	4.29	0.90	0.22	3.34	0.87
HUB	29.65	10.67	6.50	4.17	0.90	0.23	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.954

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	593.517	228.980	547.568	1230.482	0.482	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
29.081	24.798	629.574	46.000	22.693	33.000	10.307

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     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     587.383     228.980     630.436    1231.072       0.477      -0.029

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      28.851      24.685     630.178     440.827       0.073       0.214

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     543.814       0.000     543.814    1235.080       0.440       0.106

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      25.261     634.288       0.000       0.060       0.070       0.103

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.771      28.862       1.084     658.949      19.478     337.387       2.615

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  121527.586       0.348    1305.701 1765122.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     848331.00   9114.5273    185.7319      1.9105      0.7833      3.5283      1.2604


*********************************************************************
**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 100% Stat 2 10%  Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.036   EfDer =  0.993

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     187.286    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   85.13009

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     182.960    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  144075.984  146957.188       1.561     831.557     532.819     619.754       1.163

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   451.53    -0.16   451.53     0.41   677.10
  MEAN    17.06     0.00    -0.02   451.53    -0.16   451.53     0.41
  HUB     12.51     0.00    -0.02   451.53    -0.16   451.53     0.41

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.41    50.47     5.94   679.80   816.22    13.46   505.78     0.74
  MEAN    51.24    47.20     4.04   562.16   721.17    13.46   505.78     0.65
  HUB     42.41    38.62     3.79   412.23   611.50    13.46   505.78     0.55

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   696.53   353.95   599.90  1119.98     0.62
  MEAN    18.04   735.63   407.21   612.65  1115.28     0.66
  HUB     15.00   852.43   558.60   643.89  1104.83     0.77

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   682.68   325.85     0.61  7305.21
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 MEAN   594.32   640.58   187.11     0.57  7347.16     1.24
 HUB    494.28   647.10    64.32     0.59  8380.89

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.95     1.25    14.60   561.48     1.07   520.98     0.92     0.91
 MEAN    18.98     1.26    14.17   561.70     1.07   516.53     0.92     0.91
 HUB     19.57     1.30    13.20   567.17     1.08   506.56     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.54    28.51    24.20     4.31     0.93     0.24     2.90
 MEAN    33.61    16.98    12.70     4.28     0.92     0.19     3.51     0.91
 HUB     40.94    -5.70    -9.30     3.60     0.92     0.05     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     750.358     406.422     630.759    1114.793       0.673      -0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.115      14.105     516.425      24.000      32.795      35.400       2.605

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     661.242     406.422     776.157    1126.076       0.587       0.207

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.021      15.057     526.932     528.796       0.028       0.377

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     602.933       0.000     602.933    1132.636       0.532       0.286

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.586     533.088       0.000       0.060       0.050       0.309

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.855      18.907       1.252     563.451      40.641     230.883       1.790

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 253028.312       0.548    2677.979 1898638.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 4.036   EfDer =  0.992

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    187.286    3776.000      18.907     563.451       1.000       1.000       0.980
W Kg/sec =   85.13009

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    151.761    3622.946       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 144075.984  146957.188       1.336     590.487     441.975     474.134       1.073

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   570.19    -0.20   570.19     0.50   649.69
 MEAN    18.08     0.00    -0.02   570.19    -0.20   570.19     0.50
 HUB     15.21     0.00    -0.02   570.19    -0.20   570.19     0.50

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.91    46.36     3.55   677.16   885.39    15.92   536.31     0.78
 MEAN    46.26    42.30     3.96   595.71   824.75    15.92   536.31     0.73
 HUB     41.33    37.84     3.49   501.20   759.28    15.92   536.31     0.67
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      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   630.01   267.39   570.45  1160.12     0.54
MEAN    18.01   647.54   293.25   577.33  1157.22     0.56
HUB     15.22   705.32   393.11   585.62  1154.36     0.61

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    672.88   699.88   405.48     0.60  5464.23
MEAN   593.46   650.71   300.21     0.56  5285.03     1.36
HUB    501.63   595.58   108.52     0.52  5987.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.16     1.17    18.13   592.36     1.05   559.23     0.92     0.91
MEAN    22.05     1.17    17.82   591.41     1.05   556.41     0.92     0.91
HUB     22.49     1.19    17.48   595.13     1.06   553.60     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.11    35.41    31.50     3.91     0.93     0.26     2.90
MEAN    26.93    27.47    23.50     3.97     0.92     0.26     3.30     0.91
HUB     33.87    10.50     6.50     4.00     0.92     0.28     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     753.812     294.076     694.084    1145.695       0.658      -0.279

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.191      16.589     545.520      46.000      22.962      30.600       7.638

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     706.173     294.076     764.958    1151.777       0.613      -0.158

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      22.061      17.112     551.327     455.853       0.039       0.203

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     699.171       0.000     699.171    1152.642       0.607       0.109

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      17.072     552.149       0.000       0.060       0.077      -0.167

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.820      21.894       1.158     592.966      29.514     277.800       2.153

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 183856.922       0.406    1945.889 1731877.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.036   EfDer =  0.933

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    187.286    3776.000      21.894     592.966       1.000       1.000       0.880
W Kg/sec =   85.13009

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    134.447    3531.630       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 144075.984  146957.188       1.251     489.817     391.571     384.470       0.982

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   640.72    -0.22   640.72     0.55   618.52
MEAN    17.74     0.00    -0.02   640.72    -0.22   640.72     0.55
HUB     15.05     0.00    -0.02   640.72    -0.22   640.72     0.55

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     45.92    46.36    -0.44   661.34   920.97    17.79   558.70     0.79
MEAN    42.38    43.40    -1.02   584.52   867.43    17.79   558.70     0.75
HUB     37.75    38.84    -1.09   495.92   810.36    17.79   558.70     0.70

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   614.67   237.73   566.83  1187.82     0.52
MEAN    17.51   631.12   268.92   570.96  1186.08     0.53
HUB     14.85   687.11   372.73   577.23  1184.31     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    652.78   702.54   415.04     0.59  4713.89
MEAN   576.87   648.71   307.95     0.55  4711.83     1.42
HUB    489.33   588.89   116.61     0.50  5538.30

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.76     1.13    20.62   617.89     1.04   586.36     0.92     0.85
MEAN    24.76     1.13    20.41   617.88     1.04   584.64     0.92     0.85
HUB     25.29     1.16    20.13   622.25     1.05   582.85     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     22.75    36.21    31.50     4.71     0.93     0.28     2.90
MEAN    25.22    28.34    23.50     4.84     0.90     0.30     3.28     0.85
HUB     32.85    11.42     6.50     4.92     0.90     0.33     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.933

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     638.466     270.687     578.245    1186.660       0.538       0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.891      20.436     585.316      46.000      25.085      31.500       6.415

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     597.663     270.687     656.104    1190.920       0.502       0.108

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.804      20.881     589.526     471.992       0.029       0.236

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.121     578.568       0.000     578.568    1192.812       0.485       0.131

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      21.030     591.401       0.000       0.060       0.051       0.141

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.792      24.706       1.128     619.341      26.375     291.698       2.261

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 164385.344       0.386    1739.807 1938206.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 4.036   EfDer =  0.979
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
187.286	3776.000	24.706	619.341	1.000	1.000	0.980

W Kg/sec = 85.13009

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
121.767	3455.615	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
144075.984	146957.188	1.447	513.330	354.663	401.059	1.131

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	538.96	-0.19	538.96	0.45	580.79
MEAN	16.97	0.00	-0.02	538.96	-0.19	538.96	0.45	
HUB	14.32	0.00	-0.02	538.96	-0.19	538.96	0.45	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.67	46.36	3.31	634.65	832.77	21.49	595.11	0.70
MEAN	46.07	43.80	2.27	559.22	776.79	21.49	595.11	0.65
HUB	41.21	37.84	3.37	471.87	716.46	21.49	595.11	0.60

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	594.07	230.97	547.33	1214.31	0.49
MEAN	16.57	608.70	257.49	551.55	1212.38	0.50
HUB	13.89	659.57	353.12	557.08	1210.40	0.54

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	622.13	672.74	391.16	0.55	4364.26	
MEAN	546.14	622.52	288.65	0.51	4270.82	1.34
HUB	457.70	566.81	104.58	0.47	4907.56	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.70	1.12	23.52	642.40	1.04	612.96	0.92	0.90
MEAN	27.64	1.12	23.26	641.91	1.04	611.00	0.92	0.90
HUB	28.10	1.14	22.95	645.28	1.04	608.99	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	22.88	35.55	31.50	4.05	0.93	0.24	2.90	
MEAN	25.03	27.62	23.50	4.12	0.91	0.25	3.29	0.90
HUB	32.37	10.63	6.50	4.13	0.91	0.27	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.979

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	597.609	258.942	538.596	1214.687	0.492	0.058

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
27.767	23.529	613.401	46.000	25.677	32.400	6.723

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	564.806	258.942	621.335	1217.833	0.464	0.141

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	27.688	23.890	616.582	456.573	0.027	0.251

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	534.827	0.000	534.827	1220.546	0.438	0.140

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	24.166	619.332	0.000	0.060	0.052	0.202

```
    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.830      27.577       1.116     643.196      23.856     295.168       2.288

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 148770.641       0.384    1574.546 1678161.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 4.036   EfDer =  0.974

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    187.286    3776.000      27.577     643.196       1.000       1.000       0.980
W Kg/sec =   85.13009

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    111.172    3390.926       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
144075.984  146957.188       1.574     509.668     323.825     390.276       1.205

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   495.68    -0.17   495.68     0.41   542.10
MEAN    15.91     0.00    -0.02   495.68    -0.17   495.68     0.41
HUB     13.07     0.00    -0.02   495.68    -0.17   495.68     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.62    47.36     3.26   603.68   781.24    24.63   622.71     0.64
MEAN    46.62    44.80     1.82   524.36   721.69    24.63   622.71     0.59
HUB     41.00    38.84     2.16   430.68   656.76    24.63   622.71     0.54

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   554.63   227.05   506.03  1239.76     0.45
MEAN    15.50   565.32   241.97   510.92  1237.13     0.46
HUB     12.59   606.74   317.96   516.75  1234.50     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    591.16   623.41   364.11     0.50  4076.38
MEAN   510.67   577.27   268.71     0.47  3752.62     1.36
HUB    414.86   525.76    96.90     0.43  4005.36

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     30.56     1.11    26.63   664.73     1.03   639.07     0.92     0.89
MEAN    30.31     1.10    26.27   663.02     1.03   636.37     0.92     0.89
HUB     30.51     1.11    25.86   664.35     1.03   633.65     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     24.17    35.74    31.50     4.24     0.93     0.25     2.90
MEAN    25.34    27.74    23.50     4.24     0.91     0.25     3.34     0.89
HUB     31.60    10.62     6.50     4.12     0.91     0.26     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.974

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     571.415     246.403     515.558    1237.525       0.462      -0.006

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    30.376      26.243     636.802      46.000      25.545      33.000       7.455

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     547.915     246.403     600.770    1239.654       0.442       0.043
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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.231      26.433     638.996     440.827       0.054       0.255

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     508.939       0.000     508.939    1242.982       0.409       0.164

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.931     642.431       0.000       0.060       0.055       0.161

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.822      30.229       1.096     664.030      20.834     312.073       2.419

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 130004.406       0.372    1375.929 1713866.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    880045.62   9314.1504    182.9599      2.0010      0.8146      4.0364      1.2701



********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
********************************************************************

   Fan-Core + 4 Stage LPC 100% Stat 2 10%  Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 5.035   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    181.737    3776.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   82.60789

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    177.539    3761.129       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 139807.359  142603.203       1.608     831.557     517.033     619.754       1.199

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   435.62    -0.15   435.62     0.39   677.10
 MEAN    17.06     0.00    -0.02   435.62    -0.15   435.62     0.39
 HUB     12.51     0.00    -0.02   435.62    -0.15   435.62     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.35    50.47     6.88   679.80   807.52    13.57   506.96     0.73
 MEAN    52.24    47.20     5.04   562.16   711.31    13.57   506.96     0.64
 HUB     43.43    38.62     4.81   412.23   599.85    13.57   506.96     0.54

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   681.30   368.46   573.06  1123.47     0.61
 MEAN    18.04   718.50   415.26   586.35  1118.24     0.64
 HUB     15.00   829.23   555.72   615.46  1107.91     0.75

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    679.80   652.17   311.33     0.58  7604.47
 MEAN   594.32   613.08   179.06     0.55  7492.25     1.29
 HUB    494.28   618.52    61.44     0.56  8337.69
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.14     1.27    14.93   563.06     1.08   524.31     0.92     0.91
 MEAN    19.08     1.26    14.45   562.47     1.08   519.37     0.92     0.91
 HUB     19.57     1.30    13.49   566.94     1.08   509.57     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.74    28.51    24.20     4.31     0.93     0.27     2.90
 MEAN    35.31    16.98    12.70     4.28     0.92     0.22     3.51     0.91
 HUB     42.08    -5.70    -9.30     3.60     0.92     0.07     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     731.472     414.456     602.725    1118.075       0.654      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.213      14.408     519.470      24.000      34.514      35.400       0.886

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     627.805     414.456     752.272    1130.670       0.555       0.247

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.135      15.515     531.239     528.796       0.026       0.405

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     573.677       0.000     573.677    1136.436       0.505       0.320

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.002     536.671       0.000       0.060       0.043       0.345

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.869      19.048       1.261     564.159      41.349     223.861       1.735

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 257435.141       0.557    2643.896 1831749.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.035   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    181.737    3776.000      19.048     564.159       1.000       1.000       0.980
W Kg/sec =   82.60789

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    146.273    3620.672       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 139807.359  142603.203       1.386     590.487     425.993     474.134       1.113

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   543.57    -0.19   543.57     0.48   649.29
 MEAN    18.08     0.00    -0.02   543.57    -0.19   543.57     0.48
 HUB     15.21     0.00    -0.02   543.57    -0.19   543.57     0.48

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.25    46.36     4.89   677.16   868.49    16.30   539.49     0.76
 MEAN    47.63    42.30     5.33   595.71   806.58    16.30   539.49     0.71
 HUB     42.69    37.84     4.85   501.20   739.50    16.30   539.49     0.65

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
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     0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   612.90   289.07   540.45  1165.07     0.53
 MEAN    18.01   629.33   308.72   548.41  1161.45     0.54
 HUB     15.22   685.48   398.77   557.56  1157.90     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   662.86   383.80     0.57  5906.68
 MEAN   593.46   617.92   284.74     0.53  5563.37     1.41
 HUB    501.63   566.97   102.86     0.49  6073.30

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.63     1.19    18.73   595.41     1.06   564.05     0.92     0.91
 MEAN    22.41     1.18    18.34   593.59     1.05   560.53     0.92     0.91
 HUB     22.73     1.19    17.93   596.29     1.06   557.06     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.14    35.38    31.50     3.88     0.93     0.29     2.90
 MEAN    29.38    27.44    23.50     3.94     0.92     0.29     3.30     0.91
 HUB     35.57    10.45     6.50     3.95     0.92     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     723.114     309.584     653.492    1151.891       0.628      -0.250

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.545      17.283     551.435      46.000      25.349      30.600       5.251

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     659.130     309.584     728.214    1159.578       0.568      -0.071

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      22.457      18.032     558.820     455.853       0.031       0.244

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     650.436       0.000     650.436    1160.566       0.560       0.181

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      18.053     559.771       0.000       0.060       0.056      -0.066

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.855      22.350       1.173     595.096      30.937     261.829       2.030

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 192719.781       0.426    1979.260 1659629.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 5.035   EfDer =  0.963

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    181.737    3776.000      22.350     595.096       1.000       1.000       0.880
W Kg/sec =   82.60789

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    128.034    3525.305       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 139807.359  142603.203       1.314     489.817     372.894     384.470       1.031

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     20.07     0.00    -0.02   599.50    -0.21   599.50     0.51   617.42
MEAN    17.74     0.00    -0.02   599.50    -0.21   599.50     0.51
HUB     15.05     0.00    -0.02   599.50    -0.21   599.50     0.51

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     47.82    46.36     1.46   661.34   892.77    18.66   565.10     0.77
MEAN    44.29    43.40     0.89   584.52   837.43    18.66   565.10     0.72
HUB     39.61    38.84     0.77   495.92   778.17    18.66   565.10     0.67

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   591.42   267.34   527.55  1195.41     0.49
MEAN    17.51   607.04   290.24   533.16  1192.70     0.51
HUB     14.85   661.09   381.10   540.19  1190.04     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    652.78   653.35   385.43     0.55  5300.23
MEAN   576.87   605.33   286.63     0.51  5084.77     1.48
HUB    489.33   550.93   108.23     0.46  5662.45

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.76     1.15    21.78   623.12     1.05   593.93     0.92     0.88
MEAN    25.61     1.15    21.46   621.98     1.05   591.23     0.92     0.88
HUB     26.00     1.16    21.08   625.03     1.05   588.56     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     26.87    36.15    31.50     4.65     0.93     0.32     2.90
MEAN    28.56    28.26    23.50     4.76     0.91     0.33     3.28     0.88
HUB     35.20    11.33     6.50     4.83     0.91     0.35     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.963

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     613.564     292.145     539.548    1193.374       0.514       0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.746      21.494     591.956      46.000      28.434      31.500       3.066

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     553.071     292.145     625.489    1199.297       0.461       0.176

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.694      22.205     597.847     471.992       0.022       0.287

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     17.121     535.596       0.000     535.596    1200.889       0.446       0.195

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      22.344     599.435       0.000       0.060       0.040       0.208

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.839      25.616       1.146     623.378      28.282     267.747       2.076

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 176286.875       0.414    1810.491 1839692.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.035   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    181.737    3776.000      25.616     623.378       1.000       1.000       0.980
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W Kg/sec = 82.60789

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
114.331	3444.406	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
139807.359	142603.203	1.542	513.330	333.006	401.059	1.204

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	500.37	-0.17	500.37	0.42	578.90
MEAN	16.97	0.00	-0.02	500.37	-0.17	500.37	0.42	
HUB	14.32	0.00	-0.02	500.37	-0.17	500.37	0.42	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.75	46.36	5.39	634.65	808.32	22.74	602.49	0.67
MEAN	48.19	43.80	4.39	559.22	750.52	22.74	602.49	0.62
HUB	43.33	37.84	5.49	471.87	687.89	22.74	602.49	0.57

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	568.14	262.74	503.73	1223.87	0.46
MEAN	16.57	581.32	280.29	509.28	1220.99	0.48
HUB	13.89	629.85	361.53	515.75	1218.13	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	622.13	618.80	359.39	0.51	4963.87	
MEAN	546.14	574.50	265.85	0.47	4648.39	1.41
HUB	457.70	524.64	96.17	0.43	5024.12	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	29.21	1.14	25.19	649.61	1.04	622.68	0.92	0.91
MEAN	28.97	1.13	24.80	647.94	1.04	619.75	0.92	0.91
HUB	29.25	1.14	24.37	649.93	1.04	616.83	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.55	35.51	31.50	4.01	0.93	0.29	2.90	
MEAN	28.83	27.57	23.50	4.07	0.92	0.29	3.29	0.91
HUB	35.03	10.56	6.50	4.06	0.92	0.30	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.994

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	572.025	281.864	497.760	1223.031	0.468	0.056

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
29.099	25.046	621.859	46.000	29.521	32.400	2.879

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	517.726	281.864	589.481	1227.876	0.422	0.211

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	29.057	25.709	626.795	456.573	0.020	0.308

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	490.732	0.000	490.732	1230.099	0.399	0.210

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	25.959	629.066	0.000	0.060	0.039	0.269

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

```
      0.868      28.971       1.131     649.157      25.779     268.311       2.080

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 160785.875       0.415    1651.294 1597169.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.035   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    181.737    3776.000      28.971     649.157       1.000       1.000       0.980
W Kg/sec =   82.60789

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.161    3375.321       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 139807.359  142603.203       1.696     509.668     300.491     390.276       1.299

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   456.03    -0.16   456.03     0.37   539.60
 MEAN    15.91     0.00    -0.02   456.03    -0.16   456.03     0.37
 HUB     13.07     0.00    -0.02   456.03    -0.16   456.03     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.94    47.36     5.58   603.68   756.69    26.36   631.82     0.61
 MEAN    49.00    44.80     4.20   524.36   695.04    26.36   631.82     0.56
 HUB     43.37    38.84     4.53   430.68   627.36    26.36   631.82     0.51

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   529.77   259.60   461.80  1250.63     0.42
 MEAN    15.50   537.69   265.50   467.57  1247.20     0.43
 HUB     12.59   575.66   326.68   473.99  1243.79     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   568.50   331.55     0.45  4660.14
 MEAN   510.67   527.95   245.18     0.42  4117.07     1.44
 HUB    414.86   482.13    88.19     0.39  4114.90

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.61      1.13    28.82   673.76     1.04   650.36     0.92     0.91
 MEAN    32.17      1.11    28.31   670.90     1.03   646.79     0.92     0.91
 HUB     32.17      1.11    27.77   670.89     1.03   643.25     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.34    35.68    31.50     4.18     0.93     0.31     2.90
 MEAN    29.59    27.67    23.50     4.17     0.92     0.30     3.34     0.91
 HUB     34.57    10.54     6.50     4.04     0.92     0.29     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.993

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     543.637     270.365     471.639    1247.582       0.436      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.237      28.291     647.205      46.000      29.823      33.000       3.177

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     496.364     270.365     565.221    1251.527       0.397       0.139

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      32.167      28.860     651.304     440.827       0.037       0.317

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     462.578       0.000     462.578    1254.120       0.369       0.244

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      29.270     654.006       0.000       0.060       0.040       0.241

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.867      32.156       1.110     671.849      22.691     280.716       2.176

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  141624.141       0.405    1454.500 1629928.375

    OVERALL EXIT CONDITIONS; ALL          5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     928851.81   9539.4404    177.5392      2.1285      0.8484      5.0352      1.2851


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*******************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 100% Stat 2 10%  Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 6.012   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     176.353    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   80.16042

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     172.279    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  135665.203  138378.219       1.657     831.557     501.714     619.754       1.235

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   420.48    -0.14   420.48     0.38   677.10
  MEAN    17.06     0.00    -0.02   420.48    -0.14   420.48     0.38
  HUB     12.51     0.00    -0.02   420.48    -0.14   420.48     0.38

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.27    50.47     7.80   679.80   799.45    13.67   508.04     0.72
  MEAN    53.21    47.20     6.01   562.16   702.13    13.67   508.04     0.64
  HUB     44.44    38.62     5.82   412.23   588.94    13.67   508.04     0.53

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   668.44   381.63   548.79  1126.50     0.59
  MEAN    18.04   703.47   422.65   562.34  1120.84     0.63
  HUB     15.00   808.49   553.16   589.63  1110.61     0.73

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   624.55   298.16     0.55  7876.04
  MEAN   594.32   587.96   171.67     0.52  7625.47     1.33
  HUB    494.28   592.56    58.88     0.53  8299.19

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.31     1.28    15.21   564.50     1.08   527.19     0.92     0.91
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 MEAN    19.16     1.27    14.69   563.17     1.08   521.86     0.92     0.91
 HUB     19.56     1.29    13.74   566.74     1.08   512.19     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.82    28.52    24.20     4.32     0.93     0.30     2.90
 MEAN    36.93    16.98    12.70     4.28     0.93     0.25     3.51     0.91
 HUB     43.17    -5.70    -9.30     3.60     0.93     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     715.078     421.833     577.402    1120.898       0.638       -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.296      14.668     522.097      24.000      36.151      35.400      -0.751

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     598.555     421.833     732.264    1134.539       0.528       0.282

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.223      15.899     534.882     528.796       0.025       0.430

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     548.078       0.000     548.078    1139.655       0.481       0.350

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.346     539.716       0.000       0.060       0.040       0.375

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      19.153       1.268     564.806      41.996     217.392       1.685

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 261458.922       0.566    2605.664 1768069.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.012   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    176.353    3776.000      19.153     564.806       1.000       1.000       0.980
W Kg/sec =   80.16042

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    141.243    3618.600       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 135665.203  138378.219       1.436     590.487     411.342     474.134       1.153

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   520.10    -0.18   520.10     0.46   648.91
 MEAN    18.08     0.00    -0.02   520.10    -0.18   520.10     0.46
 HUB     15.21     0.00    -0.02   520.10    -0.18   520.10     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.48    46.36     6.12   677.16   853.98    16.61   542.22     0.75
 MEAN    48.89    42.30     6.59   595.71   790.94    16.61   542.22     0.69
 HUB     43.95    37.84     6.11   501.20   722.41    16.61   542.22     0.63

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     20.42   599.80   307.48   514.99  1169.13     0.51
 MEAN    18.01   614.66   321.99   523.58  1164.97     0.53
 HUB     15.22   668.79   403.63   533.26  1160.89     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   631.45   365.40     0.54  6282.35
 MEAN   593.46   589.77   271.47     0.51  5802.28     1.45
 HUB    501.63   542.19    97.99     0.47  6147.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.00     1.20    19.21   598.04     1.06   568.00     0.92     0.91
 MEAN    22.69     1.18    18.76   595.50     1.05   563.96     0.92     0.91
 HUB     22.91     1.20    18.29   597.33     1.06   559.99     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.84    35.36    31.50     3.86     0.93     0.32     2.90
 MEAN    31.59    27.41    23.50     3.91     0.93     0.32     3.30     0.91
 HUB     37.12    10.41     6.50     3.91     0.93     0.32     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     699.046     322.895     620.003    1156.809       0.604      -0.227

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.822      17.828     556.153      46.000      27.510      30.600       3.090

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     621.691     322.895     700.543    1165.647       0.533      -0.002

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      22.757      18.746     564.684     455.853       0.026       0.278

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     612.669       0.000     612.669    1166.607       0.525       0.235

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      18.792     565.614       0.000       0.060       0.044       0.009

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.873      22.683       1.184     596.956      32.150     248.825       1.929

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 200283.328       0.442    1995.996 1593529.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.012   EfDer =  0.981

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     176.353    3776.000      22.683     596.956       1.000       1.000       0.880
W Kg/sec =   80.16042

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     122.608    3519.808       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 135665.203  138378.219       1.372     489.817     357.090     384.470       1.077

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   566.79    -0.20   566.79     0.48   616.45
 MEAN    17.74     0.00    -0.02   566.79    -0.20   566.79     0.48
 HUB     15.05     0.00    -0.02   566.79    -0.20   566.79     0.48
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     49.41    46.36     3.05   661.34   871.14    19.32   570.14     0.74
MEAN    45.89    43.40     2.49   584.52   814.33    19.32   570.14     0.70
HUB     41.20    38.84     2.36   495.92   753.25    19.32   570.14     0.64

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   575.67   290.34   497.10  1201.21     0.48
MEAN    17.51   589.72   306.93   503.55  1197.84     0.49
HUB     14.85   641.47   387.68   511.07  1194.55     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    652.78   615.20   362.44     0.51  5755.47
MEAN   576.87   571.35   269.95     0.48  5376.70     1.53
HUB    489.33   521.08   101.66     0.44  5759.97

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.52     1.17    22.66   627.39     1.05   599.73     0.92     0.90
MEAN    26.25     1.16    22.24   625.38     1.05   596.36     0.92     0.90
HUB     26.52     1.17    21.79   627.41     1.05   593.07     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.29    36.10    31.50     4.60     0.93     0.35     2.90
MEAN    31.36    28.19    23.50     4.69     0.91     0.36     3.28     0.90
HUB     37.18    11.25     6.50     4.75     0.91     0.37     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.981

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     595.754     308.941     509.390    1198.548       0.497       0.011

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.387      22.284     597.101      46.000      31.236      31.500       0.264

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     519.390     308.941     604.327    1205.660       0.431       0.229

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.347      23.188     604.209     471.992       0.020       0.329

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     503.309       0.000     503.309    1207.029       0.417       0.244

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      23.309     605.582       0.000       0.060       0.037       0.257

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.863      26.275       1.158     626.726      29.770     250.515       1.942

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 185566.047       0.435    1849.326 1755661.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.012   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    176.353    3776.000      26.275     626.726       1.000       1.000       0.980
W Kg/sec =   80.16042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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   108.453    3435.195       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
135665.203  138378.219       1.625     513.330     315.885     401.059       1.270

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   471.09    -0.16   471.09     0.39   577.35
MEAN    16.97     0.00    -0.02   471.09    -0.16   471.09     0.39
HUB     14.32     0.00    -0.02   471.09    -0.16   471.09     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.42    46.36     7.06   634.65   790.51    23.66   608.21     0.65
MEAN    49.90    43.80     6.10   559.22   731.32    23.66   608.21     0.60
HUB     45.06    37.84     7.22   471.87   666.89    23.66   608.21     0.55

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   551.85   285.82   472.07  1230.87     0.45
MEAN    16.57   562.95   297.04   478.20  1227.42     0.46
HUB     13.89   608.75   367.75   485.12  1223.99     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    622.13   579.61   336.31     0.47  5399.46
MEAN   546.14   539.19   249.10     0.44  4925.92     1.47
HUB    457.70   493.38    89.95     0.40  5110.38

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     30.30     1.15    26.39   655.25     1.05   629.85     0.92     0.91
MEAN    29.93     1.14    25.90   652.75     1.04   626.31     0.92     0.91
HUB     30.07     1.14    25.39   653.73     1.04   622.81     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.19    35.47    31.50     3.97     0.93     0.33     2.90
MEAN    31.85    27.52    23.50     4.02     0.93     0.32     3.29     0.91
HUB     37.16    10.50     6.50     4.00     0.93     0.33     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     554.955     298.715     467.701    1229.262       0.451       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.056      26.130     628.217      46.000      32.566      32.400      -0.166

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     484.066     298.715     568.815    1235.259       0.392       0.264

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      30.023      27.004     634.361     456.573       0.018       0.353

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     459.319       0.000     459.319    1237.154       0.371       0.260

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      27.223     636.309       0.000       0.060       0.037       0.316

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      29.944       1.140     653.910      27.184     250.162       1.939

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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 169567.344       0.438    1689.885 1527988.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.012   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    176.353    3776.000      29.944     653.910       1.000       1.000       0.980
W Kg/sec =   80.16042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.206    3363.033       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 135665.203  138378.219       1.800     509.668     283.149     390.276       1.378

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   427.54    -0.15   427.54     0.34   537.64
 MEAN    15.91     0.00    -0.02   427.54    -0.15   427.54     0.34
 HUB     13.07     0.00    -0.02   427.54    -0.15   427.54     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.70    47.36     7.34   603.68   739.86    27.58   638.67     0.60
 MEAN    50.82    44.80     6.02   524.36   676.68    27.58   638.67     0.55
 HUB     45.22    38.84     6.38   430.68   606.96    27.58   638.67     0.49

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   515.31   282.08   431.24  1258.41     0.41
 MEAN    15.50   520.30   281.91   437.30  1254.51     0.41
 HUB     12.59   554.78   332.73   443.92  1250.63     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   530.56   309.07     0.42  5063.24
 MEAN   510.67   493.52   228.76     0.39  4371.32     1.50
 HUB    414.86   451.46    82.14     0.36  4190.97

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.04     1.14    30.33   680.64     1.04   658.50     0.92     0.91
 MEAN    33.46     1.12    29.72   676.99     1.04   654.42     0.92     0.91
 HUB     33.31     1.11    29.10   676.04     1.03   650.37     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.19    35.63    31.50     4.13     0.93     0.35     2.90
 MEAN    32.81    27.61    23.50     4.11     0.93     0.33     3.34     0.91
 HUB     36.85    10.48     6.50     3.98     0.93     0.32     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     526.258     287.082     441.058    1254.863       0.419      -0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    33.524      29.701     654.796      46.000      33.060      33.000      -0.060

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     461.836     287.082     543.791    1259.939       0.367       0.203

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      33.474      30.505     660.104     440.827       0.033       0.365

   VANED DIFFUSER EXIT:
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   R4          C4           Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     431.181       0.000     431.181    1262.115       0.342       0.299

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.862     662.386       0.000       0.060       0.037       0.295

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      33.459       1.117     677.888      23.979     260.757       2.021

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 149681.062       0.428    1491.701 1559344.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     966556.69   9632.5723    172.2791      2.2148      0.8633      6.0120      1.2966


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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 100% Stat 2 10%  Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    167.175    3761.129       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.708     831.557     486.850     619.754       1.273

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   406.03    -0.14   406.03     0.37   677.10
  MEAN    17.06     0.00    -0.02   406.03    -0.14   406.03     0.37
  HUB     12.51     0.00    -0.02   406.03    -0.14   406.03     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.16    50.47     8.69   679.80   791.94    13.76   509.04     0.72
  MEAN    54.17    47.20     6.97   562.16   693.58    13.76   509.04     0.63
  HUB     45.44    38.62     6.82   412.23   578.71    13.76   509.04     0.52

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   657.50   393.69   526.61  1129.16     0.58
  MEAN    18.04   690.16   429.46   540.26  1123.15     0.61
  HUB     15.00   789.74   550.81   565.95  1113.01     0.71

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   599.32   286.11     0.53  8124.65
  MEAN   594.32   564.85   164.86     0.50  7748.13     1.37
  HUB    494.28   568.77    56.53     0.51  8263.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.46     1.29    15.46   565.82     1.08   529.72     0.92     0.91
  MEAN    19.24     1.27    14.91   563.82     1.08   524.05     0.92     0.91
  HUB     19.54     1.29    13.96   566.55     1.08   514.49     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.78    28.52    24.20     4.32     0.93     0.33     2.90
 MEAN    38.48    16.97    12.70     4.27     0.93     0.28     3.51     0.91
 HUB     44.22    -5.70    -9.30     3.60     0.93     0.13     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     700.672     428.626     554.275    1123.361       0.624      -0.003

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.365      14.893     524.393      24.000      37.715      35.400      -2.315

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     572.477     428.626     715.157    1137.868       0.503       0.313

   BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.950      19.292       16.226     538.025     528.796       0.026       0.455

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     525.185       0.000     525.185    1142.444       0.460       0.376

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.634     542.361       0.000       0.060       0.039       0.401

    STAGE EXIT CONDITIONS, STAGE             1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.880      19.231       1.273     565.398      42.589     211.392       1.639

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 265150.219       0.574    2564.162 1707338.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    171.128    3776.000      19.231     565.398       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    136.570    3616.702       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.485     590.487     397.735     474.134       1.192

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   498.98    -0.17   498.98     0.44   648.57
 MEAN    18.08     0.00    -0.02   498.98    -0.17   498.98     0.44
 HUB     15.21     0.00    -0.02   498.98    -0.17   498.98     0.44

       BetaFlo   BetaBlade Incid   U1        W1       Ps1      Ts1     Rel Mach
 TIP     53.62    46.36     7.26   677.16   841.29    16.87   544.61     0.73
 MEAN    50.06    42.30     7.76   595.71   777.21    16.87   544.61     0.68
 HUB     45.14    37.84     7.30   501.20   707.36    16.87   544.61     0.62

     ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     20.42   589.50   323.54   492.78  1172.55      0.50
 MEAN    18.01   602.52   333.65   501.70  1167.98      0.52
 HUB     15.22   654.39   407.92   511.69  1163.48      0.56
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   604.04   349.33     0.52  6610.27
 MEAN   593.46   564.98   259.81     0.48  6012.18     1.49
 HUB    501.63   520.20    93.71     0.45  6212.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.30     1.21    19.60   600.37     1.06   571.35     0.92     0.91
 MEAN    22.91     1.19    19.10   597.20     1.06   566.89     0.92     0.91
 HUB     23.04     1.20    18.58   598.26     1.06   562.51     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.29    35.33    31.50     3.83     0.93     0.35     2.90
 MEAN    33.63    27.38    23.50     3.88     0.93     0.34     3.30     0.91
 HUB     38.56    10.38     6.50     3.88     0.93     0.34     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     679.407     334.589     591.307    1160.874       0.585      -0.209

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.041      18.267     560.069      46.000      29.503      30.600       1.097

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     590.391     334.589     678.610    1170.614       0.504       0.056

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      22.988      19.319     569.507     455.853       0.023       0.309

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     581.536       0.000     581.536    1171.504       0.496       0.278

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      19.374     570.374       0.000       0.060       0.037       0.070

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      22.931       1.192     598.612      33.213     237.846       1.844

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 206906.594       0.457    2000.911 1532291.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    3776.000      22.931     598.612       1.000       1.000       0.880
W Kg/sec =   77.78547

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    117.850    3514.937       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.427     489.817     343.235     384.470       1.120

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   539.42    -0.19   539.42     0.46   615.60
 MEAN    17.74     0.00    -0.02   539.42    -0.19   539.42     0.46
 HUB     15.05     0.00    -0.02   539.42    -0.19   539.42     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.81    46.36     4.45   661.34   853.58    19.84   574.33     0.73
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 MEAN    47.31    43.40     3.91   584.52   795.52    19.84   574.33     0.68
 HUB     42.61    38.84     3.77   495.92   732.87    19.84   574.33     0.62

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   564.38   309.16   472.17  1205.90     0.47
 MEAN    17.51   576.53   320.68   479.12  1202.05     0.48
 HUB     14.85   625.80   393.09   486.93  1198.28     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   583.97   343.62     0.48  6128.11
 MEAN   576.87   543.31   256.19     0.45  5617.37     1.58
 HUB    489.33   496.36    96.25     0.41  5840.15

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.11     1.18    23.33   631.01     1.05   604.42     0.92     0.91
 MEAN    26.74     1.17    22.84   628.31     1.05   600.57     0.92     0.91
 HUB     26.90     1.17    22.33   629.49     1.05   596.80     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.21    36.04    31.50     4.54     0.93     0.38     2.90
 MEAN    33.80    28.13    23.50     4.63     0.92     0.38     3.28     0.91
 HUB     38.91    11.18     6.50     4.68     0.92     0.39     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     582.245     322.789     484.579    1202.758       0.484       0.012

     Pt3          Ps3         Ts3          Vane No.     Alpha3     Vane A3      Incid3
     26.876      22.891     601.307       46.000      33.668      31.500      -2.168

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth         Cmth         Aoth         Machth      cp 2-Th
     17.392     492.238     322.789     588.634    1210.804       0.407       0.272

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.836      23.946     609.379     471.992       0.020       0.366

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     477.385       0.000     477.385    1211.997       0.394       0.282

   Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.044     610.581       0.000       0.060       0.038       0.296

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      26.761       1.167     629.602      30.991     237.127       1.838

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 193184.781       0.453    1868.213 1681031.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    171.128    3776.000      26.761     629.602       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    103.566    3427.338       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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131645.797  134278.422       1.702     513.330     301.653     401.059       1.330

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   447.42    -0.15   447.42     0.37   576.03
MEAN    16.97     0.00    -0.02   447.42    -0.15   447.42     0.37
HUB     14.32     0.00    -0.02   447.42    -0.15   447.42     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.82    46.36     8.46   634.65   776.64    24.36   612.90     0.64
MEAN    51.34    43.80     7.54   559.22   716.30    24.36   612.90     0.59
HUB     46.53    37.84     8.69   471.87   650.38    24.36   612.90     0.54

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   540.71   303.89   447.24  1236.41     0.44
MEAN    16.57   549.55   310.22   453.62  1232.56     0.45
HUB     13.89   592.55   372.62   460.73  1228.74     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    622.13   548.90   318.24     0.44  5740.41
MEAN   546.14   511.30   235.91     0.41  5144.23     1.52
HUB    457.70   468.52    85.09     0.38  5177.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     31.11     1.16    27.27   659.93     1.05   635.54     0.92     0.91
MEAN    30.63     1.14    26.72   656.78     1.04   631.58     0.92     0.91
HUB     30.66     1.15    26.15   656.96     1.04   627.67     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.20    35.43    31.50     3.93     0.93     0.36     2.90
MEAN    34.37    27.48    23.50     3.98     0.93     0.35     3.29     0.91
HUB     38.96    10.46     6.50     3.96     0.93     0.35     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     542.564     311.969     443.904    1234.246       0.440       0.051

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    30.759      26.933     633.330      46.000      35.099      32.400      -2.699

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     457.898     311.969     554.072    1241.113       0.369       0.306

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      30.725      27.965     640.396     456.573       0.018       0.392

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     434.970       0.000     434.970    1242.766       0.350       0.298

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      28.149     642.104       0.000       0.060       0.039       0.351

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.880      30.640       1.145     657.888      28.286     236.628       1.834

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 176451.797       0.456    1706.395 1466273.750
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    3776.000      30.640     657.888       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.463    3352.850       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.892     509.668     269.335     390.276       1.449

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   405.34    -0.14   405.34     0.33   536.01
 MEAN    15.91     0.00    -0.02   405.34    -0.14   405.34     0.33
 HUB     13.07     0.00    -0.02   405.34    -0.14   405.34     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.13    47.36     8.77   603.68   727.25    28.47   644.19     0.58
 MEAN    52.30    44.80     7.50   524.36   662.87    28.47   644.19     0.53
 HUB     46.75    38.84     7.91   430.68   591.53    28.47   644.19     0.48

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   505.91   299.08   408.04  1264.48     0.40
 MEAN    15.50   508.12   294.38   414.16  1260.26     0.40
 HUB     12.59   539.33   337.34   420.80  1256.07     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   501.80   292.08     0.40  5367.99
 MEAN   510.67   467.24   216.30     0.37  4564.38     1.56
 HUB    414.86   427.88    77.52     0.34  4248.97

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     35.07     1.14    31.40   686.22     1.04   664.88     0.92     0.91
 MEAN    34.38     1.12    30.73   681.98     1.04   660.46     0.92     0.91
 HUB     34.11     1.11    30.05   680.32     1.03   656.07     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.24    35.60     31.50     4.10     0.93     0.38     2.90
 MEAN    35.40    27.58     23.50     4.08     0.93     0.36     3.34     0.91
 HUB     38.72    10.44      6.50     3.94     0.93     0.35     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      514.140     299.776      417.701    1260.587       0.408       -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.442      30.712      660.802       46.000      35.666      33.000      -2.666

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      436.048     299.776     529.154    1266.475       0.344       0.251

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       34.388      31.679     666.988     440.827       0.034       0.404

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      407.615       0.000     407.615    1268.372       0.321       0.338
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   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      31.994     668.988       0.000       0.060       0.039       0.334

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      34.369       1.122     682.842      24.954     246.395       1.910

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 155787.172       0.446    1506.555 1496738.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    997480.62   9646.2363    167.1750      2.2751      0.8683      6.9673      1.3061


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 100% Stat 2 10%  Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    165.780    3776.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   75.35457

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    161.951    3761.129       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127531.688  130082.039       1.763     831.557     471.635     619.754       1.314

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   391.49    -0.13   391.49     0.35   677.10
 MEAN    17.06     0.00    -0.02   391.49    -0.13   391.49     0.35
 HUB     12.51     0.00    -0.02   391.49    -0.13   391.49     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.07    50.47     9.60   679.80   784.58    13.86   510.01     0.71
 MEAN    55.15    47.20     7.95   562.16   685.16    13.86   510.01     0.62
 HUB     46.49    38.62     7.87   412.23   568.60    13.86   510.01     0.51

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   647.67   405.39   505.11  1131.63     0.57
 MEAN    18.04   677.67   436.10   518.70  1125.31     0.60
 HUB     15.00   771.77   548.53   542.90  1115.26     0.69

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    679.80   574.84   274.40     0.51  8366.02
 MEAN   594.32   542.30   158.22     0.48  7867.78     1.42
 HUB    494.28   545.60    54.26     0.49  8229.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.59     1.30    15.69   567.09     1.08   532.06     0.92     0.91
 MEAN    19.30     1.28    15.10   564.46     1.08   526.11     0.92     0.91
 HUB     19.51     1.29    14.16   566.37     1.08   516.64     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.75    28.51    24.20     4.31     0.93     0.36     2.90
 MEAN    40.06    16.96    12.70     4.26     0.93     0.30     3.51     0.91
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HUB     45.30    -5.71    -9.30     3.59     0.93     0.15     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     687.226     435.251     531.823    1125.645       0.611      -0.001

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.424      15.098     526.529      24.000      39.297      35.400      -3.897

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     547.630     435.251     699.530    1140.932       0.480       0.343

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.346      16.521     540.927     528.796       0.027       0.478

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    18.083     503.630       0.000     503.630    1144.999       0.440       0.397

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.879     544.790       0.000       0.060       0.042       0.423

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.878      19.281       1.276     565.975      43.165     205.488       1.593

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 268740.031       0.582    2517.659 1646176.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.996

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   165.780    3776.000      19.281     565.975       1.000       1.000       0.980
W Kg/sec =   75.35457

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
   132.026    3614.860       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127531.688  130082.039       1.536     590.487     384.502     474.134       1.233

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   479.00    -0.16   479.00     0.42   648.24
 MEAN    18.08     0.00    -0.02   479.00    -0.16   479.00     0.42
 HUB     15.21     0.00    -0.02   479.00    -0.16   479.00     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.73    46.36     8.37   677.16   829.59    17.10   546.82     0.72
 MEAN    51.21    42.30     8.91   595.71   764.53    17.10   546.82     0.67
 HUB     46.31    37.84     8.47   501.20   693.40    17.10   546.82     0.60

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   580.95   338.32   472.28  1175.62     0.49
 MEAN    18.01   591.91   344.45   481.36  1170.70     0.51
 HUB     15.22   641.27   411.88   491.50  1165.85     0.55

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   578.77   334.56     0.49  6911.82
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 MEAN   593.46   541.95   249.01     0.46  6206.53     1.54
 HUB    501.63   499.63    89.74     0.43  6272.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.54     1.22    19.92   602.54     1.06   574.36     0.92     0.91
 MEAN    23.08     1.20    19.38   598.81     1.06   569.56     0.92     0.91
 HUB     23.12     1.20    18.82   599.16     1.06   564.83     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.62    35.31    31.50     3.81     0.93     0.37     2.90
 MEAN    35.59    27.35    23.50     3.85     0.93     0.36     3.30     0.91
 HUB     39.96    10.35     6.50     3.85     0.93     0.36     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     662.358     345.418     565.159    1164.460       0.569      -0.193

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.207      18.629     563.537      46.000      31.433      30.600      -0.833

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     562.390     345.418     659.997    1174.974       0.479       0.109

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      23.158      19.794     573.760     455.853       0.022       0.338

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     554.172       0.000     554.172    1175.759       0.471       0.312

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      19.838     574.526       0.000       0.060       0.037       0.121

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      23.103       1.198     600.169      34.194     228.005       1.767

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 213016.469       0.470    1995.620 1472152.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    165.780    3776.000      23.103     600.169       1.000       1.000       0.880
W Kg/sec =   75.35457

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    113.466    3510.375       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127531.688  130082.039       1.482     489.817     330.467     384.470       1.163

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   515.11    -0.18   515.11     0.44   614.80
 MEAN    17.74     0.00    -0.02   515.11    -0.18   515.11     0.44
 HUB     15.05     0.00    -0.02   515.11    -0.18   515.11     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.09    46.36     5.73   661.34   838.42    20.26   578.02     0.71
 MEAN    48.62    43.40     5.22   584.52   779.23    20.26   578.02     0.66
 HUB     43.92    38.84     5.08   495.92   715.16    20.26   578.02     0.61
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      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   555.78   325.52   450.47  1209.94     0.46
 MEAN    17.51   565.84   332.71   457.69  1205.72     0.47
 HUB     14.85   612.47   397.81   465.68  1201.58     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   556.79   327.25     0.46  6452.12
 MEAN   576.87   518.74   244.16     0.43  5827.76     1.62
 HUB    489.33   474.59    91.52     0.39  5910.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.56     1.19    23.85   634.28     1.06   608.50     0.92     0.91
 MEAN    27.11     1.17    23.31   630.98     1.05   604.26     0.92     0.91
 HUB     27.17     1.18    22.75   631.41     1.05   600.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.85    36.00    31.50     4.50     0.93     0.40     2.90
 MEAN    36.01    28.08    23.50     4.58     0.92     0.40     3.28     0.91
 HUB     40.51    11.12     6.50     4.62     0.92     0.41     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     571.313     334.893     462.866    1206.421       0.474       0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.239      23.358     604.981      46.000      35.887      31.500      -4.387

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     468.815     334.893     576.144    1215.261       0.386       0.311

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.192      24.536     613.879     471.992       0.022       0.400

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     455.092       0.000     455.092    1216.308       0.374       0.314

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.607     614.937       0.000       0.060       0.043       0.328

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      27.107       1.173     632.223      32.055     225.923       1.751

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 199824.016       0.469    1872.028 1609976.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    165.780    3776.000      27.107     632.223       1.000       1.000       0.980
W Kg/sec =   75.35457

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     99.252    3420.226       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127531.688  130082.039       1.776     513.330     289.091     401.059       1.387

     ROTOR LEADING EDGE CONDITIONS, STAGE            4
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   426.97    -0.15   426.97     0.35   574.84
MEAN    16.97     0.00    -0.02   426.97    -0.15   426.97     0.35
HUB     14.32     0.00    -0.02   426.97    -0.15   426.97     0.35

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.07    46.36     9.71   634.65   765.03    24.90   617.02     0.63
MEAN    52.64    43.80     8.84   559.22   703.70    24.90   617.02     0.58
HUB     47.87    37.84    10.03   471.87   636.48    24.90   617.02     0.52

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   532.46   319.10   426.25  1241.13     0.43
MEAN    16.57   538.99   321.37   432.70  1236.98     0.44
HUB     13.89   579.15   376.73   439.87  1232.85     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    622.13   522.98   303.03     0.42  6027.53
MEAN   546.14   487.60   224.77     0.39  5328.79     1.57
HUB    457.70   447.26    80.97     0.36  5234.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     31.71     1.17    27.94   664.06     1.05   640.41     0.92     0.91
MEAN    31.15     1.15    27.33   660.37     1.04   636.14     0.92     0.91
HUB     31.07     1.15    26.71   659.88     1.04   631.90     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     36.82    35.41    31.50     3.91     0.93     0.39     2.90
MEAN    36.60    27.45    23.50     3.95     0.93     0.38     3.29     0.91
HUB     40.58    10.43     6.50     3.93     0.93     0.37     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     532.831     323.174     423.636    1238.538       0.430       0.049

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    31.269      27.530     637.755      46.000      37.338      32.400      -4.938

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     435.885     323.174     542.621    1246.122       0.350       0.343

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      31.226      28.690     645.589     456.573       0.021       0.426

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     414.527       0.000     414.527    1247.583       0.332       0.328

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      28.837     647.104       0.000       0.060       0.045       0.379

   STAGE EXIT CONDITIONS, STAGE             4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.875      31.130       1.148     661.438      29.215     225.610       1.749

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 182260.703       0.471    1707.488 1407139.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.996
```

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
165.780	3776.000	31.130	661.438	1.000	1.000	0.980

W Kg/sec = 75.35457

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
88.402	3343.840	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
127531.688	130082.039	1.979	509.668	257.508	390.276	1.516

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	386.63	-0.13	386.63	0.31	534.57
MEAN	15.91	0.00	-0.02	386.63	-0.13	386.63	0.31	
HUB	13.07	0.00	-0.02	386.63	-0.13	386.63	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.37	47.36	10.01	603.68	716.98	29.13	648.98	0.57
MEAN	53.60	44.80	8.80	524.36	651.59	29.13	648.98	0.52
HUB	48.09	38.84	9.25	430.68	578.86	29.13	648.98	0.46

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	499.22	313.09	388.84	1269.62	0.39
MEAN	15.50	498.77	304.68	394.90	1265.17	0.39
HUB	12.59	526.82	341.12	401.47	1260.74	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	591.16	478.03	278.06	0.38	5619.35	
MEAN	510.67	445.40	206.00	0.35	4723.91	1.62
HUB	414.86	408.19	73.75	0.32	4296.40	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	35.81	1.15	32.18	691.10	1.04	670.32	0.92	0.91
MEAN	35.03	1.13	31.47	686.37	1.04	665.63	0.92	0.91
HUB	34.66	1.11	30.74	684.12	1.03	660.98	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.84	35.57	31.50	4.07	0.93	0.41	2.90	
MEAN	37.65	27.55	23.50	4.05	0.93	0.39	3.34	0.91
HUB	40.35	10.41	6.50	3.91	0.93	0.37	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	504.872	310.265	398.285	1265.463	0.399	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
35.093	31.445	665.945	46.000	37.919	33.000	-4.919

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	414.913	310.265	518.090	1272.000	0.326	0.289

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	35.025	32.535	672.843	440.827	0.038	0.438

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	388.247	0.000	388.247	1273.687	0.305	0.370

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	32.815	674.629	0.000	0.060	0.045	0.365

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    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      35.001       1.124     687.196      25.757     234.969       1.821

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  160821.766       0.460    1506.640 1436845.000

    OVERALL EXIT CONDITIONS; ALL          5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1024662.94   9599.4336    161.9505      2.3169      0.8664      7.9532      1.3144


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 100% Stat 2 10%  Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 8.966   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     160.332    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   72.87835

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     156.629    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  123340.875  125807.422       1.823     831.557     456.137     619.754       1.359

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   376.90    -0.13   376.90     0.34   677.10
  MEAN    17.06     0.00    -0.02   376.90    -0.13   376.90     0.34
  HUB     12.51     0.00    -0.02   376.90    -0.13   376.90     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.00    50.47    10.53   679.80   777.40    13.94   510.95     0.70
  MEAN    56.17    47.20     8.97   562.16   676.92    13.94   510.95     0.61
  HUB     47.57    38.62     8.95   412.23   558.65    13.94   510.95     0.50

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   638.88   416.73   484.26  1133.93     0.56
  MEAN    18.04   665.98   442.55   497.68  1127.34     0.59
  HUB     15.00   754.52   546.29   520.45  1117.37     0.68

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   551.10   263.07     0.49  8599.78
  MEAN   594.32   520.30   151.77     0.46  7984.09     1.46
  HUB    494.28   523.04    52.01     0.47  8195.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.72      1.31    15.89   568.33     1.09   534.24     0.92     0.91
  MEAN    19.36      1.28    15.28   565.07     1.08   528.03     0.92     0.91
  HUB     19.48      1.29    14.35   566.19     1.08   518.66     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     40.71    28.51    24.20     4.31     0.93     0.38     2.90
  MEAN    41.64    16.96    12.70     4.26     0.93     0.33     3.51     0.91
  HUB     46.39    -5.71    -9.30     3.59     0.93     0.18     4.78
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     674.687     441.692     510.011    1127.765       0.598       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.473      15.283     528.513      24.000      40.894      35.400      -5.494

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     523.856     441.692     685.213    1143.761       0.458       0.371

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.386      16.786     543.612     528.796       0.030       0.503

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     482.934       0.000     482.934    1147.375       0.421       0.417

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.095     547.053       0.000       0.060       0.047       0.443

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      19.313       1.278     566.533      43.723     199.689       1.548

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 272215.094       0.589    2466.412 1584834.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.966   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    160.332    3776.000      19.313     566.533       1.000       1.000       0.980
W Kg/sec =   72.87835

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    127.537    3613.079       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123340.875  125807.422       1.590     590.487     371.429     474.134       1.277

     ROTOR LEADING EDGE CONDITIONS, STAGE           2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   459.74    -0.16   459.74     0.40   647.92
 MEAN    18.08     0.00    -0.02   459.74    -0.16   459.74     0.40
 HUB     15.21     0.00    -0.02   459.74    -0.16   459.74     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.83    46.36     9.47   677.16   818.61    17.29   548.89     0.71
 MEAN    52.35    42.30    10.05   595.71   752.61    17.29   548.89     0.65
 HUB     47.48    37.84     9.64   501.20   680.24    17.29   548.89     0.59

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   573.76   352.24   452.91  1178.43     0.49
 MEAN    18.01   582.45   354.66   462.01  1173.21     0.50
 HUB     15.22   629.03   415.60   472.19  1168.05     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   554.92   320.64     0.47  7195.91
 MEAN   593.46   520.08   238.80     0.44  6390.33     1.58
 HUB    501.63   479.96    86.03     0.41  6329.05
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.74     1.23    20.18   604.60     1.07   577.11     0.92     0.91
MEAN    23.21     1.20    19.61   600.34     1.06   572.01     0.92     0.91
HUB     23.17     1.20    19.02   600.01     1.06   566.98     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.87    35.30    31.50     3.80     0.93     0.40     2.90
MEAN    37.51    27.33    23.50     3.83     0.94     0.38     3.30     0.91
HUB     41.35    10.33     6.50     3.83     0.94     0.37     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     647.183     355.659     540.697    1167.699       0.554       -0.179

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.337      18.937     566.679      46.000      33.336      30.600      -2.736

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     536.569     355.659     643.739    1178.910       0.455       0.158

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      23.287      20.199     577.612     455.853       0.023       0.366

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     529.052       0.000     529.052    1179.592       0.449       0.343

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      20.229     578.281       0.000       0.060       0.039       0.166

    STAGE EXIT CONDITIONS, STAGE            2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.876      23.227       1.203     601.651      35.118     218.948       1.697

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 218776.641       0.483    1982.232 1412895.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.966   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    160.332    3776.000      23.227     601.651       1.000       1.000       0.880
W Kg/sec =   72.87835

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    109.284    3506.047       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123340.875  125807.422       1.539     489.817     318.289     384.470       1.208

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   492.60    -0.17   492.60     0.42   614.04
 MEAN    17.74     0.00    -0.02   492.60    -0.17   492.60     0.42
 HUB     15.05     0.00    -0.02   492.60    -0.17   492.60     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.33    46.36     6.97   661.34   824.78    20.61   581.40     0.70
 MEAN    49.89    43.40     6.49   584.52   764.53    20.61   581.40     0.65
 HUB     45.20    38.84     6.36   495.92   699.12    20.61   581.40     0.59

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
```

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	548.99	340.38	430.73	1213.56	0.45
MEAN	17.51	556.80	343.68	438.07	1209.04	0.46
HUB	14.85	600.62	402.12	446.15	1204.58	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	652.78	532.09	312.39	0.44	6746.39	
MEAN	576.87	496.27	233.19	0.41	6019.70	1.67
HUB	489.33	454.60	87.22	0.38	5973.99	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.93	1.20	24.27	637.32	1.06	612.16	0.92	0.91
MEAN	27.39	1.18	23.68	633.47	1.05	607.60	0.92	0.91
HUB	27.36	1.18	23.08	633.23	1.05	603.13	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.32	35.95	31.50	4.45	0.93	0.43	2.90	
MEAN	38.12	28.03	23.50	4.53	0.93	0.42	3.28	0.91
HUB	42.03	11.06	6.50	4.56	0.93	0.42	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	562.083	345.937	443.018	1209.724	0.465	0.013

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
27.521	23.732	608.306	46.000	37.985	31.500	-6.485

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	447.635	345.937	565.729	1219.277	0.367	0.345

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	27.461	25.018	617.951	471.992	0.025	0.433

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	434.977	0.000	434.977	1220.196	0.356	0.342

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	25.059	618.883	0.000	0.060	0.051	0.356

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.876	27.363	1.178	634.674	33.023	216.051	1.675

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
205866.516	0.483	1865.259	1541290.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 8.966 EfDer = 0.991

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
160.332	3776.000	27.363	634.674	1.000	1.000	0.980

W Kg/sec = 72.87835

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
95.279	3413.616	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
123340.875	125807.422	1.850	513.330	277.521	401.059	1.445

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	408.45	-0.14	408.45	0.33	573.73

```
 MEAN    16.97     0.00    -0.02   408.45    -0.14   408.45     0.33
 HUB     14.32     0.00    -0.02   408.45    -0.14   408.45     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.24    46.36    10.88   634.65   754.85    25.32   620.76     0.62
 MEAN    53.86    43.80    10.06   559.22   692.61    25.32   620.76     0.57
 HUB     49.13    37.84    11.29   471.87   624.20    25.32   620.76     0.51

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   526.03   332.57   407.55  1245.33     0.42
 MEAN    16.57   530.20   331.27   413.97  1240.94     0.43
 HUB     13.89   567.45   380.35   421.10  1236.57     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   499.94   289.56     0.40  6281.68
 MEAN   546.14   466.41   214.87     0.38  5492.88     1.62
 HUB    457.70   428.15    77.35     0.35  5285.13

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.17     1.18    28.45   667.86     1.05   644.77     0.92     0.91
 MEAN    31.53     1.15    27.81   663.69     1.05   640.24     0.92     0.91
 HUB     31.37     1.15    27.15   662.59     1.04   635.73     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.22    35.39    31.50     3.89     0.93     0.41     2.90
 MEAN    38.67    27.43    23.50     3.93     0.94     0.40     3.29     0.91
 HUB     42.09    10.41     6.50     3.91     0.94     0.39     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     524.771     333.137     405.468    1242.389       0.422       0.047

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.651      27.993      641.741      46.000      39.407      32.400      -7.007

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     416.332     333.137     533.209    1250.602       0.333       0.375

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.596      29.261     650.254     456.573       0.024       0.458

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     396.385       0.000     396.385    1251.902       0.317       0.354

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.369     651.606        0.000       0.060       0.053       0.403

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4           PR4       Texit        Del T       Ns         Ns nondim
      0.866      31.484        1.151     664.712      30.038     216.103       1.675

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 187406.938       0.484    1698.006 1349634.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.966   EfDer =  0.991

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    160.332    3776.000       31.484     664.712       1.000       1.000       0.980
W Kg/sec =   72.87835
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
84.744	3335.595	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
123340.875	125807.422	2.065	509.668	246.857	390.276	1.581

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	369.97	-0.13	369.97	0.30	533.25
MEAN	15.91	0.00	-0.02	369.97	-0.13	369.97	0.30	
HUB	13.07	0.00	-0.02	369.97	-0.13	369.97	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.50	47.36	11.14	603.68	708.14	29.64	653.30	0.56
MEAN	54.80	44.80	10.00	524.36	641.85	29.64	653.30	0.51
HUB	49.34	38.84	10.50	430.68	567.87	29.64	653.30	0.45

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	494.15	325.30	371.98	1274.18	0.39
MEAN	15.50	491.14	313.68	377.92	1269.55	0.39
HUB	12.59	516.09	344.40	384.37	1264.93	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	591.16	457.22	265.85	0.36	5838.24	
MEAN	510.67	426.18	197.00	0.34	4863.29	1.67
HUB	414.86	390.77	70.46	0.31	4337.70	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	36.36	1.15	32.77	695.53	1.05	675.17	0.92	0.91
MEAN	35.51	1.13	32.02	690.38	1.04	670.27	0.92	0.91
HUB	35.06	1.11	31.26	687.61	1.03	665.40	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.17	35.55	31.50	4.05	0.93	0.43	2.90	
MEAN	39.69	27.53	23.50	4.03	0.94	0.41	3.34	0.91
HUB	41.86	10.39	6.50	3.89	0.94	0.39	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.991

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	497.319	319.430	381.170	1269.810	0.392	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
35.569	31.997	670.552	46.000	39.964	33.000	-6.964

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	396.466	319.430	509.138	1276.905	0.310	0.322

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	35.481	33.186	678.067	440.827	0.044	0.470

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	371.309	0.000	371.309	1278.420	0.290	0.396

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	33.433	679.677	0.000	0.060	0.053	0.390

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.868	35.450	1.126	691.170	26.458	225.257	1.746

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 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  165211.156       0.473    1496.900 1378601.250

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1049476.38   9508.8096    156.6287      2.3466      0.8604      8.9664      1.3220


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 100% Stat 2 10%  Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.991

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     154.804    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   70.36555

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     151.228    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  119088.148  121469.656       1.888     831.557     440.409     619.754       1.407

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   362.31    -0.12   362.31     0.33   677.10
  MEAN    17.06     0.00    -0.02   362.31    -0.12   362.31     0.33
  HUB     12.51     0.00    -0.02   362.31    -0.12   362.31     0.33

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.95    50.47    11.48   679.80   770.43    14.03   511.85     0.69
  MEAN    57.20    47.20    10.00   562.16   668.91    14.03   511.85     0.60
  HUB     48.70    38.62    10.08   412.23   548.91    14.03   511.85     0.49

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   631.06   427.71   464.01  1136.06     0.56
  MEAN    18.04   655.05   448.80   477.15  1129.24     0.58
  HUB     15.00   737.95   544.07   498.56  1119.36     0.66

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   528.07   252.09     0.46  8826.17
  MEAN   594.32   498.84   145.52     0.44  8096.73     1.51
  HUB    494.28   501.04    49.79     0.45  8162.58

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.83     1.31    16.07   569.53     1.09   536.27     0.92     0.91
  MEAN    19.40     1.28    15.44   565.67     1.08   529.83     0.92     0.91
  HUB     19.44     1.29    14.52   566.02     1.08   520.54     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     42.67    28.51    24.20     4.31     0.93     0.41     2.90
  MEAN    43.25    16.96    12.70     4.26     0.94     0.35     3.51     0.91
  HUB     47.50    -5.70    -9.30     3.60     0.94     0.20     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.991
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071      662.986     447.930      488.783    1129.733       0.587        0.002

     Pt3          Ps3         Ts3          Vane No.     Alpha3     Vane A3      Incid3
     19.513       15.451      530.360       24.000      42.503      35.400      -7.103

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth         Cmth         Aoth         Machth       cp 2-Th
     18.071      501.002     447.930      672.045    1146.383       0.437        0.399

   BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.950       19.414       17.024     546.108      528.796       0.034        0.527

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083      462.934       0.000     462.934    1149.596       0.403        0.435

   Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       17.285      549.173       0.000       0.060       0.053        0.461

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4        Pt4           PR4        Texit         Del T       Ns         Ns nondim
      0.865       19.331        1.280      567.073       44.263     193.995        1.504

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 275572.750       0.596    2410.745 1523501.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.985

   W act       RPM act         Pt          Tt            POTS         POTH        AeroBl
    154.804     3776.000       19.331      567.073        1.000        1.000        0.980
W Kg/sec =   70.36555

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
    123.086     3611.360        1.402        0.249       53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
 119088.148  121469.656        1.647      590.487      358.468      474.134        1.323

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.55      0.00     -0.02    441.06     -0.15    441.06      0.38    647.62
 MEAN    18.08      0.00     -0.02    441.06     -0.15    441.06      0.38
 HUB     15.21      0.00     -0.02    441.06     -0.15    441.06      0.38

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     56.93     46.36     10.57   677.16    808.26     17.47    550.83      0.70
 MEAN    53.49     42.30     11.19   595.71    741.34     17.47    550.83      0.64
 HUB     48.66     37.84     10.82   501.20    667.75     17.47    550.83      0.58

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     20.42    567.70    365.43    434.44   1181.01      0.48
 MEAN    18.01    573.96    364.39    443.46   1175.54      0.49
 HUB     15.22    617.57    419.14    453.55   1170.11      0.53

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    672.88    532.22    307.45      0.45   7465.20
 MEAN   593.46    499.13    229.08      0.42   6565.30      1.62
 HUB    501.63    460.99     82.49      0.39   6382.85

         Pt2        PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     23.91      1.24     20.41    606.56      1.07    579.66      0.92      0.90
 MEAN    23.32      1.21     19.81    601.80      1.06    574.30      0.92      0.90
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 HUB     23.20     1.20    19.19   600.84     1.06   569.00     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.07    35.29    31.50     3.79     0.93     0.42     2.90
 MEAN    39.41    27.32    23.50     3.82     0.94     0.40     3.30     0.90
 HUB     42.74    10.31     6.50     3.81     0.94     0.39     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     633.541     365.408     517.544    1170.656       0.541      -0.165

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.437      19.199     569.556      46.000      35.224      30.600      -4.624

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     512.413     365.408     629.357    1182.507       0.433       0.204

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      23.381      20.547     581.145     455.853       0.025       0.395

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     505.600       0.000     505.600    1183.096       0.427       0.370

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      20.559     581.724       0.000       0.060       0.044       0.207

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      23.313       1.206     603.069      35.996     210.518       1.632

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 224247.969       0.495    1961.749 1354479.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    154.804    3776.000      23.313     603.069       1.000       1.000       0.880
W Kg/sec =   70.36555

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    105.251    3501.925       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119088.148  121469.656       1.598     489.817     306.545     384.470       1.254

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   471.45    -0.16   471.45     0.40   613.32
 MEAN    17.74     0.00    -0.02   471.45    -0.16   471.45     0.40
 HUB     15.05     0.00    -0.02   471.45    -0.16   471.45     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.52    46.36     8.16   661.34   812.31    20.90   584.52     0.69
 MEAN    51.12    43.40     7.72   584.52   751.08    20.90   584.52     0.63
 HUB     46.46    38.84     7.62   495.92   684.37    20.90   584.52     0.58

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   543.58   354.08   412.45  1216.86     0.45
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 MEAN    17.51   549.03   353.83   419.81  1212.08     0.45
 HUB     14.85   589.89   406.06   427.88  1207.35     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   509.25   298.70     0.42  7017.50
 MEAN   576.87   475.38   223.05     0.39  6197.17     1.72
 HUB    489.33   435.91    83.27     0.36  6032.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.22     1.21    24.60   640.17     1.06   615.51     0.92     0.91
 MEAN    27.61     1.18    23.98   635.83     1.05   610.67     0.92     0.91
 HUB     27.49     1.18    23.34   634.96     1.05   605.92     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.65    35.91    31.50     4.41     0.93     0.45     2.90
 MEAN    40.13    27.98    23.50     4.48     0.93     0.44     3.28     0.91
 HUB     43.50    11.01     6.50     4.51     0.93     0.44     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     554.156     356.149     424.555    1212.744       0.457       0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    27.734      24.030     611.355      46.000      39.992      31.500      -8.492

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     428.098     356.149     556.875    1222.951       0.350       0.378

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.660      25.410     621.689     471.992       0.029       0.464

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     416.443       0.000     416.443    1223.759       0.340       0.366

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.420     622.511       0.000       0.060       0.060       0.381

    STAGE EXIT CONDITIONS, STAGE            3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      27.543       1.181     636.984      33.916     207.171       1.606

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 211436.781       0.496    1849.676 1474504.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    154.804    3776.000      27.543     636.984       1.000       1.000       0.980
W Kg/sec =   70.36555

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.556    3407.421       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119088.148  121469.656       1.925     513.330     266.680     401.059       1.504

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   391.34    -0.13   391.34     0.32   572.69
 MEAN    16.97     0.00    -0.02   391.34    -0.13   391.34     0.32
 HUB     14.32     0.00    -0.02   391.34    -0.13   391.34     0.32
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.35    46.36    11.99   634.65   745.72    25.66   624.21     0.61
MEAN    55.02    43.80    11.22   559.22   682.66    25.66   624.21     0.56
HUB     50.34    37.84    12.50   471.87   613.14    25.66   624.21     0.50

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   520.92   344.79   390.48  1249.14     0.42
MEAN    16.57   522.74   340.29   396.81  1244.56     0.42
HUB     13.89   557.00   383.63   403.83  1239.98     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    622.13   478.95   277.34     0.38  6512.15
MEAN   546.14   447.02   205.85     0.36  5642.23     1.67
HUB    457.70   410.57    74.07     0.33  5330.56

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     32.52     1.18    28.85   671.38     1.05   648.75     0.92     0.90
MEAN    31.82     1.16    28.18   666.79     1.05   643.99     0.92     0.90
HUB     31.57     1.15    27.48   665.14     1.04   639.26     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.44    35.38    31.50     3.88     0.93     0.44     2.90
MEAN    40.62    27.42    23.50     3.92     0.94     0.42     3.29     0.90
HUB     43.53    10.39     6.50     3.89     0.94     0.41     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.985

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     517.946     342.205     388.798    1245.904       0.416       0.044

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    31.930      28.347     645.393      46.000      41.353      32.400      -8.953

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     398.515     342.205     525.279    1254.685       0.318       0.405

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      31.862      29.709     654.523     456.573       0.028       0.489

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     379.856       0.000     379.856    1255.845       0.302       0.377

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      29.777     655.734       0.000       0.060       0.063       0.423

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.856      31.730       1.152     667.770      30.785     207.657       1.610

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 192078.375       0.496    1680.326 1293392.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    154.804    3776.000      31.730     667.770       1.000       1.000       0.980
W Kg/sec =   70.36555

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.373    3327.950       1.401       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
119088.148	121469.656	2.150	509.668	237.042	390.276	1.646

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	354.76	-0.12	354.76	0.28	532.03
MEAN	15.91	0.00	-0.02	354.76	-0.12	354.76	0.28	
HUB	13.07	0.00	-0.02	354.76	-0.12	354.76	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.56	47.36	12.20	603.68	700.31	30.02	657.28	0.56
MEAN	55.93	44.80	11.13	524.36	633.20	30.02	657.28	0.50
HUB	50.53	38.84	11.69	430.68	558.07	30.02	657.28	0.44

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	490.25	336.29	356.73	1278.31	0.38
MEAN	15.50	484.73	321.79	362.51	1273.53	0.38
HUB	12.59	506.58	347.30	368.79	1268.75	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	591.16	438.42	254.87	0.34	6035.25	
MEAN	510.67	408.76	188.88	0.32	4988.99	1.72
HUB	414.86	374.93	67.57	0.30	4374.08	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	36.76	1.16	33.21	699.62	1.05	679.59	0.92	0.90
MEAN	35.85	1.13	32.44	694.10	1.04	674.51	0.92	0.90
HUB	35.32	1.11	31.65	690.85	1.03	669.46	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.31	35.54	31.50	4.04	0.93	0.46	2.90	
MEAN	41.60	27.52	23.50	4.02	0.94	0.43	3.34	0.90
HUB	43.28	10.38	6.50	3.88	0.94	0.40	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.986

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	491.001	327.695	365.647	1273.764	0.385	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
35.908	32.408	674.762	46.000	41.867	33.000	-8.867

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	379.851	327.695	501.668	1281.357	0.296	0.351

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	35.797	33.678	682.830	440.827	0.051	0.500

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	356.029	0.000	356.029	1282.727	0.278	0.419

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	33.894	684.291	0.000	0.060	0.062	0.412

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.858	35.758	1.127	694.857	27.087	216.708	1.680

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
169156.016	0.484	1479.798	1321591.125

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   OVERALL EXIT CONDITIONS; ALL          5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1072491.88   9382.2939    151.2282      2.3670      0.8516     10.0040      1.3291


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

   Fan-Core + 4 Stage LPC 100% Stat 2 10%  Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =11.015   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    149.467    3776.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   67.93939

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    146.014    3761.129       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 114982.070  117281.461       1.956     831.557     425.224     619.754       1.457

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   348.42    -0.12   348.42     0.31   677.10
 MEAN    17.06     0.00    -0.02   348.42    -0.12   348.42     0.31
 HUB     12.51     0.00    -0.02   348.42    -0.12   348.42     0.31

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.87    50.47    12.40   679.80   763.99    14.11   512.67     0.69
 MEAN    58.22    47.20    11.02   562.16   661.48    14.11   512.67     0.60
 HUB     49.80    38.62    11.18   412.23   539.84    14.11   512.67     0.49

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

        R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   624.43   437.86   445.19  1137.96     0.55
 MEAN    18.04   645.29   454.60   457.98  1130.94     0.57
 HUB     15.00   722.74   541.97   478.15  1121.14     0.64

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    679.80   506.68   241.94     0.45  9035.51
 MEAN   594.32   478.82   139.72     0.42  8201.17     1.56
 HUB    494.28   480.52    47.69     0.43  8131.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.92     1.32    16.23   570.64     1.09   538.07     0.92     0.90
 MEAN    19.44     1.29    15.58   566.22     1.08   531.45     0.92     0.90
 HUB     19.40     1.28    14.66   565.85     1.08   522.23     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.52    28.52    24.20     4.32     0.93     0.44     2.90
 MEAN    44.79    16.97    12.70     4.27     0.94     0.38     3.51     0.90
 HUB     48.58    -5.70    -9.30     3.60     0.94     0.22     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     652.557     453.714     469.013    1131.483       0.577       0.003
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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.544      15.595     532.004      24.000      44.050      35.400      -8.650

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     479.922     453.714     660.440    1148.716       0.418       0.424

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.431      17.229     548.333     528.796       0.038       0.551

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     444.397       0.000     444.397    1151.585       0.386       0.452

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.445     551.076       0.000       0.060       0.061       0.477

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.856      19.335       1.280     567.571      44.761     188.651       1.462

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 278673.156       0.603    2353.812 1465094.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.015   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    149.467    3776.000      19.335     567.571       1.000       1.000       0.980
W Kg/sec =   67.93939

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.867    3609.776       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 114982.070  117281.461       1.706     590.487     346.179     474.134       1.370

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   423.70    -0.15   423.70     0.37   647.33
 MEAN    18.08     0.00    -0.02   423.70    -0.15   423.70     0.37
 HUB     15.21     0.00    -0.02   423.70    -0.15   423.70     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.97    46.36    11.61   677.16   798.92    17.61   552.58     0.69
 MEAN    54.58    42.30    12.28   595.71   731.14    17.61   552.58     0.63
 HUB     49.80    37.84    11.96   501.20   656.41    17.61   552.58     0.57

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   562.83   377.46   417.49  1183.30     0.48
 MEAN    18.01   566.65   373.26   426.35  1177.62     0.48
 HUB     15.22   607.22   422.34   436.29  1171.96     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   511.44   295.42     0.43  7710.74
 MEAN   593.46   479.85   220.20     0.41  6725.02     1.67
 HUB    501.63   443.44    79.29     0.38  6431.44

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.03     1.24    20.58   608.36     1.07   581.91     0.92     0.90
 MEAN    23.39     1.21    19.96   603.15     1.06   576.34     0.92     0.90
 HUB     23.20     1.20    19.32   601.59     1.06   570.81     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     42.12    35.28    31.50     3.78     0.93     0.44     2.90
 MEAN    41.20    27.32    23.50     3.82     0.94     0.42     3.30     0.90
 HUB     44.07    10.30     6.50     3.80     0.94     0.41     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     621.731     374.307     496.431    1173.257       0.530       -0.153

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.508      19.412     572.092      46.000      37.016      30.600      -6.416

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     490.590     374.307     617.077    1185.680       0.414       0.245

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      23.441      20.833     584.271     455.853       0.029       0.422

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     484.448       0.000     484.448    1186.187       0.408       0.394

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      20.825     584.771       0.000       0.060       0.050       0.243

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.860      23.363       1.208     604.367      36.796     202.958       1.573

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 229233.406       0.506    1936.219 1299477.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.015   EfDer =  0.996

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    149.467    3776.000       23.363     604.367       1.000        1.000        0.880
W Kg/sec =   67.93939

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    101.513    3498.162        1.402       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 114982.070  117281.461        1.657     489.817     295.659     384.470        1.300

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   452.27    -0.16   452.27      0.38    612.66
 MEAN    17.74      0.00    -0.02   452.27    -0.16   452.27      0.38
 HUB     15.05      0.00    -0.02   452.27    -0.16   452.27      0.38

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     55.64     46.36      9.28   661.34   801.33     21.14   587.30      0.67
 MEAN    52.28     43.40      8.88   584.52   739.18     21.14   587.30      0.62
 HUB     47.64     38.84      8.80   495.92   671.30     21.14   587.30      0.56

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   539.48    366.29    396.07   1219.76      0.44
 MEAN    17.51   542.58    362.89    403.36   1214.77      0.45
 HUB     14.85   580.49    409.57    411.37   1209.82      0.48
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   488.82   286.49     0.40  7259.32
 MEAN   576.87   456.61   213.99     0.38  6355.65     1.76
 HUB    489.33   419.03    79.76     0.35  6084.47

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.43     1.22    24.85   642.74     1.06   618.45     0.92     0.91
 MEAN    27.76     1.19    24.21   637.96     1.06   613.40     0.92     0.91
 HUB     27.56     1.18    23.54   636.53     1.05   608.41     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.76    35.88    31.50     4.38     0.93     0.47     2.90
 MEAN    41.98    27.95    23.50     4.45     0.93     0.46     3.28     0.91
 HUB     44.87    10.97     6.50     4.47     0.93     0.45     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     547.572     365.267     407.939    1215.411       0.451       0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.882      24.253     614.056      46.000      41.841      31.500     -10.341

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     410.631     365.267     549.580    1226.201       0.335       0.407

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.792      25.714     625.007     471.992       0.034       0.494

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     399.874       0.000     399.874    1226.914       0.326       0.387

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.693     625.734       0.000       0.060       0.070       0.401

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      27.657       1.184     639.079      34.712     199.409       1.546

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 216405.219       0.508    1827.866 1412261.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.015   EfDer =  0.978

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    149.467    3776.000      27.657     639.079       1.000       1.000       0.980
W Kg/sec =   67.93939

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.182    3401.833       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 114982.070  117281.461       1.999     513.330     256.853     401.059       1.561

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   376.00    -0.13   376.00     0.31   571.75
 MEAN    16.97     0.00    -0.02   376.00    -0.13   376.00     0.31
 HUB     14.32     0.00    -0.02   376.00    -0.13   376.00     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.36    46.36    13.00   634.65   737.78    25.92   627.29     0.60
 MEAN    56.09    43.80    12.29   559.22   673.98    25.92   627.29     0.55
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 HUB     51.46    37.84    13.62   471.87   603.46    25.92   627.29     0.49

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500      0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   517.01   355.57   375.33  1252.50     0.41
 MEAN    16.57   516.55   348.24   381.51  1247.75     0.41
 HUB     13.89   547.91   386.47   388.39  1243.00     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   460.35   266.56     0.37  6715.64
 MEAN   546.14   429.78   197.90     0.34  5773.93     1.72
 HUB    457.70   394.87    71.23     0.32  5369.94

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.76     1.18    29.13   674.55     1.06   652.26     0.92     0.90
 MEAN    32.01     1.16    28.44   669.58     1.05   647.32     0.92     0.90
 HUB     31.69     1.15    27.73   667.44     1.04   642.40     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.45    35.38    31.50     3.88     0.93     0.46     2.90
 MEAN    42.39    27.42    23.50     3.92     0.94     0.44     3.29     0.90
 HUB     44.86    10.39     6.50     3.89     0.94     0.43     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     512.315     350.201     373.933    1249.009       0.410        0.042

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.115      28.600     648.631      46.000      43.123      32.400     -10.723

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     16.481     382.713     350.201     518.758    1258.289       0.304        0.432

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      32.034      30.041     658.306     456.573       0.032        0.517

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096     365.185       0.000     365.185    1259.333       0.290        0.396

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      30.073     659.399       0.000       0.060       0.073        0.441

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.844      31.882       1.153     670.522      31.443     200.336        1.553

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 196193.125       0.507    1657.145 1240680.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =11.015   EfDer =  0.979

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    149.467    3776.000       31.882     670.522       1.000        1.000        0.980
W Kg/sec =   67.93939

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     78.354    3321.113        1.401       0.249      53.349      56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 114982.070  117281.461        2.233     509.668     228.250     390.276        1.710
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    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   341.23    -0.12   341.23     0.27   530.94
MEAN    15.91     0.00    -0.02   341.23    -0.12   341.23     0.27
HUB     13.07     0.00    -0.02   341.23    -0.12   341.23     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.53    47.36    13.17   603.68   693.55    30.30   660.82     0.55
MEAN    56.95    44.80    12.15   524.36   625.71    30.30   660.82     0.50
HUB     51.62    38.84    12.78   430.68   549.57    30.30   660.82     0.44

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   487.31   345.89   343.26  1281.95     0.38
MEAN    15.50   479.46   328.90   348.87  1277.05     0.38
HUB     12.59   498.39   349.84   354.98  1272.14     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    591.16   421.88   245.26     0.33  6207.48
MEAN   510.67   393.39   181.78     0.31  5099.02     1.77
HUB    414.86   360.88    65.02     0.28  4406.04

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     37.03     1.16    33.52   703.28     1.05   683.49     0.92     0.90
MEAN    36.07     1.13    32.73   697.43     1.04   678.27     0.92     0.90
HUB     35.48     1.11    31.92   693.77     1.03   673.07     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     45.22    35.55    31.50     4.05     0.93     0.48     2.90
MEAN    43.31    27.52    23.50     4.02     0.94     0.45     3.34     0.90
HUB     44.58    10.38     6.50     3.88     0.94     0.42     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.979

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     485.816     334.930     351.907    1277.252       0.380      -0.010

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    36.126      32.692     678.489      46.000      43.584      33.000     -10.584

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     365.220     334.930     495.544    1285.278       0.284       0.376

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      35.991      34.028     687.043     440.827       0.059       0.528

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    14.701     342.554       0.000     342.554    1286.528       0.266       0.439

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      34.216     688.380       0.000       0.060       0.072       0.431

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.847      35.945       1.127     698.160      27.638     209.340       1.623

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 172607.828       0.494    1457.931 1268103.250

   OVERALL EXIT CONDITIONS; ALL          5   STAGES
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Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
1093112.75	9232.9727	146.0140	2.3794	0.8413	11.0152	1.3354

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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Fan-Core + 4 Stage LPC 100% Stat 2 10% Ice Block 3-11-2011

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1

RESET = 0.000BLEED = 0.000 DPInc =12.000 EfDer = 0.980

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
144.313	3776.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 65.59689

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
140.979	3761.129	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
111017.570	113237.688	2.025	831.557	410.563	619.754	1.510

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	335.18	-0.12	335.18	0.30	677.10
MEAN	17.06	0.00	-0.02	335.18	-0.12	335.18	0.30	
HUB	12.51	0.00	-0.02	335.18	-0.12	335.18	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	63.76	50.47	13.29	679.80	758.04	14.18	513.43	0.68
MEAN	59.20	47.20	12.00	562.16	654.60	14.18	513.43	0.59
HUB	50.89	38.62	12.27	412.23	531.39	14.18	513.43	0.48

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	618.80	447.30	427.60	1139.65	0.54
MEAN	18.04	636.54	459.99	440.00	1132.47	0.56
HUB	15.00	708.69	539.96	459.01	1122.74	0.63

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	679.80	486.72	232.50	0.43	9230.09	
MEAN	594.32	460.05	134.33	0.41	8298.31	1.62
HUB	494.28	461.28	45.68	0.41	8100.79	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.00	1.32	16.36	571.67	1.09	539.69	0.92	0.90
MEAN	19.46	1.29	15.70	566.74	1.08	532.90	0.92	0.90
HUB	19.35	1.28	14.79	565.69	1.08	523.75	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	46.29	28.53	24.20	4.33	0.93	0.46	2.90	
MEAN	46.27	16.98	12.70	4.28	0.94	0.40	3.51	0.90
HUB	49.63	-5.68	-9.30	3.62	0.94	0.25	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.980

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	643.207	459.094	450.498	1133.048	0.568	0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.566	15.720	533.477	24.000	45.541	35.400	-10.141

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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     460.320     459.094     650.124    1150.810       0.400       0.448

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.438      17.407     550.334     528.796       0.042       0.574

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     427.085       0.000     427.085    1153.383       0.370       0.467

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.581     552.797       0.000       0.060       0.069       0.492

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.847      19.330       1.280     568.032      45.222     183.613       1.423

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 281545.531       0.609    2296.079 1409401.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =12.000   EfDer =  0.971

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    144.313    3776.000      19.330     568.032       1.000       1.000       0.980
W Kg/sec =   65.59689

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    114.847    3608.309       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111017.570  113237.688       1.765     590.487     334.472     474.134       1.418

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   407.44    -0.14   407.44     0.35   647.07
 MEAN    18.08      0.00    -0.02   407.44    -0.14   407.44     0.35
 HUB     15.21      0.00    -0.02   407.44    -0.14   407.44     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.97    46.36    12.61   677.16   790.41    17.73   554.17     0.68
 MEAN    55.64    42.30    13.34   595.71   721.84    17.73   554.17     0.63
 HUB     50.90    37.84    13.06   501.20   646.03    17.73   554.17     0.56

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     20.42   558.92   388.53   401.79  1185.35      0.47
 MEAN    18.01   560.32   381.45   410.43  1179.49      0.48
 HUB     15.22   597.81   425.25   420.17  1173.64      0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   492.23   284.35     0.42  7936.59
 MEAN   593.46   461.95   212.01     0.39  6872.52     1.72
 HUB    501.63   427.05    76.37     0.36  6475.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.13     1.25    20.72   610.02     1.07   583.93     0.92     0.89
 MEAN    23.45     1.21    20.09   604.39     1.06   578.17     0.92     0.89
 HUB     23.19     1.20    19.42   602.29     1.06   572.45     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.04    35.29    31.50     3.79     0.93     0.46     2.90
 MEAN    42.90    27.32    23.50     3.82     0.94     0.44     3.30     0.89
 HUB     45.34    10.30     6.50     3.80     0.94     0.42     3.92
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   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      611.409     382.525     476.964    1175.569       0.520       -0.142

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     23.555      19.584      574.353      46.000      38.730      30.600       -8.130

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     17.960      470.609     382.525     606.464    1188.516       0.396        0.282

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      23.476      21.069      587.073     455.853       0.032        0.449

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4        cp 3-4
     17.823      465.106       0.000     465.106    1188.951       0.391        0.415

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.850      21.041      587.503       0.000       0.060       0.058        0.274

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.849       23.386        1.210      605.564       37.532     196.090        1.520

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 233821.703       0.516    1906.878 1247507.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =12.000   EfDer =  0.992

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    144.313     3776.000       23.386      605.564       1.000        1.000        0.880
W Kg/sec =   65.59689

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     98.015     3494.700        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
 111017.570  113237.688        1.716      489.817     285.473      384.470        1.347

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00     -0.02    434.65     -0.15    434.65      0.36    612.06
 MEAN    17.74      0.00     -0.02    434.65     -0.15    434.65      0.36
 HUB     15.05      0.00     -0.02    434.65     -0.15    434.65      0.36

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     56.69     46.36     10.33   661.34    791.52     21.33    589.80      0.66
 MEAN    53.37     43.40      9.97   584.52    728.53     21.33    589.80      0.61
 HUB     48.78     38.84      9.94   495.92    659.56     21.33    589.80      0.55

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81    536.34    377.34    381.16   1222.35      0.44
 MEAN    17.51    537.14    371.10    388.33   1217.18      0.44
 HUB     14.85    572.14    412.74    396.22   1212.04      0.47

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    652.78    470.26    275.44      0.38   7478.04
 MEAN   576.87    439.48    205.77      0.36   6499.36      1.81
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 HUB    489.33   403.55    76.59     0.33  6131.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.59     1.22    25.04   645.09     1.07   621.09     0.92     0.91
 MEAN    27.86     1.19    24.37   639.92     1.06   615.84     0.92     0.91
 HUB     27.60     1.18    23.69   637.98     1.05   610.66     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.71    35.85    31.50     4.35     0.93     0.49     2.90
 MEAN    43.70    27.92    23.50     4.42     0.94     0.47     3.28     0.91
 HUB     46.17    10.94     6.50     4.44     0.94     0.47     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     542.022     373.536     392.757    1217.799       0.445       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.979      24.418     616.480      46.000      43.563      31.500     -12.063

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     394.748     373.536     543.466    1229.118       0.321       0.434

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.874      25.950     627.993     471.992       0.039       0.521

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     384.798       0.000     384.798    1229.751       0.313       0.406

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.899     628.641       0.000       0.060       0.081       0.420

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.853      27.720       1.185     640.997      35.433     192.494       1.492

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 220902.812       0.518    1801.521 1353889.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =12.000   EfDer =  0.972

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    144.313    3776.000      27.720     640.997       1.000       1.000       0.980
W Kg/sec =   65.59689

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     85.076    3396.738       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111017.570  113237.688       2.071     513.330     247.807     401.059       1.618

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   362.01    -0.12   362.01     0.29   570.89
 MEAN    16.97     0.00    -0.02   362.01    -0.12   362.01     0.29
 HUB     14.32     0.00    -0.02   362.01    -0.12   362.01     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.30    46.36    13.94   634.65   730.75    26.10   630.07     0.59
 MEAN    57.09    43.80    13.29   559.22   666.27    26.10   630.07     0.54
 HUB     52.51    37.84    14.67   471.87   594.84    26.10   630.07     0.48

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   513.96   365.24   361.60  1255.50     0.41
MEAN    16.57   511.32   355.39   367.62  1250.61     0.41
HUB     13.89   539.86   389.01   374.33  1245.73     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    622.13   443.56   256.89     0.35  6898.18
MEAN   546.14   414.16   190.75     0.33  5892.24     1.77
HUB    457.70   380.59    68.69     0.31  5405.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     32.93     1.19    29.34   677.43     1.06   655.40     0.92     0.89
MEAN    32.13     1.16    28.63   672.12     1.05   650.31     0.92     0.89
HUB     31.75     1.15    27.90   669.54     1.04   645.24     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     45.29    35.39    31.50     3.89     0.93     0.48     2.90
MEAN    44.03    27.42    23.50     3.92     0.94     0.46     3.29     0.89
HUB     46.10    10.40     6.50     3.90     0.94     0.44     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.972

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     507.571     357.384     360.423    1251.794       0.405       0.040

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    32.231      28.778     651.545      46.000      44.757      32.400     -12.357

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     368.412     357.384     513.275    1261.523       0.292       0.457

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      32.136      30.287     661.711     456.573       0.036       0.544

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     351.889       0.000     351.889    1262.469       0.279       0.413

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      30.284     662.704       0.000       0.060       0.083       0.456

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.833      31.965       1.153     673.031      32.034     193.846       1.503

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 199883.953       0.516    1630.107 1190993.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =12.000   EfDer =  0.973

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    144.313    3776.000      31.965     673.031       1.000       1.000       0.980
W Kg/sec =   65.59689

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     75.598    3314.917       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111017.570  113237.688       2.314     509.668     220.224     390.276       1.772

    ROTOR LEADING EDGE CONDITIONS, STAGE            5
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	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	328.95	-0.11	328.95	0.26	529.95
MEAN	15.91	0.00	-0.02	328.95	-0.11	328.95	0.26	
HUB	13.07	0.00	-0.02	328.95	-0.11	328.95	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.42	47.36	14.06	603.68	687.58	30.49	664.01	0.54
MEAN	57.90	44.80	13.10	524.36	619.10	30.49	664.01	0.49
HUB	52.63	38.84	13.79	430.68	542.03	30.49	664.01	0.43

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	485.09	354.51	331.11	1285.21	0.38
MEAN	15.50	475.03	335.27	336.53	1280.20	0.37
HUB	12.59	491.15	352.08	342.45	1275.19	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	591.16	406.98	236.64	0.32	6362.06	
MEAN	510.67	379.50	175.41	0.30	5197.67	1.82
HUB	414.86	348.15	62.78	0.27	4434.18	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	37.21	1.16	33.72	706.60	1.05	686.99	0.92	0.89
MEAN	36.20	1.13	32.92	700.46	1.04	681.65	0.92	0.89
HUB	35.56	1.11	32.10	696.43	1.03	676.32	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	46.96	35.55	31.50	4.05	0.93	0.50	2.90	
MEAN	44.89	27.53	23.50	4.03	0.94	0.47	3.34	0.89
HUB	45.79	10.39	6.50	3.89	0.94	0.44	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.973

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	481.467	341.417	339.478	1280.380	0.376	-0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
36.255	32.882	681.844	46.000	45.163	33.000	-12.163

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	352.029	341.417	490.398	1288.794	0.273	0.399

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	36.098	34.274	690.835	440.827	0.066	0.553

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	330.388	0.000	330.388	1289.942	0.256	0.456

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	34.436	692.065	0.000	0.060	0.082	0.447

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.836	36.044	1.128	701.162	28.131	202.821	1.572

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
175698.719	0.503	1432.870	1217628.875

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
1111852.75	9067.4561	140.9795	2.3859	0.8301	12.0004	1.3411

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 100% Stat 2 10%  Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =12.960   EfDer =  0.974

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     139.337    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   63.33516

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     136.119    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  107189.766  109333.328       2.098     831.557     396.407     619.754       1.563

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   322.54    -0.11   322.54     0.29   677.10
  MEAN    17.06     0.00    -0.02   322.54    -0.11   322.54     0.29
  HUB     12.51     0.00    -0.02   322.54    -0.11   322.54     0.29

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.62    50.47    14.15   679.80   752.53    14.25   514.12     0.68
  MEAN    60.16    47.20    12.96   562.16   648.21    14.25   514.12     0.58
  HUB     51.97    38.62    13.35   412.23   523.50    14.25   514.12     0.47

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   614.00   456.08   411.08  1141.18     0.54
  MEAN    18.04   628.64   464.99   423.05  1133.85     0.55
  HUB     15.00   695.63   537.99   440.98  1124.20     0.62

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   468.01   223.72     0.41  9411.22
  MEAN   594.32   442.38   129.33     0.39  8388.45     1.67
  HUB    494.28   443.15    43.72     0.39  8071.31

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     20.07     1.33    16.48   572.63     1.10   541.14     0.92     0.89
  MEAN    19.48     1.29    15.81   567.21     1.08   534.21     0.92     0.89
  HUB     19.30     1.28    14.91   565.53     1.08   525.12     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     47.97    28.56    24.20     4.36     0.93     0.48     2.90
  MEAN    47.70    17.00    12.70     4.30     0.94     0.42     3.51     0.89
  HUB     50.66    -5.66    -9.30     3.64     0.94     0.27     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.974

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     634.768     464.086     433.076    1134.457       0.560       0.005

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      19.582      15.828     534.804      24.000      46.980      35.400     -11.580

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     441.982     464.086     640.877    1152.700       0.383       0.471

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.439      17.561     552.142     528.796       0.047       0.597

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     410.819       0.000     410.819    1155.014       0.356       0.481

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.697     554.362       0.000       0.060       0.078       0.505

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.836      19.317       1.279     568.459      45.649     178.852       1.386

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 284201.719       0.615    2237.827 1356237.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =12.960   EfDer =  0.964

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    139.337    3776.000      19.317     568.459       1.000       1.000       0.980
W Kg/sec =   63.33516

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    111.003    3606.955       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107189.766  109333.328       1.827     590.487     323.279     474.134       1.467

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   392.14    -0.14   392.14     0.34   646.83
 MEAN    18.08     0.00    -0.02   392.14    -0.14   392.14     0.34
 HUB     15.21     0.00    -0.02   392.14    -0.14   392.14     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.93    46.36    13.57   677.16   782.62    17.84   555.62     0.68
 MEAN    56.65    42.30    14.35   595.71   713.30    17.84   555.62     0.62
 HUB     51.97    37.84    14.13   501.20   636.48    17.84   555.62     0.55

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   555.76   398.76   387.12  1187.19     0.47
 MEAN    18.01   554.78   389.04   395.51  1181.18     0.47
 HUB     15.22   589.18   427.91   405.00  1175.16     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   474.34   274.12     0.40  8145.46
 MEAN   593.46   445.21   204.42     0.38  7009.09     1.76
 HUB    501.63   411.66    73.71     0.35  6516.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.21     1.25    20.83   611.55     1.08   585.76     0.92     0.88
 MEAN    23.48     1.22    20.18   605.54     1.07   579.84     0.92     0.88
 HUB     23.17     1.20    19.51   602.93     1.06   573.95     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.85    35.30    31.50     3.80     0.93     0.48     2.90
 MEAN    44.53    27.33    23.50     3.83     0.95     0.46     3.30     0.88
 HUB     46.58    10.32     6.50     3.82     0.95     0.44     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.850       1.000       0.964

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     602.294     390.135     458.861    1177.642       0.511      -0.133

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.583      19.725     576.384      46.000      40.372      30.600      -9.772

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     452.132     390.135     597.184    1191.071       0.380       0.317

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      23.491      21.265     589.604     455.853       0.037       0.474

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     447.230       0.000     447.230    1191.443       0.375       0.433

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      21.217     589.972       0.000       0.060       0.067       0.303

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.838      23.387       1.211     606.671      38.213     189.796       1.471

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 238060.281       0.526    1874.505 1198265.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =12.960   EfDer =  0.986

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    139.337    3776.000      23.387     606.671       1.000       1.000       0.880
W Kg/sec =   63.33516

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     94.718    3491.511       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107189.766  109333.328       1.776     489.817     275.872     384.470       1.394

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   418.31    -0.14   418.31     0.35   611.50
 MEAN    17.74     0.00    -0.02   418.31    -0.14   418.31     0.35
 HUB     15.05     0.00    -0.02   418.31    -0.14   418.31     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.69    46.36    11.33   661.34   782.66    21.48   592.07     0.66
 MEAN    54.42    43.40    11.02   584.52   718.90    21.48   592.07     0.60
 HUB     49.86    38.84    11.02   495.92   648.90    21.48   592.07     0.54

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   533.95   387.44   367.41  1224.68     0.44
 MEAN    17.51   532.50   378.63   374.43  1219.36     0.44
 HUB     14.85   564.60   415.61   382.16  1214.06     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   453.20   265.33     0.37  7678.11
 MEAN   576.87   423.67   198.24     0.35  6631.08     1.85
 HUB    489.33   389.21    73.73     0.32  6173.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     28.70     1.23    25.18   647.26     1.07   623.47     0.92     0.90
 MEAN    27.93     1.19    24.49   641.72     1.06   618.06     0.92     0.90
 HUB     27.60     1.18    23.79   639.31     1.05   612.71     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.52    35.84    31.50     4.34     0.93     0.51     2.90
 MEAN    45.32    27.90    23.50     4.40     0.94     0.49     3.28     0.90
 HUB     47.40    10.92     6.50     4.42     0.94     0.48     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     537.288     381.115     378.721    1219.954       0.440       0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.037      24.537     618.673      46.000      45.181      31.500     -13.681

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     380.118     381.115     538.274    1231.760       0.309       0.459

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.918      26.132     630.706     471.992       0.043       0.548

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     370.890       0.000     370.890    1232.325       0.301       0.423

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.053     631.284       0.000       0.060       0.092       0.436

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.843      27.744       1.186     642.763      36.092     186.247       1.444

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 225014.516       0.528    1771.782 1298904.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =12.960   EfDer =  0.965

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    139.337    3776.000      27.744     642.763       1.000       1.000       0.980
W Kg/sec =   63.33516

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     82.183    3392.069       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107189.766  109333.328       2.144     513.330     239.384     401.059       1.675

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   349.09    -0.12   349.09     0.28   570.11
 MEAN    16.97     0.00    -0.02   349.09    -0.12   349.09     0.28
 HUB     14.32     0.00    -0.02   349.09    -0.12   349.09     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.19    46.36    14.83   634.65   724.43    26.24   632.60     0.59
 MEAN    58.03    43.80    14.23   559.22   659.33    26.24   632.60     0.53
 HUB     53.51    37.84    15.67   471.87   587.06    26.24   632.60     0.48

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   511.58   374.06   348.99  1258.20     0.41
MEAN    16.57   506.83   361.90   354.83  1253.21     0.40
HUB     13.89   532.62   391.29   361.35  1248.20     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    622.13   428.17   248.07     0.34  7064.55
MEAN   546.14   399.81   184.24     0.32  6000.10     1.82
HUB    457.70   367.41    66.41     0.29  5436.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     33.03     1.19    29.48   680.07     1.06   658.25     0.92     0.88
MEAN    32.19     1.16    28.76   674.45     1.05   653.03     0.92     0.88
HUB     31.76     1.14    28.02   671.48     1.04   647.82     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.99    35.41    31.50     3.91     0.93     0.50     2.90
MEAN    45.57    27.44    23.50     3.94     0.95     0.48     3.29     0.88
HUB     47.28    10.41     6.50     3.91     0.95     0.46     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.965

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     503.518     363.934     347.970    1254.318       0.401       0.038

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    32.293      28.897     654.191      46.000      46.285      32.400     -13.885

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     355.271     363.934     508.591    1264.455       0.281       0.479

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      32.185      30.467     664.808     456.573       0.040       0.569

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    16.096     339.650       0.000     339.650    1265.316       0.268       0.429

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      30.431     665.714       0.000       0.060       0.093       0.470

   STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.822      31.995       1.153     675.334      32.571     187.989       1.457

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 203244.609       0.525    1600.364 1143971.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =12.960   EfDer =  0.966

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    139.337    3776.000      31.995     675.334       1.000       1.000       0.980
W Kg/sec =   63.33516

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     73.047    3309.259       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107189.766  109333.328       2.395     509.668     212.794     390.276       1.834

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   317.63    -0.11   317.63     0.25   529.04
 MEAN    15.91     0.00    -0.02   317.63    -0.11   317.63     0.25
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 HUB     13.07     0.00    -0.02   317.63    -0.11   317.63     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.25    47.36    14.89   603.68   682.24    30.62   666.93     0.54
 MEAN    58.80    44.80    14.00   524.36   613.16    30.62   666.93     0.48
 HUB     53.60    38.84    14.76   430.68   535.23    30.62   666.93     0.42

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   483.40   362.37   319.94  1288.15     0.38
 MEAN    15.50   471.25   341.07   325.18  1283.06     0.37
 HUB     12.59   484.67   354.12   330.91  1277.96     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   393.33   228.79     0.31  6502.87
 MEAN   510.67   366.75   169.60     0.29  5287.53     1.87
 HUB    414.86   336.43    60.74     0.26  4459.84

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     37.31     1.17    33.85   709.65     1.05   690.17     0.92     0.88
 MEAN    36.27     1.13    33.04   703.23     1.04   684.73     0.92     0.88
 HUB     35.58     1.11    32.21   698.87     1.03   679.29     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.56    35.57    31.50     4.07     0.93     0.51     2.90
 MEAN    46.37    27.54    23.50     4.04     0.95     0.48     3.34     0.88
 HUB     46.94    10.40     6.50     3.90     0.95     0.45     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     477.755     347.325     328.047    1283.217       0.372      -0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.318      33.001     684.895      46.000      46.635      33.000     -13.635

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     339.929     347.325     485.990    1291.985       0.263       0.420

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      36.140      34.441     694.286     440.827       0.073       0.577

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     319.213       0.000     319.213    1293.043       0.247       0.471

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      34.580     695.424       0.000       0.060       0.091       0.461

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.826      36.078       1.128     703.915      28.581     196.937       1.527

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  178514.688       0.511    1405.639 1169813.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1129035.75   8890.1182    136.1186      2.3882      0.8185     12.9602      1.3464


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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
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*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 100% Stat 2 10%  Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =13.497   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    136.571    3776.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   62.07791

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    133.417    3761.129       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 105061.984  107163.000       2.140     831.557     388.538     619.754       1.595

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   315.57    -0.11   315.57     0.28   677.10
 MEAN    17.06     0.00    -0.02   315.57    -0.11   315.57     0.28
 HUB     12.51     0.00    -0.02   315.57    -0.11   315.57     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     65.10    50.47    14.63   679.80   749.57    14.29   514.49     0.67
 MEAN    60.70    47.20    13.50   562.16   644.77    14.29   514.49     0.58
 HUB     52.57    38.62    13.95   412.23   519.23    14.29   514.49     0.47

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   611.59   460.84   402.07  1141.99     0.54
 MEAN    18.04   624.48   467.70   413.79  1134.59     0.55
 HUB     15.00   688.58   536.91   431.14  1124.97     0.61

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    679.80   457.82   218.95     0.40  9509.46
 MEAN   594.32   432.73   126.62     0.38  8437.36     1.70
 HUB    494.28   433.24    42.63     0.39  8054.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.11     1.33    16.54   573.15     1.10   541.91     0.92     0.89
 MEAN    19.49     1.29    15.86   567.47     1.09   534.90     0.92     0.89
 HUB     19.28     1.28    14.96   565.45     1.08   525.85     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.90    28.57    24.20     4.37     0.93     0.50     2.90
 MEAN    48.50    17.01    12.70     4.31     0.94     0.44     3.51     0.89
 HUB     51.24    -5.65    -9.30     3.65     0.94     0.28     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.970

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     630.320     466.795     423.564    1135.200       0.555       0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.588      15.883     535.505      24.000      47.780      35.400     -12.380

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     432.002     466.795     636.021    1153.700       0.374       0.483

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      19.436      17.641     553.102     528.796       0.049       0.609

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     401.937       0.000     401.937    1155.883       0.348       0.488

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.756     555.196       0.000       0.060       0.083       0.513

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.830      19.307       1.278     568.689      45.879     176.241       1.366

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 285638.469       0.618    2204.493 1326929.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.497   EfDer =  0.959

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    136.571    3776.000      19.307     568.689       1.000       1.000       0.980
W Kg/sec =   62.07791

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.878    3606.223       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 105061.984  107163.000       1.862     590.487     317.090     474.134       1.495

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   383.77    -0.13   383.77     0.33   646.69
 MEAN    18.08     0.00    -0.02   383.77    -0.13   383.77     0.33
 HUB     15.21     0.00    -0.02   383.77    -0.13   383.77     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.46    46.36    14.10   677.16   778.46    17.89   556.39     0.67
 MEAN    57.22    42.30    14.92   595.71   708.74    17.89   556.39     0.61
 HUB     52.57    37.84    14.73   501.20   631.35    17.89   556.39     0.55

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   554.26   404.29   379.15  1188.17     0.47
 MEAN    18.01   551.93   393.14   387.38  1182.07     0.47
 HUB     15.22   584.56   429.34   396.72  1175.98     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   464.64   268.58     0.39  8258.37
 MEAN   593.46   436.11   200.32     0.37  7082.90     1.79
 HUB    501.63   403.25    72.29     0.34  6537.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.24     1.26    20.88   612.38     1.08   586.73     0.92     0.88
 MEAN    23.49     1.22    20.23   606.16     1.07   580.72     0.92     0.88
 HUB     23.15     1.20    19.55   603.27     1.06   574.74     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.84    35.31    31.50     3.81     0.93     0.49     2.90
 MEAN    45.42    27.34    23.50     3.84     0.95     0.47     3.30     0.88
 HUB     47.26    10.33     6.50     3.83     0.95     0.45     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.959

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     597.556     394.248     449.045    1178.736       0.507      -0.128

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.593      19.792     577.457      46.000      41.282      30.600     -10.682

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     442.150     394.248     592.391    1192.425       0.371       0.336

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      23.492      21.362     590.947     455.853       0.039       0.489

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     437.571       0.000     437.571    1192.764       0.367       0.443

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      21.302     591.284       0.000       0.060       0.072       0.318

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.831      23.380       1.211     607.269      38.580     186.417       1.445

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 240349.141       0.531    1854.960 1171253.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =13.497   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    136.571    3776.000      23.380     607.269       1.000       1.000       0.880
W Kg/sec =   62.07791

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.912    3489.791       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 105061.984  107163.000       1.810     489.817     270.613     384.470       1.421

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   409.46    -0.14   409.46     0.34   611.20
 MEAN    17.74     0.00    -0.02   409.46    -0.14   409.46     0.34
 HUB     15.05     0.00    -0.02   409.46    -0.14   409.46     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.24    46.36    11.88   661.34   777.96    21.55   593.28     0.65
 MEAN    54.99    43.40    11.59   584.52   713.78    21.55   593.28     0.60
 HUB     50.46    38.84    11.62   495.92   643.23    21.55   593.28     0.54

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   532.85   392.86   359.99  1225.91     0.43
 MEAN    17.51   530.16   382.68   366.91  1220.51     0.43
 HUB     14.85   560.59   417.11   374.54  1215.14     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   444.02   259.92     0.36  7785.32
 MEAN   576.87   415.13   194.19     0.34  6701.91     1.88
 HUB    489.33   381.44    72.22     0.31  6196.25

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.74     1.23    25.24   648.42     1.07   624.73     0.92     0.90
 MEAN    27.95     1.20    24.55   642.70     1.06   619.24     0.92     0.90
 HUB     27.58     1.18    23.84   640.02     1.05   613.80     0.92     0.90
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.50    35.83    31.50     4.33     0.93     0.52     2.90
 MEAN    46.21    27.89    23.50     4.39     0.94     0.50     3.28     0.90
 HUB     48.08    10.91     6.50     4.41     0.94     0.49     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.983

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     534.893     385.191     371.131    1221.097       0.438       0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.056      24.588     619.839      46.000      46.065      31.500     -14.565

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     372.225     385.191     535.652    1233.166       0.302       0.472

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.929      26.216     632.152     471.992       0.046       0.562

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     363.376       0.000     363.376    1233.696       0.295       0.432

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.122     632.696       0.000       0.060       0.098       0.445

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.837      27.744       1.187     643.714      36.445     182.926       1.418

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 227215.578       0.533    1753.599 1268851.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =13.497   EfDer =  0.960

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    136.571    3776.000       27.744     643.714       1.000        1.000        0.980
W Kg/sec =   62.07791

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     80.610    3389.562        1.401       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 105061.984  107163.000        2.186     513.330     234.803     401.059       1.708

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   342.10    -0.12   342.10      0.28   569.68
 MEAN    16.97      0.00    -0.02   342.10    -0.12   342.10      0.28
 HUB     14.32      0.00    -0.02   342.10    -0.12   342.10      0.28

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     61.68    46.36    15.32   634.65   721.09     26.30    633.95      0.58
 MEAN    58.55    43.80    14.75   559.22   655.66     26.30    633.95      0.53
 HUB     54.07    37.84    16.23   471.87   582.93     26.30    633.95      0.47

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   510.45   378.77   342.19  1259.64      0.41
 MEAN    16.57   504.53   365.38   347.92  1254.59      0.40
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 HUB     13.89   528.78   392.50   354.34  1249.52     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   419.90   243.36     0.33  7153.51
 MEAN   546.14   392.07   180.76     0.31  6057.78     1.85
 HUB    457.70   360.28    65.20     0.29  5453.52

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     33.07     1.19    29.53   681.49     1.06   659.77     0.92     0.88
 MEAN    32.21     1.16    28.81   675.71     1.05   654.48     0.92     0.88
 HUB     31.75     1.14    28.06   672.52     1.04   649.20     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.90    35.42    31.50     3.92     0.93     0.51     2.90
 MEAN    46.40    27.45    23.50     3.95     0.95     0.49     3.29     0.88
 HUB     47.93    10.43     6.50     3.93     0.95     0.47     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.960

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     501.454     367.436     341.244    1255.661       0.399       0.037

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.309      28.944     655.603      46.000      47.117      32.400     -14.717

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     348.189     367.436     506.206    1266.018       0.275       0.492

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      32.194      30.545     666.462     456.573       0.042       0.582

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     333.041       0.000     333.041    1266.835       0.263       0.438

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.493     667.323       0.000       0.060       0.099       0.477

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.816      31.995       1.153     676.572      32.858     184.874       1.433

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 205039.391       0.530    1582.448 1118186.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =13.497   EfDer =  0.963

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    136.571    3776.000      31.995     676.572       1.000       1.000       0.980
W Kg/sec =   62.07791

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     71.664    3306.230       1.401       0.250      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 105061.984  107163.000       2.441     509.668     208.767     390.276       1.869

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   311.51    -0.11   311.51     0.25   528.56
 MEAN    15.91     0.00    -0.02   311.51    -0.11   311.51     0.25
 HUB     13.07     0.00    -0.02   311.51    -0.11   311.51     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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 TIP     62.71    47.36    15.35   603.68   679.41    30.68   668.49     0.54
 MEAN    59.29    44.80    14.49   524.36   610.01    30.68   668.49     0.48
 HUB     54.13    38.84    15.29   430.68   531.62    30.68   668.49     0.42

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   482.60   366.55   313.93  1289.72     0.37
 MEAN    15.50   469.31   344.18   319.06  1284.59     0.37
 HUB     12.59   481.22   355.19   324.67  1279.44     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   386.01   224.61     0.30  6577.80
 MEAN   510.67   359.89   166.50     0.28  5335.62     1.89
 HUB    414.86   330.11    59.67     0.26  4473.26

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     37.34     1.17    33.90   711.28     1.05   691.87     0.92     0.88
 MEAN    36.28     1.13    33.09   704.72     1.04   686.37     0.92     0.88
 HUB     35.56     1.11    32.25   700.17     1.03   680.88     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.42    35.58    31.50     4.08     0.93     0.52     2.90
 MEAN    47.17    27.56    23.50     4.06     0.95     0.49     3.34     0.88
 HUB     47.57    10.41     6.50     3.91     0.95     0.46     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.963

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     475.867     350.488     321.881    1284.728       0.370      -0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.330      33.044     686.523      46.000      47.436      33.000     -14.436

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     333.410     350.488     483.739    1293.685       0.258       0.431

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      36.141      34.509     696.129     440.827       0.077       0.591

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     313.186       0.000     313.186    1294.697       0.242       0.480

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      34.635     697.219       0.000       0.060       0.097       0.469

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.820      36.075       1.128     705.392      28.820     193.812       1.502

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  180013.219       0.515    1389.301 1143573.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1138255.75   8784.8018    133.4166      2.3879      0.8117     13.4974      1.3492


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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 100% Stat 2 20% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 3.698   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    189.173    3776.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   85.98781

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    184.803    3761.129       1.402       0.249      53.349      32.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 145527.594  148437.844       1.545     831.557     538.187     619.754       1.152

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   457.01    -0.16   457.01     0.41   677.10
 MEAN    17.06     0.00    -0.02   457.01    -0.16   457.01     0.41
 HUB     12.51     0.00    -0.02   457.01    -0.16   457.01     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.09    50.47     5.62   679.80   819.27    13.42   505.37     0.74
 MEAN    50.90    47.20     3.70   562.16   724.61    13.42   505.37     0.66
 HUB     42.06    38.62     3.44   412.23   615.57    13.42   505.37     0.56

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   702.24   348.77   609.51  1118.69     0.63
 MEAN    18.04   741.88   404.36   622.00  1114.20     0.67
 HUB     15.00   860.80   559.64   654.05  1103.70     0.78

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    679.80   693.60   331.02     0.62  7198.42
 MEAN   594.32   650.36   189.96     0.58  7295.71     1.23
 HUB    494.28   657.31    65.36     0.60  8396.53

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.88     1.25    14.48   560.91     1.07   519.75     0.92     0.91
 MEAN    18.94     1.25    14.06   561.43     1.07   515.49     0.92     0.91
 HUB     19.57     1.30    13.09   567.26     1.09   505.46     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.78    28.51    24.20     4.31     0.93     0.23     2.90
 MEAN    33.03    16.98    12.70     4.28     0.92     0.18     3.51     0.91
 HUB     40.55    -5.71    -9.30     3.59     0.92     0.04     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     757.313     403.574     640.821    1113.575       0.680      -0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.078      13.993     515.297      24.000      32.202      35.400       3.198

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     673.574     403.574     785.222    1124.337       0.599       0.192

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.977      14.884     525.305     528.796       0.029       0.367
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	613.746	0.000	613.746	1131.201	0.543	0.273

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.426	531.738	0.000	0.060	0.053	0.295

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.848	18.851	1.248	563.200	40.390	233.365	1.809

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
251461.969	0.544	2688.216	1921699.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 3.698 EfDer = 0.989

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
189.173	3776.000	18.851	563.200	1.000	1.000	0.980

W Kg/sec = 85.98781

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
153.716	3623.755	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
145527.594	148437.844	1.319	590.487	447.669	474.134	1.059

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	579.96	-0.20	579.96	0.51	649.84
MEAN	18.08	0.00	-0.02	579.96	-0.20	579.96	0.51	
HUB	15.21	0.00	-0.02	579.96	-0.20	579.96	0.51	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.43	46.36	3.07	677.16	891.72	15.77	535.12	0.79
MEAN	45.78	42.30	3.48	595.71	831.54	15.77	535.12	0.73
HUB	40.84	37.84	3.00	501.20	766.65	15.77	535.12	0.68

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	636.94	259.20	581.81	1158.21	0.55
MEAN	18.01	654.65	287.46	588.16	1155.61	0.57
HUB	15.22	712.88	391.02	596.07	1153.02	0.62

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	672.88	713.88	413.67	0.62	5297.04	
MEAN	593.46	663.01	306.00	0.57	5180.71	1.35
HUB	501.63	606.24	110.60	0.53	5955.55	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.98	1.17	17.89	591.22	1.05	557.36	0.92	0.91
MEAN	21.91	1.16	17.62	590.61	1.05	554.83	0.92	0.91
HUB	22.40	1.19	17.30	594.71	1.06	552.29	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	24.01	35.41	31.50	3.91	0.93	0.25	2.90	
MEAN	26.05	27.49	23.50	3.99	0.92	0.26	3.30	0.91
HUB	33.27	10.51	6.50	4.01	0.92	0.27	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.989

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	974.961	288.264	931.372	1110.971	0.878	-0.950

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.051      13.349     512.830      46.000      17.198      30.600      13.402

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960    1002.457     288.264    1043.081    1106.438       0.906      -1.081

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      21.716      12.750     508.343     400.556       0.085       0.006

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823    1065.718       0.000    1065.718    1097.510       0.971      -0.423

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      11.451     497.865       0.000       0.060       0.250      -1.370

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.604      20.973       1.113     592.180      28.980     284.040       2.202

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 180525.344       0.399    1929.879 1757655.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.698   EfDer =  0.771

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    189.173    3776.000      20.973     592.180       1.000       1.000       0.780
W Kg/sec =   85.98781

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    141.669    3533.974       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 145527.594  148437.844       1.052     434.156     412.615     339.175       0.822

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   868.08    -0.30   868.08     0.77   618.94
 MEAN    17.74     0.00    -0.02   868.08    -0.30   868.08     0.77
 HUB     15.05     0.00    -0.02   868.08    -0.30   868.08     0.77

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     37.31    46.36    -9.05   661.34  1091.48    14.17   529.29     0.97
 MEAN    33.97    43.40    -9.43   584.52  1046.69    14.17   529.29     0.93
 HUB     29.75    38.84    -9.09   495.92   999.90    14.17   529.29     0.89

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   654.47   167.74   632.61  1175.38     0.56
 MEAN    17.51   668.55   215.84   632.74  1176.27     0.57
 HUB     14.85   725.16   343.49   638.65  1176.76     0.62

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   797.16   485.04     0.68  3328.89
 MEAN   576.87   728.50   361.03     0.62  3783.99     1.50
 HUB    489.33   655.09   145.84     0.56  5105.36

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.55     1.08    18.26   609.78     1.03   574.05     0.92     0.71
 MEAN    22.77     1.09    18.29   612.19     1.03   574.90     0.92     0.71
 HUB     23.42     1.12    18.12   619.18     1.05   575.31     0.92     0.71

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     14.85    37.48    31.50     5.98     0.93     0.30     2.90
 MEAN    18.84    29.71    23.50     6.21     0.85     0.34     3.28     0.71
 HUB     28.27    12.86     6.50     6.36     0.85     0.39     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.771

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     678.665     217.260     642.950    1176.409       0.577      -0.009

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.868      18.246     575.278      46.000      18.671      31.500      12.829

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     680.946     217.260     714.765    1176.144       0.579      -0.036

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.665      18.056     575.019     471.992       0.053       0.129

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     663.870       0.000     663.870    1178.105       0.564      -0.040

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.059     576.936       0.000       0.060       0.108      -0.035

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.526      22.407       1.068     613.717      21.537     372.148       2.885

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 134221.359       0.315    1434.873 2521421.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.698   EfDer =  0.925

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    189.173    3776.000       22.407     613.717       1.000        1.000        0.980
W Kg/sec =   85.98781

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    134.994    3471.412        1.401       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 145527.594  148437.844        1.306     513.330     393.199     401.059       1.020

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   613.87    -0.21   613.87     0.52   583.44
 MEAN    16.97      0.00    -0.02   613.87    -0.21   613.87     0.52
 HUB     14.32      0.00    -0.02   613.87    -0.21   613.87     0.52

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     45.96     46.36    -0.40   634.65   883.11     18.65   582.28     0.75
 MEAN    42.34     43.80    -1.46   559.22   830.54     18.65   582.28     0.70
 HUB     37.56     37.84    -0.28   471.87   774.40     18.65   582.28     0.65

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   660.00    164.56    639.16  1195.34      0.55
 MEAN    16.57   672.32    210.86    638.40  1196.03      0.56
 HUB     13.89   723.70    336.09    640.92  1196.31      0.60
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   786.06   457.57     0.66  3111.00
 MEAN   546.14   721.09   335.28     0.60  3498.41     1.23
 HUB    457.70   652.35   121.61     0.55  4671.37

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.23     1.08    19.70   630.16     1.03   593.84     0.92     0.85
 MEAN    24.47     1.09    19.74   632.21     1.03   594.52     0.92     0.85
 HUB     25.19     1.12    19.67   638.41     1.04   594.74     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     14.44    35.60    31.50     4.10     0.93     0.14     2.90
 MEAN    18.28    27.71    23.50     4.21     0.90     0.17     3.29     0.85
 HUB     27.67    10.74     6.50     4.24     0.90     0.21     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.925

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     657.674     212.049     622.551    1198.813       0.549       0.058

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.579      20.029     597.513      46.000      18.810      32.400      13.590

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     668.629     212.049     701.448    1197.597       0.558       0.003

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.365      19.713     596.301     456.573       0.054       0.143

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     634.960       0.000     634.960    1201.268       0.529      -0.023

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.917     599.962       0.000       0.060       0.108       0.044

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.649      24.096       1.075     633.593      19.877     361.287       2.801

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 123923.414       0.320    1324.785 1761466.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 3.698   EfDer =  0.897

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    189.173    3776.000      24.096     633.593       1.000       1.000       0.980
W Kg/sec =   85.98781

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    127.549    3416.527       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 145527.594  148437.844       1.372     509.668     371.536     390.276       1.050

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   583.79    -0.20   583.79     0.48   546.19
 MEAN    15.91     0.00    -0.02   583.79    -0.20   583.79     0.48
 HUB     13.07     0.00    -0.02   583.79    -0.20   583.79     0.48

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.97    47.36    -1.39   603.68   839.93    20.53   605.18     0.70
 MEAN    41.94    44.80    -2.86   524.36   784.85    20.53   605.18     0.65
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 HUB     36.43    38.84    -2.41   430.68   725.59    20.53   605.18     0.60

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   630.16   149.38   612.20  1215.93     0.52
 MEAN    15.50   640.62   186.83   612.77  1215.96     0.53
 HUB     12.59   684.27   297.79   616.07  1215.69     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   754.95   441.77     0.62  2683.63
 MEAN   510.67   693.09   323.85     0.57  2898.56     1.21
 HUB    414.86   627.10   117.07     0.52  3751.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.68     1.07    21.38   647.77     1.02   614.67     0.92     0.82
 MEAN    25.81     1.07    21.36   648.91     1.02   614.70     0.92     0.82
 HUB     26.33     1.09    21.23   653.42     1.03   614.39     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     13.71    35.81    31.50     4.31     0.93     0.13     2.90
 MEAN    16.96    27.86    23.50     4.36     0.89     0.15     3.34     0.82
 HUB     25.80    10.76     6.50     4.26     0.89     0.19     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.897

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      648.261     190.252     619.714    1216.113       0.533      -0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.846      21.297      614.993      46.000      17.066      33.000      15.934

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      684.506     190.252     710.454    1212.124       0.565      -0.192

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.375      20.434     610.965     440.827       0.122       0.128

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     629.539       0.000     629.539    1218.084       0.517      -0.038

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.120     616.988       0.000       0.060       0.129      -0.044

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.561      25.343       1.052     650.032      16.439     404.662       3.137

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102536.945       0.293    1096.156 1810898.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    792669.06   8473.9082    184.8033      1.6776      0.6571      3.6983      1.2433


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 100% Stat 2 20% Ice Block 3-11-2011
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 4.036   EfDer =  0.993

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    187.286    3776.000      15.107     522.810      1.000       1.000       0.980
W Kg/sec =   85.13009

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    182.960    3761.129       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
144075.984  146957.188       1.561     831.557     532.819     619.754       1.163

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   451.53    -0.16   451.53     0.41   677.10
MEAN    17.06     0.00    -0.02   451.53    -0.16   451.53     0.41
HUB     12.51     0.00    -0.02   451.53    -0.16   451.53     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.41    50.47     5.94   679.80   816.22    13.46   505.78     0.74
MEAN    51.24    47.20     4.04   562.16   721.17    13.46   505.78     0.65
HUB     42.41    38.62     3.79   412.23   611.50    13.46   505.78     0.55

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   696.53   353.95   599.90  1119.98     0.62
MEAN    18.04   735.63   407.21   612.65  1115.28     0.66
HUB     15.00   852.43   558.60   643.89  1104.83     0.77

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    679.80   682.68   325.85     0.61  7305.21
MEAN   594.32   640.58   187.11     0.57  7347.16     1.24
HUB    494.28   647.10    64.32     0.59  8380.89

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.95     1.25    14.60   561.48     1.07   520.98     0.92     0.91
MEAN    18.98     1.26    14.17   561.70     1.07   516.53     0.92     0.91
HUB     19.57     1.30    13.20   567.17     1.08   506.56     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.54    28.51    24.20     4.31     0.93     0.24     2.90
MEAN    33.61    16.98    12.70     4.28     0.92     0.19     3.51     0.91
HUB     40.94    -5.70    -9.30     3.60     0.92     0.05     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.993

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     750.358     406.422     630.759    1114.793       0.673      -0.012

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.115      14.105     516.425      24.000      32.795      35.400       2.605

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     661.242     406.422     776.157    1126.076       0.587       0.207

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.021      15.057     526.932     528.796       0.028       0.377

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     602.933       0.000     602.933    1132.636       0.532       0.286
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.586	533.088	0.000	0.060	0.050	0.309

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.855	18.907	1.252	563.451	40.641	230.883	1.790

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
253028.312	0.548	2677.979	1898638.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 4.036 EfDer = 0.992

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
187.286	3776.000	18.907	563.451	1.000	1.000	0.980

W Kg/sec = 85.13009

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
151.761	3622.946	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
144075.984	146957.188	1.336	590.487	441.975	474.134	1.073

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	570.19	-0.20	570.19	0.50	649.69
MEAN	18.08	0.00	-0.02	570.19	-0.20	570.19	0.50	
HUB	15.21	0.00	-0.02	570.19	-0.20	570.19	0.50	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.91	46.36	3.55	677.16	885.39	15.92	536.31	0.78
MEAN	46.26	42.30	3.96	595.71	824.75	15.92	536.31	0.73
HUB	41.33	37.84	3.49	501.20	759.28	15.92	536.31	0.67

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	630.01	267.39	570.45	1160.12	0.54
MEAN	18.01	647.54	293.25	577.33	1157.22	0.56
HUB	15.22	705.32	393.11	585.62	1154.36	0.61

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	672.88	699.88	405.48	0.60	5464.23	
MEAN	593.46	650.71	300.21	0.56	5285.03	1.36
HUB	501.63	595.58	108.52	0.52	5987.31	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.16	1.17	18.13	592.36	1.05	559.23	0.92	0.91
MEAN	22.05	1.17	17.82	591.41	1.05	556.41	0.92	0.91
HUB	22.49	1.19	17.48	595.13	1.06	553.60	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.11	35.41	31.50	3.91	0.93	0.26	2.90	
MEAN	26.93	27.47	23.50	3.97	0.92	0.26	3.30	0.91
HUB	33.87	10.50	6.50	4.00	0.92	0.28	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	940.532	294.076	893.375	1117.673	0.842	-0.875

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.191	13.952	519.111	46.000	18.220	30.600	12.380

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	937.826	294.076	982.852	1118.210	0.839	-0.904

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	21.903	13.811	519.545	400.556	0.075	0.081

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	963.000	0.000	963.000	1114.860	0.864	-0.189

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	13.116	515.665	0.000	0.060	0.200	-1.061

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.677	21.352	1.129	592.966	29.514	277.800	2.153

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
183856.922	0.406	1945.889	1731877.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 4.036 EfDer = 0.793

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
187.286	3776.000	21.352	592.966	1.000	1.000	0.780

W Kg/sec = 85.13009

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
137.861	3531.630	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
144075.984	146957.188	1.081	434.156	401.521	339.175	0.845

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	817.24	-0.28	817.24	0.72	618.52
MEAN	17.74	0.00	-0.02	817.24	-0.28	817.24	0.72	
HUB	15.05	0.00	-0.02	817.24	-0.28	817.24	0.72	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	38.99	46.36	-7.37	661.34	1051.49	15.13	537.23	0.92
MEAN	35.59	43.40	-7.81	584.52	1004.92	15.13	537.23	0.88
HUB	31.27	38.84	-7.57	495.92	956.08	15.13	537.23	0.84

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	634.54	190.99	605.11	1180.79	0.54
MEAN	17.51	649.90	232.79	606.78	1180.70	0.55
HUB	14.85	706.66	351.19	613.22	1180.35	0.60

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	652.78	761.19	461.79	0.64	3789.14	
MEAN	576.87	697.54	344.08	0.59	4080.42	1.51
HUB	489.33	628.59	138.15	0.53	5219.36	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.23	1.09	19.09	613.00	1.03	579.41	0.92	0.73
MEAN	23.38	1.10	19.03	614.54	1.04	579.30	0.92	0.73
HUB	23.98	1.12	18.81	620.57	1.05	578.90	0.92	0.73

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	17.52	37.35	31.50	5.85	0.93	0.31	2.90	
MEAN	20.99	29.56	23.50	6.06	0.86	0.34	3.28	0.73
HUB	29.80	12.70	6.50	6.20	0.86	0.39	3.87	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.793

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      658.943     234.322     615.872     1181.031       0.558       -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     23.486      19.007      579.798      46.000      20.830       31.500       10.670

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     17.392      646.059     234.322     687.240     1182.459       0.546       0.015

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       23.334      19.044      581.202      471.992       0.043       0.167

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4        cp 3-4
     17.121      627.456       0.000     627.456     1184.470       0.530       0.025

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       19.122      583.179       0.000       0.060       0.083       0.032

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.603       23.153        1.084      616.037       23.071      342.917       2.658

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 143786.188       0.337    1521.792 2410987.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 4.036   EfDer =  0.951

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    187.286     3776.000       23.153      616.037       1.000        1.000        0.980
W Kg/sec =   85.13009

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
    129.585     3464.869        1.401        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
 144075.984  146957.188        1.360      513.330      377.443      401.059       1.063

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00     -0.02    582.22     -0.20    582.22      0.49    582.34
 MEAN    16.97      0.00     -0.02    582.22     -0.20    582.22      0.49
 HUB     14.32      0.00     -0.02    582.22     -0.20    582.22      0.49

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     47.48     46.36      1.12   634.65    861.40     19.65    587.76      0.72
 MEAN    43.86     43.80      0.06   559.22    807.42     19.65    587.76      0.68
 HUB     39.04     37.84      1.20   471.87    749.55     19.65    587.76      0.63

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP      18.88   629.57    193.42    599.12   1203.74      0.52
 MEAN     16.57   643.77    230.94    600.93   1203.17      0.54
 HUB      13.89   695.57    343.37    604.92   1202.40      0.58

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP     622.13    736.71    428.71      0.61   3655.55
 MEAN    546.14    678.58    315.20      0.56   3830.93      1.27
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 HUB    457.70   615.63   114.33     0.51  4772.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.44     1.10    21.11   635.36     1.03   602.30     0.92     0.87
 MEAN    25.55     1.10    21.02   636.28     1.03   601.72     0.92     0.87
 HUB     26.16     1.13    20.85   641.26     1.04   600.91     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.89    35.59    31.50     4.09     0.93     0.18     2.90
 MEAN    21.02    27.68    23.50     4.18     0.90     0.20     3.29     0.87
 HUB     29.58    10.70     6.50     4.20     0.90     0.24     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.951

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     630.615     232.236     586.295    1205.772       0.523       0.059

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.669      21.300     604.461      46.000      21.609      32.400      10.791

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     622.390     232.236     664.306    1206.629       0.516       0.062

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.522      21.284     605.320     456.573       0.041       0.189

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     589.328       0.000     589.328    1209.955       0.487       0.054

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.554     608.662       0.000       0.060       0.077       0.119

    STAGE EXIT CONDITIONS, STAGE             4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.751      25.354       1.095     637.634      21.598     330.580       2.563

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 134666.344       0.348    1425.270 1714915.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 4.036   EfDer =  0.936

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    187.286    3776.000      25.354     637.634       1.000       1.000       0.980
W Kg/sec =   85.13009

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.395    3405.683       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 144075.984  146957.188       1.453     509.668     350.696     390.276       1.113

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   544.03    -0.19   544.03     0.45   544.46
 MEAN    15.91     0.00    -0.02   544.03    -0.19   544.03     0.45
 HUB     13.07     0.00    -0.02   544.03    -0.19   544.03     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.98    47.36     0.62   603.68   812.79    22.09   612.96     0.67
 MEAN    43.96    44.80    -0.84   524.36   755.73    22.09   612.96     0.62
 HUB     38.38    38.84    -0.46   430.68   693.99    22.09   612.96     0.57

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   592.63   185.32   562.91  1226.96     0.48
MEAN    15.50   604.35   212.15   565.89  1225.63     0.49
HUB     12.59   647.88   307.00   570.53  1224.18     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    591.16   693.95   405.83     0.57  3328.16
MEAN   510.67   639.80   298.52     0.52  3290.79     1.27
HUB    414.86   580.63   107.86     0.47  3867.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     27.51     1.08    23.45   655.22     1.03   625.93     0.92     0.86
MEAN    27.48     1.08    23.27   655.02     1.03   624.57     0.92     0.86
HUB     27.87     1.10    23.03   658.07     1.03   623.07     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     18.22    35.79    31.50     4.29     0.93     0.19     2.90
MEAN    20.55    27.81    23.50     4.31     0.90     0.19     3.34     0.86
HUB     28.28    10.71     6.50     4.21     0.90     0.22     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.936

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     611.010     216.040     571.541    1225.948       0.498       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.532      23.232      624.971      46.000      20.706      33.000      12.294

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     618.225     216.040     654.885    1225.223       0.505       -0.083

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.234      22.886     624.232     440.827       0.088       0.185

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     570.711       0.000     570.711    1229.836       0.464       0.064

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.512     628.942       0.000       0.060       0.084       0.060

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.722      27.254       1.075     656.100      18.466     357.973       2.775

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  115198.258       0.330    1219.225 1755963.000

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     830536.00   8790.1543    182.9599      1.8040      0.7230      4.0364      1.2549


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 100% Stat 2 20% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.539   EfDer =  0.995
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
184.491	3776.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 83.85950

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
180.229	3761.129	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
141925.625	144763.828	1.584	831.557	524.867	619.754	1.181

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	443.47	-0.15	443.47	0.40	677.10
MEAN	17.06	0.00	-0.02	443.47	-0.15	443.47	0.40	
HUB	12.51	0.00	-0.02	443.47	-0.15	443.47	0.40	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.89	50.47	6.42	679.80	811.79	13.52	506.38	0.74
MEAN	51.74	47.20	4.54	562.16	716.15	13.52	506.38	0.65
HUB	42.92	38.62	4.30	412.23	605.58	13.52	506.38	0.55

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	688.58	361.39	586.13	1121.79	0.61
MEAN	18.04	726.78	411.33	599.18	1116.81	0.65
HUB	15.00	840.50	557.13	629.32	1106.42	0.76

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	679.80	667.03	318.41	0.59	7458.55	
MEAN	594.32	626.51	182.99	0.56	7421.31	1.26
HUB	494.28	632.45	62.85	0.57	8358.83	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.05	1.26	14.77	562.29	1.08	522.71	0.92	0.91
MEAN	19.03	1.26	14.31	562.09	1.08	518.00	0.92	0.91
HUB	19.57	1.30	13.35	567.06	1.08	508.12	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.66	28.51	24.20	4.31	0.93	0.26	2.90	
MEAN	34.47	16.98	12.70	4.28	0.92	0.21	3.51	0.91
HUB	41.52	-5.70	-9.30	3.60	0.92	0.06	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	740.566	410.528	616.364	1116.499	0.663	-0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.166	14.262	518.007	24.000	33.666	35.400	1.734

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	643.917	410.528	763.650	1128.479	0.571	0.227

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.081	15.297	529.183	528.796	0.027	0.391

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	587.769	0.000	587.769	1134.621	0.518	0.304

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.805	534.959	0.000	0.060	0.046	0.328

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    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.863      18.983       1.257     563.814      41.004     227.296       1.762

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 255285.109       0.552    2661.539 1864774.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.539   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    184.491    3776.000      18.983     563.814       1.000       1.000       0.980
W Kg/sec =   83.85950

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    148.952    3621.781       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141925.625  144763.828       1.361     590.487     433.794     474.134       1.093

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   556.42    -0.19   556.42     0.49   649.48
 MEAN    18.08     0.00    -0.02   556.42    -0.19   556.42     0.49
 HUB     15.21     0.00    -0.02   556.42    -0.19   556.42     0.49

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.60    46.36     4.24   677.16   876.59    16.12   537.96     0.77
 MEAN    46.96    42.30     4.66   595.71   815.29    16.12   537.96     0.72
 HUB     42.02    37.84     4.18   501.20   748.99    16.12   537.96     0.66

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   620.85   278.72   554.77  1162.73     0.53
 MEAN    18.01   637.90   301.30   562.26  1159.44     0.55
 HUB     15.22   694.93   396.05   571.03  1156.21     0.60

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   680.54   394.15     0.59  5695.44
 MEAN   593.46   633.64   292.16     0.55  5429.85     1.39
 HUB    501.63   580.71   105.58     0.50  6031.98

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.41     1.18    18.45   593.94     1.05   561.77     0.92     0.91
 MEAN    22.24     1.17    18.10   592.54     1.05   558.57     0.92     0.91
 HUB     22.62     1.19    17.72   595.73     1.06   555.41     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.68    35.39    31.50     3.89     0.93     0.28     2.90
 MEAN    28.19    27.46    23.50     3.96     0.92     0.28     3.30     0.91
 HUB     34.74    10.47     6.50     3.97     0.92     0.29     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     901.259     302.145     849.104    1125.294       0.801      -0.793

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.379      14.662     526.249      46.000      19.588      30.600      11.012

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     17.960     874.936     302.145     925.638    1129.470       0.775      -0.739

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      22.145      14.887     530.154     400.556       0.064       0.135

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     880.773       0.000     880.773    1128.849       0.780      -0.027

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      14.545     529.328       0.000       0.060       0.154      -0.818

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.742      21.754       1.146     594.070      30.256     269.364       2.088

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188478.703       0.416    1965.032 1694878.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 4.539   EfDer =  0.826

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    184.491    3776.000      21.754     594.070       1.000       1.000       0.780
W Kg/sec =   83.85950

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    133.420    3528.347       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141925.625  144763.828       1.117     434.156     388.583     339.175       0.873

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   767.84    -0.26   767.84     0.67   617.95
 MEAN    17.74     0.00    -0.02   767.84    -0.26   767.84     0.67
 HUB     15.05     0.00    -0.02   767.84    -0.26   767.84     0.67

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     40.75    46.36    -5.61   661.34  1013.56    16.09   544.86     0.89
 MEAN    37.29    43.40    -6.11   584.52   965.17    16.09   544.86     0.84
 HUB     32.87    38.84    -5.97   495.92   914.21    16.09   544.86     0.80

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   613.69   216.27   574.31  1186.76     0.52
 MEAN    17.51   629.64   251.25   577.33  1185.70     0.53
 HUB     14.85   685.72   359.31   584.04  1184.52     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   721.37   436.50     0.61  4289.65
 MEAN   576.87   662.83   325.62     0.56  4403.21     1.53
 HUB    489.33   598.34   130.02     0.51  5339.75

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.02     1.10    20.02   616.75     1.04   585.33     0.92     0.76
 MEAN    24.09     1.11    19.87   617.35     1.04   584.27     0.92     0.76
 HUB     24.60     1.13    19.60   622.30     1.05   583.07     0.92     0.76

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.64    37.24    31.50     5.74     0.93     0.32     2.90
 MEAN    23.52    29.42    23.50     5.92     0.87     0.35     3.28     0.76
 HUB     31.60    12.55     6.50     6.05     0.87     0.40     3.87


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.826

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     637.661     252.899     585.366    1186.190       0.538      -0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.194      19.871     584.867      46.000      23.366      31.500       8.134

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     608.544     252.899     659.002    1189.257       0.512       0.071

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.090      20.145     587.895     471.992       0.034       0.209

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     589.593       0.000     589.593    1191.172       0.495       0.091

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.273     589.790       0.000       0.060       0.060       0.100

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.678      23.972       1.102     618.803      24.733     315.481       2.446

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 154153.031       0.362    1607.161 2300390.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 4.539   EfDer =  0.973

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    184.491    3776.000      23.972     618.803       1.000       1.000       0.980
W Kg/sec =   83.85950

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    123.566    3457.116       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 141925.625  144763.828       1.426     513.330     359.909     401.059       1.114

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   548.79    -0.19   548.79     0.46   581.04
 MEAN    16.97     0.00    -0.02   548.79    -0.19   548.79     0.46
 HUB     14.32     0.00    -0.02   548.79    -0.19   548.79     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.16    46.36     2.80   634.65   839.16    20.74   593.68     0.70
 MEAN    45.55    43.80     1.75   559.22   783.65    20.74   593.68     0.66
 HUB     40.70    37.84     2.86   471.87   723.88    20.74   593.68     0.61

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   601.54   222.61   558.83  1212.21     0.50
 MEAN    16.57   616.27   251.55   562.59  1210.55     0.51
 HUB     13.89   667.51   350.93   567.81  1208.83     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   686.96   399.52     0.57  4206.51
 MEAN   546.14   635.05   294.59     0.52  4172.34     1.33
 HUB    457.70   577.77   106.77     0.48  4877.13

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     26.76     1.12    22.61   641.03     1.04   610.85     0.92     0.89
 MEAN    26.74     1.12    22.40   640.85     1.04   609.18     0.92     0.89
 HUB     27.22     1.14    22.13   644.58     1.04   607.42     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.72    35.56    31.50     4.06     0.93     0.23     2.90
 MEAN    24.09    27.64    23.50     4.14     0.91     0.24     3.29     0.89
 HUB     31.72    10.65     6.50     4.15     0.91     0.26     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     604.714     252.963     549.262    1212.929       0.499       0.058

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.861      22.663     611.650      46.000      24.729      32.400       7.671

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     577.415     252.963     630.395    1215.595       0.475       0.123

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.771      22.936     614.342     456.573       0.030       0.237

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     546.657       0.000     546.657    1218.445       0.449       0.121

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.211     617.226       0.000       0.060       0.056       0.184

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.817      26.653       1.112     642.155      23.352     302.664       2.346

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 145621.562       0.376    1518.214 1660570.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 4.539   EfDer =  0.967

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    184.491    3776.000      26.653     642.155       1.000       1.000       0.980
W Kg/sec =   83.85950

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    113.216    3393.674       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 141925.625  144763.828       1.545     509.668     329.784     390.276       1.183

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   506.25    -0.17   506.25     0.41   542.54
 MEAN    15.91     0.00    -0.02   506.25    -0.17   506.25     0.41
 HUB     13.07     0.00    -0.02   506.25    -0.17   506.25     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.02    47.36     2.66   603.68   787.99    23.68   620.79     0.64
 MEAN    46.02    44.80     1.22   524.36   728.99    23.68   620.79     0.60
 HUB     40.40    38.84     1.56   430.68   664.77    23.68   620.79     0.54

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   562.22   218.12   518.19  1237.23      0.45
 MEAN    15.50   573.36   235.54   522.74  1234.85      0.46
 HUB     12.59   615.43   315.60   528.35  1232.46      0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   638.50   373.04     0.52  3916.18
 MEAN   510.67   590.73   275.14     0.48  3653.03     1.34
 HUB    414.86   537.60    99.27     0.44  3975.62

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.40     1.10    25.52   662.84     1.03   636.48     0.92     0.88
 MEAN    29.21     1.10    25.20   661.45     1.03   634.04     0.92     0.88
 HUB     29.45     1.10    24.83   663.15     1.03   631.57     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.83    35.75    31.50     4.25     0.93     0.24     2.90
 MEAN    24.26    27.76    23.50     4.26     0.91     0.24     3.34     0.88
 HUB     30.85    10.64     6.50     4.14     0.91     0.25     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     579.530     239.856     527.565    1235.240       0.469      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.270      25.170     634.477      46.000      24.449      33.000       8.551

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     562.506     239.856     611.509    1236.817       0.455       0.016

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.100      25.248     636.098     440.827       0.061       0.239

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     521.914       0.000     521.914    1240.380       0.421       0.142

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.762     639.768       0.000       0.060       0.060       0.139

    STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.805      29.101       1.092     662.481      20.326     321.295       2.491

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  126824.016       0.363    1322.235 1696613.000

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     870362.44   9074.1797    180.2291      1.9263      0.7741      4.5386      1.2672


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*******************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 100% Stat 2 20% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.035   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     181.737    3776.000      15.107     522.810       1.000       1.000       0.980
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W Kg/sec =   82.60789

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    177.539    3761.129       1.402       0.249      53.349      32.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
139807.359  142603.203       1.608     831.557     517.033     619.754       1.199

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   435.62    -0.15   435.62     0.39   677.10
MEAN    17.06     0.00    -0.02   435.62    -0.15   435.62     0.39
HUB     12.51     0.00    -0.02   435.62    -0.15   435.62     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.35    50.47     6.88   679.80   807.52    13.57   506.96     0.73
MEAN    52.24    47.20     5.04   562.16   711.31    13.57   506.96     0.64
HUB     43.43    38.62     4.81   412.23   599.85    13.57   506.96     0.54

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

        R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   681.30   368.46   573.06  1123.47     0.61
MEAN    18.04   718.50   415.26   586.35  1118.24     0.64
HUB     15.00   829.23   555.72   615.46  1107.91     0.75

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    679.80   652.17   311.33     0.58  7604.47
MEAN   594.32   613.08   179.06     0.55  7492.25     1.29
HUB    494.28   618.52    61.44     0.56  8337.69

       Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.14     1.27    14.93   563.06     1.08   524.31     0.92     0.91
MEAN    19.08     1.26    14.45   562.47     1.08   519.37     0.92     0.91
HUB     19.57     1.30    13.49   566.94     1.08   509.57     0.92     0.91

       Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.74    28.51    24.20     4.31     0.93     0.27     2.90
MEAN    35.31    16.98    12.70     4.28     0.92     0.22     3.51     0.91
HUB     42.08    -5.70    -9.30     3.60     0.92     0.07     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     731.472     414.456     602.725    1118.075       0.654      -0.008

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.213      14.408     519.470      24.000      34.514      35.400       0.886

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     627.805     414.456     752.272    1130.670       0.555       0.247

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.135      15.515     531.239     528.796       0.026       0.405

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     573.677       0.000     573.677    1136.436       0.505       0.320

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.002     536.671       0.000       0.060       0.043       0.345

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
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      0.869      19.048       1.261     564.159      41.349     223.861       1.735

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 257435.141       0.557    2643.896 1831749.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 5.035   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    181.737    3776.000      19.048     564.159       1.000       1.000       0.980
W Kg/sec =   82.60789

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    146.273    3620.672       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 139807.359  142603.203       1.386     590.487     425.993     474.134       1.113

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   543.57    -0.19   543.57     0.48   649.29
 MEAN    18.08     0.00    -0.02   543.57    -0.19   543.57     0.48
 HUB     15.21     0.00    -0.02   543.57    -0.19   543.57     0.48

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.25    46.36     4.89   677.16   868.49    16.30   539.49     0.76
 MEAN    47.63    42.30     5.33   595.71   806.58    16.30   539.49     0.71
 HUB     42.69    37.84     4.85   501.20   739.50    16.30   539.49     0.65

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   612.90   289.07   540.45  1165.07     0.53
 MEAN    18.01   629.33   308.72   548.41  1161.45     0.54
 HUB     15.22   685.48   398.77   557.56  1157.90     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   662.86   383.80     0.57  5906.68
 MEAN   593.46   617.92   284.74     0.53  5563.37     1.41
 HUB    501.63   566.97   102.86     0.49  6073.30

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.63     1.19    18.73   595.41     1.06   564.05     0.92     0.91
 MEAN    22.41     1.18    18.34   593.59     1.05   560.53     0.92     0.91
 HUB     22.73     1.19    17.93   596.29     1.06   557.06     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.14    35.38    31.50     3.88     0.93     0.29     2.90
 MEAN    29.38    27.44    23.50     3.94     0.92     0.29     3.30     0.91
 HUB     35.57    10.45     6.50     3.95     0.92     0.30     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     870.706     309.584     813.810    1131.197       0.770      -0.733

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.545      15.229     531.794      46.000      20.827      30.600       9.773

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     829.800     309.584     885.670    1137.358       0.730      -0.624

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.750      22.352      15.681     537.602     400.556       0.055       0.168

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     827.786       0.000     827.786    1137.768       0.728       0.065

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      15.503     537.892       0.000       0.060       0.125      -0.666

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.783      22.057       1.158     595.096      30.937     261.829       2.030

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 192719.781       0.426    1979.260 1659629.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 5.035   EfDer =  0.855

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    181.737    3776.000      22.057     595.096       1.000       1.000       0.780
W Kg/sec =   82.60789

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    129.731    3525.305       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 139807.359  142603.203       1.149     434.156     377.840     339.175       0.898

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   731.83    -0.25   731.83     0.64   617.42
 MEAN    17.74     0.00    -0.02   731.83    -0.25   731.83     0.64
 HUB     15.05     0.00    -0.02   731.83    -0.25   731.83     0.64

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.11    46.36    -4.25   661.34   986.55    16.80   550.40     0.86
 MEAN    38.63    43.40    -4.77   584.52   936.76    16.80   550.40     0.81
 HUB     34.14    38.84    -4.70   495.92   884.17    16.80   550.40     0.77

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   598.40   235.99   549.90  1191.42     0.50
 MEAN    17.51   614.26   265.66   553.84  1189.68     0.52
 HUB     14.85   669.33   365.54   560.70  1187.90     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   690.00   416.79     0.58  4679.97
 MEAN   576.87   635.29   311.22     0.53  4655.19     1.56
 HUB    489.33   574.20   123.80     0.48  5432.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.66     1.12    20.76   619.84     1.04   589.96     0.92     0.78
 MEAN    24.65     1.12    20.55   619.71     1.04   588.22     0.92     0.78
 HUB     25.10     1.14    20.23   623.82     1.05   586.43     0.92     0.78

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.23    37.16    31.50     5.66     0.93     0.34     2.90
 MEAN    25.63    29.33    23.50     5.83     0.88     0.36     3.28     0.78
 HUB     33.10    12.45     6.50     5.95     0.88     0.40     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.855

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     621.611     267.399     561.158    1190.250       0.522       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.763      20.559     588.873      46.000      25.478      31.500       6.022

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     579.836     267.399     638.523    1194.476       0.485       0.116

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.689      21.010     593.062     471.992       0.027       0.241

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     17.121     561.513       0.000     561.513    1196.232       0.469       0.137

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      21.148     594.807       0.000       0.060       0.049       0.148

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.725      24.597       1.115     621.123      26.027     296.430       2.298

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 162223.062       0.381    1666.054 2216409.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.035   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    181.737    3776.000      24.597     621.123       1.000       1.000       0.980
W Kg/sec =   82.60789

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.853    3450.654       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 139807.359  142603.203       1.483     513.330     346.180     401.059       1.159

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   523.71    -0.18   523.71     0.44   579.95
 MEAN    16.97     0.00    -0.02   523.71    -0.18   523.71     0.44
 HUB     14.32     0.00    -0.02   523.71    -0.18   523.71     0.44

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.48    46.36     4.12   634.65   822.97    21.58   598.24     0.69
 MEAN    46.89    43.80     3.09   559.22   766.29    21.58   598.24     0.64
 HUB     42.03    37.84     4.19   471.87   705.05    21.58   598.24     0.59

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   583.20   243.71   529.84  1218.36     0.48
 MEAN    16.57   597.45   266.61   534.66  1216.02     0.49
 HUB     13.89   647.55   356.47   540.61  1213.67     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   651.10   378.42     0.53  4604.64
 MEAN   546.14   603.33   279.53     0.50  4421.76     1.37
 HUB    457.70   550.00   101.23     0.45  4953.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.77     1.13    23.74   645.46     1.04   617.08     0.92     0.90
 MEAN    27.64     1.12    23.43   644.49     1.04   614.72     0.92     0.90
 HUB     28.02     1.14    23.08   647.30     1.04   612.32     0.92     0.90
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.70    35.54    31.50     4.04     0.93     0.26     2.90
 MEAN    26.50    27.60    23.50     4.10     0.91     0.26     3.29     0.90
 HUB     33.40    10.61     6.50     4.11     0.91     0.28     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     587.079     268.106     522.285    1218.222       0.482       0.057

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.766      23.683     616.996      46.000      27.173      32.400       5.227

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     545.791     268.106     608.086    1222.068       0.447       0.169

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.706      24.158     620.898     456.573       0.024       0.273

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     517.003       0.000     517.003    1224.577       0.422       0.168

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.420     623.451       0.000       0.060       0.046       0.229

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.848      27.608       1.122     645.749      24.626     284.102       2.202

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 153578.953       0.397    1577.278 1615373.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.035   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    181.737    3776.000      27.608     645.749       1.000       1.000       0.980
W Kg/sec =   82.60789

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    107.968    3384.217       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 139807.359  142603.203       1.621     509.668     314.497     390.276       1.241

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   479.71    -0.17   479.71     0.39   541.03
 MEAN    15.91     0.00    -0.02   479.71    -0.17   479.71     0.39
 HUB     13.07     0.00    -0.02   479.71    -0.17   479.71     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.54    47.36     4.18   603.68   771.20    24.85   626.56     0.63
 MEAN    47.56    44.80     2.76   524.36   710.81    24.85   626.56     0.58
 HUB     41.93    38.84     3.09   430.68   644.78    24.85   626.56     0.53

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   543.94   240.33   487.97  1244.36     0.44
 MEAN    15.50   553.71   251.54   493.28  1241.39     0.45
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 HUB     12.59   593.93   321.50   499.39  1238.43     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   600.99   350.82     0.48  4314.57
 MEAN   510.67   557.21   259.13     0.45  3900.90     1.39
 HUB    414.86   508.04    93.36     0.41  4049.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.79     1.12    27.00   668.53     1.04   643.87     0.92     0.90
 MEAN    30.48     1.10    26.58   666.35     1.03   640.79     0.92     0.90
 HUB     30.59     1.11    26.13   667.14     1.03   637.72     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.22    35.71    31.50     4.21     0.93     0.27     2.90
 MEAN    27.02    27.71    23.50     4.21     0.91     0.27     3.34     0.90
 HUB     32.77    10.59     6.50     4.09     0.91     0.27     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.983

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     559.720     256.153     497.667    1241.784       0.451      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.540      26.564     641.218      46.000      27.235      33.000       5.765

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     526.595     256.153     585.591    1244.686       0.423       0.082

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.434      26.907     644.219     440.827       0.046       0.279

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     489.861       0.000     489.861    1247.690       0.393       0.196

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.358     647.332       0.000       0.060       0.048       0.194

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.844      30.428       1.102     667.341      21.592     298.877       2.317

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 134738.812       0.386    1383.787 1649085.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    900695.75   9250.2744    177.5392      2.0141      0.8043      5.0352      1.2764


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 100% Stat 2 20% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 6.012   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    176.353    3776.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   80.16042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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   172.279    3761.129       1.402       0.249      53.349      32.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
135665.203  138378.219       1.657     831.557     501.714     619.754       1.235

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   420.48    -0.14   420.48     0.38   677.10
MEAN    17.06     0.00    -0.02   420.48    -0.14   420.48     0.38
HUB     12.51     0.00    -0.02   420.48    -0.14   420.48     0.38

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.27    50.47     7.80   679.80   799.45    13.67   508.04     0.72
MEAN    53.21    47.20     6.01   562.16   702.13    13.67   508.04     0.64
HUB     44.44    38.62     5.82   412.23   588.94    13.67   508.04     0.53

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   668.44   381.63   548.79  1126.50     0.59
MEAN    18.04   703.47   422.65   562.34  1120.84     0.63
HUB     15.00   808.49   553.16   589.63  1110.61     0.73

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    679.80   624.55   298.16     0.55  7876.04
MEAN   594.32   587.96   171.67     0.52  7625.47     1.33
HUB    494.28   592.56    58.88     0.53  8299.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.31     1.28    15.21   564.50     1.08   527.19     0.92     0.91
MEAN    19.16     1.27    14.69   563.17     1.08   521.86     0.92     0.91
HUB     19.56     1.29    13.74   566.74     1.08   512.19     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.82    28.52    24.20     4.32     0.93     0.30     2.90
MEAN    36.93    16.98    12.70     4.28     0.93     0.25     3.51     0.91
HUB     43.17    -5.70    -9.30     3.60     0.93     0.10     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     715.078     421.833     577.402    1120.898       0.638      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.296      14.668     522.097      24.000      36.151      35.400      -0.751

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     598.555     421.833     732.264    1134.539       0.528       0.282

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.223      15.899     534.882     528.796       0.025       0.430

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     548.078       0.000     548.078    1139.655       0.481       0.350

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.346     539.716       0.000       0.060       0.040       0.375

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      19.153       1.268     564.806      41.996     217.392       1.685

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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261458.922       0.566    2605.664 1768069.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.012   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    176.353    3776.000      19.153     564.806       1.000       1.000       0.980
W Kg/sec =   80.16042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    141.243    3618.600       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 135665.203  138378.219       1.436     590.487     411.342     474.134       1.153

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   520.10    -0.18   520.10     0.46   648.91
 MEAN    18.08     0.00    -0.02   520.10    -0.18   520.10     0.46
 HUB     15.21     0.00    -0.02   520.10    -0.18   520.10     0.46

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.48    46.36     6.12   677.16   853.98    16.61   542.22     0.75
 MEAN    48.89    42.30     6.59   595.71   790.94    16.61   542.22     0.69
 HUB     43.95    37.84     6.11   501.20   722.41    16.61   542.22     0.63

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   599.80   307.48   514.99  1169.13     0.51
 MEAN    18.01   614.66   321.99   523.58  1164.97     0.53
 HUB     15.22   668.79   403.63   533.26  1160.89     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   631.45   365.40     0.54  6282.35
 MEAN   593.46   589.77   271.47     0.51  5802.28     1.45
 HUB    501.63   542.19    97.99     0.47  6147.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.00     1.20    19.21   598.04     1.06   568.00     0.92     0.91
 MEAN    22.69     1.18    18.76   595.50     1.05   563.96     0.92     0.91
 HUB     22.91     1.20    18.29   597.33     1.06   559.99     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.84    35.36    31.50     3.86     0.93     0.32     2.90
 MEAN    31.59    27.41    23.50     3.91     0.93     0.32     3.30     0.91
 HUB     37.12    10.41     6.50     3.91     0.93     0.32     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     824.265     322.895     758.387    1140.125       0.723      -0.646

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.822      16.109     540.226      46.000      23.063      30.600       7.537

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     763.891     322.895     829.331    1148.542       0.665      -0.462

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      22.687      16.857     548.232     400.556       0.043       0.214

   VANED DIFFUSER EXIT:
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   R4          C4           Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     755.894       0.000     755.894    1149.630       0.658       0.175

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      16.829     549.249       0.000       0.060       0.088      -0.469

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.831      22.504       1.175     596.956      32.150     248.825       1.929

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 200283.328       0.442    1995.996 1593529.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.012   EfDer =  0.902

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    176.353    3776.000      22.504     596.956       1.000       1.000       0.780
W Kg/sec =   80.16042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    123.583    3519.808       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 135665.203  138378.219       1.206     434.156     359.931     339.175       0.942

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   678.38    -0.23   678.38     0.59   616.45
 MEAN    17.74     0.00    -0.02   678.38    -0.23   678.38     0.59
 HUB     15.05     0.00    -0.02   678.38    -0.23   678.38     0.59

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.28    46.36    -2.08   661.34   947.57    17.84   558.55     0.82
 MEAN    40.76    43.40    -2.64   584.52   895.62    17.84   558.55     0.77
 HUB     36.18    38.84    -2.66   495.92   840.46    17.84   558.55     0.73

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   576.91   266.60   511.61  1198.61     0.48
 MEAN    17.51   591.66   288.09   516.78  1195.90     0.49
 HUB     14.85   644.33   375.10   523.89  1193.25     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   641.00   386.17     0.53  5286.07
 MEAN   576.87   592.00   288.79     0.50  5047.57     1.61
 HUB    489.33   536.20   114.24     0.45  5573.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.69     1.14    21.92   624.90     1.05   597.13     0.92     0.82
 MEAN    25.54     1.13    21.60   623.64     1.04   594.43     0.92     0.82
 HUB     25.87     1.15    21.21   626.42     1.05   591.78     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.52    37.05    31.50     5.55     0.93     0.37     2.90
 MEAN    29.14    29.20    23.50     5.70     0.89     0.39     3.28     0.82
 HUB     35.60    12.30     6.50     5.80     0.89     0.42     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.902

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3           Mach3       cp 2-3
    17.392     598.160     289.978     523.171    1196.557       0.500       0.006
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Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.655	21.625	595.127	46.000	28.998	31.500	2.502

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	536.265	289.978	609.645	1202.435	0.446	0.185

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	25.611	22.339	600.988	471.992	0.021	0.294

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	519.509	0.000	519.509	1203.911	0.432	0.204

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.466	602.464	0.000	0.060	0.039	0.216

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.786	25.537	1.135	624.990	28.035	269.918	2.092

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
174747.859	0.410	1741.513	2084762.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.012 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
176.353	3776.000	25.537	624.990	1.000	1.000	0.980

W Kg/sec = 80.16042

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
111.433	3439.960	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
135665.203	138378.219	1.582	513.330	324.569	401.059	1.236

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	485.81	-0.17	485.81	0.40	578.16
MEAN	16.97	0.00	-0.02	485.81	-0.17	485.81	0.40	
HUB	14.32	0.00	-0.02	485.81	-0.17	485.81	0.40	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.57	46.36	6.21	634.65	799.38	22.84	605.30	0.66
MEAN	49.03	43.80	5.23	559.22	740.89	22.84	605.30	0.61
HUB	44.18	37.84	6.34	471.87	677.37	22.84	605.30	0.56

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	559.68	274.32	487.84	1227.34	0.46
MEAN	16.57	571.92	288.68	493.72	1224.16	0.47
HUB	13.89	619.20	364.65	500.44	1221.01	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	622.13	599.13	347.81	0.49	5182.47	
MEAN	546.14	556.81	257.46	0.45	4787.45	1.44
HUB	457.70	509.02	93.05	0.42	5067.45	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	29.28	1.15	25.39	652.37	1.04	626.24	0.92	0.91
MEAN	28.99	1.14	24.96	650.29	1.04	623.00	0.92	0.91
HUB	29.20	1.14	24.49	651.77	1.04	619.78	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	29.35	35.49	31.50	3.99	0.93	0.31	2.90	

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 MEAN    30.32    27.54    23.50     4.04     0.92     0.31     3.29     0.91
 HUB     36.08    10.53     6.50     4.03     0.92     0.32     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     563.285     290.307     482.712    1226.105       0.459        0.055

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.114      25.188     625.006      46.000      31.023      32.400       1.377

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     500.783     290.307     578.845    1231.535       0.407        0.238

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.079      25.946     630.554     456.573       0.018        0.330

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096     474.906       0.000     474.906    1233.590       0.385        0.235

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      26.178     632.660       0.000       0.060       0.037        0.293

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.875      28.999       1.136     651.475      26.485     259.073        2.008

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 165190.828       0.427    1646.269 1538922.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.012   EfDer =  0.997

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    176.353    3776.000       28.999     651.475       1.000        1.000        0.980
W Kg/sec =   80.16042

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    100.186    3369.311        1.401       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 135665.203  138378.219        1.746     509.668     291.831     390.276        1.337

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1       Stator    Alfa     C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   441.70    -0.15   441.70      0.36   538.64
 MEAN    15.91      0.00    -0.02   441.70    -0.15   441.70      0.36
 HUB     13.07      0.00    -0.02   441.70    -0.15   441.70      0.36

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     53.81     47.36      6.45   603.68   748.14     26.55   635.21      0.61
 MEAN    49.90     44.80      5.10   524.36   685.72     26.55   635.21      0.55
 HUB     44.29     38.84      5.45   430.68   617.02     26.55   635.21      0.50

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   522.14    271.00    446.31   1254.51      0.42
 MEAN    15.50   528.68    273.81    452.25   1250.83      0.42
 HUB     12.59   565.01    329.75    458.80   1247.17      0.45

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
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  TIP    591.16   549.26   320.15     0.44  4864.55
  MEAN   510.67   510.53   236.86     0.41  4245.84     1.47
  HUB    414.86   466.63    85.11     0.37  4153.56

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     32.81     1.13    29.12   677.16     1.04   654.43     0.92     0.91
  MEAN    32.31     1.11    28.57   673.89     1.03   650.59     0.92     0.91
  HUB     32.23     1.11    28.00   673.41     1.03   646.79     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     31.27    35.65    31.50     4.15     0.93     0.33     2.90
  MEAN    31.19    27.64    23.50     4.14     0.92     0.31     3.34     0.91
  HUB     35.71    10.51     6.50     4.01     0.92     0.31     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.997

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     534.628     278.832     456.158    1251.201       0.427      -0.005

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      32.372      28.551     650.988      46.000      31.436      33.000       1.564

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     478.764     278.832     554.042    1255.729       0.381       0.172

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      32.316      29.230     655.708     440.827       0.034       0.341

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     446.600       0.000     446.600    1258.103       0.355       0.272

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      29.607     658.190       0.000       0.060       0.037       0.269

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.876      32.304       1.114     674.820      23.345     270.440       2.096

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  145708.984       0.417    1452.116 1570412.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     947389.94   9441.5586    172.2791      2.1383      0.8374      6.0120      1.2908


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 100% Stat 2 20% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     171.128    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   77.78547

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     167.175    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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131645.797  134278.422       1.708     831.557     486.850     619.754       1.273

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   406.03    -0.14   406.03     0.37   677.10
MEAN    17.06     0.00    -0.02   406.03    -0.14   406.03     0.37
HUB     12.51     0.00    -0.02   406.03    -0.14   406.03     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.16    50.47     8.69   679.80   791.94    13.76   509.04     0.72
MEAN    54.17    47.20     6.97   562.16   693.58    13.76   509.04     0.63
HUB     45.44    38.62     6.82   412.23   578.71    13.76   509.04     0.52

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   657.50   393.69   526.61  1129.16     0.58
MEAN    18.04   690.16   429.46   540.26  1123.15     0.61
HUB     15.00   789.74   550.81   565.95  1113.01     0.71

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    679.80   599.32   286.11     0.53  8124.65
MEAN   594.32   564.85   164.86     0.50  7748.13     1.37
HUB    494.28   568.77    56.53     0.51  8263.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.46     1.29    15.46   565.82     1.08   529.72     0.92     0.91
MEAN    19.24     1.27    14.91   563.82     1.08   524.05     0.92     0.91
HUB     19.54     1.29    13.96   566.55     1.08   514.49     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     36.78    28.52    24.20     4.32     0.93     0.33     2.90
MEAN    38.48    16.97    12.70     4.27     0.93     0.28     3.51     0.91
HUB     44.22    -5.70    -9.30     3.60     0.93     0.13     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     700.672     428.626     554.275    1123.361       0.624      -0.003

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.365      14.893     524.393      24.000      37.715      35.400      -2.315

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     572.477     428.626     715.157    1137.868       0.503       0.313

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.292      16.226     538.025     528.796       0.026       0.455

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     525.185       0.000     525.185    1142.444       0.460       0.376

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.634     542.361       0.000       0.060       0.039       0.401

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.880      19.231       1.273     565.398      42.589     211.392       1.639

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 265150.219       0.574    2564.162 1707338.750
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    3776.000      19.231     565.398       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    136.570    3616.702       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.485     590.487     397.735     474.134       1.192

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   498.98    -0.17   498.98     0.44   648.57
 MEAN    18.08     0.00    -0.02   498.98    -0.17   498.98     0.44
 HUB     15.21     0.00    -0.02   498.98    -0.17   498.98     0.44

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.62    46.36     7.26   677.16   841.29    16.87   544.61     0.73
 MEAN    50.06    42.30     7.76   595.71   777.21    16.87   544.61     0.68
 HUB     45.14    37.84     7.30   501.20   707.36    16.87   544.61     0.62

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   589.50   323.54   492.78  1172.55     0.50
 MEAN    18.01   602.52   333.65   501.70  1167.98     0.52
 HUB     15.22   654.39   407.92   511.69  1163.48     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   604.04   349.33     0.52  6610.27
 MEAN   593.46   564.98   259.81     0.48  6012.18     1.49
 HUB    501.63   520.20    93.71     0.45  6212.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.30     1.21    19.60   600.37     1.06   571.35     0.92     0.91
 MEAN    22.91     1.19    19.10   597.20     1.06   566.89     0.92     0.91
 HUB     23.04     1.20    18.58   598.26     1.06   562.51     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.29    35.33    31.50     3.83     0.93     0.35     2.90
 MEAN    33.63    27.38    23.50     3.88     0.93     0.34     3.30     0.91
 HUB     38.56    10.38     6.50     3.88     0.93     0.34     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     789.308     334.589     714.882    1146.821       0.688      -0.582

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.041      16.779     546.592      46.000      25.081      30.600       5.519

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     714.839     334.589     789.269    1156.591       0.618      -0.343

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      22.943      17.726     555.944     400.556       0.035       0.249

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     705.079       0.000     705.079    1157.802       0.609       0.246
```

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	17.759	557.102	0.000	0.060	0.066	-0.335

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.856	22.819	1.187	598.612	33.213	237.846	1.844

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
206906.594	0.457	2000.911	1532291.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 6.967 EfDer = 0.935

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
171.128	3776.000	22.819	598.612	1.000	1.000	0.780

W Kg/sec = 77.78547

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
118.427	3514.937	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
131645.797	134278.422	1.259	434.156	344.915	339.175	0.983

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	638.03	-0.22	638.03	0.55	615.60
MEAN	17.74	0.00	-0.02	638.03	-0.22	638.03	0.55	
HUB	15.05	0.00	-0.02	638.03	-0.22	638.03	0.55	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.04	46.36	-0.32	661.34	919.10	18.61	564.64	0.79
MEAN	42.50	43.40	-0.90	584.52	865.44	18.61	564.64	0.74
HUB	37.87	38.84	-0.97	495.92	808.23	18.61	564.64	0.69

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	562.48	290.33	481.76	1204.11	0.47
MEAN	17.51	575.51	305.51	487.73	1200.74	0.48
HUB	14.85	625.58	382.45	495.06	1197.47	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	652.78	602.88	362.45	0.50	5755.78	
MEAN	576.87	558.13	271.36	0.46	5352.38	1.65
HUB	489.33	506.47	106.89	0.42	5682.65	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.47	1.16	22.79	629.04	1.05	602.64	0.92	0.86
MEAN	26.21	1.15	22.39	626.91	1.05	599.27	0.92	0.86
HUB	26.43	1.16	21.94	628.65	1.05	595.99	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.07	36.96	31.50	5.46	0.93	0.40	2.90	
MEAN	32.06	29.09	23.50	5.59	0.90	0.41	3.28	0.86
HUB	37.69	12.18	6.50	5.68	0.90	0.43	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.935

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	581.490	307.518	493.521	1201.426	0.484	0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
26.329	22.427	599.980	46.000	31.927	31.500	-0.427

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	503.258	307.518	589.776	1208.496	0.416	0.240

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	26.293	23.332	607.063	471.992	0.019	0.339

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	487.863	0.000	487.863	1209.763	0.403	0.254

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.441	608.336	0.000	0.060	0.037	0.267

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.822	26.223	1.149	628.202	29.590	251.367	1.949

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
184452.781	0.433	1783.769	1978643.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.967 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
171.128	3776.000	26.223	628.202	1.000	1.000	0.980

W Kg/sec = 77.78547

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
105.573	3431.156	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
131645.797	134278.422	1.669	513.330	307.502	401.059	1.304

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	457.00	-0.16	457.00	0.38	576.68
MEAN	16.97	0.00	-0.02	457.00	-0.16	457.00	0.38	
HUB	14.32	0.00	-0.02	457.00	-0.16	457.00	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.25	46.36	7.89	634.65	782.20	23.77	610.78	0.65
MEAN	50.75	43.80	6.95	559.22	722.32	23.77	610.78	0.60
HUB	45.93	37.84	8.09	471.87	657.01	23.77	610.78	0.54

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	545.00	296.66	457.19	1233.96	0.44
MEAN	16.57	554.81	304.94	463.50	1230.26	0.45
HUB	13.89	599.01	370.66	470.55	1226.59	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	622.13	561.21	325.47	0.45	5603.96	
MEAN	546.14	522.50	241.20	0.42	5056.65	1.50
HUB	457.70	478.53	87.04	0.39	5150.78	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.39	1.16	26.57	657.81	1.05	633.03	0.92	0.91
MEAN	29.96	1.14	26.06	654.92	1.04	629.24	0.92	0.91
HUB	30.03	1.15	25.51	655.41	1.04	625.48	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.98	35.45	31.50	3.95	0.93	0.35	2.90	
MEAN	33.34	27.49	23.50	3.99	0.93	0.34	3.29	0.91
HUB	38.23	10.48	6.50	3.98	0.93	0.34	3.90	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     547.422     306.651     453.471    1232.013       0.444       0.052

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.086      26.270     631.048      46.000      34.068      32.400      -1.668

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     468.368     306.651     559.824    1238.535       0.378       0.289

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.054      27.227     637.747     456.573       0.018       0.376

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     444.703       0.000     444.703    1240.284       0.359       0.283

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.423     639.549       0.000       0.060       0.038       0.337

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      29.974       1.143     656.047      27.845     241.990       1.876

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 173693.547       0.449    1679.721 1473290.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    171.128    3776.000      29.974     656.047       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     94.385    3357.551       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 131645.797  134278.422       1.854     509.668     274.935     390.276       1.420

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   414.22    -0.14   414.22     0.33   536.76
 MEAN    15.91     0.00    -0.02   414.22    -0.14   414.22     0.33
 HUB     13.07     0.00    -0.02   414.22    -0.14   414.22     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.55    47.36     8.19   603.68   732.24    27.75   641.74     0.59
 MEAN    51.70    44.80     6.90   524.36   668.35    27.75   641.74     0.54
 HUB     46.13    38.84     7.29   430.68   597.65    27.75   641.74     0.48

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   509.47   292.33   417.25  1261.83     0.40
 MEAN    15.50   512.83   289.41   423.37  1257.73     0.41
 HUB     12.59   545.41   335.50   430.02  1253.66     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   513.22   298.82     0.41  5247.04
 MEAN   510.67   477.70   221.26     0.38  4487.45     1.54
 HUB    414.86   437.28    79.36     0.35  4225.82
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         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.22     1.14    30.58   683.75     1.04   662.11     0.92     0.91
 MEAN    33.58     1.12    29.94   679.74     1.04   657.81     0.92     0.91
 HUB     33.36     1.11    29.29   678.36     1.03   653.55     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.02    35.61    31.50     4.11     0.93     0.37     2.90
 MEAN    34.36    27.59    23.50     4.09     0.93     0.35     3.34     0.91
 HUB     37.96    10.46     6.50     3.96     0.93     0.34     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     518.826     294.718     426.991    1258.071       0.412       -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.643      29.924     658.171      46.000      34.614      33.000      -1.614

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     446.251     294.718     534.789    1263.640       0.353       0.232

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.593      30.816     664.010     440.827       0.033       0.388

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     416.947       0.000     416.947    1265.645       0.329       0.323

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      31.144     666.119       0.000       0.060       0.037       0.319

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.882      33.577       1.120     680.614      24.567     252.033       1.954

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 153358.906       0.439    1483.073 1503685.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    983562.12   9511.6348     167.1750      2.2226      0.8526      6.9673      1.3018


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 100% Stat 2 20% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    165.780    3776.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   75.35457

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    161.951    3761.129       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127531.688  130082.039       1.763     831.557     471.635     619.754       1.314

     ROTOR LEADING EDGE CONDITIONS, STAGE            1
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   391.49    -0.13   391.49     0.35   677.10
MEAN    17.06     0.00    -0.02   391.49    -0.13   391.49     0.35
HUB     12.51     0.00    -0.02   391.49    -0.13   391.49     0.35

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.07    50.47     9.60   679.80   784.58    13.86   510.01     0.71
MEAN    55.15    47.20     7.95   562.16   685.16    13.86   510.01     0.62
HUB     46.49    38.62     7.87   412.23   568.60    13.86   510.01     0.51

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   647.67   405.39   505.11  1131.63     0.57
MEAN    18.04   677.67   436.10   518.70  1125.31     0.60
HUB     15.00   771.77   548.53   542.90  1115.26     0.69

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    679.80   574.84   274.40     0.51  8366.02
MEAN   594.32   542.30   158.22     0.48  7867.78     1.42
HUB    494.28   545.60    54.26     0.49  8229.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.59     1.30    15.69   567.09     1.08   532.06     0.92     0.91
MEAN    19.30     1.28    15.10   564.46     1.08   526.11     0.92     0.91
HUB     19.51     1.29    14.16   566.37     1.08   516.64     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.75    28.51    24.20     4.31     0.93     0.36     2.90
MEAN    40.06    16.96    12.70     4.26     0.93     0.30     3.51     0.91
HUB     45.30    -5.71    -9.30     3.59     0.93     0.15     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     687.226     435.251     531.823    1125.645       0.611      -0.001

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.424      15.098     526.529      24.000      39.297      35.400      -3.897

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     547.630     435.251     699.530    1140.932       0.480       0.343

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.346      16.521     540.927     528.796       0.027       0.478

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     503.630       0.000     503.630    1144.999       0.440       0.397

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.879     544.790       0.000       0.060       0.042       0.423

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.878      19.281       1.276     565.975      43.165     205.488       1.593

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 268740.031       0.582    2517.659 1646176.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.996
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
165.780	3776.000	19.281	565.975	1.000	1.000	0.980

W Kg/sec = 75.35457

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
132.026	3614.860	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
127531.688	130082.039	1.536	590.487	384.502	474.134	1.233

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	479.00	-0.16	479.00	0.42	648.24
MEAN	18.08	0.00	-0.02	479.00	-0.16	479.00	0.42	
HUB	15.21	0.00	-0.02	479.00	-0.16	479.00	0.42	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.73	46.36	8.37	677.16	829.59	17.10	546.82	0.72
MEAN	51.21	42.30	8.91	595.71	764.53	17.10	546.82	0.67
HUB	46.31	37.84	8.47	501.20	693.40	17.10	546.82	0.60

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	580.95	338.32	472.28	1175.62	0.49
MEAN	18.01	591.91	344.45	481.36	1170.70	0.51
HUB	15.22	641.27	411.88	491.50	1165.85	0.55

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	672.88	578.77	334.56	0.49	6911.82	
MEAN	593.46	541.95	249.01	0.46	6206.53	1.54
HUB	501.63	499.63	89.74	0.43	6272.60	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.54	1.22	19.92	602.54	1.06	574.36	0.92	0.91
MEAN	23.08	1.20	19.38	598.81	1.06	569.56	0.92	0.91
HUB	23.12	1.20	18.82	599.16	1.06	564.83	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.62	35.31	31.50	3.81	0.93	0.37	2.90	
MEAN	35.59	27.35	23.50	3.85	0.93	0.36	3.30	0.91
HUB	39.96	10.35	6.50	3.85	0.93	0.36	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	760.360	345.418	677.373	1152.369	0.660	-0.531

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.207	17.321	551.895	46.000	27.019	30.600	3.581

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	673.859	345.418	757.231	1163.133	0.579	-0.245

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	23.133	18.423	562.254	400.556	0.029	0.279

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	663.716	0.000	663.716	1164.307	0.570	0.300

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	18.483	563.387	0.000	0.060	0.052	-0.229

```
    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.868      23.046       1.195     600.169      34.194     228.005       1.767

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 213016.469       0.470    1995.620 1472152.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.960

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    165.780    3776.000      23.046     600.169       1.000       1.000       0.780
W Kg/sec =   75.35457

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    113.746    3510.375       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127531.688  130082.039       1.311     434.156     331.284     339.175       1.024

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   603.94    -0.21   603.94     0.52   614.80
 MEAN    17.74     0.00    -0.02   603.94    -0.21   603.94     0.52
 HUB     15.05     0.00    -0.02   603.94    -0.21   603.94     0.52

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.61    46.36     1.25   661.34   895.76    19.22   569.73     0.77
 MEAN    44.07    43.40     0.67   584.52   840.62    19.22   569.73     0.72
 HUB     39.40    38.84     0.56   495.92   781.59    19.22   569.73     0.67

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   551.95   310.47   456.35  1208.73     0.46
 MEAN    17.51   562.90   320.35   462.85  1204.85     0.47
 HUB     14.85   610.18   388.69   470.36  1201.10     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   570.46   342.30     0.47  6154.68
 MEAN   576.87   529.18   256.52     0.44  5611.95     1.70
 HUB    489.33   481.01   100.64     0.40  5775.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.11     1.18    23.49   632.71     1.05   607.28     0.92     0.88
 MEAN    26.73     1.16    23.01   629.84     1.05   603.39     0.92     0.88
 HUB     26.84     1.16    22.50   630.70     1.05   599.63     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.23    36.87    31.50     5.37     0.93     0.42     2.90
 MEAN    34.69    29.00    23.50     5.50     0.90     0.43     3.28     0.88
 HUB     39.57    12.08     6.50     5.58     0.90     0.45     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.960

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     568.507     322.454     468.213    1205.546       0.472       0.011

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.855      23.058     604.106      46.000      34.555      31.500      -3.055

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     475.629     322.454     574.630    1213.595       0.392       0.287
```

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	26.816	24.119	612.200	471.992	0.020	0.379

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	461.496	0.000	461.496	1214.690	0.380	0.294

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	24.202	613.305	0.000	0.060	0.040	0.308

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.845	26.739	1.160	631.081	30.912	236.665	1.835

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
192702.734	0.452	1805.313	1882971.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 7.953 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
165.780	3776.000	26.739	631.081	1.000	1.000	0.980

W Kg/sec = 75.35457

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
100.527	3423.320	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
127531.688	130082.039	1.753	513.330	292.804	401.059	1.370

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	432.85	-0.15	432.85	0.36	575.36
MEAN	16.97	0.00	-0.02	432.85	-0.15	432.85	0.36	
HUB	14.32	0.00	-0.02	432.85	-0.15	432.85	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.71	46.36	9.35	634.65	768.33	24.50	615.45	0.63
MEAN	52.27	43.80	8.47	559.22	707.28	24.50	615.45	0.58
HUB	47.48	37.84	9.64	471.87	640.44	24.50	615.45	0.53

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	534.69	314.77	432.22	1239.41	0.43
MEAN	16.57	541.92	318.20	438.67	1235.34	0.44
HUB	13.89	582.94	375.57	445.83	1231.30	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	622.13	530.36	307.36	0.43	5945.80	
MEAN	546.14	494.35	227.94	0.40	5276.29	1.56
HUB	457.70	453.34	82.13	0.37	5218.75	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	31.23	1.17	27.47	662.49	1.05	638.64	0.92	0.91
MEAN	30.70	1.15	26.89	658.95	1.04	634.46	0.92	0.91
HUB	30.65	1.15	26.29	658.65	1.04	630.30	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.07	35.42	31.50	3.92	0.93	0.38	2.90	
MEAN	35.96	27.46	23.50	3.96	0.93	0.37	3.29	0.91
HUB	40.11	10.44	6.50	3.94	0.93	0.37	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.997

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     535.527     319.987     429.416    1236.936       0.433       0.050

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.817      27.090     636.109      46.000      36.692      32.400      -4.292

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     442.132     319.987     545.776    1244.320       0.355       0.332

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.778      28.203     643.726     456.573       0.020       0.416

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     420.323       0.000     420.323    1245.835       0.337       0.320

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.360     645.295       0.000       0.060       0.043       0.372

    STAGE EXIT CONDITIONS, STAGE             4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877       30.687       1.148     660.033      28.951     228.715       1.773

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 180608.312       0.467    1692.008 1411617.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    165.780    3776.000      30.687     660.033       1.000       1.000       0.980
W Kg/sec =   75.35457

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.583    3347.399       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127531.688  130082.039       1.953     509.668     260.949     390.276       1.496

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   391.94    -0.13   391.94     0.31   535.14
 MEAN    15.91     0.00    -0.02   391.94    -0.13   391.94     0.31
 HUB     13.07     0.00    -0.02   391.94    -0.13   391.94     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.01    47.36     9.65   603.68   719.86    28.66   647.23     0.58
 MEAN    53.23    44.80     8.43   524.36   654.76    28.66   647.23     0.52
 HUB     47.71    38.84     8.87   430.68   582.42    28.66   647.23     0.47

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     17.94   501.00   309.16   394.24  1267.79      0.40
 MEAN    15.50   501.33   301.78   400.33  1263.41      0.40
 HUB     12.59   530.31   340.04   406.93  1259.04      0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   484.71   281.99     0.38  5548.83
 MEAN   510.67   451.55   208.89     0.36  4679.01     1.60
 HUB    414.86   413.75    74.82     0.33  4282.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     35.25     1.15    31.65   689.32     1.04   668.40     0.92     0.91
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 MEAN    34.51     1.12    30.96   684.73     1.04   663.78     0.92     0.91
 HUB     34.17     1.11    30.24   682.64     1.03   659.19     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.10    35.58    31.50     4.08     0.93     0.40     2.90
 MEAN    37.01    27.56    23.50     4.06     0.93     0.38     3.34     0.91
 HUB     39.88    10.42     6.50     3.92     0.93     0.36     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     507.406     307.313     403.757    1263.708       0.402       -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.569      30.933     664.100      46.000      37.276      33.000      -4.276

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     420.840     307.313     521.102    1270.066       0.331       0.279

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      34.507      31.979     670.799     440.827       0.037       0.429

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     393.680       0.000     393.680    1271.811       0.310       0.361

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.267     672.643       0.000       0.060       0.043       0.357

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      34.485       1.124     685.564      25.532     238.151       1.846

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 159405.562       0.456    1493.372 1441222.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1014473.12   9503.9707    161.9505      2.2827      0.8577      7.9532      1.3113


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 100% Stat 2 20% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.966   EfDer =  0.996

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    160.332    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   72.87835

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    156.629    3761.129       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123340.875  125807.422       1.823     831.557     456.137     619.754       1.359

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   376.90    -0.13   376.90     0.34   677.10
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 MEAN    17.06     0.00    -0.02   376.90    -0.13   376.90     0.34
 HUB     12.51     0.00    -0.02   376.90    -0.13   376.90     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.00    50.47    10.53   679.80   777.40    13.94   510.95     0.70
 MEAN    56.17    47.20     8.97   562.16   676.92    13.94   510.95     0.61
 HUB     47.57    38.62     8.95   412.23   558.65    13.94   510.95     0.50

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.63   638.88   416.73   484.26  1133.93     0.56
 MEAN    18.04   665.98   442.55   497.68  1127.34     0.59
 HUB     15.00   754.52   546.29   520.45  1117.37     0.68

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    679.80   551.10   263.07     0.49  8599.78
 MEAN   594.32   520.30   151.77     0.46  7984.09     1.46
 HUB    494.28   523.04    52.01     0.47  8195.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.72     1.31    15.89   568.33     1.09   534.24     0.92     0.91
 MEAN    19.36     1.28    15.28   565.07     1.08   528.03     0.92     0.91
 HUB     19.48     1.29    14.35   566.19     1.08   518.66     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.71    28.51    24.20     4.31     0.93     0.38     2.90
 MEAN    41.64    16.96    12.70     4.26     0.93     0.33     3.51     0.91
 HUB     46.39    -5.71    -9.30     3.59     0.93     0.18     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     674.687     441.692     510.011    1127.765       0.598       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.473      15.283     528.513      24.000      40.894      35.400      -5.494

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     523.856     441.692     685.213    1143.761       0.458       0.371

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.386      16.786     543.612     528.796       0.030       0.503

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     482.934       0.000     482.934    1147.375       0.421       0.417

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.095     547.053       0.000       0.060       0.047       0.443

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      19.313       1.278     566.533      43.723     199.689       1.548

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 272215.094       0.589    2466.412 1584834.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.966   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    160.332    3776.000      19.313     566.533       1.000       1.000       0.980
W Kg/sec =   72.87835
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
127.537	3613.079	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
123340.875	125807.422	1.590	590.487	371.429	474.134	1.277

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	459.74	-0.16	459.74	0.40	647.92
MEAN	18.08	0.00	-0.02	459.74	-0.16	459.74	0.40	
HUB	15.21	0.00	-0.02	459.74	-0.16	459.74	0.40	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.83	46.36	9.47	677.16	818.61	17.29	548.89	0.71
MEAN	52.35	42.30	10.05	595.71	752.61	17.29	548.89	0.65
HUB	47.48	37.84	9.64	501.20	680.24	17.29	548.89	0.59

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	573.76	352.24	452.91	1178.43	0.49
MEAN	18.01	582.45	354.66	462.01	1173.21	0.50
HUB	15.22	629.03	415.60	472.19	1168.05	0.54

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	672.88	554.92	320.64	0.47	7195.91	
MEAN	593.46	520.08	238.80	0.44	6390.33	1.58
HUB	501.63	479.96	86.03	0.41	6329.05	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.74	1.23	20.18	604.60	1.07	577.11	0.92	0.91
MEAN	23.21	1.20	19.61	600.34	1.06	572.01	0.92	0.91
HUB	23.17	1.20	19.02	600.01	1.06	566.98	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.87	35.30	31.50	3.80	0.93	0.40	2.90	
MEAN	37.51	27.33	23.50	3.83	0.94	0.38	3.30	0.91
HUB	41.35	10.33	6.50	3.83	0.94	0.37	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.991

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	735.365	355.659	643.637	1157.164	0.635	-0.486

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.337	17.777	556.499	46.000	28.924	30.600	1.676

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	637.805	355.659	730.266	1168.736	0.546	-0.158

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	23.278	19.007	567.685	400.556	0.026	0.308

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	627.856	0.000	627.856	1169.818	0.537	0.345

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	19.076	568.737	0.000	0.060	0.043	-0.140

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.873	23.213	1.202	601.651	35.118	218.948	1.697

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
218776.641	0.483	1982.232	1412895.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 8.966 EfDer = 0.978

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
160.332	3776.000	23.213	601.651	1.000	1.000	0.780

W Kg/sec = 72.87835

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
109.351	3506.047	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
123340.875	125807.422	1.363	434.156	318.485	339.175	1.065

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	573.66	-0.20	573.66	0.49	614.04
MEAN	17.74	0.00	-0.02	573.66	-0.20	573.66	0.49	
HUB	15.05	0.00	-0.02	573.66	-0.20	573.66	0.49	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.07	46.36	2.71	661.34	875.63	19.72	574.19	0.75
MEAN	45.55	43.40	2.15	584.52	819.13	19.72	574.19	0.70
HUB	40.85	38.84	2.01	495.92	758.43	19.72	574.19	0.65

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	544.04	328.28	433.84	1212.76	0.45
MEAN	17.51	552.67	333.53	440.68	1208.48	0.46
HUB	14.85	597.00	394.23	448.32	1204.33	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	652.78	541.77	324.50	0.45	6507.14	
MEAN	576.87	503.40	243.34	0.42	5842.52	1.75
HUB	489.33	458.30	95.11	0.38	5857.22	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.63	1.19	24.06	636.05	1.06	611.35	0.92	0.89
MEAN	27.15	1.17	23.52	632.54	1.05	607.05	0.92	0.89
HUB	27.16	1.17	22.96	632.62	1.05	602.87	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.11	36.80	31.50	5.30	0.93	0.45	2.90	
MEAN	37.12	28.91	23.50	5.41	0.91	0.45	3.28	0.89
HUB	41.33	11.98	6.50	5.48	0.91	0.46	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.978

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	558.002	335.722	445.709	1209.169	0.461	0.012

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
27.275	23.567	607.748	46.000	36.988	31.500	-5.488

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	451.403	335.722	562.560	1218.070	0.371	0.328

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	27.226	24.760	616.728	471.992	0.023	0.416

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	438.452	0.000	438.452	1219.019	0.360	0.328

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	24.813	617.690	0.000	0.060	0.047	0.342

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.858	27.136	1.169	633.735	32.083	224.307	1.739

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
200008.578	0.469	1812.183	1793801.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 8.966 EfDer = 0.992

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
160.332	3776.000	27.136	633.735	1.000	1.000	0.980

W Kg/sec = 72.87835

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
96.005	3416.146	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
123340.875	125807.422	1.836	513.330	279.633	401.059	1.434

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	411.66	-0.14	411.66	0.34	574.15
MEAN	16.97	0.00	-0.02	411.66	-0.14	411.66	0.34	
HUB	14.32	0.00	-0.02	411.66	-0.14	411.66	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.04	46.36	10.68	634.65	756.59	25.08	619.60	0.62
MEAN	53.65	43.80	9.85	559.22	694.51	25.08	619.60	0.57
HUB	48.91	37.84	11.07	471.87	626.30	25.08	619.60	0.51

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	527.06	330.29	410.73	1244.11	0.42
MEAN	16.57	531.66	329.60	417.17	1239.77	0.43
HUB	13.89	569.42	379.72	424.32	1235.43	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	622.13	503.86	291.84	0.40	6238.63	
MEAN	546.14	470.02	216.54	0.38	5465.11	1.62
HUB	457.70	431.43	77.98	0.35	5276.40	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	31.88	1.17	28.17	666.69	1.05	643.52	0.92	0.91
MEAN	31.26	1.15	27.55	662.60	1.05	639.03	0.92	0.91
HUB	31.11	1.15	26.89	661.61	1.04	634.56	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.80	35.40	31.50	3.90	0.93	0.41	2.90	
MEAN	38.31	27.43	23.50	3.93	0.94	0.39	3.29	0.91
HUB	41.83	10.41	6.50	3.91	0.94	0.39	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

```
    16.481     526.108     331.451     408.571    1241.231       0.424       0.047

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    31.378      27.728     640.545      46.000      39.050      32.400      -6.650

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     419.649     331.451     534.757    1249.342       0.336       0.370

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      31.326      28.971     648.944     456.573       0.023       0.453

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     399.461       0.000     399.461    1250.669       0.319       0.350

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      29.085     650.323       0.000       0.060       0.051       0.399

   STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.868      31.218       1.150     663.634      29.899     217.710       1.688

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 186532.750       0.482    1690.085 1352437.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.966   EfDer =  0.992

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   160.332    3776.000      31.218     663.634       1.000       1.000       0.980
W Kg/sec =   72.87835

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    85.397    3338.304       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123340.875  125807.422       2.049     509.668     248.760     390.276       1.569

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   372.80    -0.13   372.80     0.30   533.69
 MEAN    15.91     0.00    -0.02   372.80    -0.13   372.80     0.30
 HUB     13.07     0.00    -0.02   372.80    -0.13   372.80     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.31    47.36    10.95   603.68   709.62    29.35   652.05     0.57
 MEAN    54.60    44.80     9.80   524.36   643.48    29.35   652.05     0.51
 HUB     49.13    38.84    10.29   430.68   569.71    29.35   652.05     0.45

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   494.95   323.26   374.80  1272.92     0.39
 MEAN    15.50   492.38   312.18   380.77  1268.31     0.39
 HUB     12.59   517.86   343.83   387.25  1263.72     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   460.70   267.90     0.36  5801.62
 MEAN   510.67   429.40   198.49     0.34  4840.12     1.66
 HUB    414.86   393.71    71.03     0.31  4330.49

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     36.03     1.15    32.46   694.25     1.05   673.83     0.92     0.91
 MEAN    35.20     1.13    31.72   689.18     1.04   668.97     0.92     0.91
 HUB     34.76     1.11    30.97   686.49     1.03   664.13     0.92     0.91
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         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     40.78    35.56    31.50     4.06     0.93     0.43     2.90
  MEAN    39.35    27.53    23.50     4.03     0.94     0.40     3.34     0.91
  HUB     41.60    10.39     6.50     3.89     0.94     0.38     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.992

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     498.554     317.907     384.046    1268.582       0.393      -0.007

      Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      35.260       31.696     669.254      46.000      39.617      33.000      -6.617

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     399.547     317.907     510.590    1275.588       0.313       0.317

    BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
       0.950       35.176      32.862     676.667     440.827       0.043       0.465

     VANED DIFFUSER EXIT:
    R4           C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
      14.701     374.137       0.000     374.137    1277.132       0.293       0.392

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       33.113     678.306       0.000       0.060       0.051       0.386

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
       0.869       35.147       1.126     689.975      26.341     226.873       1.759

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  164475.109       0.471    1490.231 1381318.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1042008.19   9441.1436     156.6287      2.3265      0.8567      8.9664      1.3197


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 100% Stat 2 20% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.991

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     154.804     3776.000       15.107     522.810       1.000        1.000        0.980
 W Kg/sec =   70.36555

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     151.228     3761.129        1.402        0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  119088.148  121469.656        1.888     831.557     440.409     619.754       1.407

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   362.31    -0.12   362.31     0.33   677.10
  MEAN    17.06      0.00    -0.02   362.31    -0.12   362.31     0.33
  HUB     12.51      0.00    -0.02   362.31    -0.12   362.31     0.33
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.95    50.47    11.48   679.80   770.43    14.03   511.85     0.69
MEAN    57.20    47.20    10.00   562.16   668.91    14.03   511.85     0.60
HUB     48.70    38.62    10.08   412.23   548.91    14.03   511.85     0.49

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   631.06   427.71   464.01  1136.06     0.56
MEAN    18.04   655.05   448.80   477.15  1129.24     0.58
HUB     15.00   737.95   544.07   498.56  1119.36     0.66

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    679.80   528.07   252.09     0.46  8826.17
MEAN   594.32   498.84   145.52     0.44  8096.73     1.51
HUB    494.28   501.04    49.79     0.45  8162.58

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.83     1.31    16.07   569.53     1.09   536.27     0.92     0.91
MEAN    19.40     1.28    15.44   565.67     1.08   529.83     0.92     0.91
HUB     19.44     1.29    14.52   566.02     1.08   520.54     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.67    28.51    24.20     4.31     0.93     0.41     2.90
MEAN    43.25    16.96    12.70     4.26     0.94     0.35     3.51     0.91
HUB     47.50    -5.70    -9.30     3.60     0.94     0.20     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     662.986     447.930     488.783    1129.733       0.587       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.513      15.451     530.360      24.000      42.503      35.400      -7.103

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     501.002     447.930     672.045    1146.383       0.437       0.399

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.414      17.024     546.108     528.796       0.034       0.527

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     462.934       0.000     462.934    1149.596       0.403       0.435

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.285     549.173       0.000       0.060       0.053       0.461

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      19.331       1.280     567.073      44.263     193.995       1.504

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 275572.750       0.596    2410.745 1523501.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    154.804    3776.000      19.331     567.073       1.000       1.000       0.980
W Kg/sec =   70.36555

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    123.086    3611.360       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
119088.148	121469.656	1.647	590.487	358.468	474.134	1.323

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	441.06	-0.15	441.06	0.38	647.62
MEAN	18.08	0.00	-0.02	441.06	-0.15	441.06	0.38	
HUB	15.21	0.00	-0.02	441.06	-0.15	441.06	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.93	46.36	10.57	677.16	808.26	17.47	550.83	0.70
MEAN	53.49	42.30	11.19	595.71	741.34	17.47	550.83	0.64
HUB	48.66	37.84	10.82	501.20	667.75	17.47	550.83	0.58

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	567.70	365.43	434.44	1181.01	0.48
MEAN	18.01	573.96	364.39	443.46	1175.54	0.49
HUB	15.22	617.57	419.14	453.55	1170.11	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	672.88	532.22	307.45	0.45	7465.20	
MEAN	593.46	499.13	229.08	0.42	6565.30	1.62
HUB	501.63	460.99	82.49	0.39	6382.85	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.91	1.24	20.41	606.56	1.07	579.66	0.92	0.90
MEAN	23.32	1.21	19.81	601.80	1.06	574.30	0.92	0.90
HUB	23.20	1.20	19.19	600.84	1.06	569.00	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.07	35.29	31.50	3.79	0.93	0.42	2.90	
MEAN	39.41	27.32	23.50	3.82	0.94	0.40	3.30	0.90
HUB	42.74	10.31	6.50	3.81	0.94	0.39	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.985

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	713.341	365.408	612.644	1161.397	0.614	-0.447

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.437	18.164	560.581	46.000	30.814	30.600	-0.214

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	605.232	365.408	706.986	1173.662	0.516	-0.081

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	23.386	19.503	572.484	400.556	0.024	0.336

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	595.728	0.000	595.728	1174.638	0.507	0.383

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	19.572	573.437	0.000	0.060	0.038	-0.062

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.873	23.333	1.207	603.069	35.996	210.518	1.632

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
224247.969	0.495	1961.749	1354479.875

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    154.804    3776.000      23.333     603.069       1.000       1.000       0.780
W Kg/sec =   70.36555

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    105.160    3501.925       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119088.148  121469.656       1.418     434.156     306.279     339.175       1.107

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   546.05    -0.19   546.05     0.46   613.32
 MEAN    17.74     0.00    -0.02   546.05    -0.19   546.05     0.46
 HUB     15.05     0.00    -0.02   546.05    -0.19   546.05     0.46

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.46    46.36     4.10   661.34   857.79    20.14   578.18     0.73
 MEAN    46.96    43.40     3.56   584.52   800.03    20.14   578.18     0.68
 HUB     42.26    38.84     3.42   495.92   737.77    20.14   578.18     0.63

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   538.09   344.36   413.46  1216.35     0.44
 MEAN    17.51   544.21   345.47   420.50  1211.75     0.45
 HUB     14.85   585.43   399.20   428.21  1207.26     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   515.82   308.42     0.42  6825.51
 MEAN   576.87   479.96   231.40     0.40  6051.36     1.80
 HUB    489.33   437.60    90.13     0.36  5930.97

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.05     1.20    24.52   639.15     1.06   614.99     0.92     0.91
 MEAN    27.48     1.18    23.93   635.06     1.05   610.34     0.92     0.91
 HUB     27.40     1.17    23.32   634.42     1.05   605.82     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.79    36.72    31.50     5.22     0.93     0.47     2.90
 MEAN    39.41    28.82    23.50     5.32     0.92     0.47     3.28     0.91
 HUB     42.99    11.89     6.50     5.39     0.92     0.48     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.990

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     549.337     347.739     425.263    1212.417       0.453       0.013

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    27.607      23.977     611.025      46.000      39.273      31.500      -7.773

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     429.620     347.739     552.717    1222.083       0.352       0.366

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.542      25.284     620.806     471.992       0.027       0.452

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     17.121     417.775       0.000     417.775    1222.907       0.342       0.357

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.304     621.644       0.000       0.060       0.056       0.371

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864      27.434       1.176     636.210      33.142     213.577       1.656

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 206610.828       0.485    1807.458 1709304.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    154.804    3776.000      27.434     636.210       1.000       1.000       0.980
W Kg/sec =   70.36555

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     91.865    3409.493       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119088.148  121469.656       1.918     513.330     267.577     401.059       1.499

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   392.57    -0.14   392.57     0.32   573.03
 MEAN    16.97     0.00    -0.02   392.57    -0.14   392.57     0.32
 HUB     14.32     0.00    -0.02   392.57    -0.14   392.57     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.27    46.36    11.91   634.65   746.37    25.55   623.36     0.61
 MEAN    54.94    43.80    11.14   559.22   683.36    25.55   623.36     0.56
 HUB     50.25    37.84    12.41   471.87   613.92    25.55   623.36     0.50

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   521.25   343.94   391.67  1248.29     0.42
 MEAN    16.57   523.24   339.67   398.01  1243.72     0.42
 HUB     13.89   557.73   383.40   405.05  1239.15     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   480.41   278.19     0.38  6496.24
 MEAN   546.14   448.38   206.47     0.36  5631.89     1.67
 HUB    457.70   411.81    74.30     0.33  5327.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.38     1.18    28.72   670.52     1.05   647.86     0.92     0.90
 MEAN    31.69     1.16    28.06   665.96     1.05   643.12     0.92     0.90
 HUB     31.45     1.15    27.36   664.35     1.04   638.40     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.29    35.38    31.50     3.88     0.93     0.44     2.90
 MEAN    40.48    27.42    23.50     3.92     0.94     0.42     3.29     0.90
 HUB     43.43    10.39     6.50     3.89     0.94     0.41     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     518.408     341.577     389.964    1245.071       0.416       0.044

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     31.803      28.224     644.528      46.000      41.216      32.400      -8.816

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     399.744     341.577     525.804    1253.818       0.319       0.403

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.737      29.576     653.615     456.573       0.028       0.487

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     380.995       0.000     380.995    1254.989       0.304       0.375

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.648     654.836       0.000       0.060       0.062       0.422

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.856      31.607       1.152     666.944      30.734     208.246       1.614

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 191754.438       0.495    1677.492 1295065.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    154.804    3776.000      31.607     666.944       1.000       1.000       0.980
W Kg/sec =   70.36555

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.641    3330.009       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119088.148  121469.656       2.143     509.668     237.820     390.276       1.641

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   355.81    -0.12   355.81     0.28   532.36
 MEAN    15.91     0.00    -0.02   355.81    -0.12   355.81     0.28
 HUB     13.07     0.00    -0.02   355.81    -0.12   355.81     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.49    47.36    12.13   603.68   700.84    29.89   656.39     0.56
 MEAN    55.85    44.80    11.05   524.36   633.79    29.89   656.39     0.50
 HUB     50.45    38.84    11.61   430.68   558.74    29.89   656.39     0.44

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   490.49   335.56   357.75  1277.46     0.38
 MEAN    15.50   485.15   321.25   363.55  1272.68     0.38
 HUB     12.59   507.23   347.12   369.85  1267.91     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   439.67   255.60     0.34  6022.15
 MEAN   510.67   409.94   189.43     0.32  4980.54     1.72
 HUB    414.86   376.00    67.74     0.30  4371.88

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     36.62     1.16    33.07   698.73     1.05   678.67     0.92     0.90
 MEAN    35.71     1.13    32.30   693.23     1.04   673.61     0.92     0.90
 HUB     35.19     1.11    31.51   690.02     1.03   668.57     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.17    35.54    31.50     4.04     0.93     0.45     2.90
 MEAN    41.47    27.52    23.50     4.02     0.94     0.43     3.34     0.90
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 HUB     43.18    10.38     6.50     3.88     0.94     0.40     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     491.410     327.139     366.693    1272.919       0.386       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     35.768      32.272     673.861      46.000      41.737      33.000      -8.737

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     380.959     327.139     502.145    1280.482       0.298       0.349

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      35.659      33.534     681.893     440.827       0.051       0.498

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     357.046       0.000     357.046    1281.863       0.279       0.418

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      33.752     683.364       0.000       0.060       0.061       0.411

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      35.622       1.127     693.990      27.046     217.279       1.684

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 168895.094       0.483    1477.516 1323203.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1067081.12   9334.9600    151.2282      2.3579      0.8516     10.0040      1.3274


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 100% Stat 2 20% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =11.015   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    149.467    3776.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   67.93939

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    146.014    3761.129       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 114982.070  117281.461       1.956     831.557     425.224     619.754       1.457

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   348.42    -0.12   348.42     0.31   677.10
 MEAN    17.06     0.00    -0.02   348.42    -0.12   348.42     0.31
 HUB     12.51     0.00    -0.02   348.42    -0.12   348.42     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.87    50.47    12.40   679.80   763.99    14.11   512.67     0.69
 MEAN    58.22    47.20    11.02   562.16   661.48    14.11   512.67     0.60
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HUB     49.80    38.62    11.18   412.23   539.84    14.11   512.67     0.49

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   624.43   437.86   445.19  1137.96     0.55
MEAN    18.04   645.29   454.60   457.98  1130.94     0.57
HUB     15.00   722.74   541.97   478.15  1121.14     0.64

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    679.80   506.68   241.94     0.45  9035.51
MEAN   594.32   478.82   139.72     0.42  8201.17     1.56
HUB    494.28   480.52    47.69     0.43  8131.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.92     1.32    16.23   570.64     1.09   538.07     0.92     0.90
MEAN    19.44     1.29    15.58   566.22     1.08   531.45     0.92     0.90
HUB     19.40     1.28    14.66   565.85     1.08   522.23     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.52    28.52    24.20     4.32     0.93     0.44     2.90
MEAN    44.79    16.97    12.70     4.27     0.94     0.38     3.51     0.90
HUB     48.58    -5.70    -9.30     3.60     0.94     0.22     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.986

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     652.557     453.714     469.013    1131.483       0.577       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.544      15.595     532.004      24.000      44.050      35.400      -8.650

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     479.922     453.714     660.440    1148.716       0.418       0.424

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.431      17.229     548.333     528.796       0.038       0.551

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     444.397       0.000     444.397    1151.585       0.386       0.452

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.445     551.076       0.000       0.060       0.061       0.477

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.856      19.335       1.280     567.571      44.761     188.651       1.462

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 278673.156       0.603    2353.812 1465094.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.015   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    149.467    3776.000      19.335     567.571       1.000       1.000       0.980
W Kg/sec =   67.93939

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.867    3609.776       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 114982.070  117281.461       1.706     590.487     346.179     474.134       1.370
```

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	423.70	-0.15	423.70	0.37	647.33
MEAN	18.08	0.00	-0.02	423.70	-0.15	423.70	0.37	
HUB	15.21	0.00	-0.02	423.70	-0.15	423.70	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.97	46.36	11.61	677.16	798.92	17.61	552.58	0.69
MEAN	54.58	42.30	12.28	595.71	731.14	17.61	552.58	0.63
HUB	49.80	37.84	11.96	501.20	656.41	17.61	552.58	0.57

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	562.83	377.46	417.49	1183.30	0.48
MEAN	18.01	566.65	373.26	426.35	1177.62	0.48
HUB	15.22	607.22	422.34	436.29	1171.96	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	672.88	511.44	295.42	0.43	7710.74	
MEAN	593.46	479.85	220.20	0.41	6725.02	1.67
HUB	501.63	443.44	79.29	0.38	6431.44	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.03	1.24	20.58	608.36	1.07	581.91	0.92	0.90
MEAN	23.39	1.21	19.96	603.15	1.06	576.34	0.92	0.90
HUB	23.20	1.20	19.32	601.59	1.06	570.81	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.12	35.28	31.50	3.78	0.93	0.44	2.90	
MEAN	41.20	27.32	23.50	3.82	0.94	0.42	3.30	0.90
HUB	44.07	10.30	6.50	3.80	0.94	0.41	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.979

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	694.522	374.307	585.026	1165.025	0.596	-0.412

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.508	18.481	564.092	46.000	32.612	30.600	-2.012

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	576.583	374.307	687.425	1177.880	0.490	-0.013

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	23.457	19.908	576.609	400.556	0.024	0.363

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	567.726	0.000	567.726	1178.744	0.482	0.414

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	19.968	577.455	0.000	0.060	0.038	0.004

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.869	23.408	1.211	604.367	36.796	202.958	1.573

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
229233.406	0.506	1936.219	1299477.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

```
 RESET =  0.000BLEED =  0.000 DPInc =11.015   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    149.467    3776.000      23.408     604.367       1.000       1.000       0.780
W Kg/sec =   67.93939

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.321    3498.162       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 114982.070  117281.461       1.471     434.156     295.098     339.175       1.149

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   521.68    -0.18   521.68     0.44   612.66
 MEAN    17.74     0.00    -0.02   521.68    -0.18   521.68     0.44
 HUB     15.05     0.00    -0.02   521.68    -0.18   521.68     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.74    46.36     5.38   661.34   842.47    20.48   581.65     0.71
 MEAN    48.26    43.40     4.86   584.52   783.59    20.48   581.65     0.66
 HUB     43.56    38.84     4.72   495.92   719.91    20.48   581.65     0.61

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   533.82   358.37   395.64  1219.45     0.44
 MEAN    17.51   537.49   355.93   402.74  1214.59     0.44
 HUB     14.85   575.62   403.55   410.47  1209.82     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   493.16   294.41     0.40  7102.92
 MEAN   576.87   459.37   220.94     0.38  6234.38     1.84
 HUB    489.33   419.34    85.79     0.35  5995.40

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.37     1.21    24.87   641.91     1.06   618.13     0.92     0.91
 MEAN    27.73     1.18    24.24   637.32     1.05   613.21     0.92     0.91
 HUB     27.55     1.18    23.59   636.06     1.05   608.41     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.17    36.65    31.50     5.15     0.93     0.49     2.90
 MEAN    41.47    28.75    23.50     5.25     0.92     0.48     3.28     0.91
 HUB     44.51    11.80     6.50     5.30     0.92     0.49     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     542.450     358.270     407.301    1215.234       0.446       0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.847      24.284     613.875      46.000      41.336      31.500      -9.836

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     410.630     358.270     544.954    1225.568       0.335       0.399

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.766      25.688     624.360     471.992       0.032       0.485

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     399.762       0.000     399.762    1226.290       0.326       0.381

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      25.674     625.095       0.000       0.060       0.067       0.395

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      27.637       1.181     638.432      34.066     204.491       1.585

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 212376.328       0.498    1793.836 1632082.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =11.015   EfDer =  0.978

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    149.467    3776.000      27.637     638.432       1.000       1.000       0.980
W Kg/sec =   67.93939

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.199    3403.554       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 114982.070  117281.461       1.998     513.330     256.903     401.059       1.561

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   375.89    -0.13   375.89     0.31   572.04
 MEAN    16.97     0.00    -0.02   375.89    -0.13   375.89     0.31
 HUB     14.32     0.00    -0.02   375.89    -0.13   375.89     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.37    46.36    13.01   634.65   737.73    25.90   626.65     0.60
 MEAN    56.10    43.80    12.30   559.22   673.92    25.90   626.65     0.55
 HUB     51.47    37.84    13.63   471.87   603.39    25.90   626.65     0.49

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   516.98   355.67   375.19  1251.89     0.41
 MEAN    16.57   516.50   348.31   381.38  1247.14     0.41
 HUB     13.89   547.83   386.48   388.27  1242.39     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   460.18   266.46     0.37  6717.49
 MEAN   546.14   429.63   197.83     0.34  5775.06     1.72
 HUB    457.70   394.74    71.22     0.32  5370.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.74     1.18    29.12   673.91     1.06   651.62     0.92     0.90
 MEAN    31.99     1.16    28.43   668.94     1.05   646.69     0.92     0.90
 HUB     31.67     1.15    27.71   666.80     1.04   641.76     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.47    35.38    31.50     3.88     0.93     0.46     2.90
 MEAN    42.41    27.42    23.50     3.92     0.94     0.44     3.29     0.90
 HUB     44.87    10.39     6.50     3.89     0.94     0.43     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.978

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     512.266     350.270     373.801    1248.401       0.410       0.042

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    32.098      28.582     647.994      46.000      43.139      32.400     -10.739

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	382.560	350.270	518.692	1257.692	0.304	0.432

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	32.016	30.024	657.675	456.573	0.032	0.517

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	365.042	0.000	365.042	1258.735	0.290	0.396

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	30.056	658.767	0.000	0.060	0.073	0.441

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.844	31.864	1.153	669.881	31.449	200.282	1.553

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
196227.562	0.507	1657.435	1241643.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =11.015 EfDer = 0.979

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
149.467	3776.000	31.864	669.881	1.000	1.000	0.980

W Kg/sec = 67.93939

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
78.360	3322.700	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
114982.070	117281.461	2.233	509.668	228.267	390.276	1.710

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	341.10	-0.12	341.10	0.27	531.19
MEAN	15.91	0.00	-0.02	341.10	-0.12	341.10	0.27	
HUB	13.07	0.00	-0.02	341.10	-0.12	341.10	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.54	47.36	13.18	603.68	693.48	30.28	660.18	0.55
MEAN	56.96	44.80	12.16	524.36	625.64	30.28	660.18	0.50
HUB	51.63	38.84	12.79	430.68	549.49	30.28	660.18	0.44

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	487.29	346.02	343.10	1281.37	0.38
MEAN	15.50	479.40	328.97	348.72	1276.46	0.38
HUB	12.59	498.30	349.86	354.83	1271.55	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	591.16	421.68	245.14	0.33	6209.69	
MEAN	510.67	393.22	181.70	0.31	5100.12	1.77
HUB	414.86	360.73	65.00	0.28	4406.32	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	37.02	1.16	33.50	702.65	1.05	682.86	0.92	0.90
MEAN	36.06	1.13	32.71	696.79	1.04	677.64	0.92	0.90
HUB	35.46	1.11	31.90	693.13	1.03	672.44	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.24	35.54	31.50	4.04	0.93	0.48	2.90	
MEAN	43.33	27.52	23.50	4.02	0.94	0.45	3.34	0.90
HUB	44.60	10.38	6.50	3.88	0.94	0.42	4.06	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     485.753     335.002     351.752    1276.666       0.380       -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     36.110      32.676     677.860      46.000      43.603      33.000     -10.603

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     365.046     335.002     495.464    1284.701       0.284       0.377

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      35.976      34.013     686.419     440.827       0.059       0.528

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     342.390       0.000     342.390    1285.951       0.266       0.439

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      34.201     687.755       0.000       0.060       0.072       0.431

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.847      35.930       1.128     697.526      27.645     209.263       1.622

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  172647.406       0.494    1458.266 1269024.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1089157.88   9199.5684    146.0140      2.3783      0.8438     11.0152      1.3342


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 100% Stat 2 20% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =12.000   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    144.313    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   65.59689

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    140.979    3761.129       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  111017.570  113237.688       2.025     831.557     410.563     619.754       1.510

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   335.18    -0.12   335.18     0.30   677.10
  MEAN    17.06     0.00    -0.02   335.18    -0.12   335.18     0.30
  HUB     12.51     0.00    -0.02   335.18    -0.12   335.18     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.76    50.47    13.29   679.80   758.04    14.18   513.43     0.68
  MEAN    59.20    47.20    12.00   562.16   654.60    14.18   513.43     0.59
  HUB     50.89    38.62    12.27   412.23   531.39    14.18   513.43     0.48

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.700      0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   618.80   447.30   427.60  1139.65     0.54
MEAN    18.04   636.54   459.99   440.00  1132.47     0.56
HUB     15.00   708.69   539.96   459.01  1122.74     0.63

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    679.80   486.72   232.50     0.43  9230.09
MEAN   594.32   460.05   134.33     0.41  8298.31     1.62
HUB    494.28   461.28    45.68     0.41  8100.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.00     1.32    16.36   571.67     1.09   539.69     0.92     0.90
MEAN    19.46     1.29    15.70   566.74     1.08   532.90     0.92     0.90
HUB     19.35     1.28    14.79   565.69     1.08   523.75     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.29    28.53    24.20     4.33     0.93     0.46     2.90
MEAN    46.27    16.98    12.70     4.28     0.94     0.40     3.51     0.90
HUB     49.63    -5.68    -9.30     3.62     0.94     0.25     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.980

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     643.207     459.094     450.498    1133.048       0.568       0.004

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.566      15.720     533.477      24.000      45.541      35.400     -10.141

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     460.320     459.094     650.124    1150.810       0.400       0.448

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.438      17.407     550.334     528.796       0.042       0.574

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     427.085       0.000     427.085    1153.383       0.370       0.467

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.581     552.797       0.000       0.060       0.069       0.492

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.847      19.330       1.280     568.032      45.222     183.613       1.423

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 281545.531       0.609    2296.079 1409401.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =12.000   EfDer =  0.971

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    144.313    3776.000      19.330     568.032       1.000       1.000       0.980
W Kg/sec =   65.59689

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    114.847    3608.309       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111017.570  113237.688       1.765     590.487     334.472     474.134       1.418

    ROTOR LEADING EDGE CONDITIONS, STAGE            2
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   407.44    -0.14   407.44     0.35   647.07
MEAN    18.08     0.00    -0.02   407.44    -0.14   407.44     0.35
HUB     15.21     0.00    -0.02   407.44    -0.14   407.44     0.35

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.97    46.36    12.61   677.16   790.41    17.73   554.17     0.68
MEAN    55.64    42.30    13.34   595.71   721.84    17.73   554.17     0.63
HUB     50.90    37.84    13.06   501.20   646.03    17.73   554.17     0.56

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   558.92   388.53   401.79  1185.35     0.47
MEAN    18.01   560.32   381.45   410.43  1179.49     0.48
HUB     15.22   597.81   425.25   420.17  1173.64     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    672.88   492.23   284.35     0.42  7936.59
MEAN   593.46   461.95   212.01     0.39  6872.52     1.72
HUB    501.63   427.05    76.37     0.36  6475.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.13     1.25    20.72   610.02     1.07   583.93     0.92     0.89
MEAN    23.45     1.21    20.09   604.39     1.06   578.17     0.92     0.89
HUB     23.19     1.20    19.42   602.29     1.06   572.45     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.04    35.29    31.50     3.79     0.93     0.46     2.90
MEAN    42.90    27.32    23.50     3.82     0.94     0.44     3.30     0.89
HUB     45.34    10.30     6.50     3.80     0.94     0.42     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.971

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     678.189     382.525     560.013    1168.188       0.581      -0.382

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.555      18.742     567.163      46.000      34.336      30.600      -3.736

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     550.892     382.525     670.677    1181.564       0.466       0.048

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      23.500      20.244     580.226     400.556       0.026       0.388

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     542.826       0.000     542.826    1182.314       0.459       0.440

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750      20.287     580.962       0.000       0.060       0.041       0.060

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.861      23.445       1.213     605.564      37.532     196.090       1.520

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 233821.703       0.516    1906.878 1247507.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =12.000   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
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    144.313    3776.000      23.445     605.564       1.000       1.000       0.780
W Kg/sec =   65.59689

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.767    3494.700       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111017.570  113237.688       1.525     434.156     284.750     339.175       1.191

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   499.79    -0.17   499.79     0.42   612.06
 MEAN    17.74     0.00    -0.02   499.79    -0.17   499.79     0.42
 HUB     15.05     0.00    -0.02   499.79    -0.17   499.79     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.93    46.36     6.57   661.34   829.09    20.75   584.72     0.70
 MEAN    49.48    43.40     6.08   584.52   769.19    20.75   584.72     0.65
 HUB     44.79    38.84     5.95   495.92   704.20    20.75   584.72     0.59

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   530.78   370.81   379.77  1222.17     0.43
 MEAN    17.51   532.03   365.23   386.87  1217.09     0.44
 HUB     14.85   567.12   407.39   394.54  1212.10     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   473.00   281.96     0.39  7349.23
 MEAN   576.87   440.97   211.65     0.36  6396.93     1.89
 HUB    489.33   402.96    81.94     0.33  6052.33

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.61     1.22    25.13   644.41     1.06   620.90     0.92     0.91
 MEAN    27.90     1.19    24.46   639.38     1.06   615.76     0.92     0.91
 HUB     27.64     1.18    23.79   637.56     1.05   610.72     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.32    36.59    31.50     5.09     0.93     0.51     2.90
 MEAN    43.35    28.68    23.50     5.18     0.93     0.50     3.28     0.91
 HUB     45.92    11.73     6.50     5.23     0.93     0.50     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     536.862     367.624     391.247    1217.719       0.441       0.013

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    28.013      24.509     616.397      46.000      43.217      31.500     -11.717

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     393.753     367.624     538.692    1228.649       0.320       0.428

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.915      25.996     627.512     471.992       0.037       0.515

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     383.747       0.000     383.747    1229.284       0.312       0.401

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      25.950     628.161       0.000       0.060       0.079       0.415

   STAGE EXIT CONDITIONS, STAGE            3
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      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      27.766       1.184     640.450      34.886     196.613       1.524

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 217493.281       0.510    1773.716 1560723.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =12.000   EfDer =  0.971

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    144.313    3776.000      27.766     640.450       1.000       1.000       0.980
W Kg/sec =   65.59689

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     84.899    3398.188       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111017.570  113237.688       2.076     513.330     247.291     401.059       1.622

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   361.04    -0.12   361.04     0.29   571.13
 MEAN    16.97     0.00    -0.02   361.04    -0.12   361.04     0.29
 HUB     14.32     0.00    -0.02   361.04    -0.12   361.04     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.37    46.36    14.01   634.65   730.27    26.15   629.58     0.59
 MEAN    57.16    43.80    13.36   559.22   665.74    26.15   629.58     0.54
 HUB     52.59    37.84    14.75   471.87   594.24    26.15   629.58     0.48

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   513.76   365.94   360.61  1255.06     0.41
 MEAN    16.57   510.95   355.89   366.63  1250.17     0.41
 HUB     13.89   539.31   389.20   373.34  1245.27     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   442.35   256.19     0.35  6911.28
 MEAN   546.14   413.05   190.25     0.33  5900.63     1.77
 HUB    457.70   379.57    68.50     0.30  5407.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.99     1.19    29.40   676.95     1.06   654.94     0.92     0.89
 MEAN    32.19     1.16    28.69   671.61     1.05   649.84     0.92     0.89
 HUB     31.80     1.15    27.95   669.01     1.04   644.75     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.42    35.39    31.50     3.89     0.93     0.48     2.90
 MEAN    44.15    27.43    23.50     3.93     0.94     0.46     3.29     0.89
 HUB     46.19    10.40     6.50     3.90     0.94     0.44     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.971

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     507.243     357.894     359.454    1251.343       0.405       0.040

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.292      28.834     651.068      46.000      44.875      32.400     -12.475

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     367.374     357.894     512.886    1261.110       0.291       0.458
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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      32.196      30.353     661.270     456.573       0.036       0.546

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     350.923       0.000     350.923    1262.049       0.278       0.415

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.347     662.256       0.000       0.060       0.084       0.457

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.832      32.023       1.153     672.526      32.076     193.392       1.499

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 200148.812       0.517    1632.267 1191515.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =12.000   EfDer =  0.972

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    144.313    3776.000      32.023     672.526       1.000       1.000       0.980
W Kg/sec =   65.59689

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     75.433    3316.160       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111017.570  113237.688       2.319     509.668     219.741     390.276       1.776

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   328.06    -0.11   328.06     0.26   530.15
 MEAN    15.91     0.00    -0.02   328.06    -0.11   328.06     0.26
 HUB     13.07     0.00    -0.02   328.06    -0.11   328.06     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.48    47.36    14.12   603.68   687.16    30.55   663.56     0.54
 MEAN    57.97    44.80    13.17   524.36   618.62    30.55   663.56     0.49
 HUB     52.71    38.84    13.87   430.68   541.48    30.55   663.56     0.43

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   484.94   355.16   330.20  1284.81     0.38
 MEAN    15.50   474.71   335.73   335.61  1279.79     0.37
 HUB     12.59   490.63   352.25   341.52  1274.77     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   405.86   236.00     0.32  6373.57
 MEAN   510.67   378.47   174.94     0.30  5204.81     1.82
 HUB    414.86   347.22    62.62     0.27  4436.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     37.29     1.16    33.79   706.16     1.05   686.56     0.92     0.89
 MEAN    36.28     1.13    32.99   699.99     1.04   681.21     0.92     0.89
 HUB     35.63     1.11    32.16   695.94     1.03   675.87     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.09    35.55    31.50     4.05     0.93     0.50     2.90
 MEAN    45.01    27.53    23.50     4.03     0.94     0.47     3.34     0.89
 HUB     45.89    10.39     6.50     3.89     0.94     0.44     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.972
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     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219      481.150     341.886      338.555     1279.972       0.376       -0.011

      Pt3          Ps3         Ts3          Vane No.     Alpha3      Vane A3      Incid3
      36.328       32.950      681.401       46.000      45.281       33.000      -12.281

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG          Cth         Cuth         Cmth         Aoth         Machth       cp 2-Th
      15.219      351.043     341.886      490.017     1288.419       0.272        0.401

    BlockageThr  PtTh         PsTh        TsTh         AreaTh         w 2-Th  DiffFact4
       0.950       36.169       34.350      690.424      440.827       0.066        0.555

     VANED DIFFUSER EXIT:
    R4           C4           Cu4         Cm4          Ao4           Mach4        cp 3-4
      14.701      329.475       0.000      329.475     1289.560       0.255        0.457

    Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4     w2-4OD       cp 2-4
       0.950       34.511      691.647       0.000        0.060        0.083        0.448

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
       0.836       36.114        1.128      700.694       28.168      202.348        1.569

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  175926.438       0.503    1434.727 1218120.250

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    1108935.75   9043.6680     140.9795      2.3905       0.8344      12.0004       1.3402


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 100% Stat 2 27% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.526   EfDer =  0.998

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     179.025     3776.000       15.107      522.810       1.000        1.000        0.980
 W Kg/sec =   81.37495

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     174.889     3761.129        1.402        0.249       53.349       32.000        0.050

    CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
  137720.719  140474.828        1.633      831.557      509.316      619.754        1.217

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   427.96    -0.15   427.96      0.39   677.10
  MEAN    17.06      0.00    -0.02   427.96    -0.15   427.96      0.39
  HUB     12.51      0.00    -0.02   427.96    -0.15   427.96      0.39

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
  TIP     57.81     50.47      7.34   679.80   803.41     13.62   507.51      0.73
  MEAN    52.73     47.20      5.53   562.16   706.64     13.62   507.51      0.64
  HUB     43.94     38.62      5.32   412.23   594.31     13.62   507.51      0.54

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial     THK         AeroBl      Blades2
       0.700        0.050        0.950       32.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   674.60   375.20   560.64  1125.04     0.60
 MEAN    18.04   710.75   419.04   574.09  1119.58     0.63
 HUB     15.00   818.59   554.42   602.25  1109.30     0.74

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    679.80   638.04   304.60     0.57  7743.36
 MEAN   594.32   600.25   175.28     0.54  7560.35     1.31
 HUB    494.28   605.25    60.14     0.55  8318.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.23     1.27    15.08   563.80     1.08   525.80     0.92     0.91
 MEAN    19.12     1.27    14.57   562.83     1.08   520.65     0.92     0.91
 HUB     19.56     1.30    13.62   566.84     1.08   510.92     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.79    28.52    24.20     4.32     0.93     0.29     2.90
 MEAN    36.13    16.98    12.70     4.28     0.92     0.24     3.51     0.91
 HUB     42.63    -5.70    -9.30     3.60     0.92     0.09     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     723.002     418.227     589.761    1119.537       0.646      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.257      14.543     520.830      24.000      35.342      35.400       0.058

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     612.728     418.227     741.856    1132.682       0.541       0.265

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.182      15.715     533.132     528.796       0.025       0.418

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     560.489       0.000     560.489    1138.107       0.492       0.336

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.182     538.251       0.000       0.060       0.041       0.360

    STAGE EXIT CONDITIONS, STAGE             1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.873      19.104       1.265     564.490      41.680     220.562       1.710

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 259493.953       0.562    2625.264 1799525.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 5.526   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.025    3776.000      19.104     564.490       1.000       1.000       0.980
W Kg/sec =   81.37495

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    143.708    3619.612       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 137720.719  140474.828       1.411     590.487     418.521     474.134       1.133

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   531.50    -0.18   531.50     0.47   649.10
 MEAN    18.08     0.00    -0.02   531.50    -0.18   531.50     0.47
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 HUB     15.21     0.00    -0.02   531.50    -0.18   531.50     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.88    46.36     5.52   677.16   860.98    16.46   540.90     0.75
 MEAN    48.27    42.30     5.97   595.71   798.49    16.46   540.90     0.70
 HUB     43.33    37.84     5.49   501.20   730.66    16.46   540.90     0.64

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   605.94   298.63   527.24  1167.19     0.52
 MEAN    18.01   621.63   315.58   535.56  1163.28     0.53
 HUB     15.22   676.81   401.30   545.01  1159.45     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   646.57   374.25     0.55  6101.69
 MEAN   593.46   603.36   277.88     0.52  5686.87     1.43
 HUB    501.63   554.17   100.33     0.48  6111.73

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.82     1.19    18.99   596.77     1.06   566.12     0.92     0.91
 MEAN    22.55     1.18    18.56   594.58     1.05   562.31     0.92     0.91
 HUB     22.83     1.19    18.12   596.82     1.06   558.58     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.53    35.37    31.50     3.87     0.93     0.31     2.90
 MEAN    30.51    27.42    23.50     3.92     0.92     0.30     3.30     0.91
 HUB     36.36    10.43     6.50     3.93     0.92     0.31     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960    1095.559     316.465    1048.857    1093.620       1.002      -1.582

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.692      11.956     496.041      46.000      16.790      30.600      13.810

    STATOR / VANED DIFFUSER THROAT IS CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960    1163.536     316.465    1205.806    1082.879       1.074      -1.862

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      22.319      10.780     483.829     361.848       0.099      -0.162

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823    1378.623       0.000    1378.623    1054.249       1.308      -1.049

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680       7.575     443.637       0.000       0.060       0.362      -2.629

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.548      21.224       1.111     596.056      31.566     255.023       1.977

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 196640.594       0.434    1989.385 1625903.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 5.526   EfDer =  0.772

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     179.025    3776.000      21.224     596.056       1.000       1.000       0.710
 W Kg/sec =   81.37495
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
132.920	3522.465	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
137720.719	140474.828	1.021	395.194	387.136	307.469	0.794

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	950.66	-0.33	950.66	0.85	616.92
MEAN	17.74	0.00	-0.02	950.66	-0.33	950.66	0.85	
HUB	15.05	0.00	-0.02	950.66	-0.33	950.66	0.85	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	34.84	46.36	-11.52	661.34	1158.26	13.24	520.64	1.03
MEAN	31.60	43.40	-11.80	584.52	1116.16	13.24	520.64	1.00
HUB	27.56	38.84	-11.28	495.92	1072.39	13.24	520.64	0.96

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	610.31	190.21	579.91	1186.33	0.51
MEAN	17.51	625.29	229.33	581.71	1186.10	0.53
HUB	14.85	679.95	341.93	587.72	1185.80	0.57

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	652.78	741.80	462.57	0.63	3774.62	
MEAN	576.87	677.62	347.54	0.57	4020.67	1.72
HUB	489.33	605.93	147.40	0.51	5082.59	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.03	1.09	19.22	616.01	1.03	584.94	0.92	0.71
MEAN	23.15	1.09	19.15	617.32	1.04	584.70	0.92	0.71
HUB	23.68	1.12	18.94	622.93	1.05	584.36	0.92	0.71

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	18.16	38.58	31.50	7.08	0.93	0.39	2.90	
MEAN	21.52	30.86	23.50	7.36	0.84	0.42	3.28	0.71
HUB	30.19	14.08	6.50	7.58	0.84	0.48	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.772

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	633.670	230.840	590.128	1186.538	0.534	-0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.245	19.139	585.246	46.000	21.364	31.500	10.136

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	617.683	230.840	659.408	1188.229	0.520	0.029

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.121	19.227	586.916	471.992	0.040	0.177

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	599.220	0.000	599.220	1190.125	0.503	0.044

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.324	588.791	0.000	0.060	0.073	0.052

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.605	22.980	1.083	618.754	22.698	357.194	2.769

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 141468.141       0.332    1431.213 2762708.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.526   EfDer =  0.968

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.025    3776.000      22.980     618.754       1.000       1.000       0.980
W Kg/sec =   81.37495

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    125.081    3457.253       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 137720.719  140474.828       1.409     513.330     364.329     401.059       1.101

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   557.35    -0.19   557.35     0.47   581.06
 MEAN    16.97     0.00    -0.02   557.35    -0.19   557.35     0.47
 HUB     14.32     0.00    -0.02   557.35    -0.19   557.35     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.72    46.36     2.36   634.65   844.79    19.79   592.84     0.71
 MEAN    45.11    43.80     1.31   559.22   789.67    19.79   592.84     0.66
 HUB     40.26    37.84     2.42   471.87   730.40    19.79   592.84     0.61

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   608.35   215.23   569.00  1210.73     0.50
 MEAN    16.57   623.07   246.31   572.32  1209.33     0.52
 HUB     13.89   674.55   349.00   577.24  1207.84     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   699.52   406.90     0.58  4067.25
 MEAN   546.14   646.10   299.83     0.53  4085.52     1.31
 HUB    457.70   587.39   108.70     0.49  4850.37

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.55     1.11    21.50   640.25     1.03   609.39     0.92     0.89
 MEAN    25.56     1.11    21.32   640.35     1.03   607.97     0.92     0.89
 HUB     26.06     1.13    21.08   644.39     1.04   606.45     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.72    35.57    31.50     4.07     0.93     0.22     2.90
 MEAN    23.29    27.65    23.50     4.15     0.91     0.23     3.29     0.89
 HUB     31.16    10.66     6.50     4.16     0.91     0.26     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.968

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     611.107     247.692     558.659    1211.764       0.504       0.059

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.678      21.581     610.514      46.000      23.911      32.400       8.489

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     588.644     247.692     638.634    1213.993       0.485       0.107

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.578      21.776     612.761     456.573       0.032       0.225
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	557.200	0.000	557.200	1216.966	0.458	0.105

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.045	615.767	0.000	0.060	0.060	0.168

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.803	25.456	1.108	641.663	22.909	309.453	2.399

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
142844.094	0.369	1445.134	1616896.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 5.526 EfDer = 0.960

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
179.025	3776.000	25.456	641.663	1.000	1.000	0.980

W Kg/sec = 81.37495

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
114.982	3394.976	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
137720.719	140474.828	1.522	509.668	334.936	390.276	1.165

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	515.64	-0.18	515.64	0.42	542.75
MEAN	15.91	0.00	-0.02	515.64	-0.18	515.64	0.42	
HUB	13.07	0.00	-0.02	515.64	-0.18	515.64	0.42	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.51	47.36	2.15	603.68	794.06	22.51	619.50	0.65
MEAN	45.49	44.80	0.69	524.36	735.55	22.51	619.50	0.60
HUB	39.88	38.84	1.04	430.68	671.96	22.51	619.50	0.55

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	569.32	210.07	529.14	1235.33	0.46
MEAN	15.50	580.75	229.79	533.36	1233.19	0.47
HUB	12.59	623.31	313.48	538.75	1231.03	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	591.16	652.09	381.09	0.53	3771.86	
MEAN	510.67	602.80	280.89	0.49	3563.97	1.32
HUB	414.86	548.20	101.38	0.45	3949.08	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.97	1.10	24.17	661.59	1.03	634.57	0.92	0.88
MEAN	27.82	1.09	23.90	660.49	1.03	632.37	0.92	0.88
HUB	28.09	1.10	23.58	662.52	1.03	630.14	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	21.65	35.76	31.50	4.26	0.93	0.22	2.90	
MEAN	23.31	27.77	23.50	4.27	0.90	0.23	3.34	0.88
HUB	30.19	10.66	6.50	4.16	0.90	0.24	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.960

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	587.014	234.000	538.358	1233.573	0.476	-0.007

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.878      23.872     632.805      46.000      23.492      33.000       9.508

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     575.825     234.000     621.555    1234.630       0.466      -0.008

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.687      23.851     633.890     440.827       0.067       0.225

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     533.693       0.000     533.693    1238.419       0.431       0.123

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.371     637.787       0.000       0.060       0.066       0.120

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.787      27.692       1.088     661.533      19.870     329.847       2.557

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 123968.945       0.355    1254.176 1652785.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    864415.69   8745.1729    174.8894      1.8330      0.7152      5.5263      1.2653


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 100% Stat 2 27% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.012   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    176.353    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   80.16042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    172.279    3761.129       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 135665.203  138378.219       1.657     831.557     501.714     619.754       1.235

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   420.48    -0.14   420.48     0.38   677.10
  MEAN    17.06     0.00    -0.02   420.48    -0.14   420.48     0.38
  HUB     12.51     0.00    -0.02   420.48    -0.14   420.48     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.27    50.47     7.80   679.80   799.45    13.67   508.04     0.72
  MEAN    53.21    47.20     6.01   562.16   702.13    13.67   508.04     0.64
  HUB     44.44    38.62     5.82   412.23   588.94    13.67   508.04     0.53

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   668.44   381.63   548.79  1126.50     0.59
  MEAN    18.04   703.47   422.65   562.34  1120.84     0.63
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 HUB     15.00   808.49   553.16   589.63  1110.61     0.73

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    679.80   624.55   298.16     0.55  7876.04
 MEAN   594.32   587.96   171.67     0.52  7625.47     1.33
 HUB    494.28   592.56    58.88     0.53  8299.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.31     1.28    15.21   564.50     1.08   527.19     0.92     0.91
 MEAN    19.16     1.27    14.69   563.17     1.08   521.86     0.92     0.91
 HUB     19.56     1.29    13.74   566.74     1.08   512.19     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.82    28.52    24.20     4.32     0.93     0.30     2.90
 MEAN    36.93    16.98    12.70     4.28     0.93     0.25     3.51     0.91
 HUB     43.17    -5.70    -9.30     3.60     0.93     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     715.078     421.833     577.402    1120.898       0.638      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.296      14.668     522.097      24.000      36.151      35.400      -0.751

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     598.555     421.833     732.264    1134.539       0.528       0.282

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.223      15.899     534.882     528.796       0.025       0.430

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     548.078       0.000     548.078    1139.655       0.481       0.350

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.346     539.716       0.000       0.060       0.040       0.375

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      19.153       1.268     564.806      41.996     217.392       1.685

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 261458.922       0.566    2605.664 1768069.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.012   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    176.353    3776.000      19.153     564.806       1.000       1.000       0.980
W Kg/sec =   80.16042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    141.243    3618.600       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 135665.203  138378.219       1.436     590.487     411.342     474.134       1.153

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   520.10    -0.18   520.10     0.46   648.91
 MEAN    18.08     0.00    -0.02   520.10    -0.18   520.10     0.46
 HUB     15.21     0.00    -0.02   520.10    -0.18   520.10     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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 TIP     52.48    46.36     6.12   677.16   853.98    16.61   542.22     0.75
 MEAN    48.89    42.30     6.59   595.71   790.94    16.61   542.22     0.69
 HUB     43.95    37.84     6.11   501.20   722.41    16.61   542.22     0.63

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   599.80   307.48   514.99  1169.13     0.51
 MEAN    18.01   614.66   321.99   523.58  1164.97     0.53
 HUB     15.22   668.79   403.63   533.26  1160.89     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   631.45   365.40     0.54  6282.35
 MEAN   593.46   589.77   271.47     0.51  5802.28     1.45
 HUB    501.63   542.19    97.99     0.47  6147.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.00     1.20    19.21   598.04     1.06   568.00     0.92     0.91
 MEAN    22.69     1.18    18.76   595.50     1.05   563.96     0.92     0.91
 HUB     22.91     1.20    18.29   597.33     1.06   559.99     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.84    35.36    31.50     3.86     0.93     0.32     2.90
 MEAN    31.59    27.41    23.50     3.91     0.93     0.32     3.30     0.91
 HUB     37.12    10.41     6.50     3.91     0.93     0.32     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960    1017.772     322.895     965.194    1108.583       0.918      -1.348

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.822      13.223     510.505      46.000      18.497      30.600      12.103

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     999.797     322.895    1050.645    1112.042       0.899      -1.320

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      22.535      13.330     513.554     361.848       0.080       0.098

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823    1026.044       0.000    1026.044    1109.015       0.925      -0.148

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      12.617     509.359       0.000       0.060       0.223      -1.494

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.700      21.948       1.146     596.956      32.150     248.825       1.929

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 200283.328       0.442    1995.996 1593529.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
  RESET =  0.000BLEED =  0.000 DPInc = 6.012   EfDer =  0.782

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    176.353    3776.000      21.948     596.956       1.000       1.000       0.710
W Kg/sec =   80.16042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    126.713    3519.808       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
135665.203	138378.219	1.071	395.194	369.055	307.469	0.833

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	837.06	-0.29	837.06	0.74	616.45
MEAN	17.74	0.00	-0.02	837.06	-0.29	837.06	0.74	
HUB	15.05	0.00	-0.02	837.06	-0.29	837.06	0.74	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	38.32	46.36	-8.04	661.34	1066.97	15.32	538.48	0.94
MEAN	34.94	43.40	-8.46	584.52	1021.11	15.32	538.48	0.90
HUB	30.66	38.84	-8.18	495.92	973.08	15.32	538.48	0.85

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	587.55	227.37	541.78	1193.44	0.49
MEAN	17.51	602.94	257.38	545.25	1191.92	0.51
HUB	14.85	657.27	356.29	552.33	1190.36	0.55

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	652.78	688.83	425.40	0.58	4510.07	
MEAN	576.87	631.96	319.49	0.53	4510.91	1.69
HUB	489.33	568.12	133.04	0.48	5295.28	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.22	1.10	20.52	620.80	1.04	591.99	0.92	0.72
MEAN	24.22	1.10	20.33	620.81	1.04	590.47	0.92	0.72
HUB	24.63	1.12	20.02	624.95	1.05	588.91	0.92	0.72

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	22.77	38.14	31.50	6.64	0.93	0.39	2.90	
MEAN	25.27	30.37	23.50	6.87	0.86	0.42	3.28	0.72
HUB	32.83	13.54	6.50	7.04	0.86	0.46	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.782

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	610.428	259.067	552.726	1192.469	0.512	-0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.314	20.330	591.090	46.000	25.113	31.500	6.387

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	572.097	259.067	628.021	1196.279	0.478	0.108

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.243	20.727	594.873	471.992	0.028	0.235

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	554.220	0.000	554.220	1197.967	0.463	0.128

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.852	596.553	0.000	0.060	0.050	0.139

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.657	24.151	1.100	622.188	25.232	309.584	2.400

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
157269.156	0.369	1567.323	2508860.500

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.012   EfDer =  0.989

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    176.353    3776.000      24.151     622.188      1.000       1.000       0.980
W Kg/sec =   80.16042

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    117.563    3447.700       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
135665.203  138378.219       1.499     513.330     342.430     401.059       1.171

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   517.17    -0.18   517.17     0.43   579.46
MEAN    16.97     0.00    -0.02   517.17    -0.18   517.17     0.43
HUB     14.32     0.00    -0.02   517.17    -0.18   517.17     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.83    46.36     4.47   634.65   818.82    21.26   599.88     0.68
MEAN    47.25    43.80     3.45   559.22   761.83    21.26   599.88     0.63
HUB     42.39    37.84     4.55   471.87   700.21    21.26   599.88     0.58

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   578.80   249.10   522.46  1220.33     0.47
MEAN    16.57   592.80   270.47   527.50  1217.83     0.49
HUB     13.89   642.52   357.90   533.61  1215.34     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    622.13   641.96   373.03     0.53  4706.44
MEAN   546.14   595.19   275.67     0.49  4485.75     1.38
HUB    457.70   542.86    99.80     0.45  4973.85

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     27.34     1.13    23.44   647.06     1.04   619.12     0.92     0.90
MEAN    27.19     1.13    23.12   645.89     1.04   616.58     0.92     0.90
HUB     27.53     1.14    22.76   648.47     1.04   614.04     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.49    35.53    31.50     4.03     0.93     0.27     2.90
MEAN    27.15    27.59    23.50     4.09     0.92     0.27     3.29     0.90
HUB     33.85    10.59     6.50     4.09     0.92     0.29     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     582.741     271.990     515.372    1219.990       0.478       0.057

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    27.310      23.358     618.815      46.000      27.823      32.400       4.577

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     537.825     271.990     602.689    1224.121       0.439       0.181

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.258      23.870     623.014     456.573       0.022       0.283

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     509.543       0.000     509.543    1226.546       0.415       0.180
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	24.122	625.484	0.000	0.060	0.044	0.240

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.855	27.167	1.125	647.141	24.954	279.541	2.167

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
155618.797	0.402	1550.876	1561601.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 6.012 EfDer = 0.987

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
176.353	3776.000	27.167	647.141	1.000	1.000	0.980

W Kg/sec = 80.16042

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
106.587	3380.574	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
135665.203	138378.219	1.642	509.668	310.478	390.276	1.257

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	473.00	-0.16	473.00	0.38	540.44
MEAN	15.91	0.00	-0.02	473.00	-0.16	473.00	0.38	
HUB	13.07	0.00	-0.02	473.00	-0.16	473.00	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.93	47.36	4.57	603.68	767.04	24.53	628.49	0.62
MEAN	47.96	44.80	3.16	524.36	706.30	24.53	628.49	0.57
HUB	42.33	38.84	3.49	430.68	639.81	24.53	628.49	0.52

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	539.73	245.83	480.50	1246.55	0.43
MEAN	15.50	549.05	255.53	485.96	1243.44	0.44
HUB	12.59	588.68	322.98	492.17	1240.35	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	591.16	591.72	345.33	0.47	4413.12	
MEAN	510.67	548.86	255.14	0.44	3962.76	1.40
HUB	414.86	500.67	91.89	0.40	4068.39	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.38	1.12	26.71	670.45	1.04	646.16	0.92	0.90
MEAN	30.04	1.11	26.27	668.07	1.03	642.94	0.92	0.90
HUB	30.12	1.11	25.81	668.63	1.03	639.74	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.09	35.70	31.50	4.20	0.93	0.28	2.90	
MEAN	27.74	27.70	23.50	4.20	0.91	0.28	3.34	0.90
HUB	33.27	10.58	6.50	4.08	0.91	0.28	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.987

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	555.030	260.220	490.249	1243.831	0.446	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
30.102	26.254	643.364	46.000	27.959	33.000	5.041

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     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     517.890     260.220     579.590    1247.039       0.415       0.099

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      30.011      26.650     646.687     440.827       0.043       0.290

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     482.034       0.000     482.034    1249.918       0.386       0.210

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      27.076     649.676       0.000       0.060       0.045       0.207

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.852      30.003       1.104     669.048      21.907     293.574       2.276

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  136704.453       0.391    1362.378 1594048.000

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     911334.62   9082.2373    172.2791      1.9860      0.7773      6.0120      1.2797


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 100% Stat 2 27% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.492   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     173.721    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   78.96402

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     169.708    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  133640.391  136312.906       1.683     831.557     494.226     619.754       1.254

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   413.17    -0.14   413.17     0.37   677.10
  MEAN    17.06     0.00    -0.02   413.17    -0.14   413.17     0.37
  HUB     12.51     0.00    -0.02   413.17    -0.14   413.17     0.37

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.71    50.47     8.24   679.80   795.63    13.72   508.55     0.72
  MEAN    53.69    47.20     6.49   562.16   697.78    13.72   508.55     0.63
  HUB     44.94    38.62     6.32   412.23   583.75    13.72   508.55     0.53

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   662.75   387.79   537.46  1127.87     0.59
  MEAN    18.04   696.61   426.12   551.08  1122.03     0.62
  HUB     15.00   798.88   551.95   577.55  1111.84     0.72

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
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 TIP    679.80   611.66   292.01     0.54  8002.98
 MEAN   594.32   576.18   168.20     0.51  7687.95     1.35
 HUB    494.28   580.42    57.68     0.52  8281.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.39     1.28    15.34   565.17     1.08   528.49     0.92     0.91
 MEAN    19.20     1.27    14.80   563.51     1.08   522.99     0.92     0.91
 HUB     19.55     1.29    13.85   566.65     1.08   513.37     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.81    28.52    24.20     4.32     0.93     0.32     2.90
 MEAN    37.71    16.97    12.70     4.27     0.93     0.26     3.51     0.91
 HUB     43.70    -5.70    -9.30     3.60     0.93     0.11     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     707.649     425.293     565.591    1122.170       0.631      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.332      14.784     523.282      24.000      36.941      35.400      -1.541

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     585.169     425.293     723.393    1136.262       0.515       0.298

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.260      16.069     536.508     528.796       0.025       0.443

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     536.339       0.000     536.339    1141.096       0.470       0.363

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.496     541.082       0.000       0.060       0.039       0.388

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      19.195       1.271     565.108      42.298     214.339       1.662

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 263341.031       0.570    2585.251 1737350.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.492   EfDer =  1.000

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    173.721    3776.000      19.195     565.108       1.000       1.000       0.980
W Kg/sec =   78.96402

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    138.867    3617.632       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 133640.391  136312.906       1.460     590.487     404.423     474.134       1.172

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   509.28    -0.18   509.28     0.45   648.74
 MEAN    18.08     0.00    -0.02   509.28    -0.18   509.28     0.45
 HUB     15.21     0.00    -0.02   509.28    -0.18   509.28     0.45

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.06    46.36     6.70   677.16   847.44    16.75   543.45     0.74
 MEAN    49.48    42.30     7.18   595.71   783.87    16.75   543.45     0.69
 HUB     44.55    37.84     6.71   501.20   714.66    16.75   543.45     0.62
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     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   594.35   315.76   503.54  1170.91     0.51
MEAN    18.01   608.32   328.00   512.32  1166.53     0.52
HUB     15.22   661.35   405.85   522.18  1162.23     0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    672.88   617.32   357.12     0.53  6451.40
MEAN   593.46   577.01   265.47     0.49  5910.34     1.47
HUB    501.63   530.89    95.78     0.46  6180.87

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.15     1.21    19.42   599.24     1.06   569.74     0.92     0.91
MEAN    22.80     1.19    18.94   596.37     1.06   565.48     0.92     0.91
HUB     22.98     1.20    18.44   597.81     1.06   561.29     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.09    35.34    31.50     3.84     0.93     0.34     2.90
MEAN    32.63    27.39    23.50     3.89     0.93     0.33     3.30     0.91
HUB     37.85    10.39     6.50     3.89     0.93     0.33     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     968.780     328.915     911.235    1118.068       0.866      -1.209

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.938      14.051     519.451      46.000      19.847      30.600      10.753

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     925.880     328.915     982.568    1125.353       0.823      -1.083

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      22.705      14.552     526.238     361.848       0.068       0.153

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.823     930.569       0.000     930.569    1125.145       0.827       0.044

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.680      14.227     525.575       0.000       0.060       0.169      -1.163

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4        Pt4          PR4       Texit        Del T       Ns         Ns nondim
     0.758      22.296       1.162     597.806      32.698     243.123       1.885

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 203697.125       0.450    1999.720 1562365.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.492   EfDer =  0.811

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    173.721    3776.000      22.296     597.806       1.000       1.000       0.710
W Kg/sec =   78.96402

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    122.962    3517.305       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 133640.391  136312.906       1.104     395.194     358.127     307.469       0.859
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    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   788.20    -0.27   788.20     0.69   616.02
MEAN    17.74     0.00    -0.02   788.20    -0.27   788.20     0.69
HUB     15.05     0.00    -0.02   788.20    -0.27   788.20     0.69

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     40.01    46.36    -6.35   661.34  1029.07    16.24   545.96     0.90
MEAN    36.57    43.40    -6.83   584.52   981.44    16.24   545.96     0.86
HUB     32.19    38.84    -6.65   495.92   931.38    16.24   545.96     0.81

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   574.65   247.97   518.39  1197.71     0.48
MEAN    17.51   589.47   272.76   522.57  1195.54     0.49
HUB     14.85   642.46   363.56   529.70  1193.39     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    652.78   657.72   404.81     0.55  4917.74
MEAN   576.87   604.62   304.12     0.51  4779.85     1.71
HUB    489.33   544.42   125.77     0.46  5403.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.91     1.12    21.28   623.81     1.04   596.25     0.92     0.74
MEAN    24.83     1.11    21.03   623.08     1.04   594.08     0.92     0.74
HUB     25.18     1.13    20.67   626.37     1.05   591.93     0.92     0.74

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.56    37.99    31.50     6.49     0.93     0.40     2.90
MEAN    27.56    30.20    23.50     6.70     0.87     0.43     3.28     0.74
HUB     34.46    13.36     6.50     6.86     0.87     0.47     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.811

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     596.401     274.546     529.451    1196.146       0.499       0.002

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.934      21.036     594.733      46.000      27.409      31.500       4.091

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     545.029     274.546     610.273    1201.057       0.454       0.154

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.884      21.603     599.627     471.992       0.023       0.269

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.121     528.028       0.000     528.028    1202.581       0.439       0.173

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      21.726     601.149       0.000       0.060       0.042       0.185

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.697      24.805       1.113     624.419      26.613     288.633       2.237

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 165885.172       0.389    1628.515 2393901.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.492   EfDer =  0.996
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
173.721	3776.000	24.805	624.419	1.000	1.000	0.980

W Kg/sec = 78.96402

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
112.954	3441.534	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
133640.391	136312.906	1.560	513.330	329.002	401.059	1.219

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	493.53	-0.17	493.53	0.41	578.42
MEAN	16.97	0.00	-0.02	493.53	-0.17	493.53	0.41	
HUB	14.32	0.00	-0.02	493.53	-0.17	493.53	0.41	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.14	46.36	5.78	634.65	804.10	22.10	604.10	0.67
MEAN	48.58	43.80	4.78	559.22	745.98	22.10	604.10	0.62
HUB	43.72	37.84	5.88	471.87	682.93	22.10	604.10	0.57

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	564.08	268.21	496.24	1225.76	0.46
MEAN	16.57	576.85	284.24	501.95	1222.74	0.47
HUB	13.89	624.81	363.00	508.54	1219.74	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	622.13	609.52	353.92	0.50	5067.11	
MEAN	546.14	566.17	261.90	0.46	4713.91	1.42
HUB	457.70	517.29	94.70	0.42	5044.46	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	28.36	1.14	24.52	651.19	1.04	624.65	0.92	0.91
MEAN	28.10	1.13	24.12	649.33	1.04	621.57	0.92	0.91
HUB	28.34	1.14	23.69	651.07	1.04	618.51	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.39	35.50	31.50	4.00	0.93	0.30	2.90	
MEAN	29.52	27.55	23.50	4.05	0.92	0.30	3.29	0.91
HUB	35.52	10.55	6.50	4.05	0.92	0.31	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	567.863	285.842	490.676	1224.735	0.464	0.056

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
28.226	24.356	623.633	46.000	30.223	32.400	2.177

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	509.729	285.842	584.406	1229.855	0.414	0.224

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	28.189	25.043	628.859	456.573	0.019	0.318

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	483.261	0.000	483.261	1231.997	0.392	0.222

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	25.277	631.051	0.000	0.060	0.038	0.280

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    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      28.109       1.133     650.532      26.113     263.918       2.046

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 162862.953       0.421    1598.846 1521090.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.492   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    173.721    3776.000      28.109     650.532       1.000       1.000       0.980
W Kg/sec =   78.96402

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.743    3371.753       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 133640.391  136312.906       1.720     509.668     296.369     390.276       1.317

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   449.27    -0.15   449.27     0.36   539.03
 MEAN    15.91     0.00    -0.02   449.27    -0.15   449.27     0.36
 HUB     13.07     0.00    -0.02   449.27    -0.15   449.27     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.35    47.36     5.99   603.68   752.63    25.65   633.70     0.61
 MEAN    49.42    44.80     4.62   524.36   690.63    25.65   633.70     0.56
 HUB     43.80    38.84     4.96   430.68   622.47    25.65   633.70     0.50

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   526.08   264.99   454.47  1252.72     0.42
 MEAN    15.50   533.38   269.43   460.33  1249.16     0.43
 HUB     12.59   570.60   328.13   466.82  1245.63     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   559.40   326.16     0.45  4756.77
 MEAN   510.67   519.71   241.24     0.42  4178.05     1.45
 HUB    414.86   474.81    86.74     0.38  4133.12

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.72     1.13    28.09   675.65     1.04   652.58     0.92     0.91
 MEAN    31.26     1.11    27.58   672.59     1.03   648.88     0.92     0.91
 HUB     31.23     1.11    27.04   672.36     1.03   645.21     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.25    35.67    31.50     4.17     0.93     0.32     2.90
 MEAN    30.34    27.66    23.50     4.16     0.92     0.31     3.34     0.91
 HUB     35.10    10.53     6.50     4.03     0.92     0.30     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     539.327     274.375     464.319    1249.539       0.432      -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.325      27.558     649.283      46.000      30.580      33.000       2.420

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     15.219     488.012     274.375     559.855    1253.761       0.389       0.155

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.265      28.161     653.678     440.827       0.036       0.328

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     455.005       0.000     455.005    1256.248       0.362       0.257

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.543     656.273       0.000       0.060       0.039       0.254

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      31.253       1.112     673.534      23.002     275.812       2.138

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 143555.656       0.411    1409.303 1552277.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    939341.88   9221.6348     169.7079      2.0688      0.8039      6.4923      1.2883


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 100% Stat 2 27% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    171.128    3776.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    167.175    3761.129       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.708     831.557     486.850     619.754       1.273

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   406.03    -0.14   406.03     0.37   677.10
 MEAN    17.06     0.00    -0.02   406.03    -0.14   406.03     0.37
 HUB     12.51     0.00    -0.02   406.03    -0.14   406.03     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.16    50.47     8.69   679.80   791.94    13.76   509.04     0.72
 MEAN    54.17    47.20     6.97   562.16   693.58    13.76   509.04     0.63
 HUB     45.44    38.62     6.82   412.23   578.71    13.76   509.04     0.52

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK         AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   657.50   393.69   526.61  1129.16     0.58
 MEAN    18.04   690.16   429.46   540.26  1123.15     0.61
 HUB     15.00   789.74   550.81   565.95  1113.01     0.71

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    679.80   599.32   286.11     0.53  8124.65
 MEAN   594.32   564.85   164.86     0.50  7748.13     1.37
 HUB    494.28   568.77    56.53     0.51  8263.93
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.46     1.29    15.46   565.82     1.08   529.72     0.92     0.91
 MEAN    19.24     1.27    14.91   563.82     1.08   524.05     0.92     0.91
 HUB     19.54     1.29    13.96   566.55     1.08   514.49     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.78    28.52    24.20     4.32     0.93     0.33     2.90
 MEAN    38.48    16.97    12.70     4.27     0.93     0.28     3.51     0.91
 HUB     44.22    -5.70    -9.30     3.60     0.93     0.13     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     700.672     428.626     554.275    1123.361       0.624      -0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.365      14.893     524.393      24.000      37.715      35.400      -2.315

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     572.477     428.626     715.157    1137.868       0.503       0.313

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.292      16.226     538.025     528.796       0.026       0.455

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     525.185       0.000     525.185    1142.444       0.460       0.376

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.634     542.361       0.000       0.060       0.039       0.401

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      19.231       1.273     565.398      42.589     211.392       1.639

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 265150.219       0.574    2564.162 1707338.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    3776.000      19.231     565.398       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    136.570    3616.702       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.485     590.487     397.735     474.134       1.192

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   498.98    -0.17   498.98     0.44   648.57
 MEAN    18.08     0.00    -0.02   498.98    -0.17   498.98     0.44
 HUB     15.21     0.00    -0.02   498.98    -0.17   498.98     0.44

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.62    46.36     7.26   677.16   841.29    16.87   544.61     0.73
 MEAN    50.06    42.30     7.76   595.71   777.21    16.87   544.61     0.68
 HUB     45.14    37.84     7.30   501.20   707.36    16.87   544.61     0.62

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
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     0.500       0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   589.50   323.54   492.78  1172.55     0.50
 MEAN    18.01   602.52   333.65   501.70  1167.98     0.52
 HUB     15.22   654.39   407.92   511.69  1163.48     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   604.04   349.33     0.52  6610.27
 MEAN   593.46   564.98   259.81     0.48  6012.18     1.49
 HUB    501.63   520.20    93.71     0.45  6212.34

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.30     1.21    19.60   600.37     1.06   571.35     0.92     0.91
 MEAN    22.91     1.19    19.10   597.20     1.06   566.89     0.92     0.91
 HUB     23.04     1.20    18.58   598.26     1.06   562.51     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.29    35.33    31.50     3.83     0.93     0.35     2.90
 MEAN    33.63    27.38    23.50     3.88     0.93     0.34     3.30     0.91
 HUB     38.56    10.38     6.50     3.88     0.93     0.34     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     932.598     334.589     870.511    1125.034       0.829      -1.110

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.041      14.674     525.994      46.000      21.025      30.600       9.575

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     876.252     334.589     937.959    1134.092       0.773      -0.929

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      22.847      15.389     534.503     361.848       0.059       0.184

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     873.037       0.000     873.037    1134.829       0.769       0.139

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      15.230     534.997       0.000       0.060       0.136      -0.969

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.792      22.538       1.172     598.612      33.213     237.846       1.844

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 206906.594       0.457    2000.911 1532291.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  0.837

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    3776.000      22.538     598.612       1.000       1.000       0.710
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    119.904    3514.937       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.132     395.194     349.220     307.469       0.880

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     20.07     0.00    -0.02   753.42    -0.26   753.42     0.65   615.60
MEAN    17.74     0.00    -0.02   753.42    -0.26   753.42     0.65
HUB     15.05     0.00    -0.02   753.42    -0.26   753.42     0.65

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     41.29    46.36    -5.07   661.34  1002.68    16.90   551.24     0.87
MEAN    37.82    43.40    -5.58   584.52   953.73    16.90   551.24     0.83
HUB     33.37    38.84    -5.47   495.92   902.13    16.90   551.24     0.78

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   565.16   263.94   499.74  1201.09     0.47
MEAN    17.51   579.21   284.66   504.43  1198.45     0.48
HUB     14.85   630.78   369.05   511.56  1195.87     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    652.78   633.19   388.83     0.53  5233.94
MEAN   576.87   582.95   292.21     0.49  4988.09     1.73
HUB    489.33   525.51   120.29     0.44  5484.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.45     1.13    21.86   626.28     1.05   599.63     0.92     0.77
MEAN    25.31     1.12    21.57   624.98     1.04   596.99     0.92     0.77
HUB     25.59     1.14    21.17   627.61     1.05   594.40     0.92     0.77

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     27.84    37.89    31.50     6.39     0.93     0.41     2.90
MEAN    29.44    30.08    23.50     6.58     0.87     0.43     3.28     0.77
HUB     35.81    13.23     6.50     6.73     0.87     0.47     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.837

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     585.735     286.532     510.867    1199.086       0.488       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.411      21.581     597.657      46.000      29.287      31.500       2.213

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     523.901     286.532     597.137    1204.817       0.435       0.190

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.371      22.277     603.384     471.992       0.020       0.298

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     17.121     507.668       0.000     507.668    1206.211       0.421       0.208

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      22.395     604.781       0.000       0.060       0.038       0.220

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4           PR4       Texit        Del T       Ns        Ns nondim
     0.728      25.300       1.123     626.291      27.680     273.992       2.124

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 172538.609       0.405    1668.552 2307733.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    3776.000      25.300     626.291       1.000       1.000       0.980
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W Kg/sec = 77.78547

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
109.257	3436.386	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
131645.797	134278.422	1.613	513.330	318.235	401.059	1.260

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	475.05	-0.16	475.05	0.39	577.55
MEAN	16.97	0.00	-0.02	475.05	-0.16	475.05	0.39	
HUB	14.32	0.00	-0.02	475.05	-0.16	475.05	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.19	46.36	6.83	634.65	792.89	22.74	607.47	0.66
MEAN	49.66	43.80	5.86	559.22	733.88	22.74	607.47	0.61
HUB	44.82	37.84	6.98	471.87	669.70	22.74	607.47	0.55

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	553.89	282.76	476.28	1229.94	0.45
MEAN	16.57	565.31	294.81	482.35	1226.56	0.46
HUB	13.89	611.52	366.90	489.22	1223.20	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	622.13	584.82	339.37	0.48	5341.57	
MEAN	546.14	543.90	251.33	0.44	4888.85	1.46
HUB	457.70	497.58	90.80	0.41	5098.64	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	29.13	1.15	25.34	654.51	1.05	628.92	0.92	0.91
MEAN	28.79	1.14	24.89	652.12	1.04	625.47	0.92	0.91
HUB	28.95	1.14	24.40	653.23	1.04	622.04	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.70	35.47	31.50	3.97	0.93	0.32	2.90	
MEAN	31.43	27.52	23.50	4.02	0.92	0.32	3.29	0.91
HUB	36.87	10.51	6.50	4.01	0.92	0.33	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	557.145	296.464	471.721	1228.426	0.454	0.054

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
28.916	25.107	627.396	46.000	32.148	32.400	0.252

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	488.526	296.464	571.444	1234.272	0.396	0.257

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	28.884	25.925	633.382	456.573	0.018	0.347

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	463.474	0.000	463.474	1236.209	0.375	0.253

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	26.141	635.371	0.000	0.060	0.037	0.310

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.879      28.807       1.139     653.290      26.999     252.524       1.958

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 168394.828       0.435    1628.479 1485520.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    3776.000      28.807     653.290       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     98.002    3364.629       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.785     509.668     285.473     390.276       1.367

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   431.32    -0.15   431.32     0.35   537.89
 MEAN    15.91     0.00    -0.02   431.32    -0.15   431.32     0.35
 HUB     13.07     0.00    -0.02   431.32    -0.15   431.32     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.46    47.36     7.10   603.68   742.05    26.49   637.78     0.60
 MEAN    50.57    44.80     5.77   524.36   679.08    26.49   637.78     0.55
 HUB     44.97    38.84     6.13   430.68   609.63    26.49   637.78     0.49

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   517.05   279.13   435.23  1257.38     0.41
 MEAN    15.50   522.47   279.75   441.27  1253.53     0.42
 HUB     12.59   557.48   331.95   447.88  1249.71     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   535.52   312.02     0.43  5010.38
 MEAN   510.67   498.04   230.93     0.40  4337.76     1.50
 HUB    414.86   455.49    82.91     0.36  4181.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.71     1.14    29.11   679.74     1.04   657.46     0.92     0.91
 MEAN    32.16     1.12    28.54   676.19     1.04   653.43     0.92     0.91
 HUB     32.04     1.11    27.94   675.37     1.03   649.46     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.67    35.64    31.50     4.14     0.93     0.34     2.90
 MEAN    32.37    27.62    23.50     4.12     0.92     0.33     3.34     0.91
 HUB     36.54    10.49     6.50     3.99     0.92     0.32     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     528.427     284.876     445.062    1253.895       0.421      -0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    32.227      28.519     653.821      46.000      32.622      33.000       0.378

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     466.307     284.876     546.440    1258.825       0.370       0.195

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      32.178      29.267     658.972     440.827       0.033       0.358

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     435.257       0.000     435.257    1261.052       0.345       0.291

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      29.618     661.306       0.000       0.060       0.037       0.288

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.880      32.165       1.117     677.101      23.811     263.302       2.041

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  148624.094       0.425    1437.284 1515973.750

    OVERALL EXIT CONDITIONS; ALL          5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     961614.38   9299.3887    167.1750      2.1291      0.8198      6.9673      1.2951


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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*******************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 100% Stat 2 27% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.999

    W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     168.485    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   76.58430

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     164.593    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  129612.891  132204.875       1.735     831.557     479.332     619.754       1.293

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   398.82    -0.14   398.82     0.36   677.10
  MEAN    17.06     0.00    -0.02   398.82    -0.14   398.82     0.36
  HUB     12.51     0.00    -0.02   398.82    -0.14   398.82     0.36

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.61    50.47     9.14   679.80   788.27    13.81   509.53     0.71
  MEAN    54.65    47.20     7.45   562.16   689.37    13.81   509.53     0.62
  HUB     45.96    38.62     7.34   412.23   573.67    13.81   509.53     0.52

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   652.49   399.55   515.85  1130.41     0.58
  MEAN    18.04   683.85   432.77   529.49  1124.24     0.61
  HUB     15.00   780.72   549.67   554.43  1114.14     0.70

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   587.06   280.25     0.52  8245.51
  MEAN   594.32   553.58   161.55     0.49  7807.78     1.39
  HUB    494.28   557.19    55.39     0.50  8246.80

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.53     1.29    15.57   566.46     1.08   530.90     0.92     0.91
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 MEAN    19.27     1.28    15.01   564.14     1.08   525.09     0.92     0.91
 HUB     19.53     1.29    14.06   566.46     1.08   515.58     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.76    28.51    24.20     4.31     0.93     0.34     2.90
 MEAN    39.26    16.97    12.70     4.27     0.93     0.29     3.51     0.91
 HUB     44.75    -5.71    -9.30     3.59     0.93     0.14     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     693.868     431.929     543.039    1124.518       0.617      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.395      14.997     525.474      24.000      38.498      35.400      -3.098

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     559.992     431.929     707.215    1139.421       0.491       0.328

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.320      16.376     539.495     528.796       0.026       0.466

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     514.344       0.000     514.344    1143.738       0.450       0.387

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.760     543.591       0.000       0.060       0.040       0.412

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      19.259       1.275     565.687      42.877     208.447       1.616

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 266944.938       0.578    2541.654 1676995.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.485    3776.000      19.259     565.687       1.000       1.000       0.980
W Kg/sec =   76.58430

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    134.302    3615.781       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129612.891  132204.875       1.510     590.487     391.129     474.134       1.212

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   488.94    -0.17   488.94     0.43   648.41
 MEAN    18.08     0.00    -0.02   488.94    -0.17   488.94     0.43
 HUB     15.21     0.00    -0.02   488.94    -0.17   488.94     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.18    46.36     7.82   677.16   835.37    16.99   545.73     0.73
 MEAN    50.63    42.30     8.33   595.71   770.80    16.99   545.73     0.67
 HUB     45.72    37.84     7.88   501.20   700.31    16.99   545.73     0.61

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     20.42   585.06   331.02   482.42  1174.11     0.50
 MEAN    18.01   597.08   339.10   491.44  1169.36     0.51
 HUB     15.22   647.74   409.92   501.53  1164.68     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   591.27   341.86     0.50  6762.84
 MEAN   593.46   553.37   254.36     0.47  6110.29     1.51
 HUB    501.63   509.84    91.70     0.44  6242.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.42     1.22    19.77   601.46     1.06   572.88     0.92     0.91
 MEAN    23.00     1.19    19.24   598.01     1.06   568.25     0.92     0.91
 HUB     23.08     1.20    18.70   598.71     1.06   563.68     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.46    35.32    31.50     3.82     0.93     0.36     2.90
 MEAN    34.61    27.36    23.50     3.86     0.93     0.35     3.30     0.91
 HUB     39.26    10.36     6.50     3.86     0.93     0.35     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     903.107     340.056     836.638    1130.671       0.799       -1.033

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.129      15.185     531.296      46.000      22.120      30.600       8.480

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     837.172     340.056     903.601    1140.816       0.734       -0.812

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      22.966      16.049     540.876     361.848       0.051       0.207

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     830.076       0.000     830.076    1141.970       0.727       0.203

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      15.982     541.874       0.000       0.060       0.113       -0.828

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.815      22.725       1.180     599.396      33.709     232.840       1.805

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 209995.422       0.464    1999.422 1502299.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.861

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    168.485    3776.000      22.725     599.396       1.000       1.000       0.710
W Kg/sec =   76.58430

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    117.160    3512.638       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129612.891  132204.875       1.158     395.194     341.229     307.469       0.901

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   724.89    -0.25   724.89     0.63   615.20
 MEAN    17.74     0.00    -0.02   724.89    -0.25   724.89     0.63
 HUB     15.05     0.00    -0.02   724.89    -0.25   724.89     0.63
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     42.39    46.36    -3.97   661.34   981.41    17.43   555.54     0.85
MEAN    38.89    43.40    -4.51   584.52   931.35    17.43   555.54     0.81
HUB     34.39    38.84    -4.45   495.92   878.44    17.43   555.54     0.76

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   557.52   277.72   483.43  1204.03     0.46
MEAN    17.51   570.64   294.91   488.53  1201.00     0.48
HUB     14.85   620.76   373.70   495.67  1198.07     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    652.78   611.86   375.06     0.51  5506.61
MEAN   576.87   564.06   281.96     0.47  5167.27     1.75
HUB    489.33   508.98   115.63     0.42  5553.22

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.91     1.14    22.36   628.51     1.05   602.57     0.92     0.79
MEAN    25.70     1.13    22.02   626.71     1.05   599.54     0.92     0.79
HUB     25.94     1.14    21.59   628.75     1.05   596.60     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     29.88    37.81    31.50     6.31     0.93     0.43     2.90
MEAN    31.12    29.99    23.50     6.49     0.88     0.44     3.28     0.79
HUB     37.01    13.13     6.50     6.63     0.88     0.48     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.861

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     576.852     296.844     494.612    1201.656       0.480       0.006

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.810      22.040     600.220      46.000      30.970      31.500       0.530

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     505.712     296.844     586.397    1208.072       0.419       0.221

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.775      22.845     606.648     471.992       0.019       0.323

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     490.202       0.000     490.202    1209.355       0.405       0.237

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      22.953     607.937       0.000       0.060       0.037       0.249

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.754      25.707       1.131     627.992      28.597     262.258       2.033

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 178260.172       0.418    1697.262 2233609.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.485    3776.000      25.707     627.992       1.000       1.000       0.980
W Kg/sec =   76.58430

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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   106.011    3431.729       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
129612.891  132204.875       1.662     513.330     308.780     401.059       1.299

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   459.14    -0.16   459.14     0.38   576.77
MEAN    16.97     0.00    -0.02   459.14    -0.16   459.14     0.38
HUB     14.32     0.00    -0.02   459.14    -0.16   459.14     0.38

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.12    46.36     7.76   634.65   783.45    23.28   610.41     0.65
MEAN    50.62    43.80     6.82   559.22   723.67    23.28   610.41     0.60
HUB     45.79    37.84     7.95   471.87   658.50    23.28   610.41     0.54

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   545.99   295.02   459.43  1233.50     0.44
MEAN    16.57   556.01   303.74   465.71  1229.83     0.45
HUB     13.89   600.46   370.21   472.75  1226.20     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    622.13   563.98   327.11     0.46  5573.03
MEAN   546.14   525.02   242.40     0.43  5036.89     1.50
HUB    457.70   480.77    87.49     0.39  5144.55

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     29.77     1.16    26.02   657.44     1.05   632.57     0.92     0.91
MEAN    29.36     1.14    25.51   654.60     1.04   628.82     0.92     0.91
HUB     29.44     1.15    24.98   655.17     1.04   625.10     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.71    35.45    31.50     3.95     0.93     0.34     2.90
MEAN    33.11    27.50    23.50     4.00     0.93     0.34     3.29     0.91
HUB     38.06    10.48     6.50     3.98     0.93     0.34     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     548.530     305.452     455.614    1231.597       0.445       0.053

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    29.482      25.726     630.640      46.000      33.839      32.400      -1.439

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     470.724     305.452     561.143    1238.040       0.380       0.285

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      29.450      26.652     637.255     456.573       0.018       0.373

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     446.895       0.000     446.895    1239.810       0.360       0.279

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      26.848     639.079       0.000       0.060       0.037       0.334

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.881      29.372       1.143     655.738      27.746     243.212       1.885

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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 173068.547       0.447    1647.832 1451928.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.485    3776.000      29.372     655.738       1.000       1.000       0.980
W Kg/sec =   76.58430

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.810    3358.341       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129612.891  132204.875       1.845     509.668     276.174     390.276       1.413

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   416.22    -0.14   416.22     0.34   536.89
 MEAN    15.91     0.00    -0.02   416.22    -0.14   416.22     0.34
 HUB     13.07     0.00    -0.02   416.22    -0.14   416.22     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.42    47.36     8.06   603.68   733.38    27.17   641.30     0.59
 MEAN    51.57    44.80     6.77   524.36   669.59    27.17   641.30     0.54
 HUB     45.99    38.84     7.15   430.68   599.04    27.17   641.30     0.48

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   510.31   290.81   419.34  1261.32     0.40
 MEAN    15.50   513.93   288.31   425.44  1257.25     0.41
 HUB     12.59   546.80   335.09   432.09  1253.20     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   515.80   300.35     0.41  5219.73
 MEAN   510.67   480.05   222.37     0.38  4470.32     1.53
 HUB    414.86   439.40    79.77     0.35  4220.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     33.51     1.14    29.94   683.30     1.04   661.59     0.92     0.91
 MEAN    32.89     1.12    29.32   679.34     1.04   657.32     0.92     0.91
 HUB     32.69     1.11    28.68   678.02     1.03   653.09     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.74    35.61    31.50     4.11     0.93     0.36     2.90
 MEAN    34.12    27.59    23.50     4.09     0.93     0.35     3.34     0.91
 HUB     37.79    10.46     6.50     3.96     0.93     0.33     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     519.917     293.592     429.089    1257.587       0.413      -0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    32.956      29.296     657.683      46.000      34.381      33.000      -1.381

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     448.564     293.592     536.102    1263.083       0.355       0.228

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      32.907      30.158     663.444     440.827       0.033       0.385

   VANED DIFFUSER EXIT:
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   R4          C4           Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     419.061       0.000     419.061    1265.113       0.331       0.319

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.484     665.578       0.000       0.060       0.037       0.316

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.882      32.892       1.120     680.219      24.480     253.316       1.964

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 152814.297       0.437    1454.985 1481856.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     981083.44   9341.1562    164.5934      2.1772      0.8301      7.4534      1.3011


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

   Fan-Core + 4 Stage LPC 100% Stat 2 27% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    165.780    3776.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   75.35457

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    161.951    3761.129       1.402       0.249      53.349      32.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127531.688  130082.039       1.763     831.557     471.635     619.754       1.314

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   391.49    -0.13   391.49     0.35   677.10
 MEAN    17.06     0.00    -0.02   391.49    -0.13   391.49     0.35
 HUB     12.51     0.00    -0.02   391.49    -0.13   391.49     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.07    50.47     9.60   679.80   784.58    13.86   510.01     0.71
 MEAN    55.15    47.20     7.95   562.16   685.16    13.86   510.01     0.62
 HUB     46.49    38.62     7.87   412.23   568.60    13.86   510.01     0.51

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   647.67   405.39   505.11  1131.63     0.57
 MEAN    18.04   677.67   436.10   518.70  1125.31     0.60
 HUB     15.00   771.77   548.53   542.90  1115.26     0.69

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    679.80   574.84   274.40     0.51  8366.02
 MEAN   594.32   542.30   158.22     0.48  7867.78     1.42
 HUB    494.28   545.60    54.26     0.49  8229.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.59     1.30    15.69   567.09     1.08   532.06     0.92     0.91
 MEAN    19.30     1.28    15.10   564.46     1.08   526.11     0.92     0.91
 HUB     19.51     1.29    14.16   566.37     1.08   516.64     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.75    28.51    24.20     4.31     0.93     0.36     2.90
 MEAN    40.06    16.96    12.70     4.26     0.93     0.30     3.51     0.91
 HUB     45.30    -5.71    -9.30     3.59     0.93     0.15     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     687.226     435.251     531.823    1125.645       0.611      -0.001

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.424      15.098     526.529      24.000      39.297      35.400      -3.897

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     547.630     435.251     699.530    1140.932       0.480       0.343

   BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.950      19.346      16.521     540.927     528.796       0.027       0.478

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     503.630       0.000     503.630    1144.999       0.440       0.397

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.879     544.790       0.000       0.060       0.042       0.423

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.878      19.281       1.276     565.975      43.165     205.488       1.593

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 268740.031       0.582    2517.659 1646176.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.996

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    165.780    3776.000      19.281     565.975       1.000       1.000       0.980
W Kg/sec =   75.35457

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    132.026    3614.860       1.402       0.249      53.349       56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*     AthrRotor  ChokeMargin
 127531.688  130082.039       1.536     590.487     384.502     474.134       1.233

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   479.00    -0.16   479.00     0.42   648.24
 MEAN    18.08      0.00    -0.02   479.00    -0.16   479.00     0.42
 HUB     15.21      0.00    -0.02   479.00    -0.16   479.00     0.42

       BetaFlo   BetaBlade Incid   U1        W1       Ps1      Ts1     Rel Mach
 TIP     54.73    46.36     8.37   677.16   829.59    17.10   546.82     0.72
 MEAN    51.21    42.30     8.91   595.71   764.53    17.10   546.82     0.67
 HUB     46.31    37.84     8.47   501.20   693.40    17.10   546.82     0.60

     ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     20.42   580.95   338.32   472.28  1175.62      0.49
 MEAN    18.01   591.91   344.45   481.36  1170.70      0.51
 HUB     15.22   641.27   411.88   491.50  1165.85      0.55
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   578.77   334.56     0.49  6911.82
 MEAN   593.46   541.95   249.01     0.46  6206.53     1.54
 HUB    501.63   499.63    89.74     0.43  6272.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.54     1.22    19.92   602.54     1.06   574.36     0.92     0.91
 MEAN    23.08     1.20    19.38   598.81     1.06   569.56     0.92     0.91
 HUB     23.12     1.20    18.82   599.16     1.06   564.83     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.62    35.31    31.50     3.81     0.93     0.37     2.90
 MEAN    35.59    27.35    23.50     3.85     0.93     0.36     3.30     0.91
 HUB     39.96    10.35     6.50     3.85     0.93     0.36     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     877.657     345.418     806.826    1135.502       0.773      -0.968

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.207      15.627     535.853      46.000      23.177      30.600       7.423

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     803.857     345.418     874.928    1146.425       0.701      -0.713

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      23.070      16.608     546.214     361.848       0.045       0.226

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     794.662       0.000     794.662    1147.769       0.692       0.251

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      16.600     547.446       0.000       0.060       0.095      -0.715

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.832      22.877       1.187     600.169      34.194     228.005       1.767

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 213016.469       0.470    1995.620 1472152.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.883

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    165.780    3776.000      22.877     600.169       1.000       1.000       0.710
W Kg/sec =   75.35457

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    114.584    3510.375       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127531.688  130082.039       1.184     395.194     333.724     307.469       0.921

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   699.86    -0.24   699.86     0.60   614.80
 MEAN    17.74     0.00    -0.02   699.86    -0.24   699.86     0.60
 HUB     15.05     0.00    -0.02   699.86    -0.24   699.86     0.60

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.39    46.36    -2.97   661.34   963.07    17.88   559.29     0.83
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 MEAN    39.88    43.40    -3.52   584.52   912.00    17.88   559.29     0.79
 HUB     35.33    38.84    -3.51   495.92   857.90    17.88   559.29     0.74

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   551.11   290.20   468.52  1206.69     0.46
 MEAN    17.51   563.19   304.20   473.97  1203.33     0.47
 HUB     14.85   611.78   377.87   481.14  1200.09     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   592.42   362.57     0.49  5753.75
 MEAN   576.87   546.81   272.68     0.45  5329.73     1.77
 HUB    489.33   493.88   111.47     0.41  5614.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.32     1.15    22.81   630.59     1.05   605.24     0.92     0.81
 MEAN    26.05     1.14    22.42   628.35     1.05   601.87     0.92     0.81
 HUB     26.23     1.15    21.96   629.85     1.05   598.62     0.92     0.81

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.77    37.74    31.50     6.24     0.93     0.44     2.90
 MEAN    32.69    29.91    23.50     6.41     0.89     0.45     3.28     0.81
 HUB     38.14    13.04     6.50     6.54     0.89     0.48     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.883

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     569.139     306.194     479.754    1203.996       0.473       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.161      22.445     602.561      46.000      32.547      31.500      -1.047

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     489.289     306.194     577.199    1211.023       0.404       0.250

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.128      23.346     609.615     471.992       0.019       0.347

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     474.480       0.000     474.480    1212.206       0.391       0.262

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.443     610.806       0.000       0.060       0.037       0.276

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.775      26.058       1.139     629.595      29.427     252.217       1.955

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 183437.766       0.430    1718.515 2166111.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    165.780    3776.000      26.058     629.595       1.000       1.000       0.980
W Kg/sec =   75.35457

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.033    3427.357       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 127531.688  130082.039       1.711     513.330     300.105     401.059       1.336

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   444.76    -0.15   444.76     0.37   576.04
MEAN    16.97     0.00    -0.02   444.76    -0.15   444.76     0.37
HUB     14.32     0.00    -0.02   444.76    -0.15   444.76     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.98    46.36     8.62   634.65   775.10    23.75   613.09     0.64
MEAN    51.51    43.80     7.71   559.22   714.63    23.75   613.09     0.59
HUB     46.70    37.84     8.86   471.87   648.55    23.75   613.09     0.53

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   539.55   305.91   444.45  1236.68     0.44
MEAN    16.57   548.11   311.71   450.85  1232.78     0.44
HUB     13.89   590.76   373.16   457.98  1228.92     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    622.13   545.46   316.22     0.44  5778.53
MEAN   546.14   508.16   234.43     0.41  5168.80     1.53
HUB    457.70   465.72    84.54     0.38  5185.41

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     30.32     1.16    26.60   660.12     1.05   635.84     0.92     0.91
MEAN    29.85     1.15    26.06   656.90     1.04   631.84     0.92     0.91
HUB     29.86     1.15    25.49   656.99     1.04   627.88     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.54    35.43    31.50     3.93     0.93     0.36     2.90
MEAN    34.66    27.47    23.50     3.97     0.93     0.35     3.29     0.91
HUB     39.17    10.46     6.50     3.96     0.93     0.35     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     541.234     313.460     441.222    1234.455       0.438       0.051

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    29.970      26.260     633.571      46.000      35.391      32.400      -2.991

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     454.964     313.460     552.493    1241.419       0.366       0.311

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      29.935      27.281     640.740     456.573       0.019       0.396

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     432.241       0.000     432.241    1243.047       0.348       0.302

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      27.455     642.422       0.000       0.060       0.040       0.355

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.880      29.852       1.146     658.006      28.411     235.152       1.823

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 177224.016       0.458    1660.302 1419356.750
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    165.780    3776.000      29.852     658.006       1.000       1.000       0.980
W Kg/sec =   75.35457

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.946    3352.549       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127531.688  130082.039       1.903     509.668     267.833     390.276       1.457

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   402.84    -0.14   402.84     0.32   535.96
 MEAN    15.91     0.00    -0.02   402.84    -0.14   402.84     0.32
 HUB     13.07     0.00    -0.02   402.84    -0.14   402.84     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.29    47.36     8.93   603.68   725.86    27.76   644.48     0.58
 MEAN    52.47    44.80     7.67   524.36   661.35    27.76   644.48     0.53
 HUB     46.92    38.84     8.08   430.68   589.82    27.76   644.48     0.47

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   504.94   300.98   405.44  1264.82     0.40
 MEAN    15.50   506.80   295.76   411.55  1260.56     0.40
 HUB     12.59   537.61   337.84   418.20  1256.34     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   498.58   290.18     0.39  5402.09
 MEAN   510.67   464.29   214.91     0.37  4585.78     1.57
 HUB    414.86   425.23    77.02     0.34  4255.20

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.19     1.15    30.63   686.52     1.04   665.27     0.92     0.91
 MEAN    33.51     1.12    29.98   682.21     1.04   660.80     0.92     0.91
 HUB     33.24     1.11    29.30   680.47     1.03   656.37     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.59    35.59    31.50     4.09     0.93     0.38     2.90
 MEAN    35.70    27.57    23.50     4.07     0.93     0.36     3.34     0.91
 HUB     38.93    10.44     6.50     3.94     0.93     0.35     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     512.836     301.183     415.078    1260.885       0.407      -0.006

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    33.572      29.955     661.144      46.000      35.965      33.000      -2.965

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     433.173     301.183     527.589    1266.862       0.342       0.256

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      33.519      30.913     667.427     440.827       0.035       0.409

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     404.980       0.000     404.980    1268.730       0.319       0.343
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   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      31.215     669.397       0.000       0.060       0.040       0.339

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      33.500       1.122     683.070      25.063     244.837       1.898

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 156465.047       0.448    1465.824 1448854.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    998883.31   9357.9199    161.9505      2.2175      0.8369      7.9532      1.3065


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 100% Stat 2 27% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 8.966   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    160.332    3776.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   72.87835

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    156.629    3761.129       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123340.875  125807.422       1.823     831.557     456.137     619.754       1.359

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   376.90    -0.13   376.90     0.34   677.10
 MEAN    17.06     0.00    -0.02   376.90    -0.13   376.90     0.34
 HUB     12.51     0.00    -0.02   376.90    -0.13   376.90     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.00    50.47    10.53   679.80   777.40    13.94   510.95     0.70
 MEAN    56.17    47.20     8.97   562.16   676.92    13.94   510.95     0.61
 HUB     47.57    38.62     8.95   412.23   558.65    13.94   510.95     0.50

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   638.88   416.73   484.26  1133.93     0.56
 MEAN    18.04   665.98   442.55   497.68  1127.34     0.59
 HUB     15.00   754.52   546.29   520.45  1117.37     0.68

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    679.80   551.10   263.07     0.49  8599.78
 MEAN   594.32   520.30   151.77     0.46  7984.09     1.46
 HUB    494.28   523.04    52.01     0.47  8195.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.72     1.31    15.89   568.33     1.09   534.24     0.92     0.91
 MEAN    19.36     1.28    15.28   565.07     1.08   528.03     0.92     0.91
 HUB     19.48     1.29    14.35   566.19     1.08   518.66     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.71    28.51    24.20     4.31     0.93     0.38     2.90
 MEAN    41.64    16.96    12.70     4.26     0.93     0.33     3.51     0.91
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HUB     46.39    -5.71    -9.30     3.59     0.93     0.18     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     674.687     441.692     510.011    1127.765       0.598       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.473      15.283     528.513      24.000      40.894      35.400      -5.494

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     523.856     441.692     685.213    1143.761       0.458       0.371

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.386      16.786     543.612     528.796       0.030       0.503

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083     482.934       0.000     482.934    1147.375       0.421       0.417

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      17.095     547.053       0.000       0.060       0.047       0.443

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4        Pt4          PR4        Texit         Del T        Ns         Ns nondim
       0.873       19.313       1.278     566.533       43.723     199.689       1.548

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 272215.094       0.589    2466.412 1584834.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 8.966   EfDer =  0.991

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    160.332    3776.000       19.313     566.533       1.000        1.000       0.980
W Kg/sec =   72.87835

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    127.537    3613.079        1.402       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 123340.875  125807.422        1.590     590.487     371.429     474.134       1.277

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   459.74    -0.16   459.74      0.40   647.92
 MEAN    18.08      0.00    -0.02   459.74    -0.16   459.74      0.40
 HUB     15.21      0.00    -0.02   459.74    -0.16   459.74      0.40

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     55.83     46.36      9.47   677.16   818.61     17.29   548.89      0.71
 MEAN    52.35     42.30     10.05   595.71   752.61     17.29   548.89      0.65
 HUB     47.48     37.84      9.64   501.20   680.24     17.29   548.89      0.59

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     20.42   573.76    352.24    452.91  1178.43      0.49
 MEAN    18.01   582.45    354.66    462.01  1173.21      0.50
 HUB     15.22   629.03    415.60    472.19  1168.05      0.54

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    672.88    554.92    320.64      0.47  7195.91
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 MEAN   593.46   520.08   238.80     0.44  6390.33     1.58
 HUB    501.63   479.96    86.03     0.41  6329.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.74     1.23    20.18   604.60     1.07   577.11     0.92     0.91
 MEAN    23.21     1.20    19.61   600.34     1.06   572.01     0.92     0.91
 HUB     23.17     1.20    19.02   600.01     1.06   566.98     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.87    35.30    31.50     3.80     0.93     0.40     2.90
 MEAN    37.51    27.33    23.50     3.83     0.94     0.38     3.30     0.91
 HUB     41.35    10.33     6.50     3.83     0.94     0.37     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     835.496     355.659     756.016    1143.429       0.731      -0.863

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.337      16.356     543.366      46.000      25.194      30.600       5.406

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     748.702     355.659     828.883    1155.445       0.648      -0.553

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      23.238      17.518     554.847     361.848       0.036       0.259

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     737.820       0.000     737.820    1156.866       0.638       0.322

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      17.570     556.199       0.000       0.060       0.070      -0.539

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.852      23.110       1.197     601.651      35.118     218.948       1.697

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 218776.641       0.483    1982.232 1412895.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.966   EfDer =  0.920

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    160.332    3776.000      23.110     601.651       1.000       1.000       0.710
W Kg/sec =   72.87835

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    109.839    3506.047       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123340.875  125807.422       1.235     395.194     319.906     307.469       0.961

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   657.23    -0.23   657.23     0.56   614.04
 MEAN    17.74     0.00    -0.02   657.23    -0.23   657.23     0.56
 HUB     15.05     0.00    -0.02   657.23    -0.23   657.23     0.56

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.19    46.36    -1.17   661.34   932.53    18.63   565.60     0.80
 MEAN    41.66    43.40    -1.74   584.52   879.70    18.63   565.60     0.75
 HUB     37.05    38.84    -1.79   495.92   823.48    18.63   565.60     0.71
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      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   541.20   312.08   442.16  1211.33     0.45
MEAN    17.51   550.96   320.46   448.17  1207.44     0.46
HUB     14.85   596.41   385.10   455.42  1203.67     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    652.78   558.20   340.70     0.46  6186.81
MEAN   576.87   516.33   256.41     0.43  5614.23     1.81
HUB    489.33   467.19   104.24     0.39  5722.13

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     27.01     1.17    23.55   634.36     1.05   609.91     0.92     0.84
MEAN    26.63     1.15    23.09   631.33     1.05   606.00     0.92     0.84
HUB     26.71     1.16    22.58   631.90     1.05   602.22     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.21    37.62    31.50     6.12     0.93     0.46     2.90
MEAN    35.57    29.77    23.50     6.27     0.89     0.47     3.28     0.84
HUB     40.22    12.89     6.50     6.39     0.89     0.49     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.920

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     556.498     322.566     453.476    1208.105       0.461       0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.747      23.123     606.684      46.000      35.425      31.500      -3.925

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     460.650     322.566     562.359    1216.180       0.379       0.301

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.708      24.188     614.820     471.992       0.021       0.391

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     447.161       0.000     447.161    1217.190       0.367       0.305

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.257     615.842       0.000       0.060       0.042       0.319

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.808      26.629       1.152     632.530      30.879     235.734       1.827

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 192497.922       0.452    1744.133 2045994.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.966   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    160.332    3776.000      26.629     632.530       1.000       1.000       0.980
W Kg/sec =   72.87835

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.738    3419.397       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123340.875  125807.422       1.803     513.330     284.683     401.059       1.409

     ROTOR LEADING EDGE CONDITIONS, STAGE            4
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   419.67    -0.14   419.67     0.34   574.70
MEAN    16.97     0.00    -0.02   419.67    -0.14   419.67     0.34
HUB     14.32     0.00    -0.02   419.67    -0.14   419.67     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.53    46.36    10.17   634.65   760.98    24.53   617.84     0.62
MEAN    53.12    43.80     9.32   559.22   699.29    24.53   617.84     0.57
HUB     48.36    37.84    10.52   471.87   631.60    24.53   617.84     0.52

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   529.79   324.47   418.80  1242.15     0.43
MEAN    16.57   535.43   325.32   425.26  1237.90     0.43
HUB     13.89   574.46   378.17   432.43  1233.67     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    622.13   513.80   297.66     0.41  6128.83
MEAN   546.14   479.17   220.82     0.39  5394.28     1.59
HUB    457.70   439.69    79.53     0.36  5254.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     31.22     1.17    27.54   664.91     1.05   641.50     0.92     0.91
MEAN    30.64     1.15    26.94   661.03     1.05   637.11     0.92     0.91
HUB     30.53     1.15    26.31   660.29     1.04   632.76     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.77    35.40    31.50     3.90     0.93     0.40     2.90
MEAN    37.42    27.44    23.50     3.94     0.93     0.38     3.29     0.91
HUB     41.17    10.42     6.50     3.92     0.93     0.38     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.994

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     529.558     327.150     416.418    1239.418       0.427       0.048

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    30.757      27.127     638.683      46.000      38.154      32.400      -5.754

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     428.083     327.150     538.779    1247.259       0.343       0.355

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      30.712      28.306     646.789     456.573       0.022       0.439

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     407.285       0.000     407.285    1248.655       0.326       0.339

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      28.435     648.238       0.000       0.060       0.048       0.389

   STAGE EXIT CONDITIONS, STAGE             4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.872      30.612       1.150     662.075      29.545     221.804       1.719

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 184311.484       0.476    1669.959 1357565.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.966   EfDer =  0.995
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   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    160.332    3776.000      30.612     662.075      1.000       1.000       0.980
W Kg/sec =   72.87835

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.986    3342.232       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123340.875  125807.422       2.011     509.668     253.387     390.276       1.540

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   379.98    -0.13   379.98     0.30   534.31
MEAN    15.91     0.00    -0.02   379.98    -0.13   379.98     0.30
HUB     13.07     0.00    -0.02   379.98    -0.13   379.98     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.82    47.36    10.46   603.68   713.42    28.71   650.04     0.57
MEAN    54.08    44.80     9.28   524.36   647.67    28.71   650.04     0.52
HUB     48.59    38.84     9.75   430.68   574.44    28.71   650.04     0.46

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   497.09   318.01   382.05  1270.81     0.39
MEAN    15.50   495.64   308.31   388.08  1266.28     0.39
HUB     12.59   522.47   342.42   394.62  1261.77     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    591.16   469.65   273.14     0.37  5707.54
MEAN   510.67   437.67   202.36     0.35  4780.17     1.64
HUB    414.86   401.21    72.44     0.32  4312.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     35.27     1.15    31.74   692.20     1.05   671.60     0.92     0.91
MEAN    34.48     1.13    31.03   687.31     1.04   666.83     0.92     0.91
HUB     34.09     1.11    30.29   684.84     1.03   662.08     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.77    35.56    31.50     4.06     0.93     0.42     2.90
MEAN    38.47    27.54    23.50     4.04     0.93     0.39     3.34     0.91
HUB     40.95    10.40     6.50     3.90     0.93     0.37     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     501.774     313.965     391.412    1266.560       0.396      -0.007

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    34.545      31.001     667.127      46.000      38.734      33.000      -5.734

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     407.476     313.965     514.403    1273.327       0.320       0.303

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      34.471      32.108     674.274     440.827       0.040       0.451

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    14.701     381.418       0.000     381.418    1274.944       0.299       0.381

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      32.370     675.988       0.000       0.060       0.048       0.375
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    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      34.445       1.125     688.115      26.041     231.039       1.791

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  162588.703       0.465    1473.139 1386329.250

    OVERALL EXIT CONDITIONS; ALL          5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1030389.88   9335.8760    156.6287      2.2801      0.8431      8.9664      1.3162


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 100% Stat 2 27% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.991

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     154.804    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   70.36555

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     151.228    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  119088.148  121469.656       1.888     831.557     440.409     619.754       1.407

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   362.31    -0.12   362.31     0.33   677.10
  MEAN    17.06     0.00    -0.02   362.31    -0.12   362.31     0.33
  HUB     12.51     0.00    -0.02   362.31    -0.12   362.31     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.95    50.47    11.48   679.80   770.43    14.03   511.85     0.69
  MEAN    57.20    47.20    10.00   562.16   668.91    14.03   511.85     0.60
  HUB     48.70    38.62    10.08   412.23   548.91    14.03   511.85     0.49

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   631.06   427.71   464.01  1136.06     0.56
  MEAN    18.04   655.05   448.80   477.15  1129.24     0.58
  HUB     15.00   737.95   544.07   498.56  1119.36     0.66

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   528.07   252.09     0.46  8826.17
  MEAN   594.32   498.84   145.52     0.44  8096.73     1.51
  HUB    494.28   501.04    49.79     0.45  8162.58

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.83     1.31    16.07   569.53     1.09   536.27     0.92     0.91
  MEAN    19.40     1.28    15.44   565.67     1.08   529.83     0.92     0.91
  HUB     19.44     1.29    14.52   566.02     1.08   520.54     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     42.67    28.51    24.20     4.31     0.93     0.41     2.90
  MEAN    43.25    16.96    12.70     4.26     0.94     0.35     3.51     0.91
  HUB     47.50    -5.70    -9.30     3.60     0.94     0.20     4.78
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     662.986     447.930     488.783    1129.733       0.587       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.513      15.451     530.360      24.000      42.503      35.400      -7.103

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     501.002     447.930     672.045    1146.383       0.437       0.399

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.414      17.024     546.108     528.796       0.034       0.527

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     462.934       0.000     462.934    1149.596       0.403       0.435

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.285     549.173       0.000       0.060       0.053       0.461

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      19.331       1.280     567.073      44.263     193.995       1.504

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 275572.750       0.596    2410.745 1523501.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    154.804    3776.000      19.331     567.073       1.000       1.000       0.980
W Kg/sec =   70.36555

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    123.086    3611.360       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119088.148  121469.656       1.647     590.487     358.468     474.134       1.323

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   441.06    -0.15   441.06     0.38   647.62
 MEAN    18.08     0.00    -0.02   441.06    -0.15   441.06     0.38
 HUB     15.21     0.00    -0.02   441.06    -0.15   441.06     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.93    46.36    10.57   677.16   808.26    17.47   550.83     0.70
 MEAN    53.49    42.30    11.19   595.71   741.34    17.47   550.83     0.64
 HUB     48.66    37.84    10.82   501.20   667.75    17.47   550.83     0.58

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   567.70   365.43   434.44  1181.01     0.48
 MEAN    18.01   573.96   364.39   443.46  1175.54     0.49
 HUB     15.22   617.57   419.14   453.55  1170.11     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   532.22   307.45     0.45  7465.20
 MEAN   593.46   499.13   229.08     0.42  6565.30     1.62
 HUB    501.63   460.99    82.49     0.39  6382.85
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.91     1.24    20.41   606.56     1.07   579.66     0.92     0.90
MEAN    23.32     1.21    19.81   601.80     1.06   574.30     0.92     0.90
HUB     23.20     1.20    19.19   600.84     1.06   569.00     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.07    35.29    31.50     3.79     0.93     0.42     2.90
MEAN    39.41    27.32    23.50     3.82     0.94     0.40     3.30     0.90
HUB     42.74    10.31     6.50     3.81     0.94     0.39     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     800.776     365.408     712.544    1149.890       0.696       -0.778

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.437      16.945      549.528      46.000      27.150      30.600       3.450

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     702.705     365.408     792.033    1162.699       0.604       -0.422

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      23.363      18.248     561.839     361.848       0.030       0.289

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.823     691.598       0.000     691.598    1164.041       0.594       0.375

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.680      18.325     563.132       0.000       0.060       0.055       -0.401

    STAGE EXIT CONDITIONS, STAGE            2
       Eff4        Pt4          PR4        Texit        Del T        Ns         Ns nondim
       0.861      23.273       1.204     603.069      35.996     210.518       1.632

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 224247.969       0.495    1961.749 1354479.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.948

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    154.804     3776.000       23.273     603.069       1.000        1.000        0.710
W Kg/sec =   70.36555

   W cor       RPM cor         GAMMA        Cp          R           Blades       THK
    105.433     3501.925        1.402        0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 119088.148  121469.656        1.287     395.194     307.074     307.469       1.001

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   620.69    -0.21   620.69     0.53   613.32
 MEAN    17.74      0.00    -0.02   620.69    -0.21   620.69     0.53
 HUB     15.05      0.00    -0.02   620.69    -0.21   620.69     0.53

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     46.83     46.36     0.47   661.34   907.15     19.22   570.92     0.77
 MEAN    43.29     43.40    -0.11   584.52   852.74     19.22   570.92     0.73
 HUB     38.64     38.84    -0.20   495.92   794.62     19.22   570.92     0.68

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000
```

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	534.08	331.19	418.99	1215.34	0.44
MEAN	17.51	541.28	334.71	425.39	1211.02	0.45
HUB	14.85	583.45	391.37	432.71	1206.84	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	652.78	528.18	321.59	0.43	6565.15	
MEAN	576.87	489.49	242.16	0.40	5863.43	1.86
HUB	489.33	443.67	97.97	0.37	5815.03	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.59	1.19	24.16	637.77	1.06	613.97	0.92	0.87
MEAN	27.10	1.16	23.62	634.06	1.05	609.61	0.92	0.87
HUB	27.07	1.16	23.06	633.81	1.05	605.40	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.32	37.51	31.50	6.01	0.93	0.48	2.90	
MEAN	38.20	29.65	23.50	6.15	0.90	0.49	3.28	0.87
HUB	42.13	12.76	6.50	6.26	0.90	0.50	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.948

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	546.524	336.907	430.327	1211.684	0.451	0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
27.216	23.666	610.288	46.000	38.058	31.500	-6.558

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	435.771	336.907	550.820	1220.664	0.357	0.345

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	27.162	24.870	619.368	471.992	0.025	0.432

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	423.512	0.000	423.512	1221.530	0.347	0.341

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	24.905	620.247	0.000	0.060	0.051	0.355

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.829	27.067	1.163	635.216	32.148	222.269	1.723

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
200412.547	0.470	1753.234	1937931.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =10.004 EfDer = 0.988

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
154.804	3776.000	27.067	635.216	1.000	1.000	0.980

W Kg/sec = 70.36555

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
93.040	3412.160	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
119088.148	121469.656	1.894	513.330	271.000	401.059	1.480

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	397.87	-0.14	397.87	0.33	573.48

```
 MEAN    16.97     0.00    -0.02   397.87    -0.14   397.87     0.33
 HUB     14.32     0.00    -0.02   397.87    -0.14   397.87     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.92    46.36    11.56   634.65   749.17    25.15   622.01     0.61
 MEAN    54.58    43.80    10.78   559.22   686.42    25.15   622.01     0.56
 HUB     49.87    37.84    12.03   471.87   617.32    25.15   622.01     0.50

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   522.75   340.19   396.92  1246.84     0.42
 MEAN    16.57   525.49   336.89   403.30  1242.33     0.42
 HUB     13.89   560.93   382.40   410.38  1237.82     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   486.86   281.94     0.39  6425.37
 MEAN   546.14   454.35   209.25     0.37  5585.83     1.65
 HUB    457.70   417.23    75.31     0.34  5313.43

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.91     1.18    28.27   669.16     1.05   646.36     0.92     0.90
 MEAN    31.25     1.15    27.63   664.72     1.05   641.69     0.92     0.90
 HUB     31.03     1.15    26.95   663.28     1.04   637.04     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.60    35.39    31.50     3.89     0.93     0.43     2.90
 MEAN    39.87    27.42    23.50     3.92     0.94     0.41     3.29     0.90
 HUB     42.98    10.40     6.50     3.90     0.94     0.40     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     520.458     338.780     395.100    1243.714       0.418       0.045

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.359      27.797     643.127      46.000      40.612      32.400      -8.212

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     405.219     338.780     528.180    1252.288       0.324       0.394

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.297      29.106     652.025     456.573       0.026       0.477

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     386.074       0.000     386.074    1253.500       0.308       0.368

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.189     653.288       0.000       0.060       0.059       0.416

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.860      31.175       1.152     665.721      30.505     210.833       1.634

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 190317.438       0.492    1664.921 1298512.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    154.804    3776.000      31.175     665.721       1.000       1.000       0.980
W Kg/sec =   70.36555
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
82.696	3333.066	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
119088.148	121469.656	2.116	509.668	240.893	390.276	1.620

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	360.48	-0.12	360.48	0.29	532.85
MEAN	15.91	0.00	-0.02	360.48	-0.12	360.48	0.29	
HUB	13.07	0.00	-0.02	360.48	-0.12	360.48	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.16	47.36	11.80	603.68	703.22	29.44	654.89	0.56
MEAN	55.50	44.80	10.70	524.36	636.42	29.44	654.89	0.51
HUB	50.08	38.84	11.24	430.68	561.73	29.44	654.89	0.45

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	491.63	332.21	362.41	1275.92	0.39
MEAN	15.50	487.06	318.77	368.26	1271.19	0.38
HUB	12.59	510.12	346.24	374.63	1266.47	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	591.16	445.42	258.95	0.35	5962.06	
MEAN	510.67	415.27	191.91	0.33	4942.09	1.70
HUB	414.86	380.86	68.63	0.30	4360.73	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	36.08	1.16	32.57	697.19	1.05	677.04	0.92	0.90
MEAN	35.21	1.13	31.81	691.80	1.04	672.03	0.92	0.90
HUB	34.71	1.11	31.04	688.74	1.03	667.04	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.51	35.55	31.50	4.05	0.93	0.45	2.90	
MEAN	40.88	27.52	23.50	4.02	0.94	0.42	3.34	0.90
HUB	42.74	10.38	6.50	3.88	0.94	0.40	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.988

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	493.299	324.612	371.445	1271.434	0.388	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
35.264	31.785	672.292	46.000	41.151	33.000	-8.151

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	386.032	324.612	504.374	1278.847	0.302	0.340

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	35.164	33.009	680.154	440.827	0.049	0.489

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	361.712	0.000	361.712	1280.271	0.283	0.411

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	33.234	681.670	0.000	0.060	0.058	0.404

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.862	35.129	1.127	692.576	26.855	219.880	1.704

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 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  167690.016       0.480    1466.973 1326558.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1058240.75   9257.6230    151.2282      2.3253      0.8430     10.0040      1.3247


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 100% Stat 2 27% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.015   EfDer =  0.986

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     149.467    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   67.93939

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     146.014    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  114982.070  117281.461       1.956     831.557     425.224     619.754       1.457

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   348.42    -0.12   348.42     0.31   677.10
  MEAN    17.06     0.00    -0.02   348.42    -0.12   348.42     0.31
  HUB     12.51     0.00    -0.02   348.42    -0.12   348.42     0.31

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.87    50.47    12.40   679.80   763.99    14.11   512.67     0.69
  MEAN    58.22    47.20    11.02   562.16   661.48    14.11   512.67     0.60
  HUB     49.80    38.62    11.18   412.23   539.84    14.11   512.67     0.49

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   624.43   437.86   445.19  1137.96     0.55
  MEAN    18.04   645.29   454.60   457.98  1130.94     0.57
  HUB     15.00   722.74   541.97   478.15  1121.14     0.64

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   506.68   241.94     0.45  9035.51
  MEAN   594.32   478.82   139.72     0.42  8201.17     1.56
  HUB    494.28   480.52    47.69     0.43  8131.02

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.92     1.32    16.23   570.64     1.09   538.07     0.92     0.90
  MEAN    19.44     1.29    15.58   566.22     1.08   531.45     0.92     0.90
  HUB     19.40     1.28    14.66   565.85     1.08   522.23     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     44.52    28.52    24.20     4.32     0.93     0.44     2.90
  MEAN    44.79    16.97    12.70     4.27     0.94     0.38     3.51     0.90
  HUB     48.58    -5.70    -9.30     3.60     0.94     0.22     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.986
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     652.557     453.714     469.013    1131.483       0.577       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.544      15.595     532.004      24.000      44.050      35.400      -8.650

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     479.922     453.714     660.440    1148.716       0.418       0.424

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.431      17.229     548.333     528.796       0.038       0.551

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     444.397       0.000     444.397    1151.585       0.386       0.452

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.445     551.076       0.000       0.060       0.061       0.477

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.856      19.335       1.280     567.571      44.761     188.651       1.462

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 278673.156       0.603    2353.812 1465094.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.015   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    149.467    3776.000      19.335     567.571       1.000       1.000       0.980
W Kg/sec =   67.93939

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.867    3609.776       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 114982.070  117281.461       1.706     590.487     346.179     474.134       1.370

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   423.70    -0.15   423.70     0.37   647.33
 MEAN    18.08     0.00    -0.02   423.70    -0.15   423.70     0.37
 HUB     15.21     0.00    -0.02   423.70    -0.15   423.70     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.97    46.36    11.61   677.16   798.92    17.61   552.58     0.69
 MEAN    54.58    42.30    12.28   595.71   731.14    17.61   552.58     0.63
 HUB     49.80    37.84    11.96   501.20   656.41    17.61   552.58     0.57

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   562.83   377.46   417.49  1183.30     0.48
 MEAN    18.01   566.65   373.26   426.35  1177.62     0.48
 HUB     15.22   607.22   422.34   436.29  1171.96     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   511.44   295.42     0.43  7710.74
 MEAN   593.46   479.85   220.20     0.41  6725.02     1.67
 HUB    501.63   443.44    79.29     0.38  6431.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.03     1.24    20.58   608.36     1.07   581.91     0.92     0.90
 MEAN    23.39     1.21    19.96   603.15     1.06   576.34     0.92     0.90
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 HUB     23.20     1.20    19.32   601.59     1.06   570.81     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.12    35.28    31.50     3.78     0.93     0.44     2.90
 MEAN    41.20    27.32    23.50     3.82     0.94     0.42     3.30     0.90
 HUB     44.07    10.30     6.50     3.80     0.94     0.41     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     772.334     374.307     675.569    1155.142       0.669      -0.710

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.508      17.414     554.562      46.000      28.989      30.600       1.611

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     664.252     374.307     762.454    1168.566       0.568      -0.314

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      23.448      18.828     567.526     361.848       0.027       0.316

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     653.482       0.000     653.482    1169.787       0.559       0.417

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      18.911     568.711       0.000       0.060       0.046      -0.291

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.863      23.380       1.209     604.367      36.796     202.958       1.573

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 229233.406       0.506    1936.219 1299477.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =11.015   EfDer =  0.969

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    149.467    3776.000      23.380     604.367       1.000       1.000       0.710
W Kg/sec =   67.93939

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.441    3498.162       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 114982.070  117281.461       1.338     395.194     295.449     307.469       1.041

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   589.55    -0.20   589.55     0.50   612.66
 MEAN    17.74     0.00    -0.02   589.55    -0.20   589.55     0.50
 HUB     15.05     0.00    -0.02   589.55    -0.20   589.55     0.50

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.29    46.36     1.93   661.34   886.12    19.69   575.36     0.75
 MEAN    44.76    43.40     1.36   584.52   830.34    19.69   575.36     0.71
 HUB     40.08    38.84     1.24   495.92   770.53    19.69   575.36     0.65

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   529.19   347.55   399.06  1218.74     0.43
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 MEAN    17.51   533.81   346.94   405.70  1214.09     0.44
 HUB     14.85   572.72   396.71   413.07  1209.57     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   502.41   305.23     0.41  6888.96
 MEAN   576.87   466.33   229.94     0.38  6077.28     1.91
 HUB    489.33   423.33    92.62     0.35  5894.22

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.04     1.20    24.63   640.78     1.06   617.41     0.92     0.89
 MEAN    27.46     1.17    24.04   636.49     1.05   612.71     0.92     0.89
 HUB     27.33     1.17    23.43   635.52     1.05   608.15     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.05    37.41    31.50     5.91     0.93     0.50     2.90
 MEAN    40.54    29.54    23.50     6.04     0.91     0.50     3.28     0.89
 HUB     43.84    12.64     6.50     6.14     0.91     0.52     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.969

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     538.833     349.214     410.354    1214.733       0.444       0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    27.571      24.084     613.370      46.000      40.398      31.500      -8.898

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     414.517     349.214     542.010    1224.488       0.339       0.383

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.501      25.402     623.261     471.992       0.030       0.469

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     403.344       0.000     403.344    1225.236       0.329       0.369

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.402     624.023       0.000       0.060       0.062       0.383

    STAGE EXIT CONDITIONS, STAGE            3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.843      27.384       1.171     637.600      33.234     211.286       1.638

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 207188.734       0.486    1750.019 1842245.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =11.015   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    149.467    3776.000      27.384     637.600       1.000       1.000       0.980
W Kg/sec =   67.93939

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.956    3405.774       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 114982.070  117281.461       1.981     513.330     259.108     401.059       1.548

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   379.21    -0.13   379.21     0.31   572.41
 MEAN    16.97     0.00    -0.02   379.21    -0.13   379.21     0.31
 HUB     14.32     0.00    -0.02   379.21    -0.13   379.21     0.31
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.15    46.36    12.79   634.65   739.43    25.63   625.61     0.60
MEAN    55.86    43.80    12.06   559.22   675.77    25.63   625.61     0.55
HUB     51.22    37.84    13.38   471.87   605.46    25.63   625.61     0.49

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   517.76   353.35   378.43  1250.81     0.41
MEAN    16.57   517.77   346.59   384.66  1246.09     0.42
HUB     13.89   549.78   385.90   391.59  1241.37     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    622.13   464.17   268.78     0.37  6673.85
MEAN   546.14   433.34   199.55     0.35  5746.60     1.71
HUB    457.70   398.12    71.80     0.32  5362.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     32.43     1.18    28.82   672.85     1.06   650.49     0.92     0.90
MEAN    31.69     1.16    28.14   667.95     1.05   645.59     0.92     0.90
HUB     31.39     1.15    27.43   665.92     1.04   640.71     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.04    35.38    31.50     3.88     0.93     0.45     2.90
MEAN    42.02    27.42    23.50     3.92     0.94     0.44     3.29     0.90
HUB     44.58    10.39     6.50     3.89     0.94     0.42     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.980

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     513.423     348.542     376.991    1247.368       0.412       0.043

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    31.796      28.293     646.923      46.000      42.755      32.400     -10.354

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     385.938     348.542     520.028    1256.553       0.307       0.427

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      31.718      29.708     656.486     456.573       0.031       0.511

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     368.179       0.000     368.179    1257.622       0.293       0.392

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      29.747     657.603       0.000       0.060       0.071       0.437

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.847      31.572       1.153     668.909      31.309     201.844       1.565

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 195346.109       0.505    1649.990 1243972.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =11.015   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    149.467    3776.000      31.572     668.909       1.000       1.000       0.980
W Kg/sec =   67.93939

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     79.029    3325.114       1.401       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
114982.070	117281.461	2.214	509.668	230.214	390.276	1.695

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	343.99	-0.12	343.99	0.27	531.58
MEAN	15.91	0.00	-0.02	343.99	-0.12	343.99	0.27	
HUB	13.07	0.00	-0.02	343.99	-0.12	343.99	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.33	47.36	12.97	603.68	694.91	29.97	659.05	0.55
MEAN	56.74	44.80	11.94	524.36	627.22	29.97	659.05	0.50
HUB	51.39	38.84	12.55	430.68	551.29	29.97	659.05	0.44

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	487.87	343.99	345.96	1280.23	0.38
MEAN	15.50	480.50	327.48	351.61	1275.35	0.38
HUB	12.59	500.04	349.34	357.77	1270.46	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	591.16	425.18	247.17	0.33	6173.32	
MEAN	510.67	396.48	183.19	0.31	5077.04	1.76
HUB	414.86	363.72	65.52	0.29	4399.79	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	36.66	1.16	33.17	701.49	1.05	681.65	0.92	0.90
MEAN	35.72	1.13	32.38	695.70	1.04	676.46	0.92	0.90
HUB	35.14	1.11	31.58	692.13	1.03	671.29	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.84	35.54	31.50	4.04	0.93	0.47	2.90	
MEAN	42.96	27.52	23.50	4.02	0.94	0.45	3.34	0.90
HUB	44.32	10.38	6.50	3.88	0.94	0.42	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.981

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	486.831	333.485	354.672	1275.560	0.382	-0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
35.773	32.350	676.685	46.000	43.236	33.000	-10.236

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	368.144	333.485	496.731	1283.507	0.287	0.371

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	35.644	33.664	685.143	440.827	0.057	0.522

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	345.244	0.000	345.244	1284.782	0.269	0.435

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	33.857	686.505	0.000	0.060	0.070	0.427

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.849	35.600	1.128	696.439	27.530	210.813	1.634

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
171922.422	0.492	1452.142	1271286.750

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   OVERALL EXIT CONDITIONS; ALL          5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1082363.88   9142.1816    146.0140      2.3565      0.8389     11.0152      1.3321


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

   Fan-Core + 4 Stage LPC 100%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    3776.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    167.175    3761.129       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.708     831.557     486.850     619.754       1.273

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   406.03    -0.14   406.03     0.37   677.10
 MEAN    17.06     0.00    -0.02   406.03    -0.14   406.03     0.37
 HUB     12.51     0.00    -0.02   406.03    -0.14   406.03     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.16    50.47     8.69   679.80   791.94    13.76   509.04     0.72
 MEAN    54.17    47.20     6.97   562.16   693.58    13.76   509.04     0.63
 HUB     45.44    38.62     6.82   412.23   578.71    13.76   509.04     0.52

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   657.50   393.69   526.61  1129.16     0.58
 MEAN    18.04   690.16   429.46   540.26  1123.15     0.61
 HUB     15.00   789.74   550.81   565.95  1113.01     0.71

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    679.80   599.32   286.11     0.53  8124.65
 MEAN   594.32   564.85   164.86     0.50  7748.13     1.37
 HUB    494.28   568.77    56.53     0.51  8263.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.46     1.29    15.46   565.82     1.08   529.72     0.92     0.91
 MEAN    19.24     1.27    14.91   563.82     1.08   524.05     0.92     0.91
 HUB     19.54     1.29    13.96   566.55     1.08   514.49     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.78    28.52    24.20     4.32     0.93     0.33     2.90
 MEAN    38.48    16.97    12.70     4.27     0.93     0.28     3.51     0.91
 HUB     44.22    -5.70    -9.30     3.60     0.93     0.13     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     700.672     428.626     554.275    1123.361       0.624      -0.003
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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.365      14.893     524.393      24.000      37.715      35.400      -2.315

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     572.477     428.626     715.157    1137.868       0.503       0.313

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.292      16.226     538.025     528.796       0.026       0.455

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     525.185       0.000     525.185    1142.444       0.460       0.376

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.634     542.361       0.000       0.060       0.039       0.401

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      19.231       1.273     565.398      42.589     211.392       1.639

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 265150.219       0.574    2564.162 1707338.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    3776.000      19.231     565.398       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    136.570    3616.702       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.485     590.487     397.735     474.134       1.192

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   498.98    -0.17   498.98     0.44   648.57
 MEAN    18.08     0.00    -0.02   498.98    -0.17   498.98     0.44
 HUB     15.21     0.00    -0.02   498.98    -0.17   498.98     0.44

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.62    46.36     7.26   677.16   841.29    16.87   544.61     0.73
 MEAN    50.06    42.30     7.76   595.71   777.21    16.87   544.61     0.68
 HUB     45.14    37.84     7.30   501.20   707.36    16.87   544.61     0.62

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   589.50   323.54   492.78  1172.55     0.50
 MEAN    18.01   602.52   333.65   501.70  1167.98     0.52
 HUB     15.22   654.39   407.92   511.69  1163.48     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   604.04   349.33     0.52  6610.27
 MEAN   593.46   564.98   259.81     0.48  6012.18     1.49
 HUB    501.63   520.20    93.71     0.45  6212.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.30     1.21    19.60   600.37     1.06   571.35     0.92     0.91
 MEAN    22.91     1.19    19.10   597.20     1.06   566.89     0.92     0.91
 HUB     23.04     1.20    18.58   598.26     1.06   562.51     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     33.29    35.33    31.50     3.83     0.93     0.35     2.90
 MEAN    33.63    27.38    23.50     3.88     0.93     0.34     3.30     0.91
 HUB     38.56    10.38     6.50     3.88     0.93     0.34     3.92


   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960    1068.606     334.589    1014.873    1101.200       0.970      -1.634

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.041      12.588      503.376      46.000      18.247      30.600      12.353

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960    1047.464     334.589    1099.604    1105.587       0.947      -1.591

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      22.736      12.750     507.151     345.258       0.086       0.092

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823    1082.441      0.000    1082.441    1101.705       0.983      -0.174

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      11.895     501.372       0.000       0.060       0.252      -1.806

    STAGE EXIT CONDITIONS, STAGE            2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.687      22.077       1.148     598.612      33.213     237.846       1.844

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 206906.594       0.457    2000.911 1532291.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  0.775

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    171.128    3776.000      22.077     598.612       1.000       1.000       0.680
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    122.409    3514.937       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.062     378.495     356.519     293.880       0.824

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   854.51    -0.29   854.51     0.75   615.60
 MEAN    17.74     0.00    -0.02   854.51    -0.29   854.51     0.75
 HUB     15.05     0.00    -0.02   854.51    -0.29   854.51     0.75

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     37.75    46.36    -8.61   661.34  1080.71    15.18   537.68     0.95
 MEAN    34.39    43.40    -9.01   584.52  1035.46    15.18   537.68     0.91
 HUB     30.14    38.84    -8.70   495.92   988.14    15.18   537.68     0.87

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   571.83   238.84   519.56  1197.82     0.48
 MEAN    17.51   586.60   265.00   523.33  1195.90     0.49
 HUB     14.85   639.45   357.19   530.38  1194.02     0.54
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   664.29   413.93     0.55  4737.38
 MEAN   576.87   609.21   311.87     0.51  4644.51     1.78
 HUB    489.33   546.59   132.14     0.46  5308.75

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.45     1.11    20.92   623.66     1.04   596.37     0.92     0.71
 MEAN    24.40     1.11    20.70   623.17     1.04   594.45     0.92     0.71
 HUB     24.75     1.12    20.36   626.68     1.05   592.56     0.92     0.71

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.69    38.54    31.50     7.04     0.93     0.42     2.90
 MEAN    26.86    30.79    23.50     7.29     0.85     0.45     3.28     0.71
 HUB     33.96    13.99     6.50     7.49     0.85     0.49     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.775

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     593.670     266.742     530.371    1196.489       0.496       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.495      20.698     595.090      46.000      26.699      31.500       4.801

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     547.105     266.742     608.667    1200.937       0.456       0.139

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.442      21.196     599.523     471.992       0.024       0.258

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     530.103       0.000     530.103    1202.467       0.441       0.159

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.315     601.051       0.000       0.060       0.044       0.170

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.661      24.361       1.103     624.502      25.891     300.245       2.327

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 161382.000       0.379    1560.661 2563847.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.128    3776.000      24.361     624.502       1.000       1.000       0.980
W Kg/sec =   77.78547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    113.305    3441.304       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 131645.797  134278.422       1.555     513.330     330.029     401.059       1.215

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   495.41    -0.17   495.41     0.41   578.38
 MEAN    16.97     0.00    -0.02   495.41    -0.17   495.41     0.41
 HUB     14.32     0.00    -0.02   495.41    -0.17   495.41     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.03    46.36     5.67   634.65   805.25    21.68   604.03     0.67
 MEAN    48.47    43.80     4.67   559.22   747.23    21.68   604.03     0.62
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HUB     43.62    37.84     5.78   471.87   684.29    21.68   604.03     0.57

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   565.19   266.69   498.31  1225.58     0.46
MEAN    16.57   578.08   283.16   503.98  1222.60     0.47
HUB     13.89   626.20   362.61   510.53  1219.64     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    622.13   612.09   355.44     0.50  5038.36
MEAN   546.14   568.46   262.98     0.46  4696.01     1.42
HUB    457.70   519.31    95.09     0.43  5039.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     27.83     1.14    24.05   651.13     1.04   624.48     0.92     0.91
MEAN    27.58     1.13    23.66   649.32     1.04   621.45     0.92     0.91
HUB     27.83     1.14    23.25   651.13     1.04   618.43     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     28.15    35.50    31.50     4.00     0.93     0.30     2.90
MEAN    29.33    27.56    23.50     4.06     0.92     0.30     3.29     0.91
HUB     35.38    10.55     6.50     4.05     0.92     0.31     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481      569.012     284.756     492.634    1224.605       0.465        0.056

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    27.706      23.893      623.519      46.000      30.029      32.400       2.371

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481      511.940     284.756     585.806    1229.648       0.416        0.220

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.668      24.555     628.665     456.573       0.019        0.315

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
    16.096     485.328       0.000     485.328    1231.811       0.394        0.219

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950      24.787     630.878       0.000       0.060        0.039        0.277

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4        Pt4          PR4        Texit         Del T        Ns         Ns nondim
     0.871       27.589       1.133      650.525       26.023     265.119        2.055

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 162291.375       0.419    1569.455 1499206.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.967   EfDer =  0.995

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    171.128     3776.000       27.589      650.525       1.000        1.000        0.980
W Kg/sec =   77.78547

   W cor       RPM cor         GAMMA        Cp          R           Blades        THK
    102.111     3371.772        1.401        0.249       53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
 131645.797  134278.422        1.713      509.668      297.444      390.276        1.312
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    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   451.15    -0.16   451.15     0.37   539.04
MEAN    15.91     0.00    -0.02   451.15    -0.16   451.15     0.37
HUB     13.07     0.00    -0.02   451.15    -0.16   451.15     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.24    47.36     5.88   603.68   753.75    25.16   633.56     0.61
MEAN    49.30    44.80     4.50   524.36   691.85    25.16   633.56     0.56
HUB     43.68    38.84     4.84   430.68   623.82    25.16   633.56     0.51

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   527.09   263.49   456.51  1252.47     0.42
MEAN    15.50   534.57   268.34   462.34  1248.95     0.43
HUB     12.59   571.99   327.71   468.81  1245.46     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    591.16   561.93   327.67     0.45  4729.85
MEAN   510.67   522.00   242.34     0.42  4161.04     1.45
HUB    414.86   476.84    87.15     0.38  4127.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     31.11     1.13    27.54   675.50     1.04   652.34     0.92     0.91
MEAN    30.67     1.11    27.04   672.50     1.03   648.68     0.92     0.91
HUB     30.64     1.11    26.52   672.32     1.03   645.05     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     29.99    35.67    31.50     4.17     0.93     0.31     2.90
MEAN    30.13    27.66    23.50     4.16     0.92     0.30     3.34     0.91
HUB     34.96    10.53     6.50     4.03     0.92     0.30     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     540.512     273.257     466.351    1249.330       0.433      -0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    30.732      27.020     649.085      46.000      30.368      33.000       2.632

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     490.329     273.257     561.331    1253.474       0.391       0.150

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      30.671      27.598     653.398     440.827       0.036       0.325

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    14.701     457.111       0.000     457.111    1255.988       0.364       0.253

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      27.977     656.021       0.000       0.060       0.039       0.251

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.870      30.660       1.111     673.441      22.916     277.168       2.149

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 143016.219       0.409    1383.053 1530001.250

   OVERALL EXIT CONDITIONS; ALL          5   STAGES
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Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
938746.38	9078.2412	167.1750	2.0295	0.7809	6.9673	1.2881

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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Fan-Core + 4 Stage LPC 100% Stat 2 30% Ice Block 9-1-2011

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1

RESET = 0.000BLEED = 0.000 DPInc = 7.453 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
168.485	3776.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 76.58430

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
164.593	3761.129	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
129612.891	132204.875	1.735	831.557	479.332	619.754	1.293

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	398.82	-0.14	398.82	0.36	677.10
MEAN	17.06	0.00	-0.02	398.82	-0.14	398.82	0.36	
HUB	12.51	0.00	-0.02	398.82	-0.14	398.82	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.61	50.47	9.14	679.80	788.27	13.81	509.53	0.71
MEAN	54.65	47.20	7.45	562.16	689.37	13.81	509.53	0.62
HUB	45.96	38.62	7.34	412.23	573.67	13.81	509.53	0.52

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	652.49	399.55	515.85	1130.41	0.58
MEAN	18.04	683.85	432.77	529.49	1124.24	0.61
HUB	15.00	780.72	549.67	554.43	1114.14	0.70

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	679.80	587.06	280.25	0.52	8245.51	
MEAN	594.32	553.58	161.55	0.49	7807.78	1.39
HUB	494.28	557.19	55.39	0.50	8246.80	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.53	1.29	15.57	566.46	1.08	530.90	0.92	0.91
MEAN	19.27	1.28	15.01	564.14	1.08	525.09	0.92	0.91
HUB	19.53	1.29	14.06	566.46	1.08	515.58	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.76	28.51	24.20	4.31	0.93	0.34	2.90	
MEAN	39.26	16.97	12.70	4.27	0.93	0.29	3.51	0.91
HUB	44.75	-5.71	-9.30	3.59	0.93	0.14	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	693.868	431.929	543.039	1124.518	0.617	-0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.395	14.997	525.474	24.000	38.498	35.400	-3.098

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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     559.992     431.929     707.215    1139.421       0.491       0.328

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.320      16.376     539.495     528.796       0.026       0.466

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     514.344       0.000     514.344    1143.738       0.450       0.387

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.760     543.591       0.000       0.060       0.040       0.412

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4         PR4       Texit        Del T       Ns        Ns nondim
      0.879      19.259       1.275     565.687      42.877     208.447       1.616

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 266944.938       0.578    2541.654 1676995.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.998

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    168.485    3776.000      19.259     565.687       1.000       1.000       0.980
W Kg/sec =   76.58430

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    134.302    3615.781       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129612.891  132204.875       1.510     590.487     391.129     474.134       1.212

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   488.94    -0.17   488.94     0.43   648.41
 MEAN    18.08      0.00    -0.02   488.94    -0.17   488.94     0.43
 HUB     15.21      0.00    -0.02   488.94    -0.17   488.94     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.18    46.36     7.82   677.16   835.37    16.99   545.73     0.73
 MEAN    50.63    42.30     8.33   595.71   770.80    16.99   545.73     0.67
 HUB     45.72    37.84     7.88   501.20   700.31    16.99   545.73     0.61

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   585.06   331.02   482.42  1174.11      0.50
 MEAN    18.01   597.08   339.10   491.44  1169.36      0.51
 HUB     15.22   647.74   409.92   501.53  1164.68      0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   591.27   341.86     0.50  6762.84
 MEAN   593.46   553.37   254.36     0.47  6110.29      1.51
 HUB    501.63   509.84    91.70     0.44  6242.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.42     1.22    19.77   601.46     1.06   572.88     0.92     0.91
 MEAN    23.00     1.19    19.24   598.01     1.06   568.25     0.92     0.91
 HUB     23.08     1.20    18.70   598.71     1.06   563.68     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.46    35.32    31.50     3.82     0.93     0.36     2.90
 MEAN    34.61    27.36    23.50     3.86     0.93     0.35     3.30     0.91
 HUB     39.26    10.36     6.50     3.86     0.93     0.35     3.92
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   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960    1007.054     340.056     947.902    1113.091       0.905      -1.437

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.129      13.598     514.744      46.000      19.735      30.600      10.865

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     956.155     340.056    1014.825    1122.054       0.852      -1.274

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      22.888      14.232     523.082     345.258       0.071       0.158

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     961.314       0.000     961.314    1121.986       0.857       0.075

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      13.894     522.354       0.000       0.060       0.182      -1.360

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.755      22.453       1.166     599.396      33.709     232.840       1.805

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 209995.422       0.464    1999.422 1502299.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.803

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.485    3776.000      22.453     599.396       1.000       1.000       0.680
W Kg/sec =   76.58430

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.579    3512.638       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129612.891  132204.875       1.096     378.495     345.362     293.880       0.851

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   799.75    -0.28   799.75     0.70   615.20
 MEAN    17.74     0.00    -0.02   799.75    -0.28   799.75     0.70
 HUB     15.05     0.00    -0.02   799.75    -0.28   799.75     0.70

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     39.60    46.36    -6.76   661.34  1037.95    16.21   546.02     0.91
 MEAN    36.17    43.40    -7.23   584.52   990.75    16.21   546.02     0.86
 HUB     31.82    38.84    -7.02   495.92   941.18    16.21   546.02     0.82

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   560.47   259.85   496.60  1201.88     0.47
 MEAN    17.51   574.33   280.87   500.97  1199.35     0.48
 HUB     14.85   625.54   364.93   508.06  1196.88     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   633.24   392.92     0.53  5153.20
 MEAN   576.87   581.88   296.00     0.49  4921.96     1.79
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 HUB    489.33   523.07   124.40     0.44  5423.39

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.18     1.12    21.69   626.64     1.05   600.43     0.92     0.73
 MEAN    25.05     1.12    21.41   625.42     1.04   597.89     0.92     0.73
 HUB     25.33     1.13    21.02   628.07     1.05   595.42     0.92     0.73

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.62    38.35    31.50     6.85     0.93     0.43     2.90
 MEAN    29.28    30.58    23.50     7.08     0.87     0.46     3.28     0.73
 HUB     35.69    13.76     6.50     7.26     0.87     0.49     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.803

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     580.919     282.713     507.484    1199.967       0.484       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.151      21.422     598.545      46.000      29.122      31.500       2.378

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     520.873     282.713     592.651    1205.489       0.432       0.186

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.113      22.086     604.066     471.992       0.020       0.294

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     504.778       0.000     504.778    1206.862       0.418       0.204

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.199     605.444       0.000       0.060       0.039       0.216

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.697      25.042       1.115     626.709      27.313     279.035       2.163

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 170256.984       0.400    1621.062 2434820.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.485    3776.000      25.042     626.709       1.000       1.000       0.980
W Kg/sec =   76.58430

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.715    3435.241       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129612.891  132204.875       1.621     513.330     316.657     401.059       1.267

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   472.43    -0.16   472.43     0.39   577.36
 MEAN    16.97     0.00    -0.02   472.43    -0.16   472.43     0.39
 HUB     14.32     0.00    -0.02   472.43    -0.16   472.43     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.34    46.36     6.98   634.65   791.31    22.54   608.09     0.65
 MEAN    49.82    43.80     6.02   559.22   732.18    22.54   608.09     0.61
 HUB     44.98    37.84     7.14   471.87   667.83    22.54   608.09     0.55

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   552.53   284.80   473.48  1230.66     0.45
MEAN    16.57   563.73   296.29   479.59  1227.23     0.46
HUB     13.89   609.67   367.45   486.49  1223.83     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    622.13   581.35   337.33     0.47  5380.19
MEAN   546.14   540.77   249.85     0.44  4913.37     1.47
HUB    457.70   494.79    90.25     0.40  5106.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     28.86     1.15    25.13   655.14     1.05   629.67     0.92     0.91
MEAN    28.51     1.14    24.67   652.67     1.04   626.16     0.92     0.91
HUB     28.66     1.14    24.18   653.69     1.04   622.69     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.03    35.47    31.50     3.97     0.93     0.33     2.90
MEAN    31.71    27.52    23.50     4.02     0.93     0.32     3.29     0.91
HUB     37.06    10.51     6.50     4.01     0.93     0.33     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     555.684     297.952     469.051    1229.078       0.452       0.054

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    28.637      24.887     628.076      46.000      32.425      32.400      -0.025

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     485.565     297.952     569.692    1235.023       0.393       0.262

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      28.606      25.712     634.166     456.573       0.018       0.351

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     460.716       0.000     460.716    1236.931       0.372       0.258

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      25.922     636.128       0.000       0.060       0.037       0.314

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.879      28.530       1.139     653.833      27.124     250.956       1.945

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 169172.812       0.437    1610.739 1460550.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.485    3776.000      28.530     653.833       1.000       1.000       0.980
W Kg/sec =   76.58430

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.465    3363.232       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129612.891  132204.875       1.795     509.668     283.911     390.276       1.375

    ROTOR LEADING EDGE CONDITIONS, STAGE            5
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   428.81    -0.15   428.81     0.35   537.67
MEAN    15.91     0.00    -0.02   428.81    -0.15   428.81     0.35
HUB     13.07     0.00    -0.02   428.81    -0.15   428.81     0.35

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.62    47.36     7.26   603.68   740.60    26.26   638.50     0.60
MEAN    50.73    44.80     5.93   524.36   677.49    26.26   638.50     0.55
HUB     45.13    38.84     6.29   430.68   607.86    26.26   638.50     0.49

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   515.88   281.09   432.58  1258.16     0.41
MEAN    15.50   521.02   281.18   438.63  1254.27     0.42
HUB     12.59   555.67   332.46   445.25  1250.42     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    591.16   532.23   310.07     0.42  5045.46
MEAN   510.67   495.04   229.49     0.39  4359.99     1.50
HUB    414.86   452.81    82.41     0.36  4187.58

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     32.42     1.14    28.87   680.47     1.04   658.29     0.92     0.91
MEAN    31.87     1.12    28.30   676.85     1.04   654.22     0.92     0.91
HUB     31.73     1.11    27.71   675.94     1.03   650.20     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.02    35.63    31.50     4.13     0.93     0.35     2.90
MEAN    32.66    27.62    23.50     4.12     0.92     0.33     3.34     0.91
HUB     36.75    10.49     6.50     3.99     0.92     0.32     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     526.978     286.337     442.399    1254.631       0.420      -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.933      28.282     654.605      46.000      32.913      33.000       0.087

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     463.333     286.337     544.671    1259.656       0.368       0.201

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.885      29.039     659.859     440.827       0.033       0.363

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     432.547       0.000     432.547    1261.849       0.343       0.296

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.382     662.159       0.000       0.060       0.037       0.293

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      31.872       1.117     677.756      23.924     261.612       2.028

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 149324.000       0.427    1421.754 1490530.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    965694.19   9194.6309    164.5934      2.1097      0.8054      7.4534      1.2964
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 100%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     165.780    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   75.35457

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     161.951    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  127531.688  130082.039       1.763     831.557     471.635     619.754       1.314

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   391.49    -0.13   391.49     0.35   677.10
  MEAN    17.06     0.00    -0.02   391.49    -0.13   391.49     0.35
  HUB     12.51     0.00    -0.02   391.49    -0.13   391.49     0.35

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.07    50.47     9.60   679.80   784.58    13.86   510.01     0.71
  MEAN    55.15    47.20     7.95   562.16   685.16    13.86   510.01     0.62
  HUB     46.49    38.62     7.87   412.23   568.60    13.86   510.01     0.51

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   647.67   405.39   505.11  1131.63     0.57
  MEAN    18.04   677.67   436.10   518.70  1125.31     0.60
  HUB     15.00   771.77   548.53   542.90  1115.26     0.69

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   574.84   274.40     0.51  8366.02
  MEAN   594.32   542.30   158.22     0.48  7867.78     1.42
  HUB    494.28   545.60    54.26     0.49  8229.68

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.59     1.30    15.69   567.09     1.08   532.06     0.92     0.91
  MEAN    19.30     1.28    15.10   564.46     1.08   526.11     0.92     0.91
  HUB     19.51     1.29    14.16   566.37     1.08   516.64     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     38.75    28.51    24.20     4.31     0.93     0.36     2.90
  MEAN    40.06    16.96    12.70     4.26     0.93     0.30     3.51     0.91
  HUB     45.30    -5.71    -9.30     3.59     0.93     0.15     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.998

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     687.226     435.251     531.823    1125.645       0.611      -0.001

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      19.424      15.098     526.529      24.000      39.297      35.400      -3.897

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     547.630     435.251     699.530    1140.932       0.480       0.343

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.346      16.521     540.927     528.796       0.027       0.478

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     503.630       0.000     503.630    1144.999       0.440       0.397

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.879     544.790       0.000       0.060       0.042       0.423

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      19.281       1.276     565.975      43.165     205.488       1.593

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 268740.031       0.582    2517.659 1646176.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    165.780    3776.000      19.281     565.975       1.000       1.000       0.980
W Kg/sec =   75.35457

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    132.026    3614.860       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127531.688  130082.039       1.536     590.487     384.502     474.134       1.233

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   479.00    -0.16   479.00     0.42   648.24
 MEAN    18.08     0.00    -0.02   479.00    -0.16   479.00     0.42
 HUB     15.21     0.00    -0.02   479.00    -0.16   479.00     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.73    46.36     8.37   677.16   829.59    17.10   546.82     0.72
 MEAN    51.21    42.30     8.91   595.71   764.53    17.10   546.82     0.67
 HUB     46.31    37.84     8.47   501.20   693.40    17.10   546.82     0.60

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   580.95   338.32   472.28  1175.62     0.49
 MEAN    18.01   591.91   344.45   481.36  1170.70     0.51
 HUB     15.22   641.27   411.88   491.50  1165.85     0.55

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   578.77   334.56     0.49  6911.82
 MEAN   593.46   541.95   249.01     0.46  6206.53     1.54
 HUB    501.63   499.63    89.74     0.43  6272.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.54     1.22    19.92   602.54     1.06   574.36     0.92     0.91
 MEAN    23.08     1.20    19.38   598.81     1.06   569.56     0.92     0.91
 HUB     23.12     1.20    18.82   599.16     1.06   564.83     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.62    35.31    31.50     3.81     0.93     0.37     2.90
 MEAN    35.59    27.35    23.50     3.85     0.93     0.36     3.30     0.91
 HUB     39.96    10.35     6.50     3.85     0.93     0.36     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.650       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     963.395     345.418     899.343    1121.514       0.859      -1.303

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.207      14.327     522.680      46.000      21.011      30.600       9.589

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     898.703     345.418     962.798    1132.232       0.794      -1.081

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      23.010      15.182     532.736     345.258       0.061       0.191

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     894.883       0.000     894.883    1133.168       0.790       0.182

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      15.031     533.342       0.000       0.060       0.143      -1.120

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.791      22.691       1.177     600.169      34.194     228.005       1.767

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 213016.469       0.470    1995.620 1472152.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.830

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    165.780    3776.000      22.691     600.169       1.000       1.000       0.680
W Kg/sec =   75.35457

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    115.524    3510.375       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127531.688  130082.039       1.125     378.495     336.465     293.880       0.873

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   762.37    -0.26   762.37     0.66   614.80
 MEAN    17.74     0.00    -0.02   762.37    -0.26   762.37     0.66
 HUB     15.05     0.00    -0.02   762.37    -0.26   762.37     0.66

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     40.95    46.36    -5.41   661.34  1009.42    16.91   551.66     0.88
 MEAN    37.49    43.40    -5.91   584.52   960.82    16.91   551.66     0.83
 HUB     33.06    38.84    -5.78   495.92   909.62    16.91   551.66     0.79

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   552.30   275.82   478.50  1205.08     0.46
 MEAN    17.51   565.10   292.83   483.31  1202.10     0.47
 HUB     14.85   614.67   370.59   490.39  1199.22     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   609.15   376.96     0.51  5469.27
 MEAN   576.87   560.60   284.04     0.47  5131.15     1.81
 HUB    489.33   504.56   118.74     0.42  5507.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     25.72     1.13    22.27   629.08     1.05   603.63     0.92     0.76
 MEAN    25.53     1.13    21.94   627.30     1.05   600.65     0.92     0.76
 HUB     25.75     1.13    21.52   629.28     1.05   597.75     0.92     0.76

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.96    38.23    31.50     6.73     0.93     0.44     2.90
 MEAN    31.21    30.44    23.50     6.94     0.87     0.46     3.28     0.76
 HUB     37.08    13.61     6.50     7.11     0.87     0.50     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.830

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     571.335     294.755     489.432    1202.741       0.475       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.628      21.956     601.312      46.000      31.058      31.500       0.442

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     500.618     294.755     580.946    1209.051       0.414       0.222

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.596      22.744     607.639     471.992       0.019       0.324

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     485.316       0.000     485.316    1210.303       0.401       0.238

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.848     608.898       0.000       0.060       0.037       0.250

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.726      25.528       1.125     628.555      28.386     264.672       2.052

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 176948.703       0.415    1657.723 2340382.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    165.780    3776.000      25.528     628.555       1.000       1.000       0.980
W Kg/sec =   75.35457

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    105.086    3430.193       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127531.688  130082.039       1.677     513.330     306.088     401.059       1.310

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   454.67    -0.16   454.67     0.37   576.51
 MEAN    16.97     0.00    -0.02   454.67    -0.16   454.67     0.37
 HUB     14.32     0.00    -0.02   454.67    -0.16   454.67     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.39    46.36     8.03   634.65   780.84    23.16   611.31     0.64
 MEAN    50.89    43.80     7.09   559.22   720.85    23.16   611.31     0.59
 HUB     46.07    37.84     8.23   471.87   655.39    23.16   611.31     0.54

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   543.92   298.42   454.75  1234.55      0.44
MEAN    16.57   553.51   306.23   461.08  1230.81      0.45
HUB     13.89   597.42   371.13   468.15  1227.10      0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    622.13   558.20   323.71     0.45  5637.16
MEAN   546.14   519.76   239.91     0.42  5078.03     1.51
HUB    457.70   476.09    86.57     0.39  5157.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     29.61     1.16    25.91   658.34     1.05   633.66     0.92     0.91
MEAN    29.18     1.14    25.40   655.38     1.04   629.83     0.92     0.91
HUB     29.24     1.15    24.86   655.80     1.04   626.03     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.27    35.44    31.50     3.94     0.93     0.35     2.90
MEAN    33.59    27.49    23.50     3.99     0.93     0.34     3.29     0.91
HUB     38.41    10.48     6.50     3.98     0.93     0.35     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     546.217     307.950     451.132    1232.545       0.443       0.052

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    29.303      25.604     631.623      46.000      34.318      32.400      -1.918

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     465.803     307.950     558.395    1239.150       0.376       0.293

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      29.272      26.549     638.411     456.573       0.018       0.380

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    16.096     442.318       0.000     442.318    1240.875       0.356       0.286

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      26.736     640.190       0.000       0.060       0.038       0.341

   STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      29.193       1.144     656.509      27.954     240.676       1.866

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 174364.938       0.451    1633.517 1425602.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  1.000

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   165.780    3776.000      29.193     656.509       1.000       1.000       0.980
W Kg/sec =   75.35457

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    93.914    3356.370       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127531.688  130082.039       1.863     509.668     273.569     390.276       1.427

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   412.05    -0.14   412.05     0.33   536.57
 MEAN    15.91     0.00    -0.02   412.05    -0.14   412.05     0.33
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 HUB     13.07     0.00    -0.02   412.05    -0.14   412.05     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.69    47.36     8.33   603.68   731.01    27.05   642.36     0.59
 MEAN    51.85    44.80     7.05   524.36   667.00    27.05   642.36     0.54
 HUB     46.28    38.84     7.44   430.68   596.15    27.05   642.36     0.48

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   508.58   294.01   414.98  1262.47     0.40
 MEAN    15.50   511.65   290.63   421.10  1258.34     0.41
 HUB     12.59   543.91   335.96   427.75  1254.24     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   510.40   297.15     0.40  5277.14
 MEAN   510.67   475.12   220.05     0.38  4506.32     1.54
 HUB    414.86   434.96    78.90     0.35  4231.62

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     33.35     1.14    29.82   684.37     1.04   662.81     0.92     0.91
 MEAN    32.72     1.12    29.19   680.30     1.04   658.48     0.92     0.91
 HUB     32.49     1.11    28.55   678.85     1.03   654.19     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.32    35.60    31.50     4.10     0.93     0.37     2.90
 MEAN    34.61    27.59    23.50     4.09     0.93     0.35     3.34     0.91
 HUB     38.15    10.45     6.50     3.95     0.93     0.34     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       1.000

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     517.651     295.959     424.701    1258.673       0.411      -0.005

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      32.779      29.174     658.834      46.000      34.871      33.000      -1.871

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     443.730     295.959     533.374    1264.320       0.351       0.237

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      32.731      30.057     664.759     440.827       0.033       0.392

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     414.641       0.000     414.641    1266.298       0.327       0.327

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      30.371     666.840       0.000       0.060       0.038       0.323

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.882      32.714       1.121     681.173      24.664     250.634       1.943

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  153960.234       0.441    1442.358 1455065.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     987030.38   9246.8770    161.9505      2.1655      0.8187      7.9532      1.3029


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
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*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 100%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 8.966   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     160.332    3776.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   72.87835

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     156.629    3761.129       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  123340.875  125807.422       1.823     831.557     456.137     619.754       1.359

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   376.90    -0.13   376.90     0.34   677.10
  MEAN    17.06     0.00    -0.02   376.90    -0.13   376.90     0.34
  HUB     12.51     0.00    -0.02   376.90    -0.13   376.90     0.34

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.00    50.47    10.53   679.80   777.40    13.94   510.95     0.70
  MEAN    56.17    47.20     8.97   562.16   676.92    13.94   510.95     0.61
  HUB     47.57    38.62     8.95   412.23   558.65    13.94   510.95     0.50

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   638.88   416.73   484.26  1133.93     0.56
  MEAN    18.04   665.98   442.55   497.68  1127.34     0.59
  HUB     15.00   754.52   546.29   520.45  1117.37     0.68

        U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    679.80   551.10   263.07     0.49  8599.78
  MEAN   594.32   520.30   151.77     0.46  7984.09     1.46
  HUB    494.28   523.04    52.01     0.47  8195.94

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.72     1.31    15.89   568.33     1.09   534.24     0.92     0.91
  MEAN    19.36     1.28    15.28   565.07     1.08   528.03     0.92     0.91
  HUB     19.48     1.29    14.35   566.19     1.08   518.66     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     40.71    28.51    24.20     4.31     0.93     0.38     2.90
  MEAN    41.64    16.96    12.70     4.26     0.93     0.33     3.51     0.91
  HUB     46.39    -5.71    -9.30     3.59     0.93     0.18     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.996

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     674.687     441.692     510.011    1127.765       0.598       0.001

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      19.473      15.283     528.513      24.000      40.894      35.400      -5.494

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      18.071     523.856     441.692     685.213    1143.761       0.458       0.371

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      19.386      16.786     543.612     528.796       0.030       0.503

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     482.934       0.000     482.934    1147.375       0.421       0.417

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.095     547.053       0.000       0.060       0.047       0.443

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      19.313       1.278     566.533      43.723     199.689       1.548

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 272215.094       0.589    2466.412 1584834.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.966   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    160.332    3776.000      19.313     566.533       1.000       1.000       0.980
W Kg/sec =   72.87835

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    127.537    3613.079       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123340.875  125807.422       1.590     590.487     371.429     474.134       1.277

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   459.74    -0.16   459.74     0.40   647.92
 MEAN    18.08     0.00    -0.02   459.74    -0.16   459.74     0.40
 HUB     15.21     0.00    -0.02   459.74    -0.16   459.74     0.40

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.83    46.36     9.47   677.16   818.61    17.29   548.89     0.71
 MEAN    52.35    42.30    10.05   595.71   752.61    17.29   548.89     0.65
 HUB     47.48    37.84     9.64   501.20   680.24    17.29   548.89     0.59

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   573.76   352.24   452.91  1178.43     0.49
 MEAN    18.01   582.45   354.66   462.01  1173.21     0.50
 HUB     15.22   629.03   415.60   472.19  1168.05     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   554.92   320.64     0.47  7195.91
 MEAN   593.46   520.08   238.80     0.44  6390.33     1.58
 HUB    501.63   479.96    86.03     0.41  6329.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.74     1.23    20.18   604.60     1.07   577.11     0.92     0.91
 MEAN    23.21     1.20    19.61   600.34     1.06   572.01     0.92     0.91
 HUB     23.17     1.20    19.02   600.01     1.06   566.98     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.87    35.30    31.50     3.80     0.93     0.40     2.90
 MEAN    37.51    27.33    23.50     3.83     0.94     0.38     3.30     0.91
 HUB     41.35    10.33     6.50     3.83     0.94     0.37     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.991

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     900.935     355.659     827.763    1133.411       0.795      -1.122

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.337      15.381     533.879      46.000      23.251      30.600       7.349

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     819.695     355.659     893.529    1145.728       0.715      -0.826

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      23.200      16.489     545.550     345.258       0.046       0.233

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     17.823     809.775       0.000     809.775    1147.219       0.706       0.295

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      16.493     546.906       0.000       0.060       0.098      -0.825

    STAGE EXIT CONDITIONS, STAGE            2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.830      23.006       1.191     601.651      35.118     218.948       1.697

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 218776.641       0.483    1982.232 1412895.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.966   EfDer =  0.877

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    160.332    3776.000      23.006     601.651       1.000       1.000       0.680
W Kg/sec =   72.87835

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    110.334    3506.047       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123340.875  125807.422       1.178     378.495     321.349     293.880       0.915

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   706.72    -0.24   706.72     0.61   614.04
 MEAN    17.74     0.00    -0.02   706.72    -0.24   706.72     0.61
 HUB     15.05     0.00    -0.02   706.72    -0.24   706.72     0.61

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.11    46.36    -3.25   661.34   968.06    17.91   559.97     0.83
 MEAN    39.61    43.40    -3.79   584.52   917.27    17.91   559.97     0.79
 HUB     35.07    38.84    -3.77   495.92   863.50    17.91   559.97     0.74

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   540.57   301.43   448.73  1210.28     0.45
 MEAN    17.51   551.05   312.01   454.21  1206.65     0.46
 HUB     14.85   597.30   379.45   461.29  1203.14     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    652.78   569.92   351.35     0.47  5976.20
 MEAN   576.87   525.79   264.86     0.44  5466.52     1.85
 HUB    489.33   474.19   109.88     0.39  5638.51

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.57     1.15    23.17   633.24     1.05   608.86     0.92     0.80
 MEAN    26.25     1.14    22.75   630.55     1.05   605.21     0.92     0.80
 HUB     26.36     1.15    22.27   631.46     1.05   601.69     0.92     0.80
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.89    38.06    31.50     6.56     0.93     0.46     2.90
 MEAN    34.49    30.25    23.50     6.75     0.88     0.48     3.28     0.80
 HUB     39.44    13.40     6.50     6.90     0.88     0.51     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.877

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     556.764     314.056     459.734    1207.302       0.461       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.357      22.778     605.881      46.000      34.338      31.500      -2.838

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     467.932     314.056     563.553    1214.847       0.385       0.281

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.322      23.759     613.478     471.992       0.019       0.374

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     454.064       0.000     454.064    1215.903       0.373       0.289

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.838     614.545       0.000       0.060       0.039       0.303

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.770      26.249       1.141     631.752      30.100     243.855       1.890

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 187643.547       0.440    1700.150 2190191.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.966   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    160.332    3776.000      26.249     631.752       1.000       1.000       0.980
W Kg/sec =   72.87835

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     99.091    3421.503       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123340.875  125807.422       1.779     513.330     288.625     401.059       1.390

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   426.02    -0.15   426.02     0.35   575.05
 MEAN    16.97     0.00    -0.02   426.02    -0.15   426.02     0.35
 HUB     14.32     0.00    -0.02   426.02    -0.15   426.02     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.13    46.36     9.77   634.65   764.50    24.12   616.61     0.63
 MEAN    52.71    43.80     8.91   559.22   703.12    24.12   616.61     0.58
 HUB     47.93    37.84    10.09   471.87   635.84    24.12   616.61     0.52

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   532.08   319.82   425.24  1240.75     0.43
 MEAN    16.57   538.50   321.90   431.70  1236.58     0.44
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 HUB     13.89   578.52   376.93   438.88  1232.44     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    622.13   521.74   302.31     0.42  6041.01
 MEAN   546.14   486.47   224.24     0.39  5337.57     1.58
 HUB    457.70   446.25    80.77     0.36  5237.64

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.72     1.17    27.07   663.67     1.05   640.05     0.92     0.91
 MEAN    30.17     1.15    26.48   659.95     1.04   635.76     0.92     0.91
 HUB     30.09     1.15    25.87   659.42     1.04   631.51     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.95    35.41    31.50     3.91     0.93     0.39     2.90
 MEAN    36.71    27.45    23.50     3.95     0.93     0.38     3.29     0.91
 HUB     40.66    10.43     6.50     3.93     0.93     0.37     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     532.379     323.707     422.660    1238.139       0.430       0.049

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.289      26.671     637.372      46.000      37.448      32.400      -5.048

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     434.817     323.707     542.081    1245.760       0.349       0.344

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.247      27.801     645.242     456.573       0.021       0.428

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     413.533       0.000     413.533    1247.213       0.332       0.330

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.941     646.749       0.000       0.060       0.045       0.381

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      30.153       1.149     661.013      29.261     225.105       1.745

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 182535.141       0.472    1653.865 1361389.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.966   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    160.332    3776.000      30.153     661.013       1.000       1.000       0.980
W Kg/sec =   72.87835

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.238    3344.916       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123340.875  125807.422       1.983     509.668     257.036     390.276       1.518

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   385.71    -0.13   385.71     0.31   534.74
 MEAN    15.91     0.00    -0.02   385.71    -0.13   385.71     0.31
 HUB     13.07     0.00    -0.02   385.71    -0.13   385.71     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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 TIP     57.43    47.36    10.07   603.68   716.49    28.22   648.61     0.57
 MEAN    53.67    44.80     8.87   524.36   651.05    28.22   648.61     0.52
 HUB     48.16    38.84     9.32   430.68   578.25    28.22   648.61     0.46

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   498.91   313.79   387.87  1269.28     0.39
 MEAN    15.50   498.32   305.19   393.93  1264.81     0.39
 HUB     12.59   526.20   341.28   400.51  1260.37     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   476.84   277.36     0.38  5631.90
 MEAN   510.67   444.31   205.48     0.35  4731.85     1.62
 HUB    414.86   407.21    73.58     0.32  4298.49

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.70     1.15    31.19   690.74     1.04   669.99     0.92     0.91
 MEAN    33.94     1.13    30.49   685.99     1.04   665.29     0.92     0.91
 HUB     33.58     1.11    29.78   683.70     1.03   660.62     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.97    35.57    31.50     4.07     0.93     0.41     2.90
 MEAN    37.77    27.55    23.50     4.05     0.93     0.39     3.34     0.91
 HUB     40.43    10.41     6.50     3.91     0.93     0.37     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     504.427     310.787     397.314    1265.107       0.399      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.000      30.470     665.601      46.000      38.033      33.000      -5.033

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     413.852     310.787     517.554    1271.679       0.325       0.291

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.934      31.532     672.534     440.827       0.039       0.440

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     387.270       0.000     387.270    1273.356       0.304       0.372

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      31.802     674.309       0.000       0.060       0.045       0.366

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      33.910       1.125     686.812      25.799     234.419       1.817

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  161070.125       0.461    1459.380 1390080.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1022240.56   9262.0381    156.6287      2.2447      0.8317      8.9664      1.3137


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*******************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 100%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    154.804    3776.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   70.36555

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    151.228    3761.129       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119088.148  121469.656       1.888     831.557     440.409     619.754       1.407

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   362.31    -0.12   362.31     0.33   677.10
 MEAN    17.06     0.00    -0.02   362.31    -0.12   362.31     0.33
 HUB     12.51     0.00    -0.02   362.31    -0.12   362.31     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.95    50.47    11.48   679.80   770.43    14.03   511.85     0.69
 MEAN    57.20    47.20    10.00   562.16   668.91    14.03   511.85     0.60
 HUB     48.70    38.62    10.08   412.23   548.91    14.03   511.85     0.49

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   631.06   427.71   464.01  1136.06     0.56
 MEAN    18.04   655.05   448.80   477.15  1129.24     0.58
 HUB     15.00   737.95   544.07   498.56  1119.36     0.66

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    679.80   528.07   252.09     0.46  8826.17
 MEAN   594.32   498.84   145.52     0.44  8096.73     1.51
 HUB    494.28   501.04    49.79     0.45  8162.58

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.83     1.31    16.07   569.53     1.09   536.27     0.92     0.91
 MEAN    19.40     1.28    15.44   565.67     1.08   529.83     0.92     0.91
 HUB     19.44     1.29    14.52   566.02     1.08   520.54     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.67    28.51    24.20     4.31     0.93     0.41     2.90
 MEAN    43.25    16.96    12.70     4.26     0.94     0.35     3.51     0.91
 HUB     47.50    -5.70    -9.30     3.60     0.94     0.20     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.991

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     662.986     447.930     488.783    1129.733       0.587       0.002

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.513      15.451     530.360      24.000      42.503      35.400      -7.103

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     501.002     447.930     672.045    1146.383       0.437       0.399

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.414      17.024     546.108     528.796       0.034       0.527

   VANED DIFFUSER EXIT:
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   R4          C4           Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     462.934       0.000     462.934    1149.596       0.403       0.435

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.285     549.173       0.000       0.060       0.053       0.461

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      19.331       1.280     567.073      44.263     193.995       1.504

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 275572.750       0.596    2410.745 1523501.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    154.804    3776.000      19.331     567.073       1.000       1.000       0.980
W Kg/sec =   70.36555

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    123.086    3611.360       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119088.148  121469.656       1.647     590.487     358.468     474.134       1.323

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   441.06    -0.15   441.06     0.38   647.62
 MEAN    18.08      0.00    -0.02   441.06    -0.15   441.06     0.38
 HUB     15.21      0.00    -0.02   441.06    -0.15   441.06     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.93    46.36    10.57   677.16   808.26    17.47   550.83     0.70
 MEAN    53.49    42.30    11.19   595.71   741.34    17.47   550.83     0.64
 HUB     48.66    37.84    10.82   501.20   667.75    17.47   550.83     0.58

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   567.70   365.43   434.44  1181.01     0.48
 MEAN    18.01   573.96   364.39   443.46  1175.54     0.49
 HUB     15.22   617.57   419.14   453.55  1170.11     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    672.88   532.22   307.45     0.45  7465.20
 MEAN   593.46   499.13   229.08     0.42  6565.30     1.62
 HUB    501.63   460.99    82.49     0.39  6382.85

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.91     1.24    20.41   606.56     1.07   579.66     0.92     0.90
 MEAN    23.32     1.21    19.81   601.80     1.06   574.30     0.92     0.90
 HUB     23.20     1.20    19.19   600.84     1.06   569.00     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.07    35.29    31.50     3.79     0.93     0.42     2.90
 MEAN    39.41    27.32    23.50     3.82     0.94     0.40     3.30     0.90
 HUB     42.74    10.31     6.50     3.81     0.94     0.39     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3           Mach3       cp 2-3
     17.960     854.518     365.408     772.449    1142.094       0.748      -0.992
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Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.437	16.159	542.100	46.000	25.317	30.600	5.283

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	761.032	365.408	844.211	1155.300	0.659	-0.643

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	23.339	17.435	554.711	345.258	0.037	0.266

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	749.564	0.000	749.564	1156.826	0.648	0.364

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	17.498	556.159	0.000	0.060	0.072	-0.626

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.848	23.211	1.201	603.069	35.996	210.518	1.632

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
224247.969	0.495	1961.749	1354479.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =10.004 EfDer = 0.915

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
154.804	3776.000	23.211	603.069	1.000	1.000	0.680

W Kg/sec = 70.36555

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
105.714	3501.925	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
119088.148	121469.656	1.229	378.495	307.893	293.880	0.954

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	662.75	-0.23	662.75	0.57	613.32
MEAN	17.74	0.00	-0.02	662.75	-0.23	662.75	0.57	
HUB	15.05	0.00	-0.02	662.75	-0.23	662.75	0.57	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	44.95	46.36	-1.41	661.34	936.44	18.65	566.41	0.80
MEAN	41.42	43.40	-1.98	584.52	883.84	18.65	566.41	0.76
HUB	36.82	38.84	-2.02	495.92	827.89	18.65	566.41	0.71

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	532.50	322.78	423.52	1214.61	0.44
MEAN	17.51	540.38	327.96	429.48	1210.48	0.45
HUB	14.85	583.23	386.70	436.61	1206.49	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	652.78	536.90	329.99	0.44	6398.95	
MEAN	576.87	496.40	248.91	0.41	5745.55	1.90
HUB	489.33	448.51	102.64	0.37	5745.91	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.24	1.17	23.87	636.90	1.06	613.23	0.92	0.84
MEAN	26.81	1.16	23.38	633.44	1.05	609.07	0.92	0.84
HUB	26.81	1.16	22.85	633.44	1.05	605.06	0.92	0.84

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.31	37.92	31.50	6.42	0.93	0.49	2.90	

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 MEAN    37.37    30.09    23.50     6.59     0.89     0.49     3.28     0.84
 HUB     41.53    13.23     6.50     6.73     0.89     0.52     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.915

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     545.732     330.115     434.566    1211.135       0.451       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.918      23.414     609.738      46.000      37.222      31.500      -5.722

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     440.721     330.115     550.646    1219.691       0.361       0.331

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.872      24.551     618.384     471.992       0.023       0.419

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     428.165       0.000     428.165    1220.589       0.351       0.329

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.596     619.294       0.000       0.060       0.048       0.343

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.801       26.783       1.154     634.594      31.525     228.092       1.768

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 196532.359       0.461    1719.290 2063750.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.989

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    154.804     3776.000       26.783     634.594       1.000        1.000        0.980
W Kg/sec =   70.36555

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     93.978     3413.832        1.401       0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 119088.148  121469.656        1.875     513.330     273.733     401.059       1.465

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa     C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   402.17    -0.14   402.17      0.33   573.76
 MEAN    16.97      0.00    -0.02   402.17    -0.14   402.17      0.33
 HUB     14.32      0.00    -0.02   402.17    -0.14   402.17      0.33

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     57.64     46.36    11.28   634.65   751.46     24.85   621.10      0.61
 MEAN    54.28     43.80    10.48   559.22   688.92     24.85   621.10      0.56
 HUB     49.57     37.84    11.73   471.87   620.10     24.85   621.10      0.51

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88    524.03    337.12    401.20   1245.84      0.42
 MEAN    16.57    527.37    334.63    407.60   1241.37      0.42
 HUB     13.89    563.55    381.58    414.71   1236.92      0.46

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
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 TIP    622.13   492.13   285.01     0.40  6367.51
 MEAN   546.14   459.21   211.51     0.37  5548.42     1.64
 HUB    457.70   421.64    76.12     0.34  5302.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.55     1.18    27.93   668.23     1.05   645.33     0.92     0.91
 MEAN    30.90     1.15    27.29   663.90     1.05   640.71     0.92     0.91
 HUB     30.71     1.15    26.63   662.60     1.04   636.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.04    35.39    31.50     3.89     0.93     0.42     2.90
 MEAN    39.38    27.43    23.50     3.93     0.94     0.41     3.29     0.91
 HUB     42.62    10.40     6.50     3.90     0.94     0.40     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     522.170     336.509     399.279    1242.783       0.420       0.046

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.014      27.465     642.170      46.000      40.124      32.400      -7.724

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     409.684     336.509     530.169    1251.215       0.327       0.386

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.956      28.739     650.913     456.573       0.025       0.470

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     390.216       0.000     390.216    1252.462       0.312       0.363

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.831     652.212       0.000       0.060       0.056       0.411

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.863      30.840       1.151     664.912      30.318     212.952       1.651

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 189146.766       0.489    1654.680 1301037.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.004   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    154.804    3776.000      30.840     664.912       1.000       1.000       0.980
W Kg/sec =   70.36555

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.543    3335.093       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119088.148  121469.656       2.094     509.668     243.362     390.276       1.604

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   364.29    -0.13   364.29     0.29   533.17
 MEAN    15.91     0.00    -0.02   364.29    -0.13   364.29     0.29
 HUB     13.07     0.00    -0.02   364.29    -0.13   364.29     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.90    47.36    11.54   603.68   705.19    29.08   653.85     0.56
 MEAN    55.22    44.80    10.42   524.36   638.59    29.08   653.85     0.51
 HUB     49.78    38.84    10.94   430.68   564.18    29.08   653.85     0.45
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      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   492.60   329.45   366.23  1274.83     0.39
 MEAN    15.50   488.67   316.73   372.12  1270.14     0.38
 HUB     12.59   512.49   345.49   378.52  1265.46     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    591.16   450.12   261.70     0.35  5912.65
 MEAN   510.67   419.63   193.94     0.33  4910.63     1.69
 HUB    414.86   384.83    69.37     0.30  4351.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     35.67     1.16    32.17   696.12     1.05   675.89     0.92     0.91
 MEAN    34.81     1.13    31.43   690.83     1.04   670.93     0.92     0.91
 HUB     34.34     1.11    30.67   687.88     1.03   665.99     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.97    35.55    31.50     4.05     0.93     0.44     2.90
 MEAN    40.40    27.53    23.50     4.03     0.94     0.42     3.34     0.91
 HUB     42.39    10.39     6.50     3.89     0.94     0.39     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     494.881     322.543     375.331    1270.394       0.390      -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     34.871      31.405     671.195      46.000      40.674      33.000      -7.674

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     390.191     322.543     506.244    1277.682       0.305       0.333

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      34.777      32.598     678.919     440.827       0.047       0.481

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     365.536       0.000     365.536    1279.143       0.286       0.405

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.828     680.472       0.000       0.060       0.056       0.399

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864      34.745       1.127     691.609      26.697     222.024       1.721

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 166698.734       0.477    1458.302 1329019.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1052198.50   9204.7656    151.2282      2.2999      0.8354     10.0040      1.3229


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

   Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 2.953   EfDer =  0.985

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    185.302    3587.000      15.107     522.810      1.000       1.000       0.980
W Kg/sec =   84.22825

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    181.022    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
142549.688  145400.375       1.577     831.557     527.174     619.754       1.176

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   445.80    -0.15   445.80     0.40   643.21
MEAN    17.06     0.00    -0.02   445.80    -0.15   445.80     0.40
HUB     12.51     0.00    -0.02   445.80    -0.15   445.80     0.40

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.39    50.47     4.92   645.77   784.83    13.50   506.21     0.71
MEAN    50.15    47.20     2.95   534.02   695.76    13.50   506.21     0.63
HUB     41.31    38.62     2.69   391.59   593.47    13.50   506.21     0.54

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   682.90   318.12   604.28  1115.59     0.61
MEAN    18.04   720.57   377.32   613.88  1112.22     0.65
HUB     15.00   834.88   533.68   642.04  1103.00     0.76

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    645.77   687.39   327.65     0.62  6565.97
MEAN   564.57   641.80   187.25     0.58  6808.05     1.19
HUB    469.54   645.24    64.14     0.58  8007.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.32     1.21    14.22   555.83     1.06   516.90     0.92     0.90
MEAN    18.45     1.22    13.91   557.04     1.07   513.71     0.92     0.90
HUB     19.09     1.26    13.05   563.07     1.08   504.93     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     27.76    28.47    24.20     4.27     0.93     0.19     2.90
MEAN    31.58    16.96    12.70     4.26     0.91     0.16     3.51     0.90
HUB     39.73    -5.70    -9.30     3.60     0.91     0.02     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.985

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     736.223     376.591     632.616    1111.497       0.662      -0.016

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.574      13.832     513.376      24.000      30.765      35.400       4.635

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     673.311     376.591     771.472    1119.487       0.601       0.149

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.470      14.460     520.783     528.796       0.031       0.337

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     613.854       0.000     613.854    1126.337       0.545       0.234
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	14.978	527.175	0.000	0.060	0.059	0.255

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.833	18.336	1.214	558.648	35.838	239.491	1.857

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
223122.203	0.535	2336.445	1874567.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 2.953 EfDer = 0.976

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
185.302	3587.000	18.336	558.648	1.000	1.000	0.980

W Kg/sec = 84.22825

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
154.175	3456.371	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
142549.688	145400.375	1.315	590.487	449.004	474.134	1.056

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	579.95	-0.20	579.95	0.51	619.82
MEAN	18.08	0.00	-0.02	579.95	-0.20	579.95	0.51	
HUB	15.21	0.00	-0.02	579.95	-0.20	579.95	0.51	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.97	46.36	1.61	643.27	866.25	15.32	530.56	0.77
MEAN	44.31	42.30	2.01	565.89	810.43	15.32	530.56	0.72
HUB	39.40	37.84	1.56	476.11	750.48	15.32	530.56	0.66

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	632.84	216.89	594.51	1147.95	0.55
MEAN	18.01	648.96	252.87	597.67	1146.82	0.57
HUB	15.22	704.46	364.50	602.83	1145.55	0.61

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	729.24	422.31	0.64	4432.96	
MEAN	563.76	673.69	310.88	0.59	4557.86	1.29
HUB	476.52	613.14	112.01	0.54	5551.88	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.72	1.13	16.85	580.93	1.04	547.50	0.92	0.89
MEAN	20.79	1.13	16.72	581.56	1.04	546.40	0.92	0.89
HUB	21.35	1.16	16.54	586.55	1.05	545.13	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.04	35.39	31.50	3.89	0.93	0.20	2.90	
MEAN	22.93	27.48	23.50	3.98	0.91	0.22	3.30	0.89
HUB	31.16	10.53	6.50	4.03	0.91	0.25	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.976

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	768.578	253.584	725.539	1133.208	0.678	-0.321

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.910	15.361	533.688	46.000	19.265	30.600	11.335

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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     753.936     253.584     795.440    1135.183       0.664      -0.306

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      20.716      15.405     535.549     455.853       0.056       0.130

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     753.273       0.000     753.273    1135.301       0.664      -0.036

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      15.207     535.635       0.000       0.060       0.121      -0.352

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.725      20.439       1.115     583.012      24.364     307.334       2.382

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 151760.312       0.371    1589.172 1733928.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 2.953   EfDer =  0.865

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    185.302    3587.000      20.439     583.012       1.000       1.000       0.880
W Kg/sec =   84.22825

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    141.292    3383.380       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 142549.688  145400.375       1.190     489.817     411.504     384.470       0.934

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   684.26    -0.24   684.26     0.60   592.56
 MEAN    17.74     0.00    -0.02   684.26    -0.24   684.26     0.60
 HUB     15.05     0.00    -0.02   684.26    -0.24   684.26     0.60

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.57    46.36    -3.79   628.24   929.08    16.04   543.93     0.81
 MEAN    39.07    43.40    -4.33   555.26   881.35    16.04   543.93     0.77
 HUB     34.56    38.84    -4.28   471.10   830.88    16.04   543.93     0.73

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   641.79   165.66   620.04  1166.27      0.55
 MEAN    17.51   655.05   212.98   619.46  1167.11      0.56
 HUB     14.85   708.76   337.93   623.01  1167.54      0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   768.74   454.44     0.66  3286.52
 MEAN   548.00   704.25   335.02     0.60  3732.76     1.32
 HUB    464.84   635.80   126.91     0.54  5021.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.08     1.08    17.97   599.52     1.03   565.15     0.92     0.79
 MEAN    22.31     1.09    18.01   601.77     1.03   565.96     0.92     0.79
 HUB     22.99     1.12    17.92   608.24     1.04   566.33     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     14.96    36.24    31.50     4.74     0.93     0.20     2.90
 MEAN    18.97    28.41    23.50     4.91     0.88     0.24     3.28     0.79
 HUB     28.48    11.51     6.50     5.01     0.88     0.29     3.87
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.865

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      664.344     214.380     628.804     1167.277       0.569       -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     22.417      17.991      566.337      46.000      18.826       31.500       12.674

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     17.392      665.175     214.380     698.868     1167.182       0.570       -0.031

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       22.228      17.830      566.245      471.992       0.052       0.133

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4        cp 3-4
     17.121      647.990       0.000     647.990     1169.124       0.554       -0.032

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       17.847      568.128       0.000       0.060       0.104       -0.027

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.614       21.993        1.076      603.177       20.165     350.285        2.715

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 125655.180       0.327    1315.810 1990208.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 2.953   EfDer =  0.909

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    185.302     3587.000       21.993      603.177       1.000        1.000        0.980
W Kg/sec =   84.22825

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
    133.559     3326.343        1.401        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
 142549.688  145400.375        1.320      513.330      389.004      401.059       1.031

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02    599.78    -0.21    599.78      0.51    559.06
 MEAN    16.97      0.00    -0.02    599.78    -0.21    599.78      0.51
 HUB     14.32      0.00    -0.02    599.78    -0.21    599.78      0.51

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     45.16     46.36    -1.20   602.89    850.57     18.40    573.16      0.72
 MEAN    41.54     43.80    -2.26   531.23    801.35     18.40    573.16      0.68
 HUB     36.79     37.84    -1.05   448.25    748.90     18.40    573.16      0.64

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP      18.88   646.95    138.91    631.86   1182.88      0.55
 MEAN     16.57   657.11    188.26    629.56   1184.29      0.55
 HUB      13.89   705.12    315.10    630.80   1185.21      0.59

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP     590.99    776.93    452.08      0.66   2626.61
 MEAN    518.80    711.06    330.55      0.60   3123.65      1.20
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 HUB    434.79   642.06   119.69     0.54  4379.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.42     1.06    19.11   616.37     1.02   581.46     0.92     0.83
 MEAN    23.70     1.08    19.22   618.87     1.03   582.85     0.92     0.83
 HUB     24.41     1.11    19.21   625.17     1.04   583.71     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     12.40    35.58    31.50     4.08     0.93     0.11     2.90
 MEAN    16.65    27.70    23.50     4.20     0.89     0.15     3.29     0.83
 HUB     26.54    10.74     6.50     4.24     0.89     0.20     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.909

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     642.711     189.316     614.196    1186.941       0.541       0.057

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.798      19.491     585.669      46.000      17.131      32.400      15.269

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     663.247     189.316     689.736    1184.671       0.560      -0.029

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.568      19.046     583.431     456.573       0.059       0.117

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     630.973       0.000     630.973    1188.205       0.531      -0.061

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.206     586.916       0.000       0.060       0.122       0.005

    STAGE EXIT CONDITIONS, STAGE             4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.582      23.276       1.058     620.136      16.958     382.195       2.963

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 105711.070       0.303    1106.963 1740999.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 2.953   EfDer =  0.869

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    185.302    3587.000      23.276     620.136       1.000       1.000       0.980
W Kg/sec =   84.22825

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    127.958    3280.546       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 142549.688  145400.375       1.367     509.668     372.710     390.276       1.047

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   579.98    -0.20   579.98     0.49   524.45
 MEAN    15.91     0.00    -0.02   579.98    -0.20   579.98     0.49
 HUB     13.07     0.00    -0.02   579.98    -0.20   579.98     0.49

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.69    47.36    -2.67   573.46   815.76    19.80   592.08     0.68
 MEAN    40.67    44.80    -4.13   498.12   764.65    19.80   592.08     0.64
 HUB     35.21    38.84    -3.63   409.12   709.87    19.80   592.08     0.59

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   626.86   117.27   615.79  1199.38     0.52
MEAN    15.50   634.95   160.29   614.39  1200.44     0.53
HUB     12.59   675.53   276.80   616.22  1201.06     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    561.57   759.34   444.30     0.63  2107.43
MEAN   485.11   694.97   324.82     0.58  2487.27     1.18
HUB    394.10   627.28   117.30     0.52  3487.49

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.40     1.05    20.25   630.72     1.02   597.95     0.92     0.80
MEAN    24.60     1.06    20.33   632.62     1.02   599.00     0.92     0.80
HUB     25.15     1.08    20.29   637.64     1.03   599.59     0.92     0.80

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     10.78    35.81    31.50     4.31     0.93     0.09     2.90
MEAN    14.62    27.87    23.50     4.37     0.88     0.12     3.34     0.80
HUB     24.19    10.78     6.50     4.28     0.88     0.16     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.869

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     642.749     163.228     621.677    1200.487       0.535      -0.016

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.630      20.261     599.203      46.000      14.712      33.000      18.288

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     694.269     163.228     713.200    1194.717       0.581      -0.253

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.100      19.169     593.458     440.827       0.140       0.092

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     638.441       0.000     638.441    1200.948       0.532      -0.098

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.827     599.664       0.000       0.060       0.154      -0.105

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.424      24.038       1.033     633.662      13.526     443.602       3.439

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  84342.133       0.267     883.196 1804178.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    690590.88   7231.5864    181.0216      1.5911      0.6718      2.9530      1.2120

*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

   Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.989
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
182.555	3587.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 82.97945

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
178.338	3572.873	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
140436.203	143244.625	1.601	831.557	519.358	619.754	1.193

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	437.94	-0.15	437.94	0.40	643.21
MEAN	17.06	0.00	-0.02	437.94	-0.15	437.94	0.40	
HUB	12.51	0.00	-0.02	437.94	-0.15	437.94	0.40	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.86	50.47	5.39	645.77	780.39	13.55	506.79	0.71
MEAN	50.65	47.20	3.45	534.02	690.75	13.55	506.79	0.63
HUB	41.81	38.62	3.19	391.59	587.59	13.55	506.79	0.53

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	674.10	325.68	590.21	1117.46	0.60
MEAN	18.04	711.22	381.48	600.26	1113.77	0.64
HUB	15.00	822.69	532.18	627.38	1104.61	0.74

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	645.77	671.41	320.09	0.60	6721.99	
MEAN	564.57	627.56	183.09	0.56	6882.97	1.21
HUB	469.54	630.50	62.64	0.57	7984.59	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.42	1.22	14.40	556.61	1.06	518.67	0.92	0.90
MEAN	18.51	1.22	14.06	557.42	1.07	515.20	0.92	0.90
HUB	19.10	1.26	13.21	562.96	1.08	506.49	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.89	28.47	24.20	4.27	0.93	0.21	2.90	
MEAN	32.44	16.96	12.70	4.26	0.92	0.17	3.51	0.90
HUB	40.31	-5.70	-9.30	3.60	0.92	0.03	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.989

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	725.869	380.740	617.999	1113.243	0.652	-0.014

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.626	13.993	514.990	24.000	31.637	35.400	3.763

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	654.948	380.740	757.575	1122.049	0.584	0.172

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.535	14.712	523.169	528.796	0.029	0.352

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	597.613	0.000	597.613	1128.464	0.530	0.255

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.215	529.168	0.000	0.060	0.053	0.277

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.846	18.421	1.219	558.997	36.187	235.650	1.827

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
225297.688	0.540	2324.247	1841520.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 3.453 EfDer = 0.983

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
182.555	3587.000	18.421	558.997	1.000	1.000	0.980

W Kg/sec = 82.97945

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
151.228	3455.291	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
140436.203	143244.625	1.341	590.487	440.422	474.134	1.077

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	565.27	-0.19	565.27	0.50	619.63
MEAN	18.08	0.00	-0.02	565.27	-0.19	565.27	0.50	
HUB	15.21	0.00	-0.02	565.27	-0.19	565.27	0.50	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.70	46.36	2.34	643.27	856.49	15.53	532.32	0.76
MEAN	45.04	42.30	2.74	565.89	799.99	15.53	532.32	0.71
HUB	40.12	37.84	2.28	476.11	739.19	15.53	532.32	0.65

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	620.63	229.80	576.51	1151.00	0.54
MEAN	18.01	637.03	261.91	580.70	1149.35	0.55
HUB	15.22	692.33	367.77	586.57	1147.61	0.60

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	707.08	409.39	0.61	4696.59	
MEAN	563.76	654.47	301.85	0.57	4720.52	1.31
HUB	476.52	596.57	108.75	0.52	5601.51	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.98	1.14	17.21	582.60	1.04	550.45	0.92	0.90
MEAN	20.99	1.14	17.04	582.72	1.04	548.85	0.92	0.90
HUB	21.50	1.17	16.81	587.15	1.05	547.14	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	21.73	35.38	31.50	3.88	0.93	0.22	2.90	
MEAN	24.28	27.47	23.50	3.97	0.91	0.23	3.30	0.90
HUB	32.09	10.50	6.50	4.00	0.91	0.26	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.983

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	747.879	262.646	700.242	1137.202	0.658	-0.301

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.118	15.791	537.455	46.000	20.560	30.600	10.040

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	722.051	262.646	768.336	1140.551	0.633	-0.247

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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      20.959      15.997     540.625     455.853       0.048       0.158

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     717.701       0.000     717.701    1141.115       0.629       0.023

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      15.887     541.149       0.000       0.060       0.100      -0.273

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.770      20.745       1.126     584.159      25.161     296.179       2.296

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 156726.734       0.384    1616.846 1696101.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.891

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    182.555    3587.000      20.745     584.159       1.000       1.000       0.880
W Kg/sec =   82.97945

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    137.277    3380.058       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 140436.203  143244.625       1.225     489.817     399.809     384.470       0.962

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   655.59    -0.23   655.59     0.57   591.98
 MEAN    17.74     0.00    -0.02   655.59    -0.23   655.59     0.57
 HUB     15.05     0.00    -0.02   655.59    -0.23   655.59     0.57

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.79    46.36    -2.57   628.24   908.17    16.63   548.28     0.79
 MEAN    40.27    43.40    -3.13   555.26   859.28    16.63   548.28     0.75
 HUB     35.71    38.84    -3.13   471.10   807.43    16.63   548.28     0.70

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   620.42   186.94   591.59  1171.87     0.53
 MEAN    17.51   635.02   228.03   592.66  1171.80     0.54
 HUB     14.85   688.80   343.78   596.87  1171.48     0.59

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   733.22   433.17     0.63  3707.74
 MEAN   548.00   673.52   319.97     0.57  3996.00     1.35
 HUB    464.84   609.03   121.06     0.52  5108.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.69     1.09    18.74   602.79     1.03   570.66     0.92     0.82
 MEAN    22.85     1.10    18.71   604.23     1.03   570.58     0.92     0.82
 HUB     23.46     1.13    18.56   609.82     1.04   570.23     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.54    36.21    31.50     4.71     0.93     0.23     2.90
 MEAN    21.04    28.36    23.50     4.86     0.89     0.26     3.28     0.82
 HUB     29.94    11.47     6.50     4.97     0.89     0.30     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.891
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     643.290     229.525     600.949    1172.151       0.549      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.954      18.701     571.071      46.000      20.904      31.500      10.596

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     630.129     229.525     670.630    1173.586       0.537       0.018

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.815      18.746     572.470     471.992       0.042       0.169

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     611.762       0.000     611.762    1175.536       0.520       0.029

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.828     574.374       0.000       0.060       0.080       0.037

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.694      22.650       1.092     605.615      21.456     327.269       2.537

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 133703.438       0.348    1379.330 1928773.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.938

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    182.555    3587.000      22.650     605.614       1.000       1.000       0.980
W Kg/sec =   82.97945

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    128.019    3319.643       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 140436.203  143244.625       1.377     513.330     372.867     401.059       1.076

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   568.15    -0.20   568.15     0.48   557.93
 MEAN    16.97     0.00    -0.02   568.15    -0.20   568.15     0.48
 HUB     14.32     0.00    -0.02   568.15    -0.20   568.15     0.48

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.71    46.36     0.35   602.89   828.56    19.32   578.68     0.70
 MEAN    43.09    43.80    -0.71   531.23   777.95    19.32   578.68     0.66
 HUB     38.28    37.84     0.44   448.25   723.81    19.32   578.68     0.61

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   614.75   168.07   591.33  1191.49     0.52
 MEAN    16.57   627.35   208.50   591.69  1191.61     0.53
 HUB     13.89   676.20   322.41   594.39  1191.46     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   727.01   422.92     0.61  3176.91
 MEAN   518.80   668.12   310.30     0.56  3458.99     1.24
 HUB    434.79   604.92   112.38     0.51  4481.04

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.49     1.08    20.42   621.57     1.03   590.04     0.92     0.86
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 MEAN    24.66     1.09    20.41   622.98     1.03   590.15     0.92     0.86
 HUB     25.27     1.12    20.31   628.12     1.04   589.97     0.92     0.86

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.87    35.57    31.50     4.07     0.93     0.16     2.90
 MEAN    19.41    27.67    23.50     4.17     0.90     0.18     3.29     0.86
 HUB     28.48    10.71     6.50     4.21     0.90     0.22     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.938

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     614.395     209.673     577.510    1194.077       0.515       0.058

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.763      20.668     592.726      46.000      19.954      32.400      12.446

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     616.178     209.673     650.875    1193.892       0.516       0.030

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.603      20.513     592.543     456.573       0.046       0.164

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     584.117       0.000     584.117    1197.123       0.488       0.018

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.747     595.754       0.000       0.060       0.088       0.083

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.709      24.419       1.078     624.224      18.609     346.926       2.689

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 116010.500       0.332    1196.803 1686543.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 3.453   EfDer =  0.913

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    182.555    3587.000      24.419     624.224       1.000       1.000       0.980
W Kg/sec =   82.97945

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.557    3269.787       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 140436.203  143244.625       1.451     509.668     351.151     390.276       1.111

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   539.18    -0.19   539.18     0.45   522.73
 MEAN    15.91     0.00    -0.02   539.18    -0.19   539.18     0.45
 HUB     13.07     0.00    -0.02   539.18    -0.19   539.18     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.77    47.36    -0.59   573.46   787.26    21.26   599.98     0.66
 MEAN    42.74    44.80    -2.06   498.12   734.18    21.26   599.98     0.61
 HUB     37.20    38.84    -1.64   409.12   676.94    21.26   599.98     0.56

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     17.94   585.20   154.64   564.40  1210.94     0.48
 MEAN    15.50   595.66   186.50   565.72  1210.50     0.49
 HUB     12.59   636.97   286.31   568.99  1209.86     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   695.80   406.93     0.57  2777.60
 MEAN   485.11   639.69   298.62     0.53  2893.19     1.23
 HUB    394.10   579.11   107.78     0.48  3607.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.05     1.07    22.20   638.17     1.02   609.61     0.92     0.84
 MEAN    26.12     1.07    22.13   638.75     1.02   609.16     0.92     0.84
 HUB     26.55     1.09    21.98   642.33     1.03   608.49     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.32    35.79    31.50     4.29     0.93     0.15     2.90
 MEAN    18.25    27.83    23.50     4.33     0.89     0.17     3.34     0.84
 HUB     26.71    10.73     6.50     4.23     0.89     0.20     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.913

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     602.267     189.915     571.540    1210.758       0.497      -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.156      22.085     609.493      46.000      18.381      33.000      14.619

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     623.501     189.915     651.783    1208.599       0.516      -0.141

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.806      21.520     607.322     440.827       0.105       0.151

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     575.283       0.000     575.283    1213.387       0.474       0.011

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.128     612.143       0.000       0.060       0.103       0.006

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.644      25.814       1.057     639.748      15.524     385.670       2.990

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96819.523       0.307     998.823 1739509.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     728557.88   7516.0493    178.3378      1.7087      0.7423      3.4534      1.2237


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     179.821    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   81.73685
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
175.667	3572.873	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
138333.188	141099.562	1.625	831.557	511.581	619.754	1.211

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	430.20	-0.15	430.20	0.39	643.21
MEAN	17.06	0.00	-0.02	430.20	-0.15	430.20	0.39	
HUB	12.51	0.00	-0.02	430.20	-0.15	430.20	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.34	50.47	5.87	645.77	776.07	13.61	507.35	0.70
MEAN	51.15	47.20	3.95	534.02	685.87	13.61	507.35	0.62
HUB	42.32	38.62	3.70	391.59	581.84	13.61	507.35	0.53

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	665.93	332.95	576.73	1119.21	0.60
MEAN	18.04	702.38	385.50	587.14	1115.24	0.63
HUB	15.00	811.08	530.76	613.30	1106.12	0.73

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	645.77	656.10	312.82	0.59	6871.84	
MEAN	564.57	613.84	179.07	0.55	6955.39	1.23
HUB	469.54	616.35	61.22	0.56	7963.27	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.51	1.23	14.57	557.36	1.07	520.34	0.92	0.91
MEAN	18.56	1.23	14.20	557.78	1.07	516.60	0.92	0.91
HUB	19.10	1.26	13.35	562.85	1.08	507.96	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.00	28.48	24.20	4.28	0.93	0.23	2.90	
MEAN	33.29	16.96	12.70	4.26	0.92	0.19	3.51	0.91
HUB	40.87	-5.70	-9.30	3.60	0.92	0.04	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	716.149	384.750	604.017	1114.871	0.642	-0.012

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.675	14.144	516.498	24.000	32.497	35.400	2.903

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	637.774	384.750	744.841	1124.396	0.567	0.193

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.594	14.944	525.361	528.796	0.027	0.366

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	582.474	0.000	582.474	1130.412	0.515	0.275

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.430	530.997	0.000	0.060	0.048	0.297

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.856	18.497	1.224	559.334	36.524	231.939	1.798

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
227394.891	0.545	2310.753	1808952.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 3.954 EfDer = 0.989

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
179.821	3587.000	18.497	559.334	1.000	1.000	0.980

W Kg/sec = 81.73685

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
148.400	3454.250	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
138333.188	141099.562	1.366	590.487	432.185	474.134	1.097

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	551.51	-0.19	551.51	0.49	619.44
MEAN	18.08	0.00	-0.02	551.51	-0.19	551.51	0.49	
HUB	15.21	0.00	-0.02	551.51	-0.19	551.51	0.49	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.40	46.36	3.04	643.27	847.47	15.73	533.94	0.75
MEAN	45.75	42.30	3.45	565.89	790.33	15.73	533.94	0.70
HUB	40.81	37.84	2.97	476.11	728.72	15.73	533.94	0.64

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	609.97	241.64	560.06	1153.74	0.53
MEAN	18.01	626.37	270.25	565.07	1151.63	0.54
HUB	15.22	681.27	370.79	571.53	1149.50	0.59

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	686.82	397.56	0.60	4938.14	
MEAN	563.76	636.75	293.51	0.55	4870.54	1.33
HUB	476.52	581.23	105.73	0.51	5647.36	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.22	1.15	17.54	584.15	1.04	553.09	0.92	0.90
MEAN	21.18	1.15	17.32	583.81	1.04	551.06	0.92	0.90
HUB	21.63	1.17	17.05	587.72	1.05	548.97	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	23.34	35.37	31.50	3.87	0.93	0.24	2.90	
MEAN	25.56	27.45	23.50	3.95	0.92	0.25	3.30	0.90
HUB	32.97	10.48	6.50	3.98	0.92	0.27	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.989

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	729.905	271.004	677.730	1140.676	0.640	-0.284

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.304	16.169	540.742	46.000	21.795	30.600	8.805

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	694.673	271.004	745.663	1145.087	0.607	-0.196

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	21.173	16.508	544.933	455.853	0.042	0.181

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	688.247	0.000	688.247	1145.873	0.601	0.071

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	16.456	545.675	0.000	0.060	0.084	-0.209

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.802	21.006	1.136	585.228	25.894	286.321	2.220

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
161291.594	0.395	1639.021	1659861.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 3.954 EfDer = 0.913

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
179.821	3587.000	21.006	585.228	1.000	1.000	0.880

W Kg/sec = 81.73685

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
133.664	3376.968	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
138333.188	141099.562	1.258	489.817	389.287	384.470	0.988

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	631.21	-0.22	631.21	0.55	591.44
MEAN	17.74	0.00	-0.02	631.21	-0.22	631.21	0.55	
HUB	15.05	0.00	-0.02	631.21	-0.22	631.21	0.55	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	44.87	46.36	-1.49	628.24	890.73	17.13	551.97	0.77
MEAN	41.35	43.40	-2.05	555.26	840.82	17.13	551.97	0.73
HUB	36.75	38.84	-2.09	471.10	787.77	17.13	551.97	0.68

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	603.37	205.00	567.48	1176.55	0.51
MEAN	17.51	618.59	240.87	569.76	1175.77	0.53
HUB	14.85	672.09	348.80	574.50	1174.86	0.57

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.10	703.10	415.11	0.60	4065.33	
MEAN	548.00	647.27	307.12	0.55	4220.74	1.38
HUB	464.84	586.10	116.04	0.50	5182.91	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.22	1.11	19.41	605.65	1.03	575.27	0.92	0.84
MEAN	23.31	1.11	19.30	606.43	1.04	574.50	0.92	0.84
HUB	23.86	1.14	19.11	611.27	1.04	573.57	0.92	0.84

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	19.86	36.19	31.50	4.69	0.93	0.25	2.90	
MEAN	22.92	28.33	23.50	4.83	0.89	0.27	3.28	0.84
HUB	31.26	11.42	6.50	4.92	0.89	0.31	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.913

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

```
     17.392     626.156     242.455     577.310    1176.235       0.532       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.423      19.309      575.055      46.000      22.781      31.500       8.719

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     601.426     242.455     648.458    1178.824       0.510       0.059

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.318      19.520     577.589     471.992       0.035       0.199

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     582.870       0.000     582.870    1180.694       0.494       0.078

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.637     579.423       0.000       0.060       0.063       0.087

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.749      23.200       1.104     607.783      22.555     309.314       2.398

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 140555.422       0.366    1428.303 1874418.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.959

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.821    3587.000      23.200     607.783       1.000       1.000       0.980
W Kg/sec =   81.73685

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    123.335    3313.716       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 138333.188  141099.562       1.429     513.330     359.224     401.059       1.116

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   542.59    -0.19   542.59     0.46   556.94
 MEAN    16.97     0.00    -0.02   542.59    -0.19   542.59     0.46
 HUB     14.32     0.00    -0.02   542.59    -0.19   542.59     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.02    46.36     1.66   602.89   811.23    20.09   583.22     0.68
 MEAN    44.40    43.80     0.60   531.23   759.47    20.09   583.22     0.64
 HUB     39.57    37.84     1.73   448.25   703.92    20.09   583.22     0.59

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   591.51   190.82   559.88  1198.15     0.49
 MEAN    16.57   605.07   224.51   561.87  1197.40     0.51
 HUB     13.89   653.92   328.26   565.56  1196.49     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   688.19   400.17     0.57  3606.28
 MEAN   518.80   634.28   294.29     0.53  3724.16     1.28
 HUB    434.79   575.50   106.53     0.48  4562.24

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.39     1.09    21.49   625.89     1.03   596.70     0.92     0.88
 MEAN    25.46     1.10    21.38   626.48     1.03   595.94     0.92     0.88
 HUB     25.99     1.12    21.21   630.69     1.04   595.02     0.92     0.88
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.82    35.55    31.50     4.05     0.93     0.19     2.90
 MEAN    21.78    27.64    23.50     4.14     0.90     0.21     3.29     0.88
 HUB     30.13    10.67     6.50     4.17     0.90     0.24     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.959

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     593.311     225.772     548.675    1199.698       0.495       0.058

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.570      21.631     598.316      46.000      22.366      32.400      10.034

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     580.773     225.772     623.113    1200.929       0.484       0.078

   BlockageThr  PtTh         PsTh        TsTh         AreaTh       w 2-Th  DiffFact4
      0.950      25.458      21.691     599.544     456.573       0.036       0.201

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     550.224       0.000     550.224    1203.813       0.457       0.072

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.938     602.427       0.000       0.060       0.069       0.136

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.775      25.321       1.091     627.689      19.906     322.305       2.498

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 124106.141       0.355    1261.148 1639466.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.943

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    179.821    3587.000       25.321     627.689       1.000        1.000       0.980
W Kg/sec =   81.73685

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    114.840    3260.748        1.401       0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 138333.188  141099.562        1.524     509.668     334.497     390.276       1.167

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   509.22    -0.18   509.22      0.42   521.29
 MEAN    15.91      0.00    -0.02   509.22    -0.18   509.22      0.42
 HUB     13.07      0.00    -0.02   509.22    -0.18   509.22      0.42

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     48.40     47.36      1.04   573.46   767.05     22.40   606.06      0.64
 MEAN    44.38     44.80     -0.42   498.12   712.46     22.40   606.06      0.59
 HUB     38.79     38.84     -0.05   409.12   653.32     22.40   606.06      0.54

     ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   558.32    181.19    528.11   1219.24      0.46
 MEAN    15.50   569.22    205.35    530.89   1217.89      0.47
 HUB     12.59   610.08    293.19    535.01   1216.46      0.50
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       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   650.84   380.38     0.53  3253.67
 MEAN   485.11   600.09   279.76     0.49  3185.23     1.28
 HUB    394.10   544.45   100.91     0.45  3693.52

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.36     1.08    23.70   644.02     1.03   618.02     0.92     0.86
 MEAN    27.32     1.08    23.52   643.68     1.03   616.65     0.92     0.86
 HUB     27.65     1.09    23.28   646.23     1.03   615.18     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.94    35.76    31.50     4.26     0.93     0.19     2.90
 MEAN    21.15    27.79    23.50     4.29     0.90     0.20     3.34     0.86
 HUB     28.72    10.68     6.50     4.18     0.90     0.22     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.943

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     575.311     209.116     535.960    1218.227       0.472      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.364      23.485     617.034      46.000      21.314      33.000      11.686

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     577.135     209.116     613.852    1218.054       0.474      -0.060

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.129      23.260     616.858     440.827       0.080       0.193

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     534.619       0.000     534.619    1221.940       0.438       0.076

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.787     620.801       0.000       0.060       0.079       0.073

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.740      27.132       1.072     644.641      16.952     350.835       2.720

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  105736.992       0.335    1074.484 1687106.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    759085.06   7713.7100    175.6672      1.7960      0.7845      3.9536      1.2330


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.454   EfDer =  0.995

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     177.102    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   80.50081

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     173.011    3572.873       1.402       0.249      53.349      32.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
136241.297	138965.828	1.650	831.557	503.845	619.754	1.230

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	422.57	-0.15	422.57	0.38	643.21
MEAN	17.06	0.00	-0.02	422.57	-0.15	422.57	0.38	
HUB	12.51	0.00	-0.02	422.57	-0.15	422.57	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.81	50.47	6.34	645.77	771.86	13.66	507.90	0.70
MEAN	51.65	47.20	4.45	534.02	681.10	13.66	507.90	0.62
HUB	42.83	38.62	4.21	391.59	576.21	13.66	507.90	0.52

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	658.35	339.96	563.78	1120.86	0.59
MEAN	18.04	694.01	389.37	574.49	1116.63	0.62
HUB	15.00	800.00	529.41	599.77	1107.55	0.72

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	645.77	641.38	305.81	0.57	7016.36	
MEAN	564.57	600.62	175.20	0.54	7025.13	1.26
HUB	469.54	602.75	59.87	0.54	7942.90	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.60	1.23	14.72	558.09	1.07	521.90	0.92	0.91
MEAN	18.60	1.23	14.33	558.14	1.07	517.92	0.92	0.91
HUB	19.10	1.26	13.49	562.75	1.08	509.34	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.09	28.48	24.20	4.28	0.93	0.25	2.90	
MEAN	34.13	16.96	12.70	4.26	0.92	0.20	3.51	0.91
HUB	41.43	-5.70	-9.30	3.60	0.92	0.06	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	706.989	388.611	590.605	1116.396	0.633	-0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.721	14.286	517.911	24.000	33.344	35.400	2.056

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	621.619	388.611	733.096	1126.560	0.552	0.213

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.648	15.159	527.385	528.796	0.026	0.380

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	568.259	0.000	568.259	1132.210	0.502	0.292

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.626	532.688	0.000	0.060	0.044	0.315

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.863	18.563	1.229	559.659	36.849	228.350	1.770

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
229417.984	0.550	2296.057	1776857.375

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 4.454   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.102    3587.000      18.563     559.659       1.000       1.000       0.980
W Kg/sec =   80.50081

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    145.675    3453.247       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 136241.297  138965.828       1.392     590.487     424.249     474.134       1.118

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   538.54    -0.19   538.54     0.47   619.26
 MEAN    18.08     0.00    -0.02   538.54    -0.19   538.54     0.47
 HUB     15.21     0.00    -0.02   538.54    -0.19   538.54     0.47

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.07    46.36     3.71   643.27   839.08    15.91   535.44     0.74
 MEAN    46.43    42.30     4.13   565.89   781.33    15.91   535.44     0.69
 HUB     41.49    37.84     3.65   476.11   718.94    15.91   535.44     0.63

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   600.59   252.55   544.91  1156.21     0.52
 MEAN    18.01   616.76   277.99   550.56  1153.72     0.53
 HUB     15.22   671.11   373.60   557.51  1151.23     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   668.15   386.65     0.58  5160.89
 MEAN   563.76   620.31   285.77     0.54  5009.89     1.36
 HUB    476.52   566.93   102.92     0.49  5690.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.44     1.15    17.83   585.60     1.05   555.48     0.92     0.91
 MEAN    21.35     1.15    17.57   584.84     1.04   553.08     0.92     0.91
 HUB     21.75     1.17    17.27   588.26     1.05   550.66     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.87    35.36    31.50     3.86     0.93     0.26     2.90
 MEAN    26.79    27.43    23.50     3.93     0.92     0.26     3.30     0.91
 HUB     33.83    10.46     6.50     3.96     0.92     0.28     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.993

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     714.054     278.767     657.390    1143.746       0.624      -0.269

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.472      16.506     543.656      46.000      22.979      30.600       7.621

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     670.599     278.767     726.233    1149.019       0.584      -0.152

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      21.364      16.958     548.680     455.853       0.037       0.202

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     17.823     662.986       0.000     662.986    1149.909       0.577       0.111

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      16.944     549.528       0.000       0.060       0.071      -0.155

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.826      21.231       1.144     586.231      26.572     277.498       2.151

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 165516.891       0.405    1656.523 1624989.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 4.454   EfDer =  0.932

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.102    3587.000      21.231     586.231       1.000       1.000       0.880
W Kg/sec =   80.50081

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    130.362    3374.078       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 136241.297  138965.828       1.290     489.817     379.670     384.470       1.013

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   609.91    -0.21   609.91     0.53   590.93
 MEAN    17.74     0.00    -0.02   609.91    -0.21   609.91     0.53
 HUB     15.05     0.00    -0.02   609.91    -0.21   609.91     0.53

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.86    46.36    -0.50   628.24   875.75    17.56   555.18     0.76
 MEAN    42.33    43.40    -1.07   555.26   824.95    17.56   555.18     0.71
 HUB     37.70    38.84    -1.14   471.10   770.80    17.56   555.18     0.67

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   589.43   220.69   546.56  1180.56     0.50
 MEAN    17.51   604.81   252.10   549.76  1179.22     0.51
 HUB     14.85   657.79   353.20   554.92  1177.81     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   676.95   399.41     0.57  4376.14
 MEAN   548.00   624.33   295.90     0.53  4417.15     1.41
 HUB    464.84   566.04   111.65     0.48  5248.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.70     1.12    19.98   608.21     1.04   579.22     0.92     0.85
 MEAN    23.72     1.12    19.82   608.42     1.04   577.89     0.92     0.85
 HUB     24.21     1.14    19.58   612.60     1.04   576.48     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.99    36.16    31.50     4.66     0.93     0.27     2.90
 MEAN    24.63    28.29    23.50     4.79     0.90     0.29     3.28     0.85
 HUB     32.48    11.38     6.50     4.88     0.90     0.32     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.932

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     611.859     253.755     556.759    1179.748       0.519       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     23.834      19.837     578.493      46.000      24.502      31.500       6.998

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     577.121     253.755     630.445    1183.258       0.488       0.096

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.755      20.185     581.941     471.992       0.029       0.226

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     559.050       0.000     559.050    1184.999       0.472       0.116

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.311     583.655       0.000       0.060       0.053       0.126

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.786      23.659       1.114     609.744      23.513     294.705       2.285

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 146529.016       0.381    1466.489 1825059.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 4.454   EfDer =  0.973

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.102    3587.000      23.659     609.744       1.000       1.000       0.980
W Kg/sec =   80.50081

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    119.303    3308.384       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 136241.297  138965.828       1.477     513.330     347.479     401.059       1.154

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   521.32    -0.18   521.32     0.44   556.04
 MEAN    16.97     0.00    -0.02   521.32    -0.18   521.32     0.44
 HUB     14.32     0.00    -0.02   521.32    -0.18   521.32     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.16    46.36     2.80   602.89   797.16    20.73   587.07     0.67
 MEAN    45.55    43.80     1.75   531.23   744.42    20.73   587.07     0.63
 HUB     40.70    37.84     2.86   448.25   687.65    20.73   587.07     0.58

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   574.04   209.21   534.55  1203.54     0.48
 MEAN    16.57   587.77   237.58   537.62  1202.15     0.49
 HUB     13.89   636.16   333.07   542.00  1200.68     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   656.89   381.78     0.55  3953.43
 MEAN   518.80   606.73   281.22     0.50  3940.66     1.32
 HUB    434.79   551.46   101.72     0.46  4628.96

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.14     1.10    22.37   629.59     1.03   602.10     0.92     0.89
 MEAN    26.13     1.10    22.19   629.53     1.03   600.71     0.92     0.89
 HUB     26.58     1.12    21.95   632.99     1.04   599.22     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.37    35.53    31.50     4.03     0.93     0.22     2.90
 MEAN    23.84    27.61    23.50     4.11     0.91     0.23     3.29     0.89
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 HUB     31.57    10.63     6.50     4.13     0.91     0.26     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     577.010     238.916     525.224    1204.309       0.479       0.058

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.246      22.426     602.922      46.000      24.460      32.400       7.940

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     552.824     238.916     602.241    1206.584       0.458       0.118

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.166      22.655     605.202     456.573       0.029       0.231

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096     523.883       0.000     523.883    1209.173       0.433       0.114

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      22.895     607.803       0.000       0.060       0.057       0.176

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4        Pt4          PR4        Texit        Del T        Ns         Ns nondim
      0.814      26.051       1.101     630.704      20.960     303.920       2.356

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 130684.430       0.374    1307.914 1597383.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 4.454   EfDer =  0.963

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    177.102    3587.000       26.051     630.704       1.000        1.000       0.980
W Kg/sec =   80.50081

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    110.198    3252.945        1.401       0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 136241.297  138965.828        1.588     509.668     320.976     390.276       1.216

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00     -0.02   485.71     -0.17   485.71      0.40    520.04
 MEAN    15.91      0.00     -0.02   485.71     -0.17   485.71      0.40
 HUB     13.07      0.00     -0.02   485.71     -0.17   485.71      0.40

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     49.74     47.36      2.38   573.46    751.64     23.32   611.03      0.62
 MEAN    45.73     44.80      0.93   498.12    695.85     23.32   611.03      0.57
 HUB     40.12     38.84      1.28   409.12    635.16     23.32   611.03      0.52

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94    539.51    201.46    500.48   1225.68      0.44
 MEAN    15.50    550.01    219.86    504.15   1223.72      0.45
 HUB     12.59    589.94    298.54    508.82   1221.73      0.48

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    561.57    616.57    360.10      0.50   3617.30
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 MEAN   485.11   569.67   265.26     0.47  3409.94     1.32
 HUB    394.10   517.72    95.56     0.42  3760.75

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.43     1.09    24.89   648.86     1.03   624.58     0.92     0.88
 MEAN    28.29     1.09    24.63   647.82     1.03   622.59     0.92     0.88
 HUB     28.53     1.10    24.32   649.58     1.03   620.55     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.93    35.74    31.50     4.24     0.93     0.23     2.90
 MEAN    23.56    27.75    23.50     4.25     0.91     0.23     3.34     0.88
 HUB     30.40    10.64     6.50     4.14     0.91     0.24     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.963

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     555.842     223.890     508.757    1224.083       0.454      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.343      24.602      622.980      46.000      23.753      33.000       9.247

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     543.366     223.890     587.685    1225.206       0.443       0.002

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.181      24.619     624.124     440.827       0.062       0.228

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     504.751       0.000     504.751    1228.516       0.411       0.126

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.081     627.500       0.000       0.060       0.064       0.123

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.793      28.175       1.082     648.751      18.047     326.904       2.534

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  112578.250       0.357    1126.704 1641800.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     784726.56   7853.6870    173.0107      1.8650      0.8123      4.4535      1.2409


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.997

    W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     174.397    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   79.27158

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     170.369    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  134160.906  136843.844       1.676     831.557     496.151     619.754       1.249
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ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	415.04	-0.14	415.04	0.38	643.21
MEAN	17.06	0.00	-0.02	415.04	-0.14	415.04	0.38	
HUB	12.51	0.00	-0.02	415.04	-0.14	415.04	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.28	50.47	6.81	645.77	767.77	13.71	508.42	0.69
MEAN	52.15	47.20	4.95	534.02	676.46	13.71	508.42	0.61
HUB	43.35	38.62	4.73	391.59	570.72	13.71	508.42	0.52

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	651.28	346.69	551.34	1122.41	0.58
MEAN	18.04	686.09	393.14	562.28	1117.95	0.61
HUB	15.00	789.41	528.12	586.73	1108.90	0.71

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	645.77	627.23	299.08	0.56	7155.26	
MEAN	564.57	587.83	171.44	0.53	7093.05	1.28
HUB	469.54	589.65	58.58	0.53	7923.59	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.68	1.24	14.87	558.79	1.07	523.37	0.92	0.91
MEAN	18.65	1.23	14.46	558.48	1.07	519.18	0.92	0.91
HUB	19.10	1.26	13.62	562.65	1.08	510.64	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.16	28.48	24.20	4.28	0.93	0.26	2.90	
MEAN	34.96	16.96	12.70	4.26	0.92	0.22	3.51	0.91
HUB	41.99	-5.70	-9.30	3.60	0.92	0.07	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	698.366	392.372	577.718	1117.825	0.625	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.763	14.418	519.238	24.000	34.183	35.400	1.217

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	606.348	392.372	722.228	1128.567	0.537	0.232

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.696	15.358	529.265	528.796	0.025	0.393

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	554.830	0.000	554.830	1133.882	0.489	0.309

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.806	534.262	0.000	0.060	0.041	0.332

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.870	18.622	1.233	559.974	37.164	224.871	1.743

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
231374.969	0.555	2280.283	1745222.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

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 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.397    3587.000      18.622     559.974       1.000       1.000       0.980
W Kg/sec =   79.27158

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    143.040    3452.278       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134160.906  136843.844       1.417     590.487     416.576     474.134       1.138

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   526.23    -0.18   526.23     0.46   619.09
MEAN    18.08     0.00    -0.02   526.23    -0.18   526.23     0.46
HUB     15.21     0.00    -0.02   526.23    -0.18   526.23     0.46

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.72    46.36     4.36   643.27   831.23    16.07   536.85     0.73
MEAN    47.09    42.30     4.79   565.89   772.89    16.07   536.85     0.68
HUB     42.15    37.84     4.31   476.11   709.77    16.07   536.85     0.62

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
TIP     20.42   592.28   262.71   530.83  1158.46     0.51
MEAN    18.01   608.04   285.22   537.00  1155.64     0.53
HUB     15.22   661.71   376.23   544.34  1152.84     0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    639.20   650.79   376.49     0.56  5368.17
MEAN   563.76   604.94   278.54     0.52  5140.04     1.38
HUB    476.52   553.50   100.29     0.48  5730.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.63     1.16    18.10   586.95     1.05   557.67     0.92     0.91
MEAN    21.50     1.15    17.80   585.81     1.05   554.94     0.92     0.91
HUB     21.85     1.17    17.47   588.77     1.05   552.22     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     26.33    35.35    31.50     3.85     0.93     0.27     2.90
MEAN    27.97    27.42    23.50     3.92     0.92     0.27     3.30     0.91
HUB     34.65    10.44     6.50     3.94     0.92     0.29     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     699.896     286.019     638.786    1146.497       0.610      -0.256

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.622      16.808     546.274      46.000      24.121      30.600       6.479

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     649.053     286.019     709.279    1152.491       0.563      -0.111

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      21.533      17.358     552.001     455.853       0.033       0.221

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     640.777       0.000     640.777    1153.422       0.556       0.145

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.850      17.369     552.892       0.000       0.060       0.061      -0.109

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.844      21.425       1.151     587.177      27.204     269.516       2.089

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 169454.297       0.415    1670.033 1591309.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.947

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.397    3587.000      21.425     587.177       1.000       1.000       0.880
W Kg/sec =   79.27158

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    127.308    3371.358       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134160.906  136843.844       1.321     489.817     370.774     384.470       1.037

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   590.92    -0.20   590.92     0.51   590.45
 MEAN    17.74     0.00    -0.02   590.92    -0.20   590.92     0.51
 HUB     15.05     0.00    -0.02   590.92    -0.20   590.92     0.51

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.76    46.36     0.40   628.24   862.63    17.94   558.03     0.74
 MEAN    43.23    43.40    -0.17   555.26   811.00    17.94   558.03     0.70
 HUB     38.58    38.84    -0.26   471.10   755.85    17.94   558.03     0.65

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   577.83   234.59   528.07  1184.06     0.49
 MEAN    17.51   593.04   262.09   531.99  1182.25     0.50
 HUB     14.85   645.31   357.09   537.50  1180.43     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   653.82   385.51     0.55  4651.34
 MEAN   548.00   603.95   285.91     0.51  4591.92     1.43
 HUB    464.84   548.20   107.75     0.46  5305.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.12     1.13    20.49   610.54     1.04   582.67     0.92     0.87
 MEAN    24.08     1.12    20.27   610.24     1.04   580.89     0.92     0.87
 HUB     24.51     1.14    20.00   613.83     1.05   579.07     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.95    36.13    31.50     4.63     0.93     0.29     2.90
 MEAN    26.23    28.26    23.50     4.76     0.90     0.30     3.28     0.87
 HUB     33.60    11.34     6.50     4.84     0.90     0.34     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.947

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     599.705     263.811     538.563    1182.829       0.507       0.006

    Pt3        Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.197      20.299     581.518      46.000      26.098      31.500       5.402

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	556.037	263.811	615.446	1187.106	0.468	0.128

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.137	20.765	585.731	471.992	0.025	0.249

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	538.648	0.000	538.648	1188.715	0.453	0.148

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.889	587.320	0.000	0.060	0.046	0.159

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.812	24.052	1.123	611.539	24.362	282.454	2.190

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
151827.344	0.395	1496.313	1779427.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 4.953 EfDer = 0.984

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
174.397	3587.000	24.052	611.539	1.000	1.000	0.980

W Kg/sec = 79.27158

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
115.733	3303.522	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
134160.906	136843.844	1.523	513.330	337.081	401.059	1.190

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	502.97	-0.17	502.97	0.42	555.22
MEAN	16.97	0.00	-0.02	502.97	-0.17	502.97	0.42	
HUB	14.32	0.00	-0.02	502.97	-0.17	502.97	0.42	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.17	46.36	3.81	602.89	785.28	21.28	590.43	0.66
MEAN	46.57	43.80	2.77	531.23	731.69	21.28	590.43	0.61
HUB	41.72	37.84	3.88	448.25	673.85	21.28	590.43	0.57

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	560.31	224.68	513.29	1208.07	0.46
MEAN	16.57	573.77	248.63	517.10	1206.20	0.48
HUB	13.89	621.39	337.14	521.99	1204.29	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	590.99	630.59	366.31	0.52	4245.31	
MEAN	518.80	583.43	270.17	0.48	4123.69	1.35
HUB	434.79	531.04	97.65	0.44	4685.33	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.79	1.11	23.12	632.85	1.03	606.66	0.92	0.90
MEAN	26.71	1.11	22.87	632.24	1.03	604.78	0.92	0.90
HUB	27.09	1.13	22.59	635.06	1.04	602.85	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	23.64	35.51	31.50	4.01	0.93	0.25	2.90	
MEAN	25.68	27.59	23.50	4.09	0.91	0.25	3.29	0.90
HUB	32.86	10.60	6.50	4.10	0.91	0.28	3.90	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     563.848     250.027     505.382    1208.234       0.467       0.057

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.822      23.101     606.859      46.000      26.323      32.400       6.077

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     529.687     250.027     585.732    1211.333       0.437       0.152

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.764      23.467     609.976     456.573       0.024       0.259

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     502.094       0.000     502.094    1213.690       0.414       0.150

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.700     612.352       0.000       0.060       0.049       0.210

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.840      26.666       1.109     633.388      21.848     289.367       2.243

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 136228.516       0.390    1342.581 1558745.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.977

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.397    3587.000      26.666     633.388       1.000       1.000       0.980
W Kg/sec =   79.27158

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.237    3246.046       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134160.906  136843.844       1.647     509.668     309.439     390.276       1.261

     ROTOR LEADING EDGE CONDITIONS, STAGE           5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   466.14    -0.16   466.14     0.38   518.94
 MEAN    15.91     0.00    -0.02   466.14    -0.16   466.14     0.38
 HUB     13.07     0.00    -0.02   466.14    -0.16   466.14     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.90    47.36     3.54   573.46   739.14    24.09   615.26     0.61
 MEAN    46.91    44.80     2.11   498.12   682.33    24.09   615.26     0.56
 HUB     41.28    38.84     2.44   409.12   620.32    24.09   615.26     0.51

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK         AeroBl     Blades2
     0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   525.39   217.97   478.04  1230.98     0.43
 MEAN    15.50   535.08   231.76   482.29  1228.58     0.44
 HUB     12.59   573.81   302.91   487.34  1226.16     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   588.71   343.59     0.48  3913.39
 MEAN   485.11   544.79   253.36     0.44  3594.21     1.36
 HUB    394.10   495.79    91.18     0.40  3815.79
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    29.34     1.10    25.88   653.03     1.03   630.00     0.92     0.89
 MEAN   29.11     1.09    25.55   651.42     1.03   627.54     0.92     0.89
 HUB    29.27     1.10    25.19   652.54     1.03   625.07     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    24.51    35.71    31.50     4.21     0.93     0.25     2.90
 MEAN   25.67    27.71    23.50     4.21     0.91     0.25     3.34     0.89
 HUB    31.86    10.60     6.50     4.10     0.91     0.26     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     540.788     236.005     486.573    1228.939       0.440      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.167      25.532     627.935      46.000      25.875      33.000       7.125

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     516.724     236.005     568.068    1231.015       0.420       0.052

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.054      25.735     630.058     440.827       0.050       0.258

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     14.701     480.882       0.000     480.882    1233.925       0.390       0.168

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.153     633.040       0.000       0.060       0.053       0.165

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.828      29.043       1.089     652.329      18.941     308.826       2.394

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 118165.047       0.375    1164.559 1600927.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    807050.19   7953.7695    170.3689      1.9225      0.8320      4.9531      1.2477


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.704    3587.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   78.04749

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    167.738    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132089.219  134730.734       1.702     831.557     488.490     619.754       1.269

     ROTOR LEADING EDGE CONDITIONS, STAGE            1
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   407.62    -0.14   407.62     0.37   643.21
MEAN    17.06     0.00    -0.02   407.62    -0.14   407.62     0.37
HUB     12.51     0.00    -0.02   407.62    -0.14   407.62     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.75    50.47     7.28   645.77   763.77    13.75   508.93     0.69
MEAN    52.65    47.20     5.45   534.02   671.92    13.75   508.93     0.61
HUB     43.86    38.62     5.24   391.59   565.34    13.75   508.93     0.51

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   644.70   353.22   539.33  1123.88     0.57
MEAN    18.04   678.55   396.77   550.45  1119.20     0.61
HUB     15.00   779.25   526.87   574.13  1110.19     0.70

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    645.77   613.57   292.55     0.55  7289.83
MEAN   564.57   575.46   167.80     0.51  7158.59     1.30
HUB    469.54   576.99    57.33     0.52  7904.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.76     1.24    15.00   559.47     1.07   524.76     0.92     0.91
MEAN    18.69     1.24    14.57   558.81     1.07   520.36     0.92     0.91
HUB     19.09     1.26    13.74   562.56     1.08   511.87     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.22    28.48    24.20     4.28     0.93     0.28     2.90
MEAN    35.78    16.95    12.70     4.25     0.92     0.23     3.51     0.91
HUB     42.54    -5.70    -9.30     3.60     0.92     0.09     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     690.191     396.002     565.284    1119.172       0.617      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.803      14.543     520.490      24.000      35.013      35.400       0.387

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     591.831     396.002     712.096    1130.438       0.524       0.251

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.740      15.543     531.022     528.796       0.024       0.406

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     542.063       0.000     542.063    1135.444       0.477       0.324

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.973     535.735       0.000       0.060       0.039       0.348

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.874       18.673       1.236     560.277      37.467     221.493       1.717

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 233266.969       0.559    2263.430 1713990.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.998

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
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    171.704    3587.000      18.673     560.277       1.000       1.000       0.980
W Kg/sec =   78.04749

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    140.482    3451.342       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132089.219  134730.734       1.443     590.487     409.124     474.134       1.159

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   514.50    -0.18   514.50     0.45   618.92
 MEAN    18.08     0.00    -0.02   514.50    -0.18   514.50     0.45
 HUB     15.21     0.00    -0.02   514.50    -0.18   514.50     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.35    46.36     4.99   643.27   823.85    16.23   538.17     0.72
 MEAN    47.73    42.30     5.43   565.89   764.95    16.23   538.17     0.67
 HUB     42.79    37.84     4.95   476.11   701.11    16.23   538.17     0.62

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   584.86   272.22   517.64  1160.53     0.50
 MEAN    18.01   600.08   292.03   524.23  1157.42     0.52
 HUB     15.22   652.95   378.72   531.90  1154.33     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   634.53   366.98     0.55  5562.40
 MEAN   563.76   590.46   271.72     0.51  5262.71     1.40
 HUB    476.52   540.81    97.79     0.47  5768.01

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.81     1.17    18.34   588.23     1.05   559.67     0.92     0.91
 MEAN    21.64     1.16    18.01   586.73     1.05   556.66     0.92     0.91
 HUB     21.94     1.17    17.65   589.27     1.05   553.67     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.74    35.33    31.50     3.83     0.93     0.29     2.90
 MEAN    29.12    27.40    23.50     3.90     0.92     0.29     3.30     0.91
 HUB     35.45    10.42     6.50     3.92     0.92     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     687.117     292.853     621.584    1148.990       0.598      -0.245

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.758      17.080     548.652      46.000      25.227      30.600       5.373

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     629.475     292.853     694.263    1155.606       0.545      -0.074

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      21.683      17.717     554.989     455.853       0.030       0.239

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     620.860       0.000     620.860    1156.543       0.537       0.175

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      17.745     555.888       0.000       0.060       0.053      -0.067

    STAGE EXIT CONDITIONS, STAGE            2
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      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      21.595       1.156     588.075      27.798     262.207       2.033

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 173157.406       0.424    1680.177 1558638.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.960

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.704    3587.000      21.595     588.075       1.000       1.000       0.880
W Kg/sec =   78.04749

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    124.451    3368.783       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132089.219  134730.734       1.351     489.817     362.453     384.470       1.061

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   573.70    -0.20   573.70     0.49   590.00
 MEAN    17.74     0.00    -0.02   573.70    -0.20   573.70     0.49
 HUB     15.05     0.00    -0.02   573.70    -0.20   573.70     0.49

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.61    46.36     1.25   628.24   850.92    18.27   560.60     0.73
 MEAN    44.07    43.40     0.67   555.26   798.53    18.27   560.60     0.69
 HUB     39.40    38.84     0.56   471.10   742.46    18.27   560.60     0.64

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   568.02   247.07   511.48  1187.17      0.48
 MEAN    17.51   582.84   271.10   515.95  1184.97      0.49
 HUB     14.85   634.27   360.63   521.77  1182.79      0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   633.06   373.04     0.53  4898.35
 MEAN   548.00   585.56   276.90     0.49  4749.57     1.46
 HUB    464.84   532.08   104.21     0.45  5358.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.49     1.13    20.94   612.68     1.04   585.75     0.92     0.88
 MEAN    24.40     1.13    20.68   611.93     1.04   583.58     0.92     0.88
 HUB     24.78     1.15    20.37   614.99     1.05   581.41     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.78    36.10    31.50     4.60     0.93     0.31     2.90
 MEAN    27.72    28.22    23.50     4.72     0.90     0.32     3.28     0.88
 HUB     34.65    11.30     6.50     4.80     0.90     0.35     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.960

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     589.195     272.881     522.194    1185.578       0.497       0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.519      20.708     584.224      46.000      27.590      31.500       3.910

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     537.379     272.881     602.694    1190.512       0.451       0.157
```

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.472	21.276	589.097	471.992	0.022	0.272

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	520.632	0.000	520.632	1192.005	0.437	0.176

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.396	590.576	0.000	0.060	0.042	0.188

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.832	24.395	1.130	613.202	25.127	271.925	2.108

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
156597.203	0.407	1519.490	1736631.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 5.453 EfDer = 0.991

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
171.704	3587.000	24.395	613.203	1.000	1.000	0.980

W Kg/sec = 78.04749

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
112.495	3299.040	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
132089.219	134730.734	1.567	513.330	327.651	401.059	1.224

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	486.69	-0.17	486.69	0.41	554.47
MEAN	16.97	0.00	-0.02	486.69	-0.17	486.69	0.41	
HUB	14.32	0.00	-0.02	486.69	-0.17	486.69	0.41	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.09	46.36	4.73	602.89	774.95	21.76	593.44	0.65
MEAN	47.51	43.80	3.71	531.23	720.59	21.76	593.44	0.60
HUB	42.66	37.84	4.82	448.25	661.78	21.76	593.44	0.55

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	549.15	238.13	494.84	1212.01	0.45
MEAN	16.57	562.05	258.28	499.19	1209.75	0.46
HUB	13.89	608.72	340.70	504.45	1207.48	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	590.99	607.76	352.86	0.50	4499.05	
MEAN	518.80	563.08	260.52	0.47	4283.55	1.38
HUB	434.79	513.15	94.10	0.42	4734.66	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.36	1.12	23.76	635.79	1.04	610.63	0.92	0.91
MEAN	27.21	1.12	23.47	634.71	1.04	608.35	0.92	0.91
HUB	27.52	1.13	23.13	636.97	1.04	606.06	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.70	35.49	31.50	3.99	0.93	0.27	2.90	
MEAN	27.36	27.56	23.50	4.06	0.92	0.27	3.29	0.91
HUB	34.03	10.57	6.50	4.07	0.92	0.29	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.991

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481      552.859     259.733      488.049    1211.674       0.456        0.056

     Pt3          Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     27.325       23.686      610.320      46.000      28.021       32.400       4.379

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     16.481      509.811     259.733      572.161    1215.457       0.419        0.183

   BlockageThr  PtTh         PsTh        TsTh         AreaTh       w 2-Th  DiffFact4
      0.950      27.282       24.169      614.137      456.573       0.021        0.284

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096      483.405       0.000      483.405    1217.621       0.397        0.181

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      24.394      616.325       0.000       0.060        0.043        0.240

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4           PR4        Texit        Del T        Ns         Ns nondim
      0.857       27.196        1.115      635.824      22.622      277.302        2.150

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 141059.609       0.404    1368.726 1522572.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.987

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    171.704     3587.000       27.196      635.824       1.000        1.000        0.980
W Kg/sec =   78.04749

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    102.757     3239.820        1.401       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 132089.219  134730.734        1.703      509.668     299.304      390.276        1.304

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00     -0.02    449.27     -0.15    449.27      0.37    517.94
 MEAN    15.91      0.00     -0.02    449.27     -0.15    449.27      0.37
 HUB     13.07      0.00     -0.02    449.27     -0.15    449.27      0.37

       BetaFlo    BetaBlade Incid    U1        W1        Ps1       Ts1      Rel Mach
 TIP     51.93     47.36      4.57    573.46    728.62     24.76    618.99      0.60
 MEAN    47.96     44.80      3.16    498.12    670.91     24.76    618.99      0.55
 HUB     42.33     38.84      3.49    409.12    607.75     24.76    618.99      0.50

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050        0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94    514.35    231.92    459.09   1235.50      0.42
 MEAN    15.50    523.00    241.82    463.73   1232.75      0.42
 HUB     12.59    560.39    306.65    469.04   1230.01      0.46

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    561.57    565.18    329.65      0.46   4163.51
 MEAN   485.11    523.68    243.29      0.42   3750.16      1.40
 HUB    394.10    477.13     87.45      0.39   3862.70

         Pt2        PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     30.12      1.11     26.73    656.72      1.03    634.65      0.92      0.90
 MEAN    29.82      1.10     26.34    654.64      1.03    631.83      0.92      0.90
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 HUB     29.90     1.10    25.93   655.21     1.03   629.01     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.80    35.68    31.50     4.18     0.93     0.28     2.90
 MEAN    27.54    27.68    23.50     4.18     0.91     0.27     3.34     0.90
 HUB     33.18    10.56     6.50     4.06     0.91     0.28     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     528.640     246.259     467.778    1233.114       0.429      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.874      26.326     632.212      46.000      27.764      33.000       5.236

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     494.698     246.259     552.603    1235.936       0.400       0.095

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.794      26.678     635.109     440.827       0.042       0.285

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     460.988       0.000     460.988    1238.547       0.372       0.204

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.062     637.796       0.000       0.060       0.046       0.201

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.850      29.781       1.095     655.522      19.697     294.398       2.282

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 122892.156       0.390    1192.444 1563099.000

   OVERALL EXIT CONDITIONS; ALL          5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    826973.38   8024.2676    167.7381      1.9713      0.8463      5.4531      1.2538


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 6.038   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    3587.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    164.680    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       1.734     831.557     479.584     619.754       1.292

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   399.06    -0.14   399.06     0.36   643.21
 MEAN    17.06     0.00    -0.02   399.06    -0.14   399.06     0.36
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 HUB     12.51     0.00    -0.02   399.06    -0.14   399.06     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.29     50.47     7.82   645.77   759.24    13.81   509.51     0.69
 MEAN    53.24     47.20     6.04   534.02   666.77    13.81   509.51     0.60
 HUB     44.47     38.62     5.85   391.59   559.20    13.81   509.51     0.51

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   637.57   360.56   525.82  1125.49     0.57
 MEAN    18.04   670.21   400.90   537.09  1120.58     0.60
 HUB     15.00   767.88   525.47   559.93  1111.61     0.69

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    645.77   598.19   285.21     0.53  7441.09
 MEAN   564.57   561.48   163.68     0.50  7232.93     1.32
 HUB    469.54   562.71    55.93     0.51  7883.80

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.84     1.25    15.15   560.23     1.07   526.28     0.92     0.91
 MEAN    18.73     1.24    14.70   559.18     1.07   521.67     0.92     0.91
 HUB     19.09     1.26    13.87   562.45     1.08   513.23     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.44    28.48    24.20     4.28     0.93     0.29     2.90
 MEAN    36.74    16.95    12.70     4.25     0.93     0.25     3.51     0.91
 HUB     43.18    -5.70    -9.30     3.60     0.93     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     681.186     400.118     551.289    1120.648       0.608      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.845      14.679     521.864      24.000      35.972      35.400      -0.572

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     575.712     400.118     701.099    1132.475       0.508       0.271

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.785      15.744     532.937     528.796       0.024       0.421

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     527.874       0.000     527.874    1137.150       0.464       0.341

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.151     537.346       0.000       0.060       0.038       0.366

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      18.726       1.240     560.620      37.810     217.663       1.687

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 235402.172       0.564    2242.503 1678007.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.038   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    3587.000      18.726     560.620       1.000       1.000       0.980
W Kg/sec =   76.62451
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
137.578	3450.286	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
129680.953	132274.297	1.474	590.487	400.669	474.134	1.183

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	501.41	-0.17	501.41	0.44	618.73
MEAN	18.08	0.00	-0.02	501.41	-0.17	501.41	0.44	
HUB	15.21	0.00	-0.02	501.41	-0.17	501.41	0.44	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.07	46.36	5.71	643.27	815.74	16.39	539.63	0.72
MEAN	48.47	42.30	6.17	565.89	756.20	16.39	539.63	0.66
HUB	43.53	37.84	5.69	476.11	691.56	16.39	539.63	0.61

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	577.16	282.64	503.21	1162.76	0.50
MEAN	18.01	591.60	299.53	510.17	1159.34	0.51
HUB	15.22	643.42	381.47	518.15	1155.96	0.56

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	616.73	356.56	0.53	5775.08	
MEAN	563.76	574.53	264.22	0.50	5397.71	1.42
HUB	476.52	526.79	95.05	0.46	5809.71	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.01	1.18	18.59	589.64	1.05	561.83	0.92	0.91
MEAN	21.78	1.16	18.23	587.75	1.05	558.53	0.92	0.91
HUB	22.03	1.18	17.84	589.82	1.05	555.25	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	29.32	35.32	31.50	3.82	0.93	0.30	2.90	
MEAN	30.42	27.38	23.50	3.88	0.93	0.30	3.30	0.91
HUB	36.36	10.39	6.50	3.89	0.93	0.31	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	673.634	300.374	602.958	1151.633	0.585	-0.232

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.900	17.366	551.179	46.000	26.481	30.600	4.119

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	608.607	300.374	678.695	1158.884	0.525	-0.035

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	21.838	18.093	558.141	455.853	0.027	0.259

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	599.852	0.000	599.852	1159.801	0.517	0.207

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	18.134	559.025	0.000	0.060	0.046	-0.024

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.869	21.767	1.162	589.071	28.450	254.386	1.972

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
177221.141	0.434	1688.256	1521611.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 6.038 EfDer = 0.972

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
168.574	3587.000	21.767	589.071	1.000	1.000	0.880

W Kg/sec = 76.62451

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
121.320	3365.936	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
129680.953	132274.297	1.386	489.817	353.336	384.470	1.088

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	555.36	-0.19	555.36	0.48	589.51
MEAN	17.74	0.00	-0.02	555.36	-0.19	555.36	0.48	
HUB	15.05	0.00	-0.02	555.36	-0.19	555.36	0.48	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.53	46.36	2.17	628.24	838.66	18.62	563.32	0.72
MEAN	45.00	43.40	1.60	555.26	785.46	18.62	563.32	0.67
HUB	40.32	38.84	1.48	471.10	728.38	18.62	563.32	0.63

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	558.35	260.21	494.01	1190.41	0.47
MEAN	17.51	572.50	280.63	499.00	1187.83	0.48
HUB	14.85	622.81	364.36	505.11	1185.29	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.10	611.20	359.89	0.51	5158.59	
MEAN	548.00	566.11	267.37	0.48	4916.25	1.49
HUB	464.84	515.01	100.49	0.43	5413.57	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.89	1.14	21.40	614.98	1.04	588.96	0.92	0.89
MEAN	24.73	1.14	21.09	613.77	1.04	586.41	0.92	0.89
HUB	25.05	1.15	20.75	616.26	1.05	583.89	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.78	36.07	31.50	4.57	0.93	0.32	2.90	
MEAN	29.35	28.18	23.50	4.68	0.91	0.33	3.28	0.89
HUB	35.80	11.25	6.50	4.75	0.91	0.36	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.972

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	578.563	282.471	504.921	1188.454	0.487	0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.850	21.128	587.062	46.000	29.224	31.500	2.276

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	517.972	282.471	589.987	1194.054	0.434	0.189

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.812	21.800	592.608	471.992	0.020	0.296

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	501.940	0.000	501.940	1195.429	0.420	0.206

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.913	593.973	0.000	0.060	0.038	0.219

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.849	24.742	1.137	615.004	25.934	261.271	2.025

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
161629.531	0.420	1539.726	1689502.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.038 EfDer = 0.996

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
168.574	3587.000	24.742	615.004	1.000	1.000	0.980

W Kg/sec = 76.62451

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
109.055	3294.203	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
129680.953	132274.297	1.616	513.330	317.633	401.059	1.263

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	469.72	-0.16	469.72	0.39	553.66
MEAN	16.97	0.00	-0.02	469.72	-0.16	469.72	0.39	
HUB	14.32	0.00	-0.02	469.72	-0.16	469.72	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.08	46.36	5.72	602.89	764.40	22.25	596.59	0.64
MEAN	48.52	43.80	4.72	531.23	709.23	22.25	596.59	0.59
HUB	43.67	37.84	5.83	448.25	649.39	22.25	596.59	0.54

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	538.52	251.83	476.01	1216.02	0.44
MEAN	16.57	550.54	268.20	480.80	1213.41	0.45
HUB	13.89	595.96	344.37	486.39	1210.79	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	590.99	584.48	339.16	0.48	4757.71	
MEAN	518.80	542.19	250.61	0.45	4447.81	1.41
HUB	434.79	494.72	90.42	0.41	4785.63	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.94	1.13	24.41	638.89	1.04	614.69	0.92	0.91
MEAN	27.72	1.12	24.07	637.33	1.04	612.04	0.92	0.91
HUB	27.96	1.13	23.69	639.03	1.04	609.40	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.88	35.47	31.50	3.97	0.93	0.29	2.90	
MEAN	29.15	27.53	23.50	4.03	0.92	0.29	3.29	0.91
HUB	35.30	10.53	6.50	4.03	0.92	0.31	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	542.105	269.705	470.252	1215.217	0.446	0.055

```
     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.833      24.276     613.896      46.000      29.836      32.400       2.564

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     489.687     269.705     559.047    1219.675       0.401       0.215

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.800      24.875     618.409     456.573       0.019       0.311

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     464.522       0.000     464.522    1221.650       0.380       0.213

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.088     620.413       0.000       0.060       0.039       0.271

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      27.723       1.120     638.418      23.414     265.474       2.058

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 146004.938       0.418    1390.882 1482763.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.038   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    3587.000      27.723     638.418       1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     99.167    3233.232       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       1.764     509.668     288.849     390.276       1.351

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   432.16    -0.15   432.16     0.35   516.89
 MEAN    15.91     0.00    -0.02   432.16    -0.15   432.16     0.35
 HUB     13.07     0.00    -0.02   432.16    -0.15   432.16     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.01    47.36     5.65   573.46   718.18    25.43   622.84     0.59
 MEAN    49.06    44.80     4.26   498.12   659.57    25.43   622.84     0.54
 HUB     43.44    38.84     4.60   409.12   595.20    25.43   622.84     0.49

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   504.20   245.80   440.23  1240.06     0.41
 MEAN    15.50   511.50   251.90   445.17  1237.00     0.41
 HUB     12.59   547.22   310.38   450.69  1233.95     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   541.77   315.77     0.44  4412.32
 MEAN   485.11   502.56   233.21     0.41  3906.25     1.43
 HUB    394.10   458.40    83.72     0.37  3909.62

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.90     1.11    27.57   660.56     1.03   639.35     0.92     0.91
 MEAN    30.52     1.10    27.13   658.02     1.03   636.20     0.92     0.91
 HUB     30.52     1.10    26.67   658.03     1.03   633.06     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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  TIP     29.18    35.65    31.50     4.15     0.93     0.30     2.90
  MEAN    29.50    27.65    23.50     4.15     0.92     0.29     3.34     0.91
  HUB     34.55    10.52     6.50     4.02     0.92     0.29     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.994

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
       R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
       15.219     517.115     256.521     449.004    1237.346       0.418       -0.005

       Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
       30.577      27.112     636.566      46.000      29.740      33.000       3.260

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
       RCG          Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
       15.219     473.129     256.521     538.196    1240.872       0.381       0.137

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      30.520      27.605     640.199     440.827       0.036       0.314

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     441.396       0.000     441.396    1243.216       0.355       0.240

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      27.958     642.619       0.000       0.060       0.040       0.237

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.867       30.505       1.100     658.870      20.451     280.697       2.176

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  127607.078       0.405    1215.619 1521813.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     847864.88   8076.9854     164.6798      2.0193      0.8578      6.0376      1.2602


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.510   EfDer =  1.000

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     166.058     3587.000       15.107      522.810       1.000        1.000        0.980
 W Kg/sec =   75.48089

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     162.222     3572.873        1.402        0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  127745.469  130300.102        1.760      831.557      472.426      619.754       1.312

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   392.24    -0.14   392.24      0.35   643.21
  MEAN    17.06      0.00    -0.02   392.24    -0.14   392.24      0.35
  HUB     12.51      0.00    -0.02   392.24    -0.14   392.24      0.35

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
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 TIP     58.73    50.47     8.26   645.77   755.67    13.85   509.96     0.68
 MEAN    53.71    47.20     6.51   534.02   662.70    13.85   509.96     0.60
 HUB     44.96    38.62     6.34   391.59   554.35    13.85   509.96     0.50

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   632.20   366.29   515.28  1126.71     0.56
 MEAN    18.04   663.81   404.11   526.63  1121.64     0.59
 HUB     15.00   759.07   524.39   548.82  1112.70     0.68

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    645.77   586.20   279.48     0.52  7559.32
 MEAN   564.57   550.53   160.46     0.49  7290.86     1.34
 HUB    469.54   551.55    54.85     0.50  7867.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.91     1.25    15.27   560.82     1.07   527.44     0.92     0.91
 MEAN    18.77     1.24    14.80   559.47     1.07   522.68     0.92     0.91
 HUB     19.08     1.26    13.97   562.37     1.08   514.27     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.41    28.47    24.20     4.27     0.93     0.31     2.90
 MEAN    37.50    16.95    12.70     4.25     0.93     0.26     3.51     0.91
 HUB     43.70    -5.71    -9.30     3.59     0.93     0.11     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     674.287     403.326     540.362    1121.774       0.601      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.876      14.782     522.913      24.000      36.738      35.400      -1.338

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     563.279     403.326     692.788    1134.015       0.497       0.287

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.817      15.894     534.388     528.796       0.024       0.433

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     516.966       0.000     516.966    1138.440       0.454       0.354

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.283     538.566       0.000       0.060       0.037       0.378

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      18.761       1.242     560.888      38.078     214.655       1.664

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 237070.734       0.568    2224.692 1649330.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
  RESET =  0.000BLEED =  0.000 DPInc = 6.510   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    166.058    3587.000      18.761     560.888       1.000       1.000       0.980
W Kg/sec =   75.48089

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    135.304    3449.461       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
127745.469	130300.102	1.499	590.487	394.046	474.134	1.203

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	491.32	-0.17	491.32	0.43	618.58
MEAN	18.08	0.00	-0.02	491.32	-0.17	491.32	0.43	
HUB	15.21	0.00	-0.02	491.32	-0.17	491.32	0.43	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.64	46.36	6.28	643.27	809.57	16.51	540.73	0.71
MEAN	49.04	42.30	6.74	565.89	749.55	16.51	540.73	0.66
HUB	44.11	37.84	6.27	476.11	684.28	16.51	540.73	0.60

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	571.61	290.53	492.27	1164.41	0.49
MEAN	18.01	585.35	305.25	499.46	1160.78	0.50
HUB	15.22	636.24	383.56	507.63	1157.19	0.55

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	603.24	348.66	0.52	5936.15	
MEAN	563.76	562.39	258.51	0.48	5500.60	1.44
HUB	476.52	516.07	92.96	0.45	5841.48	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.14	1.18	18.78	590.72	1.05	563.44	0.92	0.91
MEAN	21.88	1.17	18.39	588.53	1.05	559.92	0.92	0.91
HUB	22.09	1.18	17.98	590.25	1.05	556.45	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.55	35.31	31.50	3.81	0.93	0.32	2.90	
MEAN	31.43	27.36	23.50	3.86	0.93	0.31	3.30	0.91
HUB	37.07	10.38	6.50	3.88	0.93	0.32	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	663.754	306.107	588.955	1153.581	0.575	-0.223

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.000	17.573	553.046	46.000	27.463	30.600	3.137

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	593.122	306.107	667.455	1161.286	0.511	-0.005

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	21.946	18.364	560.458	455.853	0.025	0.274

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	584.380	0.000	584.380	1162.177	0.503	0.229

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	18.411	561.318	0.000	0.060	0.041	0.008

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.875	21.885	1.167	589.834	28.945	248.575	1.927

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
180306.953	0.441	1692.016	1492540.375

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.510   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    166.058    3587.000      21.885     589.834       1.000       1.000       0.880
W Kg/sec =   75.48089

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    118.940    3363.757       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127745.469  130300.102       1.414     489.817     346.404     384.470       1.110

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   541.75    -0.19   541.75     0.46   589.12
 MEAN    17.74     0.00    -0.02   541.75    -0.19   541.75     0.46
 HUB     15.05     0.00    -0.02   541.75    -0.19   541.75     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.24    46.36     2.88   628.24   829.71    18.87   565.33     0.71
 MEAN    45.72    43.40     2.32   555.26   775.89    18.87   565.33     0.67
 HUB     41.02    38.84     2.18   471.10   718.06    18.87   565.33     0.62

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   551.69   269.86   481.19  1192.76     0.46
 MEAN    17.51   565.17   287.63   486.51  1189.92     0.47
 HUB     14.85   614.52   367.11   492.81  1187.13     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   595.16   350.25     0.50  5349.60
 MEAN   548.00   551.80   260.37     0.46  5038.66     1.51
 HUB    464.84   502.41    97.74     0.42  5454.33

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.17     1.15    21.73   616.71     1.05   591.30     0.92     0.90
 MEAN    24.97     1.14    21.39   615.14     1.04   588.48     0.92     0.90
 HUB     25.23     1.15    21.01   617.23     1.05   585.71     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.28    36.05    31.50     4.55     0.93     0.34     2.90
 MEAN    30.59    28.16    23.50     4.66     0.91     0.34     3.28     0.90
 HUB     36.68    11.22     6.50     4.72     0.91     0.37     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.979

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     571.046     289.514     492.214    1190.554       0.480       0.010

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.084      21.426     589.140      46.000      30.463      31.500       1.037

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     503.863     289.514     581.117    1196.629       0.421       0.212

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.050      22.171     595.168     471.992       0.019       0.315

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     488.384       0.000     488.384    1197.917       0.408       0.228
```

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.278	596.450	0.000	0.060	0.037	0.241

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.860	24.983	1.142	616.360	26.526	253.712	1.967

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
165325.391	0.430	1551.428	1653332.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.510 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
166.058	3587.000	24.983	616.360	1.000	1.000	0.980

W Kg/sec = 75.48089

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
106.512	3290.578	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
127745.469	130300.102	1.655	513.330	310.224	401.059	1.293

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	457.37	-0.16	457.37	0.38	553.05
MEAN	16.97	0.00	-0.02	457.37	-0.16	457.37	0.38	
HUB	14.32	0.00	-0.02	457.37	-0.16	457.37	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.82	46.36	6.46	602.89	756.87	22.60	598.91	0.63
MEAN	49.28	43.80	5.48	531.23	701.11	22.60	598.91	0.58
HUB	44.43	37.84	6.59	448.25	640.51	22.60	598.91	0.53

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	531.42	261.66	462.54	1218.90	0.44
MEAN	16.57	542.61	275.30	467.59	1216.04	0.45
HUB	13.89	586.93	347.00	473.37	1213.19	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	590.99	567.81	329.34	0.47	4943.08	
MEAN	518.80	527.19	243.50	0.43	4565.51	1.44
HUB	434.79	481.44	87.79	0.40	4822.10	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	28.34	1.13	24.87	641.18	1.04	617.61	0.92	0.91
MEAN	28.07	1.12	24.48	639.28	1.04	614.71	0.92	0.91
HUB	28.25	1.13	24.07	640.57	1.04	611.82	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	29.50	35.45	31.50	3.95	0.93	0.31	2.90	
MEAN	30.49	27.51	23.50	4.01	0.92	0.31	3.29	0.91
HUB	36.24	10.51	6.50	4.01	0.92	0.32	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	534.708	276.851	457.456	1217.773	0.439	0.054

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
28.185	24.686	616.484	46.000	31.182	32.400	1.218

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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     475.381     276.851     550.122    1222.702       0.389       0.238

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.157      25.367     621.484     456.573       0.017       0.331

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     451.125       0.000     451.125    1224.545       0.368       0.235

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.568     623.360       0.000       0.060       0.037       0.292

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      28.083       1.124     640.341      23.981     257.291       1.995

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 149548.328       0.428    1403.374 1452203.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.510   EfDer =  0.997

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    166.058    3587.000      28.083     640.341       1.000       1.000       0.980
W Kg/sec =   75.48089

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     96.578    3228.373       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127745.469  130300.102       1.812     509.668     281.308     390.276       1.387

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   419.98    -0.14   419.98     0.34   516.11
 MEAN    15.91     0.00    -0.02   419.98    -0.14   419.98     0.34
 HUB     13.07     0.00    -0.02   419.98    -0.14   419.98     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.79    47.36     6.43   573.46   710.92    25.89   625.63     0.58
 MEAN    49.87    44.80     5.07   498.12   651.65    25.89   625.63     0.53
 HUB     44.26    38.84     5.42   409.12   586.41    25.89   625.63     0.48

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   497.63   255.51   427.03  1243.29     0.40
 MEAN    15.50   503.77   258.97   432.12  1240.02     0.41
 HUB     12.59   538.12   312.98   437.74  1236.77     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   525.38   306.06     0.42  4586.50
 MEAN   485.11   487.72   226.15     0.39  4015.65     1.46
 HUB    394.10   445.19    81.12     0.36  3942.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.43     1.12    28.15   663.35     1.04   642.70     0.92     0.91
 MEAN    31.00     1.10    27.67   660.49     1.03   639.32     0.92     0.91
 HUB     30.95     1.10    27.17   660.12     1.03   635.97     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.89    35.63    31.50     4.13     0.93     0.32     2.90
 MEAN    30.93    27.63    23.50     4.13     0.92     0.31     3.34     0.91
 HUB     35.56    10.50     6.50     4.00     0.92     0.31     4.06
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      509.390     263.715     435.813    1240.362       0.411       -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.057      27.650      639.678      46.000      31.179      33.000       1.821

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      458.204     263.715     528.674    1244.361       0.368       0.166

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.012      28.237      643.809     440.827       0.033       0.335

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     427.788       0.000     427.788    1246.531       0.343       0.265

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.568     646.057       0.000       0.060       0.038       0.262

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      30.996       1.104     661.320      20.979     271.463       2.104

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 130907.883       0.415    1228.451 1490292.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    863159.25   8099.9604    162.2220      2.0517      0.8638      6.5098      1.2649


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.977   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    163.580    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    159.801    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*      AthrRotor  ChokeMargin
  125838.836  128355.344       1.787     831.557     465.375     619.754       1.332

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   385.57    -0.13   385.57     0.35   643.21
  MEAN    17.06     0.00    -0.02   385.57    -0.13   385.57     0.35
  HUB     12.51     0.00    -0.02   385.57    -0.13   385.57     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.17    50.47     8.70   645.77   752.23    13.89   510.39     0.68
  MEAN    54.18    47.20     6.98   534.02   658.78    13.89   510.39     0.59
  HUB     45.45    38.62     6.83   391.59   549.65    13.89   510.39     0.50
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     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   627.23   371.81   505.15  1127.87     0.56
MEAN    18.04   657.76   407.22   516.55  1122.64     0.59
HUB     15.00   750.64   523.34   538.13  1113.73     0.67

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    645.77   574.66   273.96     0.51  7673.11
MEAN   564.57   539.98   157.35     0.48  7346.94     1.36
HUB    469.54   540.81    53.80     0.49  7851.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.97     1.26    15.37   561.39     1.07   528.54     0.92     0.91
MEAN    18.80     1.24    14.89   559.75     1.07   523.62     0.92     0.91
HUB     19.07     1.26    14.06   562.29     1.08   515.25     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     36.35    28.47    24.20     4.27     0.93     0.32     2.90
MEAN    38.25    16.94    12.70     4.24     0.93     0.27     3.51     0.91
HUB     44.20    -5.71    -9.30     3.59     0.93     0.12     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    18.071     667.784     406.432     529.858    1122.833       0.595       -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.904      14.878     523.900      24.000      37.490      35.400      -2.090

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     551.432     406.432     685.029    1135.458       0.486       0.302

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.845      16.034     535.749     528.796       0.024       0.444

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083     506.677       0.000     506.677    1139.642       0.445       0.365

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.400     539.704       0.000       0.060       0.038       0.389

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      18.787       1.244     561.147      38.337     211.747       1.641

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 238678.125       0.572    2206.347 1621285.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.977   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.580    3587.000      18.787     561.147       1.000       1.000       0.980
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    133.126    3448.668       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.523     590.487     387.703     474.134       1.223
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ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	481.78	-0.17	481.78	0.42	618.44
MEAN	18.08	0.00	-0.02	481.78	-0.17	481.78	0.42	
HUB	15.21	0.00	-0.02	481.78	-0.17	481.78	0.42	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.18	46.36	6.82	643.27	803.82	16.62	541.76	0.70
MEAN	49.60	42.30	7.30	565.89	743.33	16.62	541.76	0.65
HUB	44.67	37.84	6.83	476.11	677.46	16.62	541.76	0.59

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	566.68	297.90	482.06	1165.94	0.49
MEAN	18.01	579.65	310.58	489.42	1162.12	0.50
HUB	15.22	629.57	385.49	497.75	1158.34	0.54

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	590.65	341.30	0.51	6086.52	
MEAN	563.76	551.03	253.18	0.47	5596.44	1.46
HUB	476.52	506.00	91.02	0.44	5870.91	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.26	1.18	18.94	591.74	1.05	564.92	0.92	0.91
MEAN	21.97	1.17	18.53	589.27	1.05	561.22	0.92	0.91
HUB	22.13	1.18	18.10	590.65	1.05	557.56	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.71	35.30	31.50	3.80	0.93	0.33	2.90	
MEAN	32.40	27.35	23.50	3.85	0.93	0.32	3.30	0.91
HUB	37.76	10.36	6.50	3.86	0.93	0.33	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	654.783	311.447	575.970	1155.360	0.567	-0.215

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.084	17.756	554.753	46.000	28.402	30.600	2.198

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	578.910	311.447	657.371	1163.471	0.498	0.023

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	22.037	18.604	562.569	455.853	0.023	0.288

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	570.285	0.000	570.285	1164.326	0.490	0.249

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	18.653	563.397	0.000	0.060	0.038	0.036

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	21.983	1.170	590.554	29.407	243.246	1.886

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
183183.578	0.448	1693.354	1464472.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 6.977 EfDer = 0.985

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
163.580	3587.000	21.983	590.554	1.000	1.000	0.880

W Kg/sec = 74.35432

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
116.718	3361.707	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
125838.836	128355.344	1.441	489.817	339.932	384.470	1.131

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	529.28	-0.18	529.28	0.45	588.76
MEAN	17.74	0.00	-0.02	529.28	-0.18	529.28	0.45	
HUB	15.05	0.00	-0.02	529.28	-0.18	529.28	0.45	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.89	46.36	3.53	628.24	821.62	19.09	567.17	0.70
MEAN	46.38	43.40	2.98	555.26	767.24	19.09	567.17	0.66
HUB	41.68	38.84	2.84	471.10	708.70	19.09	567.17	0.61

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	546.00	278.62	469.56	1194.88	0.46
MEAN	17.51	558.75	294.03	475.13	1191.82	0.47
HUB	14.85	607.08	369.60	481.60	1188.80	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.10	580.60	341.48	0.49	5523.09	
MEAN	548.00	538.75	253.97	0.45	5150.60	1.53
HUB	464.84	490.92	95.24	0.41	5491.37	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.41	1.16	22.01	618.30	1.05	593.41	0.92	0.90
MEAN	25.16	1.14	21.64	616.43	1.04	590.37	0.92	0.90
HUB	25.39	1.15	21.24	618.14	1.05	587.38	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.68	36.03	31.50	4.53	0.93	0.35	2.90	
MEAN	31.75	28.13	23.50	4.63	0.91	0.36	3.28	0.90
HUB	37.50	11.19	6.50	4.69	0.91	0.37	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.985

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	564.469	295.955	480.663	1192.453	0.473	0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.282	21.682	591.023	46.000	31.622	31.500	-0.122

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	491.144	295.955	573.421	1198.953	0.410	0.233

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	25.251	22.493	597.484	471.992	0.019	0.332

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	476.188	0.000	476.188	1200.164	0.397	0.247

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.592	598.691	0.000	0.060	0.037	0.260

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    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      25.184       1.146     617.620      27.066     247.014       1.915

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 168690.812       0.439    1559.382 1619020.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.977   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.580    3587.000      25.184     617.620       1.000       1.000       0.980
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.188    3287.221       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.692     513.330     303.457     401.059       1.322

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   446.23    -0.15   446.22     0.37   552.48
 MEAN    16.97     0.00    -0.02   446.23    -0.15   446.22     0.37
 HUB     14.32     0.00    -0.02   446.23    -0.15   446.22     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.50    46.36     7.14   602.89   750.18    22.90   601.01     0.62
 MEAN    49.98    43.80     6.18   531.23   693.89    22.90   601.01     0.58
 HUB     45.14    37.84     7.30   448.25   632.60    22.90   601.01     0.53

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   525.46   270.38   450.56  1221.47     0.43
 MEAN    16.57   535.79   281.65   455.78  1218.41     0.44
 HUB     13.89   578.98   349.35   461.71  1215.35     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   552.99   320.61     0.45  5107.68
 MEAN   518.80   513.79   237.15     0.42  4670.64     1.46
 HUB    434.79   469.55    85.45     0.39  4854.61

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.68     1.14    25.25   643.26     1.04   620.22     0.92     0.91
 MEAN    28.37     1.13    24.84   641.07     1.04   617.11     0.92     0.91
 HUB     28.50     1.13    24.40   641.99     1.04   614.02     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.97    35.44    31.50     3.94     0.93     0.32     2.90
 MEAN    31.71    27.49    23.50     3.99     0.93     0.32     3.29     0.91
 HUB     37.11    10.48     6.50     3.98     0.93     0.33     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     528.352     283.234     446.021    1220.067       0.433       0.053

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.482      25.035     618.813      46.000      32.416      32.400      -0.016

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     16.481     462.700     283.234     542.506    1225.407       0.378       0.259

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.456      25.787     624.242     456.573       0.017       0.349

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     439.268       0.000     439.268    1227.137       0.358       0.255

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.976     626.005       0.000       0.060       0.037       0.311

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      28.384       1.127     642.106      24.486     250.191       1.939

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 152701.938       0.437    1411.581 1423173.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.977   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.580    3587.000      28.384     642.106       1.000       1.000       0.980
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     94.258    3223.935       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.856     509.668     274.551     390.276       1.422

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   409.17    -0.14   409.17     0.33   515.40
 MEAN    15.91     0.00    -0.02   409.17    -0.14   409.17     0.33
 HUB     13.07     0.00    -0.02   409.17    -0.14   409.17     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.50    47.36     7.14   573.46   704.59    26.29   628.14     0.57
 MEAN    50.61    44.80     5.81   498.12   644.73    26.29   628.14     0.52
 HUB     45.01    38.84     6.17   409.12   578.72    26.29   628.14     0.47

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   492.24   264.00   415.45  1246.16     0.40
 MEAN    15.50   497.26   265.20   420.63  1242.72     0.40
 HUB     12.59   530.24   315.28   426.32  1239.30     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   511.02   297.56     0.41  4738.82
 MEAN   485.11   474.65   219.92     0.38  4112.16     1.49
 HUB    394.10   433.55    78.82     0.35  3971.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.88     1.12    28.63   665.88     1.04   645.67     0.92     0.91
 MEAN    31.40     1.11    28.12   662.74     1.03   642.11     0.92     0.91
 HUB     31.30     1.10    27.59   662.03     1.03   638.58     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.43    35.61    31.50     4.11     0.93     0.34     2.90
 MEAN    32.23    27.60    23.50     4.10     0.92     0.32     3.34     0.91
 HUB     36.48    10.48     6.50     3.98     0.92     0.32     4.06


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.999

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     502.888     270.060     424.222    1243.045       0.405      -0.005

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      31.460      28.103     642.455      46.000      32.481      33.000       0.519

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     445.225     270.060     520.728    1247.449       0.357       0.192

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      31.419      28.769     647.015     440.827       0.032       0.354

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     415.928       0.000     415.928    1249.476       0.333       0.287

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      29.082     649.119       0.000       0.060       0.037       0.283

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.879      31.403       1.106     663.548      21.442     263.584       2.043

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  133805.594       0.424    1236.902 1460448.000

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     877060.00   8107.5659     159.8008      2.0787      0.8672      6.9773      1.2692


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.999

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     161.070     3587.000       15.107      522.810       1.000        1.000        0.980
 W Kg/sec =   73.21345

    W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     157.349     3572.873        1.402       0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  123908.016  126385.898        1.815      831.557     458.234     619.754       1.352

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator     Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00     -0.02    378.86     -0.13    378.86      0.34    643.21
  MEAN    17.06      0.00     -0.02    378.86     -0.13    378.86      0.34
  HUB     12.51      0.00     -0.02    378.86     -0.13    378.86      0.34

        BetaFlo    BetaBlade Incid    U1        W1        Ps1       Ts1      Rel Mach
  TIP     59.61     50.47      9.14    645.77    748.81     13.93    510.82      0.68
  MEAN    54.65     47.20      7.45    534.02    654.87     13.93    510.82      0.59
  HUB     45.96     38.62      7.34    391.59    544.96     13.93    510.82      0.49

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK         AeroBl      Blades2
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     0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   622.48   377.25   495.14  1128.99     0.55
 MEAN    18.04   651.87   410.31   506.54  1123.62     0.58
 HUB     15.00   742.36   522.31   527.54  1114.73     0.67

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    645.77   563.26   268.52     0.50  7785.28
 MEAN   564.57   529.51   154.27     0.47  7402.52     1.38
 HUB    469.54   530.17    52.77     0.48  7836.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.03     1.26    15.48   561.96     1.07   529.60     0.92     0.91
 MEAN    18.82     1.25    14.98   560.03     1.07   524.55     0.92     0.91
 HUB     19.06     1.26    14.15   562.21     1.08   516.20     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.30    28.47    24.20     4.27     0.93     0.33     2.90
 MEAN    39.01    16.94    12.70     4.24     0.93     0.28     3.51     0.91
 HUB     44.71    -5.71    -9.30     3.59     0.93     0.14     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     661.465     409.509     519.460    1123.857       0.589      -0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.931      14.970     524.857      24.000      38.250      35.400      -2.850

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     539.804     409.509     677.559    1136.851       0.475       0.316

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.870      16.168     537.064     528.796       0.025       0.456

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     496.549       0.000     496.549    1140.807       0.435       0.376

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.512     540.808       0.000       0.060       0.039       0.400

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      18.810       1.245     561.402      38.592     208.855       1.619

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 240267.266       0.576    2186.958 1593081.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.999

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    161.070    3587.000      18.810     561.402       1.000       1.000       0.980
W Kg/sec =   73.21345

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    130.952    3447.884       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123908.016  126385.898       1.548     590.487     381.371     474.134       1.243

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     20.55     0.00    -0.02   472.38    -0.16   472.38     0.41   618.30
MEAN    18.08     0.00    -0.02   472.38    -0.16   472.38     0.41
HUB     15.21     0.00    -0.02   472.38    -0.16   472.38     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.72    46.36     7.36   643.27   798.21    16.72   542.77     0.70
MEAN    50.15    42.30     7.85   565.89   737.26    16.72   542.77     0.65
HUB     45.24    37.84     7.40   476.11   670.80    16.72   542.77     0.59

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   562.10   305.07   472.11  1167.40     0.48
MEAN    18.01   574.24   315.80   479.60  1163.40     0.49
HUB     15.22   623.12   387.41   488.05  1159.45     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    639.20   578.39   334.13     0.50  6232.78
MEAN   563.76   539.91   247.96     0.46  5690.45     1.48
HUB    476.52   496.12    89.11     0.43  5899.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.37     1.19    19.09   592.73     1.06   566.34     0.92     0.91
MEAN    22.05     1.17    18.66   590.00     1.05   562.47     0.92     0.91
HUB     22.17     1.18    18.21   591.05     1.05   558.63     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.87    35.29    31.50     3.79     0.93     0.34     2.90
MEAN    33.36    27.34    23.50     3.84     0.93     0.33     3.30     0.91
HUB     38.44    10.35     6.50     3.85     0.93     0.33     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     646.290     316.685     563.384    1157.055       0.559      -0.207

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.162      17.926     556.382      46.000      29.341      30.600       1.259

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     565.249     316.685     647.916    1165.548       0.485       0.049

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      22.119      18.828     564.581     455.853       0.022       0.302

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     556.913       0.000     556.913    1166.354       0.477       0.267

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      18.874     565.362       0.000       0.060       0.037       0.062

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      22.066       1.173     591.260      29.858     238.124       1.846

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 185994.016       0.455    1692.953 1436509.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
  RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.990

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     161.070    3587.000      22.066     591.260       1.000       1.000       0.880
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W Kg/sec = 73.21345

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
114.563	3359.698	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
123908.016	126385.898	1.468	489.817	333.656	384.470	1.152

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	517.40	-0.18	517.40	0.44	588.41
MEAN	17.74	0.00	-0.02	517.40	-0.18	517.40	0.44	
HUB	15.05	0.00	-0.02	517.40	-0.18	517.40	0.44	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.53	46.36	4.17	628.24	814.01	19.29	568.91	0.70
MEAN	47.03	43.40	3.63	555.26	759.09	19.29	568.91	0.65
HUB	42.33	38.84	3.49	471.10	699.86	19.29	568.91	0.60

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	540.92	286.88	458.58	1196.88	0.45
MEAN	17.51	552.87	300.07	464.36	1193.61	0.46
HUB	14.85	600.14	371.98	470.96	1190.40	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.10	566.86	333.22	0.47	5686.62	
MEAN	548.00	526.40	247.93	0.44	5256.33	1.55
HUB	464.84	480.02	92.86	0.40	5526.54	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.62	1.16	22.27	619.82	1.05	595.40	0.92	0.91
MEAN	25.34	1.15	21.87	617.66	1.04	592.15	0.92	0.91
HUB	25.52	1.16	21.45	619.02	1.05	588.96	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.03	36.00	31.50	4.50	0.93	0.36	2.90	
MEAN	32.87	28.10	23.50	4.60	0.92	0.37	3.28	0.91
HUB	38.30	11.15	6.50	4.65	0.92	0.38	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.990

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	558.456	302.038	469.730	1194.245	0.468	0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.458	21.912	592.802	46.000	32.741	31.500	-1.241

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	479.196	302.038	566.441	1201.140	0.399	0.253

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	25.427	22.783	599.667	471.992	0.019	0.349

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	464.752	0.000	464.752	1202.279	0.387	0.265

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.873	600.805	0.000	0.060	0.037	0.278

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

```
      0.872      25.360       1.149     618.835      27.575     240.832       1.867

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 171867.422       0.447    1564.370 1585343.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.070    3587.000      25.360     618.835       1.000       1.000       0.980
W Kg/sec =   73.21345

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    101.981    3283.991       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123908.016  126385.898       1.728     513.330     297.029     401.059       1.350

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   435.75    -0.15   435.75     0.36   551.94
 MEAN    16.97     0.00    -0.02   435.75    -0.15   435.75     0.36
 HUB     14.32     0.00    -0.02   435.75    -0.15   435.75     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.15    46.36     7.79   602.89   744.00    23.16   602.99     0.62
 MEAN    50.65    43.80     6.85   531.23   687.20    23.16   602.99     0.57
 HUB     45.82    37.84     7.98   448.25   625.25    23.16   602.99     0.52

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   520.24   278.47   439.44  1223.86     0.43
 MEAN    16.57   529.64   287.54   444.79  1220.62     0.43
 HUB     13.89   571.67   351.54   450.81  1217.39     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   539.23   312.52     0.44  5260.43
 MEAN   518.80   501.32   231.27     0.41  4768.15     1.49
 HUB    434.79   458.43    83.26     0.38  4884.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.99     1.14    25.60   645.24     1.04   622.66     0.92     0.91
 MEAN    28.63     1.13    25.15   642.77     1.04   619.37     0.92     0.91
 HUB     28.72     1.13    24.69   643.36     1.04   616.09     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.36    35.42    31.50     3.92     0.93     0.34     2.90
 MEAN    32.88    27.47    23.50     3.97     0.93     0.33     3.29     0.91
 HUB     37.95    10.46     6.50     3.96     0.93     0.34     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     522.636     289.154     435.361    1222.216       0.428       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.742      25.344     620.999      46.000      33.591      32.400      -1.191

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     450.959     289.154     535.700    1227.933       0.367       0.279

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      28.717      26.160     626.821     456.573       0.017       0.367

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     428.306       0.000     428.306    1229.560       0.348       0.273

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.336     628.483       0.000       0.060       0.037       0.328

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      28.644       1.130     643.790      24.955     243.739       1.889

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 155630.766       0.446    1416.581 1394644.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.070    3587.000      28.644     643.790       1.000       1.000       0.980
W Kg/sec =   73.21345

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.090    3219.715       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123908.016  126385.898       1.900     509.668     268.238     390.276       1.455

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   399.16    -0.14   399.16     0.32   514.73
 MEAN    15.91     0.00    -0.02   399.16    -0.14   399.16     0.32
 HUB     13.07     0.00    -0.02   399.16    -0.14   399.16     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.17    47.36     7.81   573.46   698.82    26.63   630.50     0.57
 MEAN    51.30    44.80     6.50   498.12   638.42    26.63   630.50     0.52
 HUB     45.72    38.84     6.88   409.12   571.68    26.63   630.50     0.46

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   487.61   271.79   404.84  1248.81     0.39
 MEAN    15.50   491.47   270.87   410.08  1245.23     0.39
 HUB     12.59   523.09   317.37   415.81  1241.66     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   497.86   289.78     0.40  4878.41
 MEAN   485.11   462.67   214.24     0.37  4200.04     1.52
 HUB    394.10   422.83    76.72     0.34  3997.54

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.28     1.13    29.05   668.26     1.04   648.43     0.92     0.91
 MEAN    31.75     1.11    28.52   664.86     1.03   644.72     0.92     0.91
 HUB     31.60     1.10    27.96   663.84     1.03   641.02     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.88    35.59    31.50     4.09     0.93     0.35     2.90
 MEAN    33.45    27.58    23.50     4.08     0.93     0.34     3.34     0.91
 HUB     37.35    10.45     6.50     3.95     0.93     0.33     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     497.118     275.838     413.570    1245.541       0.399      -0.005

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      31.808      28.499     645.045      46.000      33.702      33.000      -0.702

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     433.405     275.838     513.738    1250.306       0.347       0.215

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      31.770      29.234     649.990     440.827       0.031       0.372

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     405.107       0.000     405.107    1252.208       0.324       0.306

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      29.529     651.969       0.000       0.060       0.037       0.303

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.881      31.752       1.109     665.656      21.866     256.539       1.989

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  136454.750       0.433    1242.037 1431184.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     890214.19   8102.8979    157.3488      2.1018      0.8687      7.4530      1.2732


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     158.444    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   72.01982

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     154.784    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  121887.875  124325.375       1.845     831.557     450.763     619.754       1.375

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   371.89    -0.13   371.89     0.34   643.21
  MEAN    17.06     0.00    -0.02   371.89    -0.13   371.89     0.34
  HUB     12.51     0.00    -0.02   371.89    -0.13   371.89     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.07    50.47     9.60   645.77   745.31    13.97   511.26     0.67
  MEAN    55.15    47.20     7.95   534.02   650.86    13.97   511.26     0.59
  HUB     46.49    38.62     7.87   391.59   540.14    13.97   511.26     0.49

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     20.63   617.80   382.83   484.90  1130.11     0.55
 MEAN    18.04   645.96   413.47   496.29  1124.60     0.57
 HUB     15.00   733.92   521.23   516.68  1115.74     0.66

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    645.77   551.60   262.94     0.49  7900.33
 MEAN   564.57   518.78   151.10     0.46  7459.54     1.41
 HUB    469.54   519.26    51.69     0.47  7820.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.09     1.26    15.58   562.54     1.08   530.66     0.92     0.91
 MEAN    18.85     1.25    15.07   560.32     1.07   525.47     0.92     0.91
 HUB     19.05     1.26    14.24   562.13     1.08   517.16     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    38.29    28.47    24.20     4.27     0.93     0.35     2.90
 MEAN    39.80    16.93    12.70     4.23     0.93     0.30     3.51     0.91
 HUB     45.25    -5.71    -9.30     3.59     0.93     0.15     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     655.126     412.667     508.818    1124.883       0.582      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.956      15.061     525.816      24.000      39.043      35.400      -3.643

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     527.994     412.667     670.128    1138.242       0.464       0.331

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.893      16.300     538.379     528.796       0.026       0.468

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     486.234       0.000     486.234    1141.975       0.426       0.387

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.621     541.916       0.000       0.060       0.041       0.411

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.878      18.831       1.246     561.663      38.853     205.880       1.596

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 241894.422       0.580    2165.872 1563779.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     158.444    3587.000      18.831     561.663       1.000       1.000       0.980
W Kg/sec =   72.01982

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     128.707    3447.081       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 121887.875  124325.375       1.575     590.487     374.834     474.134       1.265

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   462.78    -0.16   462.78     0.40   618.16
 MEAN    18.08     0.00    -0.02   462.78    -0.16   462.78     0.40
 HUB     15.21     0.00    -0.02   462.78    -0.16   462.78     0.40
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.27    46.36     7.91   643.27   792.56    16.82   543.78     0.69
MEAN    50.73    42.30     8.43   565.89   731.15    16.82   543.78     0.64
HUB     45.82    37.84     7.98   476.11   664.07    16.82   543.78     0.58

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   557.71   312.29   462.07  1168.85     0.48
MEAN    18.01   568.92   321.06   469.66  1164.68     0.49
HUB     15.22   616.65   389.33   478.21  1160.56     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    639.20   566.02   326.90     0.48  6380.32
MEAN   563.76   528.66   242.69     0.45  5785.20     1.50
HUB    476.52   486.09    87.19     0.42  5929.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.48     1.19    19.23   593.73     1.06   567.76     0.92     0.91
MEAN    22.12     1.17    18.79   590.74     1.05   563.71     0.92     0.91
HUB     22.21     1.18    18.32   591.46     1.05   559.71     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.05    35.28    31.50     3.78     0.93     0.35     2.90
MEAN    34.36    27.33    23.50     3.83     0.93     0.34     3.30     0.91
HUB     39.15    10.33     6.50     3.83     0.93     0.34     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     637.950     321.964     550.744    1158.727       0.551      -0.199

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.235      18.091     557.993      46.000      30.310      30.600       0.290

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     551.643     321.964     638.725    1167.595       0.472       0.076

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      22.194      19.045     566.566     455.853       0.022       0.317

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     543.610       0.000     543.610    1168.352       0.465       0.285

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.850      19.086     567.301       0.000       0.060       0.037       0.088

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.881      22.142       1.176     591.976      30.313     233.035       1.806

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188827.203       0.462    1690.719 1407704.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.444    3587.000      22.142     591.976       1.000       1.000       0.880
W Kg/sec =   72.01982

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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   112.375    3357.666       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
121887.875  124325.375       1.497     489.817     327.286     384.470       1.175

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   505.53    -0.17   505.53     0.43   588.06
MEAN    17.74     0.00    -0.02   505.53    -0.17   505.53     0.43
HUB     15.05     0.00    -0.02   505.53    -0.17   505.53     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.19    46.36     4.83   628.24   806.51    19.48   570.64     0.69
MEAN    47.69    43.40     4.29   555.26   751.04    19.48   570.64     0.64
HUB     42.99    38.84     4.15   471.10   691.13    19.48   570.64     0.59

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   536.19   295.06   447.71  1198.84     0.45
MEAN    17.51   547.24   306.04   453.66  1195.37     0.46
HUB     14.85   593.34   374.31   460.37  1191.97     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.10   553.25   325.04     0.46  5848.72
MEAN   548.00   514.15   241.96     0.43  5360.85     1.57
HUB    464.84   469.18    90.53     0.39  5561.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.83     1.17    22.51   621.35     1.05   597.36     0.92     0.91
MEAN    25.51     1.15    22.09   618.90     1.05   593.91     0.92     0.91
HUB     25.64     1.16    21.64   619.91     1.05   590.52     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.39    35.98    31.50     4.48     0.93     0.38     2.90
MEAN    34.00    28.07    23.50     4.57     0.92     0.38     3.28     0.91
HUB     39.11    11.13     6.50     4.63     0.92     0.39     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.994

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     552.690     308.051     458.880    1196.009       0.462       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.623      22.130     594.557      46.000      33.874      31.500      -2.374

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     467.420     308.051     559.801    1203.290       0.388       0.273

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.590      23.058     601.818     471.992       0.019       0.367

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     453.499       0.000     453.499    1204.359       0.377       0.282

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      23.139     602.888       0.000       0.060       0.039       0.296

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      25.521       1.153     620.055      28.079     234.838       1.820

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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 175010.969       0.455    1567.012 1551029.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.444    3587.000      25.521     620.055       1.000       1.000       0.980
W Kg/sec =   72.01982

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     99.784    3280.759       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 121887.875  124325.375       1.766     513.330     290.630     401.059       1.380

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   425.43    -0.15   425.43     0.35   551.40
 MEAN    16.97     0.00    -0.02   425.43    -0.15   425.43     0.35
 HUB     14.32     0.00    -0.02   425.43    -0.15   425.43     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.80    46.36     8.44   602.89   737.99    23.42   604.95     0.61
 MEAN    51.32    43.80     7.52   531.23   680.69    23.42   604.95     0.56
 HUB     46.51    37.84     8.67   448.25   618.10    23.42   604.95     0.51

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   515.43   286.34   428.58  1226.19     0.42
 MEAN    16.57   523.84   293.31   434.03  1222.79     0.43
 HUB     13.89   564.61   353.66   440.13  1219.40     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   525.83   304.65     0.43  5408.88
 MEAN   518.80   489.11   225.50     0.40  4863.69     1.51
 HUB    434.79   447.54    81.13     0.37  4914.41

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.27     1.15    25.92   647.21     1.04   625.04     0.92     0.91
 MEAN    28.87     1.13    25.45   644.47     1.04   621.57     0.92     0.91
 HUB     28.91     1.13    24.96   644.72     1.04   618.13     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.75    35.41    31.50     3.91     0.93     0.35     2.90
 MEAN    34.05    27.45    23.50     3.95     0.93     0.35     3.29     0.91
 HUB     38.78    10.44     6.50     3.94     0.93     0.35     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     517.263     294.955     424.927    1224.319       0.422       0.051

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.982      25.631     623.142      46.000      34.766      32.400      -2.366

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     439.536     294.955     529.330    1230.400       0.357       0.299

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.956      26.509     629.347     456.573       0.017       0.384

    VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	417.653	0.000	417.653	1231.929	0.339	0.290

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	26.670	630.912	0.000	0.060	0.039	0.344

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.880	28.880	1.132	645.467	25.412	237.575	1.842

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
158483.938	0.454	1419.032	1365537.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 7.953 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
158.444	3587.000	28.880	645.467	1.000	1.000	0.980

W Kg/sec = 72.01982

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
89.964	3215.530	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
121887.875	124325.375	1.945	509.668	262.046	390.276	1.489

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	389.41	-0.13	389.41	0.32	514.06
MEAN	15.91	0.00	-0.02	389.41	-0.13	389.41	0.32	
HUB	13.07	0.00	-0.02	389.41	-0.13	389.41	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.83	47.36	8.47	573.46	693.29	26.95	632.82	0.56
MEAN	51.99	44.80	7.19	498.12	632.37	26.95	632.82	0.51
HUB	46.42	38.84	7.58	409.12	564.92	26.95	632.82	0.46

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	483.45	279.29	394.61	1251.39	0.39
MEAN	15.50	486.09	276.37	399.88	1247.67	0.39
HUB	12.59	516.27	319.40	405.62	1243.97	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	561.57	485.17	282.27	0.39	5012.97	
MEAN	485.11	451.08	208.75	0.36	4285.14	1.54
HUB	394.10	412.44	74.70	0.33	4022.95	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	32.64	1.13	29.44	670.61	1.04	651.12	0.92	0.91
MEAN	32.07	1.11	28.88	666.96	1.03	647.26	0.92	0.91
HUB	31.87	1.10	28.30	665.65	1.03	643.42	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.29	35.58	31.50	4.08	0.93	0.37	2.90	
MEAN	34.65	27.57	23.50	4.07	0.93	0.35	3.34	0.91
HUB	38.22	10.44	6.50	3.94	0.93	0.34	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	491.767	281.434	403.274	1247.970	0.394	-0.006

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.126      28.863     647.573      46.000      34.910      33.000      -1.910

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     422.063     281.434     507.289    1253.079       0.337       0.237

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      32.087      29.662     652.885     440.827       0.032       0.391

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     394.711       0.000     394.711    1254.865       0.315       0.325

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.940     654.748       0.000       0.060       0.038       0.321

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.882      32.067       1.110     667.741      22.275     249.884       1.937

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 139011.750       0.441    1244.682 1401372.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    903228.31   8087.3179    154.7835      2.1227      0.8689      7.9532      1.2772


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.501   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    151.988    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.879     831.557     442.622     619.754       1.400

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   364.35    -0.13   364.35     0.33   643.21
  MEAN    17.06     0.00    -0.02   364.35    -0.13   364.35     0.33
  HUB     12.51     0.00    -0.02   364.35    -0.13   364.35     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.57    50.47    10.10   645.77   741.58    14.02   511.72     0.67
  MEAN    55.70    47.20     8.50   534.02   646.58    14.02   511.72     0.58
  HUB     47.07    38.62     8.45   391.59   534.97    14.02   511.72     0.48

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   613.02   388.75   473.99  1131.28     0.54
  MEAN    18.04   639.76   416.82   485.34  1125.62     0.57
  HUB     15.00   724.99   520.07   505.10  1116.79     0.65
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    645.77   539.19   257.02     0.48  8022.49
 MEAN   564.57   507.33   147.75     0.45  7519.92     1.43
 HUB    469.54   507.62    50.54     0.45  7802.67

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.15     1.27    15.68   563.15     1.08   531.77     0.92     0.91
 MEAN    18.88     1.25    15.16   560.62     1.07   526.44     0.92     0.91
 HUB     19.03     1.26    14.33   562.05     1.08   518.16     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.36    28.47    24.20     4.27     0.93     0.36     2.90
 MEAN    40.66    16.93    12.70     4.23     0.93     0.31     3.51     0.91
 HUB     45.84    -5.71    -9.30     3.59     0.93     0.16     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     648.495     416.010     497.475    1125.951       0.576      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.981      15.155     526.815      24.000      39.904      35.400      -4.504

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     515.501     416.010     662.424    1139.684       0.452       0.347

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.915      16.435     539.744     528.796       0.027       0.481

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     475.296       0.000     475.296    1143.192       0.416       0.398

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.732     543.071       0.000       0.060       0.043       0.422

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      18.849       1.248     561.940      39.130     202.701       1.571

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 243617.312       0.584    2141.904 1532079.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.501   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3587.000      18.849     561.940       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    126.294    3446.233       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.605     590.487     367.806     474.134       1.289

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   452.58    -0.16   452.58     0.40   618.00
 MEAN    18.08     0.00    -0.02   452.58    -0.16   452.58     0.40
 HUB     15.21     0.00    -0.02   452.58    -0.16   452.58     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.88    46.36     8.52   643.27   786.65    16.92   544.84     0.69
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 MEAN    51.36    42.30     9.06   565.89   724.73    16.92   544.84     0.63
 HUB     46.46    37.84     8.62   476.11   657.01    16.92   544.84     0.57

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   553.34   319.88   451.52  1170.34     0.47
 MEAN    18.01   563.49   326.61   459.18  1166.01     0.48
 HUB     15.22   609.90   391.35   467.79  1161.71     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   553.02   319.32     0.47  6535.13
 MEAN   563.76   516.81   237.15     0.44  5884.96     1.53
 HUB    476.52   475.48    85.17     0.41  5959.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.59     1.20    19.38   594.78     1.06   569.22     0.92     0.91
 MEAN    22.19     1.18    18.91   591.52     1.05   565.00     0.92     0.91
 HUB     22.24     1.18    18.43   591.89     1.05   560.83     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.32    35.27    31.50     3.77     0.93     0.37     2.90
 MEAN    35.42    27.31    23.50     3.81     0.93     0.36     3.30     0.91
 HUB     39.92    10.32     6.50     3.82     0.93     0.35     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     629.444     327.522     537.521    1160.443       0.542      -0.191

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.305      18.255     559.648      46.000      31.355      30.600      -0.755

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     537.514     327.522     629.438    1169.693       0.460       0.104

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      22.266      19.261     568.605     455.853       0.021       0.332

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     529.813       0.000     529.813    1170.399       0.453       0.303

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      19.297     569.292       0.000       0.060       0.037       0.114

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      22.213       1.178     592.731      30.791     227.765       1.766

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 191804.141       0.469    1686.358 1376806.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.501   EfDer =  0.997

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    155.582    3587.000      22.213     592.731       1.000       1.000       0.880
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    110.063    3355.528       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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119686.578  122080.047       1.528     489.817     320.551     384.470       1.199

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   493.16    -0.17   493.16     0.42   587.68
MEAN    17.74     0.00    -0.02   493.16    -0.17   493.16     0.42
HUB     15.05     0.00    -0.02   493.16    -0.17   493.16     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.88    46.36     5.52   628.24   798.82    19.67   572.43     0.68
MEAN    48.40    43.40     5.00   555.26   742.77    19.67   572.43     0.63
HUB     43.70    38.84     4.86   471.10   682.13    19.67   572.43     0.58

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   531.63   303.50   436.49  1200.83     0.44
MEAN    17.51   541.64   312.24   442.59  1197.18     0.45
HUB     14.85   586.41   376.74   449.39  1193.59     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.10   539.22   316.60     0.45  6015.69
MEAN   548.00   501.46   235.75     0.42  5469.33     1.60
HUB    464.84   457.95    88.11     0.38  5597.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.03     1.17    22.75   622.95     1.05   599.35     0.92     0.91
MEAN    25.67     1.16    22.30   620.20     1.05   595.71     0.92     0.91
HUB     25.75     1.16    21.83   620.84     1.05   592.14     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.81    35.95    31.50     4.45     0.93     0.39     2.90
MEAN    35.20    28.04    23.50     4.54     0.92     0.39     3.28     0.91
HUB     39.97    11.09     6.50     4.59     0.92     0.40     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     546.974     314.293     447.661    1197.815       0.457       0.012

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.781      22.342     596.358      46.000      35.072      31.500      -3.572

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     455.316     314.293     553.256    1205.492       0.378       0.294

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.746      23.329     604.026     471.992       0.020       0.385

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     441.952       0.000     441.952    1206.490       0.366       0.299

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      23.397     605.027       0.000       0.060       0.041       0.313

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.878      25.672       1.156     621.331      28.600     228.770       1.773

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 178260.359       0.464    1567.280 1514587.250
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.501   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3587.000      25.672     621.331       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.503    3277.390       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.808     513.330     283.988     401.059       1.412

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   414.81    -0.14   414.81     0.34   550.83
 MEAN    16.97     0.00    -0.02   414.81    -0.14   414.81     0.34
 HUB     14.32     0.00    -0.02   414.81    -0.14   414.81     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.48    46.36     9.12   602.89   731.92    23.66   606.97     0.61
 MEAN    52.02    43.80     8.22   531.23   674.10    23.66   606.97     0.56
 HUB     47.23    37.84     9.39   448.25   610.84    23.66   606.97     0.51

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   510.85   294.34   417.53  1228.56     0.42
 MEAN    16.57   518.12   299.15   423.04  1225.00     0.42
 HUB     13.89   557.49   355.80   429.19  1221.45     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   512.19   296.65     0.42  5559.88
 MEAN   518.80   476.67   219.66     0.39  4960.44     1.54
 HUB    434.79   436.40    78.99     0.36  4944.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.54     1.15    26.22   649.24     1.04   627.46     0.92     0.91
 MEAN    29.10     1.13    25.73   646.23     1.04   623.83     0.92     0.91
 HUB     29.09     1.13    25.22   646.15     1.04   620.22     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.18    35.39     31.50     3.89     0.93     0.37     2.90
 MEAN    35.27    27.44     23.50     3.94     0.93     0.36     3.29     0.91
 HUB     39.66    10.43      6.50     3.93     0.93     0.36     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     511.973     300.829     414.268    1226.466       0.417       0.050

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.210      25.907     625.336      46.000      35.986      32.400      -3.586

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     427.933     300.829     523.092    1232.912       0.347       0.319

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      29.181      26.845     631.926     456.573       0.018       0.403

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     406.846       0.000     406.846    1234.344       0.330       0.308
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	26.990	633.395	0.000	0.060	0.041	0.360

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	29.101	1.134	647.206	25.875	231.427	1.794

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
161379.172	0.462	1418.860	1334566.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 8.501 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
155.582	3587.000	29.101	647.206	1.000	1.000	0.980

W Kg/sec = 70.71914

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
87.788	3211.208	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
119686.578	122080.047	1.993	509.668	255.709	390.276	1.526

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	379.51	-0.13	379.51	0.31	513.37
MEAN	15.91	0.00	-0.02	379.51	-0.13	379.51	0.31	
HUB	13.07	0.00	-0.02	379.51	-0.13	379.51	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.51	47.36	9.15	573.46	687.77	27.26	635.19	0.56
MEAN	52.70	44.80	7.90	498.12	626.32	27.26	635.19	0.51
HUB	47.16	38.84	8.32	409.12	558.14	27.26	635.19	0.45

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	479.54	286.82	384.30	1254.00	0.38
MEAN	15.50	480.87	281.91	389.57	1250.15	0.38
HUB	12.59	509.49	321.43	395.30	1246.32	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	561.57	472.41	274.74	0.38	5148.03	
MEAN	485.11	439.38	203.21	0.35	4370.94	1.57
HUB	394.10	401.92	72.67	0.32	4048.50	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	32.98	1.13	29.81	673.03	1.04	653.85	0.92	0.91
MEAN	32.37	1.11	29.23	669.13	1.03	649.85	0.92	0.91
HUB	32.12	1.10	28.63	667.51	1.03	645.87	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.74	35.56	31.50	4.06	0.93	0.38	2.90	
MEAN	35.89	27.55	23.50	4.05	0.93	0.37	3.34	0.91
HUB	39.12	10.42	6.50	3.92	0.93	0.35	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	486.587	287.074	392.880	1250.438	0.389	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
32.424	29.207	650.146	46.000	36.155	33.000	-3.155

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     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     410.691     287.074     501.077    1255.888       0.327       0.259

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      32.381      30.067     655.825     440.827       0.033       0.409

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     384.275       0.000     384.275    1257.563       0.306       0.343

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      30.328     657.576       0.000       0.060       0.040       0.339

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4         PR4       Texit        Del T       Ns        Ns nondim
       0.880      32.359       1.112     669.891      22.686     243.318       1.886

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  141583.547       0.449    1244.815 1369686.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     916644.56   8059.2168    151.9881      2.1420      0.8677      8.5014      1.2813


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     153.237    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   69.65320

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     149.697    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  117882.562  120239.961       1.907     831.557     435.951     619.754       1.422

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   358.22    -0.12   358.22     0.32   643.21
  MEAN    17.06     0.00    -0.02   358.22    -0.12   358.22     0.32
  HUB     12.51     0.00    -0.02   358.22    -0.12   358.22     0.32

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.99    50.47    10.52   645.77   738.58    14.05   512.09     0.67
  MEAN    56.15    47.20     8.95   534.02   643.14    14.05   512.09     0.58
  HUB     47.56    38.62     8.94   391.59   530.81    14.05   512.09     0.48

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   609.34   393.50   465.24  1132.20     0.54
  MEAN    18.04   634.89   419.53   476.53  1126.43     0.56
  HUB     15.00   717.86   519.15   495.79  1117.62     0.64

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   529.23   252.27     0.47  8120.49
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 MEAN   564.57   498.12   145.05     0.44  7568.69     1.45
 HUB    469.54   498.27    49.61     0.45  7788.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.20     1.27    15.76   563.64     1.08   532.63     0.92     0.91
 MEAN    18.90     1.25    15.23   560.87     1.07   527.21     0.92     0.91
 HUB     19.02     1.26    14.41   561.98     1.07   518.94     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.22    28.47    24.20     4.27     0.93     0.38     2.90
 MEAN    41.36    16.93    12.70     4.23     0.93     0.32     3.51     0.91
 HUB     46.32    -5.71    -9.30     3.59     0.93     0.17     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     643.284     418.711     488.360    1126.789       0.571       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.000      15.228     527.600      24.000      40.609      35.400      -5.209

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     505.523     418.711     656.409    1140.818       0.443       0.360

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.930      16.539     540.818     528.796       0.028       0.492

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     466.539       0.000     466.539    1144.151       0.408       0.407

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.817     543.983       0.000       0.060       0.046       0.431

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      18.860       1.248     562.163      39.353     200.132       1.551

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 245004.688       0.588    2121.634 1506272.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.993

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    153.237    3587.000      18.860     562.163       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    124.338    3445.549       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.631     590.487     362.111     474.134       1.309

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   444.40    -0.15   444.40     0.39   617.88
 MEAN    18.08     0.00    -0.02   444.40    -0.15   444.40     0.39
 HUB     15.21     0.00    -0.02   444.40    -0.15   444.40     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.37    46.36     9.01   643.27   781.97    17.00   545.67     0.68
 MEAN    51.86    42.30     9.56   565.89   719.65    17.00   545.67     0.63
 HUB     46.98    37.84     9.14   476.11   651.40    17.00   545.67     0.57
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      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   550.07   325.90   443.13  1171.51     0.47
MEAN    18.01   559.29   331.00   450.83  1167.05     0.48
HUB     15.22   604.60   392.97   459.47  1162.62     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    639.20   542.70   313.30     0.46  6658.02
MEAN   563.76   507.37   232.76     0.43  5964.04     1.55
HUB    476.52   467.01    83.55     0.40  5984.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.67     1.20    19.49   595.62     1.06   570.36     0.92     0.91
MEAN    22.25     1.18    19.01   592.14     1.05   566.02     0.92     0.91
HUB     22.26     1.18    18.51   592.24     1.05   561.72     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     36.33    35.26    31.50     3.76     0.93     0.38     2.90
MEAN    36.29    27.31    23.50     3.81     0.94     0.36     3.30     0.91
HUB     40.54    10.31     6.50     3.81     0.94     0.36     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     622.867     331.928     527.055    1161.779       0.536      -0.185

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.356      18.379     560.938      46.000      32.202      30.600      -1.602

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     526.406     331.928     622.318    1171.326       0.449       0.126

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      22.317      19.425     570.195     455.853       0.022       0.345

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     518.979       0.000     518.979    1171.992       0.443       0.317

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      19.455     570.843       0.000       0.060       0.037       0.134

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      22.263       1.180     593.333      31.170     223.634       1.734

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 194168.406       0.475    1681.414 1351830.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3587.000      22.263     593.333       1.000       1.000       0.880
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.215    3353.824       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.554     489.817     315.171     384.470       1.220

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   483.42    -0.17   483.42     0.41   587.38
MEAN    17.74     0.00    -0.02   483.42    -0.17   483.42     0.41
HUB     15.05     0.00    -0.02   483.42    -0.17   483.42     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     52.43    46.36     6.07   628.24   792.83    19.81   573.83     0.67
MEAN    48.97    43.40     5.57   555.26   736.33    19.81   573.83     0.63
HUB     44.27    38.84     5.43   471.10   675.12    19.81   573.83     0.57

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   528.30   310.09   427.73  1202.38     0.44
MEAN    17.51   537.42   317.09   433.91  1198.59     0.45
HUB     14.85   581.07   378.63   440.77  1194.86     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.10   528.26   310.02     0.44  6146.15
MEAN   548.00   491.52   230.91     0.41  5554.05     1.62
HUB    464.84   449.12    86.21     0.38  5625.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.18     1.18    22.93   624.20     1.05   600.91     0.92     0.91
MEAN    25.78     1.16    22.46   621.23     1.05   597.12     0.92     0.91
HUB     25.83     1.16    21.97   621.59     1.05   593.40     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.94    35.93    31.50     4.43     0.93     0.40     2.90
MEAN    36.16    28.02    23.50     4.52     0.92     0.40     3.28     0.91
HUB     40.66    11.07     6.50     4.57     0.92     0.41     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     542.659     319.167     438.875    1199.220       0.453       0.012

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.896      22.499     597.760      46.000      36.026      31.500      -4.526

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     445.885     319.167     548.344    1207.203       0.369       0.310

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.858      23.530     605.745     471.992       0.021       0.400

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.121     432.967       0.000     432.967    1208.147       0.358       0.313

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      23.587     606.692       0.000       0.060       0.044       0.327

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.878      25.780       1.158     622.340      29.007     224.109       1.737

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 180798.969       0.470    1565.640 1485369.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996
```

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
153.237	3587.000	25.780	622.340	1.000	1.000	0.980

W Kg/sec = 69.65320

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
95.711	3274.732	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
117882.562	120239.961	1.841	513.330	278.770	401.059	1.439

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	406.53	-0.14	406.53	0.34	550.39
MEAN	16.97	0.00	-0.02	406.53	-0.14	406.53	0.34	
HUB	14.32	0.00	-0.02	406.53	-0.14	406.53	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.01	46.36	9.65	602.89	727.26	23.84	608.55	0.60
MEAN	52.58	43.80	8.78	531.23	669.04	23.84	608.55	0.55
HUB	47.80	37.84	9.96	448.25	605.24	23.84	608.55	0.50

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	507.53	300.52	408.99	1230.39	0.41
MEAN	16.57	513.87	303.69	414.53	1226.71	0.42
HUB	13.89	552.06	357.46	420.70	1223.04	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	590.99	501.65	290.47	0.41	5676.56	
MEAN	518.80	467.02	215.12	0.38	5035.63	1.56
HUB	434.79	427.74	77.33	0.35	4967.17	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	29.74	1.15	26.45	650.83	1.05	629.34	0.92	0.91
MEAN	29.27	1.14	25.94	647.62	1.04	625.58	0.92	0.91
HUB	29.22	1.13	25.40	647.27	1.04	621.85	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.31	35.38	31.50	3.88	0.93	0.38	2.90	
MEAN	36.23	27.43	23.50	3.93	0.93	0.37	3.29	0.91
HUB	40.35	10.42	6.50	3.92	0.93	0.37	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	508.041	305.394	406.005	1228.130	0.414	0.049

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
29.373	26.106	627.039	46.000	36.950	32.400	-4.550

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	418.978	305.394	518.467	1234.858	0.339	0.334

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	29.340	27.091	633.928	456.573	0.019	0.418

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	398.511	0.000	398.511	1236.217	0.322	0.321

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	27.222	635.324	0.000	0.060	0.044	0.372

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.875	29.256	1.135	648.574	26.234	226.747	1.758

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
163622.062	0.468	1416.896	1309691.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
153.237	3587.000	29.256	648.574	1.000	1.000	0.980

W Kg/sec = 69.65320

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
86.098	3207.818	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
117882.562	120239.961	2.032	509.668	250.787	390.276	1.556

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	371.86	-0.13	371.86	0.30	512.83
MEAN	15.91	0.00	-0.02	371.86	-0.13	371.86	0.30	
HUB	13.07	0.00	-0.02	371.86	-0.13	371.86	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.04	47.36	9.68	573.46	683.58	27.48	637.04	0.55
MEAN	53.26	44.80	8.46	498.12	621.71	27.48	637.04	0.50
HUB	47.74	38.84	8.90	409.12	552.96	27.48	637.04	0.45

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	476.74	292.58	376.39	1256.01	0.38
MEAN	15.50	476.99	286.12	381.65	1252.07	0.38
HUB	12.59	504.34	322.97	387.36	1248.14	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	561.57	462.63	268.98	0.37	5251.28	
MEAN	485.11	430.42	199.00	0.34	4436.15	1.59
HUB	394.10	393.84	71.13	0.32	4067.86	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	33.22	1.14	30.07	674.91	1.04	655.96	0.92	0.91
MEAN	32.58	1.11	29.47	670.83	1.03	651.85	0.92	0.91
HUB	32.30	1.10	28.86	668.98	1.03	647.77	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.86	35.55	31.50	4.05	0.93	0.40	2.90	
MEAN	36.86	27.54	23.50	4.04	0.93	0.38	3.34	0.91
HUB	39.82	10.40	6.50	3.90	0.93	0.36	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	482.739	291.362	384.896	1252.345	0.385	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
32.635	29.454	652.139	46.000	37.125	33.000	-4.125

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	402.004	291.362	496.486	1258.052	0.320	0.275

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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      32.586      30.359     658.096     440.827       0.035       0.424

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     376.295       0.000     376.295    1259.645       0.299       0.357

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.606     659.764       0.000       0.060       0.042       0.352

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      32.563       1.113     671.573      22.999     238.382       1.848

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 143543.328       0.455    1243.023 1344249.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    927137.44   8028.6064    149.6973      2.1555      0.8657      8.9529      1.2845


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 9.538   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.218    3587.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   68.28079

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    146.748    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 115559.867  117870.812       1.946     831.557     427.361     619.754       1.450

     ROTOR LEADING EDGE CONDITIONS, STAGE           1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   350.37    -0.12   350.37     0.32   643.21
 MEAN    17.06     0.00    -0.02   350.37    -0.12   350.37     0.32
 HUB     12.51     0.00    -0.02   350.37    -0.12   350.37     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.52    50.47    11.05   645.77   734.80    14.10   512.56     0.66
 MEAN    56.74    47.20     9.54   534.02   638.80    14.10   512.56     0.58
 HUB     48.19    38.62     9.57   391.59   525.55    14.10   512.56     0.47

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   604.88   399.48   454.19  1133.33     0.53
 MEAN    18.04   628.84   422.92   465.39  1127.43     0.56
 HUB     15.00   708.92   517.98   484.01  1118.65     0.63

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    645.77   516.67   246.29     0.46  8243.75
 MEAN   564.57   486.47   141.65     0.43  7629.85     1.48
 HUB    469.54   486.43    48.44     0.43  7771.16
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	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.26	1.27	15.86	564.26	1.08	533.71	0.92	0.91
MEAN	18.92	1.25	15.32	561.18	1.07	528.15	0.92	0.91
HUB	19.00	1.26	14.49	561.89	1.07	519.92	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.33	28.47	24.20	4.27	0.93	0.39	2.90	
MEAN	42.26	16.93	12.70	4.23	0.94	0.34	3.51	0.91
HUB	46.94	-5.72	-9.30	3.58	0.94	0.19	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.993

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	636.825	422.098	476.843	1127.825	0.565	0.000

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.022	15.317	528.570	24.000	41.515	35.400	-6.115

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	492.991	422.098	649.005	1142.214	0.432	0.376

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.946	16.666	542.143	528.796	0.030	0.506

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	455.518	0.000	455.518	1145.337	0.398	0.418

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.920	545.111	0.000	0.060	0.049	0.442

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.869	18.871	1.249	562.442	39.632	196.880	1.526

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
246744.688	0.592	2094.601	1473267.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 9.538 EfDer = 0.990

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
150.218	3587.000	18.871	562.442	1.000	1.000	0.980

W Kg/sec = 68.28079

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
121.847	3444.693	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
115559.867	117870.812	1.664	590.487	354.856	474.134	1.336

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	434.09	-0.15	434.09	0.38	617.73
MEAN	18.08	0.00	-0.02	434.09	-0.15	434.09	0.38	
HUB	15.21	0.00	-0.02	434.09	-0.15	434.09	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.99	46.36	9.63	643.27	776.16	17.09	546.71	0.68
MEAN	52.52	42.30	10.22	565.89	713.33	17.09	546.71	0.62
HUB	47.65	37.84	9.81	476.11	644.41	17.09	546.71	0.56

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	546.21	333.39	432.66	1172.95	0.47
MEAN	18.01	554.22	336.51	440.37	1168.33	0.47
HUB	15.22	598.00	394.96	449.02	1163.74	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	529.82	305.80	0.45	6810.96	
MEAN	563.76	495.54	227.25	0.42	6063.17	1.57
HUB	476.52	456.36	81.56	0.39	6014.69	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.76	1.21	19.61	596.67	1.06	571.76	0.92	0.91
MEAN	22.31	1.18	19.12	592.91	1.05	567.27	0.92	0.91
HUB	22.28	1.18	18.60	592.67	1.05	562.81	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.62	35.25	31.50	3.75	0.93	0.39	2.90	
MEAN	37.39	27.30	23.50	3.80	0.94	0.38	3.30	0.91
HUB	41.33	10.30	6.50	3.80	0.94	0.37	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.990

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	614.894	337.451	514.024	1163.409	0.529	-0.177

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.414	18.526	562.514	46.000	33.284	30.600	-2.684

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	512.655	337.451	613.749	1173.321	0.437	0.153

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	22.373	19.620	572.140	455.853	0.022	0.361

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	505.582	0.000	505.582	1173.938	0.431	0.335

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	19.642	572.742	0.000	0.060	0.039	0.160

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.875	22.317	1.183	594.085	31.643	218.542	1.694

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
197114.422	0.482	1673.293	1320102.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 9.538 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
150.218	3587.000	22.317	594.085	1.000	1.000	0.880

W Kg/sec = 68.28079

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
105.895	3351.700	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
115559.867	117870.812	1.588	489.817	308.414	384.470	1.247

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	471.33	-0.16	471.33	0.40	587.01

```
MEAN    17.74     0.00    -0.02   471.33    -0.16   471.33     0.40
HUB     15.05     0.00    -0.02   471.33    -0.16   471.33     0.40

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.13    46.36     6.77   628.24   785.52    19.98   575.54     0.67
MEAN    49.68    43.40     6.28   555.26   728.45    19.98   575.54     0.62
HUB     45.00    38.84     6.16   471.10   666.51    19.98   575.54     0.57

     ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   524.47   318.16   416.94  1204.27     0.44
MEAN    17.51   532.41   323.04   423.20  1200.32     0.44
HUB     14.85   574.56   380.95   430.11  1196.42     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.10   514.79   301.94     0.43  6306.05
MEAN   548.00   479.27   224.96     0.40  5658.24     1.65
HUB    464.84   438.22    83.89     0.37  5659.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.35     1.18    23.13   625.76     1.05   602.80     0.92     0.91
MEAN    25.91     1.16    22.64   622.50     1.05   598.85     0.92     0.91
HUB     25.92     1.16    22.13   622.51     1.05   594.96     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.35    35.91    31.50     4.41     0.93     0.41     2.90
MEAN    37.36    27.99    23.50     4.49     0.93     0.41     3.28     0.91
HUB     41.53    11.04     6.50     4.54     0.93     0.42     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     537.539     325.162     428.040    1200.934       0.448       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.026      22.679     599.473      46.000      37.222      31.500      -5.722

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     434.312     325.162     542.547    1209.292       0.359       0.330

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.982      23.763     607.847     471.992       0.023       0.418

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     421.951       0.000     421.951    1210.171       0.349       0.329

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.806     608.730       0.000       0.060       0.048       0.343

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      25.897       1.160     623.592      29.506     218.473       1.694

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 183913.969       0.478    1561.235 1448525.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 9.538   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.218    3587.000      25.897     623.592       1.000       1.000       0.980
W Kg/sec =   68.28079
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
93.494	3271.443	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
115559.867	117870.812	1.885	513.330	272.315	401.059	1.473

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	396.37	-0.14	396.37	0.33	549.83
MEAN	16.97	0.00	-0.02	396.37	-0.14	396.37	0.33	
HUB	14.32	0.00	-0.02	396.37	-0.14	396.37	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.68	46.36	10.32	602.89	721.62	24.05	610.48	0.60
MEAN	53.28	43.80	9.48	531.23	662.91	24.05	610.48	0.55
HUB	48.52	37.84	10.68	448.25	598.46	24.05	610.48	0.49

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	503.73	308.01	398.59	1232.61	0.41
MEAN	16.57	508.84	309.19	404.13	1228.80	0.41
HUB	13.89	545.49	359.47	410.30	1224.99	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	590.99	488.83	282.98	0.40	5817.87	
MEAN	518.80	455.26	209.62	0.37	5126.72	1.59
HUB	434.79	417.16	75.32	0.34	4995.00	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	29.96	1.16	26.70	652.79	1.05	631.62	0.92	0.91
MEAN	29.45	1.14	26.17	649.32	1.04	627.72	0.92	0.91
HUB	29.36	1.13	25.62	648.66	1.04	623.84	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.70	35.37	31.50	3.87	0.93	0.40	2.90	
MEAN	37.42	27.42	23.50	3.92	0.94	0.38	3.29	0.91
HUB	41.22	10.40	6.50	3.90	0.94	0.38	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.994

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	503.405	310.924	395.908	1230.157	0.409	0.047

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
29.553	26.332	629.117	46.000	38.144	32.400	-5.744

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	408.083	310.924	513.036	1237.224	0.330	0.353

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	29.515	27.372	636.366	456.573	0.021	0.436

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	388.377	0.000	388.377	1238.496	0.314	0.336

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	27.483	637.676	0.000	0.060	0.048	0.386

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.871	29.424	1.136	650.260	26.669	221.148	1.714

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 166337.484       0.476    1412.029 1278261.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 9.538   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.218    3587.000      29.424     650.260       1.000       1.000       0.980
W Kg/sec =   68.28079

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     84.029    3203.656       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 115559.867  117870.812       2.082     509.668     244.762     390.276       1.595

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   362.54    -0.12   362.54     0.29   512.16
 MEAN    15.91     0.00    -0.02   362.54    -0.12   362.54     0.29
 HUB     13.07     0.00    -0.02   362.54    -0.12   362.54     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.70    47.36    10.34   573.46   678.56    27.73   639.30     0.55
 MEAN    53.96    44.80     9.16   498.12   616.18    27.73   639.30     0.50
 HUB     48.46    38.84     9.62   409.12   546.74    27.73   639.30     0.44

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   473.58   299.52   366.83  1258.45     0.38
 MEAN    15.50   472.49   291.25   372.05  1254.40     0.38
 HUB     12.59   498.20   324.85   377.72  1250.36     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   450.82   262.05     0.36  5375.63
 MEAN   485.11   419.53   193.87     0.33  4515.62     1.62
 HUB    394.10   384.02    69.25     0.31  4091.52

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     33.49     1.14    30.37   677.22     1.04   658.52     0.92     0.91
 MEAN    32.81     1.12    29.75   672.91     1.03   654.29     0.92     0.91
 HUB     32.48     1.10    29.12   670.78     1.03   650.09     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.23    35.54    31.50     4.04     0.93     0.41     2.90
 MEAN    38.05    27.52    23.50     4.02     0.93     0.39     3.34     0.91
 HUB     40.70    10.39     6.50     3.89     0.93     0.37     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     478.284     296.588     375.221    1254.659       0.381      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.866      29.728     654.563      46.000      38.324      33.000      -5.324

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     391.525     296.588     491.178    1260.675       0.311       0.295

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      32.809      30.685     660.855     440.827       0.038       0.443
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     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     366.662       0.000     366.662    1262.174       0.291       0.373

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      30.916     662.427       0.000       0.060       0.046       0.368

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.874      32.782       1.114     673.638      23.378     232.501       1.802

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  145916.891       0.463    1238.680 1312122.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     940027.50   7979.8379    146.7477      2.1700      0.8622      9.5375      1.2885


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.974   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     147.976    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   67.26170

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     144.557    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  113835.133  116111.594       1.975     831.557     420.983     619.754       1.472

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   344.58    -0.12   344.58     0.31   643.21
  MEAN    17.06     0.00    -0.02   344.58    -0.12   344.58     0.31
  HUB     12.51     0.00    -0.02   344.58    -0.12   344.58     0.31

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.92    50.47    11.45   645.77   732.06    14.13   512.89     0.66
  MEAN    57.17    47.20     9.97   534.02   635.64    14.13   512.89     0.57
  HUB     48.66    38.62    10.04   391.59   521.70    14.13   512.89     0.47

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
  TIP     20.63   601.77   403.83   446.14  1134.14     0.53
  MEAN    18.04   624.53   425.40   457.24  1128.14     0.55
  HUB     15.00   702.43   517.10   475.41  1119.39     0.63

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   507.52   241.94     0.45  8333.52
  MEAN   564.57   477.95   139.17     0.42  7674.57     1.50
  HUB    469.54   477.78    47.56     0.43  7757.94

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.30     1.28    15.93   564.71     1.08   534.47     0.92     0.91
  MEAN    18.94     1.25    15.38   561.40     1.07   528.83     0.92     0.91
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 HUB     18.98     1.26    14.56   561.82     1.07   520.62     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.15    28.47    24.20     4.27     0.93     0.40     2.90
 MEAN    42.93    16.93    12.70     4.23     0.94     0.35     3.51     0.91
 HUB     47.41    -5.71    -9.30     3.59     0.94     0.20     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     632.218     424.575     468.440    1128.562       0.560       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.036      15.379     529.261      24.000      42.188      35.400      -6.788

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     483.893     424.575     643.752    1143.209       0.423       0.388

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.956      16.755     543.088     528.796       0.031       0.516

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     447.501       0.000     447.501    1146.185       0.390       0.426

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.991     545.919       0.000       0.060       0.052       0.450

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      18.877       1.250     562.646      39.836     194.498       1.508

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 248010.453       0.595    2073.924 1448913.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.974   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3587.000      18.877     562.646       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.015    3444.071       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.689     590.487     349.520     474.134       1.357

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   426.58    -0.15   426.58     0.37   617.62
 MEAN    18.08     0.00    -0.02   426.58    -0.15   426.58     0.37
 HUB     15.21     0.00    -0.02   426.58    -0.15   426.58     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.46    46.36    10.10   643.27   771.98    17.16   547.45     0.67
 MEAN    53.00    42.30    10.70   565.89   708.78    17.16   547.45     0.62
 HUB     48.15    37.84    10.31   476.11   639.37    17.16   547.45     0.56

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   543.58   338.79   425.08  1173.97     0.46
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 MEAN    18.01   550.66   340.48   432.78  1169.25     0.47
 HUB     15.22   593.28   396.39   441.42  1164.55     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   520.52   300.41     0.44  6921.09
 MEAN   563.76   486.98   223.28     0.42  6134.65     1.59
 HUB    476.52   448.63    80.12     0.39  6036.55

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.82     1.21    19.70   597.43     1.06   572.76     0.92     0.90
 MEAN    22.35     1.18    19.19   593.48     1.05   568.16     0.92     0.90
 HUB     22.29     1.18    18.66   592.98     1.05   563.59     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.55    35.25    31.50     3.75     0.93     0.40     2.90
 MEAN    38.19    27.29    23.50     3.79     0.94     0.39     3.30     0.90
 HUB     41.92    10.29     6.50     3.79     0.94     0.38     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.988

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     609.287     341.434     504.632    1164.563       0.523      -0.172

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.451      18.626     563.632      46.000      34.082      30.600      -3.482

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     502.797     341.434     607.768    1174.734       0.428       0.172

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      22.409      19.754     573.520     455.853       0.023       0.374

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     495.990       0.000     495.990    1175.315       0.422       0.347

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      19.770     574.088       0.000       0.060       0.041       0.177

    STAGE EXIT CONDITIONS, STAGE            2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.872      22.349       1.184     594.629      31.984     214.910       1.666

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 199237.484       0.488    1666.072 1296830.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 9.974   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3587.000      22.349     594.629       1.000       1.000       0.880
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.209    3350.167       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.614     489.817     303.504     384.470       1.267

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   462.65    -0.16   462.65     0.39   586.74
 MEAN    17.74     0.00    -0.02   462.65    -0.16   462.65     0.39
 HUB     15.05     0.00    -0.02   462.65    -0.16   462.65     0.39
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.64    46.36     7.28   628.24   780.34    20.09   576.76     0.66
MEAN    50.21    43.40     6.81   555.26   722.87    20.09   576.76     0.61
HUB     45.53    38.84     6.69   471.10   660.40    20.09   576.76     0.56

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   521.94   323.93   409.26  1205.60     0.43
MEAN    17.51   528.96   327.29   415.55  1201.54     0.44
HUB     14.85   569.99   382.61   422.48  1197.52     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.10   505.18   296.18     0.42  6420.18
MEAN   548.00   470.52   220.71     0.39  5732.55     1.66
HUB    464.84   430.41    82.23     0.36  5684.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.46     1.18    23.26   626.88     1.05   604.14     0.92     0.91
MEAN    26.00     1.16    22.76   623.42     1.05   600.07     0.92     0.91
HUB     25.97     1.16    22.23   623.18     1.05   596.06     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.36    35.89    31.50     4.39     0.93     0.42     2.90
MEAN    38.22    27.97    23.50     4.47     0.93     0.42     3.28     0.91
HUB     42.16    11.01     6.50     4.51     0.93     0.42     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     534.022     329.438     420.298    1202.148       0.444       0.012

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.109      22.798     600.689      46.000      38.090      31.500      -6.590

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     426.076     329.438     538.581    1210.773       0.352       0.345

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.061      23.920     609.339     471.992       0.024       0.432

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     414.118       0.000     414.118    1211.606       0.342       0.340

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      23.951     610.178       0.000       0.060       0.051       0.354

   STAGE EXIT CONDITIONS, STAGE             3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.875      25.970       1.162     624.492      29.863     214.510       1.663

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 186137.344       0.484    1556.526 1421672.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 9.974   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3587.000      25.970     624.492       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.906    3269.083       1.401       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
113835.133	116111.594	1.918	513.330	267.688	401.059	1.498

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	389.13	-0.13	389.13	0.32	549.44
MEAN	16.97	0.00	-0.02	389.13	-0.13	389.13	0.32	
HUB	14.32	0.00	-0.02	389.13	-0.13	389.13	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.17	46.36	10.81	602.89	717.67	24.18	611.86	0.59
MEAN	53.78	43.80	9.98	531.23	658.61	24.18	611.86	0.54
HUB	49.05	37.84	11.21	448.25	593.69	24.18	611.86	0.49

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	501.22	313.31	391.23	1234.18	0.41
MEAN	16.57	505.40	313.07	396.76	1230.27	0.41
HUB	13.89	540.91	360.89	402.91	1226.37	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	590.99	479.76	277.68	0.39	5917.86	
MEAN	518.80	446.93	205.73	0.36	5191.07	1.61
HUB	434.79	409.64	73.90	0.33	5014.75	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.10	1.16	26.86	654.20	1.05	633.24	0.92	0.91
MEAN	29.57	1.14	26.32	650.55	1.04	629.24	0.92	0.91
HUB	29.44	1.13	25.75	649.66	1.04	625.25	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.69	35.37	31.50	3.87	0.93	0.41	2.90	
MEAN	38.28	27.41	23.50	3.91	0.94	0.39	3.29	0.91
HUB	41.85	10.39	6.50	3.89	0.94	0.39	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	500.243	314.832	388.746	1231.591	0.406	0.046

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
29.667	26.478	630.591	46.000	39.003	32.400	-6.603

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	400.384	314.832	509.339	1238.897	0.323	0.367

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	29.626	27.556	638.094	456.573	0.022	0.450

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	381.218	0.000	381.218	1240.109	0.307	0.347

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	27.653	639.344	0.000	0.060	0.051	0.396

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.867	29.528	1.137	651.468	26.976	217.240	1.684

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
168258.688	0.482	1407.020	1255306.875

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 9.974   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3587.000      29.528     651.468       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     82.558    3200.685       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       2.119     509.668     240.481     390.276       1.623

    ROTOR LEADING EDGE CONDITIONS, STAGE           5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   355.96    -0.12   355.96     0.29   511.69
 MEAN    15.91     0.00    -0.02   355.96    -0.12   355.96     0.29
 HUB     13.07     0.00    -0.02   355.96    -0.12   355.96     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.18    47.36    10.82   573.46   675.06    27.89   640.90     0.54
 MEAN    54.46    44.80     9.66   498.12   612.33    27.89   640.90     0.49
 HUB     48.98    38.84    10.14   409.12   542.39    27.89   640.90     0.44

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   471.52   304.38   360.11  1260.17     0.37
 MEAN    15.50   469.42   294.82   365.29  1256.05     0.37
 HUB     12.59   493.91   326.14   370.92  1251.93     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   442.52   257.18     0.35  5462.86
 MEAN   485.11   411.88   190.29     0.33  4570.97     1.64
 HUB    394.10   377.09    67.96     0.30  4107.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     33.66     1.14    30.56   678.87     1.04   660.33     0.92     0.91
 MEAN    32.96     1.12    29.93   674.39     1.04   656.02     0.92     0.91
 HUB     32.60     1.10    29.28   672.07     1.03   651.73     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.21    35.53    31.50     4.03     0.93     0.42     2.90
 MEAN    38.91    27.52    23.50     4.02     0.94     0.40     3.34     0.91
 HUB     41.32    10.38     6.50     3.88     0.94     0.38     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.993

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     475.246     300.227     368.406    1256.292       0.378      -0.008

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    33.011      29.904     656.278      46.000      39.178      33.000      -6.178

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     384.174     300.227     487.572    1262.524       0.304       0.309

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      32.947      30.896     662.804     440.827       0.040       0.456

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     14.701     359.900       0.000     359.900    1263.957       0.285       0.384

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      31.115     664.310       0.000       0.060       0.049       0.378

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      32.918       1.115     675.111      23.643     228.436       1.771

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 147573.969       0.468    1234.049 1288659.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    949217.88   7937.5908    144.5575      2.1790      0.8589      9.9739      1.2913


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =10.453   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.527    3587.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   66.14857

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    142.165    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111951.250  114190.039       2.009     831.557     414.016     619.754       1.497

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   338.28    -0.12   338.28     0.30   643.21
 MEAN    17.06     0.00    -0.02   338.28    -0.12   338.28     0.30
 HUB     12.51     0.00    -0.02   338.28    -0.12   338.28     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.36    50.47    11.89   645.77   729.11    14.17   513.25     0.66
 MEAN    57.65    47.20    10.45   534.02   632.25    14.17   513.25     0.57
 HUB     49.19    38.62    10.57   391.59   517.56    14.17   513.25     0.47

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   598.56   408.52   437.48  1134.99     0.53
 MEAN    18.04   619.96   428.05   448.47  1128.90     0.55
 HUB     15.00   695.49   516.15   466.15  1120.18     0.62

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    645.77   497.67   237.25     0.44  8430.08
 MEAN   564.57   468.79   136.52     0.42  7722.39     1.52
 HUB    469.54   468.47    46.61     0.42  7743.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.34     1.28    16.00   565.20     1.08   535.28     0.92     0.91
 MEAN    18.96     1.25    15.44   561.64     1.07   529.54     0.92     0.91
 HUB     18.97     1.26    14.62   561.75     1.07   521.35     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     43.04    28.47    24.20     4.27     0.93     0.41     2.90
 MEAN    43.67    16.93    12.70     4.23     0.94     0.36     3.51     0.91
 HUB     47.91    -5.71    -9.30     3.59     0.94     0.21     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     627.343     427.223     459.391    1129.342       0.555       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.050      15.444     529.992      24.000      42.922      35.400      -7.522

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     474.138     427.223     638.221    1144.260       0.414       0.401

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.964      16.848     544.087     528.796       0.033       0.528

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     438.889       0.000     438.889    1147.083       0.383       0.434

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.065     546.775       0.000       0.060       0.055       0.458

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.862       18.881       1.250     562.864      40.054     191.926       1.488

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 249368.562       0.598    2050.771 1422458.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.453   EfDer =  0.985

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    145.527     3587.000       18.881     562.864       1.000        1.000        0.980
W Kg/sec =   66.14857

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    118.028     3443.404        1.402       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 111951.250  114190.039        1.718     590.487     343.734     474.134        1.379

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   418.50    -0.14   418.50      0.36   617.50
 MEAN    18.08      0.00    -0.02   418.50    -0.14   418.50      0.36
 HUB     15.21      0.00    -0.02   418.50    -0.14   418.50      0.36

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     56.96     46.36    10.60   643.27   767.54     17.22   548.24      0.67
 MEAN    53.52     42.30    11.22   565.89   703.95     17.22   548.24      0.61
 HUB     48.69     37.84    10.85   476.11   634.01     17.22   548.24      0.55

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     20.42   540.93    344.56    416.99  1175.04      0.46
 MEAN    18.01   546.95    344.71    424.65  1170.21      0.47
 HUB     15.22   588.26    397.91    433.27  1165.40      0.50
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   510.58   294.64     0.43  7038.84
 MEAN   563.76   477.82   219.05     0.41  6210.79     1.61
 HUB    476.52   440.34    78.61     0.38  6059.57

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.88     1.21    19.78   598.24     1.06   573.81     0.92     0.90
 MEAN    22.38     1.19    19.27   594.08     1.06   569.10     0.92     0.90
 HUB     22.29     1.18    18.73   593.32     1.05   564.42     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.57    35.24    31.50     3.74     0.93     0.41     2.90
 MEAN    39.07    27.29    23.50     3.79     0.94     0.40     3.30     0.90
 HUB     42.56    10.28     6.50     3.78     0.94     0.39     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     603.439     345.676     494.618    1165.774       0.518      -0.166

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.487      18.728     564.806      46.000      34.949      30.600      -4.349

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     492.332     345.676     601.567    1176.218       0.419       0.193

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      22.441      19.890     574.971     455.853       0.024       0.387

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     485.816       0.000     485.816    1176.762       0.413       0.359

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      19.899     575.504       0.000       0.060       0.043       0.196

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      22.379       1.185     595.211      32.347     211.070       1.636

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 201501.250       0.493    1657.117 1271672.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =10.453   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.527    3587.000      22.379     595.211       1.000       1.000       0.880
W Kg/sec =   66.14857

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.399    3348.530       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111951.250  114190.039       1.642     489.817     298.234     384.470       1.289

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   453.42    -0.16   453.42     0.38   586.46
 MEAN    17.74     0.00    -0.02   453.42    -0.16   453.42     0.38
 HUB     15.05     0.00    -0.02   453.42    -0.16   453.42     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.19    46.36     7.83   628.24   774.90    20.21   578.05     0.66
 MEAN    50.77    43.40     7.37   555.26   716.99    20.21   578.05     0.61
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HUB     46.10    38.84     7.26   471.10   653.97    20.21   578.05     0.55

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   519.42   329.99   401.13  1207.00     0.43
MEAN    17.51   525.44   331.77   407.44  1202.82     0.44
HUB     14.85   565.19   384.35   414.39  1198.69     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.10   495.05   290.12     0.41  6540.14
MEAN   548.00   461.26   216.22     0.38  5811.00     1.69
HUB    464.84   422.13    80.49     0.35  5709.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.57     1.19    23.40   628.06     1.06   605.54     0.92     0.91
MEAN    26.08     1.17    22.87   624.40     1.05   601.35     0.92     0.91
HUB     26.01     1.16    22.34   623.89     1.05   597.23     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.44    35.88    31.50     4.38     0.93     0.43     2.90
MEAN    39.16    27.95    23.50     4.45     0.93     0.43     3.28     0.91
HUB     42.85    10.99     6.50     4.49     0.93     0.43     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     530.428     333.952     412.104    1203.420       0.441       0.012

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.189      22.915     601.965      46.000      39.020      31.500      -7.520

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     417.387     333.952     534.543    1212.327       0.344       0.360

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.135      24.075     610.908     471.992       0.026       0.446

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     405.859       0.000     405.859    1213.112       0.335       0.351

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      24.094     611.700       0.000       0.060       0.055       0.365

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.873      26.038       1.163     625.449      30.238     210.381       1.631

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188476.078       0.490    1550.000 1392785.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.453   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.527    3587.000      26.038     625.449       1.000       1.000       0.980
W Kg/sec =   66.14857

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     90.219    3266.583       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111951.250  114190.039       1.953     513.330     262.777     401.059       1.526
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ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	381.49	-0.13	381.49	0.31	549.02
MEAN	16.97	0.00	-0.02	381.49	-0.13	381.49	0.31	
HUB	14.32	0.00	-0.02	381.49	-0.13	381.49	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.68	46.36	11.32	602.89	713.56	24.31	613.31	0.59
MEAN	54.32	43.80	10.52	531.23	654.12	24.31	613.31	0.54
HUB	49.61	37.84	11.77	448.25	588.71	24.31	613.31	0.48

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	498.73	318.85	383.50	1235.81	0.40
MEAN	16.57	501.91	317.15	389.01	1231.82	0.41
HUB	13.89	536.13	362.36	395.13	1227.83	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	590.99	470.25	272.15	0.38	6022.33	
MEAN	518.80	438.17	201.65	0.36	5258.62	1.63
HUB	434.79	401.72	72.43	0.33	5035.12	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.23	1.16	27.02	655.68	1.05	634.92	0.92	0.90
MEAN	29.68	1.14	26.47	651.84	1.04	630.83	0.92	0.90
HUB	29.52	1.13	25.89	650.72	1.04	626.74	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.74	35.36	31.50	3.86	0.93	0.42	2.90	
MEAN	39.19	27.40	23.50	3.90	0.94	0.40	3.29	0.90
HUB	42.52	10.39	6.50	3.89	0.94	0.40	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.989

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	497.030	318.933	381.210	1233.094	0.403	0.045

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
29.775	26.620	632.136	46.000	39.917	32.400	-7.517

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	392.305	318.933	505.590	1240.649	0.316	0.381

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	29.729	27.737	639.906	456.573	0.024	0.464

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	373.706	0.000	373.706	1241.801	0.301	0.358

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	27.818	641.095	0.000	0.060	0.055	0.406

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.863	29.624	1.138	652.746	27.297	213.192	1.653

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
170266.422	0.487	1400.246	1230570.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

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 RESET =  0.000BLEED =  0.000 DPInc =10.453   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.527    3587.000      29.624     652.746       1.000       1.000       0.980
W Kg/sec =   66.14857

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     81.009    3197.550       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
111951.250  114190.039       2.160     509.668     235.968     390.276       1.654

    ROTOR LEADING EDGE CONDITIONS, STAGE             5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   349.04    -0.12   349.04     0.28   511.18
MEAN    15.91     0.00    -0.02   349.04    -0.12   349.04     0.28
HUB     13.07     0.00    -0.02   349.04    -0.12   349.04     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.68    47.36    11.32   573.46   671.43    28.04   642.59     0.54
MEAN    54.99    44.80    10.19   498.12   608.33    28.04   642.59     0.49
HUB     49.54    38.84    10.70   409.12   537.87    28.04   642.59     0.43

     ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
TIP     17.94   469.50   309.46   353.08  1261.96     0.37
MEAN    15.50   466.31   298.55   358.21  1257.77     0.37
HUB     12.59   489.48   327.49   363.78  1253.58     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    561.57   433.84   252.10     0.34  5553.98
MEAN   485.11   403.88   186.56     0.32  4628.76     1.67
HUB    394.10   369.83    66.61     0.30  4124.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     33.82     1.14    30.74   680.60     1.04   662.22     0.92     0.91
MEAN    33.10     1.12    30.10   675.96     1.04   657.83     0.92     0.91
HUB     32.70     1.10    29.44   673.43     1.03   653.46     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.23    35.53    31.50     4.03     0.93     0.43     2.90
MEAN    39.81    27.51    23.50     4.01     0.94     0.41     3.34     0.91
HUB     41.99    10.38     6.50     3.88     0.94     0.39     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.991

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     472.174     304.027     361.270    1258.002       0.375      -0.008

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    33.146      30.072     658.075      46.000      40.082      33.000      -7.082

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     376.501     304.027     483.927    1264.457       0.298       0.324

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      33.075      31.100     664.846     440.827       0.043       0.470

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     352.837       0.000     352.837    1265.824       0.279       0.396

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      31.305     666.285       0.000       0.060       0.053       0.389

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      33.042       1.115     676.665      23.919     224.236       1.738

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  149304.484       0.473    1227.858 1263374.875

   OVERALL EXIT CONDITIONS; ALL          5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    958916.81   7885.9922    142.1652      2.1872      0.8549     10.4530      1.2943

*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =10.975   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    142.874    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   64.94257

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    139.573    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  109910.180  112108.148       2.046     831.557     406.468     619.754       1.525

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   331.51    -0.11   331.51     0.30   643.21
  MEAN    17.06     0.00    -0.02   331.51    -0.11   331.51     0.30
  HUB     12.51     0.00    -0.02   331.51    -0.11   331.51     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.83    50.47    12.36   645.77   725.99    14.20   513.63     0.65
  MEAN    58.17    47.20    10.97   534.02   628.65    14.20   513.63     0.57
  HUB     49.76    38.62    11.14   391.59   513.16    14.20   513.63     0.46

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   595.28   413.47   428.25  1135.88     0.52
  MEAN    18.04   615.20   430.89   439.09  1129.69     0.54
  HUB     15.00   688.13   515.13   456.25  1120.99     0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   487.20   232.30     0.43  8532.29
  MEAN   564.57   458.99   133.69     0.41  7773.43     1.55
  HUB    469.54   458.52    45.60     0.41  7728.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.38     1.28    16.07   565.71     1.08   536.12     0.92     0.90
  MEAN    18.97     1.26    15.50   561.90     1.07   530.29     0.92     0.90
  HUB     18.95     1.25    14.69   561.67     1.07   522.13     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     43.99    28.48    24.20     4.28     0.93     0.43     2.90
  MEAN    44.46    16.93    12.70     4.23     0.94     0.37     3.51     0.90
  HUB     48.47    -5.71    -9.30     3.59     0.94     0.22     4.78
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     622.256     430.050     449.733    1130.153       0.551       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.063      15.510     530.754      24.000      43.718      35.400      -8.318

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     463.767     430.050     632.474    1145.357       0.405       0.414

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.972      16.943     545.131     528.796       0.035       0.540

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     429.716       0.000     429.716    1148.024       0.374       0.443

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.139     547.672       0.000       0.060       0.059       0.467

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      18.882       1.250     563.095      40.285     189.175       1.466

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 250808.750       0.601    2025.010 1393961.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.975   EfDer =  0.982

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    142.874    3587.000      18.882     563.095       1.000       1.000       0.980
W Kg/sec =   64.94257

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    115.891    3442.696       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109910.180  112108.148       1.750     590.487     337.510     474.134       1.405

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   409.89    -0.14   409.89     0.36   617.37
 MEAN    18.08     0.00    -0.02   409.89    -0.14   409.89     0.36
 HUB     15.21     0.00    -0.02   409.89    -0.14   409.89     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.50    46.36    11.14   643.27   762.88    17.29   549.07     0.66
 MEAN    54.09    42.30    11.79   565.89   698.86    17.29   549.07     0.61
 HUB     49.28    37.84    11.44   476.11   628.35    17.29   549.07     0.55

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   538.28   350.63   408.41  1176.15     0.46
 MEAN    18.01   543.14   349.18   416.02  1171.22     0.46
 HUB     15.22   583.00   399.52   424.59  1166.29     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   500.07   288.57     0.43  7162.77
 MEAN   563.76   468.10   214.58     0.40  6291.25     1.64
 HUB    476.52   431.51    77.00     0.37  6083.98
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.94     1.22    19.87   599.09     1.06   574.90     0.92     0.90
 MEAN    22.42     1.19    19.34   594.71     1.06   570.08     0.92     0.90
 HUB     22.29     1.18    18.79   593.67     1.05   565.29     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.65    35.24    31.50     3.74     0.93     0.42     2.90
 MEAN    40.01    27.28    23.50     3.78     0.94     0.41     3.30     0.90
 HUB     43.26    10.28     6.50     3.78     0.94     0.39     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     597.409     350.159     484.031    1167.030       0.512      -0.160

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.520      18.829     566.025      46.000      35.883      30.600      -5.283

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     481.316     350.159     595.211    1177.760       0.409       0.215

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      22.471      20.027     576.482     455.853       0.025       0.401

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     475.116       0.000     475.116    1178.266       0.403       0.372

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      20.027     576.977       0.000       0.060       0.046       0.215

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864      22.404       1.187     595.825      32.730     207.049       1.605

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 203888.938       0.499    1646.183 1244706.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =10.975   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    142.874    3587.000      22.404     595.825       1.000       1.000       0.880
W Kg/sec =   64.94257

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.473    3346.802       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109910.180  112108.148       1.674     489.817     292.624     384.470       1.314

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   443.70    -0.15   443.70     0.38   586.15
 MEAN    17.74     0.00    -0.02   443.70    -0.15   443.70     0.38
 HUB     15.05     0.00    -0.02   443.70    -0.15   443.70     0.38

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.77    46.36     8.41   628.24   769.25    20.32   579.39     0.65
 MEAN    51.38    43.40     7.98   555.26   710.88    20.32   579.39     0.60
 HUB     46.73    38.84     7.89   471.10   647.26    20.32   579.39     0.55

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
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     0.500       0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   516.99   336.34   392.62  1208.44     0.43
 MEAN    17.51   521.88   336.47   398.93  1204.15     0.43
 HUB     14.85   560.22   386.16   405.87  1199.90     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   484.43   283.76     0.40  6665.95
 MEAN   548.00   451.54   211.53     0.37  5893.18     1.71
 HUB    464.84   413.42    78.68     0.34  5736.83

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.68     1.19    23.52   629.31     1.06   607.00     0.92     0.91
 MEAN    26.16     1.17    22.99   625.42     1.05   602.69     0.92     0.91
 HUB     26.05     1.16    22.43   624.64     1.05   598.44     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.58    35.86    31.50     4.36     0.93     0.45     2.90
 MEAN    40.15    27.93    23.50     4.43     0.93     0.44     3.28     0.91
 HUB     43.57    10.97     6.50     4.47     0.93     0.44     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     526.798     338.680     403.499    1204.744       0.437       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.264      23.028     603.293      46.000      40.009      31.500      -8.509

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     408.292     338.680     530.477    1213.943       0.336       0.376

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.203      24.228     612.542     471.992       0.028       0.462

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     397.215       0.000     397.215    1214.681       0.327       0.363

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.232     613.287       0.000       0.060       0.060       0.377

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      26.097       1.165     626.456      30.631     206.105       1.598

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 190927.391       0.497    1541.532 1361970.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.975   EfDer =  0.986

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    142.874    3587.000      26.097     626.456       1.000       1.000       0.980
W Kg/sec =   64.94257

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.443    3263.955       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109910.180  112108.148       1.993     513.330     257.603     401.059       1.557

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     19.26     0.00    -0.02   373.48    -0.13   373.48     0.31   548.57
MEAN    16.97     0.00    -0.02   373.48    -0.13   373.48     0.31
HUB     14.32     0.00    -0.02   373.48    -0.13   373.48     0.31

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.23    46.36    11.87   602.89   709.31    24.44   614.82     0.58
MEAN    54.90    43.80    11.10   531.23   649.48    24.44   614.82     0.53
HUB     50.21    37.84    12.37   448.25   583.55    24.44   614.82     0.48

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   496.30   324.60   375.44  1237.51     0.40
MEAN    16.57   498.38   321.39   380.91  1233.43     0.40
HUB     13.89   531.22   363.91   386.99  1229.34     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    590.99   460.35   266.39     0.37  6130.86
MEAN   518.80   429.03   197.42     0.35  5328.81     1.66
HUB    434.79   393.43    70.88     0.32  5056.55

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     30.36     1.16    27.17   657.23     1.05   636.68     0.92     0.90
MEAN    29.78     1.14    26.61   653.20     1.04   632.48     0.92     0.90
HUB     29.58     1.13    26.02   651.84     1.04   628.29     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.85    35.36    31.50     3.86     0.93     0.43     2.90
MEAN    40.16    27.40    23.50     3.90     0.94     0.41     3.29     0.90
HUB     43.24    10.38     6.50     3.88     0.94     0.40     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.986

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     493.796     323.194     373.337    1234.655       0.400       0.044

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.874      26.754     633.746      46.000      40.882      32.400      -8.482

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     383.888     323.194     501.821    1242.470       0.309       0.396

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      29.822      27.910     641.793     456.573       0.026       0.479

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     16.096     365.880       0.000     365.880    1243.560       0.294       0.369

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      27.975     642.920       0.000       0.060       0.060       0.416

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.857      29.709       1.138     654.088      27.632     209.023       1.620

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 172355.016       0.493    1391.580 1204128.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.975   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    142.874    3587.000      29.709     654.088       1.000       1.000       0.980
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W Kg/sec = 64.94257

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
79.387	3194.269	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
109910.180	112108.148	2.204	509.668	231.245	390.276	1.688

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	341.82	-0.12	341.82	0.27	510.66
MEAN	15.91	0.00	-0.02	341.82	-0.12	341.82	0.27	
HUB	13.07	0.00	-0.02	341.82	-0.12	341.82	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.21	47.36	11.85	573.46	667.71	28.19	644.35	0.54
MEAN	55.55	44.80	10.75	498.12	604.22	28.19	644.35	0.49
HUB	50.13	38.84	11.29	409.12	533.22	28.19	644.35	0.43

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	467.55	314.71	345.77	1263.82	0.37
MEAN	15.50	463.20	302.42	350.84	1259.56	0.37
HUB	12.59	484.94	328.90	356.36	1255.30	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	561.57	424.85	246.86	0.34	5648.02	
MEAN	485.11	395.56	182.69	0.31	4688.71	1.69
HUB	394.10	362.27	65.20	0.29	4142.37	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	33.97	1.14	30.91	682.41	1.04	664.19	0.92	0.90
MEAN	33.22	1.12	30.26	677.60	1.04	659.71	0.92	0.90
HUB	32.80	1.10	29.59	674.86	1.03	655.26	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.31	35.52	31.50	4.02	0.93	0.44	2.90	
MEAN	40.76	27.51	23.50	4.01	0.94	0.42	3.34	0.90
HUB	42.71	10.37	6.50	3.87	0.94	0.40	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.988

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	469.100	307.969	353.850	1259.778	0.372	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
33.268	30.229	659.945	46.000	41.034	33.000	-8.034

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	368.546	307.969	480.282	1266.463	0.291	0.338

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	33.187	31.292	666.968	440.827	0.046	0.485

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	345.510	0.000	345.510	1267.764	0.273	0.407

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	31.483	668.340	0.000	0.060	0.058	0.400

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.862      33.151       1.116     678.293      24.206     219.929       1.705

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  151096.578       0.479    1219.942 1236342.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     969076.62   7824.2466    139.5732      2.1944      0.8499     10.9747      1.2974


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.536   EfDer =  0.983

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     140.038    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   63.65342

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     136.803    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  107728.406  109882.742       2.087     831.557     398.399     619.754       1.556

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   324.31    -0.11   324.31     0.29   643.21
  MEAN    17.06     0.00    -0.02   324.31    -0.11   324.31     0.29
  HUB     12.51     0.00    -0.02   324.31    -0.11   324.31     0.29

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.34    50.47    12.87   645.77   722.73    14.24   514.03     0.65
  MEAN    58.74    47.20    11.54   534.02   624.88    14.24   514.03     0.56
  HUB     50.38    38.62    11.76   391.59   508.54    14.24   514.03     0.46

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   592.01   418.69   418.54  1136.79     0.52
  MEAN    18.04   610.28   433.85   429.21  1130.51     0.54
  HUB     15.00   680.43   514.03   445.82  1121.84     0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   476.17   227.08     0.42  8639.87
  MEAN   564.57   448.68   130.73     0.40  7826.76     1.58
  HUB    469.54   448.03    44.50     0.40  7711.89

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.43     1.29    16.14   566.26     1.08   536.98     0.92     0.90
  MEAN    18.99     1.26    15.57   562.17     1.08   531.06     0.92     0.90
  HUB     18.92     1.25    14.76   561.59     1.07   522.92     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     45.01    28.48    24.20     4.28     0.93     0.44     2.90
  MEAN    45.31    16.94    12.70     4.24     0.94     0.38     3.51     0.90
  HUB     49.06    -5.70    -9.30     3.60     0.94     0.23     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.983
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     617.014     433.003     439.561    1130.988       0.546       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.076      15.577     531.539      24.000      44.569      35.400      -9.169

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     452.888     433.003     626.578    1146.486       0.395       0.428

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.977      17.039     546.206     528.796       0.037       0.553

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     420.074       0.000     420.074    1148.994       0.366       0.452

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.214     548.598       0.000       0.060       0.064       0.476

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.852      18.881       1.250     563.337      40.527     186.271       1.444

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 252315.062       0.605    1996.732 1363684.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =11.536   EfDer =  0.978

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.038    3587.000      18.881     563.337       1.000       1.000       0.980
W Kg/sec =   63.65342

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    113.622    3441.957       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107728.406  109882.742       1.784     590.487     330.903     474.134       1.433

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   400.83    -0.14   400.83     0.35   617.24
 MEAN    18.08     0.00    -0.02   400.83    -0.14   400.83     0.35
 HUB     15.21     0.00    -0.02   400.83    -0.14   400.83     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.08    46.36    11.72   643.27   758.04    17.36   549.92     0.66
 MEAN    54.70    42.30    12.40   565.89   693.58    17.36   549.92     0.60
 HUB     49.91    37.84    12.07   476.11   622.47    17.36   549.92     0.54

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     20.42   535.70   356.97   399.44  1177.30     0.46
 MEAN    18.01   539.30   353.86   406.97  1172.25     0.46
 HUB     15.22   577.56   401.20   415.47  1167.21     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   489.08   282.23     0.42  7292.19
 MEAN   563.76   457.91   209.89     0.39  6375.57     1.66
 HUB    476.52   422.24    75.32     0.36  6109.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.00     1.22    19.95   599.98     1.07   576.02     0.92     0.89
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 MEAN    22.45     1.19    19.41   595.38     1.06   571.09     0.92     0.89
 HUB     22.29     1.18    18.85   594.04     1.05   566.19     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.79    35.24    31.50     3.74     0.93     0.44     2.90
 MEAN    41.01    27.28    23.50     3.78     0.94     0.42     3.30     0.89
 HUB     44.00    10.28     6.50     3.78     0.94     0.40     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     591.299     354.857     472.982    1168.315       0.506      -0.153

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.549      18.928     567.274      46.000      36.879      30.600      -6.279

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     469.863     354.857     588.808    1179.343       0.398       0.238

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      22.495      20.162     578.034     455.853       0.027       0.416

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     464.001       0.000     464.001    1179.809       0.393       0.386

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      20.153     578.491       0.000       0.060       0.050       0.235

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      22.423       1.188     596.468      33.131     202.886       1.573

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 206385.719       0.505    1633.264 1216193.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.536   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.038    3587.000      22.423     596.468       1.000       1.000       0.880
W Kg/sec =   63.65342

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     98.447    3344.999       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107728.406  109882.742       1.708     489.817     286.724     384.470       1.341

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   433.57    -0.15   433.57     0.37   585.84
 MEAN    17.74     0.00    -0.02   433.57    -0.15   433.57     0.37
 HUB     15.05     0.00    -0.02   433.57    -0.15   433.57     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.40    46.36     9.04   628.24   763.45    20.43   580.78     0.65
 MEAN    52.02    43.40     8.62   555.26   704.60    20.43   580.78     0.60
 HUB     47.38    38.84     8.54   471.10   640.36    20.43   580.78     0.54

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     19.81   514.67   342.88   383.81  1209.92     0.43
 MEAN    17.51   518.35   341.33   390.10  1205.52     0.43
 HUB     14.85   555.15   388.03   397.01  1201.15     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   473.46   277.22     0.39  6795.53
 MEAN   548.00   441.46   206.67     0.37  5978.13     1.74
 HUB    464.84   404.37    76.81     0.34  5764.56

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.78     1.19    23.64   630.60     1.06   608.49     0.92     0.91
 MEAN    26.23     1.17    23.09   626.49     1.05   604.07     0.92     0.91
 HUB     26.08     1.16    22.53   625.42     1.05   599.70     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.78    35.84    31.50     4.34     0.93     0.46     2.90
 MEAN    41.19    27.91    23.50     4.41     0.93     0.45     3.28     0.91
 HUB     44.34    10.95     6.50     4.45     0.93     0.45     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     523.190     343.568     394.575    1206.101       0.434       0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.330      23.133     604.658      46.000      41.047      31.500      -9.547

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     398.887     343.568     526.450    1215.604       0.328       0.393

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.263      24.373     614.224     471.992       0.031       0.478

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     388.279       0.000     388.279    1216.294       0.319       0.375

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.363     614.921       0.000       0.060       0.066       0.389

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      26.147       1.166     627.504      31.036     201.739       1.564

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 193455.656       0.503    1530.940 1329531.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.536   EfDer =  0.982

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    140.038    3587.000      26.147     627.504       1.000       1.000       0.980
W Kg/sec =   63.65342

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     86.594    3261.228       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107728.406  109882.742       2.035     513.330     252.219     401.059       1.590

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   365.20    -0.13   365.20     0.30   548.12
 MEAN    16.97     0.00    -0.02   365.20    -0.13   365.20     0.30
 HUB     14.32     0.00    -0.02   365.20    -0.13   365.20     0.30
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.80    46.36    12.44   602.89   704.98    24.56   616.38     0.58
MEAN    55.50    43.80    11.70   531.23   644.75    24.56   616.38     0.53
HUB     50.84    37.84    13.00   448.25   578.28    24.56   616.38     0.47

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   493.99   330.51   367.14  1239.25     0.40
MEAN    16.57   494.87   325.74   372.55  1235.07     0.40
HUB     13.89   526.21   365.47   378.58  1230.89     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    590.99   450.16   260.49     0.36  6242.37
MEAN   518.80   419.60   193.06     0.34  5400.91     1.69
HUB    434.79   384.88    69.32     0.31  5078.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     30.48     1.17    27.31   658.83     1.05   638.48     0.92     0.90
MEAN    29.87     1.14    26.74   654.61     1.04   634.18     0.92     0.90
HUB     29.63     1.13    26.13   652.99     1.04   629.89     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.99    35.36    31.50     3.86     0.93     0.44     2.90
MEAN    41.16    27.39    23.50     3.89     0.94     0.43     3.29     0.90
HUB     43.99    10.38     6.50     3.88     0.94     0.41     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.982

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     490.592     327.572     365.208    1236.258       0.397       0.043

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    29.960      26.876     635.401      46.000      41.890      32.400      -9.490

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     375.222     327.572     498.091    1244.338       0.302       0.412

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      29.902      28.073     643.733     456.573       0.028       0.495

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     357.821       0.000     357.821    1245.366       0.287       0.381

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      28.119     644.798       0.000       0.060       0.066       0.426

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.851      29.779       1.139     655.479      27.975     204.786       1.587

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 174496.641       0.500    1380.905 1176234.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =11.536   EfDer =  0.984

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    140.038    3587.000      29.779     655.479       1.000       1.000       0.980
W Kg/sec =   63.65342

   W cor      RPM cor        GAMMA       Cp         R          Blades       THK
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    77.709    3190.878       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
107728.406  109882.742       2.252     509.668     226.359     390.276       1.724

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   334.39    -0.12   334.39     0.27   510.12
MEAN    15.91     0.00    -0.02   334.39    -0.12   334.39     0.27
HUB     13.07     0.00    -0.02   334.39    -0.12   334.39     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.76    47.36    12.40   573.46   663.93    28.33   646.16     0.53
MEAN    56.13    44.80    11.33   498.12   600.04    28.33   646.16     0.48
HUB     50.75    38.84    11.91   409.12   528.48    28.33   646.16     0.42

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   465.72   320.09   338.28  1265.73     0.37
MEAN    15.50   460.13   306.41   343.27  1261.39     0.36
HUB     12.59   480.30   330.30   348.71  1257.06     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    561.57   415.62   241.47     0.33  5744.58
MEAN   485.11   387.00   178.71     0.31  4750.40     1.72
HUB    394.10   354.50    63.80     0.28  4159.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     34.11     1.15    31.06   684.29     1.04   666.21     0.92     0.90
MEAN    33.33     1.12    30.40   679.30     1.04   661.65     0.92     0.90
HUB     32.87     1.10    29.72   676.34     1.03   657.11     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.42    35.52    31.50     4.02     0.93     0.46     2.90
MEAN    41.75    27.50    23.50     4.00     0.94     0.43     3.34     0.90
HUB     43.45    10.37     6.50     3.87     0.94     0.40     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.984

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     466.079     312.025     346.223    1261.597       0.369      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.373      30.369     661.866      46.000      42.026      33.000      -9.026

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     360.390     312.025     476.697    1268.519       0.284       0.353

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      33.282      31.467     669.149     440.827       0.050       0.501

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     337.993       0.000     337.993    1269.755       0.266       0.419

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      31.644     670.453       0.000       0.060       0.063       0.412

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.856      33.243       1.116     679.977      24.499     215.563       1.671

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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  152931.484       0.485    1210.246 1207818.625

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     979584.56   7752.0869    136.8026      2.2005      0.8441     11.5355      1.3006


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.981

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     137.937    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   62.69868

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     134.751    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  106112.586  108234.609       2.119     831.557     392.423     619.754       1.579

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   319.00    -0.11   319.00     0.29   643.21
  MEAN    17.06     0.00    -0.02   319.00    -0.11   319.00     0.29
  HUB     12.51     0.00    -0.02   319.00    -0.11   319.00     0.29

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.72    50.47    13.25   645.77   720.36    14.27   514.31     0.65
  MEAN    59.15    47.20    11.95   534.02   622.14    14.27   514.31     0.56
  HUB     50.84    38.62    12.22   391.59   505.17    14.27   514.31     0.45

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   589.72   422.47   411.44  1137.44     0.52
  MEAN    18.04   606.77   436.01   421.98  1131.09     0.54
  HUB     15.00   674.84   513.23   438.19  1122.45     0.60

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   468.13   223.30     0.41  8717.87
  MEAN   564.57   441.13   128.57     0.39  7865.69     1.60
  HUB    469.54   440.36    43.69     0.39  7699.84

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.46     1.29    16.19   566.65     1.08   537.60     0.92     0.90
  MEAN    19.00     1.26    15.61   562.36     1.08   531.61     0.92     0.90
  HUB     18.91     1.25    14.80   561.53     1.07   523.49     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     45.76    28.49    24.20     4.29     0.93     0.45     2.90
  MEAN    45.94    16.94    12.70     4.24     0.94     0.39     3.51     0.90
  HUB     49.51    -5.69    -9.30     3.61     0.94     0.24     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.981

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
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    18.071     613.265     435.159     432.123    1131.585       0.542       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.084      15.624     532.100      24.000      45.201      35.400      -9.801

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     444.958     435.159     622.375    1147.294       0.388       0.438

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.980      17.107     546.976     528.796       0.039       0.563

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     413.032       0.000     413.032    1149.691       0.359       0.458

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.265     549.264       0.000       0.060       0.067       0.482

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.848      18.878       1.250     563.513      40.703     184.143       1.427

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 253409.453       0.608    1975.314 1341379.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.975

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.937    3587.000      18.878     563.513       1.000       1.000       0.980
W Kg/sec =   62.69868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.950    3441.420       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106112.586  108234.609       1.811     590.487     326.035     474.134       1.454

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   394.20    -0.14   394.20     0.34   617.14
 MEAN    18.08     0.00    -0.02   394.20    -0.14   394.20     0.34
 HUB     15.21     0.00    -0.02   394.20    -0.14   394.20     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.51    46.36    12.15   643.27   754.56    17.40   550.54     0.66
 MEAN    55.15    42.30    12.85   565.89   689.77    17.40   550.54     0.60
 HUB     50.38    37.84    12.54   476.11   618.23    17.40   550.54     0.54

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   533.96   361.57   392.90  1178.12     0.45
 MEAN    18.01   536.60   357.26   400.38  1172.99     0.46
 HUB     15.22   573.62   402.38   408.81  1167.88     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   481.09   277.62     0.41  7386.09
 MEAN   563.76   450.49   206.50     0.38  6436.62     1.68
 HUB    476.52   415.47    74.13     0.36  6127.55

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.04     1.22    20.01   600.63     1.07   576.83     0.92     0.89
 MEAN    22.47     1.19    19.46   595.86     1.06   571.82     0.92     0.89
 HUB     22.29     1.18    18.90   594.31     1.05   566.83     0.92     0.89
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.62    35.24    31.50     3.74     0.93     0.44     2.90
 MEAN    41.74    27.28    23.50     3.78     0.94     0.43     3.30     0.89
 HUB     44.55    10.28     6.50     3.78     0.94     0.41     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.975

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     586.972     358.259     464.958    1169.232       0.502      -0.149

     Pt3          Ps3         Ts3          Vane No.     Alpha3     Vane A3      Incid3
     22.568      18.996     568.166       46.000      37.615      30.600      -7.015

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     461.575     358.259     584.295    1180.474       0.391       0.254

   BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.850      22.510       20.255     579.144     455.853       0.028       0.428

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     455.963       0.000     455.963    1180.912       0.386       0.395

   Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      20.238     579.574        0.000       0.060       0.053       0.249

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4           PR4        Texit        Del T       Ns         Ns nondim
      0.855      22.433         1.188     596.934      33.421     199.892       1.550

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 208191.156       0.510    1622.840 1195271.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.995

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    137.937    3587.000       22.433     596.934       1.000        1.000        0.880
W Kg/sec =   62.69868

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     96.966    3343.694        1.402        0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 106112.586  108234.609        1.734     489.817     282.413     384.470       1.361

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   426.23    -0.15   426.23     0.36   585.61
 MEAN    17.74      0.00    -0.02   426.23    -0.15   426.23     0.36
 HUB     15.05      0.00    -0.02   426.23    -0.15   426.23     0.36

       BetaFlo   BetaBlade Incid   U1        W1       Ps1      Ts1     Rel Mach
 TIP     55.85     46.36     9.49   628.24   759.31    20.51   581.77     0.64
 MEAN    52.50     43.40     9.10   555.26   700.11    20.51   581.77     0.59
 HUB     47.87     38.84     9.03   471.10   635.41    20.51   581.77     0.54

     ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   513.12   347.59   377.46  1210.98      0.42
 MEAN    17.51   515.88   344.81   383.72  1206.50      0.43
 HUB     14.85   551.53   389.38   390.60  1202.05      0.46
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   465.55   272.51     0.38  6888.68
 MEAN   548.00   434.19   203.19     0.36  6039.09     1.76
 HUB    464.84   397.82    75.46     0.33  5784.54

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.84     1.20    23.72   631.53     1.06   609.56     0.92     0.91
 MEAN    26.27     1.17    23.16   627.26     1.05   605.05     0.92     0.91
 HUB     26.10     1.16    22.59   625.99     1.05   600.60     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.64    35.83    31.50     4.33     0.93     0.47     2.90
 MEAN    41.94    27.90    23.50     4.40     0.93     0.45     3.28     0.91
 HUB     44.91    10.93     6.50     4.43     0.93     0.45     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     520.675     347.075     388.126    1207.071       0.431       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.371      23.202     605.634      46.000      41.804      31.500     -10.304

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     392.109     347.075     523.651    1216.792       0.322       0.405

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.298      24.471     615.429     471.992       0.032       0.490

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     381.838       0.000     381.838    1217.448       0.314       0.384

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.448     616.092       0.000       0.060       0.070       0.398

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.861      26.176       1.167     628.261      31.327     198.627       1.540

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 195272.359       0.508    1522.138 1305816.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.937    3587.000      26.176     628.261       1.000       1.000       0.980
W Kg/sec =   62.69868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     85.254    3259.263       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106112.586  108234.609       2.067     513.330     248.317     401.059       1.615

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   359.22    -0.12   359.22     0.29   547.79
 MEAN    16.97     0.00    -0.02   359.22    -0.12   359.22     0.29
 HUB     14.32     0.00    -0.02   359.22    -0.12   359.22     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.22    46.36    12.86   602.89   701.90    24.64   617.50     0.58
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MEAN    55.94    43.80    12.14   531.23   641.38    24.64   617.50     0.53
HUB     51.30    37.84    13.46   448.25   574.52    24.64   617.50     0.47

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   492.43   334.73   361.17  1240.49     0.40
MEAN    16.57   492.42   328.84   366.54  1236.25     0.40
HUB     13.89   522.64   366.58   372.52  1232.01     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    590.99   442.85   256.26     0.36  6322.05
MEAN   518.80   412.84   189.97     0.33  5452.17     1.71
HUB    434.79   378.71    68.22     0.31  5093.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     30.55     1.17    27.40   659.99     1.05   639.76     0.92     0.90
MEAN    29.92     1.14    26.82   655.62     1.04   635.40     0.92     0.90
HUB     29.66     1.13    26.21   653.82     1.04   631.04     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.82    35.36    31.50     3.86     0.93     0.45     2.90
MEAN    41.90    27.40    23.50     3.90     0.94     0.43     3.29     0.90
HUB     44.54    10.38     6.50     3.88     0.94     0.42     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.979

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     488.353     330.684     359.355    1237.404       0.395       0.042

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    30.012      26.955     636.585      46.000      42.621      32.400     -10.221

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     368.997     330.684     495.490    1245.673       0.296       0.423

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      29.949      28.179     645.121     456.573       0.029       0.507

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    16.096     352.030       0.000     352.030    1246.658       0.282       0.389

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      28.211     646.142       0.000       0.060       0.070       0.433

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.847      29.819       1.139     656.480      28.219     201.781       1.564

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 176023.156       0.504    1372.092 1155802.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.937    3587.000      29.819     656.480       1.000       1.000       0.980
W Kg/sec =   62.69868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     76.499    3188.444       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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106112.586  108234.609       2.287     509.668     222.835     390.276       1.751

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   329.04    -0.11   329.04     0.26   509.73
MEAN    15.91     0.00    -0.02   329.04    -0.11   329.04     0.26
HUB     13.07     0.00    -0.02   329.04    -0.11   329.04     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.16    47.36    12.80   573.46   661.25    28.41   647.45     0.53
MEAN    56.56    44.80    11.76   498.12   597.07    28.41   647.45     0.48
HUB     51.20    38.84    12.36   409.12   525.11    28.41   647.45     0.42

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   464.49   323.93   332.90  1267.09     0.37
MEAN    15.50   457.98   309.22   337.84  1262.70     0.36
HUB     12.59   477.04   331.32   343.21  1258.31     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    561.57   409.02   237.64     0.32  5813.41
MEAN   485.11   380.89   175.90     0.30  4793.91     1.74
HUB    394.10   348.91    62.77     0.28  4172.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     34.19     1.15    31.15   685.63     1.04   667.65     0.92     0.90
MEAN    33.39     1.12    30.49   680.52     1.04   663.03     0.92     0.90
HUB     32.91     1.10    29.80   677.41     1.03   658.43     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.22    35.52    31.50     4.02     0.93     0.47     2.90
MEAN    42.47    27.50    23.50     4.00     0.94     0.44     3.34     0.90
HUB     43.99    10.37     6.50     3.87     0.94     0.41     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.982

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     463.963     314.886     340.747    1262.898       0.367      -0.010

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    33.436      30.458     663.241      46.000      42.741      33.000      -9.741

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     354.548     314.886     474.191    1269.986       0.279       0.364

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      33.337      31.579     670.707     440.827       0.053       0.512

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    14.701     332.606       0.000     332.606    1271.176       0.262       0.427

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      31.745     671.964       0.000       0.060       0.067       0.419

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.852      33.294       1.117     681.187      24.708     212.471       1.647

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 154238.469       0.489    1202.281 1186923.125

   OVERALL EXIT CONDITIONS; ALL          5   STAGES
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Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
987134.62	7694.6650	134.7507	2.2039	0.8395	11.9530	1.3029

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1

RESET = 0.000BLEED = 0.000 DPInc =12.498 EfDer = 0.977

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
135.209	3587.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 61.45868

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
132.086	3572.873	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
104013.984	106094.039	2.162	831.557	384.662	619.754	1.611

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	312.15	-0.11	312.15	0.28	643.21
MEAN	17.06	0.00	-0.02	312.15	-0.11	312.15	0.28	
HUB	12.51	0.00	-0.02	312.15	-0.11	312.15	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	64.21	50.47	13.74	645.77	717.35	14.30	514.67	0.64
MEAN	59.70	47.20	12.50	534.02	618.65	14.30	514.67	0.56
HUB	51.45	38.62	12.83	391.59	500.87	14.30	514.67	0.45

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	586.92	427.32	402.34	1138.26	0.52
MEAN	18.04	602.35	438.75	412.69	1131.83	0.53
HUB	15.00	667.71	512.17	428.39	1123.21	0.59

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	645.77	457.82	218.45	0.40	8817.75	
MEAN	564.57	431.45	125.82	0.38	7915.20	1.63
HUB	469.54	430.50	42.64	0.38	7683.94	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.49	1.29	16.26	567.15	1.08	538.38	0.92	0.89
MEAN	19.01	1.26	15.67	562.61	1.08	532.31	0.92	0.89
HUB	18.88	1.25	14.86	561.45	1.07	524.21	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	46.72	28.50	24.20	4.30	0.93	0.46	2.90	
MEAN	46.75	16.96	12.70	4.26	0.94	0.41	3.51	0.89
HUB	50.09	-5.68	-9.30	3.62	0.94	0.26	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.977

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	608.543	437.901	422.572	1132.335	0.537	0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3

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     19.093      15.682     532.806      24.000      46.021      35.400     -10.621

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     434.804     437.901     617.099    1148.311       0.379       0.451

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.981      17.191     547.946     528.796       0.042       0.576

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     403.999       0.000     403.999    1150.570       0.351       0.466

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.329     550.104       0.000       0.060       0.072       0.491

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.842      18.873       1.249     563.736      40.926     181.406       1.406

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 254802.141       0.611    1946.889 1312555.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =12.498   EfDer =  0.971

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.209    3587.000      18.873     563.736       1.000       1.000       0.980
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    109.789    3440.737       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       1.847     590.487     319.740     474.134       1.483

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   385.69    -0.13   385.69     0.33   617.02
 MEAN    18.08     0.00    -0.02   385.69    -0.13   385.69     0.33
 HUB     15.21     0.00    -0.02   385.69    -0.13   385.69     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.06    46.36    12.70   643.27   750.15    17.46   551.32     0.65
 MEAN    55.73    42.30    13.43   565.89   684.94    17.46   551.32     0.59
 HUB     51.00    37.84    13.16   476.11   612.83    17.46   551.32     0.53

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   531.87   367.43   384.56  1179.15     0.45
 MEAN    18.01   533.24   361.57   391.93  1173.93     0.45
 HUB     15.22   568.65   403.92   400.26  1168.71     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   470.89   271.77     0.40  7505.65
 MEAN   563.76   441.01   202.18     0.38  6514.28     1.71
 HUB    476.52   406.79    72.60     0.35  6150.92

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.08     1.22    20.07   601.46     1.07   577.84     0.92     0.89
 MEAN    22.49     1.19    19.52   596.47     1.06   572.73     0.92     0.89
 HUB     22.28     1.18    18.94   594.65     1.05   567.65     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.70    35.25    31.50     3.75     0.93     0.46     2.90
 MEAN    42.69    27.29    23.50     3.79     0.94     0.44     3.30     0.89
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 HUB     45.26    10.28     6.50     3.78     0.94     0.42     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      581.582     362.586     454.718    1170.381       0.497       -0.143

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.587      19.077      569.285       46.000      38.568      30.600      -7.968

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     17.960      451.030     362.586     578.703    1181.895       0.382        0.275

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850       22.523      20.368     580.541     455.853       0.031        0.442

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4           Mach4        cp 3-4
     17.823      445.742       0.000     445.742    1182.298       0.377        0.407

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.850       20.340      580.937       0.000       0.060       0.057        0.267

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
       0.849       22.440        1.189      597.527       33.790     196.098        1.520

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 210493.172       0.515    1608.334 1168334.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =12.498   EfDer =  0.993

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    135.209     3587.000       22.440      597.527       1.000        1.000        0.880
W Kg/sec =   61.45868

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     95.066     3342.034        1.402        0.249       53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 104013.984  106094.039        1.769      489.817     276.877      384.470        1.389

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00     -0.02   416.88     -0.14   416.88      0.35    585.32
 MEAN    17.74      0.00     -0.02   416.88     -0.14   416.88      0.35
 HUB     15.05      0.00     -0.02   416.88     -0.14   416.88      0.35

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     56.44     46.36    10.08   628.24    754.09     20.60    583.02      0.64
 MEAN    53.11     43.40     9.71   555.26    694.45     20.60    583.02      0.59
 HUB     48.50     38.84     9.66   471.10    629.18     20.60    583.02      0.53

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050        0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81    511.31    353.54    369.39   1212.30      0.42
 MEAN    17.51    512.88    349.24    375.60   1207.73      0.42
 HUB     14.85    546.99    391.07    382.44   1203.18      0.45

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    620.10    455.53    266.56      0.38   7006.55
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 MEAN   548.00   424.95   198.75     0.35  6116.60     1.78
 HUB    464.84   389.49    73.77     0.32  5809.53

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.92     1.20    23.81   632.72     1.06   610.90     0.92     0.91
 MEAN    26.32     1.17    23.24   628.25     1.05   606.29     0.92     0.91
 HUB     26.11     1.16    22.66   626.70     1.05   601.73     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.74    35.81    31.50     4.31     0.93     0.48     2.90
 MEAN    42.92    27.89    23.50     4.39     0.94     0.46     3.28     0.91
 HUB     45.64    10.92     6.50     4.42     0.94     0.46     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     517.615     351.535     379.932    1208.289       0.428       0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.415      23.281     606.861      46.000      42.777      31.500     -11.277

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     383.513     351.535     520.250    1218.288       0.315       0.420

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.335      24.585     616.947     471.992       0.035       0.506

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     373.667       0.000     373.667    1218.902       0.307       0.395

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.548     617.569       0.000       0.060       0.076       0.408

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.856      26.203       1.168     629.223      31.696     194.719       1.509

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 197572.125       0.514    1509.607 1275377.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =12.498   EfDer =  0.976

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    135.209    3587.000      26.203     629.223       1.000       1.000       0.980
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     83.545    3256.771       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       2.110     513.330     243.342     401.059       1.648

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   351.63    -0.12   351.63     0.29   547.37
 MEAN    16.97     0.00    -0.02   351.63    -0.12   351.63     0.29
 HUB     14.32     0.00    -0.02   351.63    -0.12   351.63     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.75    46.36    13.39   602.89   698.04    24.73   618.91     0.57
 MEAN    56.50    43.80    12.70   531.23   637.16    24.73   618.91     0.52
 HUB     51.90    37.84    14.06   448.25   569.81    24.73   618.91     0.47
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      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   490.60   340.06   353.62  1242.05     0.39
MEAN    16.57   489.44   332.77   358.92  1237.73     0.40
HUB     13.89   518.16   367.96   364.82  1233.41     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    590.99   433.60   250.93     0.35  6422.66
MEAN   518.80   404.26   186.04     0.33  5517.31     1.73
HUB    434.79   370.89    66.83     0.30  5112.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     30.63     1.17    27.51   661.46     1.05   641.38     0.92     0.89
MEAN    29.98     1.14    26.91   656.91     1.04   636.93     0.92     0.89
HUB     29.69     1.13    26.29   654.88     1.04   632.49     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.88    35.36    31.50     3.86     0.93     0.46     2.90
MEAN    42.84    27.40    23.50     3.90     0.94     0.44     3.29     0.89
HUB     45.25    10.38     6.50     3.88     0.94     0.43     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.976

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     485.637     334.639     351.937    1238.846       0.392       0.041

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.067      27.042     638.077      46.000      43.557      32.400     -11.157

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     361.120     334.639     492.332    1247.354       0.290       0.437

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.997      28.300     646.872     456.573       0.032       0.522

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     344.698       0.000     344.698    1248.286       0.276       0.399

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.316     647.839       0.000       0.060       0.075       0.442

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.840      29.858       1.139     657.751      28.528     198.011       1.535

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 177953.922       0.510    1359.708 1129530.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =12.498   EfDer =  0.978

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.209    3587.000      29.858     657.751       1.000       1.000       0.980
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     74.962    3185.362       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       2.334     509.668     218.359     390.276       1.787

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
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	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	322.26	-0.11	322.26	0.26	509.24
MEAN	15.91	0.00	-0.02	322.26	-0.11	322.26	0.26	
HUB	13.07	0.00	-0.02	322.26	-0.11	322.26	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.67	47.36	13.31	573.46	657.90	28.51	649.09	0.53
MEAN	57.10	44.80	12.30	498.12	593.36	28.51	649.09	0.47
HUB	51.78	38.84	12.94	409.12	520.89	28.51	649.09	0.42

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	463.07	328.76	326.11	1268.80	0.36
MEAN	15.50	455.38	312.79	330.97	1264.35	0.36
HUB	12.59	472.95	332.58	336.26	1259.90	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	561.57	400.68	232.80	0.32	5900.07	
MEAN	485.11	373.14	172.33	0.30	4849.23	1.77
HUB	394.10	341.84	61.52	0.27	4188.66	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	34.27	1.15	31.26	687.34	1.04	669.46	0.92	0.90
MEAN	33.46	1.12	30.58	682.07	1.04	664.78	0.92	0.90
HUB	32.95	1.10	29.89	678.76	1.03	660.11	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.23	35.52	31.50	4.02	0.93	0.48	2.90	
MEAN	43.38	27.50	23.50	4.00	0.94	0.45	3.34	0.90
HUB	44.69	10.37	6.50	3.87	0.94	0.42	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.978

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	461.406	318.523	333.824	1264.534	0.365	-0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
33.500	30.554	664.973	46.000	43.656	33.000	-10.656

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	347.174	318.523	471.155	1271.834	0.273	0.378

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	33.391	31.705	672.673	440.827	0.057	0.527

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	325.801	0.000	325.801	1272.967	0.256	0.437

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	31.858	673.872	0.000	0.060	0.072	0.429

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.846	33.344	1.117	682.721	24.971	208.604	1.617

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
155885.125	0.494	1191.085	1160043.625

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
996706.50	7615.6240	132.0858	2.2071	0.8332	12.4979	1.3059

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.037   EfDer =  0.973

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     132.525    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   60.23870

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     129.464    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  101949.258  103988.031       2.206     831.557     377.027     619.754       1.644

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   305.44    -0.11   305.44     0.27   643.21
  MEAN    17.06     0.00    -0.02   305.44    -0.11   305.44     0.27
  HUB     12.51     0.00    -0.02   305.44    -0.11   305.44     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.69    50.47    14.22   645.77   714.46    14.34   515.02     0.64
  MEAN    60.24    47.20    13.04   534.02   615.30    14.34   515.02     0.55
  HUB     52.05    38.62    13.43   391.59   496.71    14.34   515.02     0.45

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   584.35   432.00   393.50  1139.04     0.51
  MEAN    18.04   598.15   441.40   403.66  1132.53     0.53
  HUB     15.00   660.83   511.13   418.85  1123.94     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   447.82   213.77     0.39  8914.36
  MEAN   564.57   422.04   123.17     0.37  7962.92     1.66
  HUB    469.54   420.91    41.59     0.37  7668.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.53     1.29    16.31   567.64     1.09   539.12     0.92     0.89
  MEAN    19.02     1.26    15.72   562.85     1.08   532.97     0.92     0.89
  HUB     18.86     1.25    14.92   561.37     1.07   524.90     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     47.67    28.51    24.20     4.31     0.93     0.48     2.90
  MEAN    47.56    16.97    12.70     4.27     0.94     0.42     3.51     0.89
  HUB     50.67    -5.67    -9.30     3.63     0.94     0.27     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     604.059     440.544     413.289    1133.047       0.533       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.100      15.735     533.475      24.000      46.828      35.400     -11.428

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	424.962	440.544	612.104	1149.277	0.370	0.464

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.981	17.269	548.868	528.796	0.044	0.589

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	395.226	0.000	395.226	1151.408	0.343	0.474

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.387	550.905	0.000	0.060	0.077	0.498

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.836	18.866	1.249	563.952	41.142	178.741	1.386

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
256145.047	0.614	1918.300	1284351.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =13.037 EfDer = 0.966

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
132.525	3587.000	18.866	563.952	1.000	1.000	0.980

W Kg/sec = 60.23870

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
107.671	3440.079	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
101949.258	103988.031	1.883	590.487	313.573	474.134	1.512

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	377.42	-0.13	377.42	0.33	616.90
MEAN	18.08	0.00	-0.02	377.42	-0.13	377.42	0.33	
HUB	15.21	0.00	-0.02	377.42	-0.13	377.42	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.60	46.36	13.24	643.27	745.92	17.51	552.06	0.65
MEAN	56.31	42.30	14.01	565.89	680.31	17.51	552.06	0.59
HUB	51.60	37.84	13.76	476.11	607.66	17.51	552.06	0.53

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	530.01	373.06	376.48	1180.12	0.45
MEAN	18.01	530.12	365.74	383.74	1174.82	0.45
HUB	15.22	563.89	405.38	391.96	1169.51	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	461.04	266.13	0.39	7620.60	
MEAN	563.76	431.82	198.02	0.37	6589.31	1.73
HUB	476.52	398.37	71.14	0.34	6173.08	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.12	1.23	20.13	602.25	1.07	578.80	0.92	0.88
MEAN	22.51	1.19	19.57	597.07	1.06	573.60	0.92	0.88
HUB	22.27	1.18	18.99	594.98	1.06	568.43	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.74	35.26	31.50	3.76	0.93	0.47	2.90	
MEAN	43.62	27.29	23.50	3.79	0.95	0.45	3.30	0.88
HUB	45.96	10.29	6.50	3.79	0.95	0.43	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     576.533     366.766     444.828    1171.468       0.492      -0.138

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.602      19.149     570.345      46.000      39.506      30.600      -8.906

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     440.875     366.766     573.488    1183.243       0.373       0.295

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      22.532      20.470     581.869     455.853       0.033       0.457

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     435.901       0.000     435.901    1183.614       0.368       0.418

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      20.432     582.233       0.000       0.060       0.062       0.283

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.842      22.441       1.190     598.098      34.146     192.468       1.492

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 212706.531       0.521    1592.984 1142074.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.037   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    132.525    3587.000      22.441     598.098       1.000       1.000       0.880
W Kg/sec =   60.23870

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.217    3340.438       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 101949.258  103988.031       1.804     489.817     271.495     384.470       1.416

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   407.87    -0.14   407.87     0.34   585.04
 MEAN    17.74     0.00    -0.02   407.87    -0.14   407.87     0.34
 HUB     15.05     0.00    -0.02   407.87    -0.14   407.87     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.01    46.36    10.65   628.24   749.15    20.67   584.21     0.63
 MEAN    53.71    43.40    10.31   555.26   689.08    20.67   584.21     0.58
 HUB     49.12    38.84    10.28   471.10   623.24    20.67   584.21     0.53

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   509.75   359.24   361.65  1213.56     0.42
 MEAN    17.51   510.12   353.48   367.80  1208.90     0.42
 HUB     14.85   542.68   392.68   374.57  1204.26     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   445.91   260.86     0.37  7119.34
 MEAN   548.00   416.06   194.51     0.34  6190.79     1.81
 HUB    464.84   381.46    72.16     0.32  5833.44
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	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.98	1.20	23.89	633.85	1.06	612.17	0.92	0.91
MEAN	26.35	1.17	23.31	629.19	1.05	607.47	0.92	0.91
HUB	26.11	1.16	22.71	627.40	1.05	602.82	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.81	35.80	31.50	4.30	0.93	0.49	2.90	
MEAN	43.86	27.87	23.50	4.37	0.94	0.47	3.28	0.91
HUB	46.35	10.90	6.50	4.40	0.94	0.47	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.990

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	514.795	355.804	372.045	1209.446	0.426	0.012

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
26.448	23.347	608.029	46.000	43.722	31.500	-12.222

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	375.259	355.804	517.123	1219.711	0.308	0.435

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	26.361	24.685	618.394	471.992	0.037	0.521

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	365.816	0.000	365.816	1220.287	0.300	0.405

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	24.633	618.978	0.000	0.060	0.082	0.418

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.851	26.219	1.168	630.147	32.049	191.009	1.481

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
199772.875	0.520	1496.122	1245801.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =13.037 EfDer = 0.972

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
132.525	3587.000	26.219	630.147	1.000	1.000	0.980

W Kg/sec = 60.23870

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
81.895	3254.383	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
101949.258	103988.031	2.152	513.330	238.536	401.059	1.681

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	344.33	-0.12	344.33	0.28	546.96
MEAN	16.97	0.00	-0.02	344.33	-0.12	344.33	0.28	
HUB	14.32	0.00	-0.02	344.33	-0.12	344.33	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.27	46.36	13.91	602.89	694.39	24.81	620.26	0.57
MEAN	57.06	43.80	13.26	531.23	633.16	24.81	620.26	0.52
HUB	52.48	37.84	14.64	448.25	565.33	24.81	620.26	0.46

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	488.98	345.15	346.38	1243.53	0.39
MEAN	16.57	486.70	336.53	351.60	1239.14	0.39
HUB	13.89	513.94	369.30	357.43	1234.75	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	590.99	424.76	245.84	0.34	6518.66	
MEAN	518.80	396.04	182.28	0.32	5579.56	1.76
HUB	434.79	363.38	65.50	0.29	5131.21	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.70	1.17	27.59	662.86	1.05	642.92	0.92	0.89
MEAN	30.02	1.14	26.99	658.15	1.04	638.39	0.92	0.89
HUB	29.70	1.13	26.36	655.90	1.04	633.87	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.90	35.37	31.50	3.87	0.93	0.47	2.90	
MEAN	43.75	27.40	23.50	3.90	0.94	0.45	3.29	0.89
HUB	45.94	10.38	6.50	3.88	0.94	0.44	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.972

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	483.139	338.419	344.814	1240.217	0.390	0.040

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
30.106	27.113	639.499	46.000	44.464	32.400	-12.064

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	353.571	338.419	489.428	1248.955	0.283	0.451

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	30.031	28.404	648.542	456.573	0.034	0.537

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	337.667	0.000	337.667	1249.838	0.270	0.408

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	28.403	649.459	0.000	0.060	0.081	0.451

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.834	29.882	1.140	658.970	28.823	194.436	1.507

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
179797.672	0.515	1346.526	1103951.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =13.037 EfDer = 0.975

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
132.525	3587.000	29.882	658.970	1.000	1.000	0.980

W Kg/sec = 60.23870

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
73.483	3182.415	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
101949.258	103988.031	2.381	509.668	214.052	390.276	1.823

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	315.76	-0.11	315.76	0.25	508.76

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 MEAN    15.91     0.00    -0.02   315.76    -0.11   315.76     0.25
 HUB     13.07     0.00    -0.02   315.76    -0.11   315.76     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.17    47.36    13.81   573.46   654.74    28.59   650.66     0.52
 MEAN    57.64    44.80    12.84   498.12   589.86    28.59   650.66     0.47
 HUB     52.35    38.84    13.51   409.12   516.89    28.59   650.66     0.41

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   461.81   333.35   319.61  1270.42     0.36
 MEAN    15.50   452.99   316.19   324.38  1265.92     0.36
 HUB     12.59   469.06   333.76   329.58  1261.41     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   392.73   228.22     0.31  5982.26
 MEAN   485.11   365.73   168.92     0.29  4901.97     1.80
 HUB    394.10   335.06    60.34     0.27  4203.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.34     1.15    31.34   688.97     1.05   671.19     0.92     0.89
 MEAN    33.50     1.12    30.66   683.55     1.04   666.45     0.92     0.89
 HUB     32.97     1.10    29.96   680.05     1.03   661.71     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.21    35.53    31.50     4.03     0.93     0.49     2.90
 MEAN    44.27    27.51    23.50     4.01     0.94     0.46     3.34     0.89
 HUB     45.36    10.37     6.50     3.87     0.94     0.43     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.975

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     459.057     321.991     327.192    1266.089       0.363      -0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.545      30.630     666.622      46.000      44.541      33.000     -11.541

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     340.122     321.991     468.360    1273.592       0.267       0.391

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.426      31.808     674.546     440.827       0.060       0.541

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     319.290       0.000     319.290    1274.672       0.250       0.447

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      31.948     675.691       0.000       0.060       0.078       0.438

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.840      33.374       1.117     684.190      25.220     204.949       1.589

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  157447.750       0.499    1179.145 1133864.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1005869.88   7533.0762    129.4638      2.2092      0.8266     13.0371      1.3087


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**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =13.453   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    130.466    3587.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   59.30256

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    127.452    3572.873       1.402       0.249      53.349      32.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
100364.922  102372.000       2.240     831.557     371.168     619.754       1.670

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   300.32    -0.10   300.32     0.27   643.21
MEAN    17.06     0.00    -0.02   300.32    -0.10   300.32     0.27
HUB     12.51     0.00    -0.02   300.32    -0.10   300.32     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     65.06    50.47    14.59   645.77   712.28    14.36   515.28     0.64
MEAN    60.65    47.20    13.45   534.02   612.77    14.36   515.28     0.55
HUB     52.52    38.62    13.90   391.59   493.58    14.36   515.28     0.44

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   582.50   435.54   386.80  1139.61     0.51
MEAN    18.04   595.03   443.40   396.80  1133.05     0.53
HUB     15.00   655.63   510.32   411.61  1124.48     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    645.77   440.24   210.23     0.39  8987.31
MEAN   564.57   414.89   121.17     0.37  7999.03     1.68
HUB    469.54   413.63    40.79     0.37  7656.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.55     1.29    16.36   568.00     1.09   539.66     0.92     0.89
MEAN    19.02     1.26    15.76   563.03     1.08   533.46     0.92     0.89
HUB     18.84     1.25    14.96   561.31     1.07   525.41     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     48.39    28.52    24.20     4.32     0.93     0.49     2.90
MEAN    48.17    16.98    12.70     4.28     0.94     0.43     3.51     0.89
HUB     51.11    -5.66    -9.30     3.64     0.94     0.28     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.970

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     600.728     442.544     406.239    1133.575       0.530       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.104      15.774     533.973      24.000      47.449      35.400     -12.049

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     417.503     442.544     608.402    1149.996       0.363       0.474
```

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.980	17.326	549.556	528.796	0.046	0.599

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	388.564	0.000	388.564	1152.033	0.337	0.480

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.429	551.504	0.000	0.060	0.081	0.504

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.831	18.859	1.248	564.115	41.305	176.712	1.370

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
257156.594	0.617	1895.946	1262810.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =13.453 EfDer = 0.963

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
130.466	3587.000	18.859	564.115	1.000	1.000	0.980

W Kg/sec = 59.30256

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
106.051	3439.583	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
100364.922	102372.000	1.912	590.487	308.856	474.134	1.535

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	371.13	-0.13	371.13	0.32	616.81
MEAN	18.08	0.00	-0.02	371.13	-0.13	371.13	0.32	
HUB	15.21	0.00	-0.02	371.13	-0.13	371.13	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.02	46.36	13.66	643.27	742.76	17.55	552.61	0.64
MEAN	56.75	42.30	14.45	565.89	676.84	17.55	552.61	0.59
HUB	52.07	37.84	14.23	476.11	603.77	17.55	552.61	0.52

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	528.71	377.32	370.36	1180.85	0.45
MEAN	18.01	527.82	368.87	377.53	1175.48	0.45
HUB	15.22	560.32	406.47	385.66	1170.10	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	453.59	261.88	0.38	7707.46	
MEAN	563.76	424.87	194.89	0.36	6645.63	1.75
HUB	476.52	391.97	70.04	0.33	6189.70	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.15	1.23	20.17	602.85	1.07	579.51	0.92	0.88
MEAN	22.52	1.19	19.61	597.51	1.06	574.25	0.92	0.88
HUB	22.25	1.18	19.02	595.22	1.06	569.01	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.53	35.26	31.50	3.76	0.93	0.48	2.90	
MEAN	44.34	27.30	23.50	3.80	0.95	0.45	3.30	0.88
HUB	46.51	10.29	6.50	3.79	0.95	0.44	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.963

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     572.803     369.904     437.349    1172.276       0.489      -0.133

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.610      19.201     571.133      46.000      40.224      30.600      -9.624

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     433.215     369.904     569.653    1184.247       0.366       0.311

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      22.535      20.543     582.858     455.853       0.035       0.468

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     428.480       0.000     428.480    1184.594       0.362       0.426

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      20.497     583.199       0.000       0.060       0.066       0.295

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.837      22.439       1.190     598.528      34.413     189.743       1.471

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 214374.250       0.525    1580.524 1122080.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =13.453   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    130.466    3587.000      22.439     598.528       1.000       1.000       0.880
W Kg/sec =   59.30256

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.811    3339.238       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100364.922  102372.000       1.832     489.817     267.401     384.470       1.438

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   401.06    -0.14   401.06     0.34   584.83
 MEAN    17.74     0.00    -0.02   401.06    -0.14   401.06     0.34
 HUB     15.05     0.00    -0.02   401.06    -0.14   401.06     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.45    46.36    11.09   628.24   745.46    20.73   585.10     0.63
 MEAN    54.17    43.40    10.77   555.26   685.07    20.73   585.10     0.58
 HUB     49.60    38.84    10.76   471.10   618.80    20.73   585.10     0.52

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   508.67   363.51   355.81  1214.49     0.42
 MEAN    17.51   508.11   356.65   361.91  1209.77     0.42
 HUB     14.85   539.47   393.89   368.63  1205.06     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   438.68   256.59     0.36  7203.86
 MEAN   548.00   409.38   191.35     0.34  6246.16     1.83
 HUB    464.84   375.39    70.96     0.31  5851.29

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.02     1.20    23.94   634.71     1.06   613.11     0.92     0.90
 MEAN    26.37     1.18    23.36   629.90     1.05   608.35     0.92     0.90
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 HUB     26.11     1.16    22.75   627.92     1.05   603.63     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.61    35.80    31.50     4.30     0.93     0.50     2.90
 MEAN    44.58    27.87    23.50     4.37     0.94     0.48     3.28     0.90
 HUB     46.90    10.90     6.50     4.40     0.94     0.48     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     512.739     358.990     366.098    1210.308       0.424       0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.468      23.392     608.899      46.000      44.438      31.500     -12.938

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     369.046     358.990     514.848    1220.772       0.302       0.446

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.375      24.753     619.474     471.992       0.039       0.533

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     359.902       0.000     359.902    1221.320       0.295       0.412

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.690     620.030       0.000       0.060       0.087       0.426

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.846      26.226       1.169     630.841      32.313     188.246       1.459

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 201418.938       0.524    1485.008 1223339.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =13.453   EfDer =  0.969

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    130.466    3587.000      26.226     630.841       1.000       1.000       0.980
W Kg/sec =   59.30256

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.647    3252.592       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100364.922  102372.000       2.185     513.330     234.901     401.059       1.707

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   338.82    -0.12   338.82     0.28   546.66
 MEAN    16.97     0.00    -0.02   338.82    -0.12   338.82     0.28
 HUB     14.32     0.00    -0.02   338.82    -0.12   338.82     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.67    46.36    14.31   602.89   691.67    24.86   621.26     0.57
 MEAN    57.48    43.80    13.68   531.23   630.18    24.86   621.26     0.52
 HUB     52.92    37.84    15.08   448.25   561.99    24.86   621.26     0.46

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   487.87   348.96   340.94  1244.63     0.39
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 MEAN    16.57   484.70   339.34   346.09  1240.19     0.39
 HUB     13.89   510.79   370.28   351.86  1235.74     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   418.11   242.03     0.34  6590.69
 MEAN   518.80   389.86   179.46     0.31  5626.15     1.78
 HUB    434.79   357.72    64.51     0.29  5144.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.73     1.17    27.64   663.92     1.05   644.06     0.92     0.89
 MEAN    30.04     1.15    27.04   659.08     1.04   639.48     0.92     0.89
 HUB     29.70     1.13    26.40   656.66     1.04   634.90     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.67    35.37    31.50     3.87     0.93     0.48     2.90
 MEAN    44.44    27.41    23.50     3.91     0.94     0.46     3.29     0.89
 HUB     46.46    10.39     6.50     3.89     0.94     0.45     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.969

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     481.328     341.248     339.451    1241.239       0.388        0.039

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.128      27.158     640.560      46.000      45.151      32.400     -12.751

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     347.897     341.248     487.322    1250.149       0.278        0.462

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.048      28.473     649.789     456.573       0.036        0.548

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096     332.377       0.000     332.377    1250.996       0.266        0.415

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      28.459     650.670       0.000       0.060       0.086        0.457

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.829      29.892       1.140     659.885      29.044     191.772        1.487

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 181177.750       0.519    1335.775 1084492.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =13.453   EfDer =  0.972

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    130.466    3587.000       29.892     659.885       1.000        1.000        0.980
W Kg/sec =   59.30256

   W cor       RPM cor         GAMMA        Cp          R           Blades        THK
     72.367    3180.208        1.401        0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 100364.922  102372.000        2.418     509.668     210.803     390.276        1.851

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   310.86    -0.11   310.86     0.25   508.41
 MEAN    15.91     0.00    -0.02   310.86    -0.11   310.86     0.25
 HUB     13.07     0.00    -0.02   310.86    -0.11   310.86     0.25
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.54    47.36    14.18   573.46   652.39    28.64   651.83     0.52
MEAN    58.04    44.80    13.24   498.12   587.25    28.64   651.83     0.47
HUB     52.78    38.84    13.94   409.12   513.91    28.64   651.83     0.41

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   460.96   336.79   314.72  1271.63     0.36
MEAN    15.50   451.25   318.74   319.43  1267.09     0.36
HUB     12.59   466.20   334.66   324.56  1262.54     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    561.57   386.75   224.77     0.30  6044.02
MEAN   485.11   360.16   166.38     0.28  4941.38     1.82
HUB    394.10   329.96    59.44     0.26  4214.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     34.38     1.15    31.39   690.19     1.05   672.48     0.92     0.89
MEAN    33.53     1.12    30.71   684.66     1.04   667.69     0.92     0.89
HUB     32.97     1.10    30.01   681.02     1.03   662.90     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.94    35.53    31.50     4.03     0.93     0.50     2.90
MEAN    44.94    27.51    23.50     4.01     0.94     0.47     3.34     0.89
HUB     45.88    10.38     6.50     3.88     0.94     0.44     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.972

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     457.351     324.583     322.205    1267.251       0.361      -0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.569      30.678     667.856      46.000      45.211      33.000     -12.211

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     334.826     324.583     466.329    1274.904       0.263       0.400

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.442      31.875     675.947     440.827       0.063       0.552

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     314.397       0.000     314.397    1275.946       0.246       0.454

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.006     677.053       0.000       0.060       0.082       0.445

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.835      33.387       1.117     685.292      25.408     202.224       1.568

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  158621.469       0.503    1169.473 1113942.000

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1012749.00   7466.7266    127.4519      2.2100      0.8215     13.4528      1.3108


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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =13.962   EfDer =  0.967

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    127.956    3587.000      15.107     522.810      1.000       1.000       0.980
W Kg/sec =   58.16170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    125.000    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 98434.109  100402.578       2.284     831.557     364.027     619.754       1.702

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   294.10    -0.10   294.10     0.26   643.21
 MEAN    17.06     0.00    -0.02   294.10    -0.10   294.10     0.26
 HUB     12.51     0.00    -0.02   294.10    -0.10   294.10     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     65.52    50.47    15.05   645.77   709.68    14.39   515.59     0.64
 MEAN    61.16    47.20    13.96   534.02   609.74    14.39   515.59     0.55
 HUB     53.10    38.62    14.48   391.59   489.82    14.39   515.59     0.44

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   580.37   439.79   378.70  1140.29     0.51
 MEAN    18.04   591.34   445.81   388.51  1133.67     0.52
 HUB     15.00   649.41   509.34   402.86  1125.12     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    645.77   431.10   205.98     0.38  9074.98
 MEAN   564.57   406.25   118.76     0.36  8042.37     1.71
 HUB    469.54   404.83    39.81     0.36  7641.41

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.58     1.30    16.40   568.44     1.09   540.31     0.92     0.88
 MEAN    19.03     1.26    15.80   563.25     1.08   534.04     0.92     0.88
 HUB     18.82     1.25    15.01   561.23     1.07   526.01     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.27    28.54    24.20     4.34     0.93     0.50     2.90
 MEAN    48.93    17.00    12.70     4.30     0.95     0.44     3.51     0.88
 HUB     51.66    -5.64    -9.30     3.66     0.95     0.29     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     596.792     444.944     397.725    1134.200       0.526       0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.108      15.819     534.562      24.000      48.207      35.400     -12.807

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     408.512     444.944     604.034    1150.849       0.355       0.486

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.977      17.392     550.371     528.796       0.048       0.611
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    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     380.518       0.000     380.518    1152.776       0.330       0.487

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.478     552.216       0.000       0.060       0.086       0.511

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.825      18.850       1.248     564.310      41.500     174.258       1.351

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 258370.312       0.620    1868.249 1236673.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =13.962   EfDer =  0.958

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    127.956    3587.000      18.850     564.310       1.000       1.000       0.980
W Kg/sec =   58.16170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.082    3438.989       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  98434.109  100402.578       1.948     590.487     303.120     474.134       1.564

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   363.53    -0.13   363.53     0.32   616.70
 MEAN    18.08      0.00    -0.02   363.53    -0.13   363.53     0.32
 HUB     15.21      0.00    -0.02   363.53    -0.13   363.53     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.53    46.36    14.17   643.27   738.99    17.59   553.28     0.64
 MEAN    57.29    42.30    14.99   565.89   672.70    17.59   553.28     0.58
 HUB     52.64    37.84    14.80   476.11   599.13    17.59   553.28     0.52

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     20.42   527.25   382.40   362.99  1181.71     0.45
 MEAN    18.01   525.16   372.64   370.04  1176.26     0.45
 HUB     15.22   556.04   407.76   378.05  1170.81     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   444.64   256.80     0.38  7811.19
 MEAN   563.76   416.48   191.12     0.35  6713.43     1.78
 HUB    476.52   384.25    68.76     0.33  6209.20

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.18     1.23    20.21   603.57     1.07   580.35     0.92     0.88
 MEAN    22.53     1.20    19.64   598.05     1.06   575.02     0.92     0.88
 HUB     22.24     1.18    19.05   595.51     1.06   569.70     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.49    35.28    31.50     3.78     0.93     0.49     2.90
 MEAN    45.20    27.32    23.50     3.82     0.95     0.46     3.30     0.88
 HUB     47.17    10.31     6.50     3.81     0.95     0.45     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.958

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3       cp 2-3
     17.960     568.445     373.683     428.358    1173.228       0.485      -0.129
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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.617      19.258     572.063      46.000      41.100      30.600     -10.500

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     424.024     373.683     565.186    1185.437       0.358       0.329

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      22.535      20.626     584.031     455.853       0.037       0.482

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     419.576       0.000     419.576    1185.755       0.354       0.436

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      20.570     584.344       0.000       0.060       0.071       0.310

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.831      22.432       1.190     599.043      34.733     186.491       1.446

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 216368.188       0.530    1564.536 1097888.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.962   EfDer =  0.984

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    127.956    3587.000      22.432     599.043       1.000       1.000       0.880
W Kg/sec =   58.16170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     90.112    3337.802       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  98434.109  100402.578       1.866     489.817     262.451     384.470       1.465

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   392.88    -0.14   392.88     0.33   584.58
 MEAN    17.74     0.00    -0.02   392.88    -0.14   392.88     0.33
 HUB     15.05     0.00    -0.02   392.88    -0.14   392.88     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.99    46.36    11.63   628.24   741.09    20.79   586.16     0.62
 MEAN    54.72    43.40    11.32   555.26   680.31    20.79   586.16     0.57
 HUB     50.18    38.84    11.34   471.10   613.53    20.79   586.16     0.52

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   507.50   368.62   348.82  1215.60     0.42
 MEAN    17.51   505.80   360.45   354.84  1210.80     0.42
 HUB     14.85   535.68   395.32   361.48  1206.02     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   430.02   251.48     0.35  7305.13
 MEAN   548.00   401.35   187.55     0.33  6312.67     1.85
 HUB    464.84   368.11    69.52     0.31  5872.52

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.06     1.21    24.00   635.73     1.06   614.24     0.92     0.90
 MEAN    26.39     1.18    23.40   630.75     1.05   609.40     0.92     0.90
 HUB     26.10     1.16    22.79   628.54     1.05   604.59     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     46.58    35.79    31.50     4.29     0.93     0.50     2.90
 MEAN    45.45    27.86    23.50     4.36     0.94     0.49     3.28     0.90
 HUB     47.56    10.89     6.50     4.39     0.94     0.48     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     510.380     362.817     358.959    1211.330       0.421       0.011

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.485      23.437     609.932      46.000      45.306      31.500     -13.806

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     361.598     362.817     512.240    1222.034       0.296       0.459

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.386      24.829     620.760     471.992       0.042       0.547

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     352.807       0.000     352.807    1222.550       0.289       0.421

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.752     621.284       0.000       0.060       0.093       0.435

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.841      26.227       1.169     631.672      32.629     184.959       1.434

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 203391.188       0.529    1470.700 1196222.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =13.962   EfDer =  0.965

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    127.956     3587.000       26.227     631.672       1.000        1.000        0.980
W Kg/sec =   58.16170

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     79.143     3250.451        1.401       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  98434.109  100402.578        2.227     513.330     230.523     401.059       1.740

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   332.22    -0.11   332.22     0.27   546.30
 MEAN    16.97      0.00    -0.02   332.22    -0.11   332.22     0.27
 HUB     14.32      0.00    -0.02   332.22    -0.11   332.22     0.27

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     61.15     46.36    14.79   602.89   688.46     24.92   622.47      0.56
 MEAN    57.98     43.80    14.18   531.23   626.65     24.92   622.47      0.51
 HUB     53.46     37.84    15.62   448.25   558.03     24.92   622.47      0.46

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   486.62    353.50    334.42  1245.94      0.39
 MEAN    16.57   482.38    342.69    339.50  1241.44      0.39
 HUB     13.89   507.08    371.46    345.17  1236.93      0.41
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   410.17   237.49     0.33  6676.32
 MEAN   518.80   382.46   176.12     0.31  5681.58     1.81
 HUB    434.79   350.93    63.33     0.28  5161.26

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.77     1.17    27.70   665.18     1.05   645.43     0.92     0.88
 MEAN    30.06     1.15    27.09   660.19     1.05   640.78     0.92     0.88
 HUB     29.70     1.13    26.45   657.57     1.04   636.13     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.59    35.38    31.50     3.88     0.93     0.49     2.90
 MEAN    45.27    27.42    23.50     3.92     0.95     0.47     3.29     0.88
 HUB     47.10    10.40     6.50     3.90     0.95     0.46     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.965

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     479.229     344.613     333.020    1242.454       0.386       0.037

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.146      27.203     641.823      46.000      45.980      32.400     -13.580

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     341.102     344.613     484.880    1251.569       0.273       0.474

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.060      28.547     651.274     456.573       0.038       0.562

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     326.037       0.000     326.037    1252.374       0.260       0.424

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.517     652.112       0.000       0.060       0.091       0.465

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.823      29.895       1.140     660.979      29.307     188.612       1.462

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 182821.297       0.523    1321.962 1060961.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =13.962   EfDer =  0.968

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    127.956    3587.000      29.895     660.979       1.000       1.000       0.980
W Kg/sec =   58.16170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     71.026    3177.574       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  98434.109  100402.578       2.463     509.668     206.899     390.276       1.886

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   304.99    -0.11   304.99     0.24   507.99
 MEAN    15.91     0.00    -0.02   304.99    -0.11   304.99     0.24
 HUB     13.07     0.00    -0.02   304.99    -0.11   304.99     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.00    47.36    14.64   573.46   649.61    28.69   653.23     0.52
 MEAN    58.53    44.80    13.73   498.12   584.16    28.69   653.23     0.47
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HUB     53.30    38.84    14.46   409.12   510.38    28.69   653.23     0.41

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   460.03   340.91   308.88  1273.07     0.36
MEAN    15.50   449.23   321.76   313.50  1268.49     0.35
HUB     12.59   462.79   335.72   318.54  1263.89     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    561.57   379.60   220.66     0.30  6117.83
MEAN   485.11   353.51   163.36     0.28  4988.12     1.84
HUB    394.10   323.85    58.38     0.26  4228.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     34.42     1.15    31.44   691.66     1.05   674.02     0.92     0.89
MEAN    33.55     1.12    30.76   685.99     1.04   669.17     0.92     0.89
HUB     32.97     1.10    30.05   682.18     1.03   664.33     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     47.82    35.54    31.50     4.04     0.93     0.51     2.90
MEAN    45.74    27.52    23.50     4.02     0.94     0.48     3.34     0.89
HUB     46.50    10.39     6.50     3.89     0.94     0.44     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.968

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     455.368     327.656     316.230    1268.632       0.359       -0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.587      30.723     669.325      46.000      46.017      33.000     -13.017

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     328.489     327.656     463.965    1276.465       0.257       0.412

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.450      31.944     677.615     440.827       0.067       0.565

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     308.538       0.000     308.538    1277.462       0.242       0.463

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.062     678.674       0.000       0.060       0.087       0.453

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.829      33.392       1.117     686.610      25.631     198.992       1.543

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 160017.922       0.507    1157.073 1089844.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1020968.94   7382.5190    125.0000      2.2103      0.8150     13.9618      1.3133


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc =14.480   EfDer =  0.963

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    125.416    3587.000      15.107     522.810      1.000       1.000       0.980
W Kg/sec =   57.00716

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    122.519    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 96480.141   98409.539       2.331     831.557     356.801     619.754       1.737

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   287.84    -0.10   287.84     0.26   643.21
MEAN    17.06     0.00    -0.02   287.84    -0.10   287.84     0.26
HUB     12.51     0.00    -0.02   287.84    -0.10   287.84     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     65.98    50.47    15.51   645.77   707.11    14.42   515.89     0.63
MEAN    61.68    47.20    14.48   534.02   606.75    14.42   515.89     0.54
HUB     53.69    38.62    15.07   391.59   486.08    14.42   515.89     0.44

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   578.36   444.02   370.60  1140.96     0.51
MEAN    18.04   587.73   448.20   380.20  1134.27     0.52
HUB     15.00   643.21   508.34   394.10  1125.75     0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    645.77   421.96   201.75     0.37  9162.08
MEAN   564.57   397.61   116.38     0.35  8085.39     1.75
HUB    469.54   396.00    38.80     0.35  7626.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.61     1.30    16.45   568.88     1.09   540.94     0.92     0.88
MEAN    19.03     1.26    15.85   563.47     1.08   534.62     0.92     0.88
HUB     18.79     1.24    15.06   561.16     1.07   526.60     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     50.15    28.56    24.20     4.36     0.93     0.51     2.90
MEAN    49.69    17.02    12.70     4.32     0.95     0.45     3.51     0.88
HUB     52.21    -5.62    -9.30     3.68     0.95     0.30     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.963

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     592.937     447.327     389.195    1134.810       0.522       0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.111      15.862     535.138      24.000      48.975      35.400     -13.575

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     399.521     447.327     599.765    1151.685       0.347       0.498

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.973      17.456     551.171     528.796       0.051       0.624

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     372.455       0.000     372.455    1153.506       0.323       0.494
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.524	552.916	0.000	0.060	0.091	0.518

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.819	18.839	1.247	564.502	41.692	171.795	1.332

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
259570.328	0.622	1839.668	1210347.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =14.480 EfDer = 0.954

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
125.416	3587.000	18.839	564.502	1.000	1.000	0.980

W Kg/sec = 57.00716

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
102.093	3438.402	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96480.141	98409.539	1.986	590.487	297.330	474.134	1.595

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	355.90	-0.12	355.90	0.31	616.60
MEAN	18.08	0.00	-0.02	355.90	-0.12	355.90	0.31	
HUB	15.21	0.00	-0.02	355.90	-0.12	355.90	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.05	46.36	14.69	643.27	735.27	17.64	553.93	0.64
MEAN	57.84	42.30	15.54	565.89	668.61	17.64	553.93	0.58
HUB	53.23	37.84	15.39	476.11	594.53	17.64	553.93	0.51

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	525.93	387.47	355.63	1182.55	0.44
MEAN	18.01	522.60	376.39	362.55	1177.03	0.44
HUB	15.22	551.84	409.04	370.42	1171.51	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	435.70	251.73	0.37	7914.61	
MEAN	563.76	408.10	187.37	0.35	6780.90	1.81
HUB	476.52	376.51	67.47	0.32	6228.73	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.20	1.23	20.25	604.28	1.07	581.18	0.92	0.87
MEAN	22.53	1.20	19.68	598.58	1.06	575.78	0.92	0.87
HUB	22.22	1.18	19.08	595.81	1.06	570.38	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	47.45	35.29	31.50	3.79	0.93	0.50	2.90	
MEAN	46.07	27.33	23.50	3.83	0.95	0.47	3.30	0.87
HUB	47.84	10.32	6.50	3.82	0.95	0.45	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.954

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	564.221	377.442	419.385	1174.161	0.481	-0.124

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.620	19.310	572.975	46.000	41.987	30.600	-11.387

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	414.870	377.442	560.874	1186.604	0.350	0.347

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	22.532	20.703	585.184	455.853	0.040	0.496

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	410.706	0.000	410.706	1186.895	0.346	0.445

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	20.636	585.471	0.000	0.060	0.077	0.324

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.824	22.421	1.190	599.555	35.052	183.265	1.421

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
218354.859	0.534	1547.559	1073592.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =14.480 EfDer = 0.981

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
125.416	3587.000	22.421	599.555	1.000	1.000	0.880

W Kg/sec = 57.00716

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
88.405	3336.377	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96480.141	98409.539	1.902	489.817	257.480	384.470	1.493

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	384.72	-0.13	384.72	0.32	584.33
MEAN	17.74	0.00	-0.02	384.72	-0.13	384.72	0.32	
HUB	15.05	0.00	-0.02	384.72	-0.13	384.72	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.52	46.36	12.16	628.24	736.79	20.85	587.20	0.62
MEAN	55.29	43.40	11.89	555.26	675.62	20.85	587.20	0.57
HUB	50.77	38.84	11.93	471.10	608.33	20.85	587.20	0.51

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	506.46	373.68	341.86	1216.68	0.42
MEAN	17.51	503.60	364.21	347.79	1211.82	0.42
HUB	14.85	531.93	396.71	354.36	1206.96	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.10	421.42	246.43	0.35	7405.19	
MEAN	548.00	393.37	183.79	0.32	6378.44	1.88
HUB	464.84	360.84	68.13	0.30	5893.20	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.09	1.21	24.04	636.75	1.06	615.34	0.92	0.90
MEAN	26.40	1.18	23.44	631.59	1.05	610.42	0.92	0.90
HUB	26.08	1.16	22.82	629.15	1.05	605.54	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	47.55	35.79	31.50	4.29	0.93	0.51	2.90	
MEAN	46.32	27.85	23.50	4.35	0.94	0.50	3.28	0.90
HUB	48.23	10.88	6.50	4.38	0.94	0.49	3.87	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      508.126     366.601     351.846     1212.333       0.419       0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     26.495      23.476      610.948      46.000      46.177      31.500      -14.677

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392      354.188     366.601     509.751     1223.275       0.290       0.472

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       26.389      24.896      622.026     471.992       0.044       0.562

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121      345.741       0.000     345.741     1223.760       0.283       0.431

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       24.806      622.520       0.000       0.060       0.098       0.443

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4           PR4       Texit        Del T       Ns         Ns nondim
      0.835       26.221        1.170     632.496      32.941     181.725       1.409

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 205337.531       0.534    1455.301 1169051.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =14.480   EfDer =  0.961

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    125.416     3587.000       26.221     632.496       1.000        1.000        0.980
W Kg/sec =   57.00716

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     77.640     3248.334        1.401        0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  96480.141   98409.539        2.270     513.330     226.144     401.059       1.773

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00     -0.02   325.63     -0.11   325.63      0.27    545.95
 MEAN    16.97      0.00     -0.02   325.63     -0.11   325.63      0.27
 HUB     14.32      0.00     -0.02   325.63     -0.11   325.63      0.27

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     61.63     46.36     15.27   602.89    685.31     24.96   623.65      0.56
 MEAN    58.50     43.80     14.70   531.23    623.18     24.96   623.65      0.51
 HUB     54.01     37.84     16.17   448.25    554.14     24.96   623.65      0.45

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   485.49    357.99    327.94   1247.22      0.39
 MEAN    16.57   480.16    345.99    332.93   1242.67      0.39
 HUB     13.89   503.40    372.59    338.51   1238.10      0.41

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    590.99    402.28    233.00      0.32   6761.10
 MEAN   518.80    375.11    172.81      0.30   5736.33      1.83
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 HUB    434.79   344.18    62.20     0.28  5176.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.80     1.17    27.74   666.43     1.05   646.77     0.92     0.88
 MEAN    30.07     1.15    27.13   661.28     1.05   642.05     0.92     0.88
 HUB     29.68     1.13    26.48   658.48     1.04   637.34     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.51    35.39    31.50     3.89     0.93     0.50     2.90
 MEAN    46.10    27.43    23.50     3.93     0.95     0.48     3.29     0.88
 HUB     47.74    10.41     6.50     3.91     0.95     0.46     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.961

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     477.220     347.937     326.617    1243.650       0.384       0.036

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.154      27.239     643.067      46.000      46.810      32.400     -14.410

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     334.347     347.937     482.544    1252.967       0.267       0.486

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.063      28.610     652.738     456.573       0.040       0.575

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     319.728       0.000     319.728    1253.732       0.255       0.433

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.565     653.535       0.000       0.060       0.097       0.472

    STAGE EXIT CONDITIONS, STAGE             4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.817      29.888       1.140     662.062      29.566     185.503       1.438

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 184440.047       0.528    1307.193 1037343.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =14.480   EfDer =  0.965

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    125.416    3587.000      29.888     662.062       1.000       1.000       0.980
W Kg/sec =   57.00716

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     69.689    3174.974       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96480.141   98409.539       2.511     509.668     203.004     390.276       1.923

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   299.14    -0.10   299.14     0.24   507.58
 MEAN    15.91     0.00    -0.02   299.14    -0.10   299.14     0.24
 HUB     13.07     0.00    -0.02   299.14    -0.10   299.14     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.46    47.36    15.10   573.46   646.88    28.73   654.60     0.52
 MEAN    59.02    44.80    14.22   498.12   581.12    28.73   654.60     0.46
 HUB     53.83    38.84    14.99   409.12   506.90    28.73   654.60     0.40

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   459.19   344.97   303.07  1274.49     0.36
MEAN    15.50   447.30   324.75   307.60  1269.86     0.35
HUB     12.59   459.44   336.74   312.55  1265.21     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    561.57   372.51   216.60     0.29  6190.58
MEAN   485.11   346.89   160.37     0.27  5034.46     1.87
HUB    394.10   317.77    57.36     0.25  4240.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     34.44     1.15    31.48   693.10     1.05   675.53     0.92     0.88
MEAN    33.55     1.12    30.79   687.31     1.04   670.63     0.92     0.88
HUB     32.96     1.10    30.08   683.33     1.03   665.73     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     48.70    35.55    31.50     4.05     0.93     0.52     2.90
MEAN    46.55    27.54    23.50     4.04     0.95     0.49     3.34     0.88
HUB     47.13    10.40     6.50     3.90     0.95     0.45     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.965

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     453.479     330.703     310.288    1269.991       0.357      -0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.592      30.757     670.771      46.000      46.824      33.000     -13.824

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     322.193     330.703     461.706    1278.001       0.252       0.423

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.446      31.999     679.260     440.827       0.071       0.579

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     302.714       0.000     302.714    1278.955       0.237       0.471

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.106     680.274       0.000       0.060       0.093       0.461

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.824      33.384       1.117     687.913      25.851     195.813       1.518

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  161394.891       0.512    1143.864 1065651.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1029097.69   7293.5840    122.5186      2.2098      0.8083     14.4797      1.3158


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 95% Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =14.753   EfDer =  0.960
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
124.081	3587.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 56.40044

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
121.215	3572.873	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
95453.312	97362.164	2.356	831.557	353.004	619.754	1.756

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	284.56	-0.10	284.56	0.26	643.21
MEAN	17.06	0.00	-0.02	284.56	-0.10	284.56	0.26	
HUB	12.51	0.00	-0.02	284.56	-0.10	284.56	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	66.22	50.47	15.75	645.77	705.78	14.44	516.05	0.63
MEAN	61.95	47.20	14.75	534.02	605.20	14.44	516.05	0.54
HUB	54.00	38.62	15.38	391.59	484.15	14.44	516.05	0.43

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	577.36	446.22	366.38	1141.30	0.51
MEAN	18.04	585.89	449.44	375.86	1134.58	0.52
HUB	15.00	640.00	507.81	389.52	1126.07	0.57

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	645.77	417.20	199.55	0.37	9207.47	
MEAN	564.57	393.10	115.13	0.35	8107.82	1.76
HUB	469.54	391.40	38.27	0.35	7618.37	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.62	1.30	16.47	569.11	1.09	541.27	0.92	0.88
MEAN	19.04	1.26	15.87	563.58	1.08	534.91	0.92	0.88
HUB	18.78	1.24	15.08	561.12	1.07	526.91	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	50.61	28.58	24.20	4.38	0.93	0.52	2.90	
MEAN	50.10	17.03	12.70	4.33	0.95	0.46	3.51	0.88
HUB	52.51	-5.61	-9.30	3.69	0.95	0.31	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.960

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	590.968	448.569	384.745	1135.123	0.521	0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.112	15.884	535.433	24.000	49.380	35.400	-13.980

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	394.835	448.569	597.586	1152.114	0.343	0.504

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.971	17.488	551.582	528.796	0.052	0.630

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	368.245	0.000	368.245	1153.883	0.319	0.498

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.547	553.276	0.000	0.060	0.094	0.521

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    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.816      18.832       1.247     564.603      41.793     170.506       1.322

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 260195.047       0.624    1824.469 1196561.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =14.753   EfDer =  0.951

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    124.081    3587.000      18.832     564.603       1.000       1.000       0.980
W Kg/sec =   56.40044

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.050    3438.096       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 95453.312   97362.164       2.006     590.487     294.291     474.134       1.611

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   351.92    -0.12   351.92     0.30   616.54
 MEAN    18.08     0.00    -0.02   351.92    -0.12   351.92     0.30
 HUB     15.21     0.00    -0.02   351.92    -0.12   351.92     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.32    46.36    14.96   643.27   733.35    17.66   554.26     0.64
 MEAN    58.13    42.30    15.83   565.89   666.50    17.66   554.26     0.58
 HUB     53.54    37.84    15.70   476.11   592.15    17.66   554.26     0.51

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   525.29   390.09   351.79  1182.98     0.44
 MEAN    18.01   521.30   378.33   358.64  1177.43     0.44
 HUB     15.22   549.67   409.71   366.43  1171.86     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   431.06   249.11     0.36  7968.09
 MEAN   563.76   403.74   185.43     0.34  6815.84     1.82
 HUB    476.52   372.47    66.81     0.32  6238.89

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.21     1.23    20.27   604.65     1.07   581.61     0.92     0.87
 MEAN    22.54     1.20    19.69   598.86     1.06   576.17     0.92     0.87
 HUB     22.20     1.18    19.09   595.96     1.06   570.73     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.96    35.30    31.50     3.80     0.93     0.50     2.90
 MEAN    46.53    27.34    23.50     3.84     0.95     0.48     3.30     0.87
 HUB     48.19    10.33     6.50     3.83     0.95     0.46     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.951

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     562.072     379.389     414.716    1174.639       0.479      -0.121

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.620      19.335     573.442      46.000      42.453      30.600     -11.853

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     17.960     410.114     379.389     558.685    1187.205       0.345       0.356

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      22.529      20.741     585.777     455.853       0.041       0.503

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     406.097       0.000     406.097    1187.482       0.342       0.450

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      20.669     586.051       0.000       0.060       0.080       0.332

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.820      22.413       1.190     599.820      35.217     181.595       1.408

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 219383.734       0.537    1538.303 1060895.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =14.753   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    124.081    3587.000      22.413     599.820       1.000       1.000       0.880
W Kg/sec =   56.40044

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     87.512    3335.639       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95453.312   97362.164       1.922     489.817     254.881     384.470       1.508

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   380.47    -0.13   380.47     0.32   584.20
 MEAN    17.74     0.00    -0.02   380.47    -0.13   380.47     0.32
 HUB     15.05     0.00    -0.02   380.47    -0.13   380.47     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.81    46.36    12.45   628.24   734.58    20.88   587.74     0.62
 MEAN    55.59    43.40    12.19   555.26   673.21    20.88   587.74     0.57
 HUB     51.08    38.84    12.24   471.10   605.66    20.88   587.74     0.51

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   505.96   376.28   338.25  1217.24     0.42
 MEAN    17.51   502.48   366.15   344.13  1212.34     0.41
 HUB     14.85   530.02   397.45   350.65  1207.44     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   416.96   243.82     0.34  7456.81
 MEAN   548.00   389.23   181.85     0.32  6412.26     1.89
 HUB    464.84   357.06    67.39     0.30  5904.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.10     1.21    24.06   637.27     1.06   615.91     0.92     0.90
 MEAN    26.41     1.18    23.46   632.02     1.05   610.95     0.92     0.90
 HUB     26.07     1.16    22.84   629.47     1.05   606.03     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.05    35.79    31.50     4.29     0.93     0.52     2.90
 MEAN    46.78    27.85    23.50     4.35     0.94     0.50     3.28     0.90
 HUB     48.58    10.88     6.50     4.38     0.94     0.49     3.87


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     506.985     368.548     348.148    1212.850       0.418       0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.497      23.493     611.472      46.000      46.630      31.500     -15.130

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     350.340     368.548     508.494    1223.915       0.286       0.479

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.388      24.927     622.679     471.992       0.045       0.569

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     342.068       0.000     342.068    1224.385       0.279       0.435

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.831     623.157       0.000       0.060       0.101       0.448

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.832      26.216       1.170     632.922      33.102     180.059       1.396

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 206342.516       0.537    1446.859 1154876.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =14.753   EfDer =  0.959

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    124.081    3587.000      26.216     632.922       1.000       1.000       0.980
W Kg/sec =   56.40044

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     76.856    3247.239       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95453.312   97362.164       2.293     513.330     223.861     401.059       1.792

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   322.21    -0.11   322.21     0.26   545.76
 MEAN    16.97     0.00    -0.02   322.21    -0.11   322.21     0.26
 HUB     14.32     0.00    -0.02   322.21    -0.11   322.21     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.88    46.36    15.52   602.89   683.68    24.98   624.26     0.56
 MEAN    58.77    43.80    14.97   531.23   621.40    24.98   624.26     0.51
 HUB     54.30    37.84    16.46   448.25   552.13    24.98   624.26     0.45

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   484.95   360.32   324.57  1247.89     0.39
 MEAN    16.57   479.05   347.71   329.51  1243.30     0.39
 HUB     13.89   501.51   373.17   335.05  1238.70     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   398.19   230.67     0.32  6804.93
 MEAN   518.80   371.28   171.09     0.30  5764.86     1.85
 HUB    434.79   340.67    61.62     0.28  5184.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     30.81     1.18    27.76   667.07     1.05   647.46     0.92     0.88
 MEAN    30.07     1.15    27.14   661.85     1.05   642.71     0.92     0.88
 HUB     29.67     1.13    26.50   658.94     1.04   637.96     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.99    35.40    31.50     3.90     0.93     0.51     2.90
 MEAN    46.54    27.44    23.50     3.94     0.95     0.49     3.29     0.88
 HUB     48.08    10.42     6.50     3.92     0.95     0.47     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.959

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     476.221     349.670     323.291    1244.265       0.383       0.036

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.154      27.253     643.707      46.000      47.245      32.400     -14.845

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     330.840     349.670     481.377    1253.688       0.264       0.493

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.060      28.638     653.494     456.573       0.041       0.583

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     316.449       0.000     316.449    1254.433       0.252       0.437

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.586     654.271       0.000       0.060       0.100       0.476

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.814      29.881       1.140     662.623      29.701     183.897       1.426

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 185280.125       0.530    1299.171 1025006.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =14.753   EfDer =  0.963

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    124.081    3587.000      29.881     662.623       1.000       1.000       0.980
W Kg/sec =   56.40044

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     68.993    3173.630       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95453.312   97362.164       2.536     509.668     200.977     390.276       1.942

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   296.10    -0.10   296.10     0.24   507.36
 MEAN    15.91     0.00    -0.02   296.10    -0.10   296.10     0.24
 HUB     13.07     0.00    -0.02   296.10    -0.10   296.10     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.70    47.36    15.34   573.46   645.48    28.75   655.32     0.51
 MEAN    59.28    44.80    14.48   498.12   579.56    28.75   655.32     0.46
 HUB     54.11    38.84    15.27   409.12   505.11    28.75   655.32     0.40

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   458.78   347.06   300.05  1275.22      0.36
 MEAN    15.50   446.34   326.31   304.53  1270.56      0.35
 HUB     12.59   457.72   337.28   309.44  1265.90      0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   368.84   214.51     0.29  6228.14
 MEAN   485.11   343.45   158.80     0.27  5058.72     1.89
 HUB    394.10   314.61    56.82     0.25  4247.72

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.45     1.15    31.50   693.85     1.05   676.31     0.92     0.88
 MEAN    33.55     1.12    30.81   687.99     1.04   671.38     0.92     0.88
 HUB     32.94     1.10    30.10   683.92     1.03   666.46     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.15    35.56    31.50     4.06     0.93     0.52     2.90
 MEAN    46.98    27.54    23.50     4.04     0.95     0.49     3.34     0.88
 HUB     47.47    10.40     6.50     3.90     0.95     0.46     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.963

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     452.543     332.298     307.202    1270.691       0.356      -0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.590      30.769     671.518      46.000      47.247      33.000     -14.247

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     318.924     332.298     460.581    1278.795       0.249       0.429

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.440      32.023     680.110     440.827       0.073       0.586

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     299.688       0.000     299.688    1279.727       0.234       0.476

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.124     681.102       0.000       0.060       0.096       0.465

    STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.820      33.375       1.117     688.588      25.965     194.169       1.505

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  162111.297       0.514    1136.713 1053010.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    1033312.75   7245.5146    121.2147      2.2092      0.8047     14.7528      1.3171


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*******************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 95% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     179.821    3587.000      15.107     522.810       1.000       1.000       0.980
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W Kg/sec = 81.73685

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
175.667	3572.873	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
138333.188	141099.562	1.625	831.557	511.581	619.754	1.211

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	430.20	-0.15	430.20	0.39	643.21
MEAN	17.06	0.00	-0.02	430.20	-0.15	430.20	0.39	
HUB	12.51	0.00	-0.02	430.20	-0.15	430.20	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.34	50.47	5.87	645.77	776.07	13.61	507.35	0.70
MEAN	51.15	47.20	3.95	534.02	685.87	13.61	507.35	0.62
HUB	42.32	38.62	3.70	391.59	581.84	13.61	507.35	0.53

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	665.93	332.95	576.73	1119.21	0.60
MEAN	18.04	702.38	385.50	587.14	1115.24	0.63
HUB	15.00	811.08	530.76	613.30	1106.12	0.73

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	645.77	656.10	312.82	0.59	6871.84	
MEAN	564.57	613.84	179.07	0.55	6955.39	1.23
HUB	469.54	616.35	61.22	0.56	7963.27	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.51	1.23	14.57	557.36	1.07	520.34	0.92	0.91
MEAN	18.56	1.23	14.20	557.78	1.07	516.60	0.92	0.91
HUB	19.10	1.26	13.35	562.85	1.08	507.96	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.00	28.48	24.20	4.28	0.93	0.23	2.90	
MEAN	33.29	16.96	12.70	4.26	0.92	0.19	3.51	0.91
HUB	40.87	-5.70	-9.30	3.60	0.92	0.04	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	716.149	384.750	604.017	1114.871	0.642	-0.012

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.675	14.144	516.498	24.000	32.497	35.400	2.903

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	637.774	384.750	744.841	1124.396	0.567	0.193

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.594	14.944	525.361	528.796	0.027	0.366

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	582.474	0.000	582.474	1130.412	0.515	0.275

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.430	530.997	0.000	0.060	0.048	0.297

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

```
      0.856      18.497       1.224     559.334      36.524     231.939       1.798

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 227394.891       0.545    2310.753 1808952.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.821    3587.000      18.497     559.334       1.000       1.000       0.980
W Kg/sec =   81.73685

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    148.400    3454.250       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 138333.188  141099.562       1.366     590.487     432.185     474.134       1.097

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   551.51    -0.19   551.51     0.49   619.44
 MEAN    18.08     0.00    -0.02   551.51    -0.19   551.51     0.49
 HUB     15.21     0.00    -0.02   551.51    -0.19   551.51     0.49

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.40    46.36     3.04   643.27   847.47    15.73   533.94     0.75
 MEAN    45.75    42.30     3.45   565.89   790.33    15.73   533.94     0.70
 HUB     40.81    37.84     2.97   476.11   728.72    15.73   533.94     0.64

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   609.97   241.64   560.06  1153.74     0.53
 MEAN    18.01   626.37   270.25   565.07  1151.63     0.54
 HUB     15.22   681.27   370.79   571.53  1149.50     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   686.82   397.56     0.60  4938.14
 MEAN   563.76   636.75   293.51     0.55  4870.54     1.33
 HUB    476.52   581.23   105.73     0.51  5647.36

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.22     1.15    17.54   584.15     1.04   553.09     0.92     0.90
 MEAN    21.18     1.15    17.32   583.81     1.04   551.06     0.92     0.90
 HUB     21.63     1.17    17.05   587.72     1.05   548.97     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.34    35.37    31.50     3.87     0.93     0.24     2.90
 MEAN    25.56    27.45    23.50     3.95     0.92     0.25     3.30     0.90
 HUB     32.97    10.48     6.50     3.98     0.92     0.27     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     903.625     271.004     862.030    1115.433       0.810      -0.863

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.304      13.829     517.049      46.000      17.452      30.600      13.148

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     912.335     271.004     951.734    1114.066       0.819      -0.932

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.750      21.035      13.534     515.735     400.556       0.077       0.067

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     934.170       0.000     934.170    1111.137       0.841      -0.226

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      12.916     512.451       0.000       0.060       0.202      -1.085

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.654      20.526       1.110     585.228      25.894     286.321       2.220

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 161291.594       0.395    1639.021 1659861.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.781

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.821    3587.000      20.526     585.228       1.000       1.000       0.780
W Kg/sec =   81.73685

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    136.789    3376.968       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 138333.188  141099.562       1.090     434.156     398.392     339.175       0.851

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   799.09    -0.28   799.09     0.71   591.44
 MEAN    17.74     0.00    -0.02   799.09    -0.28   799.09     0.71
 HUB     15.05     0.00    -0.02   799.09    -0.28   799.09     0.71

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     38.19    46.36    -8.17   628.24  1016.65    14.71   531.93     0.90
 MEAN    34.81    43.40    -8.59   555.26   973.22    14.71   531.93     0.86
 HUB     30.54    38.84    -8.30   471.10   927.76    14.71   531.93     0.82

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   622.57   162.49   600.99  1170.25     0.53
 MEAN    17.51   636.13   207.79   601.23  1170.95     0.54
 HUB     14.85   689.67   328.70   606.30  1171.33     0.59

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   755.38   457.61     0.65  3224.43
 MEAN   548.00   690.81   340.21     0.59  3642.53     1.48
 HUB    464.84   621.40   136.14     0.53  4885.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.98     1.07    18.12   601.43     1.03   569.09     0.92     0.71
 MEAN    22.17     1.08    18.14   603.53     1.03   569.76     0.92     0.71
 HUB     22.75     1.11    17.99   609.77     1.04   570.09     0.92     0.71

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.13    37.29    31.50     5.79     0.93     0.28     2.90
 MEAN    19.07    29.50    23.50     6.00     0.86     0.32     3.28     0.71
 HUB     28.46    12.66     6.50     6.16     0.86     0.38     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.781

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     645.256     209.151     610.419    1171.195       0.551      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.259      18.106     570.157      46.000      18.913      31.500      12.587

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     644.773     209.151     677.847    1171.248       0.551      -0.026

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.090      17.975     570.209     471.992       0.050       0.137

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     17.121     627.365       0.000     627.365    1173.146       0.535      -0.022

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      18.012     572.057       0.000       0.060       0.098      -0.017

    STAGE EXIT CONDITIONS, STAGE            3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.552      21.887       1.066     604.909      19.681     362.930       2.813

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 122641.305       0.319    1246.263 2318766.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.926

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    179.821    3587.000      21.887     604.909       1.000       1.000       0.980
W Kg/sec =   81.73685

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    130.422    3321.578       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 138333.188  141099.562       1.351     513.330     379.870     401.059       1.056

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   581.85    -0.20   581.85     0.49   558.26
 MEAN    16.97     0.00    -0.02   581.85    -0.20   581.85     0.49
 HUB     14.32     0.00    -0.02   581.85    -0.20   581.85     0.49

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.03    46.36    -0.33   602.89   838.01    18.52   576.66     0.71
 MEAN    42.41    43.80    -1.39   531.23   788.01    18.52   576.66     0.67
 HUB     37.62    37.84    -0.22   448.25   734.61    18.52   576.66     0.62

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   628.23   155.57   608.67  1188.18     0.53
 MEAN    16.57   639.96   199.80   607.97  1188.83     0.54
 HUB     13.89   688.55   319.25   610.07  1189.13     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   748.37   435.42     0.63  2941.10
 MEAN   518.80   686.57   319.00     0.58  3314.89     1.22
 HUB    434.79   620.91   115.54     0.52  4437.23

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.51     1.07    19.43   619.68     1.02   586.76     0.92     0.85
 MEAN    23.72     1.08    19.47   621.56     1.03   587.40     0.92     0.85
 HUB     24.37     1.11    19.41   627.19     1.04   587.65     0.92     0.85
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     14.34    35.58    31.50     4.08     0.93     0.14     2.90
 MEAN    18.19    27.69    23.50     4.19     0.90     0.17     3.29     0.85
 HUB     27.62    10.72     6.50     4.22     0.90     0.21     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.926

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     626.372     200.925     593.271    1191.380       0.526       0.058

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.822      19.729     590.076      46.000      18.710      32.400      13.690

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     636.081     200.925     667.061    1190.347       0.534       0.004

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.637      19.458     589.053     456.573       0.052       0.144

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     603.719       0.000     603.719    1193.725       0.506      -0.015

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.661     592.401       0.000       0.060       0.102       0.050

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.660      23.416       1.070     622.810      17.901     361.466       2.802

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 111588.898       0.319    1133.950 1672453.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.895

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    179.821    3587.000       23.416     622.810       1.000        1.000        0.980
W Kg/sec =   81.73685

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    123.697    3273.495        1.401       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 138333.188  141099.562        1.415     509.668     360.301     390.276       1.083

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02    556.35    -0.19    556.35      0.46    523.33
 MEAN    15.91      0.00    -0.02    556.35    -0.19    556.35      0.46
 HUB     13.07      0.00    -0.02    556.35    -0.19    556.35      0.46

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     45.88     47.36    -1.48   573.46   799.13     20.20    597.00      0.67
 MEAN    41.85     44.80    -2.95   498.12   746.88     20.20    597.00      0.62
 HUB     36.34     38.84    -2.50   409.12   690.70     20.20    597.00      0.58

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94    602.04    139.08    585.75   1206.49      0.50
 MEAN    15.50    611.76    175.53    586.04   1206.64      0.51
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 HUB     12.59   652.94   282.31   588.75  1206.50     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   722.22   422.49     0.60  2498.54
 MEAN   485.11   662.79   309.59     0.55  2723.29     1.21
 HUB    394.10   599.27   111.79     0.50  3556.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.79     1.06    20.91   635.35     1.02   605.13     0.92     0.82
 MEAN    24.92     1.06    20.91   636.48     1.02   605.27     0.92     0.82
 HUB     25.39     1.08    20.80   640.67     1.03   605.12     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     13.36    35.80    31.50     4.30     0.93     0.13     2.90
 MEAN    16.67    27.85    23.50     4.35     0.89     0.15     3.34     0.82
 HUB     25.62    10.75     6.50     4.25     0.89     0.18     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.895

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     618.784     178.745     592.405    1206.826       0.513      -0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.952      20.853     605.566      46.000      16.790      33.000      16.210

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     652.055     178.745     676.110    1203.307       0.542      -0.188

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.539      20.093     602.040     440.827       0.119       0.127

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     600.702       0.000     600.702    1208.657       0.497      -0.034

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.713     607.405       0.000       0.060       0.123      -0.039

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.565      24.524       1.047     637.501      14.690     408.359       3.166

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91609.055       0.290     930.918 1728073.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    714525.75   7260.9043    175.6672      1.6234      0.6794      3.9536      1.2194

*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 95% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.454   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.102    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   80.50081

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    173.011    3572.873       1.402       0.249      53.349      32.000       0.050
```

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
136241.297	138965.828	1.650	831.557	503.845	619.754	1.230

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	422.57	-0.15	422.57	0.38	643.21
MEAN	17.06	0.00	-0.02	422.57	-0.15	422.57	0.38	
HUB	12.51	0.00	-0.02	422.57	-0.15	422.57	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.81	50.47	6.34	645.77	771.86	13.66	507.90	0.70
MEAN	51.65	47.20	4.45	534.02	681.10	13.66	507.90	0.62
HUB	42.83	38.62	4.21	391.59	576.21	13.66	507.90	0.52

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	658.35	339.96	563.78	1120.86	0.59
MEAN	18.04	694.01	389.37	574.49	1116.63	0.62
HUB	15.00	800.00	529.41	599.77	1107.55	0.72

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	645.77	641.38	305.81	0.57	7016.36	
MEAN	564.57	600.62	175.20	0.54	7025.13	1.26
HUB	469.54	602.75	59.87	0.54	7942.90	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.60	1.23	14.72	558.09	1.07	521.90	0.92	0.91
MEAN	18.60	1.23	14.33	558.14	1.07	517.92	0.92	0.91
HUB	19.10	1.26	13.49	562.75	1.08	509.34	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.09	28.48	24.20	4.28	0.93	0.25	2.90	
MEAN	34.13	16.96	12.70	4.26	0.92	0.20	3.51	0.91
HUB	41.43	-5.70	-9.30	3.60	0.92	0.06	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	706.989	388.611	590.605	1116.396	0.633	-0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.721	14.286	517.911	24.000	33.344	35.400	2.056

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	621.619	388.611	733.096	1126.560	0.552	0.213

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.648	15.159	527.385	528.796	0.026	0.380

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	568.259	0.000	568.259	1132.210	0.502	0.292

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.626	532.688	0.000	0.060	0.044	0.315

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.863	18.563	1.229	559.659	36.849	228.350	1.770

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
229417.984	0.550	2296.057	1776857.375

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.454   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.102    3587.000      18.563     559.659       1.000       1.000       0.980
W Kg/sec =   80.50081

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    145.675    3453.247       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 136241.297  138965.828       1.392     590.487     424.249     474.134       1.118

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   538.54    -0.19   538.54     0.47   619.26
 MEAN    18.08     0.00    -0.02   538.54    -0.19   538.54     0.47
 HUB     15.21     0.00    -0.02   538.54    -0.19   538.54     0.47

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.07    46.36     3.71   643.27   839.08    15.91   535.44     0.74
 MEAN    46.43    42.30     4.13   565.89   781.33    15.91   535.44     0.69
 HUB     41.49    37.84     3.65   476.11   718.94    15.91   535.44     0.63

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   600.59   252.55   544.91  1156.21     0.52
 MEAN    18.01   616.76   277.99   550.56  1153.72     0.53
 HUB     15.22   671.11   373.60   557.51  1151.23     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   668.15   386.65     0.58  5160.89
 MEAN   563.76   620.31   285.77     0.54  5009.89     1.36
 HUB    476.52   566.93   102.92     0.49  5690.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.44     1.15    17.83   585.60     1.05   555.48     0.92     0.91
 MEAN    21.35     1.15    17.57   584.84     1.04   553.08     0.92     0.91
 HUB     21.75     1.17    17.27   588.26     1.05   550.66     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.87    35.36    31.50     3.86     0.93     0.26     2.90
 MEAN    26.79    27.43    23.50     3.93     0.92     0.26     3.30     0.91
 HUB     33.83    10.46     6.50     3.96     0.92     0.28     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.993

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     868.861     278.767     822.927    1122.025       0.774      -0.792

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.472      14.438     523.195      46.000      18.714      30.600      11.886

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     856.196     278.767     900.435    1123.990       0.762      -0.783

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      21.249      14.463     525.021     400.556       0.066       0.115

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     17.823     861.849       0.000     861.849    1123.355       0.767      -0.077

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      14.135     524.233       0.000       0.060       0.161      -0.866

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.721      20.876       1.125     586.231      26.572     277.498       2.151

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 165516.891       0.405    1656.523 1624989.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 4.454   EfDer =  0.807

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.102    3587.000      20.876     586.231       1.000       1.000       0.780
W Kg/sec =   80.50081

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    132.578    3374.078       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 136241.297  138965.828       1.124     434.156     386.126     339.175       0.878

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   754.11    -0.26   754.11     0.66   590.93
 MEAN    17.74     0.00    -0.02   754.11    -0.26   754.11     0.66
 HUB     15.05     0.00    -0.02   754.11    -0.26   754.11     0.66

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     39.81    46.36    -6.55   628.24   981.68    15.55   538.76     0.86
 MEAN    36.38    43.40    -7.02   555.26   936.63    15.55   538.76     0.82
 HUB     32.01    38.84    -6.83   471.10   889.31    15.55   538.76     0.78

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   601.93   185.67   572.57  1175.76     0.51
 MEAN    17.51   616.53   224.63   574.15  1175.55     0.52
 HUB     14.85   669.98   336.08   579.59  1175.15     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   718.73   434.43     0.61  3683.34
 MEAN   548.00   658.95   323.37     0.56  3937.16     1.49
 HUB    464.84   593.72   128.77     0.51  4994.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.62     1.08    18.92   604.74     1.03   574.50     0.92     0.74
 MEAN    22.75     1.09    18.86   606.01     1.03   574.29     0.92     0.74
 HUB     23.27     1.11    18.66   611.32     1.04   573.87     0.92     0.74

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.97    37.19    31.50     5.69     0.93     0.30     2.90
 MEAN    21.37    29.39    23.50     5.89     0.87     0.33     3.28     0.74
 HUB     30.11    12.53     6.50     6.03     0.87     0.38     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.807

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     624.709     226.107     582.355    1175.942       0.531      -0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     22.840      18.843     574.781      46.000      21.219      31.500      10.281

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     609.829     226.107     650.396    1177.509       0.518       0.026

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.719      18.918     576.314     471.992       0.040       0.174

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     591.632       0.000     591.632    1179.372       0.502       0.041

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.011     578.139       0.000       0.060       0.074       0.049

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.631      22.580       1.082     607.356      21.125     334.323       2.592

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 131645.062       0.342    1317.528 2218858.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 4.454   EfDer =  0.953

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.102    3587.000      22.580     607.356       1.000       1.000       0.980
W Kg/sec =   80.50081

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    124.760    3314.880       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 136241.297  138965.828       1.413     513.330     363.379     401.059       1.104

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   550.37    -0.19   550.37     0.47   557.13
 MEAN    16.97     0.00    -0.02   550.37    -0.19   550.37     0.47
 HUB     14.32     0.00    -0.02   550.37    -0.19   550.37     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.62    46.36     1.26   602.89   816.46    19.47   582.08     0.69
 MEAN    44.00    43.80     0.20   531.23   765.06    19.47   582.08     0.65
 HUB     39.17    37.84     1.33   448.25   709.94    19.47   582.08     0.60

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   598.33   183.95   569.35  1196.38     0.50
 MEAN    16.57   611.69   219.67   570.88  1195.88     0.51
 HUB     13.89   660.61   326.49   574.28  1195.20     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   699.89   407.04     0.59  3476.71
 MEAN   518.80   644.51   299.13     0.54  3644.04     1.27
 HUB    434.79   584.41   108.30     0.49  4537.70

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.62     1.09    20.75   624.82     1.03   594.95     0.92     0.87
 MEAN    24.72     1.09    20.68   625.66     1.03   594.44     0.92     0.87
 HUB     25.27     1.12    20.53   630.14     1.04   593.74     0.92     0.87

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.91    35.56    31.50     4.06     0.93     0.18     2.90
 MEAN    21.05    27.65    23.50     4.15     0.90     0.20     3.29     0.87
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 HUB     29.62    10.68     6.50     4.18     0.90     0.23     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.953

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     599.572     220.908     557.392    1198.234       0.500       0.058

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.826      20.920     596.877      46.000      21.620      32.400      10.780

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     591.343     220.908     631.258    1199.055       0.493       0.063

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.703      20.916     597.695     456.573       0.039       0.190

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     560.185       0.000     560.185    1202.054       0.466       0.057

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.161     600.689       0.000       0.060       0.073       0.121

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.758      24.560       1.088     626.871      19.515     329.490       2.554

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 121661.477       0.348    1217.610 1620586.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 4.454   EfDer =  0.935

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    177.102    3587.000      24.560     626.871       1.000       1.000       0.980
W Kg/sec =   80.50081

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    116.532    3262.874       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 136241.297  138965.828       1.502     509.668     339.430     390.276       1.150

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   518.06    -0.18   518.06     0.43   521.63
 MEAN    15.91     0.00    -0.02   518.06    -0.18   518.06     0.43
 HUB     13.07     0.00    -0.02   518.06    -0.18   518.06     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.91    47.36     0.55   573.46   772.95    21.63   604.49     0.64
 MEAN    43.89    44.80    -0.91   498.12   718.81    21.63   604.49     0.60
 HUB     38.31    38.84    -0.53   409.12   660.24    21.63   604.49     0.55

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   565.93   173.44   538.70  1217.03     0.47
 MEAN    15.50   576.81   199.82   541.09  1215.94     0.47
 HUB     12.59   617.88   291.17   544.97  1214.72     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   663.96   388.13     0.55  3114.73
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 MEAN   485.11   611.69   285.29     0.50  3099.64     1.27
 HUB    394.10   554.61   102.93     0.46  3668.20

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.44     1.08    22.79   642.51     1.02   615.80     0.92     0.86
 MEAN    26.43     1.08    22.65   642.43     1.02   614.68     0.92     0.86
 HUB     26.78     1.09    22.44   645.28     1.03   613.45     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.85    35.77    31.50     4.27     0.93     0.18     2.90
 MEAN    20.27    27.80    23.50     4.30     0.90     0.19     3.34     0.86
 HUB     28.11    10.70     6.50     4.20     0.90     0.21     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.935

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     583.022     203.489     546.357    1216.253       0.479      -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.472      22.617     615.056      46.000      20.428      33.000      12.572

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     590.400     203.489     624.484    1215.539       0.486      -0.084

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.211      22.302     614.334     440.827       0.087       0.181

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     546.216       0.000     546.216    1219.675       0.448       0.058

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.845     618.523       0.000       0.060       0.084       0.055

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.717      26.220       1.068     643.407      16.535     360.558       2.795

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  103129.719       0.327    1032.141 1668647.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     751371.12   7519.8599    173.0107      1.7356      0.7425      4.4535      1.2307


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 95% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.997

    W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     174.397    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   79.27158

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     170.369    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  134160.906  136843.844       1.676     831.557     496.151     619.754       1.249
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ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	415.04	-0.14	415.04	0.38	643.21
MEAN	17.06	0.00	-0.02	415.04	-0.14	415.04	0.38	
HUB	12.51	0.00	-0.02	415.04	-0.14	415.04	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.28	50.47	6.81	645.77	767.77	13.71	508.42	0.69
MEAN	52.15	47.20	4.95	534.02	676.46	13.71	508.42	0.61
HUB	43.35	38.62	4.73	391.59	570.72	13.71	508.42	0.52

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	651.28	346.69	551.34	1122.41	0.58
MEAN	18.04	686.09	393.14	562.28	1117.95	0.61
HUB	15.00	789.41	528.12	586.73	1108.90	0.71

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	645.77	627.23	299.08	0.56	7155.26	
MEAN	564.57	587.83	171.44	0.53	7093.05	1.28
HUB	469.54	589.65	58.58	0.53	7923.59	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.68	1.24	14.87	558.79	1.07	523.37	0.92	0.91
MEAN	18.65	1.23	14.46	558.48	1.07	519.18	0.92	0.91
HUB	19.10	1.26	13.62	562.65	1.08	510.64	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.16	28.48	24.20	4.28	0.93	0.26	2.90	
MEAN	34.96	16.96	12.70	4.26	0.92	0.22	3.51	0.91
HUB	41.99	-5.70	-9.30	3.60	0.92	0.07	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	698.366	392.372	577.718	1117.825	0.625	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.763	14.418	519.238	24.000	34.183	35.400	1.217

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	606.348	392.372	722.228	1128.567	0.537	0.232

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.696	15.358	529.265	528.796	0.025	0.393

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	554.830	0.000	554.830	1133.882	0.489	0.309

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.806	534.262	0.000	0.060	0.041	0.332

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.870	18.622	1.233	559.974	37.164	224.871	1.743

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
231374.969	0.555	2280.283	1745222.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

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 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.397    3587.000      18.622     559.974       1.000       1.000       0.980
W Kg/sec =   79.27158

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    143.040    3452.278       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
134160.906  136843.844       1.417     590.487     416.576     474.134       1.138

    ROTOR LEADING EDGE CONDITIONS, STAGE             2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   526.23    -0.18   526.23     0.46   619.09
MEAN    18.08     0.00    -0.02   526.23    -0.18   526.23     0.46
HUB     15.21     0.00    -0.02   526.23    -0.18   526.23     0.46

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.72    46.36     4.36   643.27   831.23    16.07   536.85     0.73
MEAN    47.09    42.30     4.79   565.89   772.89    16.07   536.85     0.68
HUB     42.15    37.84     4.31   476.11   709.77    16.07   536.85     0.62

     ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
TIP     20.42   592.28   262.71   530.83  1158.46     0.51
MEAN    18.01   608.04   285.22   537.00  1155.64     0.53
HUB     15.22   661.71   376.23   544.34  1152.84     0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    639.20   650.79   376.49     0.56  5368.17
MEAN   563.76   604.94   278.54     0.52  5140.04     1.38
HUB    476.52   553.50   100.29     0.48  5730.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.63     1.16    18.10   586.95     1.05   557.67     0.92     0.91
MEAN    21.50     1.15    17.80   585.81     1.05   554.94     0.92     0.91
HUB     21.85     1.17    17.47   588.77     1.05   552.22     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     26.33    35.35    31.50     3.85     0.93     0.27     2.90
MEAN    27.97    27.42    23.50     3.92     0.92     0.27     3.30     0.91
HUB     34.65    10.44     6.50     3.94     0.92     0.29     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     840.557     286.019     790.398    1127.354       0.746      -0.738

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.622      14.944     528.181      46.000      19.893      30.600      10.707

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth       cp 2-Th
    17.960     813.803     286.019     862.602    1131.293       0.719      -0.674

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      21.436      15.181     531.877     400.556       0.058       0.148

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     17.823     812.200       0.000     812.200    1131.619       0.718       0.015

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.750      15.001     532.103       0.000       0.060       0.132      -0.720

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.765      21.151       1.136     587.177      27.204     269.516       2.089

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 169454.297       0.415    1670.033 1591309.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.834

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.397    3587.000      21.151     587.177       1.000       1.000       0.780
W Kg/sec =   79.27158

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    128.959    3371.358       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134160.906  136843.844       1.156     434.156     375.585     339.175       0.903

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   719.73    -0.25   719.73     0.63   590.45
 MEAN    17.74     0.00    -0.02   719.73    -0.25   719.73     0.63
 HUB     15.05     0.00    -0.02   719.73    -0.25   719.73     0.63

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     41.13    46.36    -5.23   628.24   955.52    16.20   543.94     0.84
 MEAN    37.66    43.40    -5.74   555.26   909.18    16.20   543.94     0.79
 HUB     33.22    38.84    -5.62   471.10   860.34    16.20   543.94     0.75

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   585.93   204.55   549.06  1180.23     0.50
 MEAN    17.51   600.89   238.44   551.55  1179.35     0.51
 HUB     14.85   653.76   341.99   557.18  1178.36     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   688.59   415.55     0.58  4057.18
 MEAN   548.00   632.49   309.56     0.54  4178.58     1.52
 HUB    464.84   570.56   122.85     0.48  5082.32

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.17     1.10    19.58   607.56     1.03   578.91     0.92     0.76
 MEAN    23.23     1.10    19.46   608.17     1.04   578.03     0.92     0.76
 HUB     23.70     1.12    19.23   612.71     1.04   577.04     0.92     0.76

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.43    37.12    31.50     5.62     0.93     0.32     2.90
 MEAN    23.38    29.30    23.50     5.80     0.87     0.34     3.28     0.76
 HUB     31.54    12.43     6.50     5.93     0.87     0.39     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.834

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     608.399     240.000     559.061    1179.828       0.516       0.000

    Pt3        Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.330     19.456     578.582      46.000      23.233      31.500       8.267

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	581.804	240.000	629.362	1182.518	0.492	0.069

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.240	19.693	581.224	471.992	0.033	0.206

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	563.820	0.000	563.820	1184.267	0.476	0.089

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.807	582.944	0.000	0.060	0.059	0.098

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.686	23.136	1.094	609.479	22.301	313.596	2.431

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
138981.047	0.361	1369.708	2139588.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 4.953 EfDer = 0.971

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
174.397	3587.000	23.136	609.479	1.000	1.000	0.980

W Kg/sec = 79.27158

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
120.112	3309.103	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
134160.906	136843.844	1.467	513.330	349.838	401.059	1.146

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	525.59	-0.18	525.59	0.44	556.16
MEAN	16.97	0.00	-0.02	525.59	-0.18	525.59	0.44	
HUB	14.32	0.00	-0.02	525.59	-0.18	525.59	0.44	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.93	46.36	2.57	602.89	799.96	20.22	586.43	0.67
MEAN	45.32	43.80	1.52	531.23	747.42	20.22	586.43	0.63
HUB	40.47	37.84	2.63	448.25	690.90	20.22	586.43	0.58

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	577.42	205.56	539.59	1202.59	0.48
MEAN	16.57	591.16	234.98	542.45	1201.32	0.49
HUB	13.89	639.66	332.10	546.70	1199.97	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	590.99	663.11	385.43	0.55	3884.40	
MEAN	518.80	612.22	283.83	0.51	3897.57	1.31
HUB	434.79	556.26	102.69	0.46	4615.45	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.51	1.10	21.79	628.98	1.03	601.17	0.92	0.89
MEAN	25.52	1.10	21.63	629.05	1.03	599.89	0.92	0.89
HUB	25.98	1.12	21.41	632.65	1.04	598.52	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.85	35.54	31.50	4.04	0.93	0.21	2.90	
MEAN	23.42	27.62	23.50	4.12	0.91	0.23	3.29	0.89
HUB	31.28	10.64	6.50	4.14	0.91	0.26	3.90	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     580.201     236.299     529.902    1203.511       0.482       0.058

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.632      21.861     602.142      46.000      24.034      32.400       8.366

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     558.343     236.299     606.287    1205.584       0.463       0.110

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.548      22.052     604.218     456.573       0.031       0.225

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     529.085       0.000     529.085    1208.230       0.438       0.106

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.290     606.873       0.000       0.060       0.059       0.168

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.807      25.431       1.099     630.230      20.751     307.481       2.384

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 129373.383       0.370    1275.021 1576092.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.960

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.397    3587.000      25.431     630.230       1.000       1.000       0.980
W Kg/sec =   79.27158

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.117    3254.169       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134160.906  136843.844       1.575     509.668     323.658     390.276       1.206

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   490.37    -0.17   490.37     0.40   520.24
 MEAN    15.91     0.00    -0.02   490.37    -0.17   490.37     0.40
 HUB     13.07     0.00    -0.02   490.37    -0.17   490.37     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.47    47.36     2.11   573.46   754.66    22.72   610.17     0.62
 MEAN    45.46    44.80     0.66   498.12   699.11    22.72   610.17     0.58
 HUB     39.85    38.84     1.01   409.12   638.73    22.72   610.17     0.53

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   543.08   197.49   505.90  1224.53     0.44
 MEAN    15.50   553.71   217.02   509.41  1222.69     0.45
 HUB     12.59   593.86   297.47   513.98  1220.80     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   623.28   364.08     0.51  3546.04
 MEAN   485.11   575.65   268.09     0.47  3366.01     1.31
 HUB    394.10   522.98    96.62     0.43  3747.41
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    27.70     1.09    24.20   648.03     1.03   623.43     0.92     0.88
 MEAN   27.58     1.08    23.96   647.12     1.03   621.55     0.92     0.88
 HUB    27.84     1.09    23.67   649.04     1.03   619.63     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    21.32    35.74    31.50     4.24     0.93     0.22     2.90
 MEAN   23.08    27.76    23.50     4.26     0.90     0.22     3.34     0.88
 HUB    30.06    10.65     6.50     4.15     0.90     0.24     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.960

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     559.589     221.001     514.099    1223.047       0.458       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.632      23.934      621.945      46.000      23.262      33.000       9.738

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     549.893     221.001     592.641    1223.929       0.449       -0.010

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.461      23.906     622.842     440.827       0.066       0.221

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     510.563       0.000     510.563    1227.342       0.416       0.116

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      24.371     626.321       0.000       0.060       0.067       0.113

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.784      27.456       1.080     648.063      17.833     331.434       2.569

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 111236.758       0.353    1096.278 1620278.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency      Rotor1Inc   TR
    780420.44   7691.3242     170.3689      1.8174      0.7799      4.9531      1.2396


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 95% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.998

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    171.704     3587.000       15.107      522.810       1.000        1.000        0.980
W Kg/sec =   78.04749

   W cor       RPM cor         GAMMA        Cp          R           Blades       THK
    167.738     3572.873        1.402        0.249      53.349       32.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 132089.219  134730.734        1.702      831.557     488.490      619.754       1.269

     ROTOR LEADING EDGE CONDITIONS, STAGE            1
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   407.62    -0.14   407.62     0.37   643.21
MEAN    17.06     0.00    -0.02   407.62    -0.14   407.62     0.37
HUB     12.51     0.00    -0.02   407.62    -0.14   407.62     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.75    50.47     7.28   645.77   763.77    13.75   508.93     0.69
MEAN    52.65    47.20     5.45   534.02   671.92    13.75   508.93     0.61
HUB     43.86    38.62     5.24   391.59   565.34    13.75   508.93     0.51

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   644.70   353.22   539.33  1123.88     0.57
MEAN    18.04   678.55   396.77   550.45  1119.20     0.61
HUB     15.00   779.25   526.87   574.13  1110.19     0.70

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    645.77   613.57   292.55     0.55  7289.83
MEAN   564.57   575.46   167.80     0.51  7158.59     1.30
HUB    469.54   576.99    57.33     0.52  7904.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.76     1.24    15.00   559.47     1.07   524.76     0.92     0.91
MEAN    18.69     1.24    14.57   558.81     1.07   520.36     0.92     0.91
HUB     19.09     1.26    13.74   562.56     1.08   511.87     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.22    28.48    24.20     4.28     0.93     0.28     2.90
MEAN    35.78    16.95    12.70     4.25     0.92     0.23     3.51     0.91
HUB     42.54    -5.70    -9.30     3.60     0.92     0.09     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     690.191     396.002     565.284    1119.172       0.617      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.803      14.543     520.490      24.000      35.013      35.400       0.387

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     591.831     396.002     712.096    1130.438       0.524       0.251

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.740      15.543     531.022     528.796       0.024       0.406

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     542.063       0.000     542.063    1135.444       0.477       0.324

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.973     535.735       0.000       0.060       0.039       0.348

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.874       18.673       1.236     560.277      37.467     221.493       1.717

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 233266.969       0.559    2263.430 1713990.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
  RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.998

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
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    171.704    3587.000      18.673     560.277       1.000       1.000       0.980
W Kg/sec =   78.04749

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    140.482    3451.342       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132089.219  134730.734       1.443     590.487     409.124     474.134       1.159

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   514.50    -0.18   514.50     0.45   618.92
 MEAN    18.08     0.00    -0.02   514.50    -0.18   514.50     0.45
 HUB     15.21     0.00    -0.02   514.50    -0.18   514.50     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.35    46.36     4.99   643.27   823.85    16.23   538.17     0.72
 MEAN    47.73    42.30     5.43   565.89   764.95    16.23   538.17     0.67
 HUB     42.79    37.84     4.95   476.11   701.11    16.23   538.17     0.62

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   584.86   272.22   517.64  1160.53     0.50
 MEAN    18.01   600.08   292.03   524.23  1157.42     0.52
 HUB     15.22   652.95   378.72   531.90  1154.33     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   634.53   366.98     0.55  5562.40
 MEAN   563.76   590.46   271.72     0.51  5262.71     1.40
 HUB    476.52   540.81    97.79     0.47  5768.01

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.81     1.17    18.34   588.23     1.05   559.67     0.92     0.91
 MEAN    21.64     1.16    18.01   586.73     1.05   556.66     0.92     0.91
 HUB     21.94     1.17    17.65   589.27     1.05   553.67     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.74    35.33    31.50     3.83     0.93     0.29     2.90
 MEAN    29.12    27.40    23.50     3.90     0.92     0.29     3.30     0.91
 HUB     35.45    10.42     6.50     3.92     0.92     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     816.561     292.853     762.240    1131.845       0.721      -0.693

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.758      15.379     532.399      46.000      21.017      30.600       9.583

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     779.087     292.853     832.310    1137.140       0.685      -0.586

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      21.602      15.774     537.392     400.556       0.051       0.173

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     773.685       0.000     773.685    1137.924       0.680       0.080

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      15.683     538.096       0.000       0.060       0.110      -0.610

    STAGE EXIT CONDITIONS, STAGE            2
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Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.797	21.379	1.145	588.075	27.798	262.207	2.033

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
173157.406	0.424	1680.177	1558638.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
RESET = 0.000BLEED = 0.000 DPInc = 5.453 EfDer = 0.859

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
171.704	3587.000	21.379	588.075	1.000	1.000	0.780

W Kg/sec = 78.04749

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
125.712	3368.783	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
132089.219	134730.734	1.186	434.156	366.129	339.175	0.926

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	691.31	-0.24	691.31	0.60	590.00
MEAN	17.74	0.00	-0.02	691.31	-0.24	691.31	0.60	
HUB	15.05	0.00	-0.02	691.31	-0.24	691.31	0.60	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	42.27	46.36	-4.09	628.24	934.29	16.73	548.18	0.81
MEAN	38.78	43.40	-4.62	555.26	886.84	16.73	548.18	0.77
HUB	34.29	38.84	-4.55	471.10	836.70	16.73	548.18	0.73

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	572.96	220.81	528.71	1184.05	0.48
MEAN	17.51	587.86	250.30	531.91	1182.62	0.50
HUB	14.85	639.95	347.05	537.67	1181.16	0.54

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.10	662.55	399.30	0.56	4378.93	
MEAN	548.00	609.55	297.70	0.52	4386.08	1.54
HUB	464.84	550.42	117.79	0.47	5157.32	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.65	1.11	20.15	610.07	1.04	582.67	0.92	0.79
MEAN	23.66	1.11	19.98	610.11	1.04	581.27	0.92	0.79
HUB	24.07	1.13	19.71	613.98	1.04	579.80	0.92	0.79

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	22.67	37.06	31.50	5.56	0.93	0.33	2.90	
MEAN	25.20	29.24	23.50	5.74	0.88	0.36	3.28	0.79
HUB	32.84	12.36	6.50	5.86	0.88	0.40	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.859

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	594.861	251.941	538.874	1183.158	0.503	0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.756	19.986	581.851	46.000	25.058	31.500	6.442

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	558.122	251.941	612.351	1186.748	0.470	0.107

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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.690      20.356     585.386     471.992       0.027       0.233

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     540.824       0.000     540.824    1188.355       0.455       0.126

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.471     586.973       0.000       0.060       0.050       0.137

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.725      23.600       1.104     611.388      23.313     297.283       2.305

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 145286.375       0.378    1409.739 2071682.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.704    3587.000      23.600     611.388       1.000       1.000       0.980
W Kg/sec =   78.04749

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    116.115    3303.932       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132089.219  134730.734       1.518     513.330     338.197     401.059       1.186

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   504.94    -0.17   504.94     0.42   555.29
 MEAN    16.97     0.00    -0.02   504.94    -0.17   504.94     0.42
 HUB     14.32     0.00    -0.02   504.94    -0.17   504.94     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.06    46.36     3.70   602.89   786.54    20.86   590.11     0.66
 MEAN    46.46    43.80     2.66   531.23   733.04    20.86   590.11     0.62
 HUB     41.61    37.84     3.77   448.25   675.31    20.86   590.11     0.57

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   561.71   223.03   515.54  1207.62     0.47
 MEAN    16.57   575.22   247.46   519.27  1205.80     0.48
 HUB     13.89   622.95   336.71   524.11  1203.94     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   633.38   367.96     0.52  4214.23
 MEAN   518.80   585.89   271.34     0.49  4104.35     1.35
 HUB    434.79   533.21    98.08     0.44  4679.43

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.26     1.11    22.64   632.55     1.03   606.22     0.92     0.90
 MEAN    26.19     1.11    22.41   632.00     1.03   604.39     0.92     0.90
 HUB     26.57     1.13    22.13   634.88     1.04   602.51     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.39    35.52    31.50     4.02     0.93     0.24     2.90
 MEAN    25.48    27.59    23.50     4.09     0.91     0.25     3.29     0.90
 HUB     32.72    10.60     6.50     4.10     0.91     0.27     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.983
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     565.216     248.853     507.485    1207.848       0.468       0.057

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.304      22.636     606.487      46.000      26.122      32.400       6.278

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     532.119     248.853     587.434    1210.861       0.439       0.148

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.244      22.981     609.517     456.573       0.025       0.256

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     504.383       0.000     504.383    1213.242       0.416       0.146

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.212     611.916       0.000       0.060       0.050       0.207

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.837      26.146       1.108     633.143      21.755     290.872       2.255

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 135640.797       0.388    1316.146 1536085.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.976

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.704    3587.000      26.146     633.143       1.000       1.000       0.980
W Kg/sec =   78.04749

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.655    3246.674       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132089.219  134730.734       1.641     509.668     310.659     390.276       1.256

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   468.20    -0.16   468.20     0.39   519.04
 MEAN    15.91     0.00    -0.02   468.20    -0.16   468.20     0.39
 HUB     13.07     0.00    -0.02   468.20    -0.16   468.20     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.78    47.36     3.42   573.46   740.44    23.60   614.86     0.61
 MEAN    46.78    44.80     1.98   498.12   683.74    23.60   614.86     0.56
 HUB     41.16    38.84     2.32   409.12   621.87    23.60   614.86     0.51

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   526.80   216.24   480.37  1230.45     0.43
 MEAN    15.50   536.60   230.51   484.57  1228.09     0.44
 HUB     12.59   575.47   302.45   489.58  1225.72     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   591.62   345.33     0.48  3882.31
 MEAN   485.11   547.39   254.61     0.45  3574.84     1.36
 HUB    394.10   498.09    91.65     0.41  3809.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.74     1.10    25.34   652.63     1.03   629.48     0.92     0.89
 MEAN    28.53     1.09    25.02   651.08     1.03   627.07     0.92     0.89
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 HUB     28.69     1.10    24.67   652.26     1.03   624.64     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.23    35.71    31.50     4.21     0.93     0.25     2.90
 MEAN    25.44    27.72    23.50     4.22     0.91     0.25     3.34     0.89
 HUB     31.71    10.60     6.50     4.10     0.91     0.26     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.976

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     542.320     234.732     488.888    1228.457       0.441      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.583      25.000     627.460      46.000      25.647      33.000       7.353

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     519.471     234.732     570.043    1230.437       0.422       0.047

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.468      25.181     629.484     440.827       0.052       0.255

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     483.354       0.000     483.354    1233.385       0.392       0.163

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.596     632.505       0.000       0.060       0.054       0.161

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.824      28.457       1.088     651.991      18.848     310.667       2.408

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 117578.000       0.373    1140.880 1577762.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    804929.56   7810.3726    167.7381      1.8837      0.8058      5.4531      1.2471


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 95% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 6.038   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    3587.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    164.680    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       1.734     831.557     479.584     619.754       1.292

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   399.06    -0.14   399.06     0.36   643.21
 MEAN    17.06     0.00    -0.02   399.06    -0.14   399.06     0.36
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 HUB     12.51     0.00    -0.02   399.06    -0.14   399.06     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.29     50.47     7.82   645.77   759.24    13.81   509.51     0.69
 MEAN    53.24     47.20     6.04   534.02   666.77    13.81   509.51     0.60
 HUB     44.47     38.62     5.85   391.59   559.20    13.81   509.51     0.51

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   637.57   360.56   525.82  1125.49     0.57
 MEAN    18.04   670.21   400.90   537.09  1120.58     0.60
 HUB     15.00   767.88   525.47   559.93  1111.61     0.69

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    645.77   598.19   285.21     0.53  7441.09
 MEAN   564.57   561.48   163.68     0.50  7232.93     1.32
 HUB    469.54   562.71    55.93     0.51  7883.80

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.84     1.25    15.15   560.23     1.07   526.28     0.92     0.91
 MEAN    18.73     1.24    14.70   559.18     1.07   521.67     0.92     0.91
 HUB     19.09     1.26    13.87   562.45     1.08   513.23     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.44    28.48    24.20     4.28     0.93     0.29     2.90
 MEAN    36.74    16.95    12.70     4.25     0.93     0.25     3.51     0.91
 HUB     43.18    -5.70    -9.30     3.60     0.93     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     681.186     400.118     551.289    1120.648       0.608      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.845      14.679     521.864      24.000      35.972      35.400      -0.572

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     575.712     400.118     701.099    1132.475       0.508       0.271

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.785      15.744     532.937     528.796       0.024       0.421

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     527.874       0.000     527.874    1137.150       0.464       0.341

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.151     537.346       0.000       0.060       0.038       0.366

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      18.726       1.240     560.620      37.810     217.663       1.687

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 235402.172       0.564    2242.503 1678007.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.038   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    3587.000      18.726     560.620       1.000       1.000       0.980
W Kg/sec =   76.62451
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
137.578	3450.286	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
129680.953	132274.297	1.474	590.487	400.669	474.134	1.183

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	501.41	-0.17	501.41	0.44	618.73
MEAN	18.08	0.00	-0.02	501.41	-0.17	501.41	0.44	
HUB	15.21	0.00	-0.02	501.41	-0.17	501.41	0.44	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.07	46.36	5.71	643.27	815.74	16.39	539.63	0.72
MEAN	48.47	42.30	6.17	565.89	756.20	16.39	539.63	0.66
HUB	43.53	37.84	5.69	476.11	691.56	16.39	539.63	0.61

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	577.16	282.64	503.21	1162.76	0.50
MEAN	18.01	591.60	299.53	510.17	1159.34	0.51
HUB	15.22	643.42	381.47	518.15	1155.96	0.56

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	616.73	356.56	0.53	5775.08	
MEAN	563.76	574.53	264.22	0.50	5397.71	1.42
HUB	476.52	526.79	95.05	0.46	5809.71	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.01	1.18	18.59	589.64	1.05	561.83	0.92	0.91
MEAN	21.78	1.16	18.23	587.75	1.05	558.53	0.92	0.91
HUB	22.03	1.18	17.84	589.82	1.05	555.25	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	29.32	35.32	31.50	3.82	0.93	0.30	2.90	
MEAN	30.42	27.38	23.50	3.88	0.93	0.30	3.30	0.91
HUB	36.36	10.39	6.50	3.89	0.93	0.31	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	792.433	300.374	733.298	1136.339	0.697	-0.649

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.900	15.820	536.636	46.000	22.275	30.600	8.325

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	744.771	300.374	803.062	1142.797	0.652	-0.500

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	21.772	16.362	542.754	400.556	0.044	0.197

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	736.991	0.000	736.991	1143.829	0.644	0.138

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	16.334	543.718	0.000	0.060	0.091	-0.508

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.824	21.600	1.154	589.071	28.450	254.386	1.972

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
177221.141	0.434	1688.256	1521611.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 6.038 EfDer = 0.885

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
168.574	3587.000	21.600	589.071	1.000	1.000	0.780

W Kg/sec = 76.62451

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
122.256	3365.936	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
129680.953	132274.297	1.219	434.156	356.062	339.175	0.953

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	663.01	-0.23	663.01	0.58	589.51
MEAN	17.74	0.00	-0.02	663.01	-0.23	663.01	0.58	
HUB	15.05	0.00	-0.02	663.01	-0.23	663.01	0.58	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	43.47	46.36	-2.89	628.24	913.54	17.26	552.38	0.79
MEAN	39.96	43.40	-3.44	555.26	864.95	17.26	552.38	0.75
HUB	35.41	38.84	-3.43	471.10	813.47	17.26	552.38	0.71

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	560.57	237.40	507.82	1187.91	0.47
MEAN	17.51	575.05	262.43	511.67	1185.96	0.48
HUB	14.85	626.02	352.16	517.57	1184.03	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.10	635.88	382.70	0.54	4707.43	
MEAN	548.00	585.97	285.57	0.49	4598.27	1.56
HUB	464.84	529.69	112.68	0.45	5233.06	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.15	1.12	20.73	612.72	1.04	586.49	0.92	0.81
MEAN	24.09	1.12	20.51	612.17	1.04	584.57	0.92	0.81
HUB	24.45	1.13	20.20	615.36	1.04	582.65	0.92	0.81

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.06	37.00	31.50	5.50	0.93	0.35	2.90	
MEAN	27.15	29.17	23.50	5.67	0.89	0.37	3.28	0.81
HUB	34.23	12.28	6.50	5.78	0.89	0.40	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.885

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	581.593	264.151	518.145	1186.540	0.490	0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.191	20.523	585.180	46.000	27.013	31.500	4.487

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	534.303	264.151	596.033	1190.997	0.449	0.145

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.143	21.025	589.585	471.992	0.023	0.262

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    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     517.759       0.000     517.759    1192.464       0.434       0.164

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.139     591.038       0.000       0.060       0.043       0.176

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.761      24.066       1.114     613.415      24.344     281.826       2.185

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 151719.250       0.395    1445.318 2001570.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.038   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    3587.000      24.066     613.415       1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.976    3298.469       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       1.574     513.330     326.141     401.059       1.230

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   484.09    -0.17   484.09     0.41   554.37
 MEAN    16.97     0.00    -0.02   484.09    -0.17   484.09     0.41
 HUB     14.32     0.00    -0.02   484.09    -0.17   484.09     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.24    46.36     4.88   602.89   773.31    21.49   593.86     0.65
 MEAN    47.67    43.80     3.87   531.23   718.83    21.49   593.86     0.60
 HUB     42.81    37.84     4.97   448.25   659.86    21.49   593.86     0.55

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   547.44   240.24   491.91  1212.56     0.45
 MEAN    16.57   560.23   259.83   496.34  1210.24     0.46
 HUB     13.89   606.74   341.28   501.66  1207.91     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   604.16   350.75     0.50  4538.98
 MEAN   518.80   559.84   258.98     0.46  4309.14     1.39
 HUB    434.79   510.30    93.51     0.42  4742.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.02     1.12    23.49   636.20     1.04   611.20     0.92     0.91
 MEAN    26.86     1.12    23.19   635.05     1.04   608.86     0.92     0.91
 HUB     27.16     1.13    22.86   637.23     1.04   606.51     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.03    35.49    31.50     3.99     0.93     0.27     2.90
 MEAN    27.63    27.55    23.50     4.05     0.92     0.28     3.29     0.91
 HUB     34.23    10.56     6.50     4.06     0.92     0.29     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3       cp 2-3
     16.481     551.162     261.286     485.293    1212.149       0.455       0.056
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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.975      23.405     610.813      46.000      28.298      32.400       4.102

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     506.674     261.286     570.078    1216.039       0.417       0.188

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.934      23.899     614.740     456.573       0.021       0.288

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     480.458       0.000     480.458    1218.173       0.394       0.186

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.118     616.899       0.000       0.060       0.042       0.245

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      26.851       1.116     636.160      22.746     275.435       2.135

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 141827.484       0.406    1351.086 1493081.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.038   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    3587.000      26.851     636.160       1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.205    3238.965       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       1.712     509.668     297.700     390.276       1.311

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   446.61    -0.15   446.61     0.37   517.81
 MEAN    15.91     0.00    -0.02   446.61    -0.15   446.61     0.37
 HUB     13.07     0.00    -0.02   446.61    -0.15   446.61     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.10    47.36     4.74   573.46   726.97    24.48   619.52     0.60
 MEAN    48.13    44.80     3.33   498.12   669.13    24.48   619.52     0.55
 HUB     42.50    38.84     3.66   409.12   605.78    24.48   619.52     0.50

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   512.69   234.10   456.12  1236.14     0.41
 MEAN    15.50   521.16   243.42   460.82  1233.34     0.42
 HUB     12.59   558.30   307.22   466.16  1230.55     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   561.50   327.46     0.45  4202.61
 MEAN   485.11   520.35   241.70     0.42  3774.83     1.40
 HUB    394.10   474.19    86.87     0.39  3869.96

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.77     1.11    26.44   657.25     1.03   635.33     0.92     0.90
 MEAN    29.46     1.10    26.05   655.10     1.03   632.45     0.92     0.90
 HUB     29.53     1.10    25.64   655.58     1.03   629.58     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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  TIP     27.17    35.68    31.50     4.18     0.93     0.28     2.90
  MEAN    27.84    27.68    23.50     4.18     0.92     0.28     3.34     0.90
  HUB     33.39    10.56     6.50     4.06     0.92     0.28     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.988

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
       R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
       15.219      526.792     247.881     464.828    1233.701       0.427      -0.005

       Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
       29.515       26.035      632.831      46.000      28.070      33.000       4.930

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
       RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
       15.219      491.280     247.881     550.274    1236.637       0.397       0.102

    BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
       0.950       29.441       26.404     635.846     440.827       0.041       0.290

     VANED DIFFUSER EXIT:
    R4           C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701      457.889       0.000     457.889    1239.205       0.370       0.210

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       26.777      638.490       0.000       0.060       0.045       0.207

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.853       29.427       1.096      655.977      19.816     292.202       2.265

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  123633.188       0.392    1177.763 1532732.625

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     829803.25   7904.9263     164.6798      1.9479      0.8271      6.0376      1.2547


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 95% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.510   EfDer =  1.000

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     166.058     3587.000       15.107      522.810       1.000        1.000        0.980
 W Kg/sec =   75.48089

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     162.222     3572.873        1.402        0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  127745.469  130300.102        1.760      831.557      472.426      619.754       1.312

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00     -0.02   392.24     -0.14   392.24      0.35    643.21
  MEAN    17.06      0.00     -0.02   392.24     -0.14   392.24      0.35
  HUB     12.51      0.00     -0.02   392.24     -0.14   392.24      0.35

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
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 TIP     58.73    50.47     8.26   645.77   755.67    13.85   509.96     0.68
 MEAN    53.71    47.20     6.51   534.02   662.70    13.85   509.96     0.60
 HUB     44.96    38.62     6.34   391.59   554.35    13.85   509.96     0.50

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   632.20   366.29   515.28  1126.71     0.56
 MEAN    18.04   663.81   404.11   526.63  1121.64     0.59
 HUB     15.00   759.07   524.39   548.82  1112.70     0.68

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    645.77   586.20   279.48     0.52  7559.32
 MEAN   564.57   550.53   160.46     0.49  7290.86     1.34
 HUB    469.54   551.55    54.85     0.50  7867.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.91     1.25    15.27   560.82     1.07   527.44     0.92     0.91
 MEAN    18.77     1.24    14.80   559.47     1.07   522.68     0.92     0.91
 HUB     19.08     1.26    13.97   562.37     1.08   514.27     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.41    28.47    24.20     4.27     0.93     0.31     2.90
 MEAN    37.50    16.95    12.70     4.25     0.93     0.26     3.51     0.91
 HUB     43.70    -5.71    -9.30     3.59     0.93     0.11     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     674.287     403.326     540.362    1121.774       0.601      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.876      14.782     522.913      24.000      36.738      35.400      -1.338

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     563.279     403.326     692.788    1134.015       0.497       0.287

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.817      15.894     534.388     528.796       0.024       0.433

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     516.966       0.000     516.966    1138.440       0.454       0.354

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.283     538.566       0.000       0.060       0.037       0.378

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      18.761       1.242     560.888      38.078     214.655       1.664

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 237070.734       0.568    2224.692 1649330.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
  RESET =  0.000BLEED =  0.000 DPInc = 6.510   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    166.058    3587.000      18.761     560.888       1.000       1.000       0.980
W Kg/sec =   75.48089

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    135.304    3449.461       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
127745.469	130300.102	1.499	590.487	394.046	474.134	1.203

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	491.32	-0.17	491.32	0.43	618.58
MEAN	18.08	0.00	-0.02	491.32	-0.17	491.32	0.43	
HUB	15.21	0.00	-0.02	491.32	-0.17	491.32	0.43	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.64	46.36	6.28	643.27	809.57	16.51	540.73	0.71
MEAN	49.04	42.30	6.74	565.89	749.55	16.51	540.73	0.66
HUB	44.11	37.84	6.27	476.11	684.28	16.51	540.73	0.60

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	571.61	290.53	492.27	1164.41	0.49
MEAN	18.01	585.35	305.25	499.46	1160.78	0.50
HUB	15.22	636.24	383.56	507.63	1157.19	0.55

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	603.24	348.66	0.52	5936.15	
MEAN	563.76	562.39	258.51	0.48	5500.60	1.44
HUB	476.52	516.07	92.96	0.45	5841.48	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.14	1.18	18.78	590.72	1.05	563.44	0.92	0.91
MEAN	21.88	1.17	18.39	588.53	1.05	559.92	0.92	0.91
HUB	22.09	1.18	17.98	590.25	1.05	556.45	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.55	35.31	31.50	3.81	0.93	0.32	2.90	
MEAN	31.43	27.36	23.50	3.86	0.93	0.31	3.30	0.91
HUB	37.07	10.38	6.50	3.88	0.93	0.32	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	775.354	306.107	712.372	1139.509	0.680	-0.618

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.000	16.131	539.635	46.000	23.253	30.600	7.347

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	720.628	306.107	782.947	1146.704	0.628	-0.440

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	21.891	16.772	546.471	400.556	0.040	0.214

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	711.804	0.000	711.804	1147.821	0.620	0.177

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	16.777	547.527	0.000	0.060	0.078	-0.439

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.839	21.750	1.159	589.834	28.945	248.575	1.927

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
180306.953	0.441	1692.016	1492540.375

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.510   EfDer =  0.903

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    166.058    3587.000      21.750     589.834       1.000       1.000       0.780
W Kg/sec =   75.48089

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    119.679    3363.757       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127745.469  130300.102       1.246     434.156     348.557     339.175       0.973

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   642.98    -0.22   642.98     0.56   589.12
 MEAN    17.74     0.00    -0.02   642.98    -0.22   642.98     0.56
 HUB     15.05     0.00    -0.02   642.98    -0.22   642.98     0.56

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.35    46.36    -2.01   628.24   899.10    17.62   555.32     0.78
 MEAN    40.82    43.40    -2.58   555.26   849.69    17.62   555.32     0.74
 HUB     36.24    38.84    -2.60   471.10   797.22    17.62   555.32     0.69

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   552.24   249.32   492.76  1190.65     0.46
 MEAN    17.51   566.20   271.15   497.05  1188.36     0.48
 HUB     14.85   616.20   355.85   503.06  1186.11     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   616.68   370.79     0.52  4943.38
 MEAN   548.00   568.95   276.84     0.48  4750.90     1.59
 HUB    464.84   514.73   108.99     0.43  5287.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.51     1.13    21.14   614.67     1.04   589.21     0.92     0.83
 MEAN    24.39     1.12    20.88   613.70     1.04   586.94     0.92     0.83
 HUB     24.71     1.14    20.55   616.39     1.05   584.70     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.84    36.96    31.50     5.46     0.93     0.36     2.90
 MEAN    28.61    29.12    23.50     5.62     0.89     0.38     3.28     0.83
 HUB     35.27    12.22     6.50     5.72     0.89     0.41     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.903

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     572.452     272.933     503.198    1188.956       0.481       0.006

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.499      20.902     587.565      46.000      28.475      31.500       3.025

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     517.404     272.933     584.978    1194.012       0.433       0.174

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.461      21.497     592.573     471.992       0.020       0.284

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     501.443       0.000     501.443    1195.379       0.419       0.191
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.606	593.931	0.000	0.060	0.040	0.203

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.785	24.390	1.121	614.919	25.086	271.355	2.104

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
156344.609	0.407	1467.151	1950151.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.510 EfDer = 0.996

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
166.058	3587.000	24.390	614.919	1.000	1.000	0.980

W Kg/sec = 75.48089

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
108.973	3294.431	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
127745.469	130300.102	1.617	513.330	317.393	401.059	1.264

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	469.27	-0.16	469.27	0.39	553.70
MEAN	16.97	0.00	-0.02	469.27	-0.16	469.27	0.39	
HUB	14.32	0.00	-0.02	469.27	-0.16	469.27	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.11	46.36	5.75	602.89	764.12	21.94	596.55	0.64
MEAN	48.55	43.80	4.75	531.23	708.93	21.94	596.55	0.59
HUB	43.70	37.84	5.86	448.25	649.07	21.94	596.55	0.54

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	538.25	252.22	475.50	1215.99	0.44
MEAN	16.57	550.24	268.47	480.30	1213.36	0.45
HUB	13.89	595.61	344.46	485.90	1210.73	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	590.99	583.84	338.77	0.48	4764.96	
MEAN	518.80	541.62	250.33	0.45	4452.38	1.42
HUB	434.79	494.22	90.33	0.41	4786.88	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.54	1.13	24.07	638.84	1.04	614.67	0.92	0.91
MEAN	27.33	1.12	23.73	637.27	1.04	612.01	0.92	0.91
HUB	27.56	1.13	23.35	638.95	1.04	609.35	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.94	35.47	31.50	3.97	0.93	0.29	2.90	
MEAN	29.20	27.53	23.50	4.03	0.92	0.29	3.29	0.91
HUB	35.33	10.53	6.50	4.03	0.92	0.31	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	541.822	269.982	469.767	1215.169	0.446	0.055

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
27.440	23.937	613.861	46.000	29.887	32.400	2.513

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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     489.140     269.982     558.702    1219.646       0.401       0.216

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.408      24.531     618.393     456.573       0.019       0.311

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     464.008       0.000     464.008    1221.615       0.380       0.214

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.740     620.391       0.000       0.060       0.039       0.271

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      27.332       1.121     638.356      23.436     265.160       2.056

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 146141.234       0.418    1371.402 1460601.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.510   EfDer =  0.994

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    166.058    3587.000      27.332     638.356       1.000       1.000       0.980
W Kg/sec =   75.48089

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     99.077    3233.390       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127745.469  130300.102       1.766     509.668     288.589     390.276       1.352

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   431.69    -0.15   431.69     0.35   516.91
 MEAN    15.91     0.00    -0.02   431.69    -0.15   431.69     0.35
 HUB     13.07     0.00    -0.02   431.69    -0.15   431.69     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.04    47.36     5.68   573.46   717.90    25.08   622.81     0.59
 MEAN    49.09    44.80     4.29   498.12   659.26    25.08   622.81     0.54
 HUB     43.47    38.84     4.63   409.12   594.86    25.08   622.81     0.49

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   503.93   246.17   439.71  1240.04     0.41
 MEAN    15.50   511.19   252.18   444.66  1236.97     0.41
 HUB     12.59   546.87   310.48   450.18  1233.91     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   541.13   315.40     0.44  4419.00
 MEAN   485.11   501.98   232.93     0.41  3910.55     1.43
 HUB    394.10   457.88    83.62     0.37  3910.92

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.47     1.11    27.19   660.53     1.03   639.35     0.92     0.91
 MEAN    30.10     1.10    26.76   657.98     1.03   636.18     0.92     0.91
 HUB     30.10     1.10    26.30   657.98     1.03   633.04     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.24    35.65    31.50     4.15     0.93     0.30     2.90
 MEAN    29.56    27.65    23.50     4.15     0.92     0.30     3.34     0.91
 HUB     34.59    10.52     6.50     4.02     0.92     0.29     4.06
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      516.807     256.804     448.488     1237.320       0.418       -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     30.150      26.737      636.552      46.000      29.795       33.000       3.205

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      472.540     256.804     537.812     1240.865       0.381       0.138

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.095       27.227     640.205      440.827       0.036       0.315

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     440.858       0.000     440.858     1243.201       0.355       0.241

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      27.574     642.618       0.000       0.060       0.040       0.238

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      30.081       1.101     658.828      20.473     280.334       2.173

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 127735.586       0.405    1198.682 1499038.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    847599.12   7953.9424    162.2220      1.9912      0.8392      6.5098      1.2602


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 95% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.977   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.580    3587.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    159.801    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.787     831.557     465.375     619.754       1.332

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   385.57    -0.13   385.57     0.35   643.21
 MEAN    17.06     0.00    -0.02   385.57    -0.13   385.57     0.35
 HUB     12.51     0.00    -0.02   385.57    -0.13   385.57     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.17    50.47     8.70   645.77   752.23    13.89   510.39     0.68
 MEAN    54.18    47.20     6.98   534.02   658.78    13.89   510.39     0.59
 HUB     45.45    38.62     6.83   391.59   549.65    13.89   510.39     0.50
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     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   627.23   371.81   505.15  1127.87     0.56
MEAN    18.04   657.76   407.22   516.55  1122.64     0.59
HUB     15.00   750.64   523.34   538.13  1113.73     0.67

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    645.77   574.66   273.96     0.51  7673.11
MEAN   564.57   539.98   157.35     0.48  7346.94     1.36
HUB    469.54   540.81    53.80     0.49  7851.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.97     1.26    15.37   561.39     1.07   528.54     0.92     0.91
MEAN    18.80     1.24    14.89   559.75     1.07   523.62     0.92     0.91
HUB     19.07     1.26    14.06   562.29     1.08   515.25     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     36.35    28.47    24.20     4.27     0.93     0.32     2.90
MEAN    38.25    16.94    12.70     4.24     0.93     0.27     3.51     0.91
HUB     44.20    -5.71    -9.30     3.59     0.93     0.12     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    18.071     667.784     406.432     529.858    1122.833       0.595       -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.904      14.878     523.900      24.000      37.490      35.400      -2.090

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     551.432     406.432     685.029    1135.458       0.486       0.302

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.845      16.034     535.749     528.796       0.024       0.444

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083     506.677       0.000     506.677    1139.642       0.445       0.365

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.400     539.704       0.000       0.060       0.038       0.389

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      18.787       1.244     561.147      38.337     211.747       1.641

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 238678.125       0.572    2206.347 1621285.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.977   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.580    3587.000      18.787     561.147       1.000       1.000       0.980
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    133.126    3448.668       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.523     590.487     387.703     474.134       1.223
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ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	481.78	-0.17	481.78	0.42	618.44
MEAN	18.08	0.00	-0.02	481.78	-0.17	481.78	0.42	
HUB	15.21	0.00	-0.02	481.78	-0.17	481.78	0.42	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.18	46.36	6.82	643.27	803.82	16.62	541.76	0.70
MEAN	49.60	42.30	7.30	565.89	743.33	16.62	541.76	0.65
HUB	44.67	37.84	6.83	476.11	677.46	16.62	541.76	0.59

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	566.68	297.90	482.06	1165.94	0.49
MEAN	18.01	579.65	310.58	489.42	1162.12	0.50
HUB	15.22	629.57	385.49	497.75	1158.34	0.54

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	590.65	341.30	0.51	6086.52	
MEAN	563.76	551.03	253.18	0.47	5596.44	1.46
HUB	476.52	506.00	91.02	0.44	5870.91	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.26	1.18	18.94	591.74	1.05	564.92	0.92	0.91
MEAN	21.97	1.17	18.53	589.27	1.05	561.22	0.92	0.91
HUB	22.13	1.18	18.10	590.65	1.05	557.56	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.71	35.30	31.50	3.80	0.93	0.33	2.90	
MEAN	32.40	27.35	23.50	3.85	0.93	0.32	3.30	0.91
HUB	37.76	10.36	6.50	3.86	0.93	0.33	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	760.216	311.447	693.490	1142.314	0.666	-0.591

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.084	16.403	542.296	46.000	24.185	30.600	6.415

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	699.251	311.447	765.474	1150.113	0.608	-0.387

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	21.991	17.128	549.726	400.556	0.036	0.230

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	689.843	0.000	689.843	1151.260	0.599	0.209

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	17.155	550.817	0.000	0.060	0.069	-0.380

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.850	21.874	1.164	590.554	29.407	243.246	1.886

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
183183.578	0.448	1693.354	1464472.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 6.977 EfDer = 0.919

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
163.580	3587.000	21.874	590.554	1.000	1.000	0.780

W Kg/sec = 74.35432

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
117.298	3361.707	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
125838.836	128355.344	1.271	434.156	341.623	339.175	0.993

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	625.16	-0.22	625.16	0.54	588.76
MEAN	17.74	0.00	-0.02	625.16	-0.22	625.16	0.54	
HUB	15.05	0.00	-0.02	625.16	-0.22	625.16	0.54	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.15	46.36	-1.21	628.24	886.44	17.94	557.93	0.77
MEAN	41.62	43.40	-1.78	555.26	836.29	17.94	557.93	0.72
HUB	37.01	38.84	-1.83	471.10	782.92	17.94	557.93	0.68

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	545.22	259.99	479.24	1193.09	0.46
MEAN	17.51	558.56	279.01	483.89	1190.50	0.47
HUB	14.85	607.51	359.13	490.00	1187.97	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.10	599.46	360.11	0.50	5154.71	
MEAN	548.00	553.63	268.99	0.47	4888.25	1.61
HUB	464.84	501.27	105.71	0.42	5336.29	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.82	1.13	21.50	616.45	1.04	591.63	0.92	0.84
MEAN	24.66	1.13	21.20	615.11	1.04	589.07	0.92	0.84
HUB	24.93	1.14	20.85	617.36	1.05	586.55	0.92	0.84

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.48	36.92	31.50	5.42	0.93	0.37	2.90	
MEAN	29.97	29.07	23.50	5.57	0.89	0.39	3.28	0.84
HUB	36.24	12.17	6.50	5.67	0.89	0.42	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.919

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	564.576	280.837	489.772	1191.111	0.474	0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.766	21.231	589.697	46.000	29.830	31.500	1.670

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	502.395	280.837	575.560	1196.691	0.420	0.199

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.733	21.906	595.235	471.992	0.019	0.304

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	486.989	0.000	486.989	1197.969	0.407	0.215

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.010	596.508	0.000	0.060	0.038	0.228

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    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.803      24.667       1.128     616.304      25.750     262.368       2.034

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 160490.406       0.417    1483.578 1902832.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.977   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.580    3587.000      24.667     616.304       1.000       1.000       0.980
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.262    3290.728       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.659     513.330     309.498     401.059       1.296

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   456.09    -0.16   456.09     0.38   553.07
 MEAN    16.97     0.00    -0.02   456.09    -0.16   456.09     0.38
 HUB     14.32     0.00    -0.02   456.09    -0.16   456.09     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.90    46.36     6.54   602.89   756.10    22.33   598.95     0.63
 MEAN    49.36    43.80     5.56   531.23   700.28    22.33   598.95     0.58
 HUB     44.51    37.84     6.67   448.25   639.60    22.33   598.95     0.53

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   530.71   262.66   461.15  1218.99     0.44
 MEAN    16.57   541.81   276.04   466.22  1216.11     0.45
 HUB     13.89   586.01   347.29   472.02  1213.23     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   566.09   328.33     0.46  4962.13
 MEAN   518.80   525.63   242.76     0.43  4577.75     1.44
 HUB    434.79   480.06    87.50     0.40  4826.08

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.00     1.13    24.57   641.22     1.04   617.72     0.92     0.91
 MEAN    27.73     1.12    24.19   639.29     1.04   614.79     0.92     0.91
 HUB     27.90     1.13    23.78   640.53     1.04   611.88     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.67    35.45    31.50     3.95     0.93     0.31     2.90
 MEAN    30.63    27.51    23.50     4.01     0.92     0.31     3.29     0.91
 HUB     36.34    10.50     6.50     4.00     0.92     0.32     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     533.958     277.594     456.128    1217.832       0.438       0.054

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.838      24.391     616.556      46.000      31.324      32.400       1.076

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     16.481     473.900     277.594     549.217    1222.809       0.388       0.241

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.810      25.071     621.606     456.573       0.017       0.333

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     449.737       0.000     449.737    1224.640       0.367       0.238

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.269     623.468       0.000       0.060       0.037       0.294

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      27.738       1.125     640.345      24.041     256.459       1.988

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 149916.062       0.429    1385.828 1430072.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.977   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.580    3587.000      27.738     640.345       1.000       1.000       0.980
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     96.321    3228.365       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.817     509.668     280.560     390.276       1.391

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   418.71    -0.14   418.71     0.34   516.11
 MEAN    15.91     0.00    -0.02   418.71    -0.14   418.71     0.34
 HUB     13.07     0.00    -0.02   418.71    -0.14   418.71     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.87    47.36     6.51   573.46   710.17    25.59   625.72     0.58
 MEAN    49.96    44.80     5.16   498.12   650.83    25.59   625.72     0.53
 HUB     44.35    38.84     5.51   409.12   585.51    25.59   625.72     0.48

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   496.97   256.52   425.65  1243.43     0.40
 MEAN    15.50   503.00   259.72   430.76  1240.14     0.41
 HUB     12.59   537.19   313.26   436.39  1236.86     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   523.68   305.05     0.42  4604.53
 MEAN   485.11   486.16   225.39     0.39  4027.36     1.47
 HUB    394.10   443.81    80.83     0.36  3945.88

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.06     1.12    27.82   663.45     1.04   642.85     0.92     0.91
 MEAN    30.63     1.10    27.35   660.55     1.03   639.45     0.92     0.91
 HUB     30.57     1.10    26.85   660.14     1.03   636.08     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.07    35.63    31.50     4.13     0.93     0.32     2.90
 MEAN    31.09    27.62    23.50     4.12     0.92     0.31     3.34     0.91
 HUB     35.67    10.49     6.50     3.99     0.92     0.31     4.06


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.997

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     508.617     264.484     434.441    1240.472       0.410      -0.005

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      30.685      27.329     639.805      46.000      31.333      33.000       1.667

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     456.657     264.484     527.719    1244.521       0.367       0.169

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      30.641      27.918     643.988     440.827       0.033       0.337

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     426.374       0.000     426.374    1246.674       0.342       0.268

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      28.242     646.218       0.000       0.060       0.038       0.264

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.875      30.625       1.104     661.380      21.035     270.516       2.097

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  131255.516       0.416    1213.329 1467543.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     863523.69   7982.4360     159.8008      2.0272      0.8474      6.9773      1.2650


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 95% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     158.444     3587.000       15.107      522.810       1.000        1.000        0.980
 W Kg/sec =   72.01982

    W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     154.784     3572.873        1.402       0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  121887.875  124325.375        1.845      831.557     450.763     619.754       1.375

     ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   371.89    -0.13   371.89      0.34    643.21
  MEAN    17.06      0.00    -0.02   371.89    -0.13   371.89      0.34
  HUB     12.51      0.00    -0.02   371.89    -0.13   371.89      0.34

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
  TIP     60.07     50.47     9.60   645.77   745.31     13.97   511.26      0.67
  MEAN    55.15     47.20     7.95   534.02   650.86     13.97   511.26      0.59
  HUB     46.49     38.62     7.87   391.59   540.14     13.97   511.26      0.49

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK         AeroBl     Blades2
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     0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   617.80   382.83   484.90  1130.11     0.55
 MEAN    18.04   645.96   413.47   496.29  1124.60     0.57
 HUB     15.00   733.92   521.23   516.68  1115.74     0.66

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    645.77   551.60   262.94     0.49  7900.33
 MEAN   564.57   518.78   151.10     0.46  7459.54     1.41
 HUB    469.54   519.26    51.69     0.47  7820.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.09     1.26    15.58   562.54     1.08   530.66     0.92     0.91
 MEAN    18.85     1.25    15.07   560.32     1.07   525.47     0.92     0.91
 HUB     19.05     1.26    14.24   562.13     1.08   517.16     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.29    28.47    24.20     4.27     0.93     0.35     2.90
 MEAN    39.80    16.93    12.70     4.23     0.93     0.30     3.51     0.91
 HUB     45.25    -5.71    -9.30     3.59     0.93     0.15     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     655.126     412.667     508.818    1124.883       0.582      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.956      15.061     525.816      24.000      39.043      35.400      -3.643

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     527.994     412.667     670.128    1138.242       0.464       0.331

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.893      16.300     538.379     528.796       0.026       0.468

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     486.234       0.000     486.234    1141.975       0.426       0.387

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.621     541.916       0.000       0.060       0.041       0.411

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      18.831       1.246     561.663      38.853     205.880       1.596

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 241894.422       0.580    2165.872 1563779.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.444    3587.000      18.831     561.663       1.000       1.000       0.980
W Kg/sec =   72.01982

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    128.707    3447.081       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 121887.875  124325.375       1.575     590.487     374.834     474.134       1.265

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     20.55     0.00    -0.02   462.78    -0.16   462.78     0.40   618.16
MEAN    18.08     0.00    -0.02   462.78    -0.16   462.78     0.40
HUB     15.21     0.00    -0.02   462.78    -0.16   462.78     0.40

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.27    46.36     7.91   643.27   792.56    16.82   543.78     0.69
MEAN    50.73    42.30     8.43   565.89   731.15    16.82   543.78     0.64
HUB     45.82    37.84     7.98   476.11   664.07    16.82   543.78     0.58

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   557.71   312.29   462.07  1168.85     0.48
MEAN    18.01   568.92   321.06   469.66  1164.68     0.49
HUB     15.22   616.65   389.33   478.21  1160.56     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    639.20   566.02   326.90     0.48  6380.32
MEAN   563.76   528.66   242.69     0.45  5785.20     1.50
HUB    476.52   486.09    87.19     0.42  5929.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.48     1.19    19.23   593.73     1.06   567.76     0.92     0.91
MEAN    22.12     1.17    18.79   590.74     1.05   563.71     0.92     0.91
HUB     22.21     1.18    18.32   591.46     1.05   559.71     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.05    35.28    31.50     3.78     0.93     0.35     2.90
MEAN    34.36    27.33    23.50     3.83     0.93     0.34     3.30     0.91
HUB     39.15    10.33     6.50     3.83     0.93     0.34     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     732.532     321.964     657.984    1147.434       0.638      -0.542

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.235      16.896     547.169      46.000      26.073      30.600       4.527

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     659.894     321.964     734.248    1156.255       0.571      -0.290

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      22.166      17.768     555.615     400.556       0.030       0.260

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     650.057       0.000     650.057    1157.376       0.562       0.265

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750      17.822     556.691       0.000       0.060       0.053      -0.274

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      22.083       1.173     591.976      30.313     233.035       1.806

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188827.203       0.462    1690.719 1407704.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.946

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.444    3587.000      22.083     591.976       1.000       1.000       0.780
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W Kg/sec = 72.01982

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
112.675	3357.666	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
121887.875	124325.375	1.323	434.156	328.158	339.175	1.034

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	592.15	-0.20	592.15	0.51	588.06
MEAN	17.74	0.00	-0.02	592.15	-0.20	592.15	0.51	
HUB	15.05	0.00	-0.02	592.15	-0.20	592.15	0.51	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.70	46.36	0.34	628.24	863.47	18.50	562.71	0.74
MEAN	43.17	43.40	-0.23	555.26	811.90	18.50	562.71	0.70
HUB	38.52	38.84	-0.32	471.10	756.82	18.50	562.71	0.65

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	533.36	279.87	454.04	1197.57	0.45
MEAN	17.51	545.11	293.63	459.26	1194.47	0.46
HUB	14.85	591.74	365.24	465.57	1191.45	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.10	567.37	340.23	0.47	5548.32	
MEAN	548.00	525.00	254.36	0.44	5144.15	1.65
HUB	464.84	476.11	99.60	0.40	5426.90	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.39	1.15	22.15	619.84	1.05	596.10	0.92	0.87
MEAN	25.14	1.14	21.79	617.81	1.04	593.01	0.92	0.87
HUB	25.31	1.15	21.38	619.23	1.05	590.01	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.65	36.85	31.50	5.35	0.93	0.40	2.90	
MEAN	32.59	28.98	23.50	5.48	0.90	0.41	3.28	0.87
HUB	38.11	12.08	6.50	5.58	0.90	0.43	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.946

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	550.731	295.562	464.702	1195.091	0.461	0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.243	21.819	593.647	46.000	32.457	31.500	-0.957

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	474.758	295.562	559.242	1201.619	0.395	0.247

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	25.214	22.639	600.151	471.992	0.018	0.344

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	460.470	0.000	460.470	1202.735	0.383	0.259

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.727	601.266	0.000	0.060	0.037	0.272

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.832      25.148       1.139     618.965      26.989     246.502       1.911

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 168213.969       0.437    1506.153 1811981.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.444    3587.000      25.148     618.965       1.000       1.000       0.980
W Kg/sec =   72.01982

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    101.171    3283.647       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 121887.875  124325.375       1.742     513.330     294.671     401.059       1.361

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   431.82    -0.15   431.82     0.36   551.88
 MEAN    16.97     0.00    -0.02   431.82    -0.15   431.82     0.36
 HUB     14.32     0.00    -0.02   431.82    -0.15   431.82     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.39    46.36     8.03   602.89   741.70    23.01   603.41     0.62
 MEAN    50.90    43.80     7.10   531.23   684.71    23.01   603.41     0.57
 HUB     46.08    37.84     8.24   448.25   622.52    23.01   603.41     0.52

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   518.36   281.49   435.27  1224.42     0.42
 MEAN    16.57   527.39   289.76   440.67  1221.12     0.43
 HUB     13.89   568.96   352.35   446.72  1217.82     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   534.09   309.50     0.44  5317.40
 MEAN   518.80   496.64   229.05     0.41  4804.90     1.50
 HUB    434.79   454.27    82.44     0.37  4896.25

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.79     1.14    25.44   645.66     1.04   623.24     0.92     0.91
 MEAN    28.42     1.13    25.00   643.09     1.04   619.88     0.92     0.91
 HUB     28.48     1.13    24.52   643.54     1.04   616.54     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.89    35.41    31.50     3.91     0.93     0.34     2.90
 MEAN    33.33    27.46    23.50     3.96     0.93     0.34     3.29     0.91
 HUB     38.26    10.46     6.50     3.96     0.93     0.34     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     520.557     291.385     431.363    1222.687       0.426       0.052

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    28.527      25.182     621.486      46.000      34.039      32.400      -1.639

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     446.568     291.385     533.224    1228.545       0.363       0.287

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      28.502      26.013     627.457     456.573       0.017       0.373

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     424.208       0.000     424.208    1230.135       0.345       0.280

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.182     629.081       0.000       0.060       0.038       0.334

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      28.429       1.130     644.096      25.131     241.365       1.871

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 156726.359       0.449    1403.295 1370076.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.444    3587.000      28.429     644.096       1.000       1.000       0.980
W Kg/sec =   72.01982

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.295    3218.951       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 121887.875  124325.375       1.917     509.668     265.924     390.276       1.468

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   395.41    -0.14   395.41     0.32   514.61
 MEAN    15.91     0.00    -0.02   395.41    -0.14   395.41     0.32
 HUB     13.07     0.00    -0.02   395.41    -0.14   395.41     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.42    47.36     8.06   573.46   696.68    26.47   631.06     0.57
 MEAN    51.56    44.80     6.76   498.12   636.09    26.47   631.06     0.52
 HUB     45.99    38.84     7.15   409.12   569.07    26.47   631.06     0.46

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   485.96   274.69   400.88  1249.48     0.39
 MEAN    15.50   489.36   273.00   406.13  1245.84     0.39
 HUB     12.59   520.44   318.15   411.87  1242.22     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   492.95   286.87     0.39  4930.52
 MEAN   485.11   458.19   212.11     0.37  4233.06     1.53
 HUB    394.10   418.81    75.94     0.34  4007.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.07     1.13    28.89   668.83     1.04   649.14     0.92     0.91
 MEAN    31.54     1.11    28.35   665.33     1.03   645.36     0.92     0.91
 HUB     31.37     1.10    27.80   664.20     1.03   641.61     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.42    35.59    31.50     4.09     0.93     0.36     2.90
 MEAN    33.91    27.58    23.50     4.08     0.93     0.34     3.34     0.91
 HUB     37.68    10.45     6.50     3.95     0.93     0.33     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     495.027     278.009     409.588    1246.147       0.397      -0.006

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      31.593      28.335     645.684      46.000      34.167      33.000      -1.167

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     429.004     278.009     511.208    1251.047       0.343       0.223

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      31.555      29.087     650.772     440.827       0.032       0.379

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     401.073       0.000     401.073    1252.904       0.320       0.314

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      29.373     652.705       0.000       0.060       0.037       0.310

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.882      31.537       1.109     666.120      22.025     253.951       1.969

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  137444.969       0.436    1230.654 1405947.625

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     893107.00   7996.6934    154.7835      2.0875      0.8571      7.9532      1.2741


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 95% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     153.237    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   69.65320

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     149.697    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  117882.562  120239.961       1.907     831.557     435.951     619.754       1.422

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   358.22    -0.12   358.22     0.32   643.21
  MEAN    17.06     0.00    -0.02   358.22    -0.12   358.22     0.32
  HUB     12.51     0.00    -0.02   358.22    -0.12   358.22     0.32

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.99    50.47    10.52   645.77   738.58    14.05   512.09     0.67
  MEAN    56.15    47.20     8.95   534.02   643.14    14.05   512.09     0.58
  HUB     47.56    38.62     8.94   391.59   530.81    14.05   512.09     0.48

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

           R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     20.63   609.34   393.50   465.24  1132.20     0.54
 MEAN    18.04   634.89   419.53   476.53  1126.43     0.56
 HUB     15.00   717.86   519.15   495.79  1117.62     0.64

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    645.77   529.23   252.27     0.47  8120.49
 MEAN   564.57   498.12   145.05     0.44  7568.69     1.45
 HUB    469.54   498.27    49.61     0.45  7788.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.20     1.27    15.76   563.64     1.08   532.63     0.92     0.91
 MEAN    18.90     1.25    15.23   560.87     1.07   527.21     0.92     0.91
 HUB     19.02     1.26    14.41   561.98     1.07   518.94     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.22    28.47    24.20     4.27     0.93     0.38     2.90
 MEAN    41.36    16.93    12.70     4.23     0.93     0.32     3.51     0.91
 HUB     46.32    -5.71    -9.30     3.59     0.93     0.17     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     643.284     418.711     488.360    1126.789       0.571       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.000      15.228     527.600      24.000      40.609      35.400      -5.209

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     505.523     418.711     656.409    1140.818       0.443       0.360

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.930      16.539     540.818     528.796       0.028       0.492

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     466.539       0.000     466.539    1144.151       0.408       0.407

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.817     543.983       0.000       0.060       0.046       0.431

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.873      18.860       1.248     562.163      39.353     200.132       1.551

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 245004.688       0.588    2121.634 1506272.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.993

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     153.237    3587.000      18.860     562.163       1.000       1.000       0.980
W Kg/sec =   69.65320

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     124.338    3445.549       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.631     590.487     362.111     474.134       1.309

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   444.40    -0.15   444.40     0.39   617.88
 MEAN    18.08     0.00    -0.02   444.40    -0.15   444.40     0.39
 HUB     15.21     0.00    -0.02   444.40    -0.15   444.40     0.39
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.37    46.36     9.01   643.27   781.97    17.00   545.67     0.68
MEAN    51.86    42.30     9.56   565.89   719.65    17.00   545.67     0.63
HUB     46.98    37.84     9.14   476.11   651.40    17.00   545.67     0.57

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   550.07   325.90   443.13  1171.51     0.47
MEAN    18.01   559.29   331.00   450.83  1167.05     0.48
HUB     15.22   604.60   392.97   459.47  1162.62     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    639.20   542.70   313.30     0.46  6658.02
MEAN   563.76   507.37   232.76     0.43  5964.04     1.55
HUB    476.52   467.01    83.55     0.40  5984.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.67     1.20    19.49   595.62     1.06   570.36     0.92     0.91
MEAN    22.25     1.18    19.01   592.14     1.05   566.02     0.92     0.91
HUB     22.26     1.18    18.51   592.24     1.05   561.72     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     36.33    35.26    31.50     3.76     0.93     0.38     2.90
MEAN    36.29    27.31    23.50     3.81     0.94     0.36     3.30     0.91
HUB     40.54    10.31     6.50     3.81     0.94     0.36     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.993

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     708.356     331.928     625.773    1151.896       0.615      -0.499

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.356      17.316     551.435      46.000      27.943      30.600       2.657

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     624.993     331.928     707.667    1161.550       0.538      -0.203

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      22.303      18.310     560.716     400.556       0.026       0.288

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     615.280       0.000     615.280    1162.592       0.529       0.312

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750      18.375     561.722       0.000       0.060       0.044      -0.184

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.873      22.242       1.179     593.333      31.170     223.634       1.734

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 194168.406       0.475    1681.414 1351830.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.967

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3587.000      22.242     593.333       1.000       1.000       0.780
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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   108.317    3353.824       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
117882.562  120239.961       1.376     434.156     315.468     339.175       1.075

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   562.64    -0.19   562.64     0.48   587.38
MEAN    17.74     0.00    -0.02   562.64    -0.19   562.64     0.48
HUB     15.05     0.00    -0.02   562.64    -0.19   562.64     0.48

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     48.16    46.36     1.80   628.24   843.50    18.97   566.91     0.72
MEAN    44.63    43.40     1.23   555.26   790.63    18.97   566.91     0.68
HUB     39.95    38.84     1.11   471.10   733.95    18.97   566.91     0.63

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   524.19   297.64   431.50  1201.51     0.44
MEAN    17.51   534.01   306.73   437.13  1197.99     0.45
HUB     14.85   578.10   370.70   443.60  1194.56     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.10   538.68   322.46     0.45  5900.11
MEAN   548.00   499.29   241.27     0.42  5373.23     1.70
HUB    464.84   453.48    94.15     0.38  5507.75

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.87     1.16    22.69   622.97     1.05   600.03     0.92     0.89
MEAN    25.53     1.15    22.27   620.32     1.05   596.52     0.92     0.89
HUB     25.61     1.15    21.82   621.00     1.05   593.10     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.60    36.77    31.50     5.27     0.93     0.42     2.90
MEAN    35.06    28.90    23.50     5.40     0.91     0.43     3.28     0.89
HUB     39.88    11.98     6.50     5.48     0.91     0.45     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.967

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     539.334     308.743     442.220    1198.606       0.450       0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.635      22.306     597.149      46.000      34.921      31.500      -3.421

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     450.343     308.743     546.014    1205.962       0.373       0.290

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.602      23.249     604.500     471.992       0.020       0.382

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     437.141       0.000     437.141    1206.937       0.362       0.296

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      23.315     605.478       0.000       0.060       0.041       0.310

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.851      25.530       1.148     621.429      28.096     233.141       1.807

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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 175119.250       0.455    1516.456 1727179.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3587.000      25.530     621.429       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.575    3277.132       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.825     513.330     281.286     401.059       1.426

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   410.37    -0.14   410.37     0.34   550.79
 MEAN    16.97     0.00    -0.02   410.37    -0.14   410.37     0.34
 HUB     14.32     0.00    -0.02   410.37    -0.14   410.37     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.76    46.36     9.40   602.89   729.42    23.57   607.38     0.60
 MEAN    52.32    43.80     8.52   531.23   671.38    23.57   607.38     0.56
 HUB     47.53    37.84     9.69   448.25   607.83    23.57   607.38     0.50

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   509.03   297.67   412.93  1229.11     0.41
 MEAN    16.57   515.81   301.59   418.46  1225.48     0.42
 HUB     13.89   554.56   356.69   424.62  1221.87     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   506.50   293.32     0.41  5622.73
 MEAN   518.80   471.47   217.21     0.38  5000.95     1.55
 HUB    434.79   431.74    78.10     0.35  4956.48

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.42     1.15    26.14   649.65     1.05   628.03     0.92     0.91
 MEAN    28.97     1.13    25.64   646.53     1.04   624.33     0.92     0.91
 HUB     28.94     1.13    25.12   646.31     1.04   620.65     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.79    35.39    31.50     3.89     0.93     0.38     2.90
 MEAN    35.78    27.43    23.50     3.93     0.93     0.37     3.29     0.91
 HUB     40.03    10.42     6.50     3.92     0.93     0.36     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     509.836     303.288     409.816    1226.926       0.416       0.049

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    29.073      25.813     625.810      46.000      36.504      32.400      -4.104

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     423.096     303.288     520.570    1233.526       0.343       0.327

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      29.042      26.770     632.562     456.573       0.019       0.411

   VANED DIFFUSER EXIT:
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   R4          C4           Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     402.341       0.000     402.341    1234.919       0.326       0.315

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.906     633.992       0.000       0.060       0.042       0.366

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      28.961       1.134     647.498      26.069     228.903       1.774

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 162587.062       0.466    1407.933 1312646.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3587.000      28.961     647.498       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.902    3210.483       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       2.013     509.668     253.131     390.276       1.542

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   375.37    -0.13   375.37     0.30   513.25
 MEAN    15.91      0.00    -0.02   375.37    -0.13   375.37     0.30
 HUB     13.07      0.00    -0.02   375.37    -0.13   375.37     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.80    47.36     9.44   573.46   685.50    27.17   635.75     0.55
 MEAN    53.01    44.80     8.21   498.12   623.82    27.17   635.75     0.50
 HUB     47.47    38.84     8.63   409.12   555.33    27.17   635.75     0.45

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   477.98   289.95   380.00  1254.66     0.38
 MEAN    15.50   478.75   284.20   385.27  1250.76     0.38
 HUB     12.59   506.68   322.26   391.00  1246.87     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   467.10   271.62     0.37  5204.00
 MEAN   485.11   434.51   200.91     0.35  4406.47     1.58
 HUB    394.10   397.54    71.84     0.32  4058.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.86     1.13    29.73   673.60     1.04   654.55     0.92     0.91
 MEAN    32.24     1.11    29.14   669.60     1.03   650.49     0.92     0.91
 HUB     31.97     1.10    28.53   667.86     1.03   646.45     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.34    35.56    31.50     4.06     0.93     0.39     2.90
 MEAN    36.41    27.54    23.50     4.04     0.93     0.37     3.34     0.91
 HUB     39.50    10.41     6.50     3.91     0.93     0.35     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3           Mach3       cp 2-3
    15.219     484.485     289.411     388.545    1251.039       0.387      -0.006
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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.292      29.116     650.779      46.000      36.681      33.000      -3.681

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     405.962     289.411     498.562    1256.631       0.323       0.268

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      32.246      29.995     656.610     440.827       0.034       0.417

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     379.930       0.000     379.930    1258.263       0.302       0.351

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.247     658.316       0.000       0.060       0.041       0.346

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      32.223       1.113     670.354      22.856     240.634       1.865

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 142647.297       0.452    1235.263 1347189.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    919526.75   7962.7012    149.6973      2.1330      0.8596      8.9529      1.2822


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 95% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.974   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    144.557    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  113835.133  116111.594       1.975     831.557     420.983     619.754       1.472

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   344.58    -0.12   344.58     0.31   643.21
  MEAN    17.06     0.00    -0.02   344.58    -0.12   344.58     0.31
  HUB     12.51     0.00    -0.02   344.58    -0.12   344.58     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.92    50.47    11.45   645.77   732.06    14.13   512.89     0.66
  MEAN    57.17    47.20     9.97   534.02   635.64    14.13   512.89     0.57
  HUB     48.66    38.62    10.04   391.59   521.70    14.13   512.89     0.47

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   601.77   403.83   446.14  1134.14     0.53
  MEAN    18.04   624.53   425.40   457.24  1128.14     0.55
  HUB     15.00   702.43   517.10   475.41  1119.39     0.63
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    645.77   507.52   241.94     0.45  8333.52
 MEAN   564.57   477.95   139.17     0.42  7674.57     1.50
 HUB    469.54   477.78    47.56     0.43  7757.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.30     1.28    15.93   564.71     1.08   534.47     0.92     0.91
 MEAN    18.94     1.25    15.38   561.40     1.07   528.83     0.92     0.91
 HUB     18.98     1.26    14.56   561.82     1.07   520.62     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.15    28.47    24.20     4.27     0.93     0.40     2.90
 MEAN    42.93    16.93    12.70     4.23     0.94     0.35     3.51     0.91
 HUB     47.41    -5.71    -9.30     3.59     0.94     0.20     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     632.218     424.575     468.440    1128.562       0.560       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.036      15.379     529.261      24.000      42.188      35.400      -6.788

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     483.893     424.575     643.752    1143.209       0.423       0.388

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.956      16.755     543.088     528.796       0.031       0.516

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     447.501       0.000     447.501    1146.185       0.390       0.426

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.991     545.919       0.000       0.060       0.052       0.450

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      18.877       1.250     562.646      39.836     194.498       1.508

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 248010.453       0.595    2073.924 1448913.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.974   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3587.000      18.877     562.646       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.015    3444.071       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.689     590.487     349.520     474.134       1.357

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   426.58    -0.15   426.58     0.37   617.62
 MEAN    18.08     0.00    -0.02   426.58    -0.15   426.58     0.37
 HUB     15.21     0.00    -0.02   426.58    -0.15   426.58     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.46    46.36    10.10   643.27   771.98    17.16   547.45     0.67
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 MEAN    53.00    42.30    10.70   565.89   708.78    17.16   547.45     0.62
 HUB     48.15    37.84    10.31   476.11   639.37    17.16   547.45     0.56

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   543.58   338.79   425.08  1173.97     0.46
 MEAN    18.01   550.66   340.48   432.78  1169.25     0.47
 HUB     15.22   593.28   396.39   441.42  1164.55     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   520.52   300.41     0.44  6921.09
 MEAN   563.76   486.98   223.28     0.42  6134.65     1.59
 HUB    476.52   448.63    80.12     0.39  6036.55

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.82     1.21    19.70   597.43     1.06   572.76     0.92     0.90
 MEAN    22.35     1.18    19.19   593.48     1.05   568.16     0.92     0.90
 HUB     22.29     1.18    18.66   592.98     1.05   563.59     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.55    35.25    31.50     3.75     0.93     0.40     2.90
 MEAN    38.19    27.29    23.50     3.79     0.94     0.39     3.30     0.90
 HUB     41.92    10.29     6.50     3.79     0.94     0.38     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     686.947     341.434     596.087    1155.847       0.594      -0.460

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.451      17.675     555.226      46.000      29.804      30.600       0.796

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     593.378     341.434     684.598    1166.212       0.509      -0.125

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      22.407      18.774     565.229     400.556       0.023       0.316

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     584.044       0.000     584.044    1167.159       0.500       0.353

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      18.840     566.147       0.000       0.060       0.038      -0.105

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      22.359       1.184     594.629      31.984     214.910       1.666

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 199237.484       0.488    1666.072 1296830.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 9.974   EfDer =  0.982

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    147.976    3587.000      22.359     594.629       1.000       1.000       0.780
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    104.164    3350.167       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 113835.133  116111.594       1.431     434.156     303.372     339.175       1.118

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   535.71    -0.18   535.71     0.46   586.74
MEAN    17.74     0.00    -0.02   535.71    -0.18   535.71     0.46
HUB     15.05     0.00    -0.02   535.71    -0.18   535.71     0.46

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     49.55    46.36     3.19   628.24   825.77    19.37   570.68     0.70
MEAN    46.04    43.40     2.64   555.26   771.68    19.37   570.68     0.66
HUB     41.34    38.84     2.50   471.10   713.51    19.37   570.68     0.61

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   517.08   313.72   411.03  1205.01     0.43
MEAN    17.51   524.75   318.63   416.94  1201.15     0.44
HUB     14.85   566.13   375.67   423.53  1197.37     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.10   512.66   306.39     0.43  6218.44
MEAN   548.00   475.87   229.37     0.40  5581.43     1.74
HUB    464.84   432.81    89.17     0.36  5581.43

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.27     1.17    23.14   625.86     1.05   603.55     0.92     0.90
MEAN    25.84     1.16    22.67   622.66     1.05   599.68     0.92     0.90
HUB     25.84     1.16    22.17   622.66     1.05   595.91     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.35    36.70    31.50     5.20     0.93     0.44     2.90
MEAN    37.39    28.82    23.50     5.32     0.91     0.45     3.28     0.90
HUB     41.57    11.89     6.50     5.39     0.91     0.46     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.982

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     529.840     320.723     421.743    1201.756       0.441       0.012

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.951      22.705     600.297      46.000      37.252      31.500      -5.752

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     428.357     320.723     535.120    1209.853       0.354       0.330

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.910      23.756     608.414     471.992       0.023       0.418

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     416.196       0.000     416.196    1210.705       0.344       0.328

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      23.796     609.271       0.000       0.060       0.048       0.342

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.862      25.826       1.155     623.729      29.100     221.574       1.718

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 181382.406       0.472    1516.764 1646879.000
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 9.974   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3587.000      25.826     623.729       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.362    3271.082       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.908     513.330     269.018     401.059       1.491

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   391.05    -0.13   391.05     0.32   549.77
 MEAN    16.97     0.00    -0.02   391.05    -0.13   391.05     0.32
 HUB     14.32     0.00    -0.02   391.05    -0.13   391.05     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.04    46.36    10.68   602.89   718.71    24.03   610.97     0.59
 MEAN    53.65    43.80     9.85   531.23   659.74    24.03   610.97     0.54
 HUB     48.91    37.84    11.07   448.25   594.95    24.03   610.97     0.49

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   501.86   311.92   393.15  1233.25     0.41
 MEAN    16.57   506.29   312.06   398.69  1229.37     0.41
 HUB     13.89   542.12   360.54   404.85  1225.50     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   482.12   279.07     0.39  5891.68
 MEAN   518.80   449.11   206.75     0.37  5174.27     1.61
 HUB    434.79   411.61    74.26     0.34  5009.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.92     1.16    26.69   653.30     1.05   632.29     0.92     0.91
 MEAN    29.40     1.14    26.16   649.70     1.04   628.32     0.92     0.91
 HUB     29.28     1.13    25.59   648.87     1.04   624.36     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.43    35.37    31.50     3.87     0.93     0.40     2.90
 MEAN    38.05    27.41    23.50     3.91     0.94     0.39     3.29     0.91
 HUB     41.69    10.39     6.50     3.89     0.94     0.38     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     501.059     313.811     390.618    1230.703       0.407       0.047

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    29.498      26.313     629.680      46.000      38.777      32.400      -6.377

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     402.384     313.811     510.285    1237.950       0.325       0.363

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      29.458      27.377     637.117     456.573       0.022       0.446

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    16.096     383.076       0.000     383.076    1239.179       0.309       0.344
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	27.478	638.383	0.000	0.060	0.050	0.393

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.868	29.362	1.137	650.626	26.896	218.262	1.692

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
167758.094	0.480	1402.834	1257172.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 9.974 EfDer = 0.994

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
147.976	3587.000	29.362	650.626	1.000	1.000	0.980

W Kg/sec = 67.26170

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
82.971	3202.756	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
113835.133	116111.594	2.109	509.668	241.683	390.276	1.615

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	357.67	-0.12	357.67	0.29	512.02
MEAN	15.91	0.00	-0.02	357.67	-0.12	357.67	0.29	
HUB	13.07	0.00	-0.02	357.67	-0.12	357.67	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.05	47.36	10.69	573.46	675.96	27.71	639.96	0.54
MEAN	54.33	44.80	9.53	498.12	613.32	27.71	639.96	0.49
HUB	48.85	38.84	10.01	409.12	543.51	27.71	639.96	0.44

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	472.04	303.15	361.83	1259.22	0.37
MEAN	15.50	470.20	293.91	367.02	1255.12	0.37
HUB	12.59	495.01	325.81	372.67	1251.02	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	561.57	444.63	258.41	0.35	5440.80	
MEAN	485.11	413.84	191.21	0.33	4556.80	1.64
HUB	394.10	378.87	68.29	0.30	4103.50	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	33.46	1.14	30.37	677.92	1.04	659.34	0.92	0.91
MEAN	32.77	1.12	29.74	673.48	1.04	655.05	0.92	0.91
HUB	32.42	1.10	29.10	671.21	1.03	650.78	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.96	35.53	31.50	4.03	0.93	0.42	2.90	
MEAN	38.69	27.52	23.50	4.02	0.94	0.40	3.34	0.91
HUB	41.16	10.38	6.50	3.88	0.94	0.38	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.994

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	476.017	299.295	370.155	1255.366	0.379	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
32.821	29.719	655.307	46.000	38.958	33.000	-5.958

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     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     386.051     299.295     488.481    1261.545       0.306       0.306

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      32.760      30.698     661.774     440.827       0.039       0.453

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     361.625       0.000     361.625    1262.996       0.286       0.381

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      30.919     663.297       0.000       0.060       0.049       0.376

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4         PR4       Texit        Del T       Ns        Ns nondim
       0.872      32.731       1.115     674.201      23.576     229.476       1.779

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  147151.641       0.467    1230.518 1290493.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     943540.12   7890.1113    144.5575      2.1666      0.8571      9.9739      1.2896


*********************************************************************
**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 95% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.975   EfDer =  0.986

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     142.874    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   64.94257

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     139.573    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  109910.180  112108.148       2.046     831.557     406.468     619.754       1.525

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   331.51    -0.11   331.51     0.30   643.21
  MEAN    17.06     0.00    -0.02   331.51    -0.11   331.51     0.30
  HUB     12.51     0.00    -0.02   331.51    -0.11   331.51     0.30

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.83    50.47    12.36   645.77   725.99    14.20   513.63     0.65
  MEAN    58.17    47.20    10.97   534.02   628.65    14.20   513.63     0.57
  HUB     49.76    38.62    11.14   391.59   513.16    14.20   513.63     0.46

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   595.28   413.47   428.25  1135.88     0.52
  MEAN    18.04   615.20   430.89   439.09  1129.69     0.54
  HUB     15.00   688.13   515.13   456.25  1120.99     0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   487.20   232.30     0.43  8532.29
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 MEAN   564.57   458.99   133.69     0.41  7773.43     1.55
 HUB    469.54   458.52    45.60     0.41  7728.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.38     1.28    16.07   565.71     1.08   536.12     0.92     0.90
 MEAN    18.97     1.26    15.50   561.90     1.07   530.29     0.92     0.90
 HUB     18.95     1.25    14.69   561.67     1.07   522.13     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.99    28.48    24.20     4.28     0.93     0.43     2.90
 MEAN    44.46    16.93    12.70     4.23     0.94     0.37     3.51     0.90
 HUB     48.47    -5.71    -9.30     3.59     0.94     0.22     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     622.256     430.050     449.733    1130.153       0.551       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.063      15.510     530.754      24.000      43.718      35.400      -8.318

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     463.767     430.050     632.474    1145.357       0.405       0.414

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.972      16.943     545.131     528.796       0.035       0.540

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     429.716       0.000     429.716    1148.024       0.374       0.443

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.139     547.672       0.000       0.060       0.059       0.467

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      18.882       1.250     563.095      40.285     189.175       1.466

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 250808.750       0.601    2025.010 1393961.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.975   EfDer =  0.982

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    142.874    3587.000      18.882     563.095       1.000       1.000       0.980
W Kg/sec =   64.94257

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    115.891    3442.696       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109910.180  112108.148       1.750     590.487     337.510     474.134       1.405

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   409.89    -0.14   409.89     0.36   617.37
 MEAN    18.08     0.00    -0.02   409.89    -0.14   409.89     0.36
 HUB     15.21     0.00    -0.02   409.89    -0.14   409.89     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.50    46.36    11.14   643.27   762.88    17.29   549.07     0.66
 MEAN    54.09    42.30    11.79   565.89   698.86    17.29   549.07     0.61
 HUB     49.28    37.84    11.44   476.11   628.35    17.29   549.07     0.55
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      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   538.28   350.63   408.41  1176.15     0.46
MEAN    18.01   543.14   349.18   416.02  1171.22     0.46
HUB     15.22   583.00   399.52   424.59  1166.29     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    639.20   500.07   288.57     0.43  7162.77
MEAN   563.76   468.10   214.58     0.40  6291.25     1.64
HUB    476.52   431.51    77.00     0.37  6083.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.94     1.22    19.87   599.09     1.06   574.90     0.92     0.90
MEAN    22.42     1.19    19.34   594.71     1.06   570.08     0.92     0.90
HUB     22.29     1.18    18.79   593.67     1.05   565.29     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.65    35.24    31.50     3.74     0.93     0.42     2.90
MEAN    40.01    27.28    23.50     3.78     0.94     0.41     3.30     0.90
HUB     43.26    10.28     6.50     3.78     0.94     0.39     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     668.430     350.159     569.374    1159.265       0.577      -0.426

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.520      17.972     558.518      46.000      31.591      30.600      -0.991

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     565.319     350.159     664.978    1170.237       0.483      -0.055

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      22.478      19.158     569.141     400.556       0.023       0.343

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     556.646       0.000     556.646    1171.072       0.475       0.386

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      19.214     569.953       0.000       0.060       0.037      -0.037

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      22.433       1.188     595.825      32.730     207.049       1.605

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 203888.938       0.499    1646.183 1244706.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.975   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    142.874    3587.000      22.433     595.825       1.000       1.000       0.780
W Kg/sec =   64.94257

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.342    3346.802       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109910.180  112108.148       1.486     434.156     292.242     339.175       1.161

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   511.79    -0.18   511.79     0.44   586.15
MEAN    17.74     0.00    -0.02   511.79    -0.18   511.79     0.44
HUB     15.05     0.00    -0.02   511.79    -0.18   511.79     0.44

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.84    46.36     4.48   628.24   810.45    19.69   573.96     0.69
MEAN    47.34    43.40     3.94   555.26   755.27    19.69   573.96     0.64
HUB     42.64    38.84     3.80   471.10   695.72    19.69   573.96     0.59

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   511.81   327.86   393.01  1208.05     0.42
MEAN    17.51   517.29   329.14   399.07  1203.91     0.43
HUB     14.85   555.89   380.01   405.72  1199.85     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.10   489.76   292.25     0.41  6498.36
MEAN   548.00   455.15   218.86     0.38  5765.15     1.79
HUB    464.84   414.49    84.83     0.35  5645.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.57     1.18    23.48   628.46     1.05   606.60     0.92     0.91
MEAN    26.08     1.16    22.97   624.78     1.05   602.45     0.92     0.91
HUB     26.00     1.16    22.44   624.18     1.05   598.39     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.84    36.63    31.50     5.13     0.93     0.47     2.90
MEAN    39.51    28.74    23.50     5.24     0.92     0.46     3.28     0.91
HUB     43.13    11.81     6.50     5.31     0.92     0.47     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     522.195     331.295     403.647    1204.501       0.434       0.013

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.186      23.010     603.049      46.000      39.378      31.500      -7.878

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     409.094     331.295     526.416    1213.249       0.337       0.365

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.132      24.153     611.840     471.992       0.026       0.451

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.121     397.878       0.000     397.878    1213.997       0.328       0.355

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      24.165     612.595       0.000       0.060       0.057       0.369

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.866      26.033       1.160     625.809      29.983     211.765       1.642

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 186892.516       0.486    1508.955 1573035.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.975   EfDer =  0.986
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
142.874	3587.000	26.033	625.809	1.000	1.000	0.980

W Kg/sec = 64.94257

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
88.615	3265.643	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
109910.180	112108.148	1.989	513.330	258.106	401.059	1.554

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	374.10	-0.13	374.10	0.31	548.86
MEAN	16.97	0.00	-0.02	374.10	-0.13	374.10	0.31	
HUB	14.32	0.00	-0.02	374.10	-0.13	374.10	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.19	46.36	11.83	602.89	709.63	24.38	614.13	0.58
MEAN	54.85	43.80	11.05	531.23	649.83	24.38	614.13	0.53
HUB	50.16	37.84	12.32	448.25	583.95	24.38	614.13	0.48

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	496.47	324.18	376.03	1236.83	0.40
MEAN	16.57	498.62	321.06	381.50	1232.75	0.40
HUB	13.89	531.57	363.78	387.60	1228.67	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	590.99	461.07	266.81	0.37	6122.96	
MEAN	518.80	429.71	197.74	0.35	5323.41	1.66
HUB	434.79	394.05	71.01	0.32	5054.77	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.29	1.16	27.10	656.54	1.05	635.98	0.92	0.90
MEAN	29.71	1.14	26.54	652.53	1.04	631.79	0.92	0.90
HUB	29.51	1.13	25.95	651.18	1.04	627.61	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.77	35.36	31.50	3.86	0.93	0.43	2.90	
MEAN	40.08	27.40	23.50	3.90	0.94	0.41	3.29	0.90
HUB	43.18	10.38	6.50	3.88	0.94	0.40	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.986

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	494.019	322.867	373.914	1233.986	0.400	0.044

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
29.802	26.683	633.055	46.000	40.810	32.400	-8.410

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	384.495	322.867	502.075	1241.785	0.310	0.395

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	29.750	27.835	641.082	456.573	0.026	0.478

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	366.444	0.000	366.444	1242.880	0.295	0.368

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	27.901	642.213	0.000	0.060	0.060	0.415

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.858	29.638	1.138	653.416	27.607	209.338	1.623

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
172197.875	0.493	1390.312	1205302.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =10.975 EfDer = 0.988

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
142.874	3587.000	29.638	653.416	1.000	1.000	0.980

W Kg/sec = 64.94257

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
79.536	3195.911	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
109910.180	112108.148	2.200	509.668	231.678	390.276	1.685

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	342.34	-0.12	342.34	0.28	510.92
MEAN	15.91	0.00	-0.02	342.34	-0.12	342.34	0.28	
HUB	13.07	0.00	-0.02	342.34	-0.12	342.34	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.17	47.36	11.81	573.46	667.97	28.12	643.64	0.54
MEAN	55.51	44.80	10.71	498.12	604.51	28.12	643.64	0.49
HUB	50.09	38.84	11.25	409.12	533.55	28.12	643.64	0.43

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	467.68	314.36	346.28	1263.15	0.37
MEAN	15.50	463.42	302.17	351.36	1258.89	0.37
HUB	12.59	485.25	328.79	356.88	1254.62	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	561.57	425.46	247.21	0.34	5641.74	
MEAN	485.11	396.13	182.94	0.31	4684.78	1.69
HUB	394.10	362.80	65.31	0.29	4141.04	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	33.89	1.14	30.83	681.71	1.04	663.47	0.92	0.90
MEAN	33.14	1.12	30.18	676.91	1.04	659.01	0.92	0.90
HUB	32.72	1.10	29.51	674.18	1.03	654.55	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.23	35.52	31.50	4.02	0.93	0.44	2.90	
MEAN	40.70	27.51	23.50	4.01	0.94	0.42	3.34	0.90
HUB	42.65	10.37	6.50	3.87	0.94	0.39	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.988

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	469.320	307.710	354.366	1259.106	0.373	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
33.190	30.152	659.237	46.000	40.969	33.000	-7.969

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	369.090	307.710	480.534	1265.779	0.292	0.337

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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      33.110      31.211     666.244     440.827       0.046       0.484

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     346.009       0.000     346.009    1267.086       0.273       0.406

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      31.403     667.620       0.000       0.060       0.057       0.400

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      33.075       1.116     677.602      24.187     220.227       1.707

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 150976.500       0.479    1218.972 1237486.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    964764.56   7789.4312    139.5732      2.1894      0.8509     10.9747      1.2961


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 95% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.937    3587.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   62.69868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    134.751    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106112.586  108234.609       2.119     831.557     392.423     619.754       1.579

     ROTOR LEADING EDGE CONDITIONS, STAGE           1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   319.00    -0.11   319.00     0.29   643.21
 MEAN    17.06     0.00    -0.02   319.00    -0.11   319.00     0.29
 HUB     12.51     0.00    -0.02   319.00    -0.11   319.00     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.72    50.47    13.25   645.77   720.36    14.27   514.31     0.65
 MEAN    59.15    47.20    11.95   534.02   622.14    14.27   514.31     0.56
 HUB     50.84    38.62    12.22   391.59   505.17    14.27   514.31     0.45

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   589.72   422.47   411.44  1137.44     0.52
 MEAN    18.04   606.77   436.01   421.98  1131.09     0.54
 HUB     15.00   674.84   513.23   438.19  1122.45     0.60

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    645.77   468.13   223.30     0.41  8717.87
 MEAN   564.57   441.13   128.57     0.39  7865.69     1.60
 HUB    469.54   440.36    43.69     0.39  7699.84
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.46     1.29    16.19   566.65     1.08   537.60     0.92     0.90
MEAN    19.00     1.26    15.61   562.36     1.08   531.61     0.92     0.90
HUB     18.91     1.25    14.80   561.53     1.07   523.49     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     45.76    28.49    24.20     4.29     0.93     0.45     2.90
MEAN    45.94    16.94    12.70     4.24     0.94     0.39     3.51     0.90
HUB     49.51    -5.69    -9.30     3.61     0.94     0.24     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     613.265     435.159     432.123    1131.585       0.542       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.084      15.624     532.100      24.000      45.201      35.400      -9.801

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     444.958     435.159     622.375    1147.294       0.388       0.438

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.980      17.107     546.976     528.796       0.039       0.563

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083     413.032       0.000     413.032    1149.691       0.359       0.458

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.265     549.264       0.000       0.060       0.067       0.482

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.848      18.878       1.250     563.513      40.703     184.143       1.427

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 253409.453       0.608    1975.314 1341379.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.975

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.937    3587.000      18.878     563.513       1.000       1.000       0.980
W Kg/sec =   62.69868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.950    3441.420       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106112.586  108234.609       1.811     590.487     326.035     474.134       1.454

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   394.20    -0.14   394.20     0.34   617.14
 MEAN    18.08     0.00    -0.02   394.20    -0.14   394.20     0.34
 HUB     15.21     0.00    -0.02   394.20    -0.14   394.20     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.51    46.36    12.15   643.27   754.56    17.40   550.54     0.66
 MEAN    55.15    42.30    12.85   565.89   689.77    17.40   550.54     0.60
 HUB     50.38    37.84    12.54   476.11   618.23    17.40   550.54     0.54

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   533.96   361.57   392.90  1178.12     0.45
 MEAN    18.01   536.60   357.26   400.38  1172.99     0.46
 HUB     15.22   573.62   402.38   408.81  1167.88     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   481.09   277.62     0.41  7386.09
 MEAN   563.76   450.49   206.50     0.38  6436.62     1.68
 HUB    476.52   415.47    74.13     0.36  6127.55

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.04     1.22    20.01   600.63     1.07   576.83     0.92     0.89
 MEAN    22.47     1.19    19.46   595.86     1.06   571.82     0.92     0.89
 HUB     22.29     1.18    18.90   594.31     1.05   566.83     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.62    35.24    31.50     3.74     0.93     0.44     2.90
 MEAN    41.74    27.28    23.50     3.78     0.94     0.43     3.30     0.89
 HUB     44.55    10.28     6.50     3.78     0.94     0.41     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.975

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     652.247     358.259     545.048    1162.261       0.561      -0.396

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.568      18.219     561.412      46.000      33.317      30.600      -2.717

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     540.032     358.259     648.062    1173.768       0.460       0.007

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      22.525      19.479     572.583     400.556       0.024       0.368

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     532.074       0.000     532.074    1174.498       0.453       0.414

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      19.521     573.295       0.000       0.060       0.039       0.021

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864      22.476       1.191     596.934      33.421     199.892       1.550

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 208191.156       0.510    1622.840 1195271.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.937    3587.000      22.476     596.934       1.000       1.000       0.780
W Kg/sec =   62.69868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.779    3343.694       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106112.586  108234.609       1.540     434.156     281.867     339.175       1.203

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   490.14    -0.17   490.14     0.42   585.61
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 MEAN    17.74     0.00    -0.02   490.14    -0.17   490.14     0.42
 HUB     15.05     0.00    -0.02   490.14    -0.17   490.14     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.05    46.36     5.69   628.24   796.95    19.95   576.88     0.68
 MEAN    48.57    43.40     5.17   555.26   740.77    19.95   576.88     0.63
 HUB     43.88    38.84     5.04   471.10   679.95    19.95   576.88     0.58

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   507.89   340.49   376.85  1210.72     0.42
 MEAN    17.51   511.15   338.55   382.97  1206.35     0.42
 HUB     14.85   546.97   383.89   389.62  1202.06     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   469.25   279.61     0.39  6748.59
 MEAN   548.00   436.50   209.45     0.36  5929.82     1.83
 HUB    464.84   397.94    80.95     0.33  5703.30

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.81     1.19    23.75   630.83     1.06   609.30     0.92     0.91
 MEAN    26.26     1.17    23.20   626.72     1.05   604.91     0.92     0.91
 HUB     26.10     1.16    22.64   625.58     1.05   600.61     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.10    36.57    31.50     5.07     0.93     0.48     2.90
 MEAN    41.48    28.67    23.50     5.17     0.92     0.48     3.28     0.91
 HUB     44.58    11.74     6.50     5.24     0.92     0.49     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     515.913     340.771     387.352    1206.931       0.427       0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.358      23.243     605.492      46.000      41.339      31.500      -9.839

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     391.860     340.771     519.306    1216.263       0.322       0.397

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.291      24.465     614.891     471.992       0.031       0.482

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     381.502       0.000     381.502    1216.924       0.313       0.378

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.449     615.560       0.000       0.060       0.068       0.392

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      26.175       1.165     627.707      30.774     203.229       1.575

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 191822.375       0.499    1495.246 1504504.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.937    3587.000       26.175     627.707       1.000       1.000       0.980
W Kg/sec =   62.69868
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
85.220	3260.700	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
106112.586	108234.609	2.068	513.330	248.218	401.059	1.616

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	358.90	-0.12	358.90	0.29	548.03
MEAN	16.97	0.00	-0.02	358.90	-0.12	358.90	0.29	
HUB	14.32	0.00	-0.02	358.90	-0.12	358.90	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.24	46.36	12.88	602.89	701.74	24.64	616.96	0.58
MEAN	55.96	43.80	12.16	531.23	641.21	24.64	616.96	0.53
HUB	51.32	37.84	13.48	448.25	574.33	24.64	616.96	0.47

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	492.35	334.98	360.83	1239.99	0.40
MEAN	16.57	492.29	329.02	366.20	1235.74	0.40
HUB	13.89	522.43	366.63	372.18	1231.49	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	590.99	442.42	256.01	0.36	6326.83	
MEAN	518.80	412.46	189.79	0.33	5455.18	1.71
HUB	434.79	378.37	68.16	0.31	5094.26	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.56	1.17	27.41	659.46	1.05	639.24	0.92	0.90
MEAN	29.92	1.14	26.82	655.09	1.04	634.87	0.92	0.90
HUB	29.66	1.13	26.21	653.27	1.04	630.51	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.87	35.36	31.50	3.86	0.93	0.45	2.90	
MEAN	41.94	27.40	23.50	3.90	0.94	0.43	3.29	0.90
HUB	44.57	10.38	6.50	3.88	0.94	0.42	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.979

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	488.234	330.867	359.026	1236.894	0.395	0.042

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
30.016	26.957	636.055	46.000	42.663	32.400	-10.263

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	368.635	330.867	495.343	1245.179	0.296	0.424

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	29.953	28.184	644.604	456.573	0.030	0.508

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	351.693	0.000	351.693	1246.162	0.282	0.389

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	28.216	645.622	0.000	0.060	0.070	0.434

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.846	29.822	1.139	655.941	28.233	201.616	1.563

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 176112.578       0.504    1372.789 1156517.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.937    3587.000      29.822     655.941       1.000       1.000       0.980
W Kg/sec =   62.69868

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     76.460    3189.754       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106112.586  108234.609       2.288     509.668     222.722     390.276       1.752

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   328.72    -0.11   328.72     0.26   509.94
 MEAN    15.91     0.00    -0.02   328.72    -0.11   328.72     0.26
 HUB     13.07     0.00    -0.02   328.72    -0.11   328.72     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.18    47.36    12.82   573.46   661.10    28.42   646.93     0.53
 MEAN    56.58    44.80    11.78   498.12   596.90    28.42   646.93     0.48
 HUB     51.23    38.84    12.39   409.12   524.91    28.42   646.93     0.42

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   464.42   324.16   332.57  1266.61     0.37
 MEAN    15.50   457.85   309.39   337.51  1262.22     0.36
 HUB     12.59   476.85   331.39   342.88  1257.82     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   408.61   237.40     0.32  5817.56
 MEAN   485.11   380.51   175.73     0.30  4796.56     1.74
 HUB    394.10   348.57    62.71     0.28  4173.63

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.20     1.15    31.16   685.12     1.04   667.13     0.92     0.90
 MEAN    33.40     1.12    30.49   680.00     1.04   662.52     0.92     0.90
 HUB     32.92     1.10    29.81   676.87     1.03   657.91     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.27    35.52    31.50     4.02     0.93     0.47     2.90
 MEAN    42.51    27.50    23.50     4.00     0.94     0.44     3.34     0.90
 HUB     44.02    10.36     6.50     3.86     0.94     0.41     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     463.835     315.060     340.412    1262.411       0.367      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     33.443      30.464     662.724      46.000      42.785      33.000      -9.785

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     354.183     315.060     474.034    1269.514       0.279       0.365

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      33.344      31.588     670.202     440.827       0.053       0.513
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     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     332.267       0.000     332.267    1270.702       0.261       0.428

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      31.754     671.457       0.000       0.060       0.067       0.420

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.851      33.301       1.117     680.661      24.720     212.288       1.646

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  154317.562       0.489    1202.898 1187608.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     983853.12   7669.0864    134.7507      2.2043      0.8425     11.9530      1.3019


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 95% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.037   EfDer =  0.973

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     132.525    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   60.23870

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     129.464    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  101949.258  103988.031       2.206     831.557     377.027     619.754       1.644

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   305.44    -0.11   305.44     0.27   643.21
  MEAN    17.06     0.00    -0.02   305.44    -0.11   305.44     0.27
  HUB     12.51     0.00    -0.02   305.44    -0.11   305.44     0.27

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.69    50.47    14.22   645.77   714.46    14.34   515.02     0.64
  MEAN    60.24    47.20    13.04   534.02   615.30    14.34   515.02     0.55
  HUB     52.05    38.62    13.43   391.59   496.71    14.34   515.02     0.45

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   584.35   432.00   393.50  1139.04     0.51
  MEAN    18.04   598.15   441.40   403.66  1132.53     0.53
  HUB     15.00   660.83   511.13   418.85  1123.94     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   447.82   213.77     0.39  8914.36
  MEAN   564.57   422.04   123.17     0.37  7962.92     1.66
  HUB    469.54   420.91    41.59     0.37  7668.24

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.53     1.29    16.31   567.64     1.09   539.12     0.92     0.89
  MEAN    19.02     1.26    15.72   562.85     1.08   532.97     0.92     0.89
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 HUB     18.86     1.25    14.92   561.37     1.07   524.90     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.67    28.51    24.20     4.31     0.93     0.48     2.90
 MEAN    47.56    16.97    12.70     4.27     0.94     0.42     3.51     0.89
 HUB     50.67    -5.67    -9.30     3.63     0.94     0.27     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     604.059     440.544     413.289    1133.047       0.533       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.100      15.735     533.475      24.000      46.828      35.400     -11.428

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     424.962     440.544     612.104    1149.277       0.370       0.464

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.981      17.269     548.868     528.796       0.044       0.589

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     395.226       0.000     395.226    1151.408       0.343       0.474

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.387     550.905       0.000       0.060       0.077       0.498

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.836      18.866       1.249     563.952      41.142     178.741       1.386

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 256145.047       0.614    1918.300 1284351.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.037   EfDer =  0.966

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    132.525    3587.000      18.866     563.952       1.000       1.000       0.980
W Kg/sec =   60.23870

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    107.671    3440.079       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 101949.258  103988.031       1.883     590.487     313.573     474.134       1.512

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   377.42    -0.13   377.42     0.33   616.90
 MEAN    18.08     0.00    -0.02   377.42    -0.13   377.42     0.33
 HUB     15.21     0.00    -0.02   377.42    -0.13   377.42     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.60    46.36    13.24   643.27   745.92    17.51   552.06     0.65
 MEAN    56.31    42.30    14.01   565.89   680.31    17.51   552.06     0.59
 HUB     51.60    37.84    13.76   476.11   607.66    17.51   552.06     0.53

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   530.01   373.06   376.48  1180.12     0.45
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 MEAN    18.01   530.12   365.74   383.74  1174.82     0.45
 HUB     15.22   563.89   405.38   391.96  1169.51     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   461.04   266.13     0.39  7620.60
 MEAN   563.76   431.82   198.02     0.37  6589.31     1.73
 HUB    476.52   398.37    71.14     0.34  6173.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.12     1.23    20.13   602.25     1.07   578.80     0.92     0.88
 MEAN    22.51     1.19    19.57   597.07     1.06   573.60     0.92     0.88
 HUB     22.27     1.18    18.99   594.98     1.06   568.43     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.74    35.26    31.50     3.76     0.93     0.47     2.90
 MEAN    43.62    27.29    23.50     3.79     0.95     0.45     3.30     0.88
 HUB     45.96    10.29     6.50     3.79     0.95     0.43     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.966

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     636.114     366.766     519.734    1165.256       0.546       -0.365

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.602      18.452     564.312      46.000      35.210      30.600      -4.610

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     513.959     366.766     631.404    1177.304       0.437       0.072

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      22.554      19.783     576.042     400.556       0.026       0.396

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     506.762       0.000     506.762    1177.931       0.430       0.442

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750      19.807     576.655       0.000       0.060       0.044       0.080

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.855      22.498       1.193     598.098      34.146     192.468       1.492

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 212706.531       0.521    1592.984 1142074.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =13.037   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    132.525    3587.000      22.498     598.098       1.000       1.000       0.780
W Kg/sec =   60.23870

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.982    3340.438       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 101949.258  103988.031       1.603     434.156     270.810     339.175       1.252

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   467.66    -0.16   467.66     0.40   585.04
 MEAN    17.74     0.00    -0.02   467.66    -0.16   467.66     0.40
 HUB     15.05     0.00    -0.02   467.66    -0.16   467.66     0.40
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.34    46.36     6.98   628.24   783.32    20.19   579.84     0.66
MEAN    49.90    43.40     6.50   555.26   726.08    20.19   579.84     0.61
HUB     45.22    38.84     6.38   471.10   663.92    20.19   579.84     0.56

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   504.65   353.43   360.21  1213.42     0.42
MEAN    17.51   505.41   348.21   366.32  1208.84     0.42
HUB     14.85   538.07   387.87   372.93  1204.32     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.10   448.18   266.67     0.37  7004.74
MEAN   548.00   417.26   199.79     0.35  6098.85     1.89
HUB    464.84   380.79    76.98     0.32  5762.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     27.01     1.20    23.98   633.28     1.06   612.02     0.92     0.91
MEAN    26.40     1.17    23.40   628.73     1.05   607.41     0.92     0.91
HUB     26.17     1.16    22.82   627.04     1.05   602.87     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.46    36.51    31.50     5.01     0.93     0.51     2.90
MEAN    43.55    28.61    23.50     5.11     0.93     0.50     3.28     0.91
HUB     46.12    11.66     6.50     5.16     0.93     0.50     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     510.031     350.497     370.518    1209.391       0.422       0.013

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.495      23.441     607.971      46.000      43.409      31.500     -11.909

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     374.150     350.497     512.676    1219.323       0.307       0.429

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.413      24.742     617.998     471.992       0.036       0.516

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     364.667       0.000     364.667    1219.900       0.299       0.401

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      24.695     618.583       0.000       0.060       0.080       0.414

   STAGE EXIT CONDITIONS, STAGE             3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.861      26.276       1.168     629.682      31.584     194.682       1.509

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 196874.359       0.512    1474.415 1432038.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =13.037   EfDer =  0.971

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    132.525    3587.000      26.276     629.682       1.000       1.000       0.980
W Kg/sec =   60.23870

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.688    3255.585       1.401       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
101949.258	103988.031	2.157	513.330	237.933	401.059	1.686

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	343.26	-0.12	343.26	0.28	547.17
MEAN	16.97	0.00	-0.02	343.26	-0.12	343.26	0.28	
HUB	14.32	0.00	-0.02	343.26	-0.12	343.26	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.35	46.36	13.99	602.89	693.86	24.87	619.85	0.57
MEAN	57.14	43.80	13.34	531.23	632.58	24.87	619.85	0.52
HUB	52.56	37.84	14.72	448.25	564.68	24.87	619.85	0.46

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	488.76	345.91	345.29	1243.17	0.39
MEAN	16.57	486.30	337.09	350.51	1238.77	0.39
HUB	13.89	513.32	369.49	356.33	1234.36	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	590.99	423.43	245.08	0.34	6533.11	
MEAN	518.80	394.81	181.71	0.32	5588.86	1.76
HUB	434.79	362.27	65.30	0.29	5133.96	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.77	1.17	27.66	662.47	1.05	642.54	0.92	0.89
MEAN	30.09	1.15	27.06	657.73	1.04	638.00	0.92	0.89
HUB	29.77	1.13	26.42	655.45	1.04	633.47	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.05	35.37	31.50	3.87	0.93	0.47	2.90	
MEAN	43.88	27.40	23.50	3.90	0.94	0.46	3.29	0.89
HUB	46.04	10.38	6.50	3.88	0.94	0.44	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.971

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	482.777	338.984	343.750	1239.843	0.389	0.039

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
30.178	27.180	639.107	46.000	44.600	32.400	-12.200

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	352.434	338.984	488.999	1248.620	0.282	0.453

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	30.102	28.480	648.188	456.573	0.034	0.539

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	336.607	0.000	336.607	1249.496	0.269	0.410

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	28.476	649.097	0.000	0.060	0.082	0.452

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.833	29.951	1.140	658.549	28.867	193.909	1.503

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
180074.250	0.516	1348.597	1104315.375

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.037   EfDer =  0.974

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    132.525    3587.000      29.951     658.549       1.000       1.000       0.980
W Kg/sec =   60.23870

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     73.290    3183.431       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 101949.258  103988.031       2.387     509.668     213.491     390.276       1.828

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   314.77    -0.11   314.77     0.25   508.93
 MEAN    15.91     0.00    -0.02   314.77    -0.11   314.77     0.25
 HUB     13.07     0.00    -0.02   314.77    -0.11   314.77     0.25

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.24    47.36    13.88   573.46   654.27    28.66   650.29     0.52
 MEAN    57.72    44.80    12.92   498.12   589.33    28.66   650.29     0.47
 HUB     52.43    38.84    13.59   409.12   516.29    28.66   650.29     0.41

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   461.64   334.06   318.61  1270.10     0.36
 MEAN    15.50   452.63   316.71   323.37  1265.59     0.36
 HUB     12.59   468.50   333.96   328.57  1261.07     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   391.50   227.51     0.31  5995.01
 MEAN   485.11   364.60   168.41     0.29  4909.94     1.80
 HUB    394.10   334.02    60.13     0.26  4206.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.43     1.15    31.42   688.61     1.05   670.85     0.92     0.89
 MEAN    33.59     1.12    30.74   683.17     1.04   666.09     0.92     0.89
 HUB     33.05     1.10    30.04   679.64     1.03   661.34     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.36    35.53    31.50     4.03     0.93     0.49     2.90
 MEAN    44.40    27.51    23.50     4.01     0.94     0.46     3.34     0.89
 HUB     45.47    10.37     6.50     3.87     0.94     0.43     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.974

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     458.701     322.515     326.176    1265.759       0.362      -0.011

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    33.628      30.709     666.267      46.000      44.677      33.000     -11.677

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     339.035     322.515     467.932    1273.296       0.266       0.393

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      33.507      31.895     674.226     440.827       0.061       0.544

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     14.701     318.284       0.000     318.284    1274.369       0.250       0.449

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      32.034     675.363       0.000       0.060       0.079       0.440

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.839      33.455       1.117     683.808      25.259     204.394       1.584

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 157690.172       0.500    1180.960 1134202.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
   1003490.38   7515.2559    129.4638      2.2145      0.8314     13.0371      1.3079



**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 95% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.998

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    171.704    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   78.04749

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    167.738    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132089.219  134730.734       1.702     831.557     488.490     619.754       1.269

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   407.62    -0.14   407.62     0.37   643.21
 MEAN    17.06     0.00    -0.02   407.62    -0.14   407.62     0.37
 HUB     12.51     0.00    -0.02   407.62    -0.14   407.62     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.75    50.47     7.28   645.77   763.77    13.75   508.93     0.69
 MEAN    52.65    47.20     5.45   534.02   671.92    13.75   508.93     0.61
 HUB     43.86    38.62     5.24   391.59   565.34    13.75   508.93     0.51

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   644.70   353.22   539.33  1123.88     0.57
 MEAN    18.04   678.55   396.77   550.45  1119.20     0.61
 HUB     15.00   779.25   526.87   574.13  1110.19     0.70

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    645.77   613.57   292.55     0.55  7289.83
 MEAN   564.57   575.46   167.80     0.51  7158.59     1.30
 HUB    469.54   576.99    57.33     0.52  7904.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.76     1.24    15.00   559.47     1.07   524.76     0.92     0.91
 MEAN    18.69     1.24    14.57   558.81     1.07   520.36     0.92     0.91
 HUB     19.09     1.26    13.74   562.56     1.08   511.87     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.22    28.48    24.20     4.28     0.93     0.28     2.90
 MEAN    35.78    16.95    12.70     4.25     0.92     0.23     3.51     0.91
 HUB     42.54    -5.70    -9.30     3.60     0.92     0.09     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     690.191     396.002     565.284    1119.172       0.617      -0.007

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.803      14.543     520.490      24.000      35.013      35.400       0.387

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     591.831     396.002     712.096    1130.438       0.524       0.251

   BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.950      18.740      15.543     531.022     528.796       0.024       0.406

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     542.063       0.000     542.063    1135.444       0.477       0.324

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.973     535.735       0.000       0.060       0.039       0.348

    STAGE EXIT CONDITIONS, STAGE             1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.874      18.673       1.236     560.277      37.467     221.493       1.717

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 233266.969       0.559    2263.430 1713990.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.998

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    171.704    3587.000      18.673     560.277       1.000       1.000       0.980
W Kg/sec =   78.04749

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    140.482    3451.342       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132089.219  134730.734       1.443     590.487     409.124     474.134       1.159

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   514.50    -0.18   514.50     0.45   618.92
 MEAN    18.08     0.00    -0.02   514.50    -0.18   514.50     0.45
 HUB     15.21     0.00    -0.02   514.50    -0.18   514.50     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.35    46.36     4.99   643.27   823.85    16.23   538.17     0.72
 MEAN    47.73    42.30     5.43   565.89   764.95    16.23   538.17     0.67
 HUB     42.79    37.84     4.95   476.11   701.11    16.23   538.17     0.62

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   584.86   272.22   517.64  1160.53     0.50
 MEAN    18.01   600.08   292.03   524.23  1157.42     0.52
 HUB     15.22   652.95   378.72   531.90  1154.33     0.57
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   634.53   366.98     0.55  5562.40
 MEAN   563.76   590.46   271.72     0.51  5262.71     1.40
 HUB    476.52   540.81    97.79     0.47  5768.01

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.81     1.17    18.34   588.23     1.05   559.67     0.92     0.91
 MEAN    21.64     1.16    18.01   586.73     1.05   556.66     0.92     0.91
 HUB     21.94     1.17    17.65   589.27     1.05   553.67     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.74    35.33    31.50     3.83     0.93     0.29     2.90
 MEAN    29.12    27.40    23.50     3.90     0.92     0.29     3.30     0.91
 HUB     35.45    10.42     6.50     3.92     0.92     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960    1025.949     292.853     983.265    1097.553       0.935      -1.484

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.758      12.376     500.250      46.000      16.585      30.600      14.015

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960    1079.255     292.853    1118.282    1088.697       0.991      -1.729

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      21.439      11.434     491.105     361.848       0.094      -0.046

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823    1171.534       0.000    1171.534    1076.346       1.088      -0.682

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680       9.787     475.008       0.000       0.060       0.312      -2.163

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.579      20.612       1.104     588.075      27.798     262.207       2.033

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 173157.406       0.424    1680.177 1558638.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.769

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.704    3587.000      20.612     588.075       1.000       1.000       0.710
W Kg/sec =   78.04749

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    130.385    3368.783       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132089.219  134730.734       1.041     395.194     379.746     307.469       0.810

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   889.92    -0.31   889.92     0.79   590.00
 MEAN    17.74     0.00    -0.02   889.92    -0.31   889.92     0.79
 HUB     15.05     0.00    -0.02   889.92    -0.31   889.92     0.79

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     35.23    46.36   -11.13   628.24  1089.51    13.60   521.98     0.97
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 MEAN    31.98    43.40   -11.42   555.26  1049.10    13.60   521.98     0.94
 HUB     27.91    38.84   -10.93   471.10  1007.07    13.60   521.98     0.90

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   591.24   173.40   565.25  1177.45     0.50
 MEAN    17.51   605.20   213.20   566.40  1177.56     0.51
 HUB     14.85   657.19   324.43   571.53  1177.56     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   720.45   446.71     0.61  3441.15
 MEAN   548.00   657.95   334.80     0.56  3737.81     1.66
 HUB    464.84   588.52   140.42     0.50  4822.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.14     1.07    18.63   605.36     1.03   576.19     0.92     0.70
 MEAN    22.27     1.08    18.60   606.85     1.03   576.29     0.92     0.70
 HUB     22.77     1.10    18.43   612.30     1.04   576.26     0.92     0.70

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.05    38.32    31.50     6.82     0.93     0.37     2.90
 MEAN    20.63    30.59    23.50     7.09     0.84     0.40     3.28     0.70
 HUB     29.58    13.80     6.50     7.30     0.84     0.46     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.769

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     613.339     214.598     574.572    1177.956       0.521      -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.356      18.581     576.776      46.000      20.480      31.500      11.020

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     603.014     214.598     640.061    1179.026       0.511       0.012

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.235      18.597     577.824     471.992       0.042       0.163

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     585.210       0.000     585.210    1180.826       0.496       0.026

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.681     579.590       0.000       0.060       0.077       0.033

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.589      22.098       1.072     608.173      20.097     359.710       2.788

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 125239.828       0.326    1215.224 2571332.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.957

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    171.704    3587.000      22.098     608.173       1.000       1.000       0.980
W Kg/sec =   78.04749

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    123.678    3312.654       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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132089.219  134730.734       1.425     513.330     360.232     401.059       1.113

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   544.68    -0.19   544.68     0.46   556.76
MEAN    16.97     0.00    -0.02   544.68    -0.19   544.68     0.46
HUB     14.32     0.00    -0.02   544.68    -0.19   544.68     0.46

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     47.91    46.36     1.55   602.89   812.63    19.11   583.42     0.69
MEAN    44.29    43.80     0.49   531.23   760.97    19.11   583.42     0.64
HUB     39.46    37.84     1.62   448.25   705.53    19.11   583.42     0.60

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   593.33   188.98   562.43  1198.15     0.50
MEAN    16.57   606.84   223.21   564.30  1197.46     0.51
HUB     13.89   655.71   327.79   567.90  1196.62     0.55

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    590.99   691.34   402.01     0.58  3571.48
MEAN   518.80   637.03   295.59     0.53  3702.68     1.28
HUB    434.79   577.90   107.00     0.48  4555.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.16     1.09    20.43   626.11     1.03   596.74     0.92     0.88
MEAN    24.23     1.10    20.33   626.77     1.03   596.05     0.92     0.88
HUB     24.75     1.12    20.17   631.05     1.04   595.19     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     18.57    35.56    31.50     4.06     0.93     0.19     2.90
MEAN    21.58    27.65    23.50     4.15     0.90     0.21     3.29     0.88
HUB     29.99    10.67     6.50     4.17     0.90     0.24     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.957

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     594.992     224.468     551.026    1199.777       0.496       0.058

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.339      20.571     598.441      46.000      22.164      32.400      10.236

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     583.610     224.468     625.289    1200.898       0.486       0.074

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.229      20.612     599.560     456.573       0.037       0.198

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     552.903       0.000     552.903    1203.811       0.459       0.068

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      20.848     602.472       0.000       0.060       0.070       0.132

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.771      24.095       1.090     627.975      19.803     324.212       2.513

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 123449.906       0.353    1197.856 1565948.625
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.941

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.704    3587.000      24.095     627.975       1.000       1.000       0.980
W Kg/sec =   78.04749

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    115.260    3260.005       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132089.219  134730.734       1.518     509.668     335.729     390.276       1.162

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   511.60    -0.18   511.60     0.42   521.17
 MEAN    15.91     0.00    -0.02   511.60    -0.18   511.60     0.42
 HUB     13.07     0.00    -0.02   511.60    -0.18   511.60     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.27    47.36     0.91   573.46   768.63    21.29   606.15     0.64
 MEAN    44.24    44.80    -0.56   498.12   714.17    21.29   606.15     0.59
 HUB     38.66    38.84    -0.18   409.12   655.18    21.29   606.15     0.54

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   560.36   179.10   530.97  1219.11     0.46
 MEAN    15.50   571.26   203.86   533.65  1217.83     0.47
 HUB     12.59   612.18   292.66   537.70  1216.46     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   654.38   382.47     0.54  3216.21
 MEAN   485.11   603.23   281.25     0.50  3162.15     1.28
 HUB    394.10   547.18   101.44     0.45  3686.87

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.01     1.08    22.50   644.12     1.03   617.94     0.92     0.86
 MEAN    25.98     1.08    22.34   643.85     1.03   616.64     0.92     0.86
 HUB     26.30     1.09    22.12   646.48     1.03   615.23     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.64    35.77    31.50     4.27     0.93     0.19     2.90
 MEAN    20.91    27.79    23.50     4.29     0.90     0.20     3.34     0.86
 HUB     28.56    10.68     6.50     4.18     0.90     0.22     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.941

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     577.378     207.599     538.765    1218.161       0.474      -0.009

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.020      22.308     617.016      46.000      21.073      33.000      11.927

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     580.683     207.599     616.676    1217.846       0.477      -0.067

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.788      22.069     616.696     440.827       0.082       0.190

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     537.741       0.000     537.741    1221.795       0.440       0.071
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   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.578     620.702       0.000       0.060       0.080       0.068

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.734      25.793       1.070     644.817      16.841     353.416       2.740

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 105035.977       0.333    1019.182 1611766.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    760150.12   7375.8696    167.7381      1.7073      0.7103      5.4531      1.2334


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 95% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 6.038   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    3587.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    164.680    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       1.734     831.557     479.584     619.754       1.292

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   399.06    -0.14   399.06     0.36   643.21
 MEAN    17.06     0.00    -0.02   399.06    -0.14   399.06     0.36
 HUB     12.51     0.00    -0.02   399.06    -0.14   399.06     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.29    50.47     7.82   645.77   759.24    13.81   509.51     0.69
 MEAN    53.24    47.20     6.04   534.02   666.77    13.81   509.51     0.60
 HUB     44.47    38.62     5.85   391.59   559.20    13.81   509.51     0.51

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   637.57   360.56   525.82  1125.49     0.57
 MEAN    18.04   670.21   400.90   537.09  1120.58     0.60
 HUB     15.00   767.88   525.47   559.93  1111.61     0.69

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    645.77   598.19   285.21     0.53  7441.09
 MEAN   564.57   561.48   163.68     0.50  7232.93     1.32
 HUB    469.54   562.71    55.93     0.51  7883.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.84     1.25    15.15   560.23     1.07   526.28     0.92     0.91
 MEAN    18.73     1.24    14.70   559.18     1.07   521.67     0.92     0.91
 HUB     19.09     1.26    13.87   562.45     1.08   513.23     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.44    28.48    24.20     4.28     0.93     0.29     2.90
 MEAN    36.74    16.95    12.70     4.25     0.93     0.25     3.51     0.91
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HUB     43.18    -5.70    -9.30     3.60     0.93     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     681.186     400.118     551.289    1120.648       0.608      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.845      14.679     521.864      24.000      35.972      35.400      -0.572

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     575.712     400.118     701.099    1132.475       0.508       0.271

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.785      15.744     532.937     528.796       0.024       0.421

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083     527.874       0.000     527.874    1137.150       0.464       0.341

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.151     537.346       0.000       0.060       0.038       0.366

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      18.726       1.240     560.620      37.810     217.663       1.687

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 235402.172       0.564    2242.503 1678007.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.038   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    3587.000      18.726     560.620       1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    137.578    3450.286       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       1.474     590.487     400.669     474.134       1.183

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   501.41    -0.17   501.41     0.44   618.73
 MEAN    18.08     0.00    -0.02   501.41    -0.17   501.41     0.44
 HUB     15.21     0.00    -0.02   501.41    -0.17   501.41     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.07    46.36     5.71   643.27   815.74    16.39   539.63     0.72
 MEAN    48.47    42.30     6.17   565.89   756.20    16.39   539.63     0.66
 HUB     43.53    37.84     5.69   476.11   691.56    16.39   539.63     0.61

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   577.16   282.64   503.21  1162.76     0.50
 MEAN    18.01   591.60   299.53   510.17  1159.34     0.51
 HUB     15.22   643.42   381.47   518.15  1155.96     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   616.73   356.56     0.53  5775.08
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 MEAN   563.76   574.53   264.22     0.50  5397.71     1.42
 HUB    476.52   526.79    95.05     0.46  5809.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.01     1.18    18.59   589.64     1.05   561.83     0.92     0.91
 MEAN    21.78     1.16    18.23   587.75     1.05   558.53     0.92     0.91
 HUB     22.03     1.18    17.84   589.82     1.05   555.25     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.32    35.32    31.50     3.82     0.93     0.30     2.90
 MEAN    30.42    27.38    23.50     3.88     0.93     0.30     3.30     0.91
 HUB     36.36    10.39     6.50     3.89     0.93     0.31     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     958.822     300.374     910.557    1110.381       0.864      -1.285

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.900      13.456     512.317      46.000      18.257      30.600      12.343

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     949.228     300.374     995.620    1112.130       0.854      -1.286

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      21.652      13.444     513.856     361.848       0.077       0.099

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     964.094       0.000     964.094    1110.521       0.868      -0.137

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      12.946     511.599       0.000       0.060       0.206      -1.420

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.706      21.173       1.131     589.071      28.450     254.386       1.972

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 177221.141       0.434    1688.256 1521611.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.038   EfDer =  0.778

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    168.574    3587.000      21.173     589.071       1.000       1.000       0.710
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    124.727    3365.936       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       1.088     395.194     363.262     307.469       0.846

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   804.47    -0.28   804.47     0.71   589.51
 MEAN    17.74     0.00    -0.02   804.47    -0.28   804.47     0.71
 HUB     15.05     0.00    -0.02   804.47    -0.28   804.47     0.71

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     38.00    46.36    -8.36   628.24  1020.89    15.14   535.05     0.90
 MEAN    34.63    43.40    -8.77   555.26   977.65    15.14   535.05     0.86
 HUB     30.37    38.84    -8.47   471.10   932.40    15.14   535.05     0.82
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      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   569.41   204.56   531.39  1183.75     0.48
MEAN    17.51   583.98   236.49   533.95  1182.78     0.49
HUB     14.85   635.84   335.83   539.91  1181.75     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.10   674.57   415.54     0.57  4057.98
MEAN   548.00   618.18   311.51     0.52  4145.09     1.66
HUB    464.84   555.11   129.01     0.47  4991.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.05     1.09    19.67   609.46     1.03   582.40     0.92     0.71
MEAN    23.09     1.09    19.54   609.89     1.04   581.43     0.92     0.71
HUB     23.50     1.11    19.29   614.14     1.04   580.40     0.92     0.71

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     21.05    38.02    31.50     6.52     0.93     0.37     2.90
MEAN    23.89    30.26    23.50     6.76     0.86     0.40     3.28     0.71
HUB     31.88    13.44     6.50     6.94     0.86     0.45     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.778

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     591.333     238.045     541.304    1183.272       0.500      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.176      19.538     581.978      46.000      23.738      31.500       7.762

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     562.769     238.045     611.044    1186.066       0.474       0.080

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.101      19.798     584.730     471.992       0.030       0.213

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     545.541       0.000     545.541    1187.681       0.459       0.098

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.902     586.323       0.000       0.060       0.056       0.108

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.641      23.004       1.086     611.164      22.094     318.540       2.469

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 137689.625       0.358    1311.668 2380562.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.038   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    3587.000      23.004     611.164       1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    116.932    3304.536       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       1.507     513.330     340.580     401.059       1.178

     ROTOR LEADING EDGE CONDITIONS, STAGE            4
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   509.19    -0.18   509.19     0.43   555.39
MEAN    16.97     0.00    -0.02   509.19    -0.18   509.19     0.43
HUB     14.32     0.00    -0.02   509.19    -0.18   509.19     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     49.82    46.36     3.46   602.89   789.27    20.28   589.53     0.66
MEAN    46.22    43.80     2.42   531.23   735.97    20.28   589.53     0.62
HUB     41.37    37.84     3.53   448.25   678.50    20.28   589.53     0.57

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   564.82   219.47   520.44  1206.76     0.47
MEAN    16.57   578.42   244.91   524.01  1205.04     0.48
HUB     13.89   626.33   335.76   528.73  1203.28     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    590.99   639.44   371.52     0.53  4146.96
MEAN   518.80   591.27   273.90     0.49  4062.05     1.34
HUB    434.79   537.92    99.03     0.45  4666.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.55     1.11    21.99   631.99     1.03   605.37     0.92     0.90
MEAN    25.50     1.11    21.78   631.56     1.03   603.65     0.92     0.90
HUB     25.89     1.13    21.52   634.59     1.04   601.87     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     22.87    35.52    31.50     4.02     0.93     0.24     2.90
MEAN    25.05    27.60    23.50     4.10     0.91     0.25     3.29     0.90
HUB     32.42    10.61     6.50     4.11     0.91     0.27     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.980

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     568.215     246.285     512.066    1207.120       0.471       0.057

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.607      21.999     605.777      46.000      25.686      32.400       6.714

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     537.435     246.285     591.179    1209.945       0.444       0.140

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.545      22.306     608.617     456.573       0.026       0.249

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     509.389       0.000     509.389    1212.378       0.420       0.138

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      22.533     611.066       0.000       0.060       0.052       0.199

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.832      25.446       1.106     632.715      21.550     294.181       2.280

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 134359.297       0.385    1279.942 1510864.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.038   EfDer =  0.973
```

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
168.574	3587.000	25.446	632.715	1.000	1.000	0.980

W Kg/sec = 76.62451

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
107.557	3247.772	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
129680.953	132274.297	1.627	509.668	313.292	390.276	1.246

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	472.71	-0.16	472.71	0.39	519.21
MEAN	15.91	0.00	-0.02	472.71	-0.16	472.71	0.39	
HUB	13.07	0.00	-0.02	472.71	-0.16	472.71	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.51	47.36	3.15	573.46	743.30	22.92	614.08	0.61
MEAN	46.51	44.80	1.71	498.12	686.83	22.92	614.08	0.57
HUB	40.89	38.84	2.05	409.12	625.27	22.92	614.08	0.51

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	529.97	212.48	485.51	1229.41	0.43
MEAN	15.50	539.98	227.78	489.58	1227.15	0.44
HUB	12.59	579.15	301.45	494.51	1224.88	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	561.57	597.98	349.09	0.49	3814.80	
MEAN	485.11	553.09	257.34	0.45	3532.58	1.35
HUB	394.10	503.11	92.65	0.41	3797.32	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.92	1.10	24.57	651.86	1.03	628.44	0.92	0.89
MEAN	27.73	1.09	24.28	650.44	1.03	626.13	0.92	0.89
HUB	27.91	1.10	23.95	651.77	1.03	623.80	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	23.64	35.72	31.50	4.22	0.93	0.24	2.90	
MEAN	24.95	27.73	23.50	4.23	0.91	0.24	3.34	0.89
HUB	31.37	10.61	6.50	4.11	0.91	0.25	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.973

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	545.717	231.953	493.968	1227.517	0.445	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
27.783	24.255	626.522	46.000	25.153	33.000	7.847

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	525.524	231.953	574.437	1229.283	0.428	0.035

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	27.660	24.392	628.326	440.827	0.054	0.248

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	488.795	0.000	488.795	1232.318	0.397	0.154

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	24.807	631.433	0.000	0.060	0.057	0.151

```
    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.817      27.651       1.087     651.359      18.644     314.726       2.440

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  116300.344       0.369    1107.908 1552119.250

    OVERALL EXIT CONDITIONS; ALL          5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     800972.62   7630.2773    164.6798      1.8303      0.7697      6.0376      1.2459


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 95% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 6.510   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     166.058    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   75.48089

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     162.222    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  127745.469  130300.102       1.760     831.557     472.426     619.754       1.312

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   392.24    -0.14   392.24     0.35   643.21
  MEAN    17.06     0.00    -0.02   392.24    -0.14   392.24     0.35
  HUB     12.51     0.00    -0.02   392.24    -0.14   392.24     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.73    50.47     8.26   645.77   755.67    13.85   509.96     0.68
  MEAN    53.71    47.20     6.51   534.02   662.70    13.85   509.96     0.60
  HUB     44.96    38.62     6.34   391.59   554.35    13.85   509.96     0.50

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   632.20   366.29   515.28  1126.71     0.56
  MEAN    18.04   663.81   404.11   526.63  1121.64     0.59
  HUB     15.00   759.07   524.39   548.82  1112.70     0.68

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   586.20   279.48     0.52  7559.32
  MEAN   564.57   550.53   160.46     0.49  7290.86     1.34
  HUB    469.54   551.55    54.85     0.50  7867.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.91     1.25    15.27   560.82     1.07   527.44     0.92     0.91
  MEAN    18.77     1.24    14.80   559.47     1.07   522.68     0.92     0.91
  HUB     19.08     1.26    13.97   562.37     1.08   514.27     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     35.41    28.47    24.20     4.27     0.93     0.31     2.90
  MEAN    37.50    16.95    12.70     4.25     0.93     0.26     3.51     0.91
  HUB     43.70    -5.71    -9.30     3.59     0.93     0.11     4.78
```

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	674.287	403.326	540.362	1121.774	0.601	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.876	14.782	522.913	24.000	36.738	35.400	-1.338

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	563.279	403.326	692.788	1134.015	0.497	0.287

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.817	15.894	534.388	528.796	0.024	0.433

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	516.966	0.000	516.966	1138.440	0.454	0.354

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.283	538.566	0.000	0.060	0.037	0.378

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.880	18.761	1.242	560.888	38.078	214.655	1.664

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
237070.734	0.568	2224.692	1649330.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 6.510 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
166.058	3587.000	18.761	560.888	1.000	1.000	0.980

W Kg/sec = 75.48089

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
135.304	3449.461	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
127745.469	130300.102	1.499	590.487	394.046	474.134	1.203

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	491.32	-0.17	491.32	0.43	618.58
MEAN	18.08	0.00	-0.02	491.32	-0.17	491.32	0.43	
HUB	15.21	0.00	-0.02	491.32	-0.17	491.32	0.43	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.64	46.36	6.28	643.27	809.57	16.51	540.73	0.71
MEAN	49.04	42.30	6.74	565.89	749.55	16.51	540.73	0.66
HUB	44.11	37.84	6.27	476.11	684.28	16.51	540.73	0.60

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	571.61	290.53	492.27	1164.41	0.49
MEAN	18.01	585.35	305.25	499.46	1160.78	0.50
HUB	15.22	636.24	383.56	507.63	1157.19	0.55

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	603.24	348.66	0.52	5936.15	
MEAN	563.76	562.39	258.51	0.48	5500.60	1.44
HUB	476.52	516.07	92.96	0.45	5841.48	

```
        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.14     1.18    18.78   590.72     1.05   563.44     0.92     0.91
MEAN    21.88     1.17    18.39   588.53     1.05   559.92     0.92     0.91
HUB     22.09     1.18    17.98   590.25     1.05   556.45     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.55    35.31    31.50     3.81     0.93     0.32     2.90
MEAN    31.43    27.36    23.50     3.86     0.93     0.31     3.30     0.91
HUB     37.07    10.38     6.50     3.88     0.93     0.32     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      921.019     306.107     868.663    1117.547       0.824       -1.179

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.000      14.080      519.005      46.000      19.412      30.600      11.188

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960      891.924     306.107     942.990    1122.292       0.795       -1.099

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      21.792      14.365      523.411     361.848       0.067       0.141

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.823     893.845       0.000     893.845    1122.351       0.796       0.007

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      14.107      523.163       0.000       0.060       0.164       -1.170

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4        Pt4          PR4        Texit        Del T        Ns         Ns nondim
      0.755       21.437       1.143      589.834      28.945     248.575       1.927

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 180306.953       0.441    1692.016 1492540.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.510   EfDer =  0.800

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    166.058     3587.000       21.437      589.834       1.000        1.000        0.710
W Kg/sec =   75.48089

   W cor       RPM cor         GAMMA        Cp          R           Blades       THK
    121.430     3363.757        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 127745.469  130300.102        1.117      395.194      353.660      307.469       0.869

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1       Stator    Alfa     C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   764.91    -0.26   764.91      0.67   589.12
 MEAN    17.74      0.00    -0.02   764.91    -0.26   764.91      0.67
 HUB     15.05      0.00    -0.02   764.91    -0.26   764.91      0.67

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     39.41     46.36    -6.95   628.24   990.00     15.85   541.00      0.87
 MEAN    35.99     43.40    -7.41   555.26   945.35     15.85   541.00      0.83
 HUB     31.64     38.84    -7.20   471.10   898.48     15.85   541.00      0.79

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	557.59	221.71	511.62	1187.37	0.47
MEAN	17.51	571.94	249.27	514.77	1185.86	0.48
HUB	14.85	622.95	341.79	520.81	1184.34	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.10	648.43	398.39	0.55	4397.42	
MEAN	548.00	595.16	298.73	0.50	4368.58	1.67
HUB	464.84	535.15	123.05	0.45	5079.60	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.56	1.10	20.25	611.92	1.04	585.97	0.92	0.73
MEAN	23.54	1.10	20.08	611.78	1.04	584.48	0.92	0.73
HUB	23.90	1.11	19.79	615.35	1.04	582.96	0.92	0.73

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	23.43	37.91	31.50	6.41	0.93	0.38	2.90	
MEAN	25.84	30.13	23.50	6.63	0.86	0.41	3.28	0.73
HUB	33.28	13.29	6.50	6.79	0.86	0.45	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.800

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	578.838	250.908	521.631	1186.396	0.488	0.000

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.631	20.077	585.051	46.000	25.688	31.500	5.812

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	539.803	250.908	595.267	1190.086	0.454	0.119

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.576	20.470	588.696	471.992	0.025	0.242

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	523.208	0.000	523.208	1191.574	0.439	0.138

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.576	590.168	0.000	0.060	0.048	0.148

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.677	23.493	1.096	613.017	23.184	299.585	2.322

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
144485.656	0.376	1355.866	2286531.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.510 EfDer = 0.990

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
166.058	3587.000	23.493	613.017	1.000	1.000	0.980

W Kg/sec = 75.48089

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
112.958	3299.538	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
127745.469	130300.102	1.560	513.330	329.006	401.059	1.219

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	489.03	-0.17	489.03	0.41	554.55

```
 MEAN    16.97     0.00    -0.02   489.03    -0.17   489.03     0.41
 HUB     14.32     0.00    -0.02   489.03    -0.17   489.03     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.96    46.36     4.60   602.89   776.41    20.93   593.06     0.65
 MEAN    47.38    43.80     3.58   531.23   722.17    20.93   593.06     0.60
 HUB     42.52    37.84     4.68   448.25   663.50    20.93   593.06     0.56

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   550.68   236.22   497.45  1211.48     0.45
 MEAN    16.57   563.68   256.91   501.73  1209.27     0.47
 HUB     13.89   610.51   340.19   506.94  1207.05     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   611.00   354.77     0.50  4463.01
 MEAN   518.80   565.97   261.89     0.47  4260.87     1.38
 HUB    434.79   515.69    94.60     0.43  4727.62

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.32     1.12    22.84   635.43     1.04   610.13     0.92     0.91
 MEAN    26.19     1.11    22.56   634.41     1.03   607.90     0.92     0.91
 HUB     26.50     1.13    22.25   636.75     1.04   605.66     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.40    35.50    31.50     4.00     0.93     0.27     2.90
 MEAN    27.11    27.56    23.50     4.06     0.92     0.27     3.29     0.91
 HUB     33.86    10.57     6.50     4.07     0.92     0.29     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     554.389     258.356     490.509    1211.212       0.458       0.056

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.298      22.776     609.888      46.000      27.776      32.400       4.624

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     512.614     258.356     574.039    1214.899       0.422       0.178

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.255      23.226     613.607     456.573       0.022       0.280

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     486.039       0.000     486.039    1217.089       0.399       0.177

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.444     615.821       0.000       0.060       0.044       0.236

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.855      26.170       1.114     635.531      22.513     278.985       2.163

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 140373.125       0.402    1317.273 1474093.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.510   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    166.058    3587.000      26.170     635.531       1.000       1.000       0.980
W Kg/sec =   75.48089
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
103.247	3240.569	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
127745.469	130300.102	1.695	509.668	300.739	390.276	1.298

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	451.66	-0.16	451.66	0.37	518.06
MEAN	15.91	0.00	-0.02	451.66	-0.16	451.66	0.37	
HUB	13.07	0.00	-0.02	451.66	-0.16	451.66	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.78	47.36	4.42	573.46	730.09	23.80	618.52	0.60
MEAN	47.81	44.80	3.01	498.12	672.51	23.80	618.52	0.55
HUB	42.18	38.84	3.34	409.12	609.51	23.80	618.52	0.50

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	515.83	229.96	461.74	1234.89	0.42
MEAN	15.50	524.66	240.42	466.33	1232.19	0.43
HUB	12.59	562.25	306.12	471.61	1229.49	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	561.57	568.48	331.61	0.46	4128.26	
MEAN	485.11	526.63	244.70	0.43	3728.38	1.39
HUB	394.10	479.74	87.98	0.39	3856.09	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	28.96	1.11	25.68	656.25	1.03	634.06	0.92	0.90
MEAN	28.68	1.10	25.31	654.24	1.03	631.28	0.92	0.90
HUB	28.77	1.10	24.92	654.88	1.03	628.52	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	26.47	35.69	31.50	4.19	0.93	0.28	2.90	
MEAN	27.27	27.69	23.50	4.19	0.91	0.27	3.34	0.90
HUB	32.99	10.57	6.50	4.07	0.91	0.27	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.986

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	530.306	244.827	470.408	1232.550	0.430	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
28.731	25.296	631.670	46.000	27.495	33.000	5.505

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	497.753	244.827	554.705	1235.270	0.403	0.089

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	28.650	25.616	634.461	440.827	0.043	0.281

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	463.754	0.000	463.754	1237.921	0.375	0.199

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	25.991	637.187	0.000	0.060	0.047	0.196

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.848	28.637	1.094	655.123	19.592	296.379	2.298

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 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  122228.461       0.388    1147.002 1513413.000

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     824464.94   7736.8491    162.2220      1.8956      0.7953      6.5098      1.2531


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 95% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.977   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     163.580    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   74.35432

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     159.801    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  125838.836  128355.344       1.787     831.557     465.375     619.754       1.332

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   385.57    -0.13   385.57     0.35   643.21
  MEAN    17.06     0.00    -0.02   385.57    -0.13   385.57     0.35
  HUB     12.51     0.00    -0.02   385.57    -0.13   385.57     0.35

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.17    50.47     8.70   645.77   752.23    13.89   510.39     0.68
  MEAN    54.18    47.20     6.98   534.02   658.78    13.89   510.39     0.59
  HUB     45.45    38.62     6.83   391.59   549.65    13.89   510.39     0.50

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   627.23   371.81   505.15  1127.87     0.56
  MEAN    18.04   657.76   407.22   516.55  1122.64     0.59
  HUB     15.00   750.64   523.34   538.13  1113.73     0.67

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   574.66   273.96     0.51  7673.11
  MEAN   564.57   539.98   157.35     0.48  7346.94     1.36
  HUB    469.54   540.81    53.80     0.49  7851.71

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.97     1.26    15.37   561.39     1.07   528.54     0.92     0.91
  MEAN    18.80     1.24    14.89   559.75     1.07   523.62     0.92     0.91
  HUB     19.07     1.26    14.06   562.29     1.08   515.25     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     36.35    28.47    24.20     4.27     0.93     0.32     2.90
  MEAN    38.25    16.94    12.70     4.24     0.93     0.27     3.51     0.91
  HUB     44.20    -5.71    -9.30     3.59     0.93     0.12     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       1.000
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     667.784     406.432     529.858    1122.833       0.595      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.904      14.878     523.900      24.000      37.490      35.400      -2.090

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     551.432     406.432     685.029    1135.458       0.486       0.302

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.845      16.034     535.749     528.796       0.024       0.444

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     506.677       0.000     506.677    1139.642       0.445       0.365

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.400     539.704       0.000       0.060       0.038       0.389

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      18.787       1.244     561.147      38.337     211.747       1.641

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 238678.125       0.572    2206.347 1621285.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.977   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.580    3587.000      18.787     561.147       1.000       1.000       0.980
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    133.126    3448.668       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.523     590.487     387.703     474.134       1.223

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   481.78    -0.17   481.78     0.42   618.44
 MEAN    18.08     0.00    -0.02   481.78    -0.17   481.78     0.42
 HUB     15.21     0.00    -0.02   481.78    -0.17   481.78     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.18    46.36     6.82   643.27   803.82    16.62   541.76     0.70
 MEAN    49.60    42.30     7.30   565.89   743.33    16.62   541.76     0.65
 HUB     44.67    37.84     6.83   476.11   677.46    16.62   541.76     0.59

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   566.68   297.90   482.06  1165.94     0.49
 MEAN    18.01   579.65   310.58   489.42  1162.12     0.50
 HUB     15.22   629.57   385.49   497.75  1158.34     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   590.65   341.30     0.51  6086.52
 MEAN   563.76   551.03   253.18     0.47  5596.44     1.46
 HUB    476.52   506.00    91.02     0.44  5870.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.26     1.18    18.94   591.74     1.05   564.92     0.92     0.91
 MEAN    21.97     1.17    18.53   589.27     1.05   561.22     0.92     0.91
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 HUB     22.13     1.18    18.10   590.65     1.05   557.56     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.71    35.30    31.50     3.80     0.93     0.33     2.90
 MEAN    32.40    27.35    23.50     3.85     0.93     0.32     3.30     0.91
 HUB     37.76    10.36     6.50     3.86     0.93     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     891.246     311.447     835.057    1123.136       0.794      -1.099

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.084      14.575     524.228      46.000      20.454      30.600      10.146

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     849.989     311.447     905.251    1129.545       0.753      -0.967

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      21.908      15.044     530.227     361.848       0.059       0.168

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     846.085       0.000     846.085    1130.301       0.749       0.093

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      14.909     530.796       0.000       0.060       0.136      -1.004

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.787      21.630       1.151     590.554      29.407     243.246       1.886

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 183183.578       0.448    1693.354 1464472.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.977   EfDer =  0.822

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.580    3587.000      21.630     590.554       1.000       1.000       0.710
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.618    3361.707       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.144     395.194     345.470     307.469       0.890

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   734.55    -0.25   734.55     0.64   588.76
 MEAN    17.74     0.00    -0.02   734.55    -0.25   734.55     0.64
 HUB     15.05     0.00    -0.02   734.55    -0.25   734.55     0.64

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     40.55    46.36    -5.81   628.24   966.73    16.40   545.52     0.84
 MEAN    37.10    43.40    -6.30   555.26   920.95    16.40   545.52     0.80
 HUB     32.69    38.84    -6.15   471.10   872.78    16.40   545.52     0.76

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   548.30   235.83   494.99  1190.38     0.46
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 MEAN    17.51   562.20   259.79   498.58  1188.45     0.47
 HUB     14.85   612.19   346.57   504.65  1186.54     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   626.64   384.27     0.53  4676.88
 MEAN   548.00   575.88   288.21     0.48  4552.51     1.69
 HUB    464.84   518.32   118.27     0.44  5150.41

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.97     1.11    20.73   614.05     1.04   588.95     0.92     0.75
 MEAN    23.91     1.11    20.51   613.42     1.04   587.04     0.92     0.75
 HUB     24.22     1.12    20.20   616.43     1.04   585.15     0.92     0.75

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.47    37.82    31.50     6.32     0.93     0.39     2.90
 MEAN    27.52    30.03    23.50     6.53     0.87     0.42     3.28     0.75
 HUB     34.48    13.19     6.50     6.69     0.87     0.46     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.822

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     568.737     261.495     505.057    1189.013       0.478       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.999      20.517     587.632      46.000      27.373      31.500       4.127

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     520.822     261.495     582.782    1193.414       0.436       0.152

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      23.957      21.016     591.990     471.992       0.022       0.267

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     504.815       0.000     504.815    1194.794       0.423       0.170

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.121     593.360       0.000       0.060       0.042       0.181

    STAGE EXIT CONDITIONS, STAGE            3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.706      23.884       1.104     614.631      24.077     285.361       2.212

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 150060.406       0.390    1387.162 2210929.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.977   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.580    3587.000      23.884     614.631       1.000       1.000       0.980
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    109.596    3295.204       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.608     513.330     319.213     401.059       1.256

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   472.34    -0.16   472.34     0.39   553.83
 MEAN    16.97     0.00    -0.02   472.34    -0.16   472.34     0.39
 HUB     14.32     0.00    -0.02   472.34    -0.16   472.34     0.39
```

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.93	46.36	5.57	602.89	766.01	21.45	596.02	0.64
MEAN	48.37	43.80	4.57	531.23	710.97	21.45	596.02	0.59
HUB	43.51	37.84	5.67	448.25	651.29	21.45	596.02	0.54

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	540.08	249.76	478.87	1215.30	0.44
MEAN	16.57	552.25	266.68	483.60	1212.73	0.46
HUB	13.89	597.89	343.81	489.14	1210.16	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	590.99	588.01	341.24	0.48	4718.51	
MEAN	518.80	545.38	252.12	0.45	4422.67	1.41
HUB	434.79	497.53	90.98	0.41	4777.92	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.94	1.13	23.52	638.32	1.04	613.99	0.92	0.91
MEAN	26.74	1.12	23.19	636.84	1.04	611.39	0.92	0.91
HUB	26.98	1.13	22.83	638.62	1.04	608.80	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.54	35.47	31.50	3.97	0.93	0.29	2.90	
MEAN	28.87	27.54	23.50	4.04	0.92	0.29	3.29	0.91
HUB	35.10	10.54	6.50	4.04	0.92	0.30	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	543.701	268.179	472.960	1214.559	0.448	0.055

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
26.851	23.398	613.262	46.000	29.554	32.400	2.846

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	492.731	268.179	560.985	1218.916	0.404	0.210

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	26.818	23.960	617.670	456.573	0.019	0.306

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	467.375	0.000	467.375	1220.918	0.383	0.208

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	24.168	619.701	0.000	0.060	0.039	0.266

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.868	26.742	1.120	637.926	23.295	267.246	2.072

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
145252.391	0.416	1342.717	1440830.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 6.977 EfDer = 0.993

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
163.580	3587.000	26.742	637.926	1.000	1.000	0.980

W Kg/sec = 74.35432

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
99.720	3234.479	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
125838.836	128355.344	1.755	509.668	290.464	390.276	1.344

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	434.75	-0.15	434.75	0.36	517.09
MEAN	15.91	0.00	-0.02	434.75	-0.15	434.75	0.36	
HUB	13.07	0.00	-0.02	434.75	-0.15	434.75	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.84	47.36	5.48	573.46	719.75	24.50	622.16	0.59
MEAN	48.89	44.80	4.09	498.12	661.27	24.50	622.16	0.54
HUB	43.27	38.84	4.43	409.12	597.08	24.50	622.16	0.49

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	505.66	243.73	443.05	1239.26	0.41
MEAN	15.50	513.18	250.38	447.95	1236.24	0.42
HUB	12.59	549.18	309.82	453.44	1233.23	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	561.57	545.27	317.84	0.44	4375.22	
MEAN	485.11	505.72	234.73	0.41	3882.74	1.43
HUB	394.10	461.21	84.28	0.37	3902.59	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	29.78	1.11	26.55	659.88	1.03	638.56	0.92	0.91
MEAN	29.42	1.10	26.13	657.41	1.03	635.45	0.92	0.91
HUB	29.44	1.10	25.69	657.51	1.03	632.36	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.82	35.66	31.50	4.16	0.93	0.30	2.90	
MEAN	29.20	27.65	23.50	4.15	0.92	0.29	3.34	0.91
HUB	34.34	10.53	6.50	4.03	0.92	0.29	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.993

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	518.795	254.976	451.814	1236.590	0.420	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
29.479	26.114	635.819	46.000	29.438	33.000	3.562

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	476.331	254.976	540.282	1240.012	0.384	0.131

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	29.421	26.571	639.344	440.827	0.037	0.310

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	444.310	0.000	444.310	1242.394	0.358	0.234

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	26.917	641.802	0.000	0.060	0.041	0.232

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.865	29.407	1.100	658.266	20.340	282.710	2.192

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
126901.477	0.402	1173.081	1478808.750

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   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    844076.00   7802.6606    159.8008      1.9466      0.8122      6.9773      1.2591

*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 95% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.070    3587.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   73.21345

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    157.349    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123908.016  126385.898       1.815     831.557     458.234     619.754       1.352

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   378.86    -0.13   378.86     0.34   643.21
MEAN    17.06     0.00    -0.02   378.86    -0.13   378.86     0.34
HUB     12.51     0.00    -0.02   378.86    -0.13   378.86     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.61    50.47     9.14   645.77   748.81    13.93   510.82     0.68
MEAN    54.65    47.20     7.45   534.02   654.87    13.93   510.82     0.59
HUB     45.96    38.62     7.34   391.59   544.96    13.93   510.82     0.49

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   622.48   377.25   495.14  1128.99     0.55
MEAN    18.04   651.87   410.31   506.54  1123.62     0.58
HUB     15.00   742.36   522.31   527.54  1114.73     0.67

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    645.77   563.26   268.52     0.50  7785.28
MEAN   564.57   529.51   154.27     0.47  7402.52     1.38
HUB    469.54   530.17    52.77     0.48  7836.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.03     1.26    15.48   561.96     1.07   529.60     0.92     0.91
MEAN    18.82     1.25    14.98   560.03     1.07   524.55     0.92     0.91
HUB     19.06     1.26    14.15   562.21     1.08   516.20     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.30    28.47    24.20     4.27     0.93     0.33     2.90
MEAN    39.01    16.94    12.70     4.24     0.93     0.28     3.51     0.91
HUB     44.71    -5.71    -9.30     3.59     0.93     0.14     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     661.465     409.509     519.460    1123.857       0.589      -0.003
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Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.931	14.970	524.857	24.000	38.250	35.400	-2.850

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	539.804	409.509	677.559	1136.851	0.475	0.316

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.870	16.168	537.064	528.796	0.025	0.456

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	496.549	0.000	496.549	1140.807	0.435	0.376

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.512	540.808	0.000	0.060	0.039	0.400

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	18.810	1.245	561.402	38.592	208.855	1.619

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
240267.266	0.576	2186.958	1593081.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.453 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
161.070	3587.000	18.810	561.402	1.000	1.000	0.980

W Kg/sec = 73.21345

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
130.952	3447.884	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
123908.016	126385.898	1.548	590.487	381.371	474.134	1.243

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	472.38	-0.16	472.38	0.41	618.30
MEAN	18.08	0.00	-0.02	472.38	-0.16	472.38	0.41	
HUB	15.21	0.00	-0.02	472.38	-0.16	472.38	0.41	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.72	46.36	7.36	643.27	798.21	16.72	542.77	0.70
MEAN	50.15	42.30	7.85	565.89	737.26	16.72	542.77	0.65
HUB	45.24	37.84	7.40	476.11	670.80	16.72	542.77	0.59

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	562.10	305.07	472.11	1167.40	0.48
MEAN	18.01	574.24	315.80	479.60	1163.40	0.49
HUB	15.22	623.12	387.41	488.05	1159.45	0.54

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	578.39	334.13	0.50	6232.78	
MEAN	563.76	539.91	247.96	0.46	5690.45	1.48
HUB	476.52	496.12	89.11	0.43	5899.96	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.37	1.19	19.09	592.73	1.06	566.34	0.92	0.91
MEAN	22.05	1.17	18.66	590.00	1.05	562.47	0.92	0.91
HUB	22.17	1.18	18.21	591.05	1.05	558.63	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.87	35.29	31.50	3.79	0.93	0.34	2.90	

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 MEAN    33.36    27.34    23.50     3.84     0.93     0.33     3.30     0.91
 HUB     38.44    10.35     6.50     3.85     0.93     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     865.663     316.685     805.657    1127.895       0.768       -1.032

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.162      15.002     528.687      46.000      21.459      30.600       9.141

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     815.091     316.685     874.450    1135.439       0.718       -0.859

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      22.012      15.610     535.784     361.848       0.052       0.189

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     808.001       0.000     808.001    1136.540       0.711       0.155

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      15.550     536.753       0.000       0.060       0.115       -0.876

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.810      21.790       1.158     591.260      29.858     238.124       1.846

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 185994.016       0.455    1692.953 1436509.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.843

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    161.070    3587.000       21.790     591.260       1.000        1.000        0.710
W Kg/sec =   73.21345

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    116.010    3359.698        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 123908.016  126385.898        1.170     395.194     337.875     307.469        0.910

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa     C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   708.46    -0.24   708.46      0.62   588.41
 MEAN    17.74      0.00    -0.02   708.46    -0.24   708.46      0.62
 HUB     15.05      0.00    -0.02   708.46    -0.24   708.46      0.62

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     41.58     46.36    -4.78   628.24   947.05     16.86   549.36      0.82
 MEAN    38.10     43.40    -5.30   555.26   900.28     16.86   549.36      0.78
 HUB     33.64     38.84    -5.20   471.10   850.93     16.86   549.36      0.74

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   540.38    248.54    479.83  1193.09       0.45
 MEAN    17.51   553.68    269.24    483.80  1190.80       0.46
 HUB     14.85   602.56    350.84    489.88  1188.56       0.51

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
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 TIP    620.10   606.88   371.56     0.51  4928.45
 MEAN   548.00   558.36   278.76     0.47  4717.84     1.70
 HUB    464.84   502.97   114.00     0.42  5213.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.35     1.12    21.15   616.02     1.04   591.64     0.92     0.77
 MEAN    24.23     1.11    20.89   614.96     1.04   589.37     0.92     0.77
 HUB     24.50     1.12    20.56   617.45     1.04   587.14     0.92     0.77

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.38    37.75    31.50     6.25     0.93     0.40     2.90
 MEAN    29.10    29.95    23.50     6.45     0.88     0.43     3.28     0.77
 HUB     35.61    13.10     6.50     6.60     0.88     0.46     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.843

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     559.909     271.009     489.951    1191.381       0.470       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.327      20.908     589.973      46.000      28.949      31.500       2.551

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     503.773     271.009     572.043    1196.402       0.421       0.182

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.293      21.501     594.957     471.992       0.020       0.290

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     488.349       0.000     488.349    1197.686       0.408       0.199

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.602     596.235       0.000       0.060       0.039       0.211

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.733      24.226       1.112     616.141      24.881     273.429       2.120

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 155070.875       0.403    1411.484 2143698.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.070    3587.000      24.226     616.141       1.000       1.000       0.980
W Kg/sec =   73.21345

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.521    3291.164       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123908.016  126385.898       1.655     513.330     310.255     401.059       1.293

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   457.34    -0.16   457.34     0.38   553.15
 MEAN    16.97     0.00    -0.02   457.34    -0.16   457.34     0.38
 HUB     14.32     0.00    -0.02   457.34    -0.16   457.34     0.38

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.82    46.36     6.46   602.89   756.85    21.91   598.69     0.63
 MEAN    49.28    43.80     5.48   531.23   701.09    21.91   598.69     0.58
 HUB     44.44    37.84     6.60   448.25   640.49    21.91   598.69     0.53
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      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   531.39   261.68   462.48  1218.67     0.44
 MEAN    16.57   542.58   275.33   467.53  1215.81     0.45
 HUB     13.89   586.90   347.02   473.31  1212.95     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   567.75   329.31     0.47  4943.61
 MEAN   518.80   527.13   243.48     0.43  4565.91     1.44
 HUB    434.79   481.38    87.77     0.40  4822.34

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.48     1.13    24.12   640.96     1.04   617.40     0.92     0.91
 MEAN    27.22     1.12    23.74   639.06     1.04   614.50     0.92     0.91
 HUB     27.40     1.13    23.34   640.35     1.04   611.61     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.50    35.45    31.50     3.95     0.93     0.31     2.90
 MEAN    30.49    27.51    23.50     4.01     0.92     0.31     3.29     0.91
 HUB     36.25    10.51     6.50     4.01     0.92     0.32     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     534.672     276.875     457.400    1217.538       0.439       0.054

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.333      23.939     616.274      46.000      31.188      32.400       1.212

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     475.315     276.875     550.077    1222.469       0.389       0.238

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.306      24.600     621.276     456.573       0.017       0.331

    VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
      16.096     451.062       0.000     451.062    1224.312       0.368       0.235

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.795     623.150       0.000       0.060       0.037       0.292

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4           PR4       Texit        Del T       Ns         Ns nondim
      0.876      27.234       1.124     640.125      23.984     257.266       1.994

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 149560.109       0.428    1361.324 1409011.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.997

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    161.070    3587.000      27.234     640.125       1.000       1.000       0.980
W Kg/sec =   73.21345

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     96.580    3228.918       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 123908.016  126385.898       1.812     509.668     281.318     390.276       1.387
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ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	419.92	-0.14	419.92	0.34	516.20
MEAN	15.91	0.00	-0.02	419.92	-0.14	419.92	0.34	
HUB	13.07	0.00	-0.02	419.92	-0.14	419.92	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.79	47.36	6.43	573.46	710.88	25.11	625.42	0.58
MEAN	49.88	44.80	5.08	498.12	651.61	25.11	625.42	0.53
HUB	44.26	38.84	5.42	409.12	586.37	25.11	625.42	0.48

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	497.59	255.56	426.95	1243.07	0.40
MEAN	15.50	503.73	259.02	432.04	1239.80	0.41
HUB	12.59	538.07	313.00	437.66	1236.54	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	561.57	525.28	306.01	0.42	4587.39	
MEAN	485.11	487.62	226.09	0.39	4016.51	1.46
HUB	394.10	445.11	81.10	0.36	3942.50	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.49	1.12	27.30	663.14	1.04	642.49	0.92	0.91
MEAN	30.07	1.10	26.83	660.28	1.03	639.12	0.92	0.91
HUB	30.01	1.10	26.35	659.91	1.03	635.76	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.90	35.63	31.50	4.13	0.93	0.32	2.90	
MEAN	30.94	27.62	23.50	4.12	0.92	0.31	3.34	0.91
HUB	35.57	10.50	6.50	4.00	0.92	0.31	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	509.352	263.771	435.734	1240.134	0.411	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
30.121	26.816	639.473	46.000	31.189	33.000	1.811

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	458.111	263.771	528.622	1244.136	0.368	0.166

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	30.076	27.386	643.607	440.827	0.033	0.335

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	427.702	0.000	427.702	1246.306	0.343	0.265

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	27.707	645.853	0.000	0.060	0.038	0.262

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.875	30.061	1.104	661.109	20.984	271.413	2.104

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
130927.820	0.415	1191.730	1445937.625

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR

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    861820.06   7844.4492    157.3488      1.9899      0.8245      7.4530      1.2645


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 95% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.444    3587.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   72.01982

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    154.784    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
121887.875  124325.375       1.845     831.557     450.763     619.754       1.375

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   371.89    -0.13   371.89     0.34   643.21
MEAN    17.06     0.00    -0.02   371.89    -0.13   371.89     0.34
HUB     12.51     0.00    -0.02   371.89    -0.13   371.89     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.07    50.47     9.60   645.77   745.31    13.97   511.26     0.67
MEAN    55.15    47.20     7.95   534.02   650.86    13.97   511.26     0.59
HUB     46.49    38.62     7.87   391.59   540.14    13.97   511.26     0.49

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   617.80   382.83   484.90  1130.11     0.55
MEAN    18.04   645.96   413.47   496.29  1124.60     0.57
HUB     15.00   733.92   521.23   516.68  1115.74     0.66

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    645.77   551.60   262.94     0.49  7900.33
MEAN   564.57   518.78   151.10     0.46  7459.54     1.41
HUB    469.54   519.26    51.69     0.47  7820.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.09     1.26    15.58   562.54     1.08   530.66     0.92     0.91
MEAN    18.85     1.25    15.07   560.32     1.07   525.47     0.92     0.91
HUB     19.05     1.26    14.24   562.13     1.08   517.16     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.29    28.47    24.20     4.27     0.93     0.35     2.90
MEAN    39.80    16.93    12.70     4.23     0.93     0.30     3.51     0.91
HUB     45.25    -5.71    -9.30     3.59     0.93     0.15     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     655.126     412.667     508.818    1124.883       0.582      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.956      15.061     525.816      24.000      39.043      35.400      -3.643
```

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	527.994	412.667	670.128	1138.242	0.464	0.331

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.893	16.300	538.379	528.796	0.026	0.468

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	486.234	0.000	486.234	1141.975	0.426	0.387

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.621	541.916	0.000	0.060	0.041	0.411

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	18.831	1.246	561.663	38.853	205.880	1.596

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
241894.422	0.580	2165.872	1563779.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.953 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
158.444	3587.000	18.831	561.663	1.000	1.000	0.980

W Kg/sec = 72.01982

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
128.707	3447.081	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
121887.875	124325.375	1.575	590.487	374.834	474.134	1.265

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	462.78	-0.16	462.78	0.40	618.16
MEAN	18.08	0.00	-0.02	462.78	-0.16	462.78	0.40	
HUB	15.21	0.00	-0.02	462.78	-0.16	462.78	0.40	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.27	46.36	7.91	643.27	792.56	16.82	543.78	0.69
MEAN	50.73	42.30	8.43	565.89	731.15	16.82	543.78	0.64
HUB	45.82	37.84	7.98	476.11	664.07	16.82	543.78	0.58

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	557.71	312.29	462.07	1168.85	0.48
MEAN	18.01	568.92	321.06	469.66	1164.68	0.49
HUB	15.22	616.65	389.33	478.21	1160.56	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	566.02	326.90	0.48	6380.32	
MEAN	563.76	528.66	242.69	0.45	5785.20	1.50
HUB	476.52	486.09	87.19	0.42	5929.16	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.48	1.19	19.23	593.73	1.06	567.76	0.92	0.91
MEAN	22.12	1.17	18.79	590.74	1.05	563.71	0.92	0.91
HUB	22.21	1.18	18.32	591.46	1.05	559.71	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.05	35.28	31.50	3.78	0.93	0.35	2.90	
MEAN	34.36	27.33	23.50	3.83	0.93	0.34	3.30	0.91
HUB	39.15	10.33	6.50	3.83	0.93	0.34	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      842.346     321.964     778.388     1132.193       0.744       -0.973

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     22.235      15.391      532.728      46.000      22.471      30.600        8.129

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960      783.780     321.964     847.332     1140.612       0.687       -0.764

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.680       22.108      16.115     540.681     361.848       0.046        0.208

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.823     774.821       0.000     774.821    1141.883       0.679        0.205

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.680       16.106     541.850       0.000       0.060       0.097       -0.766

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.827       21.930        1.165      591.976       30.313     233.035        1.806

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188827.203       0.462    1690.719 1407704.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.865

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    158.444     3587.000       21.930      591.976       1.000        1.000        0.710
W Kg/sec =   72.01982

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
    113.463     3357.666        1.402        0.249       53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 121887.875  124325.375        1.196      395.194     330.456      307.469        0.930

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00     -0.02    684.50     -0.24    684.50      0.59    588.06
 MEAN    17.74      0.00     -0.02    684.50     -0.24    684.50      0.59
 HUB     15.05      0.00     -0.02    684.50     -0.24    684.50      0.59

       BetaFlo    BetaBlade Incid    U1        W1        Ps1       Ts1      Rel Mach
 TIP     42.56     46.36     -3.80    628.24    929.26     17.28    552.87      0.81
 MEAN    39.06     43.40     -4.34    555.26    881.54     17.28    552.87      0.76
 HUB     34.55     38.84     -4.29    471.10    831.09     17.28    552.87      0.72

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500       0.050        0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81    533.34    260.61    465.33   1195.65      0.45
 MEAN    17.51    545.86    278.20    469.64   1193.04      0.46
 HUB     14.85    593.50    354.84    475.75   1190.49      0.50

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    620.10    588.02    359.50      0.49   5167.35
 MEAN   548.00    541.62    269.79      0.45   4874.58      1.72
 HUB    464.84    488.30    110.01      0.41   5272.88
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    24.70     1.13    21.54   617.93     1.04   594.19     0.92     0.79
 MEAN   24.54     1.12    21.25   616.46     1.04   591.59     0.92     0.79
 HUB    24.76     1.13    20.89   618.46     1.04   589.06     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    29.25    37.69    31.50     6.19     0.93     0.42     2.90
 MEAN   30.64    29.88    23.50     6.38     0.88     0.43     3.28     0.79
 HUB    36.72    13.02     6.50     6.52     0.88     0.47     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.865

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     551.827     280.030     475.496    1193.627       0.462       0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.632      21.272     592.200      46.000      30.495      31.500       1.005

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     487.655     280.030     562.338    1199.226       0.407       0.210

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.604      21.953     597.768     471.992       0.018       0.314

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     472.831       0.000     472.831    1200.417       0.394       0.226

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.048     598.957       0.000       0.060       0.037       0.238

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.756      24.540       1.119     617.618      25.642     262.756       2.037

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 159817.609       0.416    1430.974 2080040.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.444    3587.000      24.540     617.618       1.000       1.000       0.980
W Kg/sec =   72.01982

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.568    3287.226       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 121887.875  124325.375       1.702     513.330     301.655     401.059       1.330

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP    19.26     0.00    -0.02   443.15    -0.15   443.15     0.37   552.48
 MEAN   16.97     0.00    -0.02   443.15    -0.15   443.15     0.37
 HUB    14.32     0.00    -0.02   443.15    -0.15   443.15     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP    53.69    46.36     7.33   602.89   748.36    22.34   601.23     0.62
 MEAN   50.17    43.80     6.37   531.23   691.91    22.34   601.23     0.58
 HUB    45.34    37.84     7.50   448.25   630.44    22.34   601.23     0.52

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
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     0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   523.87   272.77   447.25  1221.81     0.43
 MEAN    16.57   533.94   283.40   452.52  1218.69     0.44
 HUB     13.89   576.81   350.00   458.48  1215.58     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   548.91   318.22     0.45  5152.81
 MEAN   518.80   510.09   235.40     0.42  4699.63     1.47
 HUB    434.79   466.25    84.79     0.38  4863.70

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.98     1.14    24.66   643.49     1.04   620.59     0.92     0.91
 MEAN    27.67     1.13    24.25   641.21     1.04   617.43     0.92     0.91
 HUB     27.78     1.13    23.81   642.04     1.04   614.28     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.38    35.43    31.50     3.93     0.93     0.33     2.90
 MEAN    32.06    27.48    23.50     3.98     0.93     0.32     3.29     0.91
 HUB     37.36    10.48     6.50     3.98     0.93     0.33     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     526.635     284.994     442.857    1220.330       0.432       0.053

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.774      24.434     619.105      46.000      32.763      32.400      -0.363

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     459.201     284.994     540.451    1225.785       0.375       0.265

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.749      25.184     624.651     456.573       0.017       0.354

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     435.997       0.000     435.997    1227.484       0.355       0.260

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.365     626.384       0.000       0.060       0.037       0.316

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      27.678       1.128     642.244      24.626     248.269       1.925

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 153570.219       0.440    1375.036 1377222.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.999

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    158.444    3587.000      27.678     642.244       1.000       1.000       0.980
W Kg/sec =   72.01982

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.636    3223.587       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 121887.875  124325.375       1.869     509.668     272.743     390.276       1.431

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
```

TIP	18.32	0.00	-0.02	406.18	-0.14	406.18	0.33	515.35	
MEAN	15.91	0.00	-0.02	406.18	-0.14	406.18	0.33		
HUB	13.07	0.00	-0.02	406.18	-0.14	406.18	0.33		

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.70	47.36	7.34	573.46	702.85	25.66	628.49	0.57
MEAN	50.81	44.80	6.01	498.12	642.84	25.66	628.49	0.52
HUB	45.22	38.84	6.38	409.12	576.61	25.66	628.49	0.47

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	490.82	266.37	412.25	1246.59	0.39
MEAN	15.50	495.48	266.89	417.46	1243.10	0.40
HUB	12.59	528.08	315.91	423.17	1239.63	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	561.57	507.04	295.20	0.41	4781.19	
MEAN	485.11	471.06	218.22	0.38	4138.37	1.50
HUB	394.10	430.33	78.19	0.35	3979.16	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	31.12	1.12	27.97	666.23	1.04	646.14	0.92	0.91
MEAN	30.64	1.11	27.46	663.01	1.03	642.53	0.92	0.91
HUB	30.53	1.10	26.94	662.21	1.03	638.95	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.87	35.61	31.50	4.11	0.93	0.34	2.90	
MEAN	32.59	27.60	23.50	4.10	0.93	0.33	3.34	0.91
HUB	36.74	10.47	6.50	3.97	0.93	0.32	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	501.118	271.783	421.014	1243.423	0.403	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
30.698	27.446	642.874	46.000	32.844	33.000	0.156

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	441.653	271.783	518.578	1247.936	0.354	0.199

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	30.659	28.114	647.549	440.827	0.032	0.360

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	412.657	0.000	412.657	1249.926	0.330	0.293

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	28.414	649.615	0.000	0.060	0.037	0.289

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.880	30.643	1.107	663.816	21.571	261.450	2.027

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
134604.938	0.427	1205.225	1413247.250

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
878714.44	7867.8257	154.7835	2.0284	0.8335	7.9532	1.2697

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 95% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.501   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     155.582    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   70.71914

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     151.988    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047        1.879     831.557     442.622     619.754       1.400

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   364.35    -0.13   364.35     0.33   643.21
  MEAN    17.06     0.00    -0.02   364.35    -0.13   364.35     0.33
  HUB     12.51     0.00    -0.02   364.35    -0.13   364.35     0.33

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.57    50.47    10.10   645.77   741.58    14.02   511.72     0.67
  MEAN    55.70    47.20     8.50   534.02   646.58    14.02   511.72     0.58
  HUB     47.07    38.62     8.45   391.59   534.97    14.02   511.72     0.48

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   613.02   388.75   473.99  1131.28     0.54
  MEAN    18.04   639.76   416.82   485.34  1125.62     0.57
  HUB     15.00   724.99   520.07   505.10  1116.79     0.65

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   539.19   257.02     0.48  8022.49
  MEAN   564.57   507.33   147.75     0.45  7519.92     1.43
  HUB    469.54   507.62    50.54     0.45  7802.67

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.15     1.27    15.68   563.15     1.08   531.77     0.92     0.91
  MEAN    18.88     1.25    15.16   560.62     1.07   526.44     0.92     0.91
  HUB     19.03     1.26    14.33   562.05     1.08   518.16     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     39.36    28.47    24.20     4.27     0.93     0.36     2.90
  MEAN    40.66    16.93    12.70     4.23     0.93     0.31     3.51     0.91
  HUB     45.84    -5.71    -9.30     3.59     0.93     0.16     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.997

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     648.495     416.010     497.475    1125.951       0.576       -0.001

      Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      18.981      15.155     526.815      24.000      39.904      35.400      -4.504

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      18.071     515.501     416.010     662.424    1139.684       0.452       0.347
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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.915      16.435     539.744     528.796       0.027       0.481

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     475.296       0.000     475.296    1143.192       0.416       0.398

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.732     543.071       0.000       0.060       0.043       0.422

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      18.849       1.248     561.940      39.130     202.701       1.571

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 243617.312       0.584    2141.904 1532079.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.501   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3587.000      18.849     561.940       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    126.294    3446.233       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.605     590.487     367.806     474.134       1.289

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   452.58    -0.16   452.58     0.40   618.00
 MEAN    18.08     0.00    -0.02   452.58    -0.16   452.58     0.40
 HUB     15.21     0.00    -0.02   452.58    -0.16   452.58     0.40

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.88    46.36     8.52   643.27   786.65    16.92   544.84     0.69
 MEAN    51.36    42.30     9.06   565.89   724.73    16.92   544.84     0.63
 HUB     46.46    37.84     8.62   476.11   657.01    16.92   544.84     0.57

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   553.34   319.88   451.52  1170.34     0.47
 MEAN    18.01   563.49   326.61   459.18  1166.01     0.48
 HUB     15.22   609.90   391.35   467.79  1161.71     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   553.02   319.32     0.47  6535.13
 MEAN   563.76   516.81   237.15     0.44  5884.96     1.53
 HUB    476.52   475.48    85.17     0.41  5959.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.59     1.20    19.38   594.78     1.06   569.22     0.92     0.91
 MEAN    22.19     1.18    18.91   591.52     1.05   565.00     0.92     0.91
 HUB     22.24     1.18    18.43   591.89     1.05   560.83     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.32    35.27    31.50     3.77     0.93     0.37     2.90
 MEAN    35.42    27.31    23.50     3.81     0.93     0.36     3.30     0.91
 HUB     39.92    10.32     6.50     3.82     0.93     0.35     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.995
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     819.929     327.522     751.674    1136.292       0.722      -0.917

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.305      15.764     536.595      46.000      23.544      30.600       7.056

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     753.846     327.522     821.922    1145.450       0.658      -0.674

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      22.198      16.592     545.279     361.848       0.041       0.227

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     743.789       0.000     743.789    1146.791       0.649       0.249

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      16.619     546.538       0.000       0.060       0.083      -0.666

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.841      22.056       1.170     592.731      30.791     227.765       1.766

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 191804.141       0.469    1686.358 1376806.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.501   EfDer =  0.886

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3587.000      22.056     592.731       1.000       1.000       0.710
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    110.846    3355.528       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.224     395.194     322.835     307.469       0.952

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   661.17    -0.23   661.17     0.57   587.68
 MEAN    17.74     0.00    -0.02   661.17    -0.23   661.17     0.57
 HUB     15.05     0.00    -0.02   661.17    -0.23   661.17     0.57

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.55    46.36    -2.81   628.24   912.21    17.67   556.24     0.79
 MEAN    40.04    43.40    -3.36   555.26   863.55    17.67   556.24     0.75
 HUB     35.48    38.84    -3.36   471.10   811.97    17.67   556.24     0.70

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   526.82   272.65   450.78  1198.19     0.44
 MEAN    17.51   538.39   287.16   455.41  1195.26     0.45
 HUB     14.85   584.61   358.81   461.55  1192.43     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   569.14   347.45     0.48  5405.78
 MEAN   548.00   524.82   260.83     0.44  5031.29     1.75
 HUB    464.84   473.57   106.03     0.40  5331.75

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.05     1.14    21.93   619.88     1.05   596.72     0.92     0.81
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 MEAN    24.83     1.13    21.60   618.00     1.04   593.81     0.92     0.81
 HUB     25.01     1.13    21.21   619.51     1.05   590.99     0.92     0.81

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.17    37.62    31.50     6.12     0.93     0.43     2.90
 MEAN    32.23    29.80    23.50     6.30     0.89     0.44     3.28     0.81
 HUB     37.86    12.94     6.50     6.44     0.89     0.47     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.886

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     544.109     289.049     460.984    1195.862       0.455       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.930      21.626     594.421      46.000      32.089      31.500      -0.589

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     471.643     289.049     553.169    1202.026       0.392       0.239

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.903      22.392     600.565     471.992       0.018       0.338

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     457.461       0.000     457.461    1203.127       0.380       0.252

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.478     601.664       0.000       0.060       0.037       0.265

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.778      24.839       1.126     619.132      26.402     252.643       1.958

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 164555.312       0.428    1446.784 2016238.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.501   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    155.582    3587.000      24.839     619.132       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    100.594    3283.204       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.752     513.330     292.993     401.059       1.369

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   429.06    -0.15   429.06     0.36   551.81
 MEAN    16.97     0.00    -0.02   429.06    -0.15   429.06     0.36
 HUB     14.32     0.00    -0.02   429.06    -0.15   429.06     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.57    46.36     8.21   602.89   740.10    22.75   603.77     0.61
 MEAN    51.08    43.80     7.28   531.23   682.97    22.75   603.77     0.57
 HUB     46.26    37.84     8.42   448.25   620.61    22.75   603.77     0.51

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     18.88   517.07   283.60   432.35  1224.88     0.42
 MEAN    16.57   525.83   291.29   437.78  1221.53     0.43
 HUB     13.89   567.05   352.90   443.86  1218.19     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   530.49   307.39     0.43  5357.14
 MEAN   518.80   493.37   227.51     0.40  4830.31     1.51
 HUB    434.79   451.35    81.89     0.37  4903.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.46     1.15    25.17   646.03     1.04   623.72     0.92     0.91
 MEAN    28.09     1.13    24.73   643.38     1.04   620.31     0.92     0.91
 HUB     28.14     1.13    24.25   643.75     1.04   616.92     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.26    35.41    31.50     3.91     0.93     0.35     2.90
 MEAN    33.64    27.46    23.50     3.96     0.93     0.34     3.29     0.91
 HUB     38.49    10.45     6.50     3.95     0.93     0.34     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     519.105     292.928     428.560    1223.083       0.424       0.051

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    28.193      24.905     621.903      46.000      34.353      32.400      -1.953

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     443.497     292.928     531.504    1229.040       0.361       0.292

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      28.167      25.741     627.975     456.573       0.017       0.378

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    16.096     421.344       0.000     421.344    1230.603       0.342       0.284

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      25.904     629.574       0.000       0.060       0.038       0.338

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.880      28.095       1.131     644.385      25.253     239.720       1.858

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 157486.625       0.451    1384.636 1343952.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.501   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3587.000      28.095     644.385       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     90.733    3218.227       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.928     509.668     264.289     390.276       1.477

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   392.79    -0.14   392.79     0.32   514.49
 MEAN    15.91     0.00    -0.02   392.79    -0.14   392.79     0.32
 HUB     13.07     0.00    -0.02   392.79    -0.14   392.79     0.32
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       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.60    47.36     8.24   573.46   695.20    26.18   631.52     0.56
 MEAN    51.75    44.80     6.95   498.12   634.46    26.18   631.52     0.51
 HUB     46.18    38.84     7.34   409.12   567.25    26.18   631.52     0.46

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   484.84   276.73   398.11  1250.01     0.39
 MEAN    15.50   487.92   274.49   403.38  1246.33     0.39
 HUB     12.59   518.61   318.70   409.12  1242.67     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   489.52   284.84     0.39  4966.93
 MEAN   485.11   455.06   210.62     0.37  4256.14     1.53
 HUB    394.10   416.01    75.39     0.33  4014.26

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.72     1.13    28.59   669.30     1.04   649.70     0.92     0.91
 MEAN    31.18     1.11    28.05   665.74     1.03   645.88     0.92     0.91
 HUB     31.00     1.10    27.50   664.52     1.03   642.10     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.80    35.58    31.50     4.08     0.93     0.36     2.90
 MEAN    34.23    27.57    23.50     4.07     0.93     0.35     3.34     0.91
 HUB     37.92    10.44     6.50     3.94     0.93     0.33     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       1.000

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     493.589     279.526     406.810    1246.634       0.396      -0.006

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      31.237      28.036     646.205      46.000      34.494      33.000      -1.494

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     425.942     279.526     509.472    1251.628       0.340       0.229

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      31.199      28.795     651.392     440.827       0.032       0.384

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     398.265       0.000     398.265    1253.454       0.318       0.319

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      29.072     653.294       0.000       0.060       0.037       0.315

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.882      31.181       1.110     666.522      22.136     252.155       1.955

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  138138.047       0.438    1214.522 1379140.000

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     895601.44   7874.2041    151.9881      2.0640      0.8401      8.5014      1.2749


****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
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****************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 95% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     153.237    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   69.65320

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     149.697    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  117882.562  120239.961       1.907     831.557     435.951     619.754       1.422

     ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   358.22    -0.12   358.22     0.32   643.21
  MEAN    17.06     0.00    -0.02   358.22    -0.12   358.22     0.32
  HUB     12.51     0.00    -0.02   358.22    -0.12   358.22     0.32

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.99    50.47    10.52   645.77   738.58    14.05   512.09     0.67
  MEAN    56.15    47.20     8.95   534.02   643.14    14.05   512.09     0.58
  HUB     47.56    38.62     8.94   391.59   530.81    14.05   512.09     0.48

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   609.34   393.50   465.24  1132.20     0.54
  MEAN    18.04   634.89   419.53   476.53  1126.43     0.56
  HUB     15.00   717.86   519.15   495.79  1117.62     0.64

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   529.23   252.27     0.47  8120.49
  MEAN   564.57   498.12   145.05     0.44  7568.69     1.45
  HUB    469.54   498.27    49.61     0.45  7788.82

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.20     1.27    15.76   563.64     1.08   532.63     0.92     0.91
  MEAN    18.90     1.25    15.23   560.87     1.07   527.21     0.92     0.91
  HUB     19.02     1.26    14.41   561.98     1.07   518.94     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     40.22    28.47    24.20     4.27     0.93     0.38     2.90
  MEAN    41.36    16.93    12.70     4.23     0.93     0.32     3.51     0.91
  HUB     46.32    -5.71    -9.30     3.59     0.93     0.17     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.996

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     643.284     418.711     488.360    1126.789       0.571       0.000

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      19.000      15.228     527.600      24.000      40.609      35.400      -5.209

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      18.071     505.523     418.711     656.409    1140.818       0.443       0.360

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      18.930      16.539     540.818     528.796       0.028       0.492
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	466.539	0.000	466.539	1144.151	0.408	0.407

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.817	543.983	0.000	0.060	0.046	0.431

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.873	18.860	1.248	562.163	39.353	200.132	1.551

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
245004.688	0.588	2121.634	1506272.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.993

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
153.237	3587.000	18.860	562.163	1.000	1.000	0.980

W Kg/sec = 69.65320

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
124.338	3445.549	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
117882.562	120239.961	1.631	590.487	362.111	474.134	1.309

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	444.40	-0.15	444.40	0.39	617.88
MEAN	18.08	0.00	-0.02	444.40	-0.15	444.40	0.39	
HUB	15.21	0.00	-0.02	444.40	-0.15	444.40	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.37	46.36	9.01	643.27	781.97	17.00	545.67	0.68
MEAN	51.86	42.30	9.56	565.89	719.65	17.00	545.67	0.63
HUB	46.98	37.84	9.14	476.11	651.40	17.00	545.67	0.57

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	550.07	325.90	443.13	1171.51	0.47
MEAN	18.01	559.29	331.00	450.83	1167.05	0.48
HUB	15.22	604.60	392.97	459.47	1162.62	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	542.70	313.30	0.46	6658.02	
MEAN	563.76	507.37	232.76	0.43	5964.04	1.55
HUB	476.52	467.01	83.55	0.40	5984.44	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.67	1.20	19.49	595.62	1.06	570.36	0.92	0.91
MEAN	22.25	1.18	19.01	592.14	1.05	566.02	0.92	0.91
HUB	22.26	1.18	18.51	592.24	1.05	561.72	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.33	35.26	31.50	3.76	0.93	0.38	2.90	
MEAN	36.29	27.31	23.50	3.81	0.94	0.36	3.30	0.91
HUB	40.54	10.31	6.50	3.81	0.94	0.36	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.993

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

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     17.960     803.347     331.928     731.567    1139.304       0.705      -0.876

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.356      16.038     539.445      46.000      24.405      30.600       6.195

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     731.712     331.928     803.479    1148.959       0.637      -0.608

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      22.263      16.940     548.627     361.848       0.037       0.241

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     721.188       0.000     721.188    1150.308       0.627       0.280

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      16.986     549.904       0.000       0.060       0.073      -0.594

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.849      22.144       1.174     593.333      31.170     223.634       1.734

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 194168.406       0.475    1681.414 1351830.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.902

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    153.237    3587.000      22.144     593.333       1.000       1.000       0.710
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    108.799    3353.824       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.247     395.194     316.870     307.469       0.970

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   643.68    -0.22   643.68     0.56   587.38
 MEAN    17.74     0.00    -0.02   643.68    -0.22   643.68     0.56
 HUB     15.05     0.00    -0.02   643.68    -0.22   643.68     0.56

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.31    46.36    -2.05   628.24   899.61    17.96   558.75     0.78
 MEAN    40.79    43.40    -2.61   555.26   850.23    17.96   558.75     0.73
 HUB     36.21    38.84    -2.63   471.10   797.79    17.96   558.75     0.69

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   522.22   281.83   439.64  1200.11     0.44
 MEAN    17.51   532.92   293.97   444.51  1196.96     0.45
 HUB     14.85   577.94   361.81   450.68  1193.91     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   554.72   338.27     0.46  5587.45
 MEAN   548.00   511.97   254.03     0.43  5150.32     1.77
 HUB    464.84   462.30   103.03     0.39  5376.20

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.31     1.14    22.22   621.40     1.05   598.64     0.92     0.83
 MEAN    25.05     1.13    21.86   619.20     1.04   595.50     0.92     0.83
 HUB     25.19     1.14    21.45   620.34     1.05   592.46     0.92     0.83
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.66    37.58    31.50     6.08     0.93     0.44     2.90
 MEAN    33.48    29.75    23.50     6.25     0.89     0.45     3.28     0.83
 HUB     38.76    12.88     6.50     6.38     0.89     0.48     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.902

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     538.465     295.898     449.876    1197.560       0.450       0.008

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.149      21.888     596.111      46.000      33.334      31.500      -1.834

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     459.494     295.898     546.526    1204.149       0.382       0.262

   BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.950      25.122      22.718     602.689     471.992       0.018       0.357

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     445.828       0.000     445.828    1205.180       0.370       0.272

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.795     603.721       0.000       0.060       0.038       0.285

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.793      25.057       1.132     620.312      26.979     245.264       1.901

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 168157.172       0.437    1456.168 1967221.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.998

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    153.237    3587.000       25.057     620.312       1.000        1.000       0.980
W Kg/sec =   69.65320

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     98.311    3280.080        1.401       0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 117882.562  120239.961        1.793     513.330     286.345     401.059       1.401

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   418.37    -0.14   418.37     0.35   551.28
 MEAN    16.97      0.00    -0.02   418.37    -0.14   418.37     0.35
 HUB     14.32      0.00    -0.02   418.37    -0.14   418.37     0.35

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     55.25     46.36      8.89   602.89   733.95     23.06   605.71     0.61
 MEAN    51.79     43.80      7.99   531.23   676.30     23.06   605.71     0.56
 HUB     46.98     37.84      9.14   448.25   613.26     23.06   605.71     0.51

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   512.33   291.69   421.19  1227.18      0.42
 MEAN    16.57   520.00   297.21   426.69  1223.67      0.42
 HUB     13.89   559.86   355.10   432.83  1220.17      0.46
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   516.70   299.30     0.42  5509.84
 MEAN   518.80   480.79   221.59     0.39  4928.43     1.53
 HUB    434.79   440.10    79.69     0.36  4934.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.80     1.15    25.55   647.97     1.04   626.07     0.92     0.91
 MEAN    28.39     1.13    25.07   645.05     1.04   622.49     0.92     0.91
 HUB     28.40     1.13    24.58   645.08     1.04   618.93     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.70    35.40    31.50     3.90     0.93     0.36     2.90
 MEAN    34.86    27.44    23.50     3.94     0.93     0.36     3.29     0.91
 HUB     39.37    10.43     6.50     3.93     0.93     0.36     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     513.703     298.885     417.802    1225.159       0.419       0.050

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.496      25.247     624.018      46.000      35.579      32.400      -3.179

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     431.762     298.885     525.120    1231.488       0.351       0.312

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.468      26.146     630.482     456.573       0.018       0.397

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     410.409       0.000     410.409    1232.953       0.333       0.302

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.293     631.982       0.000       0.060       0.040       0.354

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      28.392       1.133     646.035      25.723     233.458       1.810

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 160422.172       0.459    1389.186 1317551.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3587.000      28.392     646.035       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.543    3214.115       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.976     509.668     257.912     390.276       1.513

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   382.77    -0.13   382.77     0.31   513.83
 MEAN    15.91     0.00    -0.02   382.77    -0.13   382.77     0.31
 HUB     13.07     0.00    -0.02   382.77    -0.13   382.77     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.28    47.36     8.92   573.46   689.58    26.56   633.82     0.56
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 MEAN    52.47    44.80     7.67   498.12   628.30    26.56   633.82     0.51
 HUB     46.92    38.84     8.08   409.12   560.36    26.56   633.82     0.45

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   480.76   284.35   387.66  1252.56     0.38
 MEAN    15.50   482.54   280.08   392.94  1248.75     0.39
 HUB     12.59   511.69   320.76   398.68  1244.96     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   476.58   277.21     0.38  5103.72
 MEAN   485.11   443.21   205.04     0.35  4342.64     1.56
 HUB    394.10   405.37    73.34     0.33  4040.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.15     1.13    29.04   671.64     1.04   652.36     0.92     0.91
 MEAN    31.57     1.11    28.48   667.82     1.03   648.40     0.92     0.91
 HUB     31.34     1.10    27.90   666.30     1.03   644.47     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.26    35.57    31.50     4.07     0.93     0.38     2.90
 MEAN    35.48    27.56    23.50     4.06     0.93     0.36     3.34     0.91
 HUB     38.82    10.42     6.50     3.92     0.93     0.35     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     488.242     285.214     396.274    1249.041       0.391      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.622      28.457     648.708      46.000      35.744      33.000      -2.744

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     414.390     285.214     503.057    1254.381       0.330       0.252

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.580      29.280     654.267     440.827       0.033       0.403

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     387.668       0.000     387.668    1256.093       0.309       0.337

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.541     656.054       0.000       0.060       0.039       0.333

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      31.560       1.112     668.587      22.552     245.462       1.903

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 140737.906       0.446    1218.729 1352120.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    908490.38   7867.1309    149.6973      2.0891      0.8435      8.9529      1.2788


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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Fan-Core + 4 Stage LPC 95% Stat 2 27% Ice Block 8-22-2011

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
RESET = 0.000BLEED = 0.000 DPInc = 9.538 EfDer = 0.993

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
150.218	3587.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 68.28079

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
146.748	3572.873	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
115559.867	117870.812	1.946	831.557	427.361	619.754	1.450

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	350.37	-0.12	350.37	0.32	643.21
MEAN	17.06	0.00	-0.02	350.37	-0.12	350.37	0.32	
HUB	12.51	0.00	-0.02	350.37	-0.12	350.37	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.52	50.47	11.05	645.77	734.80	14.10	512.56	0.66
MEAN	56.74	47.20	9.54	534.02	638.80	14.10	512.56	0.58
HUB	48.19	38.62	9.57	391.59	525.55	14.10	512.56	0.47

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	604.88	399.48	454.19	1133.33	0.53
MEAN	18.04	628.84	422.92	465.39	1127.43	0.56
HUB	15.00	708.92	517.98	484.01	1118.65	0.63

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	645.77	516.67	246.29	0.46	8243.75	
MEAN	564.57	486.47	141.65	0.43	7629.85	1.48
HUB	469.54	486.43	48.44	0.43	7771.16	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.26	1.27	15.86	564.26	1.08	533.71	0.92	0.91
MEAN	18.92	1.25	15.32	561.18	1.07	528.15	0.92	0.91
HUB	19.00	1.26	14.49	561.89	1.07	519.92	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.33	28.47	24.20	4.27	0.93	0.39	2.90	
MEAN	42.26	16.93	12.70	4.23	0.94	0.34	3.51	0.91
HUB	46.94	-5.72	-9.30	3.58	0.94	0.19	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.993

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	636.825	422.098	476.843	1127.825	0.565	0.000

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.022	15.317	528.570	24.000	41.515	35.400	-6.115

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	492.991	422.098	649.005	1142.214	0.432	0.376

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.946	16.666	542.143	528.796	0.030	0.506

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4

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    18.083     455.518       0.000     455.518    1145.337       0.398       0.418

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950     16.920     545.111       0.000       0.060       0.049       0.442

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869     18.871       1.249     562.442      39.632     196.880       1.526

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 246744.688       0.592    2094.601 1473267.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.538   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.218    3587.000      18.871     562.442       1.000       1.000       0.980
W Kg/sec =   68.28079

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    121.847    3444.693       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 115559.867  117870.812       1.664     590.487     354.856     474.134       1.336

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   434.09    -0.15   434.09     0.38   617.73
 MEAN    18.08     0.00    -0.02   434.09    -0.15   434.09     0.38
 HUB     15.21     0.00    -0.02   434.09    -0.15   434.09     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.99    46.36     9.63   643.27   776.16    17.09   546.71     0.68
 MEAN    52.52    42.30    10.22   565.89   713.33    17.09   546.71     0.62
 HUB     47.65    37.84     9.81   476.11   644.41    17.09   546.71     0.56

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   546.21   333.39   432.66  1172.95     0.47
 MEAN    18.01   554.22   336.51   440.37  1168.33     0.47
 HUB     15.22   598.00   394.96   449.02  1163.74     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   529.82   305.80     0.45  6810.96
 MEAN   563.76   495.54   227.25     0.42  6063.17     1.57
 HUB    476.52   456.36    81.56     0.39  6014.69

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.76     1.21    19.61   596.67     1.06   571.76     0.92     0.91
 MEAN    22.31     1.18    19.12   592.91     1.05   567.27     0.92     0.91
 HUB     22.28     1.18    18.60   592.67     1.05   562.81     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.62    35.25    31.50     3.75     0.93     0.39     2.90
 MEAN    37.39    27.30    23.50     3.80     0.94     0.38     3.30     0.91
 HUB     41.33    10.30     6.50     3.80     0.94     0.37     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     783.920     337.451     707.571    1142.811       0.686      -0.828

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     22.414      16.355     542.772      46.000      25.497      30.600       5.103

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     705.657     337.451     782.192    1153.013       0.612      -0.530

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      22.336      17.341     552.506     361.848       0.033       0.258

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     694.884       0.000     694.884    1154.333       0.602       0.314

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      17.403     553.767       0.000       0.060       0.062      -0.512

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      22.239       1.178     594.085      31.643     218.542       1.694

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 197114.422       0.482    1673.293 1320102.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 9.538   EfDer =  0.921

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.218    3587.000      22.239     594.085       1.000       1.000       0.710
W Kg/sec =   68.28079

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.266    3351.700       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 115559.867  117870.812       1.277     395.194     309.496     307.469       0.993

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   622.86    -0.21   622.86     0.54   587.01
 MEAN    17.74     0.00    -0.02   622.86    -0.21   622.86     0.54
 HUB     15.05     0.00    -0.02   622.86    -0.21   622.86     0.54

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.26    46.36    -1.10   628.24   884.82    18.29   561.70     0.76
 MEAN    41.73    43.40    -1.67   555.26   834.57    18.29   561.70     0.72
 HUB     37.11    38.84    -1.73   471.10   781.08    18.29   561.70     0.67

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   517.12   292.87   426.19  1202.40     0.43
 MEAN    17.51   526.63   302.17   431.31  1198.99     0.44
 HUB     14.85   570.05   365.41   437.53  1195.69     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   537.33   327.23     0.45  5806.13
 MEAN   548.00   496.45   245.83     0.41  5293.75     1.79
 HUB    464.84   448.69    99.44     0.38  5429.51

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.62     1.15    22.56   623.25     1.05   600.93     0.92     0.84
 MEAN    25.31     1.14    22.16   620.67     1.04   597.53     0.92     0.84
 HUB     25.39     1.14    21.73   621.36     1.05   594.23     0.92     0.84

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.50    37.52    31.50     6.02     0.93     0.45     2.90
 MEAN    35.01    29.68    23.50     6.18     0.89     0.46     3.28     0.84
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 HUB     39.87    12.80     6.50     6.30     0.89     0.49     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.921

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     531.978     304.152     436.454    1199.592       0.443       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.404      22.192     598.138      46.000      34.872      31.500      -3.372

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     444.920     304.152     538.946    1206.690       0.369       0.289

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.374      23.097     605.237     471.992       0.019       0.380

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     431.904       0.000     431.904    1207.639       0.358       0.294

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.160     606.189       0.000       0.060       0.040       0.308

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.809      25.304       1.138     621.759      27.674     236.701       1.835

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 172492.641       0.449    1464.280 1907527.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 9.538   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.218    3587.000      25.304     621.759       1.000       1.000       0.980
W Kg/sec =   68.28079

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.545    3276.260       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 115559.867  117870.812       1.845     513.330     278.288     401.059       1.441

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   405.55    -0.14   405.55     0.34   550.64
 MEAN    16.97     0.00    -0.02   405.55    -0.14   405.55     0.34
 HUB     14.32     0.00    -0.02   405.55    -0.14   405.55     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.08    46.36     9.72   602.89   726.71    23.41   608.04     0.60
 MEAN    52.65    43.80     8.85   531.23   668.44    23.41   608.04     0.55
 HUB     47.87    37.84    10.03   448.25   604.58    23.41   608.04     0.50

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   507.13   301.27   407.94  1229.91     0.41
 MEAN    16.57   513.35   304.24   413.48  1226.22     0.42
 HUB     13.89   551.40   357.66   419.66  1222.54     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   500.35   289.72     0.41  5690.62
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 MEAN   518.80   465.84   214.57     0.38  5044.73     1.57
 HUB    434.79   426.69    77.13     0.35  4969.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.20     1.15    25.97   650.32     1.05   628.87     0.92     0.91
 MEAN    28.74     1.14    25.47   647.08     1.04   625.10     0.92     0.91
 HUB     28.68     1.13    24.94   646.71     1.04   621.34     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.45    35.38    31.50     3.88     0.93     0.38     2.90
 MEAN    36.35    27.43    23.50     3.93     0.93     0.37     3.29     0.91
 HUB     40.44    10.41     6.50     3.91     0.93     0.37     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     507.562     305.946     404.989    1227.633       0.413       0.049

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.840      25.636     626.545      46.000      37.069      32.400      -4.669

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     417.867     305.946     517.895    1234.399       0.339       0.336

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.808      26.609     633.470     456.573       0.019       0.420

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     397.475       0.000     397.475    1235.750       0.322       0.322

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.735     634.857       0.000       0.060       0.044       0.373

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      28.724       1.135     648.038      26.279     226.193       1.753

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 163892.312       0.469    1391.272 1284514.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 9.538   EfDer =  0.997

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    150.218    3587.000      28.724     648.038       1.000       1.000       0.980
W Kg/sec =   68.28079

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     85.929    3209.145       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 115559.867  117870.812       2.036     509.668     250.296     390.276       1.559

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   370.90    -0.13   370.90     0.30   513.04
 MEAN    15.91     0.00    -0.02   370.90    -0.13   370.90     0.30
 HUB     13.07     0.00    -0.02   370.90    -0.13   370.90     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.11    47.36     9.75   573.46   683.06    26.99   636.57     0.55
 MEAN    53.34    44.80     8.54   498.12   621.14    26.99   636.57     0.50
 HUB     47.81    38.84     8.97   409.12   552.32    26.99   636.57     0.45
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      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   476.38   293.30   375.38  1255.58     0.38
MEAN    15.50   476.51   286.66   380.64  1251.62     0.38
HUB     12.59   503.68   323.16   386.35  1247.68     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    561.57   461.38   268.27     0.37  5264.15
MEAN   485.11   429.27   198.45     0.34  4444.59     1.60
HUB    394.10   392.81    70.94     0.31  4070.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     32.63     1.14    29.54   674.44     1.04   655.52     0.92     0.91
MEAN    32.00     1.11    28.95   670.33     1.03   651.40     0.92     0.91
HUB     31.71     1.10    28.34   668.45     1.03   647.30     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.00    35.55    31.50     4.05     0.93     0.40     2.90
MEAN    36.98    27.54    23.50     4.04     0.93     0.38     3.34     0.91
HUB     39.91    10.40     6.50     3.90     0.93     0.36     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     482.262     291.917     383.877    1251.894       0.385      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.050      28.930     651.683      46.000      37.251      33.000      -4.251

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     400.887     291.917     495.910    1257.637       0.319       0.277

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      32.002      29.824     657.676     440.827       0.035       0.426

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     375.266       0.000     375.266    1259.221       0.298       0.359

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.066     659.334       0.000       0.060       0.043       0.354

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      31.978       1.113     671.077      23.039     237.770       1.843

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 143790.016       0.456    1220.625 1318346.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    924034.06   7844.0713    146.7477      2.1168      0.8459      9.5375      1.2836


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 95% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
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 RESET =  0.000BLEED =  0.000 DPInc = 9.974   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3587.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    144.557    3572.873       1.402       0.249      53.349      32.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
113835.133  116111.594       1.975     831.557     420.983     619.754       1.472

    ROTOR LEADING EDGE CONDITIONS, STAGE             1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   344.58    -0.12   344.58     0.31   643.21
MEAN    17.06     0.00    -0.02   344.58    -0.12   344.58     0.31
HUB     12.51     0.00    -0.02   344.58    -0.12   344.58     0.31

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.92    50.47    11.45   645.77   732.06    14.13   512.89     0.66
MEAN    57.17    47.20     9.97   534.02   635.64    14.13   512.89     0.57
HUB     48.66    38.62    10.04   391.59   521.70    14.13   512.89     0.47

     ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   601.77   403.83   446.14  1134.14     0.53
MEAN    18.04   624.53   425.40   457.24  1128.14     0.55
HUB     15.00   702.43   517.10   475.41  1119.39     0.63

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    645.77   507.52   241.94     0.45  8333.52
MEAN   564.57   477.95   139.17     0.42  7674.57     1.50
HUB    469.54   477.78    47.56     0.43  7757.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.30     1.28    15.93   564.71     1.08   534.47     0.92     0.91
MEAN    18.94     1.25    15.38   561.40     1.07   528.83     0.92     0.91
HUB     18.98     1.26    14.56   561.82     1.07   520.62     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.15    28.47    24.20     4.27     0.93     0.40     2.90
MEAN    42.93    16.93    12.70     4.23     0.94     0.35     3.51     0.91
HUB     47.41    -5.71    -9.30     3.59     0.94     0.20     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     632.218     424.575     468.440    1128.562       0.560       0.001

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.036      15.379     529.261      24.000      42.188      35.400      -6.788

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     483.893     424.575     643.752    1143.209       0.423       0.388

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.956      16.755     543.088     528.796       0.031       0.516

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     447.501       0.000     447.501    1146.185       0.390       0.426

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      16.991     545.919       0.000       0.060       0.052       0.450

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      18.877       1.250     562.646      39.836     194.498       1.508

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 248010.453       0.595    2073.924 1448913.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.974   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3587.000      18.877     562.646       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.015    3444.071       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.689     590.487     349.520     474.134       1.357

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   426.58    -0.15   426.58     0.37   617.62
 MEAN    18.08     0.00    -0.02   426.58    -0.15   426.58     0.37
 HUB     15.21     0.00    -0.02   426.58    -0.15   426.58     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.46    46.36    10.10   643.27   771.98    17.16   547.45     0.67
 MEAN    53.00    42.30    10.70   565.89   708.78    17.16   547.45     0.62
 HUB     48.15    37.84    10.31   476.11   639.37    17.16   547.45     0.56

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   543.58   338.79   425.08  1173.97     0.46
 MEAN    18.01   550.66   340.48   432.78  1169.25     0.47
 HUB     15.22   593.28   396.39   441.42  1164.55     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   520.52   300.41     0.44  6921.09
 MEAN   563.76   486.98   223.28     0.42  6134.65     1.59
 HUB    476.52   448.63    80.12     0.39  6036.55

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.82     1.21    19.70   597.43     1.06   572.76     0.92     0.90
 MEAN    22.35     1.18    19.19   593.48     1.05   568.16     0.92     0.90
 HUB     22.29     1.18    18.66   592.98     1.05   563.59     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.55    35.25    31.50     3.75     0.93     0.40     2.90
 MEAN    38.19    27.29    23.50     3.79     0.94     0.39     3.30     0.90
 HUB     41.92    10.29     6.50     3.79     0.94     0.38     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.988

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     770.640     341.434     690.875    1145.195       0.673      -0.795

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.451      16.569     545.040      46.000      26.299      30.600       4.301

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	687.737	341.434	767.828	1155.752	0.595	-0.477

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	22.382	17.610	555.136	361.848	0.031	0.270

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	676.948	0.000	676.948	1157.035	0.585	0.337

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	17.681	556.365	0.000	0.060	0.056	-0.456

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.860	22.298	1.181	594.629	31.984	214.910	1.666

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
199237.484	0.488	1666.072	1296830.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 9.974 EfDer = 0.933

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
147.976	3587.000	22.298	594.629	1.000	1.000	0.710

W Kg/sec = 67.26170

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
104.449	3350.167	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
113835.133	116111.594	1.299	395.194	304.204	307.469	1.011

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	608.40	-0.21	608.40	0.52	586.74
MEAN	17.74	0.00	-0.02	608.40	-0.21	608.40	0.52	
HUB	15.05	0.00	-0.02	608.40	-0.21	608.40	0.52	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.93	46.36	-0.43	628.24	874.70	18.51	563.73	0.75
MEAN	42.40	43.40	-1.00	555.26	823.83	18.51	563.73	0.71
HUB	37.76	38.84	-1.08	471.10	769.60	18.51	563.73	0.66

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	513.85	300.59	416.76	1203.98	0.43
MEAN	17.51	522.43	307.92	422.04	1200.41	0.44
HUB	14.85	564.63	367.91	428.30	1196.93	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.10	525.15	319.51	0.44	5958.85	
MEAN	548.00	485.55	240.08	0.40	5394.37	1.81
HUB	464.84	439.13	96.93	0.37	5466.69	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.83	1.16	22.78	624.56	1.05	602.52	0.92	0.85
MEAN	25.48	1.14	22.36	621.72	1.05	598.94	0.92	0.85
HUB	25.52	1.14	21.91	622.09	1.05	595.48	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.80	37.48	31.50	5.98	0.93	0.46	2.90	
MEAN	36.11	29.63	23.50	6.13	0.90	0.47	3.28	0.85
HUB	40.66	12.75	6.50	6.25	0.90	0.49	3.87	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.933

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     527.659     309.943     427.036    1201.006       0.439       0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.574      22.396     599.550      46.000      35.972      31.500      -4.472

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     434.757     309.943     533.927    1208.457       0.360       0.308

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.540      23.353     607.013     471.992       0.020       0.397

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     422.212       0.000     422.212    1209.350       0.349       0.310

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.405     607.910       0.000       0.060       0.043       0.324

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.819      25.466       1.142     622.790      28.160     230.900       1.790

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 175524.328       0.456    1467.777 1865232.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 9.974   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3587.000      25.466     622.790       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.598    3273.549       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.883     513.330     272.618     401.059       1.471

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   396.60    -0.14   396.60     0.33   550.19
 MEAN    16.97     0.00    -0.02   396.60    -0.14   396.60     0.33
 HUB     14.32     0.00    -0.02   396.60    -0.14   396.60     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.67    46.36    10.31   602.89   721.75    23.64   609.67     0.60
 MEAN    53.26    43.80     9.46   531.23   663.05    23.64   609.67     0.55
 HUB     48.51    37.84    10.67   448.25   598.62    23.64   609.67     0.49

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   503.80   307.87   398.79  1231.80     0.41
 MEAN    16.57   508.93   309.06   404.34  1227.99     0.41
 HUB     13.89   545.64   359.44   410.51  1224.18     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   489.07   283.12     0.40  5815.18
 MEAN   518.80   455.50   209.74     0.37  5124.72     1.59
 HUB    434.79   417.37    75.35     0.34  4994.63
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     29.46     1.16    26.25   651.98     1.05   630.80     0.92     0.91
MEAN    28.96     1.14    25.73   648.51     1.04   626.90     0.92     0.91
HUB     28.87     1.13    25.19   647.86     1.04   623.02     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.67    35.37    31.50     3.87     0.93     0.40     2.90
MEAN    37.39    27.42    23.50     3.92     0.94     0.38     3.29     0.91
HUB     41.21    10.40     6.50     3.90     0.94     0.38     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     503.484     310.803     396.103    1229.351       0.410        0.047

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.065      25.892     628.302      46.000      38.120      32.400      -5.720

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     408.280     310.803     513.119    1236.415       0.330        0.353

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.028      26.915     635.544     456.573       0.021        0.436

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096     388.558       0.000     388.558    1237.690       0.314        0.336

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      27.025     636.855       0.000       0.060       0.048        0.386

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4        Pt4          PR4        Texit        Del T        Ns         Ns nondim
      0.871      28.938       1.136     649.451      26.661     221.266        1.715

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 166284.828       0.476    1390.514 1260575.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 9.974   EfDer =  0.995

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    147.976     3587.000       28.938     649.451       1.000        1.000        0.980
W Kg/sec =   67.26170

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     84.111     3205.652        1.401       0.249      53.349      56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 113835.133  116111.594        2.080     509.668     245.003     390.276        1.593

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   362.71    -0.12   362.71     0.29   512.48
 MEAN    15.91      0.00    -0.02   362.71    -0.12   362.71     0.29
 HUB     13.07      0.00    -0.02   362.71    -0.12   362.71     0.29

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     57.69     47.36    10.33   573.46   678.64     27.27   638.48     0.55
 MEAN    53.95     44.80     9.15   498.12   616.28     27.27   638.48     0.50
 HUB     48.45     38.84     9.61   409.12   546.85     27.27   638.48     0.44

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000
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          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   473.62   299.42    366.97  1257.66      0.38
 MEAN    15.50   472.55   291.16    372.19  1253.61      0.38
 HUB     12.59   498.28   324.80    377.87  1249.57      0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   450.98   262.15     0.36  5373.81
 MEAN   485.11   419.70   193.95     0.33  4514.31     1.62
 HUB    394.10   384.17    69.30     0.31  4090.83

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     32.94     1.14    29.87   676.41     1.04   657.70     0.92     0.91
 MEAN    32.28     1.12    29.26   672.09     1.03   653.47     0.92     0.91
 HUB     31.95     1.10    28.63   669.97     1.03   649.27     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.21    35.54    31.50     4.04     0.93     0.41     2.90
 MEAN    38.04    27.52    23.50     4.02     0.93     0.39     3.34     0.91
 HUB     40.68    10.39     6.50     3.89     0.93     0.37     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.995

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     478.342     296.501     375.364    1253.865       0.381      -0.007

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      32.327      29.236     653.744      46.000      38.305      33.000      -5.305

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     391.669     296.501     491.241    1259.880       0.311       0.295

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      32.272      30.179     660.032     440.827       0.038       0.442

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     366.791       0.000     366.791    1261.381       0.291       0.373

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      30.406     661.605       0.000       0.060       0.046       0.367

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.874      32.245       1.114     672.824      23.373     232.600       1.803

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  145877.469       0.463    1219.863 1293885.000

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     934934.50   7818.1499     144.5575      2.1344      0.8463      9.9739      1.2869


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 95% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =10.453   EfDer =  0.989

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
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   145.527    3587.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   66.14857

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
   142.165    3572.873       1.402       0.249      53.349      32.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
111951.250  114190.039       2.009     831.557     414.016     619.754       1.497

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   338.28    -0.12   338.28     0.30   643.21
MEAN    17.06     0.00    -0.02   338.28    -0.12   338.28     0.30
HUB     12.51     0.00    -0.02   338.28    -0.12   338.28     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     62.36    50.47    11.89   645.77   729.11    14.17   513.25     0.66
MEAN    57.65    47.20    10.45   534.02   632.25    14.17   513.25     0.57
HUB     49.19    38.62    10.57   391.59   517.56    14.17   513.25     0.47

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   598.56   408.52   437.48  1134.99     0.53
MEAN    18.04   619.96   428.05   448.47  1128.90     0.55
HUB     15.00   695.49   516.15   466.15  1120.18     0.62

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    645.77   497.67   237.25     0.44  8430.08
MEAN   564.57   468.79   136.52     0.42  7722.39     1.52
HUB    469.54   468.47    46.61     0.42  7743.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.34     1.28    16.00   565.20     1.08   535.28     0.92     0.91
MEAN    18.96     1.25    15.44   561.64     1.07   529.54     0.92     0.91
HUB     18.97     1.26    14.62   561.75     1.07   521.35     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.04    28.47    24.20     4.27     0.93     0.41     2.90
MEAN    43.67    16.93    12.70     4.23     0.94     0.36     3.51     0.91
HUB     47.91    -5.71    -9.30     3.59     0.94     0.21     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     627.343     427.223     459.391    1129.342       0.555       0.002

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.050      15.444     529.992      24.000      42.922      35.400      -7.522

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     474.138     427.223     638.221    1144.260       0.414       0.401

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.964      16.848     544.087     528.796       0.033       0.528

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     438.889       0.000     438.889    1147.083       0.383       0.434

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.065     546.775       0.000       0.060       0.055       0.458

   STAGE EXIT CONDITIONS, STAGE            1
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      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      18.881       1.250     562.864      40.054     191.926       1.488

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 249368.562       0.598    2050.771 1422458.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.453   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.527    3587.000      18.881     562.864       1.000       1.000       0.980
W Kg/sec =   66.14857

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.028    3443.404       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111951.250  114190.039       1.718     590.487     343.734     474.134       1.379

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   418.50    -0.14   418.50     0.36   617.50
 MEAN    18.08     0.00    -0.02   418.50    -0.14   418.50     0.36
 HUB     15.21     0.00    -0.02   418.50    -0.14   418.50     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.96    46.36    10.60   643.27   767.54    17.22   548.24     0.67
 MEAN    53.52    42.30    11.22   565.89   703.95    17.22   548.24     0.61
 HUB     48.69    37.84    10.85   476.11   634.01    17.22   548.24     0.55

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   540.93   344.56   416.99  1175.04     0.46
 MEAN    18.01   546.95   344.71   424.65  1170.21     0.47
 HUB     15.22   588.26   397.91   433.27  1165.40     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   510.58   294.64     0.43  7038.84
 MEAN   563.76   477.82   219.05     0.41  6210.79     1.61
 HUB    476.52   440.34    78.61     0.38  6059.57

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.88     1.21    19.78   598.24     1.06   573.81     0.92     0.90
 MEAN    22.38     1.19    19.27   594.08     1.06   569.10     0.92     0.90
 HUB     22.29     1.18    18.73   593.32     1.05   564.42     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.57    35.24    31.50     3.74     0.93     0.41     2.90
 MEAN    39.07    27.29    23.50     3.79     0.94     0.40     3.30     0.90
 HUB     42.56    10.28     6.50     3.78     0.94     0.39     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.985

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     757.071     345.676     673.546    1147.621       0.660      -0.762

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.487      16.785     547.353      46.000      27.168      30.600       3.432

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     669.300     345.676     753.296    1158.528       0.578      -0.423
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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      22.426      17.882     557.806     361.848       0.029       0.283

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     658.600       0.000     658.600    1159.761       0.568       0.360

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      17.957     558.993       0.000       0.060       0.051      -0.400

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.863      22.353       1.184     595.211      32.347     211.070       1.636

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 201501.250       0.493    1657.117 1271672.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.453   EfDer =  0.945

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.527    3587.000      22.353     595.211       1.000       1.000       0.710
W Kg/sec =   66.14857

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.516    3348.530       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111951.250  114190.039       1.324     395.194     298.575     307.469       1.030

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   593.40    -0.20   593.40     0.51   586.46
 MEAN    17.74     0.00    -0.02   593.40    -0.20   593.40     0.51
 HUB     15.05     0.00    -0.02   593.40    -0.20   593.40     0.51

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.64    46.36     0.28   628.24   864.33    18.73   565.82     0.74
 MEAN    43.11    43.40    -0.29   555.26   812.81    18.73   565.82     0.70
 HUB     38.46    38.84    -0.38   471.10   757.80    18.73   565.82     0.65

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   510.74   308.64   406.93  1205.63     0.42
 MEAN    17.51   518.25   313.90   412.37  1201.87     0.43
 HUB     14.85   559.07   370.52   418.66  1198.23     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   512.45   311.47     0.43  6118.20
 MEAN   548.00   474.19   234.10     0.39  5498.90     1.83
 HUB    464.84   429.16    94.32     0.36  5505.32

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.04     1.16    23.01   625.94     1.05   604.17     0.92     0.86
 MEAN    25.64     1.15    22.56   622.83     1.05   600.41     0.92     0.86
 HUB     25.65     1.15    22.09   622.86     1.05   596.77     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.18    37.43    31.50     5.93     0.93     0.47     2.90
 MEAN    37.28    29.58    23.50     6.08     0.90     0.48     3.28     0.86
 HUB     41.51    12.70     6.50     6.20     0.90     0.50     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.945
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     523.348     315.958     417.210    1202.471       0.435       0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.744      22.599     601.016      46.000      37.137      31.500      -5.637

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     424.204     315.958     528.941    1210.289       0.350       0.327

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.705      23.609     608.857     471.992       0.022       0.415

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     412.161       0.000     412.161    1211.125       0.340       0.326

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.648     609.698       0.000       0.060       0.047       0.339

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.828      25.624       1.146     623.877      28.666     225.009       1.744

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 178680.875       0.465    1469.446 1820685.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.453   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.527    3587.000      25.624     623.877       1.000       1.000       0.980
W Kg/sec =   66.14857

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.562    3270.694       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111951.250  114190.039       1.925     513.330     266.687     401.059       1.504

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   387.31    -0.13   387.31     0.32   549.71
 MEAN    16.97     0.00    -0.02   387.31    -0.13   387.31     0.32
 HUB     14.32     0.00    -0.02   387.31    -0.13   387.31     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.29    46.36    10.93   602.89   716.69    23.87   611.36     0.59
 MEAN    53.91    43.80    10.11   531.23   657.54    23.87   611.36     0.54
 HUB     49.18    37.84    11.34   448.25   592.50    23.87   611.36     0.49

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   500.59   314.65   389.34  1233.75     0.41
 MEAN    16.57   504.54   314.06   394.88  1229.82     0.41
 HUB     13.89   539.75   361.25   401.04  1225.89     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   477.44   276.34     0.39  5943.16
 MEAN   518.80   444.80   204.75     0.36  5207.38     1.62
 HUB    434.79   407.72    73.54     0.33  5019.69

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.72     1.16    26.53   653.71     1.05   632.80     0.92     0.91
 MEAN    29.19     1.14    25.99   650.02     1.04   628.78     0.92     0.91
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 HUB     29.05     1.13    25.43   649.07     1.04   624.77     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.94    35.37    31.50     3.87     0.93     0.41     2.90
 MEAN    38.50    27.41    23.50     3.91     0.94     0.40     3.29     0.91
 HUB     42.01    10.39     6.50     3.89     0.94     0.39     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     499.447     315.822     386.916    1231.125       0.406       0.046

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.285      26.144     630.121      46.000      39.223      32.400      -6.823

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     398.404     315.822     508.399    1238.497       0.322       0.370

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.243      27.218     637.690     456.573       0.023       0.453

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     379.375       0.000     379.375    1239.696       0.306       0.350

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.310     638.925       0.000       0.060       0.052       0.398

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      29.144       1.137     650.932      27.055     216.265       1.676

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 168744.578       0.483    1387.731 1234923.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.453   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.527    3587.000      29.144     650.932       1.000       1.000       0.980
W Kg/sec =   66.14857

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     82.228    3202.002       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111951.250  114190.039       2.128     509.668     239.518     390.276       1.629

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   354.26    -0.12   354.26     0.29   511.90
 MEAN    15.91     0.00    -0.02   354.26    -0.12   354.26     0.29
 HUB     13.07     0.00    -0.02   354.26    -0.12   354.26     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.30    47.36    10.94   573.46   674.16    27.54   640.47     0.54
 MEAN    54.59    44.80     9.79   498.12   611.34    27.54   640.47     0.49
 HUB     49.12    38.84    10.28   409.12   541.28    27.54   640.47     0.44

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   470.99   305.66   358.34  1259.80     0.37
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 MEAN    15.50   468.63   295.75   363.52  1255.66     0.37
 HUB     12.59   492.79   326.46   369.14  1251.52     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   440.34   255.91     0.35  5485.72
 MEAN   485.11   409.88   189.36     0.33  4585.39     1.65
 HUB    394.10   375.29    67.64     0.30  4111.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     33.24     1.14    30.18   678.45     1.04   659.95     0.92     0.91
 MEAN    32.54     1.12    29.56   673.93     1.04   655.62     0.92     0.91
 HUB     32.18     1.10    28.92   671.56     1.03   651.31     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.46    35.53    31.50     4.03     0.93     0.42     2.90
 MEAN    39.13    27.52    23.50     4.02     0.94     0.40     3.34     0.91
 HUB     41.49    10.38     6.50     3.88     0.94     0.38     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     474.468     301.175     366.624    1255.898       0.378       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.593      29.534     655.874      46.000      39.403      33.000      -6.403

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     382.245     301.175     486.639    1262.189       0.303       0.313

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      32.529      30.523     662.462     440.827       0.041       0.460

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     358.121       0.000     358.121    1263.607       0.283       0.387

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.735     663.951       0.000       0.060       0.050       0.381

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      32.499       1.115     674.645      23.713     227.391       1.763

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 148005.219       0.469    1217.173 1267677.375

   OVERALL EXIT CONDITIONS; ALL          5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    946300.50   7782.2373    142.1652      2.1513      0.8458     10.4530      1.2904


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 95% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =10.975   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    142.874    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   64.94257
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
139.573	3572.873	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
109910.180	112108.148	2.046	831.557	406.468	619.754	1.525

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	331.51	-0.11	331.51	0.30	643.21
MEAN	17.06	0.00	-0.02	331.51	-0.11	331.51	0.30	
HUB	12.51	0.00	-0.02	331.51	-0.11	331.51	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.83	50.47	12.36	645.77	725.99	14.20	513.63	0.65
MEAN	58.17	47.20	10.97	534.02	628.65	14.20	513.63	0.57
HUB	49.76	38.62	11.14	391.59	513.16	14.20	513.63	0.46

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	595.28	413.47	428.25	1135.88	0.52
MEAN	18.04	615.20	430.89	439.09	1129.69	0.54
HUB	15.00	688.13	515.13	456.25	1120.99	0.61

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	645.77	487.20	232.30	0.43	8532.29	
MEAN	564.57	458.99	133.69	0.41	7773.43	1.55
HUB	469.54	458.52	45.60	0.41	7728.44	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.38	1.28	16.07	565.71	1.08	536.12	0.92	0.90
MEAN	18.97	1.26	15.50	561.90	1.07	530.29	0.92	0.90
HUB	18.95	1.25	14.69	561.67	1.07	522.13	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.99	28.48	24.20	4.28	0.93	0.43	2.90	
MEAN	44.46	16.93	12.70	4.23	0.94	0.37	3.51	0.90
HUB	48.47	-5.71	-9.30	3.59	0.94	0.22	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.986

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	622.256	430.050	449.733	1130.153	0.551	0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.063	15.510	530.754	24.000	43.718	35.400	-8.318

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	463.767	430.050	632.474	1145.357	0.405	0.414

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.972	16.943	545.131	528.796	0.035	0.540

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	429.716	0.000	429.716	1148.024	0.374	0.443

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.139	547.672	0.000	0.060	0.059	0.467

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.857	18.882	1.250	563.095	40.285	189.175	1.466

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
250808.750	0.601	2025.010	1393961.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000 BLEED = 0.000 DPInc = 10.975 EfDer = 0.982

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
142.874	3587.000	18.882	563.095	1.000	1.000	0.980

W Kg/sec = 64.94257

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
115.891	3442.696	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
109910.180	112108.148	1.750	590.487	337.510	474.134	1.405

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	409.89	-0.14	409.89	0.36	617.37
MEAN	18.08	0.00	-0.02	409.89	-0.14	409.89	0.36	
HUB	15.21	0.00	-0.02	409.89	-0.14	409.89	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.50	46.36	11.14	643.27	762.88	17.29	549.07	0.66
MEAN	54.09	42.30	11.79	565.89	698.86	17.29	549.07	0.61
HUB	49.28	37.84	11.44	476.11	628.35	17.29	549.07	0.55

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	538.28	350.63	408.41	1176.15	0.46
MEAN	18.01	543.14	349.18	416.02	1171.22	0.46
HUB	15.22	583.00	399.52	424.59	1166.29	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	500.07	288.57	0.43	7162.77	
MEAN	563.76	468.10	214.58	0.40	6291.25	1.64
HUB	476.52	431.51	77.00	0.37	6083.98	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.94	1.22	19.87	599.09	1.06	574.90	0.92	0.90
MEAN	22.42	1.19	19.34	594.71	1.06	570.08	0.92	0.90
HUB	22.29	1.18	18.79	593.67	1.05	565.29	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.65	35.24	31.50	3.74	0.93	0.42	2.90	
MEAN	40.01	27.28	23.50	3.78	0.94	0.41	3.30	0.90
HUB	43.26	10.28	6.50	3.78	0.94	0.39	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.982

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	743.331	350.159	655.690	1150.066	0.646	-0.728

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.520	17.000	549.689	46.000	28.104	30.600	2.496

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	650.457	350.159	738.719	1161.318	0.560	-0.368

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	22.466	18.151	560.498	361.848	0.027	0.297

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	639.939	0.000	639.939	1162.492	0.550	0.382

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	18.229	561.631	0.000	0.060	0.046	-0.344

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.864	22.403	1.186	595.825	32.730	207.049	1.605

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
203888.938	0.499	1646.183	1244706.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =10.975 EfDer = 0.957

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
142.874	3587.000	22.403	595.825	1.000	1.000	0.710

W Kg/sec = 64.94257

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
100.475	3346.802	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
109910.180	112108.148	1.350	395.194	292.629	307.469	1.051

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	577.97	-0.20	577.97	0.49	586.15
MEAN	17.74	0.00	-0.02	577.97	-0.20	577.97	0.49	
HUB	15.05	0.00	-0.02	577.97	-0.20	577.97	0.49	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.40	46.36	1.04	628.24	853.80	18.95	567.94	0.73
MEAN	43.86	43.40	0.46	555.26	801.61	18.95	567.94	0.69
HUB	39.20	38.84	0.36	471.10	745.77	18.95	567.94	0.64

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	507.82	316.92	396.78	1207.30	0.42
MEAN	17.51	514.14	320.08	402.35	1203.38	0.43
HUB	14.85	553.45	373.21	408.68	1199.57	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.10	499.35	303.18	0.41	6282.26	
MEAN	548.00	462.43	227.92	0.38	5606.98	1.86
HUB	464.84	418.83	91.64	0.35	5545.10	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.24	1.17	23.23	627.38	1.05	605.85	0.92	0.88
MEAN	25.81	1.15	22.76	623.99	1.05	601.92	0.92	0.88
HUB	25.77	1.15	22.27	623.68	1.05	598.11	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.62	37.38	31.50	5.88	0.93	0.48	2.90	
MEAN	38.50	29.53	23.50	6.03	0.90	0.48	3.28	0.88
HUB	42.40	12.64	6.50	6.14	0.90	0.50	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.957

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	519.120	322.178	407.046	1203.972	0.431	0.011

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.909      22.798     602.521      46.000      38.362      31.500      -6.862

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     413.339     322.178     524.068    1212.170       0.341       0.348

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.864      23.862     610.754     471.992       0.024       0.434

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     401.823       0.000     401.823    1212.947       0.331       0.341

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.886     611.537       0.000       0.060       0.052       0.355

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.836      25.774       1.150     625.014      29.188     219.077       1.698

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 181936.016       0.473    1468.937 1774091.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.975   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    142.874    3587.000      25.774     625.014       1.000       1.000       0.980
W Kg/sec =   64.94257

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.449    3267.719       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109910.180  112108.148       1.970     513.330     260.534     401.059       1.539

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   377.75    -0.13   377.75     0.31   549.21
 MEAN    16.97     0.00    -0.02   377.75    -0.13   377.75     0.31
 HUB     14.32     0.00    -0.02   377.75    -0.13   377.75     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.94    46.36    11.58   602.89   711.56    24.10   613.11     0.59
 MEAN    54.59    43.80    10.79   531.23   651.94    24.10   613.11     0.54
 HUB     49.89    37.84    12.05   448.25   586.29    24.10   613.11     0.48

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   497.56   321.57   379.68  1235.73     0.40
 MEAN    16.57   500.22   319.15   385.18  1231.69     0.41
 HUB     13.89   533.82   363.11   391.30  1227.65     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   465.56   269.42     0.38  6073.68
 MEAN   518.80   433.85   199.66     0.35  5291.71     1.65
 HUB    434.79   397.81    71.68     0.32  5045.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.96     1.16    26.79   655.50     1.05   634.85     0.92     0.90
 MEAN    29.40     1.14    26.24   651.57     1.04   630.70     0.92     0.90
 HUB     29.22     1.13    25.66   650.34     1.04   626.56     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     40.26    35.36    31.50     3.86     0.93     0.42     2.90
 MEAN    39.64    27.40    23.50     3.90     0.94     0.41     3.29     0.90
 HUB     42.86    10.38     6.50     3.88     0.94     0.40     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     495.481     320.942     377.488    1232.944       0.402       0.045

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.494      26.386     631.989      46.000      40.371      32.400      -7.971

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     388.306     320.942     503.771    1240.628       0.313       0.388

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.446      27.511     639.891     456.573       0.025       0.471

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     369.987       0.000     369.987    1241.751       0.298       0.363

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.584     641.050       0.000       0.060       0.057       0.410

    STAGE EXIT CONDITIONS, STAGE             4
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.860       29.338       1.138     652.470      27.457     211.225       1.637

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 171254.781       0.490    1382.697 1207648.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =10.975   EfDer =  0.989

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    142.874     3587.000       29.338     652.470       1.000        1.000        0.980
W Kg/sec =   64.94257

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     80.290     3198.226        1.401       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 109910.180  112108.148        2.179     509.668     233.875     390.276       1.669

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   345.61    -0.12   345.61      0.28   511.29
 MEAN    15.91      0.00    -0.02   345.61    -0.12   345.61      0.28
 HUB     13.07      0.00    -0.02   345.61    -0.12   345.61      0.28

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     58.93     47.36    11.57   573.46   669.66     27.80   642.51      0.54
 MEAN    55.25     44.80    10.45   498.12   606.37     27.80   642.51      0.49
 HUB     49.82     38.84    10.98   409.12   535.65     27.80   642.51      0.43

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   468.54    311.99    349.56   1261.98      0.37
 MEAN    15.50   464.80    300.41    354.68   1257.75      0.37
 HUB     12.59   487.30    328.17    360.23   1253.52      0.39
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   429.52   249.58     0.34  5599.20
 MEAN   485.11   399.89   184.71     0.32  4657.46     1.68
 HUB    394.10   366.21    65.93     0.29  4133.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     33.53     1.14    30.48   680.55     1.04   662.25     0.92     0.91
 MEAN    32.80     1.12    29.84   675.83     1.04   657.82     0.92     0.91
 HUB     32.39     1.10    29.18   673.20     1.03   653.40     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.75    35.53    31.50     4.03     0.93     0.44     2.90
 MEAN    40.26    27.51    23.50     4.01     0.94     0.41     3.34     0.91
 HUB     42.33    10.37     6.50     3.87     0.94     0.39     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     470.681     305.914     357.711    1257.976       0.374      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.844      29.817     658.056      46.000      40.537      33.000      -7.537

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     372.671     305.914     482.148    1264.547       0.295       0.331

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      32.770      30.851     664.948     440.827       0.044       0.477

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     349.306       0.000     349.306    1265.884       0.276       0.401

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      31.048     666.354       0.000       0.060       0.055       0.395

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864      32.736       1.116     676.528      24.058     222.171       1.722

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  150165.266       0.476    1212.422 1239810.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    958053.75   7735.2480    139.5732      2.1669      0.8443     10.9747      1.2940


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 95% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.536   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.038    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   63.65342

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    136.803    3572.873       1.402       0.249      53.349      32.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
107728.406	109882.742	2.087	831.557	398.399	619.754	1.556

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	324.31	-0.11	324.31	0.29	643.21
MEAN	17.06	0.00	-0.02	324.31	-0.11	324.31	0.29	
HUB	12.51	0.00	-0.02	324.31	-0.11	324.31	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	63.34	50.47	12.87	645.77	722.73	14.24	514.03	0.65
MEAN	58.74	47.20	11.54	534.02	624.88	14.24	514.03	0.56
HUB	50.38	38.62	11.76	391.59	508.54	14.24	514.03	0.46

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	592.01	418.69	418.54	1136.79	0.52
MEAN	18.04	610.28	433.85	429.21	1130.51	0.54
HUB	15.00	680.43	514.03	445.82	1121.84	0.61

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	645.77	476.17	227.08	0.42	8639.87	
MEAN	564.57	448.68	130.73	0.40	7826.76	1.58
HUB	469.54	448.03	44.50	0.40	7711.89	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.43	1.29	16.14	566.26	1.08	536.98	0.92	0.90
MEAN	18.99	1.26	15.57	562.17	1.08	531.06	0.92	0.90
HUB	18.92	1.25	14.76	561.59	1.07	522.92	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.01	28.48	24.20	4.28	0.93	0.44	2.90	
MEAN	45.31	16.94	12.70	4.24	0.94	0.38	3.51	0.90
HUB	49.06	-5.70	-9.30	3.60	0.94	0.23	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.983

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	617.014	433.003	439.561	1130.988	0.546	0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.076	15.577	531.539	24.000	44.569	35.400	-9.169

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	452.888	433.003	626.578	1146.486	0.395	0.428

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.977	17.039	546.206	528.796	0.037	0.553

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	420.074	0.000	420.074	1148.994	0.366	0.452

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.214	548.598	0.000	0.060	0.064	0.476

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.852	18.881	1.250	563.337	40.527	186.271	1.444

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
252315.062	0.605	1996.732	1363684.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =11.536 EfDer = 0.978

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
140.038	3587.000	18.881	563.337	1.000	1.000	0.980

W Kg/sec = 63.65342

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
113.622	3441.957	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
107728.406	109882.742	1.784	590.487	330.903	474.134	1.433

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	400.83	-0.14	400.83	0.35	617.24
MEAN	18.08	0.00	-0.02	400.83	-0.14	400.83	0.35	
HUB	15.21	0.00	-0.02	400.83	-0.14	400.83	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.08	46.36	11.72	643.27	758.04	17.36	549.92	0.66
MEAN	54.70	42.30	12.40	565.89	693.58	17.36	549.92	0.60
HUB	49.91	37.84	12.07	476.11	622.47	17.36	549.92	0.54

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	535.70	356.97	399.44	1177.30	0.46
MEAN	18.01	539.30	353.86	406.97	1172.25	0.46
HUB	15.22	577.56	401.20	415.47	1167.21	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	489.08	282.23	0.42	7292.19	
MEAN	563.76	457.91	209.89	0.39	6375.57	1.66
HUB	476.52	422.24	75.32	0.36	6109.51	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.00	1.22	19.95	599.98	1.07	576.02	0.92	0.89
MEAN	22.45	1.19	19.41	595.38	1.06	571.09	0.92	0.89
HUB	22.29	1.18	18.85	594.04	1.05	566.19	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.79	35.24	31.50	3.74	0.93	0.44	2.90	
MEAN	41.01	27.28	23.50	3.78	0.94	0.42	3.30	0.89
HUB	44.00	10.28	6.50	3.78	0.94	0.40	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.978

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	729.609	354.857	637.499	1152.500	0.633	-0.694

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.549	17.211	552.020	46.000	29.102	30.600	1.498

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	631.403	354.857	724.288	1164.092	0.542	-0.312

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	22.501	18.416	563.180	361.848	0.025	0.311

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	621.143	0.000	621.143	1165.201	0.533	0.404

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	18.494	564.253	0.000	0.060	0.042	-0.288

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.864	22.447	1.189	596.468	33.131	202.886	1.573

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
206385.719	0.505	1633.264	1216193.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =11.536 EfDer = 0.968

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
140.038	3587.000	22.447	596.468	1.000	1.000	0.710

W Kg/sec = 63.65342

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
98.343	3344.999	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
107728.406	109882.742	1.380	395.194	286.421	307.469	1.073

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	562.24	-0.19	562.24	0.48	585.84
MEAN	17.74	0.00	-0.02	562.24	-0.19	562.24	0.48	
HUB	15.05	0.00	-0.02	562.24	-0.19	562.24	0.48	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.18	46.36	1.82	628.24	843.23	19.17	570.08	0.72
MEAN	44.65	43.40	1.25	555.26	790.34	19.17	570.08	0.67
HUB	39.97	38.84	1.13	471.10	733.65	19.17	570.08	0.63

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	505.16	325.37	386.42	1209.00	0.42
MEAN	17.51	510.18	326.39	392.11	1204.91	0.42
HUB	14.85	547.83	375.95	398.47	1200.93	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.10	486.00	294.74	0.40	6449.41	
MEAN	548.00	450.40	221.61	0.37	5717.36	1.88
HUB	464.84	408.27	88.89	0.34	5585.73	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.44	1.18	23.45	628.86	1.05	607.56	0.92	0.89
MEAN	25.97	1.16	22.95	625.18	1.05	603.46	0.92	0.89
HUB	25.88	1.15	22.44	624.52	1.05	599.47	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.10	37.33	31.50	5.83	0.93	0.49	2.90	
MEAN	39.77	29.47	23.50	5.97	0.91	0.49	3.28	0.89
HUB	43.33	12.58	6.50	6.08	0.91	0.51	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.968

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	515.046	328.530	396.662	1205.493	0.427	0.012

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
26.066	22.988	604.048	46.000	39.633	31.500	-8.133

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	402.283	328.530	519.388	1214.078	0.331	0.369

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	26.013	24.107	612.681	471.992	0.027	0.454

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	391.313	0.000	391.313	1214.798	0.322	0.357

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	24.114	613.408	0.000	0.060	0.058	0.371

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.843	25.914	1.154	626.189	29.721	213.165	1.652

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
185256.281	0.482	1466.053	1725923.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =11.536 EfDer = 0.983

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
140.038	3587.000	25.914	626.189	1.000	1.000	0.980

W Kg/sec = 63.65342

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
87.282	3264.652	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
107728.406	109882.742	2.019	513.330	254.225	401.059	1.578

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	368.01	-0.13	368.01	0.30	548.69
MEAN	16.97	0.00	-0.02	368.01	-0.13	368.01	0.30	
HUB	14.32	0.00	-0.02	368.01	-0.13	368.01	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.61	46.36	12.25	602.89	706.44	24.32	614.89	0.58
MEAN	55.29	43.80	11.49	531.23	646.35	24.32	614.89	0.53
HUB	50.62	37.84	12.78	448.25	580.06	24.32	614.89	0.48

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	494.74	328.54	369.90	1237.74	0.40
MEAN	16.57	496.02	324.27	375.34	1233.59	0.40
HUB	13.89	527.87	364.94	381.41	1229.43	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	590.99	453.55	262.45	0.37	6205.21	
MEAN	518.80	422.76	194.54	0.34	5376.50	1.68
HUB	434.79	387.75	69.85	0.32	5070.82	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.19	1.17	27.04	657.33	1.05	636.91	0.92	0.90
MEAN	29.60	1.14	26.47	653.17	1.04	632.65	0.92	0.90
HUB	29.38	1.13	25.88	651.64	1.04	628.39	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.61	35.36	31.50	3.86	0.93	0.44	2.90	
MEAN	40.82	27.40	23.50	3.90	0.94	0.42	3.29	0.90
HUB	43.74	10.38	6.50	3.88	0.94	0.41	3.90	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.983

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481      491.632     326.090     367.923     1234.787       0.398       0.043

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     29.690      26.614      633.885      46.000      41.551      32.400      -9.151

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481      378.097     326.090     499.291     1242.784       0.304       0.407

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       29.634      27.789      642.123      456.573       0.027       0.490

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096      360.494       0.000     360.494     1243.833       0.290       0.377

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       27.842      643.208       0.000       0.060       0.064       0.423

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4           PR4        Texit        Del T        Ns         Ns nondim
      0.853       29.515        1.139      654.049      27.860      206.210       1.599

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 173777.703       0.498    1375.215 1179011.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =11.536   EfDer =  0.986

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    140.038     3587.000       29.515      654.049       1.000        1.000        0.980
W Kg/sec =   63.65342

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     78.319     3194.364        1.401        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 107728.406  109882.742        2.234      509.668     228.136      390.276       1.711

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00     -0.02    336.85     -0.12    336.85      0.27    510.67
 MEAN    15.91      0.00     -0.02    336.85     -0.12    336.85      0.27
 HUB     13.07      0.00     -0.02    336.85     -0.12    336.85      0.27

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     59.58     47.36     12.22   573.46    665.18     28.05    644.59      0.53
 MEAN    55.94     44.80     11.14   498.12    601.42     28.05    644.59      0.48
 HUB     50.54     38.84     11.70   409.12    530.04     28.05    644.59      0.43

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP      17.94   466.29    318.33    340.72   1264.18      0.37
 MEAN     15.50   461.12    305.11    345.75   1259.87      0.37
 HUB      12.59   481.82    329.83    351.22   1255.55      0.38

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP     561.57    418.64    243.24      0.33   5712.94
 MEAN    485.11    389.80    180.01      0.31   4730.29      1.71
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  HUB    394.10   357.05    64.26     0.28  4154.13

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     33.79     1.14    30.76   682.70     1.04   664.57     0.92     0.90
  MEAN    33.03     1.12    30.11   677.77     1.04   660.04     0.92     0.90
  HUB     32.58     1.10    29.43   674.88     1.03   655.53     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     43.05    35.52    31.50     4.02     0.93     0.45     2.90
  MEAN    41.43    27.50    23.50     4.00     0.94     0.43     3.34     0.90
  HUB     43.20    10.37     6.50     3.87     0.94     0.40     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.986

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     467.057     310.703     348.721    1260.076       0.371      -0.009

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      33.074      30.079     660.265      46.000      41.700      33.000      -8.700

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     363.046     310.703     477.848    1266.926       0.287       0.349

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      32.988      31.158     667.463     440.827       0.049       0.496

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     340.438       0.000     340.438    1268.184       0.268       0.415

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      31.339     668.789       0.000       0.060       0.061       0.408

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.858       32.949       1.116      678.453      24.404     216.995       1.682

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  152330.828       0.483    1205.492 1210546.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc    TR
     970065.56   7676.7568     136.8026      2.1810      0.8417     11.5355      1.2977


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 95% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.981

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     137.937     3587.000       15.107      522.810       1.000        1.000        0.980
 W Kg/sec =   62.69868

    W cor       RPM cor         GAMMA        Cp          R           Blades       THK
     134.751     3572.873        1.402        0.249      53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  106112.586  108234.609        2.119      831.557     392.423     619.754       1.579
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ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	319.00	-0.11	319.00	0.29	643.21
MEAN	17.06	0.00	-0.02	319.00	-0.11	319.00	0.29	
HUB	12.51	0.00	-0.02	319.00	-0.11	319.00	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	63.72	50.47	13.25	645.77	720.36	14.27	514.31	0.65
MEAN	59.15	47.20	11.95	534.02	622.14	14.27	514.31	0.56
HUB	50.84	38.62	12.22	391.59	505.17	14.27	514.31	0.45

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	589.72	422.47	411.44	1137.44	0.52
MEAN	18.04	606.77	436.01	421.98	1131.09	0.54
HUB	15.00	674.84	513.23	438.19	1122.45	0.60

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	645.77	468.13	223.30	0.41	8717.87	
MEAN	564.57	441.13	128.57	0.39	7865.69	1.60
HUB	469.54	440.36	43.69	0.39	7699.84	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.46	1.29	16.19	566.65	1.08	537.60	0.92	0.90
MEAN	19.00	1.26	15.61	562.36	1.08	531.61	0.92	0.90
HUB	18.91	1.25	14.80	561.53	1.07	523.49	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.76	28.49	24.20	4.29	0.93	0.45	2.90	
MEAN	45.94	16.94	12.70	4.24	0.94	0.39	3.51	0.90
HUB	49.51	-5.69	-9.30	3.61	0.94	0.24	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.981

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	613.265	435.159	432.123	1131.585	0.542	0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.084	15.624	532.100	24.000	45.201	35.400	-9.801

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	444.958	435.159	622.375	1147.294	0.388	0.438

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.980	17.107	546.976	528.796	0.039	0.563

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	413.032	0.000	413.032	1149.691	0.359	0.458

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.265	549.264	0.000	0.060	0.067	0.482

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.848	18.878	1.250	563.513	40.703	184.143	1.427

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
253409.453	0.608	1975.314	1341379.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =11.953 EfDer = 0.975

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
137.937	3587.000	18.878	563.513	1.000	1.000	0.980

W Kg/sec = 62.69868

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
111.950	3441.420	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
106112.586	108234.609	1.811	590.487	326.035	474.134	1.454

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	394.20	-0.14	394.20	0.34	617.14
MEAN	18.08	0.00	-0.02	394.20	-0.14	394.20	0.34	
HUB	15.21	0.00	-0.02	394.20	-0.14	394.20	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.51	46.36	12.15	643.27	754.56	17.40	550.54	0.66
MEAN	55.15	42.30	12.85	565.89	689.77	17.40	550.54	0.60
HUB	50.38	37.84	12.54	476.11	618.23	17.40	550.54	0.54

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	533.96	361.57	392.90	1178.12	0.45
MEAN	18.01	536.60	357.26	400.38	1172.99	0.46
HUB	15.22	573.62	402.38	408.81	1167.88	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	481.09	277.62	0.41	7386.09	
MEAN	563.76	450.49	206.50	0.38	6436.62	1.68
HUB	476.52	415.47	74.13	0.36	6127.55	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.04	1.22	20.01	600.63	1.07	576.83	0.92	0.89
MEAN	22.47	1.19	19.46	595.86	1.06	571.82	0.92	0.89
HUB	22.29	1.18	18.90	594.31	1.05	566.83	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.62	35.24	31.50	3.74	0.93	0.44	2.90	
MEAN	41.74	27.28	23.50	3.78	0.94	0.43	3.30	0.89
HUB	44.55	10.28	6.50	3.78	0.94	0.41	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.975

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	720.004	358.259	624.544	1154.197	0.624	-0.671

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.568	17.355	553.648	46.000	29.840	30.600	0.760

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	617.917	358.259	714.263	1166.024	0.530	-0.273

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	22.522	18.597	565.053	361.848	0.025	0.322

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	607.876	0.000	607.876	1167.084	0.521	0.420

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	18.675	566.080	0.000	0.060	0.040	-0.248

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    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864      22.473       1.190     596.934      33.421     199.892       1.550

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 208191.156       0.510    1622.840 1195271.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.974

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.937    3587.000      22.473     596.934       1.000       1.000       0.710
W Kg/sec =   62.69868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.794    3343.694       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
106112.586  108234.609       1.402     395.194     281.909     307.469       1.091

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   551.05    -0.19   551.05     0.47   585.61
 MEAN    17.74     0.00    -0.02   551.05    -0.19   551.05     0.47
 HUB     15.05     0.00    -0.02   551.05    -0.19   551.05     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.75    46.36     2.39   628.24   835.81    19.32   571.59     0.71
 MEAN    45.23    43.40     1.83   555.26   782.42    19.32   571.59     0.67
 HUB     40.54    38.84     1.70   471.10   725.10    19.32   571.59     0.62

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   503.47   331.37   379.05  1210.19     0.42
 MEAN    17.51   507.49   330.86   384.81  1205.99     0.42
 HUB     14.85   543.89   377.88   391.18  1201.89     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   476.49   288.74     0.39  6568.19
 MEAN   548.00   441.84   217.14     0.37  5795.63     1.90
 HUB    464.84   400.73    86.96     0.33  5614.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.58     1.18    23.59   629.92     1.06   608.77     0.92     0.89
 MEAN    26.07     1.16    23.08   626.04     1.05   604.55     0.92     0.89
 HUB     25.95     1.15    22.55   625.13     1.05   600.44     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.16    37.30    31.50     5.80     0.93     0.50     2.90
 MEAN    40.69    29.43    23.50     5.93     0.91     0.50     3.28     0.89
 HUB     44.01    12.53     6.50     6.03     0.91     0.51     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.974

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     512.282     333.034     389.257    1206.568       0.425       0.012

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.170      23.116     605.128      46.000      40.549      31.500      -9.049

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     17.392     394.427     333.034     516.221    1215.428       0.325       0.383

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.111      24.272     614.047     471.992       0.029       0.469

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     383.847       0.000     383.847    1216.108       0.316       0.368

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.267     614.734       0.000       0.060       0.063       0.382

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.847      26.004       1.157     627.032      30.098     209.042       1.620

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 187611.141       0.488    1462.420 1691211.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.937    3587.000      26.004     627.032       1.000       1.000       0.980
W Kg/sec =   62.69868

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     85.733    3262.457       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106112.586  108234.609       2.056     513.330     249.713     401.059       1.606

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   361.08    -0.12   361.08     0.30   548.32
 MEAN    16.97     0.00    -0.02   361.08    -0.12   361.08     0.30
 HUB     14.32     0.00    -0.02   361.08    -0.12   361.08     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.09    46.36    12.73   602.89   702.85    24.46   616.16     0.58
 MEAN    55.80    43.80    12.00   531.23   642.43    24.46   616.16     0.53
 HUB     51.16    37.84    13.32   448.25   575.69    24.46   616.16     0.47

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   492.89   333.45   362.98  1239.15     0.40
 MEAN    16.57   493.16   327.89   368.37  1234.93     0.40
 HUB     13.89   523.72   366.24   374.38  1230.69     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   445.06   257.54     0.36  6297.86
 MEAN   518.80   414.90   190.91     0.34  5436.55     1.70
 HUB    434.79   380.60    68.56     0.31  5088.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.35     1.17    27.21   658.64     1.05   638.37     0.92     0.90
 MEAN    29.72     1.14    26.63   654.32     1.04   634.03     0.92     0.90
 HUB     29.48     1.13    26.02   652.57     1.04   629.69     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.57    35.36    31.50     3.86     0.93     0.45     2.90
 MEAN    41.67    27.40    23.50     3.90     0.94     0.43     3.29     0.90
 HUB     44.37    10.38     6.50     3.88     0.94     0.42     3.90


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     489.026     329.736     361.138    1236.088       0.396       0.042

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.816      26.764     635.227      46.000      42.398      32.400      -9.998

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     370.873     329.736     496.259    1244.307       0.298       0.420

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.755      27.974     643.703     456.573       0.029       0.503

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     353.775       0.000     353.775    1245.306       0.284       0.386

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.011     644.736       0.000       0.060       0.068       0.431

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.848      29.627       1.139     655.177      28.145     202.704       1.571

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 175558.344       0.503    1368.469 1158116.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.983

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    137.937    3587.000      29.627     655.177       1.000       1.000       0.980
W Kg/sec =   62.69868

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     76.918    3191.613       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 106112.586  108234.609       2.275     509.668     224.054     390.276       1.742

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   330.65    -0.11   330.65     0.27   510.23
 MEAN    15.91     0.00    -0.02   330.65    -0.11   330.65     0.27
 HUB     13.07     0.00    -0.02   330.65    -0.11   330.65     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.04    47.36    12.68   573.46   662.05    28.21   646.06     0.53
 MEAN    56.43    44.80    11.63   498.12   597.96    28.21   646.06     0.48
 HUB     51.06    38.84    12.22   409.12   526.12    28.21   646.06     0.42

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   464.84   322.79   334.48  1265.73     0.37
 MEAN    15.50   458.62   308.40   339.44  1261.36     0.36
 HUB     12.59   478.00   331.01   344.85  1256.98     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   410.96   238.77     0.32  5792.99
 MEAN   485.11   382.69   176.71     0.30  4781.27     1.74
 HUB    394.10   350.57    63.09     0.28  4168.92

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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  TIP     33.96     1.15    30.94   684.23     1.04   666.22     0.92     0.90
  MEAN    33.18     1.12    30.28   679.16     1.04   661.62     0.92     0.90
  HUB     32.71     1.10    29.60   676.09     1.03   657.03     0.92     0.90

          Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     43.98    35.52    31.50     4.02     0.93     0.46     2.90
  MEAN    42.26    27.50    23.50     4.00     0.94     0.44     3.34     0.90
  HUB     43.83    10.37     6.50     3.87     0.94     0.41     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.983

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     464.592     314.055     342.368    1261.559       0.368      -0.010

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      33.221      30.249     661.828      46.000      42.530      33.000      -9.530

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     356.262     314.055     474.924    1268.605       0.281       0.361

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      33.125      31.359     669.242     440.827       0.052       0.509

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     334.183       0.000     334.183    1269.809       0.263       0.425

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      31.527     670.513       0.000       0.060       0.066       0.417

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.853      33.084       1.117     679.824      24.647     213.391       1.654

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  153852.578       0.488    1199.273 1189186.625

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     978622.69   7628.3154    134.7507      2.1899      0.8392     11.9530      1.3003


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 95% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =12.498   EfDer =  0.977

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     135.209    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   61.45868

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     132.086    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  104013.984  106094.039       2.162     831.557     384.662     619.754       1.611

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     20.63     0.00    -0.02   312.15    -0.11   312.15     0.28   643.21
MEAN    17.06     0.00    -0.02   312.15    -0.11   312.15     0.28
HUB     12.51     0.00    -0.02   312.15    -0.11   312.15     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     64.21    50.47    13.74   645.77   717.35    14.30   514.67     0.64
MEAN    59.70    47.20    12.50   534.02   618.65    14.30   514.67     0.56
HUB     51.45    38.62    12.83   391.59   500.87    14.30   514.67     0.45

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   586.92   427.32   402.34  1138.26     0.52
MEAN    18.04   602.35   438.75   412.69  1131.83     0.53
HUB     15.00   667.71   512.17   428.39  1123.21     0.59

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    645.77   457.82   218.45     0.40  8817.75
MEAN   564.57   431.45   125.82     0.38  7915.20     1.63
HUB    469.54   430.50    42.64     0.38  7683.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.49     1.29    16.26   567.15     1.08   538.38     0.92     0.89
MEAN    19.01     1.26    15.67   562.61     1.08   532.31     0.92     0.89
HUB     18.88     1.25    14.86   561.45     1.07   524.21     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.72    28.50    24.20     4.30     0.93     0.46     2.90
MEAN    46.75    16.96    12.70     4.26     0.94     0.41     3.51     0.89
HUB     50.09    -5.68    -9.30     3.62     0.94     0.26     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.977

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     608.543     437.901     422.572    1132.335       0.537       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.093      15.682     532.806      24.000      46.021      35.400     -10.621

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     434.804     437.901     617.099    1148.311       0.379       0.451

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.981      17.191     547.946     528.796       0.042       0.576

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     18.083     403.999       0.000     403.999    1150.570       0.351       0.466

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.329     550.104       0.000       0.060       0.072       0.491

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.842      18.873       1.249     563.736      40.926     181.406       1.406

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 254802.141       0.611    1946.889 1312555.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =12.498   EfDer =  0.971

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.209    3587.000      18.873     563.736       1.000       1.000       0.980
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W Kg/sec = 61.45868

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
109.789	3440.737	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
104013.984	106094.039	1.847	590.487	319.740	474.134	1.483

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	385.69	-0.13	385.69	0.33	617.02
MEAN	18.08	0.00	-0.02	385.69	-0.13	385.69	0.33	
HUB	15.21	0.00	-0.02	385.69	-0.13	385.69	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.06	46.36	12.70	643.27	750.15	17.46	551.32	0.65
MEAN	55.73	42.30	13.43	565.89	684.94	17.46	551.32	0.59
HUB	51.00	37.84	13.16	476.11	612.83	17.46	551.32	0.53

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	531.87	367.43	384.56	1179.15	0.45
MEAN	18.01	533.24	361.57	391.93	1173.93	0.45
HUB	15.22	568.65	403.92	400.26	1168.71	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	470.89	271.77	0.40	7505.65	
MEAN	563.76	441.01	202.18	0.38	6514.28	1.71
HUB	476.52	406.79	72.60	0.35	6150.92	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.08	1.22	20.07	601.46	1.07	577.84	0.92	0.89
MEAN	22.49	1.19	19.52	596.47	1.06	572.73	0.92	0.89
HUB	22.28	1.18	18.94	594.65	1.05	567.65	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.70	35.25	31.50	3.75	0.93	0.46	2.90	
MEAN	42.69	27.29	23.50	3.79	0.94	0.44	3.30	0.89
HUB	45.26	10.28	6.50	3.78	0.94	0.42	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.971

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	708.155	362.586	608.288	1156.285	0.612	-0.641

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.587	17.530	555.655	46.000	30.798	30.600	-0.198

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	601.087	362.586	701.979	1168.399	0.514	-0.224

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	22.544	18.816	567.359	361.848	0.024	0.336

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	591.349	0.000	591.349	1169.397	0.506	0.438

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	18.892	568.329	0.000	0.060	0.038	-0.200

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

```
      0.862      22.500       1.192     597.527      33.790     196.098       1.520

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 210493.172       0.515    1608.334 1168334.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =12.498   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.209    3587.000      22.500     597.527       1.000       1.000       0.710
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     94.813    3342.034       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       1.431     395.194     276.142     307.469       1.113

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   536.99    -0.18   536.99     0.46   585.32
 MEAN    17.74     0.00    -0.02   536.99    -0.18   536.99     0.46
 HUB     15.05     0.00    -0.02   536.99    -0.18   536.99     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.49    46.36     3.13   628.24   826.61    19.49   573.46     0.70
 MEAN    45.97    43.40     2.57   555.26   772.58    19.49   573.46     0.66
 HUB     41.27    38.84     2.43   471.10   714.48    19.49   573.46     0.61

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   501.58   338.87   369.80  1211.68     0.41
 MEAN    17.51   504.30   336.49   375.63  1207.34     0.42
 HUB     14.85   539.04   380.31   382.01  1203.10     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   464.59   281.23     0.38  6716.70
 MEAN   548.00   431.08   211.51     0.36  5894.01     1.93
 HUB    464.84   391.25    84.53     0.33  5650.39

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.74     1.19    23.76   631.26     1.06   610.26     0.92     0.90
 MEAN    26.19     1.16    23.23   627.13     1.05   605.90     0.92     0.90
 HUB     26.03     1.16    22.68   625.91     1.05   601.65     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.50    37.25    31.50     5.75     0.93     0.51     2.90
 MEAN    41.85    29.38    23.50     5.88     0.91     0.51     3.28     0.90
 HUB     44.87    12.48     6.50     5.98     0.91     0.52     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.982

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     509.003     338.695     379.960    1207.906       0.421       0.012

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.290      23.265     606.475      46.000      41.714      31.500     -10.214

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     384.592     338.695     512.470    1217.111       0.316       0.402

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      26.224      24.469     615.753     471.992       0.031       0.488

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     374.500       0.000     374.500    1217.743       0.308       0.381

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.446     616.393       0.000       0.060       0.070       0.395

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.850      26.105       1.160     628.098      30.572     203.957       1.581

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 190564.000       0.496    1456.059 1647201.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =12.498   EfDer =  0.976

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.209    3587.000      26.105     628.098       1.000       1.000       0.980
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.782    3259.685       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       2.104     513.330     244.030     401.059       1.643

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   352.40    -0.12   352.40     0.29   547.86
 MEAN    16.97     0.00    -0.02   352.40    -0.12   352.40     0.29
 HUB     14.32     0.00    -0.02   352.40    -0.12   352.40     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.70    46.36    13.34   602.89   698.43    24.63   617.74     0.57
 MEAN    56.45    43.80    12.65   531.23   637.59    24.63   617.74     0.52
 HUB     51.83    37.84    13.99   448.25   570.28    24.63   617.74     0.47

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   490.77   339.56   354.34  1240.91     0.40
 MEAN    16.57   489.73   332.39   359.65  1236.59     0.40
 HUB     13.89   518.61   367.85   365.58  1232.27     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   434.48   251.43     0.35  6413.30
 MEAN   518.80   405.09   186.41     0.33  5511.07     1.73
 HUB    434.79   371.66    66.95     0.30  5111.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.52     1.17    27.40   660.29     1.05   640.19     0.92     0.89
 MEAN    29.87     1.14    26.81   655.76     1.04   635.75     0.92     0.89
 HUB     29.58     1.13    26.19   653.75     1.04   631.31     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.78    35.36    31.50     3.86     0.93     0.46     2.90
 MEAN    42.74    27.40    23.50     3.90     0.94     0.44     3.29     0.89
 HUB     45.18    10.38     6.50     3.88     0.94     0.43     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.976

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     485.894     334.261     352.651    1237.712       0.393       0.041

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.960      26.937     636.903      46.000      43.466      32.400     -11.066

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     361.858     334.261     492.617    1246.206       0.290       0.436

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.891      28.190     645.675     456.573       0.031       0.521

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     16.096     345.385       0.000     345.385    1247.144       0.277       0.398

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.208     646.647       0.000       0.060       0.075       0.441

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.841      29.753       1.140     656.598      28.500     198.378       1.538

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 177773.859       0.509    1358.333 1131328.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =12.498   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.209    3587.000      29.753     656.598       1.000       1.000       0.980
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     75.161    3188.156       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       2.328     509.668     218.937     390.276       1.783

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   322.89    -0.11   322.89     0.26   509.68
 MEAN    15.91     0.00    -0.02   322.89    -0.11   322.89     0.26
 HUB     13.07     0.00    -0.02   322.89    -0.11   322.89     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.62    47.36    13.26   573.46   658.21    28.40   647.91     0.53
 MEAN    57.05    44.80    12.25   498.12   593.71    28.40   647.91     0.48
 HUB     51.73    38.84    12.89   409.12   521.28    28.40   647.91     0.42

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   463.18   328.33   326.71  1267.67     0.37
 MEAN    15.50   455.62   312.48   331.58  1263.22     0.36
 HUB     12.59   473.30   332.44   336.89  1258.77     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   401.42   233.24     0.32  5892.30
 MEAN   485.11   373.83   172.63     0.30  4844.50     1.77
 HUB    394.10   342.48    61.65     0.27  4186.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     34.16     1.15    31.15   686.15     1.05   668.26     0.92     0.90
 MEAN    33.34     1.12    30.47   680.89     1.04   663.59     0.92     0.90
 HUB     32.84     1.10    29.78   677.60     1.03   658.92     0.92     0.90
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         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     45.14    35.52    31.50     4.02     0.93     0.48     2.90
  MEAN    43.30    27.50    23.50     4.00     0.94     0.45     3.34     0.90
  HUB     44.62    10.37     6.50     3.87     0.94     0.42     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.979

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     461.641     318.212     334.445    1263.406       0.365      -0.010

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      33.386      30.442     663.778      46.000      43.575      33.000     -10.575

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     347.821     318.212     471.422    1270.695       0.274       0.377

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      33.278      31.589     671.460     440.827       0.056       0.526

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     326.395       0.000     326.395    1271.834       0.257       0.437

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      31.743     672.664       0.000       0.060       0.072       0.428

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.846      33.231       1.117     681.546      24.948     208.958       1.620

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  155736.312       0.494    1189.948 1161792.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     989369.50   7559.5630    132.0858      2.1997      0.8353     12.4979      1.3036


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 95%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 4.754   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     175.471    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   79.75962

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     171.418    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  134986.875  137686.328       1.666     831.557     499.206     619.754       1.241

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   418.02    -0.14   418.02     0.38   643.21
  MEAN    17.06     0.00    -0.02   418.02    -0.14   418.02     0.38
  HUB     12.51     0.00    -0.02   418.02    -0.14   418.02     0.38
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.09    50.47     6.62   645.77   769.38    13.69   508.21     0.70
MEAN    51.95    47.20     4.75   534.02   678.29    13.69   508.21     0.61
HUB     43.14    38.62     4.52   391.59   572.89    13.69   508.21     0.52

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   654.03   344.04   556.23  1121.81     0.58
MEAN    18.04   689.18   391.65   567.09  1117.44     0.62
HUB     15.00   793.56   528.63   591.86  1108.37     0.72

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    645.77   632.80   301.73     0.56  7100.61
MEAN   564.57   592.87   172.93     0.53  7066.21     1.27
HUB    469.54   594.80    59.09     0.54  7931.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.65     1.23    14.81   558.52     1.07   522.80     0.92     0.91
MEAN    18.63     1.23    14.41   558.34     1.07   518.69     0.92     0.91
HUB     19.10     1.26    13.57   562.69     1.08   510.13     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.74    28.48    24.20     4.28     0.93     0.25     2.90
MEAN    34.63    16.96    12.70     4.26     0.92     0.21     3.51     0.91
HUB     41.77    -5.70    -9.30     3.60     0.92     0.07     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     701.733     390.886     582.783    1117.268       0.628      -0.009

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.747      14.366     518.720      24.000      33.851      35.400       1.549

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     612.323     390.886     726.452    1127.786       0.543       0.225

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.678      15.281     528.533     528.796       0.025       0.388

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     560.084       0.000     560.084    1133.231       0.494       0.302

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.736     533.649       0.000       0.060       0.042       0.326

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.867      18.600       1.231     559.850      37.040     226.243       1.754

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 230603.953       0.553    2286.677 1757749.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.754   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    175.471    3587.000      18.600     559.850       1.000       1.000       0.980
W Kg/sec =   79.75962

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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   144.078    3452.660       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
134986.875  137686.328       1.407     590.487     419.599     474.134       1.130

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   531.05    -0.18   531.05     0.47   619.16
MEAN    18.08     0.00    -0.02   531.05    -0.18   531.05     0.47
HUB     15.21     0.00    -0.02   531.05    -0.18   531.05     0.47

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.47    46.36     4.11   643.27   834.29    16.01   536.30     0.73
MEAN    46.83    42.30     4.53   565.89   776.18    16.01   536.30     0.68
HUB     41.89    37.84     4.05   476.11   713.35    16.01   536.30     0.63

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   595.47   258.76   536.31  1157.59     0.51
MEAN    18.01   611.41   282.40   542.29  1154.89     0.53
HUB     15.22   665.36   375.20   549.48  1152.21     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    639.20   657.54   380.44     0.57  5287.56
MEAN   563.76   610.93   281.36     0.53  5089.32     1.37
HUB    476.52   558.75   101.32     0.48  5714.38

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.56     1.16    17.99   586.42     1.05   556.82     0.92     0.91
MEAN    21.44     1.15    17.71   585.43     1.05   554.22     0.92     0.91
HUB     21.81     1.17    17.39   588.57     1.05   551.61     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.76    35.35    31.50     3.85     0.93     0.27     2.90
MEAN    27.51    27.42    23.50     3.92     0.92     0.27     3.30     0.91
HUB     34.33    10.45     6.50     3.95     0.92     0.28     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960    Infinity     283.193    Infinity       0.000    Infinity      -4.537

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.564       0.000       0.000      46.000       0.000      30.600      30.600

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960       0.000     283.193     283.193    1188.271       0.000   -Infinity

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.650   -Infinity   -Infinity     586.807     345.258    Infinity       1.000

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823    2247.147       0.000    2247.147     951.237       2.362       0.393

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.650       1.533     276.629       0.000       0.060       0.122      -4.142

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.773      21.128       1.136     586.807      26.958     272.600       2.113

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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 167920.500       0.411    1665.105 1604570.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.754   EfDer =  0.932

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    175.471    3587.000      21.128     586.807       1.000       1.000       0.680
W Kg/sec =   79.75962

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    129.857    3372.421       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134986.875  137686.328       1.001     378.495     378.199     293.880       0.777

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02  1056.64    -0.36  1056.64     0.97   590.64
 MEAN    17.74     0.00    -0.02  1056.64    -0.36  1056.64     0.97
 HUB     15.05     0.00    -0.02  1056.64    -0.36  1056.64     0.97

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     30.75    46.36   -15.61   628.24  1229.49    11.55   493.61     1.13
 MEAN    27.74    43.40   -15.66   555.26  1193.82    11.55   493.61     1.10
 HUB     24.05    38.84   -14.79   471.10  1157.06    11.55   493.61     1.06

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   576.06   162.94   552.53  1176.62     0.49
 MEAN    17.51   588.41   203.24   552.19  1177.09     0.50
 HUB     14.85   635.41   312.87   553.04  1177.78     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   717.14   457.16     0.61  3235.15
 MEAN   548.00   650.98   344.76     0.55  3564.43     1.90
 HUB    464.84   573.54   151.97     0.49  4651.64

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.92     1.08    19.45   603.06     1.03   575.36     0.92     0.85
 MEAN    23.11     1.09    19.48   604.71     1.03   575.82     0.92     0.85
 HUB     23.74     1.12    19.47   610.18     1.04   576.48     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.43    39.60    31.50     8.10     0.93     0.44     2.90
 MEAN    20.21    31.98    23.50     8.48     0.81     0.48     3.28     0.85
 HUB     29.50    15.36     6.50     8.86     0.81     0.54     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.932

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     595.445     204.570     559.201    1177.590       0.506       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.219      19.497     576.387      46.000      20.094      31.500      11.406

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     587.363     204.570     621.968    1178.405       0.498       0.006

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.099      19.490     577.185     471.992       0.042       0.158

    VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	570.036	0.000	570.036	1180.112	0.483	0.020

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.574	578.859	0.000	0.060	0.077	0.028

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.740	22.966	1.087	605.983	19.175	397.329	3.080

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
119499.117	0.311	1184.957	3141095.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 4.754 EfDer = 0.967

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
175.471	3587.000	22.966	605.983	1.000	1.000	0.980

W Kg/sec = 79.75962

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
121.399	3318.635	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
134986.875	137686.328	1.452	513.330	353.582	401.059	1.134

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	531.09	-0.18	531.09	0.45	557.76
MEAN	16.97	0.00	-0.02	531.09	-0.18	531.09	0.45	
HUB	14.32	0.00	-0.02	531.09	-0.18	531.09	0.45	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.63	46.36	2.27	602.89	803.59	20.00	582.45	0.68
MEAN	45.02	43.80	1.22	531.23	751.30	20.00	582.45	0.63
HUB	40.18	37.84	2.34	448.25	695.09	20.00	582.45	0.59

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	581.72	200.92	545.93	1198.26	0.49
MEAN	16.57	595.46	231.68	548.55	1197.14	0.50
HUB	13.89	644.13	330.88	552.65	1195.92	0.54

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	590.99	670.96	390.07	0.56	3796.87	
MEAN	518.80	619.15	287.13	0.52	3842.87	1.30
HUB	434.79	562.33	103.92	0.47	4598.49	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.28	1.10	21.51	625.05	1.03	596.81	0.92	0.88
MEAN	25.31	1.10	21.37	625.28	1.03	595.70	0.92	0.88
HUB	25.78	1.12	21.16	629.07	1.04	594.46	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.21	35.55	31.50	4.05	0.93	0.21	2.90	
MEAN	22.90	27.63	23.50	4.13	0.91	0.22	3.29	0.88
HUB	30.91	10.65	6.50	4.15	0.91	0.25	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.967

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	584.236	232.979	535.773	1199.373	0.487	0.058

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.414      21.604     597.986      46.000      23.502      32.400       8.898

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     565.307     232.979     611.434    1201.192       0.471       0.099

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.322      21.754     599.802     456.573       0.032       0.217

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     535.619       0.000     535.619    1203.920       0.445       0.095

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.995     602.529       0.000       0.060       0.062       0.158

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.797      25.200       1.097     626.468      20.486     312.097       2.419

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 127712.289       0.366    1266.399 1596787.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 4.754   EfDer =  0.955

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    175.471    3587.000      25.200     626.468       1.000       1.000       0.980
W Kg/sec =   79.75962

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.492    3263.923       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134986.875  137686.328       1.555     509.668     327.657     390.276       1.191

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   496.17    -0.17   496.17     0.41   521.80
 MEAN    15.91     0.00    -0.02   496.17    -0.17   496.17     0.41
 HUB     13.07     0.00    -0.02   496.17    -0.17   496.17     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.14    47.36     1.78   573.46   758.44    22.43   605.93     0.63
 MEAN    45.12    44.80     0.32   498.12   703.19    22.43   605.93     0.58
 HUB     39.52    38.84     0.68   409.12   643.20    22.43   605.93     0.53

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   547.53   192.58   512.55  1220.03     0.45
 MEAN    15.50   558.31   213.50   515.87  1218.33     0.46
 HUB     12.59   598.72   296.17   520.34  1216.56     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   631.55   368.99     0.52  3457.96
 MEAN   485.11   583.00   271.61     0.48  3311.52     1.30
 HUB    394.10   529.47    97.93     0.44  3730.96

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.39     1.09    23.86   643.83     1.03   618.82     0.92     0.87
 MEAN    27.30     1.08    23.64   643.09     1.03   617.09     0.92     0.87
 HUB     27.57     1.09    23.36   645.20     1.03   615.30     0.92     0.87

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.59    35.75    31.50     4.25     0.93     0.21     2.90
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 MEAN    22.48    27.77    23.50     4.27     0.90     0.22     3.34     0.87
 HUB     29.65    10.66     6.50     4.16     0.90     0.23     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.955

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     564.248     217.419     520.677    1218.674       0.463       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.346      23.607     617.480      46.000      22.664      33.000      10.336

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     558.030     217.419     598.890    1219.248       0.458       -0.026

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.157      23.520     618.062     440.827       0.070       0.213

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     517.725       0.000     517.725    1222.810       0.423       0.104

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.003     621.679       0.000       0.060       0.070       0.101

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.771      27.155       1.078     644.037      17.568     337.167       2.614

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 109577.375       0.347    1086.573 1641558.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    755313.25   7489.7119    171.4177      1.7975      0.7896      4.7545      1.2319


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*******************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 95%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.397    3587.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   79.27158

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    170.369    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134160.906  136843.844       1.676     831.557     496.151     619.754       1.249

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   415.04    -0.14   415.04     0.38   643.21
 MEAN    17.06     0.00    -0.02   415.04    -0.14   415.04     0.38
 HUB     12.51     0.00    -0.02   415.04    -0.14   415.04     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.28    50.47     6.81   645.77   767.77    13.71   508.42     0.69
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MEAN    52.15    47.20     4.95   534.02   676.46    13.71   508.42     0.61
HUB     43.35    38.62     4.73   391.59   570.72    13.71   508.42     0.52

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   651.28   346.69   551.34  1122.41     0.58
MEAN    18.04   686.09   393.14   562.28  1117.95     0.61
HUB     15.00   789.41   528.12   586.73  1108.90     0.71

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    645.77   627.23   299.08     0.56  7155.26
MEAN   564.57   587.83   171.44     0.53  7093.05     1.28
HUB    469.54   589.65    58.58     0.53  7923.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.68     1.24    14.87   558.79     1.07   523.37     0.92     0.91
MEAN    18.65     1.23    14.46   558.48     1.07   519.18     0.92     0.91
HUB     19.10     1.26    13.62   562.65     1.08   510.64     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.16    28.48    24.20     4.28     0.93     0.26     2.90
MEAN    34.96    16.96    12.70     4.26     0.92     0.22     3.51     0.91
HUB     41.99    -5.70    -9.30     3.60     0.92     0.07     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    18.071     698.366     392.372     577.718    1117.825       0.625      -0.009

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.763      14.418     519.238      24.000      34.183      35.400       1.217

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     606.348     392.372     722.228    1128.567       0.537       0.232

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.696      15.358     529.265     528.796       0.025       0.393

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     554.830       0.000     554.830    1133.882       0.489       0.309

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.806     534.262       0.000       0.060       0.041       0.332

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.870      18.622       1.233     559.974      37.164     224.871       1.743

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 231374.969       0.555    2280.283 1745222.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.397    3587.000      18.622     559.974       1.000       1.000       0.980
W Kg/sec =   79.27158

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    143.040    3452.278       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 134160.906  136843.844       1.417     590.487     416.576     474.134       1.138

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   526.23    -0.18   526.23     0.46   619.09
MEAN    18.08     0.00    -0.02   526.23    -0.18   526.23     0.46
HUB     15.21     0.00    -0.02   526.23    -0.18   526.23     0.46

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.72    46.36     4.36   643.27   831.23    16.07   536.85     0.73
MEAN    47.09    42.30     4.79   565.89   772.89    16.07   536.85     0.68
HUB     42.15    37.84     4.31   476.11   709.77    16.07   536.85     0.62

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   592.28   262.71   530.83  1158.46     0.51
MEAN    18.01   608.04   285.22   537.00  1155.64     0.53
HUB     15.22   661.71   376.23   544.34  1152.84     0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    639.20   650.79   376.49     0.56  5368.17
MEAN   563.76   604.94   278.54     0.52  5140.04     1.38
HUB    476.52   553.50   100.29     0.48  5730.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.63     1.16    18.10   586.95     1.05   557.67     0.92     0.91
MEAN    21.50     1.15    17.80   585.81     1.05   554.94     0.92     0.91
HUB     21.85     1.17    17.47   588.77     1.05   552.22     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     26.33    35.35    31.50     3.85     0.93     0.27     2.90
MEAN    27.97    27.42    23.50     3.92     0.92     0.27     3.30     0.91
HUB     34.65    10.44     6.50     3.94     0.92     0.29     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960***********     286.019***********       8.807***********      -4.597

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.622       0.000       0.000      46.000       0.000      30.600      30.600

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960       0.000     286.019     286.019    1188.645       0.000***********

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.650************************     587.177     345.258***********       1.000

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823    1772.213       0.000    1772.213     996.344       1.779       0.983

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.650       3.807     358.979       0.000       0.060       0.122      -3.611

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.776      21.189       1.138     587.177      27.204     269.516       2.089

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 169454.297       0.415    1670.033 1591309.125
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.953   EfDer =  0.834

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    174.397    3587.000      21.189     587.177       1.000       1.000       0.680
W Kg/sec =   79.27158

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    128.728    3371.358       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134160.906  136843.844       1.010     378.495     374.911     293.880       0.784

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   988.50    -0.34   988.50     0.90   590.45
 MEAN    17.74     0.00    -0.02   988.50    -0.34   988.50     0.90
 HUB     15.05     0.00    -0.02   988.50    -0.34   988.50     0.90

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     32.45    46.36   -13.91   628.24  1171.43    12.57   505.61     1.06
 MEAN    29.34    43.40   -14.06   555.26  1133.94    12.57   505.61     1.03
 HUB     25.50    38.84   -13.34   471.10  1095.16    12.57   505.61     0.99

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   577.39   170.67   551.59  1177.65     0.49
 MEAN    17.51   590.70   209.51   552.30  1177.80     0.50
 HUB     14.85   640.14   317.93   555.61  1178.03     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   711.50   449.43     0.60  3387.89
 MEAN   548.00   647.77   338.49     0.55  3673.83     1.82
 HUB    464.84   574.71   146.92     0.49  4726.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.87     1.08    19.40   604.20     1.03   576.37     0.92     0.76
 MEAN    23.02     1.09    19.38   605.63     1.03   576.51     0.92     0.76
 HUB     23.56     1.11    19.27   610.92     1.04   576.72     0.92     0.76

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.19    39.17    31.50     7.67     0.93     0.42     2.90
 MEAN    20.77    31.50    23.50     8.00     0.82     0.46     3.28     0.76
 HUB     29.78    14.81     6.50     8.31     0.82     0.51     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.834

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     598.184     210.885     559.778    1178.265       0.508       0.000

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.112      19.380     577.048      46.000      20.643      31.500      10.857

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     587.065     210.885     623.793    1179.387       0.498       0.016

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.998      19.413     578.148     471.992       0.040       0.166

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     569.580       0.000     569.580    1181.108       0.482       0.032
```

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.503	579.836	0.000	0.060	0.074	0.040

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.658	22.870	1.079	606.917	19.739	376.037	2.915

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
123014.039	0.320	1212.348	2943835.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 4.953 EfDer = 0.967

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
174.397	3587.000	22.870	606.917	1.000	1.000	0.980

W Kg/sec = 79.27158

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
121.253	3316.080	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
134160.906	136843.844	1.454	513.330	353.159	401.059	1.136

ROTOR LEADING EDGE CONDITIONS, STAGE 4

R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP 19.26	0.00	-0.02	530.70	-0.18	530.70	0.45	557.33
MEAN 16.97	0.00	-0.02	530.70	-0.18	530.70	0.45	
HUB 14.32	0.00	-0.02	530.70	-0.18	530.70	0.45	

BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP 48.65	46.36	2.29	602.89	803.33	19.92	583.42	0.68
MEAN 45.04	43.80	1.24	531.23	751.03	19.92	583.42	0.63
HUB 40.20	37.84	2.36	448.25	694.80	19.92	583.42	0.59

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

R2	C2	Cu2	Cm2	Ao2	Mach2
TIP 18.88	581.45	201.22	545.52	1199.24	0.48
MEAN 16.57	595.18	231.89	548.15	1198.12	0.50
HUB 13.89	643.84	330.97	552.25	1196.89	0.54

U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP 590.99	670.45	389.77	0.56	3802.61	
MEAN 518.80	618.70	286.91	0.52	3846.47	1.30
HUB 434.79	561.93	103.82	0.47	4599.80	

Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP 25.17	1.10	21.43	626.01	1.03	597.81	0.92	0.89
MEAN 25.20	1.10	21.29	626.23	1.03	596.68	0.92	0.89
HUB 25.67	1.12	21.08	630.02	1.04	595.43	0.92	0.89

Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP 20.25	35.55	31.50	4.05	0.93	0.21	2.90	
MEAN 22.93	27.63	23.50	4.13	0.91	0.22	3.29	0.89
HUB 30.93	10.65	6.50	4.15	0.91	0.25	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.967

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	583.976	233.198	535.394	1200.342	0.487	0.058

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.308	21.522	598.964	46.000	23.536	32.400	8.864

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	564.857	233.198	611.101	1202.177	0.470	0.100

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	25.217	21.674	600.797	456.573	0.032	0.218

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	535.204	0.000	535.204	1204.897	0.444	0.096

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.913	603.519	0.000	0.060	0.062	0.159

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.798	25.095	1.097	627.420	20.503	311.779	2.417

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
127823.242	0.366	1259.744	1584733.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 4.953 EfDer = 0.955

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
174.397	3587.000	25.095	627.420	1.000	1.000	0.980

W Kg/sec = 79.27158

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
112.353	3261.447	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
134160.906	136843.844	1.557	509.668	327.256	390.276	1.193

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	495.81	-0.17	495.81	0.41	521.40
MEAN	15.91	0.00	-0.02	495.81	-0.17	495.81	0.41	
HUB	13.07	0.00	-0.02	495.81	-0.17	495.81	0.41	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.16	47.36	1.80	573.46	758.21	22.35	606.92	0.63
MEAN	45.14	44.80	0.34	498.12	702.93	22.35	606.92	0.58
HUB	39.54	38.84	0.70	409.12	642.92	22.35	606.92	0.53

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	547.27	192.87	512.16	1221.00	0.45
MEAN	15.50	558.04	213.70	515.50	1219.29	0.46
HUB	12.59	598.44	296.26	519.96	1217.53	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	561.57	631.07	368.70	0.52	3463.14	
MEAN	485.11	582.58	271.41	0.48	3314.56	1.31
HUB	394.10	529.09	97.83	0.43	3732.20	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.28	1.09	23.77	644.80	1.03	619.82	0.92	0.87
MEAN	27.19	1.08	23.55	644.06	1.03	618.08	0.92	0.87
HUB	27.46	1.09	23.27	646.15	1.03	616.28	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.63	35.75	31.50	4.25	0.93	0.21	2.90	
MEAN	22.52	27.77	23.50	4.27	0.90	0.22	3.34	0.87
HUB	29.67	10.66	6.50	4.16	0.90	0.23	4.06	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.955

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     563.970     217.619     520.292    1219.643       0.462      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.233      23.517     618.475      46.000      22.698      33.000      10.302

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     557.546     217.619     598.511    1220.235       0.457      -0.025

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.045      23.435     619.076     440.827       0.070       0.213

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     517.313       0.000     517.313    1223.785       0.423       0.105

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.913     622.683       0.000       0.060       0.070       0.102

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.772      27.043       1.078     645.004      17.584     336.818       2.611

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  109676.062       0.348    1080.897 1629275.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    761342.56   7503.3052    170.3689      1.7901      0.7774      4.9531      1.2337


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

   Fan-Core + 4 Stage LPC 95%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.704    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   78.04749

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    167.738    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  132089.219  134730.734       1.702     831.557     488.490     619.754       1.269

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   407.62    -0.14   407.62     0.37   643.21
  MEAN    17.06     0.00    -0.02   407.62    -0.14   407.62     0.37
  HUB     12.51     0.00    -0.02   407.62    -0.14   407.62     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.75    50.47     7.28   645.77   763.77    13.75   508.93     0.69
  MEAN    52.65    47.20     5.45   534.02   671.92    13.75   508.93     0.61
  HUB     43.86    38.62     5.24   391.59   565.34    13.75   508.93     0.51
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      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   644.70   353.22   539.33  1123.88     0.57
MEAN    18.04   678.55   396.77   550.45  1119.20     0.61
HUB     15.00   779.25   526.87   574.13  1110.19     0.70

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    645.77   613.57   292.55     0.55  7289.83
MEAN   564.57   575.46   167.80     0.51  7158.59     1.30
HUB    469.54   576.99    57.33     0.52  7904.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.76     1.24    15.00   559.47     1.07   524.76     0.92     0.91
MEAN    18.69     1.24    14.57   558.81     1.07   520.36     0.92     0.91
HUB     19.09     1.26    13.74   562.56     1.08   511.87     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.22    28.48    24.20     4.28     0.93     0.28     2.90
MEAN    35.78    16.95    12.70     4.25     0.92     0.23     3.51     0.91
HUB     42.54    -5.70    -9.30     3.60     0.92     0.09     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     690.191     396.002     565.284    1119.172       0.617      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.803      14.543     520.490      24.000      35.013      35.400       0.387

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     591.831     396.002     712.096    1130.438       0.524       0.251

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.740      15.543     531.022     528.796       0.024       0.406

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     542.063       0.000     542.063    1135.444       0.477       0.324

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.973     535.735       0.000       0.060       0.039       0.348

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      18.673       1.236     560.277      37.467     221.493       1.717

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 233266.969       0.559    2263.430 1713990.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.704    3587.000      18.673     560.277       1.000       1.000       0.980
W Kg/sec =   78.04749

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    140.482    3451.342       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132089.219  134730.734       1.443     590.487     409.124     474.134       1.159

     ROTOR LEADING EDGE CONDITIONS, STAGE            2
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	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	514.50	-0.18	514.50	0.45	618.92
MEAN	18.08	0.00	-0.02	514.50	-0.18	514.50	0.45	
HUB	15.21	0.00	-0.02	514.50	-0.18	514.50	0.45	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.35	46.36	4.99	643.27	823.85	16.23	538.17	0.72
MEAN	47.73	42.30	5.43	565.89	764.95	16.23	538.17	0.67
HUB	42.79	37.84	4.95	476.11	701.11	16.23	538.17	0.62

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	584.86	272.22	517.64	1160.53	0.50
MEAN	18.01	600.08	292.03	524.23	1157.42	0.52
HUB	15.22	652.95	378.72	531.90	1154.33	0.57

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	634.53	366.98	0.55	5562.40	
MEAN	563.76	590.46	271.72	0.51	5262.71	1.40
HUB	476.52	540.81	97.79	0.47	5768.01	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.81	1.17	18.34	588.23	1.05	559.67	0.92	0.91
MEAN	21.64	1.16	18.01	586.73	1.05	556.66	0.92	0.91
HUB	21.94	1.17	17.65	589.27	1.05	553.67	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.74	35.33	31.50	3.83	0.93	0.29	2.90	
MEAN	29.12	27.40	23.50	3.90	0.92	0.29	3.30	0.91
HUB	35.45	10.42	6.50	3.92	0.92	0.30	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	2112.997	292.853	2092.604	951.937	2.220	-4.224

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.758	1.973	295.523	46.000	7.967	30.600	22.633

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	NaN	292.853	NaN	NaN	NaN	NaN

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	20.511	NaN	NaN	345.258	0.338	NaN

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	NaN	NaN	NaN	NaN	NaN	NaN

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	NaN	NaN	0.000	0.060	0.142	NaN

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.762	21.256	1.138	588.075	27.798	262.207	2.033

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
173157.406	0.424	1680.177	1558638.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 5.453 EfDer = 0.781

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl

```
    171.704    3587.000      21.256     588.075       1.000       1.000       0.680
W Kg/sec =   78.04749

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    126.439    3368.783       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132089.219  134730.734       1.028     378.495     368.247     293.880       0.798

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   922.78    -0.32   922.78     0.83   590.00
 MEAN    17.74     0.00    -0.02   922.78    -0.32   922.78     0.83
 HUB     15.05     0.00    -0.02   922.78    -0.32   922.78     0.83

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     34.26    46.36   -12.10   628.24  1116.52    13.56   517.00     1.00
 MEAN    31.05    43.40   -12.35   555.26  1077.12    13.56   517.00     0.97
 HUB     27.06    38.84   -11.78   471.10  1036.22    13.56   517.00     0.93

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   572.09   184.07   541.66  1180.43     0.48
 MEAN    17.51   586.14   219.88   543.34  1180.08     0.50
 HUB     14.85   637.00   324.25   548.30  1179.76     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   695.36   436.03     0.59  3652.80
 MEAN   548.00   634.72   328.12     0.54  3855.02     1.77
 HUB    464.84   566.04   140.59     0.48  4819.92

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.96     1.08    19.54   606.43     1.03   579.11     0.92     0.71
 MEAN    23.05     1.08    19.47   607.44     1.03   578.77     0.92     0.71
 HUB     23.52     1.11    19.28   612.29     1.04   578.42     0.92     0.71

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.77    38.83    31.50     7.33     0.93     0.41     2.90
 MEAN    22.03    31.13    23.50     7.63     0.83     0.44     3.28     0.71
 HUB     30.60    14.38     6.50     7.88     0.83     0.49     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.781

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     593.666     221.325     550.867    1180.557       0.503      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.138      19.465     579.300      46.000      21.889      31.500       9.611

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     575.649     221.325     616.731    1182.347       0.487       0.042

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.042      19.590     581.058     471.992       0.036       0.185

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     558.308       0.000     558.308    1184.016       0.472       0.059

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.686     582.700       0.000       0.060       0.066       0.067

    STAGE EXIT CONDITIONS, STAGE            3
```

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.625	22.928	1.079	608.718	20.643	351.326	2.723

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
128646.164	0.335	1248.276	2749438.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 5.453 EfDer = 0.974

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
171.704	3587.000	22.928	608.718	1.000	1.000	0.980

W Kg/sec = 78.04749

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
119.258	3311.169	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
132089.219	134730.734	1.478	513.330	347.351	401.059	1.155

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	520.63	-0.18	520.63	0.44	556.51
MEAN	16.97	0.00	-0.02	520.63	-0.18	520.63	0.44	
HUB	14.32	0.00	-0.02	520.63	-0.18	520.63	0.44	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.20	46.36	2.84	602.89	796.71	20.09	586.10	0.67
MEAN	45.59	43.80	1.79	531.23	743.94	20.09	586.10	0.63
HUB	40.74	37.84	2.90	448.25	687.13	20.09	586.10	0.58

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	573.45	209.84	533.68	1202.61	0.48
MEAN	16.57	587.18	238.01	536.78	1201.20	0.49
HUB	13.89	635.55	333.22	541.19	1199.71	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	590.99	655.81	381.15	0.55	3965.17	
MEAN	518.80	605.79	280.80	0.50	3947.74	1.32
HUB	434.79	550.64	101.57	0.46	4631.03	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.35	1.11	21.69	628.63	1.03	601.19	0.92	0.89
MEAN	25.34	1.11	21.51	628.54	1.03	599.78	0.92	0.89
HUB	25.77	1.12	21.28	631.97	1.04	598.28	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	21.46	35.53	31.50	4.03	0.93	0.22	2.90	
MEAN	23.91	27.61	23.50	4.11	0.91	0.23	3.29	0.89
HUB	31.62	10.63	6.50	4.13	0.91	0.26	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.974

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	576.444	239.345	524.406	1203.357	0.479	0.058

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.444	21.743	601.990	46.000	24.533	32.400	7.867

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	551.859	239.345	601.526	1205.668	0.458	0.119

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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.368      21.970     604.304     456.573       0.029       0.233

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     522.963       0.000     522.963    1208.251       0.433       0.115

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.203     606.896       0.000       0.060       0.057       0.177

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.815      25.257       1.102     629.715      20.997     303.342       2.351

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 130902.281       0.375    1270.168 1550537.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.964

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.704    3587.000      25.257     629.715       1.000       1.000       0.980
W Kg/sec =   78.04749

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    110.111    3255.499       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132089.219  134730.734       1.589     509.668     320.726     390.276       1.217

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   484.87    -0.17   484.87     0.40   520.45
 MEAN    15.91     0.00    -0.02   484.87    -0.17   484.87     0.40
 HUB     13.07     0.00    -0.02   484.87    -0.17   484.87     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.79    47.36     2.43   573.46   751.10    22.62   610.11     0.62
 MEAN    45.78    44.80     0.98   498.12   695.26    22.62   610.11     0.57
 HUB     40.17    38.84     1.33   409.12   634.52    22.62   610.11     0.52

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   538.83   202.22   499.45  1224.82     0.44
 MEAN    15.50   549.31   220.40   503.16  1222.84     0.45
 HUB     12.59   589.20   298.73   507.86  1220.82     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   615.29   359.35     0.50  3630.82
 MEAN   485.11   568.55   264.72     0.46  3418.28     1.33
 HUB    394.10   516.74    95.37     0.42  3763.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.58     1.09    24.15   647.94     1.03   623.72     0.92     0.88
 MEAN    27.44     1.09    23.89   646.87     1.03   621.71     0.92     0.88
 HUB     27.67     1.10    23.59   648.60     1.03   619.65     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.04    35.73    31.50     4.23     0.93     0.23     2.90
 MEAN    23.65    27.75    23.50     4.25     0.91     0.23     3.34     0.88
 HUB     30.46    10.64     6.50     4.14     0.91     0.24     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.964
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     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219      555.143     224.438      507.752    1223.198       0.454       -0.007

      Pt3          Ps3         Ts3          Vane No.     Alpha3     Vane A3      Incid3
      27.490       23.865      622.100       46.000      23.847      33.000       9.153

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG          Cth         Cuth         Cmth         Aoth         Machth      cp 2-Th
      15.219      542.148     224.438      586.768    1224.366       0.443       0.004

    BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
       0.950       27.336       23.890      623.289      440.827       0.062       0.229

     VANED DIFFUSER EXIT:
    R4           C4           Cu4         Cm4          Ao4           Mach4       cp 3-4
      14.701      503.647       0.000      503.647    1227.660       0.410       0.128

    Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       24.337      626.647       0.000        0.060       0.064       0.125

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4           PR4        Texit         Del T       Ns         Ns nondim
       0.795       27.329        1.082      647.804       18.089     326.073       2.528

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  112831.086       0.358    1094.820 1593431.625

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     778803.94   7556.8706     167.7381      1.8090      0.7749      5.4531      1.2391


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 95%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.253   EfDer =  1.000

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     167.425     3587.000       15.107      522.810       1.000        1.000       0.980
 W Kg/sec =   76.10237

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     163.558     3572.873        1.402        0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  128797.273  131372.938        1.746      831.557      476.316      619.754       1.301

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   395.94    -0.14   395.94      0.36   643.21
  MEAN    17.06      0.00    -0.02   395.94    -0.14   395.94      0.36
  HUB     12.51      0.00    -0.02   395.94    -0.14   395.94      0.36

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
  TIP     58.49     50.47      8.02   645.77   757.60     13.83   509.72      0.68
  MEAN    53.45     47.20      6.25   534.02   664.90     13.83   509.72      0.60
  HUB     44.69     38.62      6.07   391.59   556.97     13.83   509.72      0.50

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial     THK         AeroBl      Blades2
       0.700        0.050        0.950       32.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	635.08	363.19	520.98	1126.05	0.56
MEAN	18.04	667.26	402.37	532.28	1121.07	0.60
HUB	15.00	763.83	524.99	554.82	1112.11	0.69

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	645.77	592.68	282.58	0.53	7495.39	
MEAN	564.57	556.45	162.20	0.50	7259.55	1.33
HUB	469.54	557.59	55.45	0.50	7876.48	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.88	1.25	15.21	560.50	1.07	526.82	0.92	0.91
MEAN	18.75	1.24	14.75	559.31	1.07	522.14	0.92	0.91
HUB	19.08	1.26	13.91	562.42	1.08	513.71	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.88	28.48	24.20	4.28	0.93	0.30	2.90	
MEAN	37.09	16.95	12.70	4.25	0.93	0.25	3.51	0.91
HUB	43.42	-5.71	-9.30	3.59	0.93	0.11	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	677.999	401.592	546.266	1121.169	0.605	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.859	14.726	522.349	24.000	36.322	35.400	-0.922

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	569.981	401.592	697.248	1133.188	0.503	0.278

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.800	15.813	533.609	528.796	0.024	0.427

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	522.823	0.000	522.823	1137.749	0.460	0.348

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.213	537.913	0.000	0.060	0.037	0.372

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	18.743	1.241	560.744	37.934	216.282	1.677

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
236170.141	0.566	2234.489	1664888.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 6.253 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
167.425	3587.000	18.743	560.744	1.000	1.000	0.980

W Kg/sec = 76.10237

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
136.530	3449.906	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
128797.273	131372.938	1.485	590.487	397.615	474.134	1.192

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	496.74	-0.17	496.74	0.44	618.66
MEAN	18.08	0.00	-0.02	496.74	-0.17	496.74	0.44	

```
 HUB     15.21     0.00    -0.02   496.74    -0.17   496.74     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.33    46.36     5.97   643.27   812.87    16.45   540.14     0.71
 MEAN    48.73    42.30     6.43   565.89   753.11    16.45   540.14     0.66
 HUB     43.80    37.84     5.96   476.11   688.18    16.45   540.14     0.60

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   574.55   286.30   498.13  1163.53     0.49
 MEAN    18.01   588.68   302.19   505.20  1160.01     0.51
 HUB     15.22   640.08   382.44   513.27  1156.54     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   610.47   352.90     0.52  5849.71
 MEAN   563.76   568.89   261.56     0.49  5445.56     1.43
 HUB    476.52   521.82    94.08     0.45  5824.48

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.07     1.18    18.68   590.14     1.05   562.58     0.92     0.91
 MEAN    21.83     1.16    18.31   588.11     1.05   559.18     0.92     0.91
 HUB     22.06     1.18    17.91   590.02     1.05   555.81     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.89    35.32    31.50     3.82     0.93     0.31     2.90
 MEAN    30.89    27.37    23.50     3.87     0.93     0.31     3.30     0.91
 HUB     36.69    10.39     6.50     3.89     0.93     0.31     3.92


   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960    1115.692     303.040    1073.748    1082.857       1.030      -1.932

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.948      11.181     485.805      46.000      15.760      30.600      14.840

    STATOR / VANED DIFFUSER THROAT IS CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960    1286.398     303.040    1321.610    1055.858       1.218      -2.608

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      21.579       8.681     454.017     345.258       0.110      -0.938

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823    2263.620       0.000    2263.620     953.153       2.375      -2.644

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650       1.432     276.308       0.000       0.060       0.505      -4.574

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.402      20.122       1.074     589.424      28.680     251.675       1.951

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 178653.375       0.437    1690.302 1508256.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.253   EfDer =  0.987

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     167.425    3587.000      20.122     589.424       1.000       1.000       0.680
 W Kg/sec =   76.10237
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
130.380	3364.927	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
128797.273	131372.938	1.000	378.495	378.495	293.880	0.776

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	1085.77	-0.37	1085.77	1.00	589.33
MEAN	17.74	0.00	-0.02	1085.77	-0.37	1085.77	1.00	
HUB	15.05	0.00	-0.02	1085.77	-0.37	1085.77	1.00	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	30.07	46.36	-16.29	628.24	1254.61	10.64	491.04	1.15
MEAN	27.10	43.40	-16.30	555.26	1219.68	10.64	491.05	1.12
HUB	23.47	38.84	-15.37	471.10	1183.71	10.64	491.04	1.09

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	576.49	159.04	554.12	1178.80	0.49
MEAN	17.51	588.27	200.26	553.13	1179.45	0.50
HUB	14.85	633.96	310.72	552.59	1180.39	0.54

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.10	720.85	461.06	0.61	3158.13	
MEAN	548.00	653.36	347.74	0.55	3512.42	1.93
HUB	464.84	573.68	154.12	0.49	4619.83	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.88	1.09	18.58	605.29	1.03	577.56	0.92	0.90
MEAN	22.09	1.10	18.63	607.07	1.03	578.20	0.92	0.90
HUB	22.73	1.13	18.68	612.63	1.04	579.10	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	16.01	39.76	31.50	8.26	0.93	0.45	2.90	
MEAN	19.90	32.16	23.50	8.66	0.81	0.49	3.28	0.90
HUB	29.35	15.58	6.50	9.08	0.81	0.55	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.987

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	595.081	201.570	559.903	1179.969	0.504	0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.199	18.657	578.779	46.000	19.799	31.500	11.701

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	588.569	201.570	622.129	1180.625	0.499	0.000

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.081	18.630	579.423	471.992	0.043	0.154

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	571.302	0.000	571.302	1182.327	0.483	0.014

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.707	581.094	0.000	0.060	0.079	0.021

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.786	21.951	1.091	608.331	18.907	407.062	3.156

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
117820.859	0.306	1114.744	3050499.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.253 EfDer = 0.966

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
167.425	3587.000	21.951	608.331	1.000	1.000	0.980

W Kg/sec = 76.10237

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
121.424	3312.223	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
128797.273	131372.938	1.451	513.330	353.667	401.059	1.134

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	532.27	-0.18	532.27	0.45	556.69
MEAN	16.97	0.00	-0.02	532.27	-0.18	532.27	0.45	
HUB	14.32	0.00	-0.02	532.27	-0.18	532.27	0.45	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.57	46.36	2.21	602.89	804.36	19.11	584.70	0.68
MEAN	44.95	43.80	1.15	531.23	752.13	19.11	584.70	0.63
HUB	40.11	37.84	2.27	448.25	695.99	19.11	584.70	0.59

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	582.79	199.82	547.46	1200.36	0.49
MEAN	16.57	596.51	230.90	550.00	1199.28	0.50
HUB	13.89	645.19	330.61	554.04	1198.10	0.54

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	590.99	672.85	391.17	0.56	3776.15	
MEAN	518.80	620.80	287.90	0.52	3830.09	1.30
HUB	434.79	563.75	104.18	0.47	4594.86	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.14	1.10	20.54	627.29	1.03	598.96	0.92	0.88
MEAN	24.17	1.10	20.41	627.57	1.03	597.89	0.92	0.88
HUB	24.63	1.12	20.22	631.41	1.04	596.68	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.05	35.55	31.50	4.05	0.93	0.21	2.90	
MEAN	22.77	27.63	23.50	4.13	0.91	0.22	3.29	0.88
HUB	30.83	10.65	6.50	4.15	0.91	0.25	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.966

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	585.232	232.203	537.195	1201.515	0.487	0.058

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.273	20.634	600.183	46.000	23.376	32.400	9.024

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	567.003	232.203	612.707	1203.267	0.471	0.097

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.183	20.769	601.935	456.573	0.033	0.216

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	537.241	0.000	537.241	1206.005	0.445	0.093

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.998	604.677	0.000	0.060	0.063	0.155

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.795	24.065	1.096	628.755	20.424	313.155	2.428

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
127324.375	0.365	1204.661	1519350.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 6.253 EfDer = 0.954

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
167.425	3587.000	24.065	628.755	1.000	1.000	0.980

W Kg/sec = 76.10237

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
112.599	3257.982	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
128797.273	131372.938	1.554	509.668	327.982	390.276	1.190

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	497.65	-0.17	497.65	0.41	520.85
MEAN	15.91	0.00	-0.02	497.65	-0.17	497.65	0.41	
HUB	13.07	0.00	-0.02	497.65	-0.17	497.65	0.41	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.06	47.36	1.70	573.46	759.41	21.42	608.10	0.63
MEAN	45.04	44.80	0.24	498.12	704.23	21.42	608.10	0.58
HUB	39.44	38.84	0.60	409.12	644.34	21.42	608.10	0.53

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	548.79	191.25	514.38	1221.99	0.45
MEAN	15.50	559.57	212.55	517.63	1220.34	0.46
HUB	12.59	600.04	295.84	522.04	1218.62	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	561.57	633.82	370.31	0.52	3434.21	
MEAN	485.11	585.01	272.57	0.48	3296.70	1.30
HUB	394.10	531.21	98.26	0.44	3726.81	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.14	1.09	22.76	645.99	1.03	620.88	0.92	0.87
MEAN	26.05	1.08	22.55	645.30	1.03	619.19	0.92	0.87
HUB	26.32	1.09	22.30	647.46	1.03	617.44	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.40	35.75	31.50	4.25	0.93	0.21	2.90	
MEAN	22.32	27.77	23.50	4.27	0.90	0.21	3.34	0.87
HUB	29.54	10.66	6.50	4.16	0.90	0.23	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.954

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	565.523	216.444	522.463	1220.685	0.463	-0.008

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.096      22.524     619.583      46.000      22.503      33.000      10.497

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     560.220     216.444     600.579    1221.175       0.459      -0.030

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.911      22.427     620.081     440.827       0.071       0.210

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     519.710       0.000     519.710    1224.762       0.424       0.101

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.890     623.729       0.000       0.060       0.071       0.098

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.768      25.909       1.077     646.253      17.498     338.705       2.626

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 109131.211       0.346    1032.529 1562424.375

   OVERALL EXIT CONDITIONS; ALL          5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     769099.94   7276.7246    163.5577      1.7150      0.7085      6.2529      1.2361


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 95%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 6.554   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     165.826    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   75.37530

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     161.995    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  127566.758  130117.820       1.763     831.557     471.765     619.754       1.314

      ROTOR LEADING EDGE CONDITIONS, STAGE           1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   391.61    -0.13   391.61     0.35   643.21
  MEAN    17.06     0.00    -0.02   391.61    -0.13   391.61     0.35
  HUB     12.51     0.00    -0.02   391.61    -0.13   391.61     0.35

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.77    50.47     8.30   645.77   755.35    13.85   510.00     0.68
  MEAN    53.75    47.20     6.55   534.02   662.33    13.85   510.00     0.60
  HUB     45.01    38.62     6.39   391.59   553.91    13.85   510.00     0.50

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   631.73   366.81   514.32  1126.82     0.56
  MEAN    18.04   663.24   404.41   525.67  1121.74     0.59
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 HUB     15.00   758.27   524.29   547.81  1112.79     0.68

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    645.77   585.10   278.96     0.52  7570.07
 MEAN   564.57   549.53   160.16     0.49  7296.34     1.34
 HUB    469.54   550.54    54.75     0.49  7866.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.92     1.25    15.28   560.88     1.07   527.55     0.92     0.91
 MEAN    18.77     1.24    14.81   559.50     1.07   522.77     0.92     0.91
 HUB     19.08     1.26    13.98   562.36     1.08   514.36     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.50    28.47    24.20     4.27     0.93     0.31     2.90
 MEAN    37.57    16.94    12.70     4.24     0.93     0.26     3.51     0.91
 HUB     43.74    -5.71    -9.30     3.59     0.93     0.11     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     673.673     403.629     539.369    1121.875       0.600      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.879      14.791     523.007      24.000      36.809      35.400      -1.409

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     562.151     403.629     692.048    1134.154       0.496       0.288

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.820      15.908     534.518     528.796       0.024       0.434

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     515.988       0.000     515.988    1138.555       0.453       0.355

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.294     538.675       0.000       0.060       0.037       0.379

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      18.763       1.242     560.913      38.103     214.380       1.662

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 237224.250       0.569    2223.019 1646694.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.554   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    165.826    3587.000      18.763     560.913       1.000       1.000       0.980
W Kg/sec =   75.37530

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    135.099    3449.386       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127566.758  130117.820       1.501     590.487     393.447     474.134       1.205

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   490.42    -0.17   490.42     0.43   618.57
 MEAN    18.08     0.00    -0.02   490.42    -0.17   490.42     0.43
 HUB     15.21     0.00    -0.02   490.42    -0.17   490.42     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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 TIP     52.69    46.36     6.33   643.27   809.02    16.52   540.83     0.71
 MEAN    49.10    42.30     6.80   565.89   748.96    16.52   540.83     0.66
 HUB     44.16    37.84     6.32   476.11   683.63    16.52   540.83     0.60

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   571.13   291.23   491.30  1164.56     0.49
 MEAN    18.01   584.80   305.75   498.50  1160.91     0.50
 HUB     15.22   635.60   383.74   506.69  1157.30     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   602.04   347.96     0.52  5950.44
 MEAN   563.76   561.31   258.00     0.48  5509.66     1.45
 HUB    476.52   515.11    92.78     0.45  5844.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.15     1.18    18.79   590.82     1.05   563.58     0.92     0.91
 MEAN    21.89     1.17    18.40   588.60     1.05   560.05     0.92     0.91
 HUB     22.09     1.18    17.99   590.28     1.05   556.55     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.66    35.31    31.50     3.81     0.93     0.32     2.90
 MEAN    31.52    27.36    23.50     3.86     0.93     0.31     3.30     0.91
 HUB     37.14    10.38     6.50     3.88     0.93     0.32     3.92


   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960    1054.578     306.612    1009.021    1094.373       0.964      -1.722

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.008      12.117     497.146      46.000      16.902      30.600      13.698

    STATOR / VANED DIFFUSER THROAT IS CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960    1093.249     306.612    1135.431    1088.256       1.005      -1.918

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      21.698      11.395     490.453     345.258       0.095      -0.012

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823    1170.282       0.000    1170.282    1078.500       1.085      -0.590

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650       9.965     477.045       0.000       0.060       0.313      -2.310

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.608      20.903       1.114     589.902      28.989     248.064       1.923

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 180580.047       0.442    1692.208 1489888.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
  RESET =  0.000BLEED =  0.000 DPInc = 6.554   EfDer =  0.767

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    165.826    3587.000      20.903     589.902       1.000       1.000       0.680
W Kg/sec =   75.37530

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    124.366    3363.562       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
127566.758	130117.820	1.045	378.495	362.214	293.880	0.811

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	881.68	-0.30	881.68	0.78	589.09
MEAN	17.74	0.00	-0.02	881.68	-0.30	881.68	0.78	
HUB	15.05	0.00	-0.02	881.68	-0.30	881.68	0.78	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	35.48	46.36	-10.88	628.24	1082.78	13.92	525.02	0.96
MEAN	32.22	43.40	-11.18	555.26	1042.11	13.92	525.02	0.93
HUB	28.13	38.84	-10.71	471.10	999.79	13.92	525.02	0.89

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	566.11	195.16	531.41	1183.95	0.48
MEAN	17.51	580.41	228.36	533.60	1183.23	0.49
HUB	14.85	631.56	328.90	539.16	1182.52	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.10	680.42	424.94	0.57	3872.18	
MEAN	548.00	622.01	319.64	0.53	4003.12	1.75
HUB	464.84	556.04	135.95	0.47	4888.68	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.64	1.08	19.36	609.35	1.03	582.61	0.92	0.70
MEAN	22.70	1.09	19.25	610.01	1.03	581.90	0.92	0.70
HUB	23.11	1.11	19.03	614.46	1.04	581.18	0.92	0.70

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.17	38.65	31.50	7.15	0.93	0.40	2.90	
MEAN	23.17	30.92	23.50	7.42	0.84	0.44	3.28	0.70
HUB	31.38	14.15	6.50	7.65	0.84	0.49	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.767

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	587.780	229.855	540.973	1183.725	0.497	-0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.782	19.246	582.441	46.000	23.020	31.500	8.480

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	563.585	229.855	608.655	1186.085	0.475	0.065

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.703	19.448	584.766	471.992	0.032	0.202

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	546.492	0.000	546.492	1187.690	0.460	0.083

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.545	586.350	0.000	0.060	0.060	0.092

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.625	22.601	1.081	611.276	21.373	334.572	2.594

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
133198.531	0.346	1248.198	2569444.250

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.554   EfDer =  0.980

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    165.826    3587.000      22.601     611.276      1.000       1.000       0.980
W Kg/sec =   75.37530

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    117.084    3304.235       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127566.758  130117.820       1.505     513.330     341.026     401.059       1.176

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   510.04    -0.18   510.04     0.43   555.34
 MEAN    16.97     0.00    -0.02   510.04    -0.18   510.04     0.43
 HUB     14.32     0.00    -0.02   510.04    -0.18   510.04     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.78    46.36     3.42   602.89   789.83    19.92   589.57     0.66
 MEAN    46.17    43.80     2.37   531.23   736.57    19.92   589.57     0.62
 HUB     41.32    37.84     3.48   448.25   679.14    19.92   589.57     0.57

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   565.46   218.75   521.43  1206.73     0.47
 MEAN    16.57   579.07   244.39   524.97  1205.04     0.48
 HUB     13.89   627.03   335.58   529.67  1203.30     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   640.67   372.24     0.53  4133.37
 MEAN   518.80   592.37   274.41     0.49  4053.46     1.34
 HUB    434.79   538.88    99.21     0.45  4663.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.10     1.11    21.59   632.03     1.03   605.36     0.92     0.90
 MEAN    25.05     1.11    21.38   631.63     1.03   603.66     0.92     0.90
 HUB     25.43     1.13    21.13   634.69     1.04   601.90     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.76    35.52    31.50     4.02     0.93     0.24     2.90
 MEAN    24.96    27.60    23.50     4.10     0.91     0.25     3.29     0.90
 HUB     32.36    10.61     6.50     4.11     0.91     0.27     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.980

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     568.829     245.764     512.997    1207.117       0.471       0.057

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.153      21.601     605.792      46.000      25.598      32.400       6.802

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     538.519     245.764     591.948    1209.904       0.445       0.139

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.091      21.898     608.592     456.573       0.026       0.248

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     510.411       0.000     510.411    1212.346       0.421       0.136
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.121	611.052	0.000	0.060	0.052	0.197

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.830	24.992	1.106	632.785	21.510	294.852	2.286

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
134102.609	0.384	1256.670	1486487.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 6.554 EfDer = 0.972

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
165.826	3587.000	24.992	632.785	1.000	1.000	0.980

W Kg/sec = 75.37530

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
107.729	3247.591	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
127566.758	130117.820	1.624	509.668	313.797	390.276	1.244

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	473.63	-0.16	473.63	0.39	519.18
MEAN	15.91	0.00	-0.02	473.63	-0.16	473.63	0.39	
HUB	13.07	0.00	-0.02	473.63	-0.16	473.63	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.45	47.36	3.09	573.46	743.89	22.51	614.08	0.61
MEAN	46.45	44.80	1.65	498.12	687.46	22.51	614.08	0.57
HUB	40.83	38.84	1.99	409.12	625.97	22.51	614.08	0.52

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	530.62	211.68	486.57	1229.34	0.43
MEAN	15.50	540.68	227.24	490.61	1227.10	0.44
HUB	12.59	579.91	301.25	495.52	1224.85	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	561.57	599.30	349.88	0.49	3800.61	
MEAN	485.11	554.26	257.88	0.45	3524.23	1.35
HUB	394.10	504.14	92.85	0.41	3794.90	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.41	1.10	24.12	651.86	1.03	628.38	0.92	0.89
MEAN	27.23	1.09	23.83	650.47	1.03	626.10	0.92	0.89
HUB	27.41	1.10	23.51	651.83	1.03	623.79	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	23.51	35.72	31.50	4.22	0.93	0.24	2.90	
MEAN	24.85	27.73	23.50	4.23	0.91	0.24	3.34	0.89
HUB	31.30	10.61	6.50	4.11	0.91	0.25	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.972

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	546.430	231.404	495.013	1227.467	0.445	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
27.280	23.808	626.489	46.000	25.055	33.000	7.945

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     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     526.771     231.404     575.357    1229.189       0.429       0.033

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      27.158      23.934     628.248     440.827       0.055       0.246

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     489.916       0.000     489.916    1232.242       0.398       0.152

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      24.344     631.373       0.000       0.060       0.057       0.149

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.816      27.149       1.086     651.388      18.603     315.562       2.446

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  116040.117       0.368    1087.407 1527151.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     801145.62   7507.5015    161.9951      1.7971      0.7442      6.5535      1.2459


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 95%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.977   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     163.580    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   74.35432

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     159.801    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  125838.836  128355.344       1.787     831.557     465.375     619.754       1.332

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   385.57    -0.13   385.57     0.35   643.21
  MEAN    17.06     0.00    -0.02   385.57    -0.13   385.57     0.35
  HUB     12.51     0.00    -0.02   385.57    -0.13   385.57     0.35

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.17    50.47     8.70   645.77   752.23    13.89   510.39     0.68
  MEAN    54.18    47.20     6.98   534.02   658.78    13.89   510.39     0.59
  HUB     45.45    38.62     6.83   391.59   549.65    13.89   510.39     0.50

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   627.23   371.81   505.15  1127.87     0.56
  MEAN    18.04   657.76   407.22   516.55  1122.64     0.59
  HUB     15.00   750.64   523.34   538.13  1113.73     0.67

        U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
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 TIP    645.77   574.66   273.96     0.51  7673.11
 MEAN   564.57   539.98   157.35     0.48  7346.94     1.36
 HUB    469.54   540.81    53.80     0.49  7851.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.97     1.26    15.37   561.39     1.07   528.54     0.92     0.91
 MEAN    18.80     1.24    14.89   559.75     1.07   523.62     0.92     0.91
 HUB     19.07     1.26    14.06   562.29     1.08   515.25     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.35    28.47    24.20     4.27     0.93     0.32     2.90
 MEAN    38.25    16.94    12.70     4.24     0.93     0.27     3.51     0.91
 HUB     44.20    -5.71    -9.30     3.59     0.93     0.12     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     667.784     406.432     529.858    1122.833       0.595      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.904      14.878     523.900      24.000      37.490      35.400      -2.090

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     551.432     406.432     685.029    1135.458       0.486       0.302

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.845      16.034     535.749     528.796       0.024       0.444

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     506.677       0.000     506.677    1139.642       0.445       0.365

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.400     539.704       0.000       0.060       0.038       0.389

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      18.787       1.244     561.147      38.337     211.747       1.641

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 238678.125       0.572    2206.347 1621285.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.977   EfDer =  1.000

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    163.580    3587.000      18.787     561.147       1.000       1.000       0.980
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    133.126    3448.668       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.523     590.487     387.703     474.134       1.223

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   481.78    -0.17   481.78     0.42   618.44
 MEAN    18.08     0.00    -0.02   481.78    -0.17   481.78     0.42
 HUB     15.21     0.00    -0.02   481.78    -0.17   481.78     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.18    46.36     6.82   643.27   803.82    16.62   541.76     0.70
 MEAN    49.60    42.30     7.30   565.89   743.33    16.62   541.76     0.65
 HUB     44.67    37.84     6.83   476.11   677.46    16.62   541.76     0.59
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     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   566.68   297.90   482.06  1165.94     0.49
MEAN    18.01   579.65   310.58   489.42  1162.12     0.50
HUB     15.22   629.57   385.49   497.75  1158.34     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    639.20   590.65   341.30     0.51  6086.52
MEAN   563.76   551.03   253.18     0.47  5596.44     1.46
HUB    476.52   506.00    91.02     0.44  5870.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.26     1.18    18.94   591.74     1.05   564.92     0.92     0.91
MEAN    21.97     1.17    18.53   589.27     1.05   561.22     0.92     0.91
HUB     22.13     1.18    18.10   590.65     1.05   557.56     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.71    35.30    31.50     3.80     0.93     0.33     2.90
MEAN    32.40    27.35    23.50     3.85     0.93     0.32     3.30     0.91
HUB     37.76    10.36     6.50     3.86     0.93     0.33     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     998.275     311.447     948.448    1105.124       0.903      -1.536

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.084      13.004     507.371      46.000      18.179      30.600      12.421

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     986.576     311.447    1034.568    1107.412       0.891      -1.527

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.650      21.830      13.028     509.332     345.258       0.081       0.099

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
    17.823    1003.993       0.000    1003.993    1105.719       0.908      -0.144

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.650      12.485     506.629       0.000       0.060       0.225      -1.678

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
     0.702      21.312       1.134     590.554      29.407     243.246       1.886

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 183183.578       0.448    1693.354 1464472.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.977   EfDer =  0.773

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    163.580     3587.000       21.312     590.554       1.000       1.000       0.680
W Kg/sec =   74.35432

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
    120.388     3361.707       1.402       0.249      53.349      56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 125838.836  128355.344       1.079     378.495     350.628     293.880       0.838
```

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	818.41	-0.28	818.41	0.72	588.76
MEAN	17.74	0.00	-0.02	818.41	-0.28	818.41	0.72	
HUB	15.05	0.00	-0.02	818.41	-0.28	818.41	0.72	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	37.52	46.36	-8.84	628.24	1031.91	15.06	534.65	0.91
MEAN	34.17	43.40	-9.23	555.26	989.15	15.06	534.65	0.87
HUB	29.94	38.84	-8.90	471.10	944.46	15.06	534.65	0.83

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	553.06	216.66	508.86	1188.01	0.47
MEAN	17.51	567.25	244.62	511.79	1186.62	0.48
HUB	14.85	617.86	337.10	517.80	1185.24	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.10	649.39	403.44	0.55	4297.73	
MEAN	548.00	594.95	303.38	0.50	4287.45	1.74
HUB	464.84	533.32	127.74	0.45	5010.18	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.30	1.09	20.08	612.14	1.04	586.61	0.92	0.71
MEAN	23.29	1.09	19.92	612.09	1.04	585.24	0.92	0.71
HUB	23.64	1.11	19.64	615.72	1.04	583.86	0.92	0.71

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	23.06	38.41	31.50	6.91	0.93	0.41	2.90	
MEAN	25.55	30.66	23.50	7.16	0.85	0.44	3.28	0.71
HUB	33.07	13.86	6.50	7.36	0.85	0.48	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.773

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	574.175	246.225	518.700	1187.147	0.484	-0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.375	19.915	585.802	46.000	25.394	31.500	6.106

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	537.299	246.225	591.031	1190.608	0.451	0.113

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.320	20.276	589.223	471.992	0.025	0.237

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	520.861	0.000	520.861	1192.074	0.437	0.131

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.378	590.675	0.000	0.060	0.049	0.141

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.651	23.237	1.090	613.318	22.765	307.444	2.383

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
141874.641	0.369	1311.493	2427139.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.977 EfDer = 0.991

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
163.580	3587.000	23.237	613.318	1.000	1.000	0.980

W Kg/sec = 74.35432

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
112.526	3298.728	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
125838.836	128355.344	1.566	513.330	327.750	401.059	1.224

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	486.90	-0.17	486.90	0.41	554.42
MEAN	16.97	0.00	-0.02	486.90	-0.17	486.90	0.41	
HUB	14.32	0.00	-0.02	486.90	-0.17	486.90	0.41	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.08	46.36	4.72	602.89	775.08	20.72	593.54	0.65
MEAN	47.50	43.80	3.70	531.23	720.73	20.72	593.54	0.60
HUB	42.64	37.84	4.80	448.25	661.93	20.72	593.54	0.55

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	549.28	237.95	495.06	1212.05	0.45
MEAN	16.57	562.19	258.17	499.41	1209.80	0.46
HUB	13.89	608.88	340.67	504.66	1207.54	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	590.99	608.05	353.04	0.50	4495.80	
MEAN	518.80	563.33	260.63	0.47	4281.70	1.38
HUB	434.79	513.37	94.13	0.43	4734.24	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.06	1.12	22.63	635.89	1.04	610.72	0.92	0.91
MEAN	25.92	1.12	22.35	634.82	1.04	608.45	0.92	0.91
HUB	26.21	1.13	22.03	637.09	1.04	606.16	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.67	35.49	31.50	3.99	0.93	0.27	2.90	
MEAN	27.34	27.56	23.50	4.06	0.92	0.27	3.29	0.91
HUB	34.02	10.56	6.50	4.06	0.92	0.29	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.991

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	552.994	259.620	488.262	1211.728	0.456	0.056

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
26.026	22.559	610.420	46.000	28.001	32.400	4.399

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	510.054	259.620	572.326	1215.502	0.420	0.182

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	25.985	23.018	614.229	456.573	0.021	0.283

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	483.633	0.000	483.633	1217.667	0.397	0.181

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.232	616.419	0.000	0.060	0.043	0.240

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    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      25.903       1.115     635.933      22.615     277.447       2.151

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 141001.516       0.404    1303.422 1450463.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.977   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.580    3587.000      25.903     635.933       1.000       1.000       0.980
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.790    3239.544       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.702     509.668     299.408     390.276       1.303

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   449.48    -0.15   449.48     0.37   517.90
 MEAN    15.91     0.00    -0.02   449.48    -0.15   449.48     0.37
 HUB     13.07     0.00    -0.02   449.48    -0.15   449.48     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.92    47.36     4.56   573.46   728.74    23.58   619.08     0.60
 MEAN    47.95    44.80     3.15   498.12   671.05    23.58   619.08     0.55
 HUB     42.32    38.84     3.48   409.12   607.90    23.58   619.08     0.50

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   514.47   231.75   459.31  1235.54     0.42
 MEAN    15.50   523.13   241.70   463.95  1232.80     0.42
 HUB     12.59   560.55   306.61   469.26  1230.06     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   565.46   329.82     0.46  4160.46
 MEAN   485.11   523.93   243.41     0.42  3748.22     1.40
 HUB    394.10   477.34    87.49     0.39  3862.27

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.69     1.11    25.46   656.81     1.03   634.74     0.92     0.90
 MEAN    28.40     1.10    25.09   654.74     1.03   631.92     0.92     0.90
 HUB     28.48     1.10    24.70   655.31     1.03   629.11     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.77    35.68    31.50     4.18     0.93     0.28     2.90
 MEAN    27.52    27.68    23.50     4.18     0.91     0.27     3.34     0.90
 HUB     33.16    10.56     6.50     4.06     0.91     0.28     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     528.776     246.131     467.999    1233.156       0.429      -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.453      25.072     632.306      46.000      27.741      33.000       5.259

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     15.219     494.956     246.131     552.776    1235.969       0.400       0.094

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.376      25.406     635.193     440.827       0.042       0.285

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     461.222       0.000     461.222    1238.583       0.372       0.203

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.772     637.883       0.000       0.060       0.046       0.201

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.850      28.363       1.095     655.623      19.690     294.568       2.283

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 122835.484       0.390    1135.494 1489092.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    827573.31   7650.1094     159.8008      1.8775      0.7793      6.9773      1.2540


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 95%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    161.070    3587.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   73.21345

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    157.349    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123908.016  126385.898       1.815     831.557     458.234     619.754       1.352

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   378.86    -0.13   378.86     0.34   643.21
 MEAN    17.06     0.00    -0.02   378.86    -0.13   378.86     0.34
 HUB     12.51     0.00    -0.02   378.86    -0.13   378.86     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.61    50.47     9.14   645.77   748.81    13.93   510.82     0.68
 MEAN    54.65    47.20     7.45   534.02   654.87    13.93   510.82     0.59
 HUB     45.96    38.62     7.34   391.59   544.96    13.93   510.82     0.49

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.63   622.48   377.25   495.14  1128.99     0.55
 MEAN    18.04   651.87   410.31   506.54  1123.62     0.58
 HUB     15.00   742.36   522.31   527.54  1114.73     0.67

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    645.77   563.26   268.52     0.50  7785.28
 MEAN   564.57   529.51   154.27     0.47  7402.52     1.38
 HUB    469.54   530.17    52.77     0.48  7836.21
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	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.03	1.26	15.48	561.96	1.07	529.60	0.92	0.91
MEAN	18.82	1.25	14.98	560.03	1.07	524.55	0.92	0.91
HUB	19.06	1.26	14.15	562.21	1.08	516.20	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.30	28.47	24.20	4.27	0.93	0.33	2.90	
MEAN	39.01	16.94	12.70	4.24	0.93	0.28	3.51	0.91
HUB	44.71	-5.71	-9.30	3.59	0.93	0.14	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	661.465	409.509	519.460	1123.857	0.589	-0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.931	14.970	524.857	24.000	38.250	35.400	-2.850

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	539.804	409.509	677.559	1136.851	0.475	0.316

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.870	16.168	537.064	528.796	0.025	0.456

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	496.549	0.000	496.549	1140.807	0.435	0.376

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.512	540.808	0.000	0.060	0.039	0.400

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	18.810	1.245	561.402	38.592	208.855	1.619

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
240267.266	0.576	2186.958	1593081.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.453 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
161.070	3587.000	18.810	561.402	1.000	1.000	0.980

W Kg/sec = 73.21345

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
130.952	3447.884	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
123908.016	126385.898	1.548	590.487	381.371	474.134	1.243

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	472.38	-0.16	472.38	0.41	618.30
MEAN	18.08	0.00	-0.02	472.38	-0.16	472.38	0.41	
HUB	15.21	0.00	-0.02	472.38	-0.16	472.38	0.41	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.72	46.36	7.36	643.27	798.21	16.72	542.77	0.70
MEAN	50.15	42.30	7.85	565.89	737.26	16.72	542.77	0.65
HUB	45.24	37.84	7.40	476.11	670.80	16.72	542.77	0.59

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2

```
     0.500       0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   562.10   305.07   472.11  1167.40     0.48
 MEAN    18.01   574.24   315.80   479.60  1163.40     0.49
 HUB     15.22   623.12   387.41   488.05  1159.45     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   578.39   334.13     0.50  6232.78
 MEAN   563.76   539.91   247.96     0.46  5690.45     1.48
 HUB    476.52   496.12    89.11     0.43  5899.96

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.37     1.19    19.09   592.73     1.06   566.34     0.92     0.91
 MEAN    22.05     1.17    18.66   590.00     1.05   562.47     0.92     0.91
 HUB     22.17     1.18    18.21   591.05     1.05   558.63     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.87    35.29    31.50     3.79     0.93     0.34     2.90
 MEAN    33.36    27.34    23.50     3.84     0.93     0.33     3.30     0.91
 HUB     38.44    10.35     6.50     3.85     0.93     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     953.767     316.685     899.656    1113.597       0.856      -1.395

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.162      13.719     515.311      46.000      19.392      30.600      11.208

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     919.563     316.685     972.566    1119.381       0.821      -1.289

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      21.951      14.087     520.662     345.258       0.069       0.145

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     921.502       0.000     921.502    1119.592       0.823       0.030

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      13.825     520.423       0.000       0.060       0.175      -1.362

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.755      21.578       1.147     591.260      29.858     238.124       1.846

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 185994.016       0.455    1692.953 1436509.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.793

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.070    3587.000      21.578     591.260       1.000       1.000       0.680
W Kg/sec =   73.21345

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    117.152    3359.698       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123908.016  126385.898       1.109     378.495     341.200     293.880       0.861

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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```
TIP     20.07     0.00    -0.02   776.19    -0.27   776.19     0.68   588.41
MEAN    17.74     0.00    -0.02   776.19    -0.27   776.19     0.68
HUB     15.05     0.00    -0.02   776.19    -0.27   776.19     0.68

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     39.00    46.36    -7.36   628.24   998.74    15.82   540.97     0.88
MEAN    35.59    43.40    -7.81   555.26   954.50    15.82   540.97     0.84
HUB     31.27    38.84    -7.57   471.10   908.10    15.82   540.97     0.80

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   542.94   233.42   490.20  1191.34     0.46
MEAN    17.51   556.62   257.22   493.62  1189.46     0.47
HUB     14.85   606.17   343.15   499.69  1187.61     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.10   624.35   386.68     0.52  4629.48
MEAN   548.00   572.90   290.78     0.48  4507.81     1.75
HUB    464.84   514.30   121.70     0.43  5099.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.80     1.10    20.64   614.51     1.04   589.91     0.92     0.73
MEAN    23.74     1.10    20.43   613.90     1.04   588.05     0.92     0.73
HUB     24.04     1.11    20.12   616.88     1.04   586.21     0.92     0.73

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.46    38.27    31.50     6.77     0.93     0.41     2.90
MEAN    27.52    30.50    23.50     7.00     0.86     0.44     3.28     0.73
HUB     34.48    13.69     6.50     7.19     0.86     0.48     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.793

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     563.157     258.910     500.112    1190.012       0.473       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.827      20.436     588.627      46.000      27.371      31.500       4.129

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     515.928     258.910     577.249    1194.304       0.432       0.151

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      23.787      20.921     592.881     471.992       0.022       0.266

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     17.121     500.127       0.000     500.127    1195.653       0.418       0.169

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      21.023     594.221       0.000       0.060       0.042       0.180

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.680      23.715       1.099     615.098      23.838     289.229       2.242

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 148570.875       0.386    1352.320 2325751.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.070    3587.000      23.715     615.098       1.000       1.000       0.980
```

W Kg/sec = 73.21345

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
108.723	3293.952	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
123908.016	126385.898	1.621	513.330	316.673	401.059	1.266

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	468.07	-0.16	468.07	0.39	553.62
MEAN	16.97	0.00	-0.02	468.07	-0.16	468.07	0.39	
HUB	14.32	0.00	-0.02	468.07	-0.16	468.07	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.18	46.36	5.82	602.89	763.38	21.34	596.82	0.64
MEAN	48.62	43.80	4.82	531.23	708.14	21.34	596.82	0.59
HUB	43.77	37.84	5.93	448.25	648.20	21.34	596.82	0.54

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	537.53	253.17	474.18	1216.29	0.44
MEAN	16.57	549.45	269.16	479.01	1213.64	0.45
HUB	13.89	594.73	344.74	484.63	1210.99	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	590.99	582.21	337.82	0.48	4782.95	
MEAN	518.80	540.16	249.64	0.45	4463.75	1.42
HUB	434.79	492.92	90.05	0.41	4790.71	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.80	1.13	23.43	639.11	1.04	615.01	0.92	0.91
MEAN	26.58	1.12	23.09	637.51	1.04	612.32	0.92	0.91
HUB	26.80	1.13	22.72	639.15	1.04	609.64	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.10	35.47	31.50	3.97	0.93	0.29	2.90	
MEAN	29.33	27.53	23.50	4.03	0.92	0.29	3.29	0.91
HUB	35.43	10.53	6.50	4.03	0.92	0.31	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	541.082	270.673	468.515	1215.443	0.445	0.055

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
26.689	23.291	614.166	46.000	30.016	32.400	2.384

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	487.736	270.673	557.808	1219.965	0.400	0.218

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	26.658	23.876	618.745	456.573	0.018	0.313

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	462.692	0.000	462.692	1221.921	0.379	0.216

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	24.078	620.731	0.000	0.060	0.039	0.274

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.871      26.585       1.121     638.591      23.493     264.352       2.049

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 146487.594       0.419    1333.358 1415868.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.453   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.070    3587.000      26.585     638.591       1.000       1.000       0.980
W Kg/sec =   73.21345

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     98.821    3232.794       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123908.016  126385.898       1.771     509.668     287.847     390.276       1.356

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   430.50    -0.15   430.50     0.35   516.82
 MEAN    15.91     0.00    -0.02   430.50    -0.15   430.50     0.35
 HUB     13.07     0.00    -0.02   430.50    -0.15   430.50     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.11    47.36     5.75   573.46   717.19    24.40   623.14     0.59
 MEAN    49.17    44.80     4.37   498.12   658.48    24.40   623.14     0.54
 HUB     43.55    38.84     4.71   409.12   594.00    24.40   623.14     0.49

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     17.94   503.27   247.14   438.41  1240.38     0.41
 MEAN    15.50   510.41   252.88   443.37  1237.29     0.41
 HUB     12.59   545.95   310.72   448.90  1234.21     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   539.51   314.43     0.43  4436.34
 MEAN   485.11   500.51   232.23     0.40  3921.41     1.44
 HUB    394.10   456.58    83.38     0.37  3913.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.65     1.12    26.47   660.85     1.03   639.73     0.92     0.91
 MEAN    29.28     1.10    26.04   658.27     1.03   636.54     0.92     0.91
 HUB     29.28     1.10    25.59   658.23     1.03   633.37     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.41    35.65    31.50     4.15     0.93     0.31     2.90
 MEAN    29.70    27.65    23.50     4.15     0.92     0.30     3.34     0.91
 HUB     34.69    10.52     6.50     4.02     0.92     0.29     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     516.031     257.518     447.183    1237.638       0.417      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.334      26.025     636.910      46.000      29.936      33.000       3.064

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     471.056     257.518     536.851    1241.230       0.380       0.141

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      29.282      26.509     640.613     440.827       0.036       0.317

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     439.507       0.000     439.507    1243.549       0.353       0.243

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      26.844     643.008       0.000       0.060       0.040       0.241

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.868      29.267       1.101     659.117      20.526     279.411       2.166

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  128061.109       0.406    1165.636 1453116.000

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     849380.88   7731.2246    157.3488      1.9373      0.8008      7.4530      1.2607


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*******************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 95%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     158.444    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   72.01982

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     154.784    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  121887.875  124325.375       1.845     831.557     450.763     619.754       1.375

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   371.89    -0.13   371.89     0.34   643.21
  MEAN    17.06     0.00    -0.02   371.89    -0.13   371.89     0.34
  HUB     12.51     0.00    -0.02   371.89    -0.13   371.89     0.34

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.07    50.47     9.60   645.77   745.31    13.97   511.26     0.67
  MEAN    55.15    47.20     7.95   534.02   650.86    13.97   511.26     0.59
  HUB     46.49    38.62     7.87   391.59   540.14    13.97   511.26     0.49

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   617.80   382.83   484.90  1130.11     0.55
  MEAN    18.04   645.96   413.47   496.29  1124.60     0.57
  HUB     15.00   733.92   521.23   516.68  1115.74     0.66

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   551.60   262.94     0.49  7900.33
  MEAN   564.57   518.78   151.10     0.46  7459.54     1.41
  HUB    469.54   519.26    51.69     0.47  7820.08

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.09     1.26    15.58   562.54     1.08   530.66     0.92     0.91
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 MEAN    18.85     1.25    15.07   560.32     1.07   525.47     0.92     0.91
 HUB     19.05     1.26    14.24   562.13     1.08   517.16     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.29    28.47    24.20     4.27     0.93     0.35     2.90
 MEAN    39.80    16.93    12.70     4.23     0.93     0.30     3.51     0.91
 HUB     45.25    -5.71    -9.30     3.59     0.93     0.15     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     655.126     412.667     508.818    1124.883       0.582      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.956      15.061     525.816      24.000      39.043      35.400      -3.643

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     527.994     412.667     670.128    1138.242       0.464       0.331

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.893      16.300     538.379     528.796       0.026       0.468

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     486.234       0.000     486.234    1141.975       0.426       0.387

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.621     541.916       0.000       0.060       0.041       0.411

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      18.831       1.246     561.663      38.853     205.880       1.596

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 241894.422       0.580    2165.872 1563779.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.997

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    158.444    3587.000      18.831     561.663       1.000       1.000       0.980
W Kg/sec =   72.01982

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    128.707    3447.081       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 121887.875  124325.375       1.575     590.487     374.834     474.134       1.265

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   462.78    -0.16   462.78     0.40   618.16
 MEAN    18.08     0.00    -0.02   462.78    -0.16   462.78     0.40
 HUB     15.21     0.00    -0.02   462.78    -0.16   462.78     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.27    46.36     7.91   643.27   792.56    16.82   543.78     0.69
 MEAN    50.73    42.30     8.43   565.89   731.15    16.82   543.78     0.64
 HUB     45.82    37.84     7.98   476.11   664.07    16.82   543.78     0.58

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     20.42   557.71   312.29   462.07  1168.85     0.48
 MEAN    18.01   568.92   321.06   469.66  1164.68     0.49
 HUB     15.22   616.65   389.33   478.21  1160.56     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   566.02   326.90     0.48  6380.32
 MEAN   563.76   528.66   242.69     0.45  5785.20     1.50
 HUB    476.52   486.09    87.19     0.42  5929.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.48     1.19    19.23   593.73     1.06   567.76     0.92     0.91
 MEAN    22.12     1.17    18.79   590.74     1.05   563.71     0.92     0.91
 HUB     22.21     1.18    18.32   591.46     1.05   559.71     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.05    35.28    31.50     3.78     0.93     0.35     2.90
 MEAN    34.36    27.33    23.50     3.83     0.93     0.34     3.30     0.91
 HUB     39.15    10.33     6.50     3.83     0.93     0.34     3.92


   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     917.811     321.964     859.487    1120.370       0.819       -1.285

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.235      14.302     521.640      46.000      20.536      30.600      10.064

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     870.170     321.964     927.824    1127.981       0.771       -1.119

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      22.059      14.875     528.752     345.258       0.060       0.174

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     865.512       0.000     865.512    1128.928       0.767       0.129

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      14.752     529.450       0.000       0.060       0.141       -1.154

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.788      21.776       1.156     591.976      30.313     233.035       1.806

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188827.203       0.462    1690.719 1407704.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.815

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     158.444    3587.000      21.776     591.976       1.000       1.000       0.680
W Kg/sec =   72.01982

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     114.263    3357.666       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 121887.875  124325.375       1.137     378.495     332.787     293.880       0.883

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   742.73    -0.26   742.73     0.65   588.06
 MEAN    17.74     0.00    -0.02   742.73    -0.26   742.73     0.65
 HUB     15.05     0.00    -0.02   742.73    -0.26   742.73     0.65
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     40.24    46.36    -6.12   628.24   972.96    16.42   545.93     0.85
MEAN    36.79    43.40    -6.61   555.26   927.49    16.42   545.93     0.81
HUB     32.40    38.84    -6.44   471.10   879.67    16.42   545.93     0.77

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   534.58   247.87   473.65  1194.26     0.45
MEAN    17.51   547.56   268.07   477.45  1191.98     0.46
HUB     14.85   595.86   348.21   483.52  1189.76     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.10   602.41   372.23     0.50  4915.38
MEAN   548.00   553.46   279.93     0.46  4697.50     1.77
HUB    464.84   497.39   116.63     0.42  5174.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.23     1.11    21.12   616.67     1.04   592.81     0.92     0.75
MEAN    24.12     1.11    20.87   615.57     1.04   590.55     0.92     0.75
HUB     24.37     1.12    20.53   617.97     1.04   588.34     0.92     0.75

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     27.62    38.16    31.50     6.66     0.93     0.42     2.90
MEAN    29.31    30.38    23.50     6.88     0.87     0.45     3.28     0.75
HUB     35.76    13.56     6.50     7.06     0.87     0.49     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.815

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     553.774     269.828     483.590    1192.551       0.464       0.003

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.207      20.879     591.139      46.000      29.160      31.500       2.340

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     497.264     269.828     565.755    1197.541       0.415       0.185

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.176      21.468     596.097     471.992       0.019       0.293

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     482.093       0.000     482.093    1198.786       0.402       0.202

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      21.566     597.337       0.000       0.060       0.038       0.214

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.708      24.110       1.107     616.736      24.760     274.987       2.132

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 154317.125       0.401    1381.723 2241173.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.444    3587.000      24.110     616.736       1.000       1.000       0.980
W Kg/sec =   72.01982

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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   105.336    3289.576       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
121887.875  124325.375       1.673     513.330     306.807     401.059       1.307

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   451.62    -0.16   451.62     0.38   552.88
MEAN    16.97     0.00    -0.02   451.62    -0.16   451.62     0.38
HUB     14.32     0.00    -0.02   451.62    -0.16   451.62     0.38

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.17    46.36     6.81   602.89   753.41    21.87   599.72     0.63
MEAN    49.64    43.80     5.84   531.23   697.37    21.87   599.72     0.58
HUB     44.80    37.84     6.96   448.25   636.42    21.87   599.72     0.53

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   528.27   266.17   456.32  1219.93     0.43
MEAN    16.57   539.04   278.59   461.46  1216.97     0.44
HUB     13.89   582.80   348.23   467.32  1214.01     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    590.99   560.12   324.82     0.46  5028.35
MEAN   518.80   520.24   240.21     0.43  4620.00     1.45
HUB    434.79   475.27    86.56     0.39  4839.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     27.41     1.14    24.09   641.98     1.04   618.70     0.92     0.91
MEAN    27.13     1.13    23.71   639.93     1.04   615.69     0.92     0.91
HUB     27.28     1.13    23.30   641.03     1.04   612.69     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.26    35.44    31.50     3.94     0.93     0.32     2.90
MEAN    31.12    27.50    23.50     4.00     0.92     0.31     3.29     0.91
HUB     36.69    10.49     6.50     3.99     0.92     0.32     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     531.375     280.159     451.520    1218.663       0.436       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.238      23.900     617.424      46.000      31.819      32.400       0.581

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     468.782     280.159     546.119    1223.807       0.383       0.249

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.213      24.590     622.647     456.573       0.017       0.340

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     444.951       0.000     444.951    1225.591       0.363       0.246

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      24.778     624.463       0.000       0.060       0.037       0.302

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      27.143       1.126     640.981      24.245     253.591       1.966

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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151184.859       0.433    1353.678 1382464.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.444    3587.000      27.143     640.981       1.000       1.000       0.980
W Kg/sec =   72.01982

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.390    3226.762       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 121887.875  124325.375       1.834     509.668     277.855     390.276       1.405

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   414.35    -0.14   414.35     0.34   515.85
 MEAN    15.91     0.00    -0.02   414.35    -0.14   414.35     0.34
 HUB     13.07     0.00    -0.02   414.35    -0.14   414.35     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.16    47.36     6.80   573.46   707.61    25.08   626.66     0.58
 MEAN    50.25    44.80     5.45   498.12   648.03    25.08   626.66     0.53
 HUB     44.65    38.84     5.81   409.12   582.40    25.08   626.66     0.47

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   494.76   259.97   420.96  1244.49     0.40
 MEAN    15.50   500.33   262.24   426.11  1241.13     0.40
 HUB     12.59   533.99   314.20   431.77  1237.79     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   517.85   301.60     0.42  4666.41
 MEAN   485.11   480.88   222.88     0.39  4066.31     1.48
 HUB    394.10   439.10    79.90     0.35  3957.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.44     1.12    27.30   664.39     1.04   643.98     0.92     0.91
 MEAN    30.00     1.11    26.82   661.38     1.03   640.51     0.92     0.91
 HUB     29.92     1.10    26.33   660.84     1.03   637.06     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.70    35.62    31.50     4.12     0.93     0.33     2.90
 MEAN    31.61    27.61    23.50     4.11     0.92     0.32     3.34     0.91
 HUB     36.04    10.48     6.50     3.98     0.92     0.31     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     505.959     267.045     429.746    1241.464       0.408      -0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    30.055      26.804     640.857      46.000      31.857      33.000       1.143

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     451.391     267.045     524.468    1245.677       0.362       0.180

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      30.014      27.409     645.213     440.827       0.032       0.345

   VANED DIFFUSER EXIT:
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   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     421.563       0.000     421.563    1247.771       0.338       0.276

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.718     647.385       0.000       0.060       0.037       0.273

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      29.998       1.105     662.205      21.224     267.312       2.072

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 132429.516       0.420    1185.746 1418653.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    868653.12   7777.7393    154.7835      1.9857      0.8152      7.9532      1.2666


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 95%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 8.501   EfDer =  0.997

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    155.582    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    151.988    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.879     831.557     442.622     619.754       1.400

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   364.35    -0.13   364.35     0.33   643.21
  MEAN    17.06     0.00    -0.02   364.35    -0.13   364.35     0.33
  HUB     12.51     0.00    -0.02   364.35    -0.13   364.35     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.57    50.47    10.10   645.77   741.58    14.02   511.72     0.67
  MEAN    55.70    47.20     8.50   534.02   646.58    14.02   511.72     0.58
  HUB     47.07    38.62     8.45   391.59   534.97    14.02   511.72     0.48

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   613.02   388.75   473.99  1131.28     0.54
  MEAN    18.04   639.76   416.82   485.34  1125.62     0.57
  HUB     15.00   724.99   520.07   505.10  1116.79     0.65

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   539.19   257.02     0.48  8022.49
  MEAN   564.57   507.33   147.75     0.45  7519.92     1.43
  HUB    469.54   507.62    50.54     0.45  7802.67

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.15     1.27    15.68   563.15     1.08   531.77     0.92     0.91
  MEAN    18.88     1.25    15.16   560.62     1.07   526.44     0.92     0.91
  HUB     19.03     1.26    14.33   562.05     1.08   518.16     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.36    28.47    24.20     4.27     0.93     0.36     2.90
 MEAN    40.66    16.93    12.70     4.23     0.93     0.31     3.51     0.91
 HUB     45.84    -5.71    -9.30     3.59     0.93     0.16     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     648.495     416.010     497.475    1125.951       0.576      -0.001

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.981      15.155     526.815      24.000      39.904      35.400      -4.504

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     515.501     416.010     662.424    1139.684       0.452       0.347

   BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.950      18.915      16.435     539.744     528.796       0.027       0.481

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     475.296       0.000     475.296    1143.192       0.416       0.398

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.732     543.071       0.000       0.060       0.043       0.422

    STAGE EXIT CONDITIONS, STAGE             1
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.875       18.849       1.248     561.940      39.130     202.701       1.571

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 243617.312       0.584    2141.904 1532079.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 8.501   EfDer =  0.995

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    155.582    3587.000       18.849     561.940       1.000        1.000        0.980
W Kg/sec =   70.71914

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    126.294    3446.233        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 119686.578  122080.047        1.605     590.487     367.806     474.134       1.289

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   452.58    -0.16   452.58     0.40   618.00
 MEAN    18.08      0.00    -0.02   452.58    -0.16   452.58     0.40
 HUB     15.21      0.00    -0.02   452.58    -0.16   452.58     0.40

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     54.88     46.36     8.52   643.27   786.65     16.92   544.84     0.69
 MEAN    51.36     42.30     9.06   565.89   724.73     16.92   544.84     0.63
 HUB     46.46     37.84     8.62   476.11   657.01     16.92   544.84     0.57

     ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     20.42   553.34   319.88   451.52  1170.34      0.47
 MEAN    18.01   563.49   326.61   459.18  1166.01      0.48
 HUB     15.22   609.90   391.35   467.79  1161.71      0.53
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   553.02   319.32     0.47  6535.13
 MEAN   563.76   516.81   237.15     0.44  5884.96     1.53
 HUB    476.52   475.48    85.17     0.41  5959.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.59     1.20    19.38   594.78     1.06   569.22     0.92     0.91
 MEAN    22.19     1.18    18.91   591.52     1.05   565.00     0.92     0.91
 HUB     22.24     1.18    18.43   591.89     1.05   560.83     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.32    35.27    31.50     3.77     0.93     0.37     2.90
 MEAN    35.42    27.31    23.50     3.81     0.93     0.36     3.30     0.91
 HUB     39.92    10.32     6.50     3.82     0.93     0.35     3.92


   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     885.858     327.522     823.088    1126.314       0.787      -1.191

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.305      14.822     527.205      46.000      21.699      30.600       8.901

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     827.910     327.522     890.340    1135.135       0.729      -0.977

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      22.159      15.549     535.497     345.258       0.052       0.198

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     819.755       0.000     819.755    1136.424       0.721       0.200

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      15.511     536.628       0.000       0.060       0.116      -0.989

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.813      21.942       1.164     592.731      30.791     227.765       1.766

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 191804.141       0.469    1686.358 1376806.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.501   EfDer =  0.840

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3587.000      21.942     592.731       1.000       1.000       0.680
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.422    3355.528       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.166     378.495     324.512     293.880       0.906

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   712.58    -0.25   712.58     0.62   587.68
 MEAN    17.74     0.00    -0.02   712.58    -0.25   712.58     0.62
 HUB     15.05     0.00    -0.02   712.58    -0.25   712.58     0.62

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     41.41    46.36    -4.95   628.24   950.14    16.94   550.35     0.83
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 MEAN    37.94    43.40    -5.46   555.26   903.53    16.94   550.35     0.79
 HUB     33.48    38.84    -5.36   471.10   854.37    16.94   550.35     0.74

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   527.12   261.66   457.59  1197.06     0.44
 MEAN    17.51   539.17   278.37   461.75  1194.41     0.45
 HUB     14.85   586.03   352.96   467.82  1191.85     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   581.27   358.44     0.49  5188.37
 MEAN   548.00   534.71   269.62     0.45  4877.74     1.78
 HUB    464.84   481.01   111.88     0.40  5245.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.64     1.12    21.56   618.79     1.04   595.60     0.92     0.77
 MEAN    24.47     1.12    21.28   617.23     1.04   592.97     0.92     0.77
 HUB     24.67     1.12    20.91   619.08     1.04   590.41     0.92     0.77

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.76    38.07    31.50     6.57     0.93     0.44     2.90
 MEAN    31.08    30.28    23.50     6.78     0.88     0.45     3.28     0.77
 HUB     37.03    13.45     6.50     6.95     0.88     0.49     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.840

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     545.093     280.202     467.561    1194.997       0.456       0.005

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.561      21.291     593.566      46.000      30.934      31.500       0.566

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     479.408     280.202     555.288    1200.638       0.399       0.218

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.534      21.979     599.183     471.992       0.018       0.320

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     464.905       0.000     464.905    1201.783       0.387       0.233

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.069     600.326       0.000       0.060       0.037       0.245

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.734      24.472       1.115     618.366      25.636     262.412       2.034

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 159780.656       0.416    1404.805 2161792.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.501   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    155.582    3587.000      24.472     618.366       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.042    3285.236       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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119686.578  122080.047       1.727     513.330     297.213     401.059       1.349

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   435.89    -0.15   435.89     0.36   552.15
MEAN    16.97     0.00    -0.02   435.89    -0.15   435.89     0.36
HUB     14.32     0.00    -0.02   435.89    -0.15   435.89     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.14    46.36     7.78   602.89   744.08    22.35   602.51     0.62
MEAN    50.64    43.80     6.84   531.23   687.28    22.35   602.51     0.57
HUB     45.81    37.84     7.97   448.25   625.35    22.35   602.51     0.52

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   520.28   278.37   439.54  1223.36     0.43
MEAN    16.57   529.70   287.48   444.90  1220.12     0.43
HUB     13.89   571.74   351.50   450.93  1216.90     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    590.99   539.38   312.62     0.44  5258.55
MEAN   518.80   501.45   231.33     0.41  4767.12     1.49
HUB    434.79   458.56    83.29     0.38  4884.54

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     27.97     1.14    24.70   644.77     1.04   622.18     0.92     0.91
MEAN    27.63     1.13    24.27   642.30     1.04   618.89     0.92     0.91
HUB     27.71     1.13    23.82   642.89     1.04   615.62     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.35    35.42    31.50     3.92     0.93     0.34     2.90
MEAN    32.87    27.47    23.50     3.97     0.93     0.33     3.29     0.91
HUB     37.94    10.46     6.50     3.96     0.93     0.34     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     522.691     289.092     435.468    1221.719       0.428       0.052

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    27.738      24.456     620.524      46.000      33.579      32.400      -1.179

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     451.069     289.092     535.758    1227.434       0.367       0.279

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.714      25.243     626.343     456.573       0.017       0.367

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     428.406       0.000     428.406    1229.062       0.349       0.273

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      25.413     628.005       0.000       0.060       0.037       0.327

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.880      27.643       1.130     643.317      24.951     243.819       1.890

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 155595.641       0.445    1368.010 1348054.500
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.501   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3587.000      27.643     643.317       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.138    3220.897       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.899     509.668     268.383     390.276       1.454

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   399.25    -0.14   399.25     0.32   514.92
 MEAN    15.91     0.00    -0.02   399.25    -0.14   399.25     0.32
 HUB     13.07     0.00    -0.02   399.25    -0.14   399.25     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.16    47.36     7.80   573.46   698.87    25.70   630.02     0.57
 MEAN    51.29    44.80     6.49   498.12   638.48    25.70   630.02     0.52
 HUB     45.71    38.84     6.87   409.12   571.75    25.70   630.02     0.46

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   487.64   271.74   404.91  1248.32     0.39
 MEAN    15.50   491.50   270.83   410.15  1244.74     0.39
 HUB     12.59   523.15   317.37   415.88  1241.17     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    561.57   497.94   289.83     0.40  4877.53
 MEAN   485.11   462.75   214.28     0.37  4199.48     1.52
 HUB    394.10   422.90    76.72     0.34  3997.53

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.15     1.13    28.04   667.79     1.04   647.96     0.92     0.91
 MEAN    30.65     1.11    27.52   664.39     1.03   644.24     0.92     0.91
 HUB     30.50     1.10    26.99   663.37     1.03   640.55     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.87    35.59     31.50     4.09     0.93     0.35     2.90
 MEAN    33.44    27.58     23.50     4.08     0.93     0.34     3.34     0.91
 HUB     37.35    10.45      6.50     3.95     0.93     0.33     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     497.156     275.801     413.639    1245.052       0.399       -0.005

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    30.700      27.503     644.571      46.000      33.694      33.000      -0.694

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
    15.219     433.475     275.801     513.777    1249.816       0.347       0.215

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      30.663      28.213     649.513     440.827       0.031       0.372

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
    14.701     405.169       0.000     405.169    1251.719       0.324       0.306
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   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.498     651.493       0.000       0.060       0.037       0.303

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      30.645       1.109     665.182      21.865     256.590       1.989

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 136439.250       0.433    1199.586 1383319.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    887237.00   7800.6636    151.9881      2.0285      0.8256      8.5014      1.2723


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 95%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3587.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    149.697    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.907     831.557     435.951     619.754       1.422

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   358.22    -0.12   358.22     0.32   643.21
 MEAN    17.06     0.00    -0.02   358.22    -0.12   358.22     0.32
 HUB     12.51     0.00    -0.02   358.22    -0.12   358.22     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.99    50.47    10.52   645.77   738.58    14.05   512.09     0.67
 MEAN    56.15    47.20     8.95   534.02   643.14    14.05   512.09     0.58
 HUB     47.56    38.62     8.94   391.59   530.81    14.05   512.09     0.48

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   609.34   393.50   465.24  1132.20     0.54
 MEAN    18.04   634.89   419.53   476.53  1126.43     0.56
 HUB     15.00   717.86   519.15   495.79  1117.62     0.64

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    645.77   529.23   252.27     0.47  8120.49
 MEAN   564.57   498.12   145.05     0.44  7568.69     1.45
 HUB    469.54   498.27    49.61     0.45  7788.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.20     1.27    15.76   563.64     1.08   532.63     0.92     0.91
 MEAN    18.90     1.25    15.23   560.87     1.07   527.21     0.92     0.91
 HUB     19.02     1.26    14.41   561.98     1.07   518.94     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.22    28.47    24.20     4.27     0.93     0.38     2.90
 MEAN    41.36    16.93    12.70     4.23     0.93     0.32     3.51     0.91
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HUB     46.32    -5.71    -9.30     3.59     0.93     0.17     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    18.071     643.284     418.711     488.360    1126.789       0.571       0.000

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.000      15.228     527.600      24.000      40.609      35.400      -5.209

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     505.523     418.711     656.409    1140.818       0.443       0.360

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.930      16.539     540.818     528.796       0.028       0.492

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    18.083     466.539       0.000     466.539    1144.151       0.408       0.407

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.817     543.983       0.000       0.060       0.046       0.431

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4        Pt4          PR4        Texit        Del T        Ns         Ns nondim
     0.873      18.860       1.248     562.163      39.353     200.132       1.551

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 245004.688       0.588    2121.634 1506272.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.993

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    153.237    3587.000       18.860     562.163       1.000        1.000       0.980
W Kg/sec =   69.65320

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    124.338    3445.549        1.402       0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 117882.562  120239.961        1.631     590.487     362.111     474.134       1.309

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   444.40    -0.15   444.40     0.39   617.88
 MEAN    18.08      0.00    -0.02   444.40    -0.15   444.40     0.39
 HUB     15.21      0.00    -0.02   444.40    -0.15   444.40     0.39

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     55.37     46.36     9.01   643.27   781.97     17.00   545.67     0.68
 MEAN    51.86     42.30     9.56   565.89   719.65     17.00   545.67     0.63
 HUB     46.98     37.84     9.14   476.11   651.40     17.00   545.67     0.57

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK         AeroBl     Blades2
     0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     20.42   550.07   325.90   443.13  1171.51     0.47
 MEAN    18.01   559.29   331.00   450.83  1167.05     0.48
 HUB     15.22   604.60   392.97   459.47  1162.62     0.52

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   542.70   313.30     0.46  6658.02
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 MEAN   563.76   507.37   232.76     0.43  5964.04     1.55
 HUB    476.52   467.01    83.55     0.40  5984.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.67     1.20    19.49   595.62     1.06   570.36     0.92     0.91
 MEAN    22.25     1.18    19.01   592.14     1.05   566.02     0.92     0.91
 HUB     22.26     1.18    18.51   592.24     1.05   561.72     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.33    35.26    31.50     3.76     0.93     0.38     2.90
 MEAN    36.29    27.31    23.50     3.81     0.94     0.36     3.30     0.91
 HUB     40.54    10.31     6.50     3.81     0.94     0.36     3.92


   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     863.370     331.928     797.015    1130.453       0.764      -1.126

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.356      15.188     531.092      46.000      22.610      30.600       7.990

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     798.604     331.928     864.838    1139.976       0.701      -0.881

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      22.230      16.013     540.079     345.258       0.047       0.215

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     788.916       0.000     788.916    1141.386       0.691       0.245

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      16.017     541.368       0.000       0.060       0.100      -0.880

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.827      22.052       1.169     593.333      31.170     223.634       1.734

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 194168.406       0.475    1681.414 1351830.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.859

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    153.237    3587.000      22.052     593.333       1.000       1.000       0.680
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    109.249    3353.824       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.190     378.495     318.182     293.880       0.924

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   690.97    -0.24   690.97     0.60   587.38
 MEAN    17.74     0.00    -0.02   690.97    -0.24   690.97     0.60
 HUB     15.05     0.00    -0.02   690.97    -0.24   690.97     0.60

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.29    46.36    -4.07   628.24   934.04    17.30   553.48     0.81
 MEAN    38.80    43.40    -4.60   555.26   886.57    17.30   553.48     0.77
 HUB     34.30    38.84    -4.54   471.10   836.42    17.30   553.48     0.72
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      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   521.95   271.93   445.52  1199.14     0.44
MEAN    17.51   533.16   286.04   449.93  1196.23     0.45
HUB     14.85   578.81   356.48   456.00  1193.42     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    620.10   565.43   348.17     0.47  5391.76
MEAN   548.00   520.64   261.96     0.44  5011.76     1.80
HUB    464.84   468.70   108.36     0.39  5297.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.94     1.13    21.89   620.41     1.05   597.68     0.92     0.79
MEAN    24.73     1.12    21.57   618.51     1.04   594.78     0.92     0.79
HUB     24.89     1.13    21.18   619.94     1.04   591.98     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.40    38.01    31.50     6.51     0.93     0.44     2.90
MEAN    32.45    30.21    23.50     6.71     0.88     0.46     3.28     0.79
HUB     38.02    13.37     6.50     6.87     0.88     0.49     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.859

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     538.870     287.915     455.507    1196.825       0.450       0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.817      21.591     595.383      46.000      32.296      31.500      -0.796

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     466.120     287.915     547.871    1202.943       0.387       0.243

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.792      22.350     601.486     471.992       0.018       0.340

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     452.154       0.000     452.154    1204.013       0.376       0.255

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.433     602.556       0.000       0.060       0.037       0.268

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.753      24.729       1.121     619.620      26.288     253.578       1.966

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 163845.703       0.426    1418.832 2103037.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3587.000      24.729     619.620       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     99.559    3281.910       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.770     513.330     289.981     401.059       1.383

     ROTOR LEADING EDGE CONDITIONS, STAGE            4
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   424.19    -0.15   424.19     0.35   551.59
MEAN    16.97     0.00    -0.02   424.19    -0.15   424.19     0.35
HUB     14.32     0.00    -0.02   424.19    -0.15   424.19     0.35

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.88    46.36     8.52   602.89   737.28    22.70   604.61     0.61
MEAN    51.40    43.80     7.60   531.23   679.92    22.70   604.61     0.56
HUB     46.59    37.84     8.75   448.25   617.25    22.70   604.61     0.51

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   514.86   287.31   427.24  1225.88     0.42
MEAN    16.57   523.14   294.00   432.70  1222.45     0.43
HUB     13.89   563.74   353.90   438.82  1219.04     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    590.99   524.17   303.68     0.43  5427.24
MEAN   518.80   487.62   224.80     0.40  4875.23     1.52
HUB    434.79   446.21    80.89     0.37  4917.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     28.38     1.15    25.13   646.87     1.04   624.75     0.92     0.91
MEAN    27.99     1.13    24.68   644.09     1.04   621.26     0.92     0.91
HUB     28.02     1.13    24.20   644.31     1.04   617.79     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.92    35.40    31.50     3.90     0.93     0.36     2.90
MEAN    34.19    27.45    23.50     3.95     0.93     0.35     3.29     0.91
HUB     38.89    10.44     6.50     3.94     0.93     0.35     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     516.608     295.656     423.641    1223.979       0.422       0.051

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    28.094      24.851     622.824      46.000      34.911      32.400      -2.511

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     438.122     295.656     528.548    1230.107       0.356       0.301

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      28.068      25.709     629.075     456.573       0.018       0.387

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    16.096     416.334       0.000     416.334    1231.625       0.338       0.293

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      25.864     630.628       0.000       0.060       0.039       0.346

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.880      27.994       1.132     645.089      25.469     236.840       1.836

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 158830.859       0.455    1375.406 1320969.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  1.000
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
153.237	3587.000	27.994	645.089	1.000	1.000	0.980

W Kg/sec = 69.65320

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
89.735	3216.470	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
117882.562	120239.961	1.950	509.668	261.384	390.276	1.493

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	388.20	-0.13	388.20	0.31	514.21
MEAN	15.91	0.00	-0.02	388.20	-0.13	388.20	0.31	
HUB	13.07	0.00	-0.02	388.20	-0.13	388.20	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.91	47.36	8.55	573.46	692.61	26.14	632.52	0.56
MEAN	52.08	44.80	7.28	498.12	631.63	26.14	632.52	0.51
HUB	46.51	38.84	7.67	409.12	564.08	26.14	632.52	0.46

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	482.93	280.23	393.31	1251.12	0.39
MEAN	15.50	485.42	277.07	398.58	1247.39	0.39
HUB	12.59	515.42	319.65	404.33	1243.66	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	561.57	483.57	281.33	0.39	5029.85	
MEAN	485.11	449.61	208.05	0.36	4296.02	1.55
HUB	394.10	411.13	74.44	0.33	4026.20	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	31.65	1.13	28.56	670.32	1.04	650.87	0.92	0.91
MEAN	31.10	1.11	28.01	666.64	1.03	646.99	0.92	0.91
HUB	30.90	1.10	27.45	665.29	1.03	643.13	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.47	35.58	31.50	4.08	0.93	0.37	2.90	
MEAN	34.80	27.56	23.50	4.06	0.93	0.35	3.34	0.91
HUB	38.33	10.43	6.50	3.93	0.93	0.34	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	491.111	282.149	401.973	1247.684	0.394	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
31.151	27.993	647.305	46.000	35.065	33.000	-2.065

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	420.627	282.149	506.493	1252.838	0.336	0.240

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	31.112	28.775	652.663	440.827	0.032	0.393

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	393.390	0.000	393.390	1254.611	0.314	0.327

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	29.043	654.512	0.000	0.060	0.038	0.323

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    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      31.093       1.111     667.417      22.328     249.060       1.931

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  139335.656       0.442    1206.586 1355578.375

    OVERALL EXIT CONDITIONS; ALL          5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     901185.38   7803.8721    149.6973      2.0582      0.8313      8.9529      1.2766


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 95%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 9.538   EfDer =  0.993

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     150.218    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   68.28079

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     146.748    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  115559.867  117870.812       1.946     831.557     427.361     619.754       1.450

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   350.37    -0.12   350.37     0.32   643.21
  MEAN    17.06     0.00    -0.02   350.37    -0.12   350.37     0.32
  HUB     12.51     0.00    -0.02   350.37    -0.12   350.37     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.52    50.47    11.05   645.77   734.80    14.10   512.56     0.66
  MEAN    56.74    47.20     9.54   534.02   638.80    14.10   512.56     0.58
  HUB     48.19    38.62     9.57   391.59   525.55    14.10   512.56     0.47

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   604.88   399.48   454.19  1133.33     0.53
  MEAN    18.04   628.84   422.92   465.39  1127.43     0.56
  HUB     15.00   708.92   517.98   484.01  1118.65     0.63

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   516.67   246.29     0.46  8243.75
  MEAN   564.57   486.47   141.65     0.43  7629.85     1.48
  HUB    469.54   486.43    48.44     0.43  7771.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.26      1.27    15.86   564.26     1.08   533.71     0.92     0.91
  MEAN    18.92      1.25    15.32   561.18     1.07   528.15     0.92     0.91
  HUB     19.00      1.26    14.49   561.89     1.07   519.92     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     41.33    28.47    24.20     4.27     0.93     0.39     2.90
  MEAN    42.26    16.93    12.70     4.23     0.94     0.34     3.51     0.91
  HUB     46.94    -5.72    -9.30     3.58     0.94     0.19     4.78
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     636.825     422.098     476.843    1127.825       0.565       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.022      15.317     528.570      24.000      41.515      35.400      -6.115

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     492.991     422.098     649.005    1142.214       0.432       0.376

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.946      16.666     542.143     528.796       0.030       0.506

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     455.518       0.000     455.518    1145.337       0.398       0.418

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.920     545.111       0.000       0.060       0.049       0.442

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      18.871       1.249     562.442      39.632     196.880       1.526

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 246744.688       0.592    2094.601 1473267.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.538   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.218    3587.000      18.871     562.442       1.000       1.000       0.980
W Kg/sec =   68.28079

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    121.847    3444.693       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 115559.867  117870.812       1.664     590.487     354.856     474.134       1.336

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   434.09    -0.15   434.09     0.38   617.73
 MEAN    18.08     0.00    -0.02   434.09    -0.15   434.09     0.38
 HUB     15.21     0.00    -0.02   434.09    -0.15   434.09     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.99    46.36     9.63   643.27   776.16    17.09   546.71     0.68
 MEAN    52.52    42.30    10.22   565.89   713.33    17.09   546.71     0.62
 HUB     47.65    37.84     9.81   476.11   644.41    17.09   546.71     0.56

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   546.21   333.39   432.66  1172.95     0.47
 MEAN    18.01   554.22   336.51   440.37  1168.33     0.47
 HUB     15.22   598.00   394.96   449.02  1163.74     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   529.82   305.80     0.45  6810.96
 MEAN   563.76   495.54   227.25     0.42  6063.17     1.57
 HUB    476.52   456.36    81.56     0.39  6014.69
```

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.76	1.21	19.61	596.67	1.06	571.76	0.92	0.91
MEAN	22.31	1.18	19.12	592.91	1.05	567.27	0.92	0.91
HUB	22.28	1.18	18.60	592.67	1.05	562.81	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.62	35.25	31.50	3.75	0.93	0.39	2.90	
MEAN	37.39	27.30	23.50	3.80	0.94	0.38	3.30	0.91
HUB	41.33	10.30	6.50	3.80	0.94	0.37	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.990

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	837.932	337.451	766.980	1135.086	0.738	-1.054

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.414	15.599	535.458	46.000	23.748	30.600	6.852

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	765.563	337.451	836.636	1145.310	0.668	-0.774

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	22.309	16.529	545.147	345.258	0.041	0.234

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	754.829	0.000	754.829	1146.766	0.658	0.291

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	16.569	546.512	0.000	0.060	0.083	-0.762

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.840	22.169	1.175	594.085	31.643	218.542	1.694

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
197114.422	0.482	1673.293	1320102.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 9.538 EfDer = 0.882

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
150.218	3587.000	22.169	594.085	1.000	1.000	0.680

W Kg/sec = 68.28079

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
106.600	3351.700	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
115559.867	117870.812	1.219	378.495	310.468	293.880	0.947

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	666.00	-0.23	665.99	0.58	587.01
MEAN	17.74	0.00	-0.02	666.00	-0.23	665.99	0.58	
HUB	15.05	0.00	-0.02	666.00	-0.23	665.99	0.58	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	43.34	46.36	-3.02	628.24	915.71	17.71	557.06	0.79
MEAN	39.83	43.40	-3.57	555.26	867.25	17.71	557.06	0.75
HUB	35.29	38.84	-3.55	471.10	815.91	17.71	557.06	0.70

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	516.29	284.10	431.09	1201.59	0.43
MEAN	17.51	526.33	295.14	435.79	1198.40	0.44
HUB	14.85	570.33	360.59	441.88	1195.30	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.10	546.57	336.00	0.45	5632.59	
MEAN	548.00	503.84	252.86	0.42	5170.93	1.83
HUB	464.84	454.01	104.26	0.38	5358.17	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.29	1.14	22.27	622.38	1.05	600.13	0.92	0.81
MEAN	25.02	1.13	21.91	620.06	1.04	596.94	0.92	0.81
HUB	25.13	1.13	21.50	621.00	1.05	593.85	0.92	0.81

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.39	37.93	31.50	6.43	0.93	0.46	2.90	
MEAN	34.11	30.12	23.50	6.62	0.88	0.47	3.28	0.81
HUB	39.22	13.28	6.50	6.78	0.88	0.50	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.882

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	531.813	297.075	441.102	1198.987	0.444	0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.112	21.936	597.537	46.000	33.960	31.500	-2.460

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	450.379	297.075	539.532	1205.666	0.374	0.272

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	25.085	22.779	604.213	471.992	0.018	0.366

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	437.089	0.000	437.089	1206.648	0.362	0.281

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.848	605.198	0.000	0.060	0.039	0.294

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.774	25.019	1.129	621.144	27.059	243.610	1.888

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
168655.031	0.439	1431.703	2033256.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 9.538 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
150.218	3587.000	25.019	621.144	1.000	1.000	0.980

W Kg/sec = 68.28079

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
96.584	3277.883	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
115559.867	117870.812	1.825	513.330	281.316	401.059	1.426

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	410.32	-0.14	410.32	0.34	550.91

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 MEAN    16.97     0.00    -0.02   410.32    -0.14   410.32     0.34
 HUB     14.32     0.00    -0.02   410.32    -0.14   410.32     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.77    46.36     9.41   602.89   729.39    23.10   607.10     0.60
 MEAN    52.32    43.80     8.52   531.23   671.35    23.10   607.10     0.56
 HUB     47.54    37.84     9.70   448.25   607.80    23.10   607.10     0.50

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   509.01   297.73   412.85  1228.82     0.41
 MEAN    16.57   515.77   301.62   418.39  1225.20     0.42
 HUB     13.89   554.52   356.72   424.55  1221.58     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    590.99   506.41   293.27     0.41  5623.78
 MEAN   518.80   471.40   217.19     0.38  5001.33     1.55
 HUB    434.79   431.67    78.07     0.35  4956.89

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.83     1.15    25.62   649.37     1.05   627.76     0.92     0.91
 MEAN    28.39     1.13    25.13   646.25     1.04   624.06     0.92     0.91
 HUB     28.36     1.13    24.62   646.03     1.04   620.37     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.80    35.39    31.50     3.89     0.93     0.38     2.90
 MEAN    35.79    27.43    23.50     3.93     0.93     0.37     3.29     0.91
 HUB     40.04    10.42     6.50     3.92     0.93     0.36     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     509.793     303.311     409.745    1226.638       0.416       0.049

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.494      25.297     625.535      46.000      36.510      32.400      -4.110

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     423.015     303.311     520.518    1233.242       0.343       0.327

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.463      26.236     632.288     456.573       0.019       0.411

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     402.265       0.000     402.265    1234.634       0.326       0.315

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.369     633.717       0.000       0.060       0.042       0.366

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      28.383       1.134     647.217      26.073     228.870       1.774

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 162605.641       0.466    1380.350 1287261.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 9.538   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.218    3587.000      28.383     647.217       1.000       1.000       0.980
W Kg/sec =   68.28079
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
86.904	3211.179	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
115559.867	117870.812	2.013	509.668	253.139	390.276	1.542

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	375.30	-0.13	375.30	0.30	513.36
MEAN	15.91	0.00	-0.02	375.30	-0.13	375.30	0.30	
HUB	13.07	0.00	-0.02	375.30	-0.13	375.30	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.80	47.36	9.44	573.46	685.46	26.62	635.47	0.55
MEAN	53.01	44.80	8.21	498.12	623.78	26.62	635.47	0.50
HUB	47.48	38.84	8.64	409.12	555.28	26.62	635.47	0.45

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	477.95	290.02	379.91	1254.38	0.38
MEAN	15.50	478.70	284.24	385.18	1250.48	0.38
HUB	12.59	506.64	322.30	390.91	1246.59	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	561.57	466.98	271.55	0.37	5205.27	
MEAN	485.11	434.41	200.87	0.35	4407.10	1.58
HUB	394.10	397.45	71.80	0.32	4059.40	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	32.21	1.13	29.13	673.33	1.04	654.28	0.92	0.91
MEAN	31.60	1.11	28.56	669.32	1.03	650.22	0.92	0.91
HUB	31.34	1.10	27.96	667.58	1.03	646.18	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.36	35.56	31.50	4.06	0.93	0.39	2.90	
MEAN	36.43	27.54	23.50	4.04	0.93	0.37	3.34	0.91
HUB	39.50	10.41	6.50	3.91	0.93	0.35	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	484.438	289.453	388.455	1250.761	0.387	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
31.650	28.537	650.509	46.000	36.691	33.000	-3.691

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	405.861	289.453	498.504	1256.357	0.323	0.268

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	31.605	29.399	656.342	440.827	0.034	0.418

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	379.836	0.000	379.836	1257.988	0.302	0.351

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	29.646	658.047	0.000	0.060	0.041	0.346

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	31.583	1.113	670.078	22.861	240.580	1.865

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 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  142671.812       0.452    1211.133 1321104.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     917791.56   7791.0781    146.7477      2.0906      0.8359      9.5375      1.2817


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 95%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.974   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     147.976    3587.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   67.26170

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     144.557    3572.873       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  113835.133  116111.594       1.975     831.557     420.983     619.754       1.472

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   344.58    -0.12   344.58     0.31   643.21
  MEAN    17.06     0.00    -0.02   344.58    -0.12   344.58     0.31
  HUB     12.51     0.00    -0.02   344.58    -0.12   344.58     0.31

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.92    50.47    11.45   645.77   732.06    14.13   512.89     0.66
  MEAN    57.17    47.20     9.97   534.02   635.64    14.13   512.89     0.57
  HUB     48.66    38.62    10.04   391.59   521.70    14.13   512.89     0.47

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   601.77   403.83   446.14  1134.14     0.53
  MEAN    18.04   624.53   425.40   457.24  1128.14     0.55
  HUB     15.00   702.43   517.10   475.41  1119.39     0.63

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    645.77   507.52   241.94     0.45  8333.52
  MEAN   564.57   477.95   139.17     0.42  7674.57     1.50
  HUB    469.54   477.78    47.56     0.43  7757.94

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.30     1.28    15.93   564.71     1.08   534.47     0.92     0.91
  MEAN    18.94     1.25    15.38   561.40     1.07   528.83     0.92     0.91
  HUB     18.98     1.26    14.56   561.82     1.07   520.62     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     42.15    28.47    24.20     4.27     0.93     0.40     2.90
  MEAN    42.93    16.93    12.70     4.23     0.94     0.35     3.51     0.91
  HUB     47.41    -5.71    -9.30     3.59     0.94     0.20     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.992
```

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	632.218	424.575	468.440	1128.562	0.560	0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.036	15.379	529.261	24.000	42.188	35.400	-6.788

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	483.893	424.575	643.752	1143.209	0.423	0.388

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.956	16.755	543.088	528.796	0.031	0.516

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	447.501	0.000	447.501	1146.185	0.390	0.426

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.991	545.919	0.000	0.060	0.052	0.450

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.866	18.877	1.250	562.646	39.836	194.498	1.508

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
248010.453	0.595	2073.924	1448913.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 9.974 EfDer = 0.988

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
147.976	3587.000	18.877	562.646	1.000	1.000	0.980

W Kg/sec = 67.26170

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
120.015	3444.071	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
113835.133	116111.594	1.689	590.487	349.520	474.134	1.357

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	426.58	-0.15	426.58	0.37	617.62
MEAN	18.08	0.00	-0.02	426.58	-0.15	426.58	0.37	
HUB	15.21	0.00	-0.02	426.58	-0.15	426.58	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.46	46.36	10.10	643.27	771.98	17.16	547.45	0.67
MEAN	53.00	42.30	10.70	565.89	708.78	17.16	547.45	0.62
HUB	48.15	37.84	10.31	476.11	639.37	17.16	547.45	0.56

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	543.58	338.79	425.08	1173.97	0.46
MEAN	18.01	550.66	340.48	432.78	1169.25	0.47
HUB	15.22	593.28	396.39	441.42	1164.55	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	639.20	520.52	300.41	0.44	6921.09	
MEAN	563.76	486.98	223.28	0.42	6134.65	1.59
HUB	476.52	448.63	80.12	0.39	6036.55	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.82	1.21	19.70	597.43	1.06	572.76	0.92	0.90
MEAN	22.35	1.18	19.19	593.48	1.05	568.16	0.92	0.90

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 HUB     22.29     1.18    18.66   592.98     1.05   563.59     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.55    35.25    31.50     3.75     0.93     0.40     2.90
 MEAN    38.19    27.29    23.50     3.79     0.94     0.39     3.30     0.90
 HUB     41.92    10.29     6.50     3.79     0.94     0.38     3.92


   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     820.989     341.434     746.623    1138.144       0.721      -1.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.451      15.870     538.349      46.000      24.575      30.600       6.025

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     743.526     341.434     818.174    1148.791       0.647      -0.703

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      22.360      16.867     548.468     345.258       0.038       0.247

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     732.425       0.000     732.425    1150.239       0.637       0.319

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      16.924     549.838       0.000       0.060       0.074      -0.685

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.847      22.241       1.178     594.629      31.984     214.910       1.666

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 199237.484       0.488    1666.072 1296830.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 9.974   EfDer =  0.897

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3587.000      22.241     594.629       1.000       1.000       0.680
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.718    3350.167       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.241     378.495     304.986     293.880       0.964

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   649.02    -0.22   649.02     0.56   586.74
 MEAN    17.74     0.00    -0.02   649.02    -0.22   649.02     0.56
 HUB     15.05     0.00    -0.02   649.02    -0.22   649.02     0.56

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.08    46.36    -2.28   628.24   903.44    17.98   559.47     0.78
 MEAN    40.56    43.40    -2.84   555.26   854.28    17.98   559.47     0.74
 HUB     35.99    38.84    -2.85   471.10   802.11    17.98   559.47     0.69

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   512.69   292.53   421.04  1203.28     0.43
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 MEAN    17.51   521.80   301.42   425.94  1199.89     0.43
 HUB     14.85   564.55   363.40   432.04  1196.60     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    620.10   533.47   327.58     0.44  5799.42
 MEAN   548.00   492.16   246.58     0.41  5280.80     1.84
 HUB    464.84   443.79   101.44     0.37  5399.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.52     1.15    22.52   623.76     1.05   601.82     0.92     0.82
 MEAN    25.22     1.13    22.14   621.15     1.04   598.43     0.92     0.82
 HUB     25.29     1.14    21.71   621.75     1.05   595.15     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.79    37.88    31.50     6.38     0.93     0.47     2.90
 MEAN    35.29    30.07    23.50     6.57     0.89     0.48     3.28     0.82
 HUB     40.07    13.21     6.50     6.71     0.89     0.50     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.897

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     527.136     303.398     431.071    1200.480       0.439        0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.309      22.167     599.028      46.000      35.139      31.500      -3.639

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     439.499     303.398     534.051    1207.544       0.364        0.293

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.279      23.066     606.098     471.992       0.019        0.384

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     426.699       0.000     426.699    1208.466       0.353        0.298

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      23.125     607.024       0.000       0.060       0.041        0.311

    STAGE EXIT CONDITIONS, STAGE            3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.788      25.209       1.133     622.221      27.591     236.993       1.837

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 171977.469       0.447    1438.117 1984696.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 9.974   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3587.000      25.209     622.221       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.507    3275.045       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.865     513.330     275.268     401.059       1.457

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   400.74    -0.14   400.74     0.33   550.44
 MEAN    16.97     0.00    -0.02   400.74    -0.14   400.74     0.33
 HUB     14.32     0.00    -0.02   400.74    -0.14   400.74     0.33
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.39    46.36    10.03   602.89   724.04    23.36   608.82     0.60
MEAN    52.98    43.80     9.18   531.23   665.54    23.36   608.82     0.55
HUB     48.21    37.84    10.37   448.25   601.37    23.36   608.82     0.50

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   505.31   304.84   403.01  1230.84     0.41
MEAN    16.57   510.95   306.83   408.56  1227.08     0.42
HUB     13.89   548.28   358.62   414.74  1223.33     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    590.99   494.27   286.15     0.40  5758.03
MEAN   518.80   460.28   211.97     0.38  5087.69     1.58
HUB    434.79   421.68    76.17     0.34  4983.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     29.13     1.16    25.94   651.12     1.05   629.82     0.92     0.91
MEAN    28.65     1.14    25.43   647.76     1.04   625.98     0.92     0.91
HUB     28.58     1.13    24.90   647.23     1.04   622.16     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.10    35.38    31.50     3.88     0.93     0.39     2.90
MEAN    36.91    27.42    23.50     3.92     0.93     0.38     3.29     0.91
HUB     40.85    10.41     6.50     3.91     0.93     0.37     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     505.342     308.555     400.206    1228.464       0.411       0.048

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.755      25.590     627.401      46.000      37.632      32.400      -5.232

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     412.701     308.555     515.294    1235.391       0.334       0.345

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      28.720      26.583     634.497     456.573       0.020       0.428

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     392.669       0.000     392.669    1236.701       0.318       0.330

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      26.700     635.842       0.000       0.060       0.046       0.380

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      28.634       1.136     648.706      26.485     223.531       1.733

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 165182.359       0.473    1381.295 1262927.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 9.974   EfDer =  0.996

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    147.976    3587.000      28.634     648.706       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R          Blades       THK
     84.956    3207.492       1.401       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
113835.133	116111.594	2.060	509.668	247.464	390.276	1.577

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	366.49	-0.13	366.49	0.30	512.77
MEAN	15.91	0.00	-0.02	366.49	-0.13	366.49	0.30	
HUB	13.07	0.00	-0.02	366.49	-0.13	366.49	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.42	47.36	10.06	573.46	680.67	26.94	637.51	0.55
MEAN	53.66	44.80	8.86	498.12	618.51	26.94	637.51	0.50
HUB	48.16	38.84	9.32	409.12	549.36	26.94	637.51	0.44

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	474.86	296.61	370.83	1256.61	0.38
MEAN	15.50	474.35	289.09	376.08	1252.60	0.38
HUB	12.59	500.76	324.05	381.78	1248.60	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	561.57	455.76	264.96	0.36	5323.46	
MEAN	485.11	424.10	196.02	0.34	4482.21	1.61
HUB	394.10	388.15	70.04	0.31	4081.49	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	32.57	1.14	29.51	675.41	1.04	656.61	0.92	0.91
MEAN	31.92	1.11	28.91	671.19	1.03	652.43	0.92	0.91
HUB	31.62	1.10	28.30	669.18	1.03	648.27	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.65	35.55	31.50	4.05	0.93	0.40	2.90	
MEAN	37.55	27.53	23.50	4.03	0.93	0.38	3.34	0.91
HUB	40.32	10.40	6.50	3.90	0.93	0.36	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	480.124	294.391	379.280	1252.864	0.383	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
31.971	28.888	652.704	46.000	37.818	33.000	-4.818

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	395.904	294.391	493.362	1258.755	0.315	0.287

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	31.919	29.803	658.856	440.827	0.037	0.435

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	370.685	0.000	370.685	1260.294	0.294	0.366

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	30.035	660.468	0.000	0.060	0.044	0.361

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.876	31.894	1.114	671.926	23.220	234.967	1.821

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
144919.312	0.460	1211.850	1296237.250

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   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    929327.06   7771.2588    144.5575      2.1112      0.8378      9.9739      1.2852


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

   Fan-Core + 4 Stage LPC 95%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc =10.975   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    142.874    3587.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   64.94257

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    139.573    3572.873       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109910.180  112108.148       2.046     831.557     406.468     619.754       1.525

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   331.51    -0.11   331.51     0.30   643.21
 MEAN    17.06     0.00    -0.02   331.51    -0.11   331.51     0.30
 HUB     12.51     0.00    -0.02   331.51    -0.11   331.51     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.83    50.47    12.36   645.77   725.99    14.20   513.63     0.65
 MEAN    58.17    47.20    10.97   534.02   628.65    14.20   513.63     0.57
 HUB     49.76    38.62    11.14   391.59   513.16    14.20   513.63     0.46

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   595.28   413.47   428.25  1135.88     0.52
 MEAN    18.04   615.20   430.89   439.09  1129.69     0.54
 HUB     15.00   688.13   515.13   456.25  1120.99     0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    645.77   487.20   232.30     0.43  8532.29
 MEAN   564.57   458.99   133.69     0.41  7773.43     1.55
 HUB    469.54   458.52    45.60     0.41  7728.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.38     1.28    16.07   565.71     1.08   536.12     0.92     0.90
 MEAN    18.97     1.26    15.50   561.90     1.07   530.29     0.92     0.90
 HUB     18.95     1.25    14.69   561.67     1.07   522.13     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.99    28.48    24.20     4.28     0.93     0.43     2.90
 MEAN    44.46    16.93    12.70     4.23     0.94     0.37     3.51     0.90
 HUB     48.47    -5.71    -9.30     3.59     0.94     0.22     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.986

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     622.256     430.050     449.733    1130.153       0.551       0.002
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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.063      15.510     530.754      24.000      43.718      35.400      -8.318

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     463.767     430.050     632.474    1145.357       0.405       0.414

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.972      16.943     545.131     528.796       0.035       0.540

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     429.716       0.000     429.716    1148.024       0.374       0.443

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.139     547.672       0.000       0.060       0.059       0.467

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      18.882       1.250     563.095      40.285     189.175       1.466

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 250808.750       0.601    2025.010 1393961.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.975   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    142.874    3587.000      18.882     563.095       1.000       1.000       0.980
W Kg/sec =   64.94257

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    115.891    3442.696       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109910.180  112108.148       1.750     590.487     337.510     474.134       1.405

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   409.89    -0.14   409.89     0.36   617.37
 MEAN    18.08     0.00    -0.02   409.89    -0.14   409.89     0.36
 HUB     15.21     0.00    -0.02   409.89    -0.14   409.89     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.50    46.36    11.14   643.27   762.88    17.29   549.07     0.66
 MEAN    54.09    42.30    11.79   565.89   698.86    17.29   549.07     0.61
 HUB     49.28    37.84    11.44   476.11   628.35    17.29   549.07     0.55

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   538.28   350.63   408.41  1176.15     0.46
 MEAN    18.01   543.14   349.18   416.02  1171.22     0.46
 HUB     15.22   583.00   399.52   424.59  1166.29     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   500.07   288.57     0.43  7162.77
 MEAN   563.76   468.10   214.58     0.40  6291.25     1.64
 HUB    476.52   431.51    77.00     0.37  6083.98

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.94     1.22    19.87   599.09     1.06   574.90     0.92     0.90
 MEAN    22.42     1.19    19.34   594.71     1.06   570.08     0.92     0.90
 HUB     22.29     1.18    18.79   593.67     1.05   565.29     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     40.65    35.24    31.50     3.74     0.93     0.42     2.90
 MEAN    40.01    27.28    23.50     3.78     0.94     0.41     3.30     0.90
 HUB     43.26    10.28     6.50     3.78     0.94     0.39     3.92


   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     787.014     350.159     704.826    1144.212       0.688       -0.913

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.520      16.406     544.107      46.000      26.418      30.600       4.182

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     17.960     699.010     350.159     781.810    1155.636       0.605       -0.561

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      22.451      17.529     555.027     345.258       0.031       0.275

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     687.773       0.000     687.773    1156.995       0.594       0.374

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      17.607     556.328       0.000       0.060       0.057      -0.537

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.856      22.367       1.185     595.825      32.730     207.049       1.605

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 203888.938       0.499    1646.183 1244706.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.975   EfDer =  0.928

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    142.874    3587.000       22.367     595.825       1.000        1.000        0.680
W Kg/sec =   64.94257

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    100.637    3346.802        1.402       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 109910.180  112108.148        1.291     378.495     293.103     293.880       1.003

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   614.06    -0.21   614.06      0.53   586.15
 MEAN    17.74      0.00    -0.02   614.06    -0.21   614.06      0.53
 HUB     15.05      0.00    -0.02   614.06    -0.21   614.06      0.53

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     45.66     46.36    -0.70   628.24   878.65     18.51   564.35      0.75
 MEAN    42.13     43.40    -1.27   555.26   828.02     18.51   564.35      0.71
 HUB     37.51     38.84    -1.33   471.10   774.09     18.51   564.35      0.66

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   506.11    310.20    399.90   1206.78      0.42
 MEAN    17.51   512.96    314.62    405.15   1203.00      0.43
 HUB     14.85   552.77    369.30    411.31   1199.34      0.46
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	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	620.10	505.93	309.91	0.42	6149.23	
MEAN	548.00	467.56	233.38	0.39	5511.62	1.89
HUB	464.84	422.26	95.55	0.35	5487.23	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.00	1.16	23.03	626.71	1.05	605.33	0.92	0.85
MEAN	25.60	1.14	22.59	623.51	1.05	601.55	0.92	0.85
HUB	25.59	1.14	22.12	623.39	1.05	597.88	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.80	37.77	31.50	6.27	0.93	0.48	2.90	
MEAN	37.83	29.94	23.50	6.44	0.90	0.49	3.28	0.85
HUB	41.92	13.08	6.50	6.58	0.90	0.52	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.928

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	518.014	316.682	409.941	1203.588	0.430	0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.698	22.622	602.137	46.000	37.686	31.500	-6.186

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	416.763	316.682	523.430	1211.457	0.344	0.336

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	25.657	23.638	610.037	471.992	0.023	0.423

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	405.037	0.000	405.037	1212.255	0.334	0.332

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.670	610.841	0.000	0.060	0.049	0.346

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.812	25.574	1.143	624.534	28.709	223.753	1.735

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
178948.625	0.465	1444.817	1881855.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =10.975 EfDer = 0.989

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
142.874	3587.000	25.574	624.534	1.000	1.000	0.980

W Kg/sec = 64.94257

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
90.115	3268.973	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
109910.180	112108.148	1.956	513.330	262.476	401.059	1.528

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	380.72	-0.13	380.72	0.31	549.42
MEAN	16.97	0.00	-0.02	380.72	-0.13	380.72	0.31	
HUB	14.32	0.00	-0.02	380.72	-0.13	380.72	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.73	46.36	11.37	602.89	713.15	23.89	612.44	0.59
MEAN	54.38	43.80	10.58	531.23	653.67	23.89	612.44	0.54

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HUB     49.67    37.84    11.83   448.25   588.21    23.89   612.44     0.48

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   498.47   319.44   382.67  1234.99     0.40
MEAN    16.57   501.54   317.57   388.19  1230.98     0.41
HUB     13.89   535.65   362.53   394.32  1226.98     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    590.99   469.23   271.55     0.38  6033.52
MEAN   518.80   437.24   201.23     0.36  5265.62     1.64
HUB    434.79   400.89    72.26     0.33  5037.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     29.71     1.16    26.55   654.82     1.05   634.09     0.92     0.90
MEAN    29.16     1.14    26.01   650.96     1.04   629.98     0.92     0.90
HUB     29.00     1.13    25.43   649.82     1.04   625.88     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.85    35.36    31.50     3.86     0.93     0.42     2.90
MEAN    39.29    27.40    23.50     3.90     0.94     0.40     3.29     0.90
HUB     42.59    10.38     6.50     3.88     0.94     0.40     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481      496.690     319.358     380.409    1232.255       0.403        0.045

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.255      26.154      631.287      46.000      40.014      32.400      -7.614

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     16.481      391.429     319.358     505.179    1239.844       0.316        0.383

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      29.208      27.257     639.086     456.573       0.024        0.466

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
    16.096     372.890       0.000     372.890    1240.990       0.300        0.359

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950      27.336     640.268       0.000       0.060       0.056        0.407

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
     0.862       29.104       1.138      651.867      27.333     212.778        1.649

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 170480.062       0.488    1376.442 1209316.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.975   EfDer =  0.990

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    142.874     3587.000       29.104      651.867       1.000        1.000        0.980
W Kg/sec =   64.94257

   W cor       RPM cor         GAMMA        Cp          R           Blades       THK
     80.897     3199.704        1.401        0.249       53.349      56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 109910.180  112108.148        2.163      509.668     235.644     390.276        1.656
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ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	348.28	-0.12	348.28	0.28	511.53
MEAN	15.91	0.00	-0.02	348.28	-0.12	348.28	0.28	
HUB	13.07	0.00	-0.02	348.28	-0.12	348.28	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.73	47.36	11.37	573.46	671.04	27.56	641.75	0.54
MEAN	55.05	44.80	10.25	498.12	607.90	27.56	641.75	0.49
HUB	49.60	38.84	10.76	409.12	537.38	27.56	641.75	0.43

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	469.28	310.05	352.27	1261.18	0.37
MEAN	15.50	465.98	298.99	357.40	1256.98	0.37
HUB	12.59	488.98	327.63	362.98	1252.78	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	561.57	432.85	251.52	0.34	5564.42	
MEAN	485.11	402.96	186.12	0.32	4635.59	1.67
HUB	394.10	369.02	66.47	0.29	4126.42	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	33.24	1.14	30.21	679.78	1.04	661.42	0.92	0.91
MEAN	32.52	1.12	29.58	675.12	1.04	657.01	0.92	0.91
HUB	32.14	1.10	28.93	672.56	1.03	652.63	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.35	35.53	31.50	4.03	0.93	0.43	2.90	
MEAN	39.91	27.51	23.50	4.01	0.94	0.41	3.34	0.91
HUB	42.07	10.38	6.50	3.88	0.94	0.39	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.990

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	471.844	304.476	360.460	1257.210	0.375	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
32.574	29.553	657.256	46.000	40.187	33.000	-7.187

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	375.617	304.476	483.522	1263.696	0.297	0.325

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	32.502	30.568	664.056	440.827	0.043	0.472

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	352.019	0.000	352.019	1265.058	0.278	0.397

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	30.769	665.488	0.000	0.060	0.054	0.391

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.866	32.470	1.116	675.820	23.952	223.769	1.735

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
149503.609	0.474	1207.080	1241468.750

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
953630.00	7699.5317	139.5732	2.1493	0.8382	10.9747	1.2927

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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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Fan-Core + 4 Stage LPC 95% Stat 2 30% Ice Block 9-1-2011

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1

RESET = 0.000 BLEED = 0.000 DPInc = 11.153 EfDer = 0.985

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
141.967	3587.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 64.53068

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
138.688	3572.873	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
109213.102	111397.125	2.059	831.557	403.890	619.754	1.534

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	329.20	-0.11	329.20	0.30	643.21
MEAN	17.06	0.00	-0.02	329.20	-0.11	329.20	0.30	
HUB	12.51	0.00	-0.02	329.20	-0.11	329.20	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.99	50.47	12.52	645.77	724.94	14.21	513.76	0.65
MEAN	58.35	47.20	11.15	534.02	627.44	14.21	513.76	0.56
HUB	49.96	38.62	11.34	391.59	511.67	14.21	513.76	0.46

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	594.21	415.16	425.13	1136.17	0.52
MEAN	18.04	613.61	431.84	435.92	1129.96	0.54
HUB	15.00	685.65	514.78	452.90	1121.27	0.61

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	645.77	483.65	230.61	0.43	8567.06	
MEAN	564.57	455.68	132.73	0.40	7790.68	1.56
HUB	469.54	455.16	45.24	0.41	7723.11	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.40	1.28	16.09	565.89	1.08	536.40	0.92	0.90
MEAN	18.98	1.26	15.52	561.99	1.07	530.54	0.92	0.90
HUB	18.94	1.25	14.71	561.65	1.07	522.38	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.32	28.48	24.20	4.28	0.93	0.43	2.90	
MEAN	44.73	16.93	12.70	4.23	0.94	0.37	3.51	0.90
HUB	48.66	-5.70	-9.30	3.60	0.94	0.23	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.985

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	620.563	431.005	446.467	1130.424	0.549	0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.068	15.532	531.008	24.000	43.990	35.400	-8.590

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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     460.269     431.005     630.565    1145.723       0.402       0.418

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.974      16.975     545.479     528.796       0.036       0.544

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     426.618       0.000     426.618    1148.338       0.372       0.446

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.163     547.972       0.000       0.060       0.061       0.470

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.856      18.882       1.250     563.173      40.363     188.242       1.459

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 251295.531       0.603    2016.072 1384267.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.153   EfDer =  0.980

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    141.967    3587.000      18.882     563.173       1.000       1.000       0.980
W Kg/sec =   64.53068

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    115.164    3442.457       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109213.102  111397.125       1.761     590.487     335.394     474.134       1.414

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   406.98    -0.14   406.98     0.35   617.33
 MEAN    18.08      0.00    -0.02   406.98    -0.14   406.98     0.35
 HUB     15.21      0.00    -0.02   406.98    -0.14   406.98     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.69    46.36    11.33   643.27   761.32    17.31   549.34     0.66
 MEAN    54.28    42.30    11.98   565.89   697.16    17.31   549.34     0.61
 HUB     49.48    37.84    11.64   476.11   626.46    17.31   549.34     0.54

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   537.44   352.69   405.52  1176.53     0.46
 MEAN    18.01   541.90   350.70   413.11  1171.55     0.46
 HUB     15.22   581.25   400.07   421.66  1166.59     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    639.20   496.52   286.51     0.42  7204.77
 MEAN   563.76   464.82   213.06     0.40  6318.62     1.64
 HUB    476.52   428.53    76.45     0.37  6092.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.96     1.22    19.90   599.38     1.06   575.26     0.92     0.90
 MEAN    22.43     1.19    19.37   594.93     1.06   570.41     0.92     0.90
 HUB     22.29     1.18    18.81   593.79     1.05   565.58     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.01    35.24    31.50     3.74     0.93     0.43     2.90
 MEAN    40.33    27.28    23.50     3.78     0.94     0.41     3.30     0.90
 HUB     43.50    10.28     6.50     3.78     0.94     0.40     3.92
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   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      781.527     351.684     697.928     1145.186       0.682       -0.898

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     22.530      16.491      545.034      46.000      26.743       30.600       3.857

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     17.960      691.740     351.684     776.006     1156.731       0.598       -0.538

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.650       22.464      17.635     556.080      345.258       0.030       0.280

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4        cp 3-4
     17.823      680.541       0.000     680.541     1158.069       0.588       0.382

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.650       17.715      557.363       0.000       0.060       0.055       -0.513

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4           PR4        Texit        Del T        Ns         Ns nondim
      0.857       22.385        1.186      596.034      32.860      205.699       1.595

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 204700.031       0.501    1642.249 1235561.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.153   EfDer =  0.933

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    141.967     3587.000       22.385      596.034       1.000        1.000        0.680
W Kg/sec =   64.53068

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     99.936     3346.217        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 109213.102  111397.125        1.300      378.495      291.059      293.880       1.010

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00     -0.02    608.27     -0.21    608.27      0.52    586.05
 MEAN    17.74      0.00     -0.02    608.27     -0.21    608.27      0.52
 HUB     15.05      0.00     -0.02    608.27     -0.21    608.27      0.52

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     45.93     46.36     -0.43   628.24    874.61     18.59    565.15      0.75
 MEAN    42.40     43.40     -1.00   555.26    823.74     18.59    565.15      0.71
 HUB     37.77     38.84     -1.07   471.10    769.50     18.59    565.15      0.66

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP      19.81   505.13    313.15    396.36   1207.36      0.42
 MEAN     17.51   511.57    316.83    401.66   1203.52      0.43
 HUB      14.85   550.84    370.28    407.83   1199.80      0.46

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP     620.10    501.32    306.96      0.42   6207.65
 MEAN    548.00    463.43    231.17      0.39   5550.25      1.90
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 HUB    464.84   418.65    94.57     0.35  5501.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.07     1.16    23.11   627.21     1.05   605.92     0.92     0.85
 MEAN    25.66     1.15    22.66   623.91     1.05   602.07     0.92     0.85
 HUB     25.63     1.15    22.18   623.67     1.05   598.34     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.31    37.76    31.50     6.26     0.93     0.49     2.90
 MEAN    38.27    29.92    23.50     6.42     0.90     0.50     3.28     0.85
 HUB     42.24    13.05     6.50     6.55     0.90     0.52     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.933

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     516.583     318.905     406.396    1204.105       0.429       0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.759      22.695     602.656      46.000      38.122      31.500      -6.622

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     412.970     318.905     521.771    1212.109       0.341       0.343

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.717      23.730     610.695     471.992       0.024       0.430

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     401.428       0.000     401.428    1212.887       0.331       0.338

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.756     611.480       0.000       0.060       0.051       0.352

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.816       25.630       1.145     624.930      28.896     221.615       1.718

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 180113.094       0.468    1444.995 1864483.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.153   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    141.967    3587.000      25.630     624.930       1.000       1.000       0.980
W Kg/sec =   64.53068

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.376    3267.939       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109213.102  111397.125       1.972     513.330     260.322     401.059       1.541

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   377.38    -0.13   377.38     0.31   549.24
 MEAN    16.97     0.00    -0.02   377.38    -0.13   377.38     0.31
 HUB     14.32     0.00    -0.02   377.38    -0.13   377.38     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.96    46.36    11.60   602.89   711.37    23.97   613.05     0.59
 MEAN    54.62    43.80    10.82   531.23   651.73    23.97   613.05     0.54
 HUB     49.91    37.84    12.07   448.25   586.06    23.97   613.05     0.48

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   497.45   321.84   379.30  1235.68     0.40
MEAN    16.57   500.05   319.34   384.80  1231.63     0.41
HUB     13.89   533.59   363.18   390.92  1227.59     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    590.99   465.09   269.15     0.38  6078.84
MEAN   518.80   433.43   199.47     0.35  5294.84     1.65
HUB    434.79   397.43    71.61     0.32  5046.39

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     29.80     1.16    26.65   655.44     1.05   634.80     0.92     0.90
MEAN    29.24     1.14    26.10   651.51     1.04   630.65     0.92     0.90
HUB     29.06     1.13    25.52   650.26     1.04   626.51     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.31    35.36    31.50     3.86     0.93     0.42     2.90
MEAN    39.69    27.40    23.50     3.90     0.94     0.41     3.29     0.90
HUB     42.89    10.38     6.50     3.88     0.94     0.40     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.987

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     495.324     321.132     377.121    1232.886       0.402       0.045

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    29.332      26.242     631.934      46.000      40.416      32.400      -8.016

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     387.912     321.132     503.588    1240.582       0.313       0.389

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      29.283      27.362     639.849     456.573       0.025       0.472

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    16.096     369.620       0.000     369.620    1241.702       0.298       0.364

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      27.434     641.005       0.000       0.060       0.058       0.411

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.860      29.175       1.138     652.402      27.473     211.034       1.636

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 171351.703       0.491    1374.705 1200010.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =11.153   EfDer =  0.989

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    141.967    3587.000      29.175     652.402       1.000       1.000       0.980
W Kg/sec =   64.53068

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.221    3198.393       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109213.102  111397.125       2.181     509.668     233.675     390.276       1.670

    ROTOR LEADING EDGE CONDITIONS, STAGE            5
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   345.27    -0.12   345.27     0.28   511.32
MEAN    15.91     0.00    -0.02   345.27    -0.12   345.27     0.28
HUB     13.07     0.00    -0.02   345.27    -0.12   345.27     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.95    47.36    11.59   573.46   669.48    27.65   642.46     0.54
MEAN    55.28    44.80    10.48   498.12   606.18    27.65   642.46     0.49
HUB     49.85    38.84    11.01   409.12   535.43    27.65   642.46     0.43

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   468.45   312.24   349.22  1261.94     0.37
MEAN    15.50   464.66   300.60   354.33  1257.70     0.37
HUB     12.59   487.08   328.23   359.88  1253.47     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    561.57   429.09   249.33     0.34  5603.69
MEAN   485.11   399.49   184.51     0.32  4660.50     1.68
HUB    394.10   365.86    65.87     0.29  4133.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     33.35     1.14    30.32   680.51     1.04   662.21     0.92     0.91
MEAN    32.62     1.12    29.68   675.78     1.04   657.78     0.92     0.91
HUB     32.21     1.10    29.03   673.14     1.03   653.36     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.80    35.53    31.50     4.03     0.93     0.44     2.90
MEAN    40.31    27.51    23.50     4.01     0.94     0.41     3.34     0.91
HUB     42.37    10.37     6.50     3.87     0.94     0.39     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     470.543     306.114     357.358    1257.930       0.374       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     32.665      29.655     658.013      46.000      40.583      33.000      -7.583

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     372.290     306.114     481.981    1264.513       0.294       0.331

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      32.590      30.686     664.918     440.827       0.045       0.478

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     348.955       0.000     348.955    1265.847       0.276       0.402

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      30.881     666.321       0.000       0.060       0.056       0.395

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.864       32.556       1.116     676.474      24.072     221.966       1.721

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 150251.469       0.476    1205.424 1231962.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    957711.75   7683.4468    138.6880      2.1550      0.8379     11.1535      1.2939
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 3.253   EfDer =  0.988

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     175.405    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   79.72971

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     171.353    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  134936.266  137634.703       1.666     831.557     499.019     619.754       1.242

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   417.84    -0.14   417.84     0.38   609.32
  MEAN    17.06     0.00    -0.02   417.84    -0.14   417.84     0.38
  HUB     12.51     0.00    -0.02   417.84    -0.14   417.84     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     55.67    50.47     5.20   611.74   740.94    13.69   508.23     0.67
  MEAN    50.45    47.20     3.25   505.89   656.24    13.69   508.23     0.59
  HUB     41.61    38.62     2.99   370.96   558.85    13.69   508.23     0.51

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   644.12   304.14   567.79  1116.74     0.58
  MEAN    18.04   678.75   359.35   575.81  1113.72     0.61
  HUB     15.00   782.72   504.48   598.45  1105.78     0.71

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   645.76   307.60     0.58  6277.40
  MEAN   534.83   601.96   175.47     0.54  6483.75     1.20
  HUB    444.80   601.42    59.68     0.54  7568.97

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.01     1.19    14.37   552.71     1.06   518.07     0.92     0.90
  MEAN    18.11     1.20    14.09   553.70     1.06   515.23     0.92     0.90
  HUB     18.65     1.23    13.35   558.86     1.07   507.73     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     28.18    28.45    24.20     4.25     0.93     0.20     2.90
  MEAN    31.97    16.95    12.70     4.25     0.92     0.16     3.51     0.90
  HUB     40.13    -5.70    -9.30     3.60     0.92     0.03     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     692.526     358.655     592.418    1113.290       0.622      -0.014

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.214      14.027     515.034      24.000      31.191      35.400       4.209

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	631.961	358.655	726.642	1120.508	0.564	0.156

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.135	14.610	521.734	528.796	0.028	0.339

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	577.575	0.000	577.575	1126.393	0.513	0.241

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.071	527.228	0.000	0.060	0.051	0.263

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.844	18.036	1.194	555.091	32.281	237.554	1.842

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
200976.391	0.537	1992.142	1756980.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 3.253 EfDer = 0.978

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
175.405	3398.000	18.036	555.091	1.000	1.000	0.980

W Kg/sec = 79.72971

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
147.895	3284.728	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
134936.266	137634.703	1.371	590.487	430.711	474.134	1.101

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	546.97	-0.19	546.97	0.48	589.04
MEAN	18.08	0.00	-0.02	546.97	-0.19	546.97	0.48	
HUB	15.21	0.00	-0.02	546.97	-0.19	546.97	0.48	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.10	46.36	1.74	609.37	818.99	15.36	530.11	0.73
MEAN	44.43	42.30	2.13	536.08	766.00	15.36	530.11	0.68
HUB	39.52	37.84	1.68	451.02	709.06	15.36	530.11	0.63

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	601.52	204.17	565.81	1145.02	0.53
MEAN	18.01	616.47	238.90	568.30	1144.10	0.54
HUB	15.22	668.63	345.36	572.54	1143.04	0.58

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	693.70	401.35	0.61	4172.95	
MEAN	534.05	640.37	295.15	0.56	4305.96	1.28
HUB	451.41	582.28	106.05	0.51	5260.23	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.13	1.12	16.68	574.96	1.04	544.75	0.92	0.89
MEAN	20.20	1.12	16.58	575.59	1.04	543.87	0.92	0.89
HUB	20.70	1.15	16.42	580.14	1.05	542.82	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	19.84	35.35	31.50	3.85	0.93	0.20	2.90	
MEAN	22.80	27.45	23.50	3.95	0.91	0.21	3.30	0.89
HUB	31.10	10.49	6.50	3.99	0.91	0.24	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     724.234     239.569     683.463    1132.592       0.639      -0.305

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.308      15.419     533.098      46.000      19.317      30.600      11.283

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     709.552     239.569     748.904    1134.458       0.625      -0.286

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      20.148      15.474     534.856     455.853       0.052       0.136

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     705.857       0.000     705.857    1134.931       0.622      -0.017

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      15.353     535.293       0.000       0.060       0.109      -0.318

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.741      19.934       1.105     576.897      21.806     307.279       2.382

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 135820.469       0.370    1346.296 1626569.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.253   EfDer =  0.868

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    175.405    3398.000      19.934     576.897       1.000       1.000       0.880
W Kg/sec =   79.72971

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    136.411    3222.050       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 134936.266  137634.703       1.233     489.817     397.282     384.470       0.968

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   645.44    -0.22   645.44     0.57   564.31
 MEAN    17.74     0.00    -0.02   645.44    -0.22   645.44     0.57
 HUB     15.05     0.00    -0.02   645.44    -0.22   645.44     0.57

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.69    46.36    -3.67   595.14   878.09    16.05   542.12     0.77
 MEAN    39.19    43.40    -4.21   526.00   832.77    16.05   542.12     0.73
 HUB     34.67    38.84    -4.17   446.28   784.83    16.05   542.12     0.69

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   611.29   154.85   591.35  1161.24     0.53
 MEAN    17.51   623.75   200.40   590.68  1162.09     0.54
 HUB     14.85   674.31   320.01   593.53  1162.58     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   732.69   432.58     0.63  3071.95
 MEAN   519.12   671.18   318.72     0.58  3512.30     1.31
 HUB    440.35   605.61   120.34     0.52  4755.54
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	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.37	1.07	17.69	591.52	1.03	560.33	0.92	0.79
MEAN	21.58	1.08	17.73	593.62	1.03	561.14	0.92	0.79
HUB	22.19	1.11	17.66	599.53	1.04	561.59	0.92	0.79

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	14.67	36.19	31.50	4.69	0.93	0.20	2.90	
MEAN	18.74	28.35	23.50	4.85	0.88	0.23	3.28	0.79
HUB	28.33	11.46	6.50	4.96	0.88	0.28	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.868

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	632.296	201.717	599.257	1162.319	0.544	-0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.672	17.718	561.514	46.000	18.604	31.500	12.896

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	633.421	201.717	664.765	1162.196	0.545	-0.031

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.510	17.572	561.395	471.992	0.050	0.132

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	616.320	0.000	616.320	1164.042	0.529	-0.028

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.607	563.179	0.000	0.060	0.099	-0.022

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.622	21.316	1.069	594.889	17.992	351.082	2.722

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
112101.070	0.325	1111.181	1864877.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 3.253 EfDer = 0.906

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
175.405	3398.000	21.316	594.889	1.000	1.000	0.980

W Kg/sec = 79.72971

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
129.546	3172.952	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
134936.266	137634.703	1.361	513.330	377.307	401.059	1.063

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	571.90	-0.20	571.90	0.49	533.28
MEAN	16.97	0.00	-0.02	571.90	-0.20	571.90	0.49	
HUB	14.32	0.00	-0.02	571.90	-0.20	571.90	0.49	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	44.97	46.36	-1.39	571.12	808.37	18.09	567.59	0.69
MEAN	41.36	43.80	-2.44	503.23	761.91	18.09	567.59	0.65
HUB	36.61	37.84	-1.23	424.63	712.42	18.09	567.59	0.61

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	618.79	126.71	605.67	1175.60	0.53
MEAN	16.57	628.17	174.88	603.34	1177.07	0.53
HUB	13.89	673.36	297.36	604.15	1178.07	0.57

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	744.61	433.14	0.63	2396.14	
MEAN	491.47	681.35	316.59	0.58	2901.78	1.19
HUB	411.88	614.91	114.52	0.52	4133.12	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.52	1.06	18.64	606.29	1.02	574.35	0.92	0.83
MEAN	22.78	1.07	18.76	608.70	1.02	575.78	0.92	0.83
HUB	23.42	1.10	18.77	614.56	1.03	576.73	0.92	0.83

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	11.82	35.57	31.50	4.07	0.93	0.11	2.90	
MEAN	16.16	27.69	23.50	4.19	0.89	0.14	3.29	0.83
HUB	26.21	10.73	6.50	4.23	0.89	0.19	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.906

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	614.670	175.863	588.975	1179.506	0.521	0.057

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.867	18.999	578.318	46.000	16.625	32.400	15.775

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	635.440	175.863	659.327	1177.294	0.540	-0.034

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.662	18.583	576.151	456.573	0.059	0.113

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	604.283	0.000	604.283	1180.583	0.512	-0.062

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.739	579.374	0.000	0.060	0.119	0.004

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.575	22.411	1.051	609.848	14.959	388.467	3.011

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
93232.070	0.297	924.146	1648158.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 3.253 EfDer = 0.861

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
175.405	3398.000	22.411	609.848	1.000	1.000	0.980

W Kg/sec = 79.72971

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
124.752	3133.796	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
134936.266	137634.703	1.403	509.668	363.361	390.276	1.074

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	556.53	-0.19	556.53	0.47	500.99

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 MEAN    15.91     0.00    -0.02   556.53    -0.19   556.53     0.47
 HUB     13.07     0.00    -0.02   556.53    -0.19   556.53     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.32    47.36    -3.04   543.25   777.85    19.27   584.01     0.66
 MEAN    40.31    44.80    -4.49   471.87   729.78    19.27   584.01     0.62
 HUB     34.87    38.84    -3.97   387.57   678.30    19.27   584.01     0.57

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   602.60   103.79   593.59  1189.82     0.51
 MEAN    15.50   609.78   146.66   591.88  1191.06     0.51
 HUB     12.59   647.80   260.43   593.15  1191.89     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   731.91   428.19     0.62  1865.50
 MEAN   459.55   669.50   312.89     0.56  2275.93     1.16
 HUB    373.33   603.80   112.90     0.51  3281.30

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.32     1.04    19.57   618.72     1.01   588.43     0.92     0.79
 MEAN    23.53     1.05    19.67   620.67     1.02   589.66     0.92     0.79
 HUB     24.03     1.07    19.65   625.46     1.03   590.46     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP      9.92    35.80    31.50     4.30     0.93     0.08     2.90
 MEAN    13.92    27.86    23.50     4.36     0.88     0.11     3.34     0.79
 HUB     23.70    10.78     6.50     4.28     0.88     0.16     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.861

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     617.014     149.349     598.667    1191.140       0.518      -0.016

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.546      19.606     589.857      46.000      14.008      33.000      18.992

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     666.828     149.349     683.349    1185.740       0.562      -0.256

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.067      18.608     584.522     440.827       0.140       0.087

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     614.021       0.000     614.021    1191.451       0.515      -0.100

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.205     590.164       0.000       0.060       0.151      -0.107

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.401      23.023       1.027     621.618      11.770     456.965       3.542

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   73378.742       0.259     727.353 1716252.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     615508.75   6101.1182    171.3535      1.5240      0.6794      3.2529      1.1890

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**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 3.732   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    172.852    3398.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   78.56920

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    168.859    3384.617       1.402       0.249      53.349      32.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
132972.188  135631.328       1.691     831.557     491.755     619.754       1.260

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   410.77    -0.14   410.77     0.37   609.32
MEAN    17.06     0.00    -0.02   410.77    -0.14   410.77     0.37
HUB     12.51     0.00    -0.02   410.77    -0.14   410.77     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.13    50.47     5.66   611.74   736.98    13.73   508.72     0.67
MEAN    50.93    47.20     3.73   505.89   651.77    13.73   508.72     0.59
HUB     42.10    38.62     3.48   370.96   553.58    13.73   508.72     0.50

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   636.59   310.74   555.59  1118.28     0.57
MEAN    18.04   670.67   362.99   563.95  1115.01     0.60
HUB     15.00   772.31   503.23   585.85  1107.09     0.70

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    611.74   631.89   301.00     0.57  6413.50
MEAN   534.83   589.54   171.83     0.53  6549.35     1.22
HUB    444.80   588.76    58.44     0.53  7550.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.09     1.20    14.51   553.36     1.06   519.52     0.92     0.91
MEAN    18.15     1.20    14.21   554.01     1.06   516.45     0.92     0.91
HUB     18.66     1.23    13.47   558.78     1.07   508.99     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     29.22    28.45    24.20     4.25     0.93     0.22     2.90
MEAN    32.77    16.95    12.70     4.25     0.92     0.18     3.51     0.91
HUB     40.66    -5.70    -9.30     3.60     0.92     0.04     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.991

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     683.727     362.287     579.853    1114.697       0.613      -0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.257      14.158     516.336      24.000      31.997      35.400       3.403

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     616.542     362.287     715.106    1122.545       0.549       0.176
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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.186      14.811     523.632     528.796       0.027       0.352

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     563.911       0.000     563.911    1128.094       0.500       0.260

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.257     528.821       0.000       0.060       0.047       0.281

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854      18.101       1.198     555.382      32.572     233.959       1.814

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 202785.922       0.542    1980.820 1727269.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 3.732   EfDer =  0.984

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    172.852    3398.000      18.101     555.382       1.000       1.000       0.980
W Kg/sec =   78.56920

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    145.256    3283.869       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132972.188  135631.328       1.396     590.487     423.028     474.134       1.121

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   534.49    -0.18   534.49     0.47   588.89
 MEAN    18.08     0.00    -0.02   534.49    -0.18   534.49     0.47
 HUB     15.21     0.00    -0.02   534.49    -0.18   534.49     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.75    46.36     2.39   609.37   810.70    15.53   531.53     0.72
 MEAN    45.09    42.30     2.79   536.08   757.13    15.53   531.53     0.67
 HUB     40.17    37.84     2.33   451.02   699.47    15.53   531.53     0.62

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   591.10   215.10   550.57  1147.51     0.52
 MEAN    18.01   606.26   246.59   553.85  1146.17     0.53
 HUB     15.22   658.23   348.13   558.64  1144.74     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   674.95   390.42     0.59  4396.05
 MEAN   534.05   624.01   287.47     0.54  4444.31     1.30
 HUB    451.41   568.10   103.28     0.50  5302.38

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.33     1.12    16.96   576.31     1.04   547.14     0.92     0.90
 MEAN    20.36     1.12    16.82   576.54     1.04   545.86     0.92     0.90
 HUB     20.82     1.15    16.63   580.63     1.05   544.46     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.34    35.34    31.50     3.84     0.93     0.21     2.90
 MEAN    24.00    27.43    23.50     3.93     0.91     0.23     3.30     0.90
 HUB     31.93    10.47     6.50     3.97     0.91     0.25     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.984
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     707.557     247.277     662.941    1135.695       0.623      -0.290

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.468      15.750     536.023      46.000      20.456      30.600      10.144

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     684.397     247.277     727.699    1138.544       0.601      -0.239

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      20.334      15.923     538.715     455.853       0.046       0.158

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     678.677       0.000     678.677    1139.237       0.596       0.029

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      15.856     539.366       0.000       0.060       0.092      -0.257

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.777      20.163       1.114     577.828      22.447     297.228       2.304

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 139810.250       0.381    1365.672 1593729.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 3.732   EfDer =  0.890

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    172.852    3398.000      20.163     577.828       1.000       1.000       0.880
W Kg/sec =   78.56920

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    133.010    3219.453       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132972.188  135631.328       1.264     489.817     387.378     384.470       0.992

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   622.84    -0.21   622.84     0.54   563.85
 MEAN    17.74     0.00    -0.02   622.84    -0.21   622.84     0.54
 HUB     15.05     0.00    -0.02   622.84    -0.21   622.84     0.54

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.71    46.36    -2.65   595.14   861.61    16.49   545.44     0.75
 MEAN    40.19    43.40    -3.21   526.00   815.37    16.49   545.44     0.71
 HUB     35.64    38.84    -3.20   446.28   766.35    16.49   545.44     0.67

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   594.02   171.81   568.63  1165.61     0.51
 MEAN    17.51   607.51   212.43   569.16  1165.77     0.52
 HUB     14.85   658.17   324.69   572.50  1165.69     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   704.33   415.62     0.60  3407.90
 MEAN   519.12   646.53   306.70     0.55  3722.66     1.34
 HUB    440.35   584.07   115.66     0.50  4824.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.82     1.08    18.27   594.05     1.03   564.60     0.92     0.81
 MEAN    21.97     1.09    18.26   595.55     1.03   564.74     0.92     0.81
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 HUB     22.53     1.12    18.14   600.79     1.04   564.64     0.92     0.81

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.81    36.16    31.50     4.66     0.93     0.22     2.90
 MEAN    20.47    28.32    23.50     4.82     0.89     0.25     3.28     0.81
 HUB     29.56    11.42     6.50     4.92     0.89     0.29     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.890

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     615.340     213.820     576.996    1166.118       0.528      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.069      18.252     565.187      46.000      20.333      31.500      11.167

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     605.935     213.820     642.554    1167.106       0.519       0.008

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.942      18.255     566.146     471.992       0.043       0.161

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     588.215       0.000     588.215    1168.926       0.503       0.021

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.333     567.912       0.000       0.060       0.080       0.028

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.688      21.797       1.081     596.796      18.968     331.472       2.570

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 118187.953       0.343    1154.464 1815080.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.732   EfDer =  0.930

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    172.852    3398.000      21.797     596.796       1.000       1.000       0.980
W Kg/sec =   78.56920

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    125.039    3167.878       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132972.188  135631.328       1.410     513.330     364.179     401.059       1.101

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   547.12    -0.19   547.12     0.47   532.43
 MEAN    16.97     0.00    -0.02   547.12    -0.19   547.12     0.47
 HUB     14.32     0.00    -0.02   547.12    -0.19   547.12     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.24    46.36    -0.12   571.12   791.03    18.78   571.81     0.67
 MEAN    42.62    43.80    -1.18   503.23   743.49    18.78   571.82     0.63
 HUB     37.83    37.84    -0.01   424.63   692.69    18.78   571.81     0.59

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   593.24   149.45   574.11  1182.21     0.50
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 MEAN    16.57   604.56   190.73   573.68  1182.71     0.51
 HUB     13.89   650.48   303.10   575.55  1182.92     0.55

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   705.71   410.40     0.60  2825.25
 MEAN   491.47   647.73   300.74     0.55  3164.30     1.22
 HUB    411.88   585.74   108.78     0.50  4212.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.29     1.07    19.61   610.24     1.02   580.87     0.92     0.85
 MEAN    23.47     1.08    19.64   611.85     1.03   581.36     0.92     0.85
 HUB     24.05     1.10    19.58   616.84     1.03   581.54     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     14.59    35.56    31.50     4.06     0.93     0.14     2.90
 MEAN    18.39    27.66    23.50     4.16     0.90     0.17     3.29     0.85
 HUB     27.77    10.70     6.50     4.20     0.90     0.21     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.930

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     592.165     191.801     560.243    1185.000       0.500        0.057

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.565      19.866     583.714      46.000      18.899      32.400      13.501

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     599.102     191.801     629.055    1184.300       0.506        0.012

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      23.411      19.655     583.024     456.573       0.048        0.149

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096     568.295       0.000     568.295    1187.345       0.479       -0.001

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      19.862     586.025       0.000       0.060       0.092        0.063

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.682      23.237       1.066     612.978      16.181     358.204       2.777

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 100857.086       0.322     985.176 1603405.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 3.732   EfDer =  0.897

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    172.852    3398.000      23.237     612.978       1.000       1.000       0.980
W Kg/sec =   78.56920

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.872    3125.785       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132972.188  135631.328       1.472     509.668     346.233     390.276       1.127

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   525.00    -0.18   525.00     0.44   499.71
 MEAN    15.91     0.00    -0.02   525.00    -0.18   525.00     0.44
 HUB     13.07     0.00    -0.02   525.00    -0.18   525.00     0.44
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     45.99    47.36    -1.37   543.25   755.60    20.33   589.98     0.63
MEAN    41.96    44.80    -2.84   471.87   706.02    20.33   589.98     0.59
HUB     36.45    38.84    -2.39   387.57   652.67    20.33   589.98     0.55

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   569.65   132.58   554.01  1198.64     0.48
MEAN    15.50   578.88   166.91   554.30  1198.75     0.48
HUB     12.59   617.67   267.76   556.62  1198.62     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    531.98   682.97   399.40     0.57  2381.81
MEAN   459.55   626.81   292.64     0.52  2589.58     1.21
HUB    373.33   566.54   105.58     0.47  3373.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.49     1.05    20.98   624.31     1.02   597.24     0.92     0.82
MEAN    24.60     1.06    20.97   625.30     1.02   597.34     0.92     0.82
HUB     25.03     1.08    20.88   629.02     1.03   597.20     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     13.46    35.79    31.50     4.29     0.93     0.13     2.90
MEAN    16.76    27.83    23.50     4.33     0.89     0.15     3.34     0.82
HUB     25.69    10.74     6.50     4.24     0.89     0.18     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.897

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     585.249     169.971     560.023    1198.971       0.488      -0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.632      20.926     597.633      46.000      16.883      33.000      16.117

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     613.157     169.971     636.279    1196.169       0.513      -0.173

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.282      20.294     594.843     440.827       0.113       0.131

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     566.026       0.000     566.026    1200.822       0.471      -0.019

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.854     599.479       0.000       0.060       0.112      -0.024

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.589      24.285       1.045     626.209      13.231     406.517       3.151

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   82493.695       0.291     805.801 1663706.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     644134.88   6291.9331    168.8593      1.6075      0.7373      3.7317      1.1978


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.992

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    171.674    3398.000      15.107     522.810      1.000       1.000       0.980
W Kg/sec =   78.03383

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    167.709    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
132066.109  134707.141       1.703     831.557     488.404     619.754       1.269

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   407.53    -0.14   407.53     0.37   609.32
MEAN    17.06     0.00    -0.02   407.53    -0.14   407.53     0.37
HUB     12.51     0.00    -0.02   407.53    -0.14   407.53     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.34    50.47     5.87   611.74   735.18    13.75   508.94     0.66
MEAN    51.15    47.20     3.95   505.89   649.73    13.75   508.94     0.59
HUB     42.32    38.62     3.70   370.96   551.18    13.75   508.94     0.50

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   633.26   313.72   550.09  1118.96     0.57
MEAN    18.04   667.07   364.64   558.58  1115.58     0.60
HUB     15.00   767.63   502.67   580.16  1107.67     0.69

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    611.74   625.63   298.02     0.56  6474.96
MEAN   534.83   583.93   170.18     0.52  6579.13     1.23
HUB    444.80   583.04    57.87     0.53  7541.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.12     1.20    14.58   553.65     1.06   520.17     0.92     0.91
MEAN    18.17     1.20    14.27   554.15     1.06   517.00     0.92     0.91
HUB     18.66     1.23    13.53   558.74     1.07   509.55     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     29.70    28.45    24.20     4.25     0.93     0.22     2.90
MEAN    33.14    16.94    12.70     4.24     0.92     0.18     3.51     0.91
HUB     40.91    -5.70    -9.30     3.60     0.92     0.05     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     679.811     363.936     574.189    1115.320       0.610      -0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.275      14.216     516.913      24.000      32.368      35.400       3.032

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     609.676     363.936     710.038    1123.439       0.543       0.185

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.208      14.899     524.467     528.796       0.026       0.358
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	557.834	0.000	557.834	1128.841	0.494	0.268

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.338	529.522	0.000	0.060	0.045	0.290

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.858	18.128	1.200	555.513	32.703	232.332	1.801

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
203604.062	0.544	1975.260	1713642.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 3.954 EfDer = 0.986

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
171.674	3398.000	18.128	555.513	1.000	1.000	0.980

W Kg/sec = 78.03383

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
144.063	3283.480	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
132066.109	134707.141	1.407	590.487	419.553	474.134	1.130

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	528.92	-0.18	528.92	0.47	588.82
MEAN	18.08	0.00	-0.02	528.92	-0.18	528.92	0.47	
HUB	15.21	0.00	-0.02	528.92	-0.18	528.92	0.47	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.05	46.36	2.69	609.37	807.04	15.61	532.15	0.71
MEAN	45.39	42.30	3.09	536.08	753.21	15.61	532.15	0.67
HUB	40.47	37.84	2.63	451.02	695.23	15.61	532.15	0.61

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	586.65	219.91	543.88	1148.59	0.51
MEAN	18.01	601.85	249.98	547.48	1147.07	0.52
HUB	15.22	653.68	349.37	552.49	1145.48	0.57

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	666.71	385.61	0.58	4494.24	
MEAN	534.05	616.78	284.07	0.54	4505.50	1.31
HUB	451.41	561.83	102.04	0.49	5321.24	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.42	1.13	17.09	576.91	1.04	548.18	0.92	0.90
MEAN	20.43	1.13	16.93	576.97	1.04	546.72	0.92	0.90
HUB	20.87	1.15	16.73	580.85	1.05	545.18	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	22.01	35.34	31.50	3.84	0.93	0.22	2.90	
MEAN	24.54	27.42	23.50	3.92	0.91	0.23	3.30	0.90
HUB	32.31	10.46	6.50	3.96	0.91	0.26	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.986

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	700.441	250.686	654.044	1137.020	0.616	-0.284

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.537      15.893     537.274      46.000      20.971      30.600       9.629

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     673.699     250.686     718.828    1140.262       0.591      -0.219

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      20.413      16.114     540.342     455.853       0.044       0.167

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     667.328       0.000     667.328    1141.019       0.585       0.047

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      16.066     541.056       0.000       0.060       0.086      -0.232

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.791      20.259       1.118     578.242      22.729     292.913       2.271

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 141572.047       0.386    1373.458 1578894.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.899

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.674    3398.000      20.259     578.242       1.000       1.000       0.880
W Kg/sec =   78.03383

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    131.525    3218.300       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132066.109  134707.141       1.279     489.817     383.052     384.470       1.004

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   613.28    -0.21   613.28     0.53   563.65
 MEAN    17.74     0.00    -0.02   613.28    -0.21   613.28     0.53
 HUB     15.05     0.00    -0.02   613.28    -0.21   613.28     0.53

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.15    46.36    -2.21   595.14   854.72    16.67   546.84     0.75
 MEAN    40.63    43.40    -2.77   526.00   808.09    16.67   546.84     0.70
 HUB     36.06    38.84    -2.78   446.28   758.59    16.67   546.84     0.66

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   587.00   178.97   559.05  1167.44     0.50
 MEAN    17.51   600.80   217.54   560.03  1167.32     0.51
 HUB     14.85   651.41   326.67   563.58  1167.01     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   692.37   408.45     0.59  3549.72
 MEAN   519.12   636.08   301.59     0.54  3812.08     1.35
 HUB    440.35   574.93   113.68     0.49  4854.26

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.01     1.09    18.52   595.14     1.03   566.38     0.92     0.82
 MEAN    22.14     1.09    18.48   596.39     1.03   566.26     0.92     0.82
 HUB     22.68     1.12    18.35   601.35     1.04   565.93     0.92     0.82

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     17.75    36.15    31.50     4.65     0.93     0.23     2.90
 MEAN    21.23    28.30    23.50     4.80     0.89     0.25     3.28     0.82
 HUB     30.10    11.40     6.50     4.90     0.89     0.30     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.899

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     608.364     218.965     567.592    1167.706       0.521       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.238      18.478     566.727      46.000      21.096      31.500      10.404

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     594.552     218.965     633.591    1169.134       0.509       0.024

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.125      18.542     568.114     471.992       0.040       0.173

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     576.747       0.000     576.747    1170.924       0.493       0.041

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.633     569.855       0.000       0.060       0.073       0.048

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.713      21.998       1.086     597.624      19.381     323.642       2.509

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 120763.695       0.350    1171.586 1793479.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.939

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    171.674    3398.000       21.998     597.624       1.000        1.000        0.980
W Kg/sec =   78.03383

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    123.137    3165.684        1.402       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 132066.109  134707.141        1.431     513.330     358.639     401.059       1.118

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   536.93    -0.18   536.93      0.46    532.06
 MEAN    16.97      0.00    -0.02   536.93    -0.18   536.93      0.46
 HUB     14.32      0.00    -0.02   536.93    -0.18   536.93      0.46

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     46.78     46.36      0.42   571.12   784.02     19.06   573.56      0.67
 MEAN    43.15     43.80     -0.65   503.23   736.02     19.06   573.56      0.63
 HUB     38.35     37.84      0.51   424.63   684.67     19.06   573.56      0.58

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   583.40    158.63    561.42  1184.86      0.49
 MEAN    16.57   595.28    197.18    561.67  1184.99      0.50
 HUB     13.89   641.34    305.46    563.93  1184.90      0.54
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   690.06   401.22     0.58  2998.43
 MEAN   491.47   634.10   294.29     0.54  3271.18     1.24
 HUB    411.88   573.88   106.42     0.48  4245.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.61     1.07    20.00   611.89     1.02   583.49     0.92     0.86
 MEAN    23.77     1.08    20.00   613.19     1.03   583.62     0.92     0.86
 HUB     24.31     1.11    19.91   617.82     1.03   583.50     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.78    35.55    31.50     4.05     0.93     0.15     2.90
 MEAN    19.34    27.65    23.50     4.15     0.90     0.18     3.29     0.86
 HUB     28.44    10.69     6.50     4.19     0.90     0.22     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.939

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     583.350     198.289     548.615    1187.220       0.491       0.057

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.858      20.225     585.901      46.000      19.872      32.400      12.528

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     584.763     198.289     617.468    1187.081       0.493       0.031

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.723      20.094     585.763     456.573       0.044       0.164

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     554.543       0.000     554.543    1189.989       0.466       0.021

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.305     588.637       0.000       0.060       0.084       0.085

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.714      23.567       1.071     614.301      16.677     346.909       2.689

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 103948.906       0.332    1008.458 1584239.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 3.954   EfDer =  0.911

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    171.674    3398.000      23.567     614.301       1.000       1.000       0.980
W Kg/sec =   78.03383

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    116.534    3122.418       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 132066.109  134707.141       1.502     509.668     339.421     390.276       1.150

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   512.84    -0.18   512.84     0.43   499.17
 MEAN    15.91     0.00    -0.02   512.84    -0.18   512.84     0.43
 HUB     13.07     0.00    -0.02   512.84    -0.18   512.84     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.66    47.36    -0.70   543.25   747.20    20.76   592.36     0.63
 MEAN    42.63    44.80    -2.17   471.87   697.02    20.76   592.36     0.58
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HUB     37.09    38.84    -1.75   387.57   642.92    20.76   592.36     0.54

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   557.85   143.50   539.08  1202.00     0.46
MEAN    15.50   567.55   174.63   540.01  1201.71     0.47
HUB     12.59   606.41   270.60   542.69  1201.25     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    531.98   664.47   388.48     0.55  2577.58
MEAN   459.55   610.57   284.92     0.51  2709.21     1.23
HUB    373.33   552.32   102.73     0.46  3409.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.96     1.06    21.54   626.56     1.02   600.60     0.92     0.83
MEAN    25.04     1.06    21.49   627.19     1.02   600.32     0.92     0.83
HUB     25.43     1.08    21.36   630.52     1.03   599.84     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     14.91    35.78    31.50     4.28     0.93     0.14     2.90
MEAN    17.92    27.82    23.50     4.32     0.89     0.16     3.34     0.83
HUB     26.50    10.72     6.50     4.22     0.89     0.19     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.911

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      573.664     177.835     545.404    1201.977       0.477      -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.070      21.447      600.632      46.000      18.059      33.000      14.941

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      593.788     177.835     619.847    1200.015       0.495      -0.140

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.766      20.947     598.672     440.827       0.102       0.148

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     548.911       0.000     548.911    1204.295       0.456       0.009

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.482     602.950       0.000       0.060       0.100       0.005

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.642      24.775       1.051     628.088      13.787     389.550       3.020

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  85965.477       0.304     833.992 1642072.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     655854.25   6362.7544    167.7087      1.6399      0.7567      3.9535      1.2014


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

    Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 4.540   EfDer =  0.995

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    168.574    3398.000      15.107     522.810      1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    164.680    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       1.734     831.557     479.584     619.754       1.292

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   399.06    -0.14   399.06     0.36   609.32
 MEAN    17.06     0.00    -0.02   399.06    -0.14   399.06     0.36
 HUB     12.51     0.00    -0.02   399.06    -0.14   399.06     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.89    50.47     6.42   611.74   730.51    13.81   509.51     0.66
 MEAN    51.74    47.20     4.54   505.89   644.44    13.81   509.51     0.58
 HUB     42.92    38.62     4.30   370.96   544.94    13.81   509.51     0.49

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   624.93   321.38   535.96  1120.69     0.56
 MEAN    18.04   657.91   368.90   544.76  1117.04     0.59
 HUB     15.00   755.68   501.23   565.53  1109.15     0.68

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   609.56   290.36     0.54  6632.90
 MEAN   534.83   569.46   165.92     0.51  6655.90     1.25
 HUB    444.80   568.34    56.44     0.51  7520.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.21     1.21    14.74   554.41     1.06   521.79     0.92     0.91
 MEAN    18.22     1.21    14.40   554.52     1.06   518.37     0.92     0.91
 HUB     18.66     1.24    13.67   558.63     1.07   510.96     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.95    28.45    24.20     4.25     0.93     0.24     2.90
 MEAN    34.11    16.94    12.70     4.24     0.92     0.20     3.51     0.91
 HUB     41.55    -5.70    -9.30     3.60     0.92     0.06     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     669.900     368.187     559.646    1116.889       0.600      -0.010

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.322      14.363     518.369      24.000      33.341      35.400       2.059

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     592.269     368.187     697.384    1125.671       0.526       0.207

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.263      15.120     526.553     528.796       0.024       0.374

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     542.441       0.000     542.441    1130.708       0.480       0.288
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.540	531.275	0.000	0.060	0.041	0.310

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.867	18.195	1.204	555.851	33.041	228.136	1.768

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
205710.375	0.550	1959.652	1678007.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 4.540 EfDer = 0.992

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
168.574	3398.000	18.195	555.851	1.000	1.000	0.980

W Kg/sec = 76.62451

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
140.988	3282.481	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
129680.953	132274.297	1.438	590.487	410.596	474.134	1.155

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	514.78	-0.18	514.78	0.45	588.64
MEAN	18.08	0.00	-0.02	514.78	-0.18	514.78	0.45	
HUB	15.21	0.00	-0.02	514.78	-0.18	514.78	0.45	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.82	46.36	3.46	609.37	797.84	15.79	533.72	0.70
MEAN	46.17	42.30	3.87	536.08	743.35	15.79	533.72	0.66
HUB	41.23	37.84	3.39	451.02	684.53	15.79	533.72	0.60

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	575.92	231.94	527.15	1151.23	0.50
MEAN	18.01	591.00	258.52	531.46	1149.31	0.51
HUB	15.22	642.33	352.45	537.00	1147.33	0.56

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	646.10	373.57	0.56	4739.94	
MEAN	534.05	598.64	275.53	0.52	4659.21	1.34
HUB	451.41	546.04	98.96	0.48	5368.10	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.64	1.13	17.40	578.42	1.04	550.73	0.92	0.91
MEAN	20.60	1.13	17.20	578.04	1.04	548.87	0.92	0.91
HUB	20.98	1.15	16.96	581.41	1.05	546.96	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	23.75	35.32	31.50	3.82	0.93	0.24	2.90	
MEAN	25.94	27.40	23.50	3.90	0.92	0.25	3.30	0.91
HUB	33.28	10.44	6.50	3.94	0.92	0.27	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	683.181	259.250	632.081	1140.234	0.599	-0.269

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.706	16.240	540.314	46.000	22.301	30.600	8.299

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	647.757	259.250	697.710	1144.380	0.566	-0.170

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	20.606	16.576	544.251	455.853	0.038	0.190

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	640.234	0.000	640.234	1145.232	0.559	0.092

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	16.565	545.060	0.000	0.060	0.072	-0.173

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.820	20.487	1.126	579.289	23.438	282.396	2.189

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
145984.344	0.398	1390.686	1540687.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 4.540 EfDer = 0.921

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
168.574	3398.000	20.487	579.289	1.000	1.000	0.880

W Kg/sec = 76.62451

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
127.828	3215.392	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
129680.953	132274.297	1.316	489.817	372.285	384.470	1.033

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	590.18	-0.20	590.18	0.51	563.14
MEAN	17.74	0.00	-0.02	590.18	-0.20	590.18	0.51	
HUB	15.05	0.00	-0.02	590.18	-0.20	590.18	0.51	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.25	46.36	-1.11	595.14	838.30	17.12	550.21	0.73
MEAN	41.72	43.40	-1.68	526.00	790.70	17.12	550.21	0.69
HUB	37.11	38.84	-1.73	446.28	740.04	17.12	550.21	0.64

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	570.79	196.21	536.00	1171.77	0.49
MEAN	17.51	585.05	229.86	538.00	1171.03	0.50
HUB	14.85	635.32	331.47	542.00	1170.18	0.54

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	663.59	391.22	0.57	3890.93	
MEAN	519.12	610.83	289.26	0.52	4027.74	1.38
HUB	440.35	552.83	108.88	0.47	4925.43	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.48	1.10	19.11	597.81	1.03	570.61	0.92	0.84
MEAN	22.55	1.10	19.01	598.46	1.03	569.89	0.92	0.84
HUB	23.03	1.12	18.84	602.73	1.04	569.04	0.92	0.84

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.11	36.13	31.50	4.63	0.93	0.25	2.90	
MEAN	23.13	28.26	23.50	4.76	0.89	0.27	3.28	0.84
HUB	31.45	11.36	6.50	4.86	0.89	0.31	3.87	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.921

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      592.042     231.373     544.958     1171.491       0.505       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     22.648      19.021      570.404      46.000      23.005       31.500       8.495

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392      567.652     231.373     612.994     1173.913       0.484       0.065

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       22.565      19.226      572.766      471.992       0.033       0.202

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121      550.308       0.000     550.308     1175.571       0.468       0.083

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       19.328      574.384       0.000       0.060       0.060       0.092

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.760       22.463        1.096      599.666       20.377      305.774       2.370

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 126972.156       0.368    1209.571 1739869.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 4.540   EfDer =  0.959

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    168.574     3398.000       22.463      599.666       1.000        1.000        0.980
W Kg/sec =   76.62451

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
    118.615     3160.289        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
 129680.953  132274.297        1.486      513.330      345.468      401.059       1.161

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   513.30    -0.18   513.30      0.44   531.15
 MEAN    16.97      0.00    -0.02   513.30    -0.18   513.30      0.44
 HUB     14.32      0.00    -0.02   513.30    -0.18   513.30      0.44

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     48.06     46.36     1.70   571.12   768.02     19.72   577.68      0.65
 MEAN    44.44     43.80     0.64   503.23   718.96     19.72   577.68      0.61
 HUB     39.61     37.84     1.77   424.63   666.29     19.72   577.68      0.57

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   562.07    179.46    532.65  1190.85      0.47
 MEAN    16.57   574.72    211.91    534.23  1190.24      0.48
 HUB     13.89   620.74    310.87    537.29  1189.49      0.52

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    559.85    654.53    380.39      0.55  3391.64
 MEAN   491.47    602.96    279.56      0.51  3515.09      1.28
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 HUB    411.88   546.71   101.01     0.46  4320.49

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.37     1.08    20.92   615.80     1.03   589.44     0.92     0.88
 MEAN    24.44     1.09    20.83   616.39     1.03   588.83     0.92     0.88
 HUB     24.91     1.11    20.69   620.22     1.03   588.07     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.62    35.53    31.50     4.03     0.93     0.19     2.90
 MEAN    21.64    27.62    23.50     4.12     0.90     0.21     3.29     0.88
 HUB     30.05    10.65     6.50     4.15     0.90     0.24     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.959

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     563.866     213.097     522.049    1192.314       0.473       0.057

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.537      21.049     590.937      46.000      22.205      32.400      10.195

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     552.707     213.097     592.365    1193.362       0.463       0.075

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.442      21.097     591.977     456.573       0.035       0.198

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     524.205       0.000     524.205    1195.942       0.438       0.068

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.304     594.538       0.000       0.060       0.070       0.130

    STAGE EXIT CONDITIONS, STAGE             4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.772      24.313       1.082     617.471      17.805     322.923       2.503

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 110988.250       0.354    1057.304 1537312.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 4.540   EfDer =  0.940

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    168.574    3398.000      24.313     617.471       1.000       1.000       0.980
W Kg/sec =   76.62451

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.204    3114.391       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 129680.953  132274.297       1.574     509.668     323.898     390.276       1.205

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   485.83    -0.17   485.83     0.41   497.89
 MEAN    15.91     0.00    -0.02   485.83    -0.17   485.83     0.41
 HUB     13.07     0.00    -0.02   485.83    -0.17   485.83     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.20    47.36     0.84   543.25   728.92    21.71   597.78     0.61
 MEAN    44.18    44.80    -0.62   471.87   677.38    21.71   597.78     0.56
 HUB     38.59    38.84    -0.25   387.57   621.58    21.71   597.78     0.52

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   533.47   167.29   506.56  1209.37     0.44
MEAN    15.50   543.60   191.60   508.71  1208.32     0.45
HUB     12.59   582.11   276.80   512.09  1207.17     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    531.98   624.18   364.69     0.52  3004.20
MEAN   459.55   574.97   267.95     0.48  2972.02     1.27
HUB    373.33   521.11    96.53     0.43  3487.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.04     1.07    22.78   631.76     1.02   608.02     0.92     0.86
MEAN    26.03     1.07    22.65   631.61     1.02   606.95     0.92     0.86
HUB     26.33     1.08    22.45   634.06     1.03   605.79     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     18.28    35.75    31.50     4.25     0.93     0.18     2.90
MEAN    20.64    27.78    23.50     4.28     0.90     0.19     3.34     0.86
HUB     28.39    10.68     6.50     4.18     0.90     0.22     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.940

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     549.307     195.115     513.487    1208.632       0.454      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.063      22.617     607.299      46.000      20.806      33.000      12.194

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     553.006     195.115     586.417    1208.293       0.458      -0.068

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.854      22.391     606.959     440.827       0.080       0.186

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     513.196       0.000     513.196    1211.813       0.423       0.065

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.844     610.500       0.000       0.060       0.082       0.062

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.727      25.846       1.063     632.473      15.002     355.851       2.759

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   93551.508       0.331     891.196 1590449.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     683206.62   6508.4082    164.6798      1.7109      0.7936      4.5402      1.2098


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.019   EfDer =  0.997
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
166.058	3398.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 75.48089

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
162.222	3384.617	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
127745.469	130300.102	1.760	831.557	472.426	619.754	1.312

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	392.24	-0.14	392.24	0.35	609.32
MEAN	17.06	0.00	-0.02	392.24	-0.14	392.24	0.35	
HUB	12.51	0.00	-0.02	392.24	-0.14	392.24	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.34	50.47	6.87	611.74	726.81	13.85	509.96	0.66
MEAN	52.22	47.20	5.02	505.89	640.24	13.85	509.96	0.58
HUB	43.41	38.62	4.79	370.96	539.97	13.85	509.96	0.49

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	618.61	327.42	524.85	1122.01	0.55
MEAN	18.04	650.82	372.26	533.85	1118.16	0.58
HUB	15.00	746.34	500.09	554.01	1110.30	0.67

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	611.74	596.92	284.32	0.53	6757.48	
MEAN	534.83	558.05	162.56	0.50	6716.47	1.27
HUB	444.80	556.76	55.30	0.50	7503.09	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.28	1.21	14.86	555.00	1.06	523.04	0.92	0.91
MEAN	18.26	1.21	14.51	554.80	1.06	519.43	0.92	0.91
HUB	18.66	1.23	13.78	558.55	1.07	512.05	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.96	28.45	24.20	4.25	0.93	0.26	2.90	
MEAN	34.89	16.94	12.70	4.24	0.92	0.21	3.51	0.91
HUB	42.07	-5.70	-9.30	3.60	0.92	0.07	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	662.249	371.541	548.207	1118.093	0.592	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.358	14.475	519.487	24.000	34.127	35.400	1.273

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	578.782	371.541	687.773	1127.365	0.513	0.225

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.303	15.287	528.139	528.796	0.024	0.386

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	530.520	0.000	530.520	1132.128	0.469	0.303

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.692	532.610	0.000	0.060	0.039	0.326

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    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      18.242       1.208     556.118      33.308     224.817       1.743

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 207371.734       0.554    1945.994 1649330.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.019   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    166.058    3398.000      18.242     556.118       1.000       1.000       0.980
W Kg/sec =   75.48089

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    138.554    3281.693       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127745.469  130300.102       1.463     590.487     403.508     474.134       1.175

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   503.80    -0.17   503.80     0.44   588.50
 MEAN    18.08     0.00    -0.02   503.80    -0.17   503.80     0.44
 HUB     15.21     0.00    -0.02   503.80    -0.17   503.80     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.43    46.36     4.07   609.37   790.80    15.93   534.92     0.70
 MEAN    46.79    42.30     4.49   536.08   735.78    15.93   534.92     0.65
 HUB     41.85    37.84     4.01   451.02   676.31    15.93   534.92     0.60

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   568.12   241.12   514.42  1153.21     0.49
 MEAN    18.01   582.94   265.06   519.19  1150.98     0.51
 HUB     15.22   633.74   354.84   525.08  1148.74     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   630.40   364.39     0.55  4927.28
 MEAN   534.05   584.74   268.99     0.51  4776.85     1.36
 HUB    451.41   533.89    96.57     0.46  5404.33

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.81     1.14    17.62   579.58     1.04   552.63     0.92     0.91
 MEAN    20.72     1.14    17.39   578.86     1.04   550.49     0.92     0.91
 HUB     21.07     1.15    17.13   581.85     1.05   548.32     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.11    35.31    31.50     3.81     0.93     0.26     2.90
 MEAN    27.05    27.39    23.50     3.89     0.92     0.26     3.30     0.91
 HUB     34.05    10.42     6.50     3.92     0.92     0.28     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     670.510     265.804     615.575    1142.596       0.587      -0.257

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.830      16.494     542.555      46.000      23.355      30.600       7.245

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     17.960     628.654     265.804     682.538    1147.367       0.548      -0.134

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      20.747      16.913     547.095     455.853       0.034       0.207

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     620.608       0.000     620.608    1148.248       0.540       0.123

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      16.923     547.935       0.000       0.060       0.062      -0.131

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.839      20.649       1.132     580.097      23.979     274.621       2.129

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 149356.984       0.407    1401.579 1510490.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 5.019   EfDer =  0.936

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    166.058    3398.000      20.649     580.097       1.000       1.000       0.880
W Kg/sec =   75.48089

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    125.020    3213.151       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127745.469  130300.102       1.345     489.817     364.106     384.470       1.056

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   573.24    -0.20   573.24     0.50   562.75
 MEAN    17.74     0.00    -0.02   573.24    -0.20   573.24     0.50
 HUB     15.05     0.00    -0.02   573.24    -0.20   573.24     0.50

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.08    46.36    -0.28   595.14   826.46    17.44   552.66     0.72
 MEAN    42.55    43.40    -0.85   526.00   778.13    17.44   552.66     0.67
 HUB     37.91    38.84    -0.93   446.28   726.60    17.44   552.66     0.63

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   559.63   208.77   519.23  1174.88     0.48
 MEAN    17.51   573.96   238.90   521.88  1173.72     0.49
 HUB     14.85   623.77   334.97   526.19  1172.49     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   642.63   378.66     0.55  4139.74
 MEAN   519.12   592.35   280.23     0.50  4185.75     1.40
 HUB    440.35   536.64   105.38     0.46  4977.30

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.82     1.11    19.53   599.80     1.03   573.66     0.92     0.86
 MEAN    22.85     1.11    19.40   600.02     1.03   572.52     0.92     0.86
 HUB     23.28     1.13    19.20   603.79     1.04   571.31     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.90    36.10    31.50     4.60     0.93     0.27     2.90
 MEAN    24.60    28.23    23.50     4.73     0.90     0.29     3.28     0.86
 HUB     32.48    11.32     6.50     4.82     0.90     0.32     3.87


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.936

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     580.591     240.464     528.453    1174.217       0.494       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.946      19.412     573.061      46.000      24.467      31.500       7.033

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     548.431     240.464     598.832    1177.318       0.466       0.095

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.881      19.716     576.092     471.992       0.028       0.223

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     531.617       0.000     531.617    1178.866       0.451       0.113

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.820     577.608       0.000       0.060       0.053       0.123

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.789      22.791       1.104     601.201      21.104     293.526       2.275

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 131506.859       0.381    1234.072 1699152.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.019   EfDer =  0.972

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    166.058    3398.000      22.791     601.201       1.000       1.000       0.980
W Kg/sec =   75.48089

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    115.309    3156.251       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127745.469  130300.102       1.528     513.330     335.840     401.059       1.194

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   496.48    -0.17   496.48     0.42   530.47
 MEAN    16.97     0.00    -0.02   496.48    -0.17   496.48     0.42
 HUB     14.32     0.00    -0.02   496.48    -0.17   496.48     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.01    46.36     2.65   571.12   756.88    20.18   580.63     0.64
 MEAN    45.40    43.80     1.60   503.23   707.04    20.18   580.63     0.60
 HUB     40.55    37.84     2.71   424.63   653.42    20.18   580.63     0.55

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   548.16   193.97   512.69  1195.00     0.46
 MEAN    16.57   560.96   222.23   515.06  1193.91     0.47
 HUB     13.89   606.61   314.65   518.62  1192.73     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   629.86   365.88     0.53  3665.42
 MEAN   491.47   581.18   269.24     0.49  3686.07     1.31
 HUB    411.88   527.66    97.23     0.44  4372.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     24.91     1.09    21.56   618.64     1.03   593.56     0.92     0.89
 MEAN    24.92     1.09    21.42   618.74     1.03   592.48     0.92     0.89
 HUB     25.33     1.11    21.23   622.01     1.03   591.30     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.72    35.51    31.50     4.01     0.93     0.21     2.90
 MEAN    23.34    27.60    23.50     4.10     0.91     0.23     3.29     0.89
 HUB     31.25    10.62     6.50     4.12     0.91     0.25     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.972

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     550.853     223.477     503.485    1195.874       0.461       0.057

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.018      21.628     594.470      46.000      23.935      32.400       8.465

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     530.818     223.477     575.943    1197.692       0.443       0.108

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.947      21.796     596.279     456.573       0.030       0.223

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     503.483       0.000     503.483    1200.059       0.420       0.102

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.001     598.639       0.000       0.060       0.060       0.164

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.806      24.836       1.090     619.794      18.593     307.431       2.383

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 115904.148       0.370    1087.654 1501950.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.019   EfDer =  0.957

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    166.058    3398.000      24.836     619.794       1.000       1.000       0.980
W Kg/sec =   75.48089

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    107.439    3108.549       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127745.469  130300.102       1.629     509.668     312.932     390.276       1.247

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   467.25    -0.16   467.25     0.39   496.96
 MEAN    15.91     0.00    -0.02   467.25    -0.16   467.25     0.39
 HUB     13.07     0.00    -0.02   467.25    -0.16   467.25     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.31    47.36     1.95   543.25   716.67    22.38   601.58     0.60
 MEAN    45.29    44.80     0.49   471.87   664.18    22.38   601.58     0.55
 HUB     39.69    38.84     0.85   387.57   607.17    22.38   601.58     0.50

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   518.23   183.33   484.72  1214.35      0.43
MEAN    15.50   528.15   203.09   487.55  1212.83      0.44
HUB     12.59   566.03   281.04   491.33  1211.25      0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    531.98   597.08   348.64     0.49  3291.95
MEAN   459.55   550.89   256.46     0.45  3149.95     1.30
HUB    373.33   499.93    92.30     0.41  3540.37

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.81     1.08    23.65   635.45     1.03   613.04     0.92     0.88
MEAN    26.72     1.08    23.45   634.77     1.02   611.50     0.92     0.88
HUB     26.96     1.09    23.21   636.63     1.03   609.90     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     20.72    35.73    31.50     4.23     0.93     0.21     2.90
MEAN    22.61    27.75    23.50     4.25     0.90     0.22     3.34     0.88
HUB     29.77    10.64     6.50     4.14     0.90     0.23     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.957

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      533.672     206.813     491.969    1213.158       0.440      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.762      23.429      611.857      46.000      22.801      33.000      10.199

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      526.533     206.813     565.693    1213.784       0.434      -0.018

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.607      23.377     612.488     440.827       0.066       0.213

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     489.614       0.000     489.614    1216.881       0.402       0.105

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.785     615.618       0.000       0.060       0.070       0.102

    STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.775      26.594       1.071     635.618      15.824     335.283       2.599

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   98681.016       0.349     926.031 1552300.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     702820.69   6595.3301    162.2220      1.7604      0.8158      5.0193      1.2158


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.494   EfDer =  0.998

    W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     163.580    3398.000      15.107     522.810       1.000       1.000       0.980
```

W Kg/sec = 74.35432

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
159.801	3384.617	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
125838.836	128355.344	1.787	831.557	465.375	619.754	1.332

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	385.57	-0.13	385.57	0.35	609.32
MEAN	17.06	0.00	-0.02	385.57	-0.13	385.57	0.35	
HUB	12.51	0.00	-0.02	385.57	-0.13	385.57	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.78	50.47	7.31	611.74	723.23	13.89	510.39	0.65
MEAN	52.69	47.20	5.49	505.89	636.18	13.89	510.39	0.57
HUB	43.90	38.62	5.28	370.96	535.14	13.89	510.39	0.48

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	612.72	333.22	514.20	1123.25	0.55
MEAN	18.04	644.13	375.51	523.35	1119.22	0.58
HUB	15.00	737.43	499.02	542.94	1111.37	0.66

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	611.74	584.79	278.53	0.52	6876.97	
MEAN	534.83	547.06	159.31	0.49	6775.05	1.29
HUB	444.80	545.64	54.22	0.49	7486.92	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.34	1.21	14.98	555.57	1.06	524.22	0.92	0.91
MEAN	18.29	1.21	14.61	555.08	1.06	520.44	0.92	0.91
HUB	18.65	1.23	13.88	558.47	1.07	513.07	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.94	28.44	24.20	4.24	0.93	0.27	2.90	
MEAN	35.66	16.93	12.70	4.23	0.92	0.23	3.51	0.91
HUB	42.59	-5.70	-9.30	3.60	0.92	0.09	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	655.042	374.785	537.230	1119.222	0.585	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.390	14.579	520.537	24.000	34.901	35.400	0.499

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	565.991	374.785	678.829	1128.944	0.501	0.242

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.339	15.443	529.619	528.796	0.023	0.398

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	519.209	0.000	519.209	1133.454	0.458	0.318

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.831	533.859	0.000	0.060	0.037	0.341

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.876      18.284       1.210     556.375      33.565     221.616       1.718

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 208972.266       0.558    1931.745 1621285.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 5.494   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.580    3398.000      18.284     556.375       1.000       1.000       0.980
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    136.204    3280.935       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.489     590.487     396.664     474.134       1.195

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   493.35    -0.17   493.35     0.43   588.36
 MEAN    18.08     0.00    -0.02   493.35    -0.17   493.35     0.43
 HUB     15.21     0.00    -0.02   493.35    -0.17   493.35     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.01    46.36     4.65   609.37   784.18    16.06   536.05     0.69
 MEAN    47.39    42.30     5.09   536.08   728.66    16.06   536.05     0.64
 HUB     42.44    37.84     4.60   451.02   668.55    16.06   536.05     0.59

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   561.12   249.71   502.50  1155.03     0.49
 MEAN    18.01   575.56   271.21   507.66  1152.54     0.50
 HUB     15.22   625.74   357.10   513.84  1150.04     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   615.72   355.81     0.53  5102.47
 MEAN   534.05   571.66   262.84     0.50  4887.57     1.38
 HUB    451.41   522.43    94.31     0.45  5438.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.95     1.15    17.83   580.67     1.04   554.38     0.92     0.91
 MEAN    20.84     1.14    17.57   579.65     1.04   551.99     0.92     0.91
 HUB     21.14     1.16    17.28   582.27     1.05   549.58     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.42    35.30    31.50     3.80     0.93     0.27     2.90
 MEAN    28.11    27.37    23.50     3.87     0.92     0.27     3.30     0.91
 HUB     34.80    10.40     6.50     3.90     0.92     0.29     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     659.016     271.972     600.277    1144.743       0.576      -0.247

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.943      16.725     544.596      46.000      24.374      30.600       6.226

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     611.213     271.972     668.992    1150.060       0.531      -0.100

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.850      20.872      17.216     549.666     455.853       0.031       0.223

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     602.884       0.000     602.884    1150.944       0.524       0.151

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      17.241     550.511       0.000       0.060       0.054      -0.093

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.852      20.791       1.137     580.862      24.487     267.516       2.074

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 152522.766       0.416    1409.925 1481365.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 5.494   EfDer =  0.949

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.580    3398.000      20.791     580.862       1.000       1.000       0.880
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    122.392    3211.034       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.374     489.817     356.452     384.470       1.079

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   557.81    -0.19   557.81     0.48   562.38
 MEAN    17.74     0.00    -0.02   557.81    -0.19   557.81     0.48
 HUB     15.05     0.00    -0.02   557.81    -0.19   557.81     0.48

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.86    46.36     0.50   595.14   815.82    17.72   554.89     0.71
 MEAN    43.33    43.40    -0.07   526.00   766.83    17.72   554.89     0.66
 HUB     38.67    38.84    -0.17   446.28   714.48    17.72   554.89     0.62

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   550.04   220.15   504.06  1177.65     0.47
 MEAN    17.51   564.23   247.09   507.25  1176.13     0.48
 HUB     14.85   613.46   338.18   511.84  1174.58     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   623.68   367.28     0.53  4364.95
 MEAN   519.12   575.59   272.04     0.49  4329.04     1.42
 HUB    440.35   521.93   102.17     0.44  5024.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.13     1.11    19.92   601.64     1.04   576.38     0.92     0.87
 MEAN    23.11     1.11    19.74   601.47     1.04   574.89     0.92     0.87
 HUB     23.50     1.13    19.51   604.78     1.04   573.36     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.59    36.08    31.50     4.58     0.93     0.28     2.90
 MEAN    25.97    28.20    23.50     4.70     0.90     0.30     3.28     0.87
 HUB     33.45    11.29     6.50     4.79     0.90     0.33     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.949

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     570.566     248.708     513.507    1176.661       0.485       0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.213      19.761     575.449      46.000      25.842      31.500       5.658

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     531.284     248.708     586.616    1180.349       0.450       0.122

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.162      20.152     579.062     471.992       0.025       0.244

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     17.121     514.974       0.000     514.974    1181.800       0.436       0.140

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.255     580.487       0.000       0.060       0.047       0.151

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.811      23.081       1.110     602.626      21.764     282.937       2.193

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 135619.312       0.393    1253.669 1660970.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.494   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.580    3398.000      23.081     602.626       1.000       1.000       0.980
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.293    3152.518       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.570     513.330     327.055     401.059       1.226

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   481.43    -0.17   481.43     0.41   529.84
 MEAN    16.97     0.00    -0.02   481.43    -0.17   481.43     0.41
 HUB     14.32     0.00    -0.02   481.43    -0.17   481.43     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.88    46.36     3.52   571.12   747.09    20.60   583.28     0.63
 MEAN    46.28    43.80     2.48   503.23   696.56    20.60   583.28     0.59
 HUB     41.42    37.84     3.58   424.63   642.05    20.60   583.28     0.54

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   536.61   206.70   495.20  1198.62     0.45
 MEAN    16.57   549.25   231.35   498.15  1197.15     0.46
 HUB     13.89   594.36   318.03   502.11  1195.62     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   608.23   353.15     0.51  3905.69
 MEAN   491.47   561.98   260.12     0.47  3837.18     1.33
 HUB    411.88   510.81    93.86     0.43  4419.77

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.39     1.10    22.12   621.21     1.03   597.18     0.92     0.90
 MEAN    25.35     1.10    21.94   620.88     1.03   595.70     0.92     0.90
 HUB     25.70     1.11    21.71   623.65     1.03   594.17     0.92     0.90
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.66    35.49    31.50     3.99     0.93     0.23     2.90
 MEAN    24.91    27.57    23.50     4.07     0.91     0.24     3.29     0.90
 HUB     32.35    10.59     6.50     4.09     0.91     0.27     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     539.820     232.651     487.113    1199.011       0.450       0.056

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.444      22.137     597.594      46.000      25.530      32.400       6.870

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     511.821     232.651     562.216    1201.474       0.426       0.137

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.390      22.409     600.051     456.573       0.025       0.246

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     485.519       0.000     485.519    1203.664       0.403       0.133

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.609     602.240       0.000       0.060       0.052       0.193

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.830      25.294       1.096     621.913      19.287     294.519       2.283

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 120235.516       0.384    1111.460 1468888.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.494   EfDer =  0.971

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
    163.580    3398.000       25.294     621.913       1.000       1.000       0.980
W Kg/sec =   74.35432

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
    104.097    3103.249        1.401       0.249      53.349      56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 125838.836  128355.344        1.681     509.668     303.198     390.276       1.287

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   451.06    -0.16   451.06      0.37   496.11
 MEAN    15.91      0.00    -0.02   451.06    -0.16   451.06      0.37
 HUB     13.07      0.00    -0.02   451.06    -0.16   451.06      0.37

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     50.31    47.36     2.95   543.25   706.21     22.96    604.94      0.59
 MEAN    46.30    44.80     1.50   471.87   652.89     22.96    604.94      0.54
 HUB     40.68    38.84     1.84   387.57   594.79     22.96    604.94      0.49

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2      Ao2          Mach2
 TIP     17.94   506.00   197.08   466.04  1218.63      0.42
 MEAN    15.50   515.42   212.97   469.36  1216.74      0.42
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 HUB     12.59   552.46   284.68   473.46  1214.81     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   573.89   334.90     0.47  3538.41
 MEAN   459.55   530.18   246.58     0.44  3303.07     1.34
 HUB    373.33   481.69    88.65     0.40  3586.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.48     1.09    24.40   638.74     1.03   617.38     0.92     0.89
 MEAN    27.33     1.08    24.15   637.62     1.03   615.46     0.92     0.89
 HUB     27.51     1.09    23.87   638.97     1.03   613.50     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.92    35.70    31.50     4.20     0.93     0.24     2.90
 MEAN    24.41    27.72    23.50     4.22     0.91     0.24     3.34     0.89
 HUB     31.02    10.61     6.50     4.11     0.91     0.25     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     520.820     216.880     473.515    1217.071       0.428      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.374      24.133     615.811      46.000      24.609      33.000       8.391

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     504.394     216.880     549.045    1218.458       0.414       0.025

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.260      24.225     617.216     440.827       0.055       0.239

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     469.700       0.000     469.700    1221.238       0.385       0.141

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.599     620.036       0.000       0.060       0.060       0.138

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.809      27.244       1.077     638.442      16.529     318.812       2.471

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 103084.203       0.364     952.913 1517067.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    720434.06   6659.7119    159.8008      1.8034      0.8329      5.4939      1.2212


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 5.964   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.138    3398.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   73.24458

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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   157.416    3384.617       1.402       0.249      53.349      32.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
123960.672  126439.617       1.814     831.557     458.429     619.754       1.352

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   379.04    -0.13   379.04     0.34   609.32
MEAN    17.06     0.00    -0.02   379.04    -0.13   379.04     0.34
HUB     12.51     0.00    -0.02   379.04    -0.13   379.04     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.22    50.47     7.75   611.74   719.77    13.93   510.81     0.65
MEAN    53.16    47.20     5.96   505.89   632.24    13.93   510.81     0.57
HUB     44.39    38.62     5.77   370.96   530.46    13.93   510.81     0.48

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   607.24   338.78   503.96  1124.43     0.54
MEAN    18.04   637.78   378.63   513.23  1120.23     0.57
HUB     15.00   728.91   497.98   532.28  1112.39     0.66

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    611.74   573.14   272.97     0.51  6991.64
MEAN   534.83   536.47   156.19     0.48  6831.22     1.31
HUB    444.80   534.93    53.18     0.48  7471.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.40     1.22    15.09   556.11     1.06   525.32     0.92     0.91
MEAN    18.32     1.21    14.70   555.35     1.06   521.38     0.92     0.91
HUB     18.65     1.23    13.97   558.40     1.07   514.04     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.91    28.44    24.20     4.24     0.93     0.28     2.90
MEAN    36.42    16.93    12.70     4.23     0.92     0.24     3.51     0.91
HUB     43.09    -5.71    -9.30     3.59     0.92     0.10     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     648.223     377.896     526.676    1120.285       0.579      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.420      14.677     521.526      24.000      35.660      35.400      -0.260

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     553.824     377.896     670.467    1130.418       0.490       0.258

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.371      15.587     531.003     528.796       0.023       0.410

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     508.589       0.000     508.589    1134.683       0.448       0.330

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.955     535.017       0.000       0.060       0.037       0.353

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      18.317       1.212     556.622      33.812     218.530       1.694

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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 210507.453       0.563    1916.893 1593848.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 5.964   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.138    3398.000      18.317     556.622       1.000       1.000       0.980
W Kg/sec =   73.24458

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    133.962    3280.208       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123960.672  126439.617       1.514     590.487     390.134     474.134       1.215

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   483.51    -0.17   483.51     0.43   588.23
 MEAN    18.08     0.00    -0.02   483.51    -0.17   483.51     0.43
 HUB     15.21     0.00    -0.02   483.51    -0.17   483.51     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.58    46.36     5.22   609.37   778.02    16.17   537.10     0.68
 MEAN    47.96    42.30     5.66   536.08   722.04    16.17   537.10     0.64
 HUB     43.02    37.84     5.18   451.02   661.33    16.17   537.10     0.58

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   554.90   257.69   491.44  1156.69     0.48
 MEAN    18.01   568.87   276.92   496.92  1153.96     0.49
 HUB     15.22   618.36   359.17   503.35  1151.25     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   602.08   347.83     0.52  5265.37
 MEAN   534.05   559.50   257.13     0.48  4990.33     1.39
 HUB    451.41   511.73    92.24     0.44  5470.25

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.08     1.15    18.01   581.69     1.05   555.98     0.92     0.91
 MEAN    20.93     1.14    17.73   580.38     1.04   553.36     0.92     0.91
 HUB     21.20     1.16    17.41   582.67     1.05   550.74     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.67    35.29    31.50     3.79     0.93     0.28     2.90
 MEAN    29.13    27.36    23.50     3.86     0.92     0.28     3.30     0.91
 HUB     35.51    10.38     6.50     3.88     0.92     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     648.655     277.697     586.206    1146.685       0.566      -0.238

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.038      16.928     546.446      46.000      25.348      30.600       5.252

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     595.375     277.697     656.953    1152.478       0.517      -0.069

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      20.978      17.484     551.980     455.853       0.028       0.238

    VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	586.923	0.000	586.923	1153.349	0.509	0.176

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	17.519	552.815	0.000	0.060	0.048	-0.059

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.863	20.910	1.142	581.580	24.959	261.073	2.024

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
155461.078	0.424	1415.638	1453297.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 5.964 EfDer = 0.960

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
161.138	3398.000	20.910	581.580	1.000	1.000	0.880

W Kg/sec = 73.24458

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
119.952	3209.051	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
123960.672	126439.617	1.402	489.817	349.348	384.470	1.101

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	543.81	-0.19	543.81	0.47	562.03
MEAN	17.74	0.00	-0.02	543.81	-0.19	543.81	0.47	
HUB	15.05	0.00	-0.02	543.81	-0.19	543.81	0.47	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.59	46.36	1.23	595.14	806.31	17.97	556.89	0.70
MEAN	44.06	43.40	0.66	526.00	756.70	17.97	556.89	0.65
HUB	39.39	38.84	0.55	446.28	703.60	17.97	556.89	0.61

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	541.84	230.38	490.43	1180.12	0.46
MEAN	17.51	555.73	254.48	494.04	1178.30	0.47
HUB	14.85	604.31	341.07	498.86	1176.47	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	606.63	357.05	0.51	4567.59	
MEAN	519.12	560.46	264.64	0.48	4458.39	1.44
HUB	440.35	508.65	99.28	0.43	5067.73	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.40	1.12	20.25	603.32	1.04	578.81	0.92	0.88
MEAN	23.34	1.12	20.04	602.80	1.04	577.02	0.92	0.88
HUB	23.69	1.13	19.78	605.70	1.04	575.21	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.16	36.06	31.50	4.56	0.93	0.30	2.90	
MEAN	27.25	28.18	23.50	4.68	0.90	0.31	3.28	0.88
HUB	34.36	11.26	6.50	4.76	0.90	0.34	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.960

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	561.830	256.150	500.041	1178.845	0.477	0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.444	20.064	577.587	46.000	27.124	31.500	4.376

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	516.023	256.150	576.101	1183.044	0.436	0.147

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.402	20.532	581.709	471.992	0.022	0.263

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	500.194	0.000	500.194	1184.409	0.422	0.165

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.633	583.052	0.000	0.060	0.043	0.176

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.829	23.330	1.116	603.939	22.358	273.771	2.122

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
139325.375	0.404	1268.705	1625054.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 5.964 EfDer = 0.988

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
161.138	3398.000	23.330	603.939	1.000	1.000	0.980

W Kg/sec = 73.24458

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
109.559	3149.090	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
123960.672	126439.617	1.609	513.330	319.092	401.059	1.257

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	468.02	-0.16	468.02	0.39	529.27
MEAN	16.97	0.00	-0.02	468.02	-0.16	468.02	0.39	
HUB	14.32	0.00	-0.02	468.02	-0.16	468.02	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.67	46.36	4.31	571.12	738.51	20.96	585.66	0.62
MEAN	47.09	43.80	3.29	503.23	687.35	20.96	585.66	0.58
HUB	42.23	37.84	4.39	424.63	632.05	20.96	585.66	0.53

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	527.01	217.86	479.88	1201.79	0.44
MEAN	16.57	539.30	239.35	483.28	1200.00	0.45
HUB	13.89	583.72	320.97	487.55	1198.17	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	589.27	342.00	0.49	4116.23	
MEAN	491.47	545.09	252.11	0.45	3969.77	1.36
HUB	411.88	495.95	90.91	0.41	4460.59	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.80	1.11	22.61	623.52	1.03	600.34	0.92	0.90
MEAN	25.71	1.10	22.38	622.82	1.03	598.55	0.92	0.90
HUB	26.02	1.12	22.12	625.16	1.04	596.72	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	24.42	35.48	31.50	3.98	0.93	0.25	2.90	

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 MEAN    26.35    27.55    23.50     4.05     0.92     0.26     3.29     0.90
 HUB     33.36    10.56     6.50     4.06     0.92     0.28     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     530.456     240.701     472.701    1201.773       0.441       0.056

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.811      22.575     600.351      46.000      26.985      32.400       5.415

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     495.318     240.701     550.706    1204.780       0.411       0.163

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.769      22.936     603.359     456.573       0.022       0.267

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     469.937       0.000     469.937    1206.820       0.389       0.160

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.131     605.403       0.000       0.060       0.046       0.219

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.848      25.684       1.101     623.834      19.895     283.695       2.199

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 124031.266       0.396    1129.436 1437842.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.964   EfDer =  0.980

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    161.138     3398.000       25.684     623.834       1.000        1.000        0.980
W Kg/sec =   73.24458

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    101.142     3098.468        1.401       0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 123960.672  126439.617        1.730     509.668     294.592     390.276       1.325

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   436.96    -0.15   436.96      0.36   495.34
 MEAN    15.91      0.00    -0.02   436.96    -0.15   436.96      0.36
 HUB     13.07      0.00    -0.02   436.96    -0.15   436.96      0.36

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     51.20     47.36     3.84   543.25   697.29     23.47   607.90      0.58
 MEAN    47.21     44.80     2.41   471.87   643.22     23.47   607.90      0.53
 HUB     41.58     38.84     2.74   387.57   584.17     23.47   607.90      0.48

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     17.94   496.14    208.85    450.04  1222.32      0.41
 MEAN    15.50   504.88    221.48    453.71  1220.13      0.41
 HUB     12.59   540.97    287.82    458.05  1217.92      0.44

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
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 TIP    531.98   554.03   323.13     0.45  3749.45
 MEAN   459.55   512.38   238.08     0.42  3434.73     1.37
 HUB    373.33   465.96    85.51     0.38  3625.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.06     1.09    25.04   641.66     1.03   621.13     0.92     0.90
 MEAN    27.85     1.08    24.75   640.17     1.03   618.90     0.92     0.90
 HUB     27.98     1.09    24.43   641.07     1.03   616.66     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.89    35.68    31.50     4.18     0.93     0.26     2.90
 MEAN    26.02    27.69    23.50     4.19     0.91     0.25     3.34     0.90
 HUB     32.14    10.57     6.50     4.07     0.91     0.26     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     510.220     225.536     457.666    1220.460       0.418      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.897      24.734     619.249      46.000      26.234      33.000       6.766

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     485.752     225.536     535.558    1222.462       0.397       0.062

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.812      24.942     621.282     440.827       0.046       0.262

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     452.822       0.000     452.822    1224.996       0.370       0.173

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.290     623.860       0.000       0.060       0.052       0.170

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.833      27.795       1.082     640.967      17.133     305.433       2.368

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  106862.430       0.378     973.095 1484292.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    736187.62   6703.7666    157.4157      1.8398      0.8452      5.9641      1.2260


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.614    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   72.09729

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    154.950    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 122018.992  124459.109       1.843     831.557     451.248     619.754       1.373

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   372.34    -0.13   372.34     0.34   609.32
MEAN    17.06     0.00    -0.02   372.34    -0.13   372.34     0.34
HUB     12.51     0.00    -0.02   372.34    -0.13   372.34     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.68    50.47     8.21   611.74   716.26    13.97   511.23     0.65
MEAN    53.65    47.20     6.45   505.89   628.24    13.97   511.23     0.57
HUB     44.90    38.62     6.28   370.96   525.69    13.97   511.23     0.47

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   601.90   344.40   493.62  1125.58     0.53
MEAN    18.04   631.48   381.80   502.99  1121.22     0.56
HUB     15.00   720.37   496.94   521.52  1113.40     0.65

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    611.74   561.37   267.34     0.50  7107.68
MEAN   534.83   525.75   153.02     0.47  6888.38     1.33
HUB    444.80   524.12    52.15     0.47  7455.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.46     1.22    15.20   556.67     1.06   526.41     0.92     0.91
MEAN    18.35     1.21    14.80   555.62     1.06   522.32     0.92     0.91
HUB     18.64     1.23    14.06   558.33     1.07   514.99     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.90    28.44    24.20     4.24     0.93     0.30     2.90
MEAN    37.20    16.92    12.70     4.22     0.93     0.25     3.51     0.91
HUB     43.62    -5.71    -9.30     3.59     0.93     0.11     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     641.468     381.061     516.017    1121.335       0.572      -0.006

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.449      14.774     522.504      24.000      36.445      35.400      -1.045

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     541.648     381.061     662.261    1131.870       0.479       0.274

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.401      15.728     532.368     528.796       0.023       0.422

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     497.951       0.000     497.951    1135.896       0.438       0.342

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.075     536.162       0.000       0.060       0.037       0.366

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.879      18.346       1.214     556.872      34.062     215.395       1.670

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 212065.438       0.567    1900.832 1565675.000
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.614    3398.000      18.346     556.872       1.000       1.000       0.980
W Kg/sec =   72.09729

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    131.682    3279.471       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 122018.992  124459.109       1.540     590.487     383.495     474.134       1.236

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   473.63    -0.16   473.63     0.42   588.10
 MEAN    18.08     0.00    -0.02   473.63    -0.16   473.63     0.42
 HUB     15.21     0.00    -0.02   473.63    -0.16   473.63     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.15    46.36     5.79   609.37   771.92    16.28   538.14     0.68
 MEAN    48.55    42.30     6.25   536.08   715.46    16.28   538.14     0.63
 HUB     43.61    37.84     5.77   451.02   654.14    16.28   538.14     0.57

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   549.01   265.56   480.51  1158.30     0.47
 MEAN    18.01   562.40   282.61   486.24  1155.36     0.49
 HUB     15.22   611.10   361.25   492.89  1152.43     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   588.61   339.96     0.51  5426.08
 MEAN   534.05   547.40   251.44     0.47  5092.72     1.41
 HUB    451.41   501.07    90.16     0.43  5501.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.21     1.16    18.18   582.71     1.05   557.54     0.92     0.91
 MEAN    21.02     1.15    17.88   581.12     1.04   554.71     0.92     0.91
 HUB     21.25     1.16    17.54   583.07     1.05   551.89     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.93    35.28    31.50     3.78     0.93     0.30     2.90
 MEAN    30.17    27.34    23.50     3.84     0.93     0.29     3.30     0.91
 HUB     36.24    10.37     6.50     3.87     0.93     0.30     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     638.692     283.402     572.373    1148.561       0.556      -0.229

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.128      17.121     548.234      46.000      26.342      30.600       4.258

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     579.974     283.402     645.513    1154.803       0.502      -0.039

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      21.077      17.738     554.210     455.853       0.025       0.254

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     571.503       0.000     571.503    1155.651       0.495       0.200
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	17.780	555.024	0.000	0.060	0.043	-0.026

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.871	21.019	1.146	582.298	25.426	254.821	1.975

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
158374.266	0.432	1419.576	1424785.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 6.453 EfDer = 0.969

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
158.614	3398.000	21.019	582.298	1.000	1.000	0.880

W Kg/sec = 72.09729

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
117.532	3207.073	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
122018.992	124459.109	1.431	489.817	342.299	384.470	1.123

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	530.20	-0.18	530.20	0.46	561.68
MEAN	17.74	0.00	-0.02	530.20	-0.18	530.20	0.46	
HUB	15.05	0.00	-0.02	530.20	-0.18	530.20	0.46	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.31	46.36	1.95	595.14	797.19	18.21	558.83	0.69
MEAN	44.78	43.40	1.38	526.00	746.98	18.21	558.83	0.64
HUB	40.10	38.84	1.26	446.28	693.14	18.21	558.83	0.60

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	534.34	240.25	477.28	1182.48	0.45
MEAN	17.51	547.79	261.62	481.27	1180.38	0.46
HUB	14.85	595.60	343.86	486.31	1178.28	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	590.20	347.18	0.50	4762.97	
MEAN	519.12	545.83	257.51	0.46	4583.28	1.47
HUB	440.35	495.79	96.49	0.42	5109.07	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.66	1.13	20.57	604.97	1.04	581.13	0.92	0.89
MEAN	23.56	1.12	20.32	604.11	1.04	579.06	0.92	0.89
HUB	23.86	1.14	20.04	606.61	1.04	577.00	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	26.72	36.03	31.50	4.53	0.93	0.31	2.90	
MEAN	28.53	28.15	23.50	4.65	0.91	0.32	3.28	0.89
HUB	35.26	11.22	6.50	4.72	0.91	0.35	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.969

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	553.674	263.335	487.042	1180.935	0.469	0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.660	20.349	579.638	46.000	28.399	31.500	3.101

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	501.449	263.335	566.389	1185.612	0.423	0.171

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.626	20.888	584.238	471.992	0.020	0.282

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	486.109	0.000	486.109	1186.895	0.410	0.188

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.986	585.503	0.000	0.060	0.040	0.200

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.844	23.559	1.121	605.230	22.932	265.235	2.056

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
142900.594	0.414	1280.879	1589245.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.453 EfDer = 0.993

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
158.614	3398.000	23.559	605.230	1.000	1.000	0.980

W Kg/sec = 72.09729

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
106.907	3145.729	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
122018.992	124459.109	1.649	513.330	311.368	401.059	1.288

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	455.19	-0.16	455.19	0.38	528.70
MEAN	16.97	0.00	-0.02	455.19	-0.16	455.19	0.38	
HUB	14.32	0.00	-0.02	455.19	-0.16	455.19	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.45	46.36	5.09	571.12	730.45	21.29	587.94	0.61
MEAN	47.88	43.80	4.08	503.23	678.67	21.29	587.94	0.57
HUB	43.02	37.84	5.18	424.63	622.61	21.29	587.94	0.52

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	518.46	228.35	465.47	1204.76	0.43
MEAN	16.57	530.23	246.93	469.22	1202.69	0.44
HUB	13.89	573.83	323.78	473.75	1200.60	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	571.44	331.50	0.47	4314.35	
MEAN	491.47	529.12	244.54	0.44	4095.26	1.38
HUB	411.88	481.88	88.10	0.40	4499.58	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.19	1.11	23.06	625.75	1.03	603.32	0.92	0.91
MEAN	26.05	1.11	22.79	624.71	1.03	601.25	0.92	0.91
HUB	26.31	1.12	22.50	626.63	1.04	599.16	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	26.13	35.46	31.50	3.96	0.93	0.27	2.90	
MEAN	27.76	27.53	23.50	4.03	0.92	0.28	3.29	0.91
HUB	34.35	10.53	6.50	4.03	0.92	0.29	3.90	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481      521.935     248.319     459.080     1204.385       0.433       0.055

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     26.150      22.981      602.965      46.000      28.409       32.400       3.991

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481      479.887     248.319     540.328     1207.891       0.397       0.188

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       26.117      23.423     606.480      456.573       0.020       0.288

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096      455.393       0.000     455.393     1209.794       0.376       0.186

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       23.612      608.392       0.000       0.060       0.042       0.244

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4           PR4        Texit        Del T        Ns         Ns nondim
      0.861       26.041        1.105      625.699      20.469      273.865       2.123

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 127615.516       0.407    1143.872 1406929.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.988

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    158.614     3398.000       26.041      625.699       1.000        1.000       0.980
W Kg/sec =   72.09729

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     98.340     3093.846        1.401        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 122018.992  124459.109        1.779      509.668      286.429      390.276       1.363

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00     -0.02   423.76     -0.15   423.76      0.35    494.61
 MEAN    15.91      0.00     -0.02   423.76     -0.15   423.76      0.35
 HUB     13.07      0.00     -0.02   423.76     -0.15   423.76      0.35

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     52.05     47.36      4.69   543.25   689.09     23.93   610.72      0.57
 MEAN    48.08     44.80      3.28   471.87   634.33     23.93   610.72      0.52
 HUB     42.46     38.84      3.62   387.57   574.36     23.93   610.72      0.47

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   487.59    219.71    435.28   1225.75      0.40
 MEAN    15.50   495.49    229.34    439.22   1223.30      0.41
 HUB     12.59   530.51    290.74    443.75   1220.85      0.43

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    531.98    535.70    312.27      0.44   3944.24
 MEAN   459.55    495.89    230.21      0.41   3556.59      1.39
 HUB    373.33    451.37     82.60      0.37   3662.28
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         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.59     1.10    25.63   644.45     1.03   624.62     0.92     0.90
 MEAN    28.33     1.09    25.30   642.61     1.03   622.13     0.92     0.90
 HUB     28.40     1.09    24.94   643.11     1.03   619.63     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.78    35.66    31.50     4.16     0.93     0.28     2.90
 MEAN    27.57    27.66    23.50     4.16     0.92     0.27     3.34     0.90
 HUB     33.23    10.54     6.50     4.04     0.92     0.28     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     500.797     233.548     443.004    1223.625       0.409      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.377      25.283     622.468      46.000      27.798      33.000       5.202

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     468.783     233.548     523.739    1226.168       0.382       0.096

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.313      25.595     625.058     440.827       0.040       0.284

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     437.386       0.000     437.386    1228.494       0.356       0.202

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.920     627.431       0.000       0.060       0.046       0.200

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.851      28.296       1.087     643.391      17.692     293.617       2.276

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 110354.484       0.390     989.154 1451874.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    751310.31   6734.3120    154.9500      1.8730      0.8547      6.4531      1.2306


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

   Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.044   EfDer =  1.000

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    155.582    3398.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    151.988    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.879     831.557     442.622     619.754       1.400

     ROTOR LEADING EDGE CONDITIONS, STAGE            1
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   364.35    -0.13   364.35     0.33   609.32
MEAN    17.06     0.00    -0.02   364.35    -0.13   364.35     0.33
HUB     12.51     0.00    -0.02   364.35    -0.13   364.35     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.23    50.47     8.76   611.74   712.14    14.02   511.72     0.64
MEAN    54.24    47.20     7.04   505.89   623.54    14.02   511.72     0.56
HUB     45.52    38.62     6.90   370.96   520.06    14.02   511.72     0.47

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   595.87   351.00   481.52  1126.91     0.53
MEAN    18.04   624.23   385.51   490.96  1122.36     0.56
HUB     15.00   710.41   495.70   508.88  1114.57     0.64

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    611.74   547.59   260.75     0.49  7243.62
MEAN   534.83   513.16   149.32     0.46  6955.19     1.36
HUB    444.80   511.42    50.90     0.46  7437.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.53     1.23    15.32   557.32     1.07   527.66     0.92     0.91
MEAN    18.39     1.22    14.90   555.94     1.06   523.40     0.92     0.91
HUB     18.63     1.23    14.17   558.24     1.07   516.09     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     36.09    28.44    24.20     4.24     0.93     0.32     2.90
MEAN    38.14    16.92    12.70     4.22     0.93     0.27     3.51     0.91
HUB     44.25    -5.71    -9.30     3.59     0.93     0.13     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    18.071     633.699     384.760     503.522    1122.536       0.565      -0.005

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.481      14.883     523.623      24.000      37.385      35.400      -1.985

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     527.515     384.760     652.926    1133.521       0.465       0.293

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.432      15.887     533.922     528.796       0.023       0.436

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     485.568       0.000     485.568    1137.282       0.427       0.356

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.209     537.471       0.000       0.060       0.038       0.380

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.879      18.377       1.216     557.164      34.354     211.711       1.641

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 213884.875       0.572    1880.494 1532079.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.044   EfDer =  1.000
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
155.582	3398.000	18.377	557.164	1.000	1.000	0.980

W Kg/sec = 70.71914

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
128.986	3278.611	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
119686.578	122080.047	1.572	590.487	375.645	474.134	1.262

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	462.12	-0.16	462.12	0.41	587.94
MEAN	18.08	0.00	-0.02	462.12	-0.16	462.12	0.41	
HUB	15.21	0.00	-0.02	462.12	-0.16	462.12	0.41	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.83	46.36	6.47	609.37	764.90	16.41	539.33	0.67
MEAN	49.25	42.30	6.95	536.08	707.88	16.41	539.33	0.62
HUB	44.31	37.84	6.47	451.02	645.85	16.41	539.33	0.57

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	542.57	274.63	467.92	1160.12	0.47
MEAN	18.01	555.16	289.17	473.91	1156.95	0.48
HUB	15.22	602.80	363.63	480.77	1153.79	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	573.10	330.88	0.49	5611.27	
MEAN	534.05	533.44	244.88	0.46	5210.81	1.44
HUB	451.41	488.72	87.78	0.42	5537.97	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.35	1.16	18.37	583.88	1.05	559.30	0.92	0.91
MEAN	21.12	1.15	18.04	581.97	1.04	556.24	0.92	0.91
HUB	21.30	1.16	17.68	583.53	1.05	553.19	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.41	35.27	31.50	3.77	0.93	0.31	2.90	
MEAN	31.39	27.33	23.50	3.83	0.93	0.31	3.30	0.91
HUB	37.10	10.35	6.50	3.85	0.93	0.32	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	627.578	289.981	556.566	1150.659	0.545	-0.219

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.225	17.334	550.240	46.000	27.520	30.600	3.080

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	562.565	289.981	632.905	1157.395	0.486	-0.004

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	21.183	18.018	556.702	455.853	0.023	0.271

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	554.353	0.000	554.353	1158.191	0.479	0.225

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	18.059	557.467	0.000	0.060	0.040	0.009

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.876	21.129	1.150	583.129	25.965	247.776	1.921

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
161729.703	0.441	1421.941	1391148.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 7.044 EfDer = 0.978

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
155.582	3398.000	21.129	583.129	1.000	1.000	0.880

W Kg/sec = 70.71914

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
114.768	3204.787	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
119686.578	122080.047	1.465	489.817	334.249	384.470	1.150

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	514.97	-0.18	514.97	0.44	561.28
MEAN	17.74	0.00	-0.02	514.97	-0.18	514.97	0.44	
HUB	15.05	0.00	-0.02	514.97	-0.18	514.97	0.44	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.14	46.36	2.78	595.14	787.14	18.46	560.99	0.68
MEAN	45.62	43.40	2.22	526.00	736.25	18.46	560.99	0.63
HUB	40.92	38.84	2.08	446.28	681.56	18.46	560.99	0.59

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	526.51	251.17	462.73	1185.07	0.44
MEAN	17.51	539.29	269.57	467.08	1182.67	0.46
HUB	14.85	586.07	346.96	472.34	1180.30	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	572.01	336.26	0.48	4979.22	
MEAN	519.12	529.57	249.55	0.45	4722.43	1.49
HUB	440.35	481.48	93.39	0.41	5155.03	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.93	1.13	20.90	606.83	1.04	583.68	0.92	0.90
MEAN	23.78	1.13	20.62	605.60	1.04	581.32	0.92	0.90
HUB	24.04	1.14	20.31	607.66	1.04	578.99	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.49	36.01	31.50	4.51	0.93	0.33	2.90	
MEAN	29.99	28.11	23.50	4.61	0.91	0.34	3.28	0.90
HUB	36.30	11.18	6.50	4.68	0.91	0.36	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.978

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	544.970	271.341	472.617	1183.239	0.461	0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.886	20.650	581.904	46.000	29.861	31.500	1.639

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	485.435	271.341	556.123	1188.435	0.408	0.198

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.858	21.266	587.025	471.992	0.019	0.303

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	470.671	0.000	470.671	1189.627	0.396	0.214

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.359	588.203	0.000	0.060	0.038	0.227

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.857	23.795	1.126	606.697	23.568	256.085	1.985

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
146867.891	0.426	1291.275	1547823.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 7.044 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
155.582	3398.000	23.795	606.697	1.000	1.000	0.980

W Kg/sec = 70.71914

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
103.949	3141.923	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
119686.578	122080.047	1.696	513.330	302.753	401.059	1.325

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	441.08	-0.15	441.08	0.37	528.06
MEAN	16.97	0.00	-0.02	441.08	-0.15	441.08	0.37	
HUB	14.32	0.00	-0.02	441.08	-0.15	441.08	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.33	46.36	5.97	571.12	721.74	21.65	590.46	0.61
MEAN	48.77	43.80	4.97	503.23	669.29	21.65	590.46	0.56
HUB	43.92	37.84	6.08	424.63	612.37	21.65	590.46	0.51

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	509.75	239.72	449.87	1207.97	0.42
MEAN	16.57	520.75	255.16	453.95	1205.62	0.43
HUB	13.89	563.24	326.82	458.72	1203.27	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	552.15	320.14	0.46	4528.75	
MEAN	491.47	511.77	236.31	0.42	4231.57	1.41
HUB	411.88	466.54	85.06	0.39	4541.71	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.60	1.12	23.53	628.24	1.04	606.55	0.92	0.91
MEAN	26.40	1.11	23.22	626.83	1.03	604.19	0.92	0.91
HUB	26.60	1.12	22.89	628.30	1.04	601.83	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.05	35.44	31.50	3.94	0.93	0.29	2.90	
MEAN	29.34	27.50	23.50	4.00	0.92	0.29	3.29	0.91
HUB	35.47	10.51	6.50	4.01	0.92	0.31	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.997

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     513.048     256.595     444.272    1207.232       0.425       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.501      23.403     605.822      46.000      30.009      32.400       2.391

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     463.283     256.595     529.596    1211.266       0.382       0.216

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.476      23.932     609.876     456.573       0.018       0.311

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     439.775       0.000     439.775    1213.024       0.363       0.213

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.112     611.648       0.000       0.060       0.039       0.270

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      26.406       1.110     627.788      21.091     263.595       2.043

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 131499.125       0.420    1156.152 1371186.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.044   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3398.000      26.406     627.788       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.283    3088.694       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.836     509.668     277.528     390.276       1.406

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   409.54    -0.14   409.54     0.34   493.78
 MEAN    15.91     0.00    -0.02   409.54    -0.14   409.54     0.34
 HUB     13.07     0.00    -0.02   409.54    -0.14   409.54     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.00    47.36     5.64   543.25   680.44    24.41   613.80     0.56
 MEAN    49.05    44.80     4.25   471.87   624.92    24.41   613.80     0.51
 HUB     43.43    38.84     4.59   387.57   563.95    24.41   613.80     0.46

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   479.11   231.25   419.61  1229.42     0.39
 MEAN    15.50   485.91   237.72   423.79  1226.72     0.40
 HUB     12.59   519.54   293.83   428.48  1224.02     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   516.25   300.73     0.42  4151.20
 MEAN   459.55   478.34   221.84     0.39  3686.27     1.43
 HUB    373.33   435.79    79.50     0.36  3701.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.14     1.10    26.24   647.52     1.03   628.37     0.92     0.91
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 MEAN    28.82     1.09    25.87   645.31     1.03   625.62     0.92     0.91
 HUB     28.83     1.09    25.47   645.39     1.03   622.87     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.86    35.63    31.50     4.13     0.93     0.30     2.90
 MEAN    29.29    27.63    23.50     4.13     0.92     0.29     3.34     0.91
 HUB     34.44    10.51     6.50     4.01     0.92     0.29     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     491.195     242.075     427.401    1227.034       0.400      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.869      25.849     625.947      46.000      29.527      33.000       3.473

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     450.985     242.075     511.848    1230.128       0.367       0.133

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.823      26.265     629.107     440.827       0.035       0.309

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     421.138       0.000     421.138    1232.249       0.342       0.234

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.567     631.279       0.000       0.060       0.041       0.231

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      28.805       1.091     646.075      18.286     281.575       2.183

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 114066.727       0.403    1002.884 1414598.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    768048.31   6752.7466    151.9881      1.9067      0.8622      7.0442      1.2358


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.500   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.260    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   69.66364

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    149.720    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117900.242  120257.992       1.907     831.557     436.016     619.754       1.421

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   358.28    -0.12   358.28     0.32   609.32
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 MEAN    17.06     0.00    -0.02   358.28    -0.12   358.28     0.32
 HUB     12.51     0.00    -0.02   358.28    -0.12   358.28     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.65    50.47     9.18   611.74   709.04    14.05   512.09     0.64
 MEAN    54.70    47.20     7.50   505.89   620.01    14.05   512.09     0.56
 HUB     46.01    38.62     7.39   370.96   515.82    14.05   512.09     0.46

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   591.53   355.91   472.47  1127.88     0.52
 MEAN    18.04   618.89   388.29   481.94  1123.20     0.55
 HUB     15.00   703.00   494.78   499.40  1115.42     0.63

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   537.29   255.83     0.48  7345.07
 MEAN   534.83   503.72   146.54     0.45  7005.30     1.38
 HUB    444.80   501.90    49.98     0.45  7423.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.58     1.23    15.40   557.80     1.07   528.58     0.92     0.91
 MEAN    18.41     1.22    14.98   556.18     1.06   524.19     0.92     0.91
 HUB     18.62     1.23    14.25   558.17     1.07   516.90     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.99    28.43    24.20     4.23     0.93     0.33     2.90
 MEAN    38.86    16.91    12.70     4.21     0.93     0.28     3.51     0.91
 HUB     44.73    -5.71    -9.30     3.59     0.93     0.14     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     627.998     387.535     494.164    1123.413       0.559      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.503      14.961     524.443      24.000      38.104      35.400      -2.704

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     517.017     387.535     646.135    1134.724       0.456       0.307

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.454      16.002     535.056     528.796       0.023       0.447

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     476.347       0.000     476.347    1138.297       0.418       0.367

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.305     538.431       0.000       0.060       0.039       0.390

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      18.396       1.218     557.383      34.573     208.942       1.620

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 215245.641       0.575    1864.213 1506525.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 7.500   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.260    3398.000      18.396     557.383       1.000       1.000       0.980
W Kg/sec =   69.66364
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
126.951	3277.968	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
117900.242	120257.992	1.597	590.487	369.717	474.134	1.282

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	453.52	-0.16	453.52	0.40	587.83
MEAN	18.08	0.00	-0.02	453.52	-0.16	453.52	0.40	
HUB	15.21	0.00	-0.02	453.52	-0.16	453.52	0.40	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.35	46.36	6.99	609.37	759.74	16.49	540.21	0.67
MEAN	49.78	42.30	7.48	536.08	702.30	16.49	540.21	0.62
HUB	44.85	37.84	7.01	451.02	639.72	16.49	540.21	0.56

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	538.05	281.30	458.66	1161.44	0.46
MEAN	18.01	549.97	294.00	464.79	1158.10	0.47
HUB	15.22	596.74	365.40	471.78	1154.77	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	561.68	324.22	0.48	5747.37	
MEAN	534.05	523.12	240.05	0.45	5297.74	1.46
HUB	451.41	479.56	86.01	0.42	5564.87	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.44	1.17	18.51	584.75	1.05	560.57	0.92	0.91
MEAN	21.19	1.15	18.16	582.61	1.05	557.35	0.92	0.91
HUB	21.34	1.16	17.78	583.88	1.05	554.14	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.52	35.26	31.50	3.76	0.93	0.32	2.90	
MEAN	32.31	27.32	23.50	3.82	0.93	0.32	3.30	0.91
HUB	37.76	10.33	6.50	3.83	0.93	0.32	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	619.619	294.825	544.982	1152.168	0.538	-0.211

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.292	17.484	551.685	46.000	28.413	30.600	2.187

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	549.929	294.825	623.974	1159.253	0.474	0.021

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	21.254	18.216	558.491	455.853	0.022	0.285

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	541.945	0.000	541.945	1160.009	0.467	0.242

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	18.254	559.219	0.000	0.060	0.038	0.033

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	21.203	1.153	583.744	26.361	242.685	1.881

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 164200.625       0.448    1422.119 1365799.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.500   EfDer =  0.984

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.260    3398.000      21.203     583.744       1.000       1.000       0.880
W Kg/sec =   69.66364

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    112.722    3203.098       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117900.242  120257.992       1.492     489.817     328.291     384.470       1.171

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   503.90    -0.17   503.90     0.43   560.99
 MEAN    17.74     0.00    -0.02   503.90    -0.17   503.90     0.43
 HUB     15.05     0.00    -0.02   503.90    -0.17   503.90     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.75    46.36     3.39   595.14   779.94    18.64   562.55     0.67
 MEAN    46.24    43.40     2.84   526.00   728.54    18.64   562.55     0.63
 HUB     41.54    38.84     2.70   446.28   673.23    18.64   562.55     0.58

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   521.19   259.05   452.25  1186.91     0.44
 MEAN    17.51   533.38   275.31   456.83  1184.32     0.45
 HUB     14.85   579.31   349.20   462.23  1181.76     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   558.90   328.38     0.47  5135.17
 MEAN   519.12   517.83   243.82     0.44  4822.75     1.51
 HUB    440.35   471.13    91.15     0.40  5188.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.13     1.14    21.13   608.18     1.04   585.51     0.92     0.90
 MEAN    23.94     1.13    20.83   606.70     1.04   582.95     0.92     0.90
 HUB     24.16     1.14    20.49   608.44     1.04   580.42     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.80    35.98    31.50     4.48     0.93     0.34     2.90
 MEAN    31.07    28.09    23.50     4.59     0.91     0.35     3.28     0.90
 HUB     37.07    11.16     6.50     4.66     0.91     0.37     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     538.912     277.113     462.206    1184.886       0.455       0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.041      20.858     583.526      46.000      30.945      31.500       0.555

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     473.976     277.113     549.040    1190.448       0.398       0.218

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.016      21.528     589.017     471.992       0.018       0.320
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	459.649	0.000	459.649	1191.576	0.386	0.232

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.615	590.133	0.000	0.060	0.037	0.245

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.865	23.954	1.130	607.771	24.027	249.677	1.935

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
149730.000	0.434	1296.791	1517031.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 7.500 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
153.260	3398.000	23.954	607.771	1.000	1.000	0.980

W Kg/sec = 69.66364

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
101.806	3139.146	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
117900.242	120257.992	1.731	513.330	296.513	401.059	1.353

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	430.99	-0.15	430.99	0.36	527.60
MEAN	16.97	0.00	-0.02	430.99	-0.15	430.99	0.36	
HUB	14.32	0.00	-0.02	430.99	-0.15	430.99	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.97	46.36	6.61	571.12	715.61	21.89	592.27	0.60
MEAN	49.43	43.80	5.63	503.23	662.68	21.89	592.27	0.56
HUB	44.58	37.84	6.74	424.63	605.13	21.89	592.27	0.51

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	503.95	247.72	438.86	1210.24	0.42
MEAN	16.57	514.26	260.97	443.13	1207.70	0.43
HUB	13.89	555.85	328.97	448.05	1205.16	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	538.54	312.13	0.44	4679.89	
MEAN	491.47	499.49	230.50	0.41	4327.75	1.44
HUB	411.88	455.65	82.91	0.38	4571.51	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.87	1.12	23.85	630.03	1.04	608.84	0.92	0.91
MEAN	26.64	1.11	23.52	628.36	1.03	606.29	0.92	0.91
HUB	26.80	1.12	23.16	629.52	1.04	603.73	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	29.44	35.42	31.50	3.92	0.93	0.31	2.90	
MEAN	30.49	27.48	23.50	3.98	0.92	0.31	3.29	0.91
HUB	36.29	10.48	6.50	3.98	0.92	0.32	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

```
    16.481     506.984     262.434     433.775    1209.250       0.419       0.053

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.739      23.691     607.851      46.000      31.174      32.400       1.226

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     451.613     262.434     522.327    1213.648       0.372       0.236

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.718      24.279     612.281     456.573       0.017       0.328

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     428.818       0.000     428.818    1215.307       0.353       0.233

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.451     613.956       0.000       0.060       0.037       0.289

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.876      26.651       1.113     629.301      21.530     256.562       1.989

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 134238.734       0.428    1162.623 1344616.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.500   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.260    3398.000      26.651     629.301       1.000       1.000       0.980
W Kg/sec =   69.66364

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.112    3084.979       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117900.242  120257.992       1.879     509.668     271.204     390.276       1.439

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   399.54    -0.14   399.54     0.33   493.19
 MEAN    15.91     0.00    -0.02   399.54    -0.14   399.54     0.33
 HUB     13.07     0.00    -0.02   399.54    -0.14   399.54     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.67    47.36     6.31   543.25   674.46    24.73   615.98     0.55
 MEAN    49.75    44.80     4.95   471.87   618.41    24.73   615.98     0.51
 HUB     44.14    38.84     5.30   387.57   556.73    24.73   615.98     0.46

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   473.60   239.23   408.74  1231.98     0.38
 MEAN    15.50   479.48   243.53   413.03  1229.12     0.39
 HUB     12.59   512.03   295.98   417.81  1226.26     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   502.76   292.74     0.41  4294.38
 MEAN   459.55   466.12   216.03     0.38  3776.26     1.45
 HUB    373.33   424.91    77.35     0.35  3728.23

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.51     1.11    26.65   649.72     1.03   631.01     0.92     0.91
 MEAN    29.15     1.09    26.25   647.25     1.03   628.08     0.92     0.91
 HUB     29.12     1.09    25.82   647.03     1.03   625.15     0.92     0.91
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         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     30.34    35.61    31.50     4.11     0.93     0.32     2.90
  MEAN    30.52    27.61    23.50     4.11     0.92     0.30     3.34     0.91
  HUB     35.31    10.49     6.50     3.99     0.92     0.30     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.997

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     484.773     247.991     416.539    1229.426       0.394      -0.005

      Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      29.199       26.229      628.394      46.000      30.768      33.000       2.232

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     438.740     247.991     503.977    1232.891       0.356       0.158

    BlockageThr  PtTh         PsTh        TsTh         AreaTh       w 2-Th  DiffFact4
       0.950       29.162      26.715     631.941     440.827       0.032       0.327

     VANED DIFFUSER EXIT:
    R4           C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     409.931       0.000     409.931    1234.879       0.332       0.256

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       27.001     633.981       0.000       0.060       0.038       0.252

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.873       29.144       1.094     647.999      18.698     273.503       2.120

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  116639.656       0.412    1010.200 1386996.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     780054.62   6755.9463     149.7197      1.9291      0.8658      7.4999      1.2395


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     150.961     3398.000       15.107      522.810       1.000        1.000        0.980
 W Kg/sec =   68.61877

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     147.474     3384.617        1.402        0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  116131.867  118454.250        1.936      831.557      429.477      619.754       1.443

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   352.30    -0.12   352.30      0.32   609.32
  MEAN    17.06      0.00    -0.02   352.30    -0.12   352.30      0.32
  HUB     12.51      0.00    -0.02   352.30    -0.12   352.30      0.32
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.07    50.47     9.60   611.74   706.04    14.09   512.44     0.64
MEAN    55.15    47.20     7.95   505.89   616.57    14.09   512.44     0.56
HUB     46.49    38.62     7.87   370.96   511.68    14.09   512.44     0.46

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   587.46   360.70   463.68  1128.80     0.52
MEAN    18.04   613.80   391.00   473.15  1124.01     0.55
HUB     15.00   695.84   493.88   490.19  1116.24     0.62

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    611.74   527.27   251.04     0.47  7443.83
MEAN   534.83   494.53   143.82     0.44  7054.16     1.40
HUB    444.80   492.64    49.08     0.44  7409.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.63     1.23    15.49   558.27     1.07   529.45     0.92     0.91
MEAN    18.43     1.22    15.05   556.41     1.06   524.95     0.92     0.91
HUB     18.61     1.23    14.32   558.11     1.07   517.67     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.88    28.43    24.20     4.23     0.93     0.34     2.90
MEAN    39.57    16.91    12.70     4.21     0.93     0.29     3.51     0.91
HUB     45.21    -5.72    -9.30     3.58     0.93     0.15     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     622.556     390.241     485.065    1124.250       0.554      -0.003

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.523      15.036     525.224      24.000      38.817      35.400      -3.417

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     506.874     390.241     639.694    1135.869       0.446       0.321

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.472      16.110     536.137     528.796       0.024       0.458

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     467.421       0.000     467.421    1139.265       0.410       0.377

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.395     539.347       0.000       0.060       0.041       0.400

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.877      18.413       1.219     557.596      34.786     206.238       1.599

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 216571.438       0.579    1847.562 1481373.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.961    3398.000      18.413     557.596       1.000       1.000       0.980
W Kg/sec =   68.61877

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    124.958    3277.342       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
116131.867	118454.250	1.623	590.487	363.912	474.134	1.303

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	445.19	-0.15	445.19	0.39	587.72
MEAN	18.08	0.00	-0.02	445.19	-0.15	445.19	0.39	
HUB	15.21	0.00	-0.02	445.19	-0.15	445.19	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.86	46.36	7.50	609.37	754.79	16.58	541.05	0.66
MEAN	50.30	42.30	8.00	536.08	696.95	16.58	541.05	0.61
HUB	45.38	37.84	7.54	451.02	633.84	16.58	541.05	0.56

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	533.91	287.70	449.77	1162.68	0.46
MEAN	18.01	545.11	298.65	456.02	1159.19	0.47
HUB	15.22	590.96	367.09	463.11	1155.71	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	550.72	317.81	0.47	5878.04	
MEAN	534.05	513.19	235.41	0.44	5381.38	1.48
HUB	451.41	470.72	84.32	0.41	5590.59	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.53	1.17	18.63	585.58	1.05	561.78	0.92	0.91
MEAN	21.25	1.15	18.26	583.22	1.05	558.41	0.92	0.91
HUB	21.37	1.16	17.87	584.21	1.05	555.05	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.61	35.25	31.50	3.75	0.93	0.34	2.90	
MEAN	33.22	27.30	23.50	3.80	0.93	0.33	3.30	0.91
HUB	38.40	10.32	6.50	3.82	0.93	0.33	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	612.170	299.484	533.911	1153.587	0.531	-0.204

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.353	17.622	553.045	46.000	29.289	30.600	1.311

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	537.937	299.484	615.684	1160.998	0.463	0.046

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	21.318	18.398	560.174	455.853	0.021	0.298

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	530.182	0.000	530.182	1161.715	0.456	0.259

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	18.433	560.866	0.000	0.060	0.037	0.057

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.880	21.268	1.155	584.338	26.742	237.872	1.844

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
166573.438	0.454	1421.031	1341027.500

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.961    3398.000      21.268     584.338       1.000       1.000       0.880
W Kg/sec =   68.61877

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    110.748    3201.470       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 116131.867  118454.250       1.519     489.817     322.543     384.470       1.192

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   493.37    -0.17   493.37     0.42   560.70
 MEAN    17.74     0.00    -0.02   493.37    -0.17   493.37     0.42
 HUB     15.05     0.00    -0.02   493.37    -0.17   493.37     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.35    46.36     3.99   595.14   773.18    18.80   564.02     0.66
 MEAN    46.84    43.40     3.44   526.00   721.30    18.80   564.02     0.62
 HUB     42.14    38.84     3.30   446.28   665.38    18.80   564.02     0.57

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   516.43   266.48   442.36  1188.64     0.43
 MEAN    17.51   527.95   280.72   447.13  1185.86     0.45
 HUB     14.85   572.99   351.32   452.65  1183.12     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   546.53   320.95     0.46  5282.34
 MEAN   519.12   506.72   238.40     0.43  4917.50     1.53
 HUB    440.35   461.32    89.03     0.39  5219.63

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.30     1.14    21.34   609.48     1.04   587.21     0.92     0.90
 MEAN    24.08     1.13    21.01   607.74     1.04   584.47     0.92     0.90
 HUB     24.26     1.14    20.66   609.18     1.04   581.77     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.06    35.96    31.50     4.46     0.93     0.35     2.90
 MEAN    32.12    28.07    23.50     4.57     0.92     0.36     3.28     0.90
 HUB     37.82    11.13     6.50     4.63     0.92     0.37     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     533.361     282.564     452.362    1186.431       0.450       0.010

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.182      21.047     585.050      46.000      31.991      31.500      -0.491

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     463.211     282.564     542.593    1192.333       0.388       0.237

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.157      21.766     590.886     471.992       0.018       0.335

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     17.121     449.314       0.000     449.314    1193.401       0.376       0.250

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.847     591.945       0.000       0.060       0.037       0.263

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      24.096       1.133     608.798      24.460     243.763       1.890

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 152431.484       0.442    1300.387 1487236.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.961    3398.000      24.096     608.798       1.000       1.000       0.980
W Kg/sec =   68.61877

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     99.774    3136.497       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 116131.867  118454.250       1.766     513.330     290.596     401.059       1.380

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   421.50    -0.15   421.50     0.35   527.15
 MEAN    16.97     0.00    -0.02   421.50    -0.15   421.50     0.35
 HUB     14.32     0.00    -0.02   421.50    -0.15   421.50     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.58    46.36     7.22   571.12   709.93    22.11   593.97     0.59
 MEAN    50.06    43.80     6.26   503.23   656.55    22.11   593.97     0.55
 HUB     45.22    37.84     7.38   424.63   598.41    22.11   593.97     0.50

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   498.83   255.16   428.63  1212.34     0.41
 MEAN    16.57   508.41   266.38   433.04  1209.64     0.42
 HUB     13.89   549.04   330.96   438.07  1206.94     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   525.89   304.69     0.43  4820.23
 MEAN   491.47   488.05   225.09     0.40  4417.41     1.46
 HUB    411.88   445.48    80.92     0.37  4599.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.12     1.13    24.13   631.73     1.04   610.96     0.92     0.91
 MEAN    26.86     1.11    23.78   629.81     1.03   608.24     0.92     0.91
 HUB     26.98     1.12    23.40   630.67     1.04   605.52     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.76    35.41    31.50     3.91     0.93     0.32     2.90
 MEAN    31.60    27.46    23.50     3.96     0.93     0.32     3.29     0.91
 HUB     37.07    10.47     6.50     3.97     0.93     0.33     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     501.521     267.878     423.987    1211.130       0.414       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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    26.952      23.949     609.746      46.000      32.285      32.400       0.115

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     440.797     267.878     515.810    1215.864       0.363       0.255

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.932      24.591     614.522     456.573       0.016       0.345

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     418.679       0.000     418.679    1217.432       0.344       0.251

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      24.753     616.108       0.000       0.060       0.037       0.306

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.879      26.866       1.115     630.737      21.938     250.171       1.939

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 136785.672       0.436    1166.913 1318901.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.961    3398.000      26.866     630.737       1.000       1.000       0.980
W Kg/sec =   68.61877

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.083    3081.467       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 116131.867  118454.250       1.921     509.668     265.297     390.276       1.471

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   390.27    -0.13   390.27     0.32   492.63
 MEAN    15.91     0.00    -0.02   390.27    -0.13   390.27     0.32
 HUB     13.07     0.00    -0.02   390.27    -0.13   390.27     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.31    47.36     6.95   543.25   669.01    25.02   618.03     0.55
 MEAN    50.41    44.80     5.61   471.87   612.46    25.02   618.03     0.50
 HUB     44.81    38.84     5.97   387.57   550.11    25.02   618.03     0.45

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   468.83   246.58   398.75  1234.35     0.38
 MEAN    15.50   473.78   248.90   403.14  1231.35     0.38
 HUB     12.59   505.19   297.94   407.98  1228.34     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   490.36   285.39     0.40  4426.17
 MEAN   459.55   454.86   210.66     0.37  3859.43     1.48
 HUB    373.33   414.89    75.39     0.34  3752.87

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.84     1.11    27.01   651.78     1.03   633.44     0.92     0.91
 MEAN    29.44     1.10    26.58   649.08     1.03   630.36     0.92     0.91
 HUB     29.37     1.09    26.14   648.58     1.03   627.29     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.73    35.59    31.50     4.09     0.93     0.33     2.90
 MEAN    31.69    27.59    23.50     4.09     0.92     0.32     3.34     0.91
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 HUB     36.14    10.47     6.50     3.97     0.92     0.31     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     479.086     253.460     406.548    1231.641       0.389       -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.491      26.566     630.666      46.000      31.941      33.000       1.059

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     427.569     253.460     497.048    1235.440       0.346       0.181

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.459      27.114     634.563     440.827       0.031       0.344

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     399.689       0.000     399.689    1237.311       0.323       0.275

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      27.385     636.487       0.000       0.060       0.037       0.272

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      29.440       1.096     649.813      19.077     266.267       2.064

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 119008.336       0.421    1015.255 1360348.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    791370.38   6751.1484    147.4741      1.9488      0.8679      7.9534      1.2429


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 8.546   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3398.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    144.557    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.975     831.557     420.983     619.754       1.472

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   344.58    -0.12   344.58     0.31   609.32
 MEAN    17.06     0.00    -0.02   344.58    -0.12   344.58     0.31
 HUB     12.51     0.00    -0.02   344.58    -0.12   344.58     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.61    50.47    10.14   611.74   702.22    14.13   512.89     0.63
 MEAN    55.75    47.20     8.55   505.89   612.19    14.13   512.89     0.55
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HUB     47.12    38.62     8.50   370.96   506.39    14.13   512.89     0.46

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   582.47   366.77   452.49  1129.95     0.52
MEAN    18.04   607.43   394.44   461.94  1125.01     0.54
HUB     15.00   686.79   492.73   478.44  1117.26     0.61

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    611.74   514.55   244.97     0.46  7568.97
MEAN   534.83   482.80   140.38     0.43  7116.17     1.43
HUB    444.80   480.83    47.93     0.43  7392.38

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.69     1.24    15.59   558.86     1.07   530.53     0.92     0.91
MEAN    18.46     1.22    15.13   556.71     1.06   525.89     0.92     0.91
HUB     18.60     1.23    14.41   558.02     1.07   518.63     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.03    28.43    24.20     4.23     0.93     0.36     2.90
MEAN    40.49    16.90    12.70     4.20     0.93     0.31     3.51     0.91
HUB     45.84    -5.72    -9.30     3.58     0.93     0.16     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     615.758     393.675     473.475    1125.291       0.547      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.547      15.127     526.197      24.000      39.742      35.400      -4.342

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     494.043     393.675     631.711    1137.291       0.434       0.339

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.493      16.242     537.479     528.796       0.025       0.473

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     456.108       0.000     456.108    1140.471       0.400       0.389

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.505     540.490       0.000       0.060       0.043       0.413

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.875      18.430       1.220     557.866      35.056     202.788       1.572

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 218251.031       0.583    1825.068 1448913.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.546   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3398.000      18.430     557.866       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    122.400    3276.550       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.657     590.487     356.463     474.134       1.330
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ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	434.61	-0.15	434.61	0.38	587.57
MEAN	18.08	0.00	-0.02	434.61	-0.15	434.61	0.38	
HUB	15.21	0.00	-0.02	434.61	-0.15	434.61	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.51	46.36	8.15	609.37	748.60	16.68	542.09	0.66
MEAN	50.98	42.30	8.68	536.08	690.24	16.68	542.09	0.60
HUB	46.07	37.84	8.23	451.02	626.45	16.68	542.09	0.55

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	528.98	295.71	438.60	1164.21	0.45
MEAN	18.01	539.17	304.50	444.96	1160.54	0.46
HUB	15.22	583.76	369.23	452.15	1156.88	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	536.98	309.80	0.46	6041.54	
MEAN	534.05	500.68	229.55	0.43	5486.69	1.50
HUB	451.41	459.56	82.18	0.40	5623.11	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.63	1.17	18.77	586.63	1.05	563.27	0.92	0.91
MEAN	21.32	1.16	18.39	583.99	1.05	559.71	0.92	0.91
HUB	21.40	1.16	17.98	584.64	1.05	556.18	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.99	35.24	31.50	3.74	0.93	0.35	2.90	
MEAN	34.38	27.29	23.50	3.79	0.93	0.34	3.30	0.91
HUB	39.24	10.30	6.50	3.80	0.93	0.34	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	603.077	305.352	520.060	1155.327	0.522	-0.196

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.423	17.788	554.716	46.000	30.419	30.600	0.181

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	523.042	305.352	605.651	1163.138	0.450	0.076

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	21.390	18.616	562.242	455.853	0.020	0.315

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	515.591	0.000	515.591	1163.806	0.443	0.280

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	18.647	562.888	0.000	0.060	0.037	0.086

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.880	21.341	1.158	585.086	27.220	231.926	1.798

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
169552.312	0.462	1417.838	1309304.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

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 RESET =  0.000BLEED =  0.000 DPInc = 8.546   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3398.000      21.341     585.086       1.000       1.000       0.880
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    108.255    3199.423       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.554     489.817     315.281     384.470       1.219

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   480.25    -0.17   480.25     0.41   560.34
MEAN    17.74     0.00    -0.02   480.25    -0.17   480.25     0.41
HUB     15.05     0.00    -0.02   480.25    -0.17   480.25     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.11    46.36     4.75   595.14   764.87    18.99   565.83     0.66
MEAN    47.61    43.40     4.21   526.00   712.39    18.99   565.83     0.61
HUB     42.91    38.84     4.07   446.28   655.71    18.99   565.83     0.56

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   510.89   275.63   430.16  1190.74     0.43
MEAN    17.51   521.50   287.44   435.13  1187.75     0.44
HUB     14.85   565.29   353.94   440.78  1184.81     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    587.43   531.28   311.80     0.45  5463.47
MEAN   519.12   492.97   231.69     0.42  5034.94     1.56
HUB    440.35   449.17    86.41     0.38  5258.43

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.50     1.15    21.59   611.09     1.04   589.30     0.92     0.91
MEAN    24.24     1.14    21.23   609.05     1.04   586.34     0.92     0.91
HUB     24.38     1.14    20.86   610.11     1.04   583.43     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.65    35.94    31.50     4.44     0.93     0.37     2.90
MEAN    33.45    28.03    23.50     4.53     0.92     0.37     3.28     0.91
HUB     38.76    11.09     6.50     4.59     0.92     0.38     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.994

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     526.761     289.322     440.193    1188.320       0.443       0.011

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.344      21.269     586.917      46.000      33.315      31.500      -1.815

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     449.987     289.322     534.972    1194.640       0.377       0.261

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.319      22.048     593.177     471.992       0.018       0.355

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     436.641       0.000     436.641    1195.635       0.365       0.270

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      22.120     594.165       0.000       0.060       0.038       0.284

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      24.257       1.137     610.081      24.995     236.629       1.834

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 155766.312       0.451    1302.556 1449454.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.546   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3398.000      24.257     610.081       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.254    3133.198       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.812     513.330     283.256     401.059       1.416

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   409.84    -0.14   409.84     0.34   526.60
 MEAN    16.97     0.00    -0.02   409.84    -0.14   409.84     0.34
 HUB     14.32     0.00    -0.02   409.84    -0.14   409.84     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.34    46.36     7.98   571.12   703.07    22.37   596.06     0.59
 MEAN    50.85    43.80     7.05   503.23   649.12    22.37   596.06     0.54
 HUB     46.02    37.84     8.18   424.63   590.26    22.37   596.06     0.49

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   492.97   264.19   416.20  1214.89     0.41
 MEAN    16.57   501.54   272.96   420.75  1212.00     0.41
 HUB     13.89   540.87   333.40   425.88  1209.11     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   510.53   295.66     0.42  4990.63
 MEAN   491.47   474.10   218.50     0.39  4526.45     1.49
 HUB    411.88   433.05    78.48     0.36  4633.01

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.41     1.13    24.47   633.82     1.04   613.54     0.92     0.91
 MEAN    27.10     1.12    24.09   631.61     1.04   610.62     0.92     0.91
 HUB     27.17     1.12    23.68   632.12     1.04   607.71     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.41    35.39    31.50     3.89     0.93     0.34     2.90
 MEAN    32.97    27.44    23.50     3.94     0.93     0.33     3.29     0.91
 HUB     38.06    10.44     6.50     3.94     0.93     0.34     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     495.111     274.498     412.050    1213.420       0.408       0.051

    Pt3        Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    27.195      24.247     612.059      46.000      33.671      32.400      -1.271

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
```

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	427.689	274.498	508.200	1218.556	0.351	0.278

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	27.175	24.954	617.251	456.573	0.016	0.366

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	406.411	0.000	406.411	1220.017	0.333	0.272

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	25.103	618.732	0.000	0.060	0.037	0.326

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.880	27.110	1.118	632.515	22.434	242.580	1.880

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
139882.609	0.446	1169.732	1286269.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 8.546 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
147.976	3398.000	27.110	632.515	1.000	1.000	0.980

W Kg/sec = 67.26170

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
88.606	3077.131	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
113835.133	116111.594	1.975	509.668	258.081	390.276	1.512

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	379.04	-0.13	379.04	0.31	491.93
MEAN	15.91	0.00	-0.02	379.04	-0.13	379.04	0.31	
HUB	13.07	0.00	-0.02	379.04	-0.13	379.04	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.10	47.36	7.74	543.25	662.52	25.36	620.53	0.54
MEAN	51.23	44.80	6.43	471.87	605.36	25.36	620.53	0.50
HUB	45.65	38.84	6.81	387.57	542.20	25.36	620.53	0.44

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	463.46	255.36	386.77	1237.21	0.37
MEAN	15.50	467.16	255.31	391.23	1234.04	0.38
HUB	12.59	497.09	300.31	396.12	1230.87	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	531.98	475.50	276.62	0.38	4583.57	
MEAN	459.55	441.33	204.24	0.36	3958.77	1.51
HUB	373.33	402.79	73.02	0.33	3782.59	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.21	1.11	27.42	654.30	1.03	636.39	0.92	0.91
MEAN	29.77	1.10	26.97	651.33	1.03	633.13	0.92	0.91
HUB	29.65	1.09	26.50	650.50	1.03	629.88	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.43	35.57	31.50	4.07	0.93	0.35	2.90	
MEAN	33.13	27.57	23.50	4.07	0.93	0.33	3.34	0.91
HUB	37.17	10.45	6.50	3.95	0.93	0.32	4.06	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     472.492     259.992     394.529    1234.321       0.383      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.821      26.951     633.422      46.000      33.385      33.000      -0.385

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     414.243     259.992     489.074    1238.512       0.334       0.208

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.792      27.570     637.731     440.827       0.030       0.366

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     387.456       0.000     387.456    1240.250       0.312       0.299

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.823     639.522       0.000       0.060       0.037       0.295

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      29.773       1.098     652.045      19.530     257.818       1.999

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  121840.023       0.431    1018.856 1326600.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    805292.25   6734.0498    144.5575      1.9708      0.8687      8.5462      1.2472


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    142.400    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  112136.125  114378.609       2.005     831.557     414.700     619.754       1.494

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   338.90    -0.12   338.90     0.30   609.32
  MEAN    17.06     0.00    -0.02   338.90    -0.12   338.90     0.30
  HUB     12.51     0.00    -0.02   338.90    -0.12   338.90     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.02    50.47    10.55   611.74   699.45    14.16   513.22     0.63
  MEAN    56.19    47.20     8.99   505.89   609.01    14.16   513.22     0.55
  HUB     47.59    38.62     8.97   370.96   502.55    14.16   513.22     0.45

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
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B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	579.00	371.18	444.37	1130.76	0.51
MEAN	18.04	602.89	396.93	453.79	1125.72	0.54
HUB	15.00	680.25	491.88	469.89	1117.99	0.61

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	611.74	505.31	240.56	0.45	7659.92	
MEAN	534.83	474.28	137.89	0.42	7161.06	1.45
HUB	444.80	472.24	47.08	0.42	7379.62	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.73	1.24	15.66	559.30	1.07	531.30	0.92	0.91
MEAN	18.48	1.22	15.20	556.92	1.07	526.56	0.92	0.91
HUB	18.59	1.23	14.47	557.96	1.07	519.32	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.87	28.43	24.20	4.23	0.93	0.37	2.90	
MEAN	41.18	16.90	12.70	4.20	0.93	0.32	3.51	0.91
HUB	46.31	-5.72	-9.30	3.58	0.93	0.17	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	610.915	396.160	465.053	1126.030	0.543	-0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.563	15.191	526.888	24.000	40.426	35.400	-5.026

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	484.775	396.160	626.059	1138.298	0.426	0.351

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.507	16.334	538.432	528.796	0.026	0.483

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	447.921	0.000	447.921	1141.329	0.392	0.398

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.580	541.303	0.000	0.060	0.045	0.422

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.873	18.441	1.221	558.061	35.251	200.274	1.553

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
219467.391	0.586	1807.848	1425047.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 8.987 EfDer = 0.995

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
145.767	3398.000	18.441	558.061	1.000	1.000	0.980

W Kg/sec = 66.25780

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
120.527	3275.976	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
112136.125	114378.609	1.682	590.487	351.010	474.134	1.351

ROTOR LEADING EDGE CONDITIONS, STAGE 2

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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   426.95    -0.15   426.95     0.37   587.47
MEAN    18.08     0.00    -0.02   426.95    -0.15   426.95     0.37
HUB     15.21     0.00    -0.02   426.95    -0.15   426.95     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.99    46.36     8.63   609.37   744.17    16.74   542.84     0.65
MEAN    51.47    42.30     9.17   536.08   685.43    16.74   542.84     0.60
HUB     46.58    37.84     8.74   451.02   621.16    16.74   542.84     0.54

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   525.63   301.47   430.58  1165.29     0.45
MEAN    18.01   535.03   308.69   437.00  1161.50     0.46
HUB     15.22   578.63   370.76   444.24  1157.71     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    605.52   527.11   304.05     0.45  6159.03
MEAN   534.05   491.69   225.36     0.42  5562.21     1.52
HUB    451.41   451.51    80.65     0.39  5646.30

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.71     1.18    18.87   587.39     1.05   564.32     0.92     0.91
MEAN    21.37     1.16    18.48   584.54     1.05   560.64     0.92     0.91
HUB     21.42     1.16    18.06   584.94     1.05   556.99     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.00    35.23    31.50     3.73     0.93     0.36     2.90
MEAN    35.24    27.28    23.50     3.78     0.93     0.35     3.30     0.91
HUB     39.85    10.29     6.50     3.79     0.93     0.35     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     596.726     309.560     510.152    1156.549       0.516      -0.190

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.469      17.900     555.890      46.000      31.249      30.600      -0.649

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     512.458     309.560     598.699    1164.640       0.440       0.098

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      21.437      18.765     563.695     455.853       0.020       0.327

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.823     505.238       0.000     505.238    1165.273       0.434       0.294

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.850      18.793     564.309       0.000       0.060       0.037       0.107

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
     0.879      21.388       1.160     585.624      27.563     227.722       1.765

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 171689.312       0.468    1414.280 1286138.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
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   145.767    3398.000      21.388     585.624       1.000       1.000       0.880
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
   106.455    3197.952       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 112136.125  114378.609       1.580     489.817     310.041     384.470       1.240

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   470.92    -0.16   470.92     0.40   560.08
 MEAN    17.74     0.00    -0.02   470.92    -0.16   470.92     0.40
 HUB     15.05     0.00    -0.02   470.92    -0.16   470.92     0.40

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.65    46.36     5.29   595.14   759.04    19.12   567.11     0.65
 MEAN    48.17    43.40     4.77   526.00   706.12    19.12   567.11     0.60
 HUB     43.47    38.84     4.63   446.28   648.90    19.12   567.11     0.56

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   507.23   282.10   421.55  1192.21     0.43
 MEAN    17.51   517.09   292.18   426.63  1189.08     0.43
 HUB     14.85   559.92   355.78   432.36  1185.99     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   520.51   305.33     0.44  5591.57
 MEAN   519.12   483.24   226.95     0.41  5117.86     1.58
 HUB    440.35   440.55    84.57     0.37  5285.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.64     1.15    21.75   612.23     1.05   590.76     0.92     0.91
 MEAN    24.35     1.14    21.38   609.98     1.04   587.66     0.92     0.91
 HUB     24.45     1.14    20.99   610.78     1.04   584.61     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.79    35.92    31.50     4.42     0.93     0.38     2.90
 MEAN    34.40    28.01    23.50     4.51     0.92     0.38     3.28     0.91
 HUB     39.45    11.07     6.50     4.57     0.92     0.39     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     522.260     294.092     431.584    1189.644       0.439       0.011

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.452      21.417     588.228      46.000      34.271      31.500      -2.771

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     440.686     294.092     529.806    1196.256       0.368       0.278

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.425      22.238     594.785     471.992       0.018       0.370

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     427.742       0.000     427.742    1197.199       0.357       0.285

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      22.301     595.723       0.000       0.060       0.039       0.298

   STAGE EXIT CONDITIONS, STAGE            3
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Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	24.361	1.139	610.997	25.373	231.694	1.796

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
158122.281	0.458	1302.522	1422097.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
RESET = 0.000BLEED = 0.000 DPInc = 8.987 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
145.767	3398.000	24.361	610.997	1.000	1.000	0.980

W Kg/sec = 66.25780

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
95.466	3130.848	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
112136.125	114378.609	1.846	513.330	278.049	401.059	1.442

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	401.64	-0.14	401.64	0.34	526.20
MEAN	16.97	0.00	-0.02	401.64	-0.14	401.64	0.34	
HUB	14.32	0.00	-0.02	401.64	-0.14	401.64	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.89	46.36	8.53	571.12	698.32	22.54	597.54	0.58
MEAN	51.41	43.80	7.61	503.23	643.97	22.54	597.54	0.54
HUB	46.60	37.84	8.76	424.63	584.59	22.54	597.54	0.49

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	489.12	270.46	407.54	1216.66	0.40
MEAN	16.57	496.90	277.54	412.16	1213.65	0.41
HUB	13.89	535.24	335.10	417.35	1210.63	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	499.84	289.39	0.41	5108.97	
MEAN	491.47	464.37	213.93	0.38	4602.28	1.51
HUB	411.88	424.36	76.78	0.35	4656.56	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.59	1.13	24.68	635.30	1.04	615.33	0.92	0.91
MEAN	27.26	1.12	24.29	632.89	1.04	612.28	0.92	0.91
HUB	27.30	1.12	23.87	633.14	1.04	609.24	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.57	35.38	31.50	3.88	0.93	0.35	2.90	
MEAN	33.96	27.43	23.50	3.93	0.93	0.34	3.29	0.91
HUB	38.76	10.42	6.50	3.92	0.93	0.35	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	490.794	279.102	403.709	1215.017	0.404	0.050

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
27.353	24.443	613.675	46.000	34.658	32.400	-2.258

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	418.580	279.102	503.097	1220.430	0.343	0.295

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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.333      25.194     619.155     456.573       0.017       0.381

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     397.896       0.000     397.896    1221.818       0.326       0.286

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.332     620.564       0.000       0.060       0.038       0.339

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      27.265       1.119     633.776      22.779     237.406       1.840

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 142035.344       0.453    1170.007 1262620.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3398.000      27.265     633.776       1.000       1.000       0.980
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.872    3074.069       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 112136.125  114378.609       2.014     509.668     253.031     390.276       1.542

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   371.23    -0.13   371.23     0.30   491.44
 MEAN    15.91     0.00    -0.02   371.23    -0.13   371.23     0.30
 HUB     13.07     0.00    -0.02   371.23    -0.13   371.23     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.66    47.36     8.30   543.25   658.08    25.58   622.28     0.54
 MEAN    51.81    44.80     7.01   471.87   600.49    25.58   622.28     0.49
 HUB     46.24    38.84     7.40   387.57   536.77    25.58   622.28     0.44

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   460.00   261.39   378.51  1239.19     0.37
 MEAN    15.50   462.77   259.74   383.00  1235.91     0.37
 HUB     12.59   491.57   301.94   387.91  1232.64     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   465.28   270.58     0.38  4691.77
 MEAN   459.55   431.99   199.82     0.35  4027.31     1.53
 HUB    373.33   394.43    71.39     0.32  3803.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.46     1.12    27.69   656.08     1.04   638.43     0.92     0.91
 MEAN    29.99     1.10    27.22   652.92     1.03   635.06     0.92     0.91
 HUB     29.83     1.09    26.73   651.85     1.03   631.70     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.63    35.56    31.50     4.06     0.93     0.36     2.90
 MEAN    34.14    27.55    23.50     4.05     0.93     0.34     3.34     0.91
 HUB     37.90    10.43     6.50     3.93     0.93     0.33     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000
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     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219      468.117     264.498     386.231     1236.181       0.379       -0.006

      Pt3          Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
      30.034       27.202      635.339      46.000      34.404      33.000       -1.404

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG          Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
      15.219      405.106     264.498     483.808     1240.638       0.327        0.227

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      30.004      27.867     639.928      440.827       0.030        0.381

     VANED DIFFUSER EXIT:
    R4           C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
      14.701      379.059       0.000     379.059     1242.289       0.305        0.315

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
       0.950      28.108      641.632       0.000       0.060       0.037        0.311

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
       0.881       29.984        1.100     653.618      19.842     252.127        1.954

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  123790.156       0.437    1019.713 1302180.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     815104.50   6714.3701     142.3999      1.9848      0.8681      8.9875      1.2502


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.453   EfDer =  0.994

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     143.448     3398.000       15.107     522.810       1.000        1.000        0.980
 W Kg/sec =   65.20367

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     140.134     3384.617        1.402        0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  110352.086  112558.891        2.038      831.557      408.102      619.754       1.519

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator     Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00     -0.02    332.97     -0.11    332.97      0.30    609.32
  MEAN    17.06      0.00     -0.02    332.97     -0.11    332.97      0.30
  HUB     12.51      0.00     -0.02    332.97     -0.11    332.97      0.30

        BetaFlo    BetaBlade Incid    U1        W1        Ps1       Ts1      Rel Mach
  TIP     61.45     50.47     10.98    611.74    696.59     14.19    513.55      0.63
  MEAN    56.65     47.20      9.45    505.89    605.73     14.19    513.55      0.54
  HUB     48.10     38.62      9.48    370.96    498.56     14.19    513.55      0.45

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial     THK         AeroBl      Blades2
       0.700        0.050        0.950       32.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	575.55	375.73	435.98	1131.59	0.51
MEAN	18.04	598.29	399.52	445.35	1126.45	0.53
HUB	15.00	673.53	491.00	461.04	1118.73	0.60

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	611.74	495.76	236.01	0.44	7753.70	
MEAN	534.83	465.45	135.31	0.41	7207.66	1.47
HUB	444.80	463.35	46.20	0.41	7366.40	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.77	1.24	15.73	559.74	1.07	532.08	0.92	0.91
MEAN	18.49	1.22	15.26	557.14	1.07	527.25	0.92	0.91
HUB	18.57	1.23	14.53	557.90	1.07	520.01	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.76	28.43	24.20	4.23	0.93	0.38	2.90	
MEAN	41.89	16.90	12.70	4.20	0.94	0.33	3.51	0.91
HUB	46.80	-5.72	-9.30	3.58	0.94	0.18	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.994

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	606.005	398.741	456.341	1126.779	0.538	-0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.579	15.255	527.590	24.000	41.146	35.400	-5.746

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	475.231	398.741	620.354	1139.320	0.417	0.364

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.518	16.426	539.400	528.796	0.027	0.494

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	439.478	0.000	439.478	1142.202	0.385	0.407

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.656	542.131	0.000	0.060	0.048	0.431

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.870	18.449	1.221	558.263	35.453	197.666	1.532

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
220724.812	0.590	1789.280	1400116.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 9.453 EfDer = 0.993

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
143.448	3398.000	18.449	558.263	1.000	1.000	0.980

W Kg/sec = 65.20367

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
118.577	3275.384	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
110352.086	112558.891	1.710	590.487	345.331	474.134	1.373

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	419.03	-0.14	419.03	0.37	587.37
MEAN	18.08	0.00	-0.02	419.03	-0.14	419.03	0.37	

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 HUB     15.21     0.00    -0.02   419.03    -0.14   419.03     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.49    46.36     9.13   609.37   739.66    16.81   543.60     0.65
 MEAN    51.99    42.30     9.69   536.08   680.53    16.81   543.60     0.60
 HUB     47.12    37.84     9.28   451.02   615.74    16.81   543.60     0.54

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   522.35   307.33   422.37  1166.38     0.45
 MEAN    18.01   530.89   312.98   428.82  1162.46     0.46
 HUB     15.22   573.41   372.31   436.10  1158.56     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   517.02   298.18     0.44  6278.74
 MEAN   534.05   482.46   221.07     0.42  5639.30     1.54
 HUB    451.41   443.22    79.10     0.38  5669.94

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.77     1.18    18.97   588.16     1.05   565.37     0.92     0.91
 MEAN    21.42     1.16    18.56   585.11     1.05   561.58     0.92     0.91
 HUB     21.43     1.16    18.13   585.26     1.05   557.80     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.04    35.22    31.50     3.72     0.93     0.37     2.90
 MEAN    36.12    27.27    23.50     3.77     0.94     0.36     3.30     0.91
 HUB     40.49    10.28     6.50     3.78     0.94     0.36     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     590.366     313.855     500.027    1157.777       0.510      -0.184

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.512      18.010     557.073      46.000      32.116      30.600      -1.516

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     501.700     313.855     591.784    1166.149       0.430       0.120

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      21.481      18.911     565.158     455.853       0.020       0.340

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     494.726       0.000     494.726    1166.747       0.424       0.309

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      18.934     565.738       0.000       0.060       0.037       0.128

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      21.430       1.162     586.176      27.913     223.477       1.732

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 173868.859       0.474    1409.447 1262067.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 9.453   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    143.448    3398.000      21.430     586.176       1.000       1.000       0.880
W Kg/sec =   65.20367
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
104.604	3196.447	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
110352.086	112558.891	1.608	489.817	304.650	384.470	1.262

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	461.41	-0.16	461.41	0.39	559.82
MEAN	17.74	0.00	-0.02	461.41	-0.16	461.41	0.39	
HUB	15.05	0.00	-0.02	461.41	-0.16	461.41	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.22	46.36	5.86	595.14	753.18	19.25	568.40	0.64
MEAN	48.75	43.40	5.35	526.00	699.82	19.25	568.40	0.60
HUB	44.06	38.84	5.22	446.28	642.03	19.25	568.40	0.55

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	503.73	288.62	412.85	1193.68	0.42
MEAN	17.51	512.77	296.97	418.03	1190.41	0.43
HUB	14.85	554.55	357.63	423.82	1187.19	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	509.64	298.81	0.43	5720.67	
MEAN	519.12	473.39	222.16	0.40	5201.70	1.60
HUB	440.35	431.81	82.71	0.36	5313.26	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.77	1.16	21.91	613.40	1.05	592.22	0.92	0.91
MEAN	24.45	1.14	21.52	610.93	1.04	588.98	0.92	0.91
HUB	24.52	1.14	21.11	611.46	1.04	585.79	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.96	35.90	31.50	4.40	0.93	0.39	2.90	
MEAN	35.39	27.99	23.50	4.49	0.92	0.39	3.28	0.91
HUB	40.16	11.04	6.50	4.54	0.92	0.40	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	517.851	298.917	422.869	1190.971	0.435	0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.553	21.558	589.544	46.000	35.256	31.500	-3.756

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	431.311	298.917	524.767	1197.877	0.360	0.295

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.524	22.420	596.401	471.992	0.019	0.385

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	418.784	0.000	418.784	1198.770	0.349	0.299

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.475	597.290	0.000	0.060	0.041	0.312

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	24.456	1.141	611.930	25.754	226.791	1.758

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
160499.875	0.465	1301.073	1393862.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 9.453 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
143.448	3398.000	24.456	611.930	1.000	1.000	0.980

W Kg/sec = 65.20367

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
93.651	3128.459	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
110352.086	112558.891	1.882	513.330	272.765	401.059	1.470

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	393.38	-0.14	393.38	0.33	525.80
MEAN	16.97	0.00	-0.02	393.38	-0.14	393.38	0.33	
HUB	14.32	0.00	-0.02	393.38	-0.14	393.38	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.45	46.36	9.09	571.12	693.60	22.70	599.02	0.58
MEAN	51.99	43.80	8.19	503.23	638.85	22.70	599.02	0.53
HUB	47.20	37.84	9.36	424.63	578.94	22.70	599.02	0.48

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	485.47	276.73	398.88	1218.43	0.40
MEAN	16.57	492.40	282.14	403.55	1215.29	0.41
HUB	13.89	529.65	336.78	408.78	1212.15	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	489.14	283.12	0.40	5227.25	
MEAN	491.47	454.61	209.33	0.37	4678.38	1.53
HUB	411.88	415.63	75.10	0.34	4679.87	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.77	1.14	24.89	636.79	1.04	617.12	0.92	0.91
MEAN	27.41	1.12	24.48	634.18	1.04	613.95	0.92	0.91
HUB	27.41	1.12	24.04	634.19	1.04	610.78	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.75	35.37	31.50	3.87	0.93	0.36	2.90	
MEAN	34.96	27.42	23.50	3.92	0.93	0.35	3.29	0.91
HUB	39.48	10.41	6.50	3.91	0.93	0.36	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	486.616	283.722	395.344	1216.615	0.400	0.049

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
27.501	24.628	615.294	46.000	35.665	32.400	-3.265

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	409.481	283.722	498.170	1222.304	0.335	0.311

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	27.478	25.422	621.062	456.573	0.017	0.396

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	389.399	0.000	389.399	1223.621	0.318	0.301

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	25.548	622.401	0.000	0.060	0.040	0.353

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	27.408	1.121	635.054	23.124	232.316	1.801

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
144187.328	0.460	1168.837	1238189.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 9.453 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
143.448	3398.000	27.408	635.054	1.000	1.000	0.980

W Kg/sec = 65.20367

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
85.130	3070.974	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
110352.086	112558.891	2.055	509.668	247.959	390.276	1.574

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	363.42	-0.13	363.42	0.30	490.95
MEAN	15.91	0.00	-0.02	363.42	-0.13	363.42	0.30	
HUB	13.07	0.00	-0.02	363.42	-0.13	363.42	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.22	47.36	8.86	543.25	653.70	25.78	624.04	0.53
MEAN	52.40	44.80	7.60	471.87	595.70	25.78	624.04	0.49
HUB	46.85	38.84	8.01	387.57	531.40	25.78	624.04	0.43

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	456.76	267.39	370.31	1241.15	0.37
MEAN	15.50	458.53	264.11	374.82	1237.77	0.37
HUB	12.59	486.15	303.55	379.74	1234.40	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	531.98	455.12	264.58	0.37	4799.31	
MEAN	459.55	422.72	195.44	0.34	4095.06	1.55
HUB	373.33	386.10	69.78	0.31	3823.37	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.68	1.12	27.94	657.87	1.04	640.46	0.92	0.91
MEAN	30.18	1.10	27.45	654.52	1.03	636.98	0.92	0.91
HUB	29.99	1.09	26.95	653.23	1.03	633.51	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.83	35.55	31.50	4.05	0.93	0.37	2.90	
MEAN	35.17	27.54	23.50	4.04	0.93	0.36	3.34	0.91
HUB	38.64	10.41	6.50	3.91	0.93	0.34	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	463.903	268.952	377.982	1238.036	0.375	-0.006

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.230      27.435     637.254      46.000      35.434      33.000      -2.434

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     396.071     268.952     478.757    1242.753       0.319       0.245

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.199      28.145     642.120     440.827       0.031       0.397

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     370.749       0.000     370.749    1244.320       0.298       0.330

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.373     643.739       0.000       0.060       0.039       0.326

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      30.178       1.101     655.205      20.151     246.581       1.911

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 125723.242       0.444    1019.161 1276976.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    825004.12   6687.7983    140.1344      1.9976      0.8666      9.4533      1.2532


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.741    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    137.490    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 108269.750  110434.914       2.077     831.557     400.401     619.754       1.548

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   326.09    -0.11   326.09     0.29   609.32
  MEAN    17.06     0.00    -0.02   326.09    -0.11   326.09     0.29
  HUB     12.51     0.00    -0.02   326.09    -0.11   326.09     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.94    50.47    11.47   611.74   693.33    14.23   513.93     0.62
  MEAN    57.20    47.20    10.00   505.89   601.97    14.23   513.93     0.54
  HUB     48.69    38.62    10.07   370.96   493.99    14.23   513.93     0.44

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   571.73   380.93   426.35  1132.52     0.50
  MEAN    18.04   593.09   402.46   435.64  1127.27     0.53
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 HUB     15.00   665.84   489.96   450.87  1119.56     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   484.82   230.81     0.43  7860.93
 MEAN   534.83   455.30   132.36     0.40  7260.77     1.49
 HUB    444.80   453.12    45.16     0.40  7350.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.82     1.25    15.81   560.26     1.07   532.95     0.92     0.91
 MEAN    18.51     1.23    15.33   557.40     1.07   528.02     0.92     0.91
 HUB     18.56     1.23    14.60   557.83     1.07   520.80     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.78    28.43    24.20     4.23     0.93     0.40     2.90
 MEAN    42.73    16.90    12.70     4.20     0.94     0.34     3.51     0.91
 HUB     47.38    -5.72    -9.30     3.58     0.94     0.20     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     600.463     401.682     446.326    1127.620       0.533       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.595      15.326     528.378      24.000      41.986      35.400      -6.586

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     464.316     401.682     613.953    1140.467       0.407       0.379

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.530      16.529     540.486     528.796       0.029       0.507

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     429.806       0.000     429.806    1143.183       0.376       0.417

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.738     543.063       0.000       0.060       0.051       0.441

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      18.456       1.222     558.493      35.683     194.667       1.509

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 222155.500       0.594    1766.895 1371179.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.741    3398.000      18.456     558.493       1.000       1.000       0.980
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    116.321    3274.709       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 108269.750  110434.914       1.743     590.487     338.761     474.134       1.400

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   409.95    -0.14   409.95     0.36   587.24
 MEAN    18.08     0.00    -0.02   409.95    -0.14   409.95     0.36
 HUB     15.21     0.00    -0.02   409.95    -0.14   409.95     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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 TIP     56.08    46.36     9.72   609.37   734.55    16.89   544.46     0.64
 MEAN    52.60    42.30    10.30   536.08   674.97    16.89   544.46     0.59
 HUB     47.74    37.84     9.90   451.02   609.60    16.89   544.46     0.53

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   518.83   314.01   413.02  1167.60     0.44
 MEAN    18.01   526.33   317.88   419.50  1163.55     0.45
 HUB     15.22   567.53   374.08   426.79  1159.51     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   505.53   291.51     0.43  6415.00
 MEAN   534.05   471.92   216.18     0.41  5727.49     1.56
 HUB    451.41   433.74    77.33     0.37  5696.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.85     1.18    19.07   589.04     1.05   566.56     0.92     0.91
 MEAN    21.46     1.16    18.65   585.76     1.05   562.63     0.92     0.91
 HUB     21.45     1.16    18.20   585.62     1.05   558.72     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.24    35.21    31.50     3.71     0.93     0.39     2.90
 MEAN    37.15    27.26    23.50     3.76     0.94     0.37     3.30     0.91
 HUB     41.23    10.27     6.50     3.77     0.94     0.37     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     583.334     318.768     488.534    1159.145       0.503      -0.177

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.556      18.129     558.391      46.000      33.124      30.600      -2.524

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     489.549     318.768     584.185    1167.833       0.419       0.145

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      21.524      19.070     566.793     455.853       0.021       0.355

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     482.869       0.000     482.869    1168.391       0.413       0.325

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      19.087     567.335       0.000       0.060       0.039       0.151

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      21.471       1.163     586.805      28.312     218.703       1.695

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 176352.969       0.481    1402.608 1234287.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
  RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.741    3398.000      21.471     586.805       1.000       1.000       0.880
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.487    3194.734       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
108269.750	110434.914	1.641	489.817	298.484	384.470	1.288

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	450.66	-0.16	450.66	0.38	559.52
MEAN	17.74	0.00	-0.02	450.66	-0.16	450.66	0.38	
HUB	15.05	0.00	-0.02	450.66	-0.16	450.66	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.87	46.36	6.51	595.14	746.64	19.38	569.85	0.64
MEAN	49.42	43.40	6.02	526.00	692.77	19.38	569.85	0.59
HUB	44.73	38.84	5.89	446.28	634.35	19.38	569.85	0.54

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	500.04	295.92	403.08	1195.31	0.42
MEAN	17.51	508.09	302.34	408.34	1191.90	0.43
HUB	14.85	548.59	359.72	414.19	1188.52	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	497.45	291.51	0.42	5865.22	
MEAN	519.12	462.32	216.78	0.39	5295.73	1.62
HUB	440.35	421.97	80.62	0.36	5344.24	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.91	1.16	22.08	614.72	1.05	593.84	0.92	0.91
MEAN	24.56	1.14	21.67	612.01	1.04	590.46	0.92	0.91
HUB	24.59	1.15	21.25	612.24	1.04	587.11	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.28	35.87	31.50	4.37	0.93	0.40	2.90	
MEAN	36.52	27.96	23.50	4.46	0.93	0.40	3.28	0.91
HUB	40.97	11.02	6.50	4.52	0.93	0.41	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	513.067	304.327	413.066	1192.450	0.430	0.012

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.657	21.708	591.012	46.000	36.381	31.500	-4.881

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	420.812	304.327	519.324	1199.683	0.351	0.314

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.625	22.614	598.204	471.992	0.021	0.402

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	408.765	0.000	408.765	1200.520	0.340	0.314

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.657	599.038	0.000	0.060	0.045	0.328

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	24.552	1.143	612.986	26.181	221.382	1.716

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
163164.484	0.473	1297.715	1361479.250

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.741    3398.000      24.552     612.986       1.000       1.000       0.980
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     91.605    3125.764       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 108269.750  110434.914       1.924     513.330     266.805     401.059       1.503

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   384.12    -0.13   384.12     0.32   525.35
 MEAN    16.97     0.00    -0.02   384.12    -0.13   384.12     0.32
 HUB     14.32     0.00    -0.02   384.12    -0.13   384.12     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.08    46.36     9.72   571.12   688.39    22.87   600.67     0.57
 MEAN    52.65    43.80     8.85   503.23   633.19    22.87   600.67     0.53
 HUB     47.88    37.84    10.04   424.63   572.69    22.87   600.67     0.48

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   481.65   283.68   389.25  1220.38     0.39
 MEAN    16.57   487.54   287.22   393.96  1217.12     0.40
 HUB     13.89   523.50   338.63   399.22  1213.85     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   477.27   276.17     0.39  5358.41
 MEAN   491.47   443.75   204.24     0.36  4762.66     1.56
 HUB    411.88   405.88    73.25     0.33  4705.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.96     1.14    25.11   638.47     1.04   619.11     0.92     0.91
 MEAN    27.56     1.12    24.67   635.64     1.04   615.80     0.92     0.91
 HUB     27.52     1.12    24.22   635.37     1.04   612.50     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.08    35.36    31.50     3.86     0.93     0.38     2.90
 MEAN    36.09    27.40    23.50     3.90     0.93     0.37     3.29     0.91
 HUB     40.31    10.40     6.50     3.90     0.93     0.37     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     482.120     288.839     386.020    1218.389       0.396       0.048

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    27.650      24.819     617.095      46.000      36.806      32.400      -4.406

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     399.382     288.839     492.884    1224.382       0.326       0.330

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.625      25.661     623.181     456.573       0.018       0.413

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     379.977       0.000     379.977    1225.621       0.310       0.316
```

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	25.772	624.443	0.000	0.060	0.043	0.367

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.875	27.550	1.122	636.491	23.505	226.761	1.758

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
146570.328	0.468	1165.734	1210137.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =10.000 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
140.741	3398.000	27.550	636.491	1.000	1.000	0.980

W Kg/sec = 63.97328

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
83.186	3067.504	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
108269.750	110434.914	2.103	509.668	242.299	390.276	1.611

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	354.76	-0.12	354.76	0.29	490.39
MEAN	15.91	0.00	-0.02	354.76	-0.12	354.76	0.29	
HUB	13.07	0.00	-0.02	354.76	-0.12	354.76	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.86	47.36	9.50	543.25	648.92	26.00	625.99	0.53
MEAN	53.07	44.80	8.27	471.87	590.45	26.00	625.99	0.48
HUB	47.54	38.84	8.70	387.57	525.51	26.00	625.99	0.43

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	453.41	273.96	361.28	1243.32	0.36
MEAN	15.50	454.02	268.94	365.79	1239.84	0.37
HUB	12.59	480.24	305.32	370.69	1236.36	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	531.98	443.95	258.01	0.36	4917.14	
MEAN	459.55	412.47	190.61	0.33	4169.94	1.58
HUB	373.33	376.88	68.02	0.30	3845.52	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.91	1.12	28.20	659.86	1.04	642.72	0.92	0.91
MEAN	30.38	1.10	27.69	656.31	1.03	639.12	0.92	0.91
HUB	30.16	1.09	27.17	654.77	1.03	635.53	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.17	35.53	31.50	4.03	0.93	0.39	2.90	
MEAN	36.33	27.52	23.50	4.02	0.93	0.37	3.34	0.91
HUB	39.48	10.40	6.50	3.90	0.93	0.35	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	459.428	273.876	368.871	1240.087	0.370	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
30.428	27.674	639.376	46.000	36.593	33.000	-3.593

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     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     386.141     273.876     473.406    1245.090       0.310       0.266

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      30.393      28.431     644.545     440.827       0.033       0.414

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     361.610       0.000     361.610    1246.567       0.290       0.347

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      28.645     646.075       0.000       0.060       0.041       0.342

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.879      30.370       1.102     656.982      20.491     240.581       1.865

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  127847.242       0.452    1016.822 1248057.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     836090.50   6649.7744    137.4901      2.0103      0.8637     10.0004      1.2566



**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.453   EfDer =  0.989

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     138.516    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   62.96178

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     135.316    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  106557.852  108688.789       2.110     831.557     394.070     619.754       1.573

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   320.46    -0.11   320.46     0.29   609.32
  MEAN    17.06     0.00    -0.02   320.46    -0.11   320.46     0.29
  HUB     12.51     0.00    -0.02   320.46    -0.11   320.46     0.29

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.36    50.47    11.89   611.74   690.70    14.26   514.23     0.62
  MEAN    57.65    47.20    10.45   505.89   598.94    14.26   514.23     0.54
  HUB     49.19    38.62    10.57   370.96   490.30    14.26   514.23     0.44

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   568.78   385.13   418.55  1133.25     0.50
  MEAN    18.04   588.97   404.85   427.76  1127.92     0.52
  HUB     15.00   659.67   489.13   442.61  1120.22     0.59
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   475.96   226.61     0.42  7947.50
 MEAN   534.83   447.07   129.98     0.40  7303.77     1.51
 HUB    444.80   444.83    44.33     0.40  7338.36

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.85     1.25    15.87   560.67     1.07   533.65     0.92     0.91
 MEAN    18.53     1.23    15.38   557.60     1.07   528.63     0.92     0.91
 HUB     18.54     1.23    14.66   557.77     1.07   521.42     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.62    28.43    24.20     4.23     0.93     0.41     2.90
 MEAN    43.42    16.90    12.70     4.20     0.94     0.35     3.51     0.91
 HUB     47.86    -5.72    -9.30     3.58     0.94     0.21     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     596.066     404.064     438.210    1128.287       0.528       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.606      15.381     529.003      24.000      42.678      35.400      -7.278

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     455.506     404.064     608.895    1141.377       0.399       0.391

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.538      16.608     541.349     528.796       0.031       0.518

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     421.987       0.000     421.987    1143.964       0.369       0.425

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.801     543.805       0.000       0.060       0.054       0.449

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      18.459       1.222     558.679      35.869     192.229       1.490

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 223313.344       0.597    1748.021 1347516.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.453   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    138.516    3398.000      18.459     558.679       1.000       1.000       0.980
W Kg/sec =   62.96178

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    114.480    3274.164       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106557.852  108688.789       1.771     590.487     333.398     474.134       1.422

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   402.60    -0.14   402.60     0.35   587.15
 MEAN    18.08     0.00    -0.02   402.60    -0.14   402.60     0.35
 HUB     15.21     0.00    -0.02   402.60    -0.14   402.60     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.55    46.36    10.19   609.37   730.47    16.95   545.14     0.64
 MEAN    53.10    42.30    10.80   536.08   670.53    16.95   545.14     0.59
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HUB     48.26    37.84    10.42   451.02   604.68    16.95   545.14     0.53

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   516.16   319.36   405.51  1168.56     0.44
MEAN    18.01   522.76   321.79   411.98  1164.41     0.45
HUB     15.22   562.84   375.49   419.28  1160.26     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    605.52   496.31   286.16     0.42  6524.09
MEAN   534.05   463.45   212.26     0.40  5797.92     1.58
HUB    451.41   426.09    75.91     0.37  5718.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.90     1.19    19.15   589.74     1.06   567.49     0.92     0.90
MEAN    21.50     1.16    18.72   586.28     1.05   563.46     0.92     0.90
HUB     21.45     1.16    18.26   585.90     1.05   559.45     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.22    35.21    31.50     3.71     0.93     0.40     2.90
MEAN    37.99    27.26    23.50     3.76     0.94     0.38     3.30     0.90
HUB     41.85    10.26     6.50     3.76     0.94     0.37     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.987

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     577.821     322.693     479.318    1160.222       0.498       -0.171

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.588      18.219     559.430      46.000      33.950      30.600      -3.350

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
    17.960     479.854     322.693     578.266    1169.160       0.410        0.166

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      21.554      19.191     568.082     455.853       0.022       0.368

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    17.823     473.418       0.000     473.418    1169.687       0.405       0.338

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.850      19.203     568.595       0.000       0.060       0.040       0.170

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
     0.872      21.500       1.165     587.310      28.631     214.920       1.666

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 178340.078       0.486    1395.985 1211684.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =10.453   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    138.516    3398.000      21.500     587.310       1.000       1.000       0.880
W Kg/sec =   62.96178

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    100.778    3193.361       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 106557.852  108688.789       1.669     489.817     293.506     384.470       1.310
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ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	442.07	-0.15	442.07	0.38	559.28
MEAN	17.74	0.00	-0.02	442.07	-0.15	442.07	0.38	
HUB	15.05	0.00	-0.02	442.07	-0.15	442.07	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.40	46.36	7.04	595.14	741.48	19.49	571.00	0.63
MEAN	49.96	43.40	6.56	526.00	687.21	19.49	571.00	0.59
HUB	45.28	38.84	6.44	446.28	628.27	19.49	571.00	0.54

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	497.31	301.72	395.33	1196.59	0.42
MEAN	17.51	504.50	306.61	400.64	1193.07	0.42
HUB	14.85	543.94	361.40	406.52	1189.58	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	487.76	285.71	0.41	5980.11	
MEAN	519.12	453.51	212.51	0.38	5370.43	1.64
HUB	440.35	414.12	78.95	0.35	5369.02	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.01	1.16	22.21	615.77	1.05	595.12	0.92	0.91
MEAN	24.64	1.15	21.78	612.87	1.04	591.62	0.92	0.91
HUB	24.64	1.15	21.34	612.86	1.04	588.16	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.35	35.86	31.50	4.36	0.93	0.41	2.90	
MEAN	37.43	27.94	23.50	4.44	0.93	0.41	3.28	0.91
HUB	41.64	10.99	6.50	4.49	0.93	0.41	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	509.406	308.625	405.272	1193.614	0.427	0.012

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.732	21.818	592.169	46.000	37.290	31.500	-5.790

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	412.496	308.625	515.172	1201.107	0.343	0.329

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.697	22.759	599.627	471.992	0.022	0.417

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	400.837	0.000	400.837	1201.900	0.334	0.326

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.792	600.419	0.000	0.060	0.048	0.340

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	24.619	1.145	613.831	26.521	217.151	1.683

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
165283.656	0.479	1293.784	1335279.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

```
 RESET =  0.000BLEED =  0.000 DPInc =10.453   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    138.516    3398.000      24.619     613.831       1.000       1.000       0.980
W Kg/sec =   62.96178

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     89.973    3123.613       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
106557.852  108688.789       1.959     513.330     262.053     401.059       1.530

    ROTOR LEADING EDGE CONDITIONS, STAGE             4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   376.78    -0.13   376.78     0.31   524.99
MEAN    16.97     0.00    -0.02   376.78    -0.13   376.78     0.31
HUB     14.32     0.00    -0.02   376.78    -0.13   376.78     0.31

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.59    46.36    10.23   571.12   684.32    23.00   601.98     0.57
MEAN    53.18    43.80     9.38   503.23   628.76    23.00   601.98     0.52
HUB     48.43    37.84    10.59   424.63   567.79    23.00   601.98     0.47

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
TIP     18.88   478.83   289.14   381.67  1221.92     0.39
MEAN    16.57   483.84   291.21   386.39  1218.55     0.40
HUB     13.89   518.71   340.09   391.66  1215.19     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    559.85   467.93   270.71     0.38  5461.52
MEAN   491.47   435.20   200.25     0.36  4828.74     1.58
HUB    411.88   398.19    71.80     0.33  4725.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     28.09     1.14    25.26   639.81     1.04   620.67     0.92     0.91
MEAN    27.67     1.12    24.82   636.80     1.04   617.26     0.92     0.91
HUB     27.60     1.12    24.35   636.31     1.04   613.85     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.15    35.35    31.50     3.85     0.93     0.39     2.90
MEAN    37.00    27.40    23.50     3.90     0.94     0.38     3.29     0.91
HUB     40.97    10.39     6.50     3.89     0.94     0.37     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.994

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     478.694     292.851     378.664    1219.785       0.392       0.047

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    27.757      24.958     618.515      46.000      37.718      32.400      -5.318

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     391.444     292.851     488.866    1226.016       0.319       0.345

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.729      25.836     624.850     456.573       0.019       0.428

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     372.575       0.000     372.575    1227.195       0.304       0.328

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      25.935     626.053       0.000       0.060       0.046       0.378

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      27.649       1.123     637.636      23.805     222.458       1.724

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 148442.297       0.474    1161.956 1187409.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.453   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    138.516    3398.000      27.649     637.636       1.000       1.000       0.980
W Kg/sec =   62.96178

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.650    3064.750       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106557.852  108688.789       2.143     509.668     237.827     390.276       1.641

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   347.94    -0.12   347.94     0.28   489.95
 MEAN    15.91     0.00    -0.02   347.94    -0.12   347.94     0.28
 HUB     13.07     0.00    -0.02   347.94    -0.12   347.94     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.37    47.36    10.01   543.25   645.22    26.15   627.54     0.53
 MEAN    53.60    44.80     8.80   471.87   586.38    26.15   627.54     0.48
 HUB     48.09    38.84     9.25   387.57   520.93    26.15   627.54     0.42

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   450.96   279.11   354.21  1245.02     0.36
 MEAN    15.50   450.61   272.72   358.71  1241.46     0.36
 HUB     12.59   475.67   306.69   363.60  1237.90     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   435.22   252.87     0.35  5009.34
 MEAN   459.55   404.45   186.84     0.33  4228.35     1.60
 HUB    373.33   369.65    66.65     0.30  3862.75

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.08     1.12    28.38   661.45     1.04   644.48     0.92     0.91
 MEAN    30.52     1.10    27.87   657.73     1.03   640.80     0.92     0.91
 HUB     30.27     1.09    27.33   656.00     1.03   637.12     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.24    35.52    31.50     4.02     0.93     0.40     2.90
 MEAN    37.24    27.51    23.50     4.01     0.93     0.38     3.34     0.91
 HUB     40.15    10.39     6.50     3.89     0.93     0.36     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     456.048     277.717     361.736    1241.697       0.367      -0.007

    Pt3        Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    30.568      27.847     641.045      46.000      37.515      33.000      -4.515

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     378.399     277.717     469.375    1246.920       0.303       0.281

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.529      28.638     646.449     440.827       0.034       0.428

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     354.480       0.000     354.480    1248.329       0.284       0.360

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.841     647.911       0.000       0.060       0.044       0.355

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      30.503       1.103     658.392      20.756     235.967       1.829

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 129506.125       0.458    1013.730 1224639.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    844885.56   6613.4761    135.3162      2.0191      0.8607     10.4528      1.2593


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.990   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.889    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   61.76752

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    132.749    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  104536.672  106627.180       2.151     831.557     386.595     619.754       1.603

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   313.85    -0.11   313.85     0.28   609.32
  MEAN    17.06     0.00    -0.02   313.85    -0.11   313.85     0.28
  HUB     12.51     0.00    -0.02   313.85    -0.11   313.85     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.84    50.47    12.37   611.74   687.65    14.29   514.58     0.62
  MEAN    58.19    47.20    10.99   505.89   595.43    14.29   514.58     0.54
  HUB     49.78    38.62    11.16   370.96   486.00    14.29   514.58     0.44

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   565.48   390.01   409.47  1134.09     0.50
  MEAN    18.04   584.25   407.60   418.57  1128.66     0.52
  HUB     15.00   652.49   488.12   432.99  1120.98     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   465.65   221.74     0.41  8048.08
  MEAN   534.83   437.48   127.22     0.39  7353.39     1.54
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 HUB    444.80   435.15    43.33     0.39  7323.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.89     1.25    15.94   561.15     1.07   534.44     0.92     0.90
 MEAN    18.54     1.23    15.44   557.84     1.07   529.33     0.92     0.90
 HUB     18.52     1.23    14.72   557.69     1.07   522.14     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.61    28.44    24.20     4.24     0.93     0.42     2.90
 MEAN    44.24    16.91    12.70     4.21     0.94     0.37     3.51     0.90
 HUB     48.43    -5.71    -9.30     3.59     0.94     0.22     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     591.035     406.812     428.750    1129.048       0.523       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.619      15.443     529.716      24.000      43.496      35.400      -8.096

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     445.280     406.812     603.133    1142.414       0.390       0.405

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.545      16.698     542.333     528.796       0.033       0.531

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     412.897       0.000     412.897    1144.856       0.361       0.435

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.872     544.654       0.000       0.060       0.058       0.458

    STAGE EXIT CONDITIONS, STAGE             1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      18.461       1.222     558.893      36.083     189.388       1.468

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 224648.266       0.600    1725.116 1319719.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =10.990   EfDer =  0.984

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.889    3398.000      18.461     558.893       1.000       1.000       0.980
W Kg/sec =   61.76752

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.320    3273.536       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104536.672  106627.180       1.805     590.487     327.109     474.134       1.449

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   394.05    -0.14   394.05     0.34   587.03
 MEAN    18.08     0.00    -0.02   394.05    -0.14   394.05     0.34
 HUB     15.21     0.00    -0.02   394.05    -0.14   394.05     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.12    46.36    10.76   609.37   725.79    17.01   545.93     0.63
 MEAN    53.69    42.30    11.39   536.08   665.43    17.01   545.93     0.58
 HUB     48.87    37.84    11.03   451.02   599.02    17.01   545.93     0.52

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   513.25   325.52   396.82  1169.66     0.44
MEAN    18.01   518.76   326.32   403.27  1165.39     0.45
HUB     15.22   557.46   377.11   410.55  1161.12     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    605.52   485.66   280.00     0.42  6649.94
MEAN   534.05   453.63   207.73     0.39  5879.49     1.61
HUB    451.41   417.22    74.30     0.36  5742.85

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.96     1.19    19.24   590.55     1.06   568.56     0.92     0.90
MEAN    21.53     1.17    18.79   586.89     1.05   564.42     0.92     0.90
HUB     21.46     1.16    18.32   586.24     1.05   560.29     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.36    35.21    31.50     3.71     0.93     0.41     2.90
MEAN    38.98    27.25    23.50     3.75     0.94     0.39     3.30     0.90
HUB     42.57    10.26     6.50     3.76     0.94     0.38     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.984

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     571.619     327.238     468.684    1161.441       0.492      -0.165

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.621      18.318     560.608      46.000      34.923      30.600      -4.323

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     468.712     327.238     571.642    1170.665       0.400       0.189

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      21.584      19.325     569.548     455.853       0.023       0.382

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.823     462.568       0.000     462.568    1171.156       0.395       0.353

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.850      19.329     570.025       0.000       0.060       0.043       0.191

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.868      21.526       1.166     587.892      28.999     210.597       1.633

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 180633.234       0.493    1387.116 1185255.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =10.990   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.889    3398.000      21.526     587.892       1.000       1.000       0.880
W Kg/sec =   61.76752

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     98.792    3191.778       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104536.672  106627.180       1.702     489.817     287.725     384.470       1.336

    ROTOR LEADING EDGE CONDITIONS, STAGE            3
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   432.19    -0.15   432.19     0.37   559.00
MEAN    17.74     0.00    -0.02   432.19    -0.15   432.19     0.37
HUB     15.05     0.00    -0.02   432.19    -0.15   432.19     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.02    46.36     7.66   595.14   735.63    19.60   572.30     0.63
MEAN    50.60    43.40     7.20   526.00   680.90    19.60   572.30     0.58
HUB     45.93    38.84     7.09   446.28   621.36    19.60   572.30     0.53

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   494.39   308.32   386.47  1198.04     0.41
MEAN    17.51   500.53   311.47   391.81  1194.39     0.42
HUB     14.85   538.65   363.27   397.72  1190.78     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    587.43   476.71   279.10     0.40  6110.90
MEAN   519.12   443.44   207.65     0.37  5455.49     1.67
HUB    440.35   405.12    77.08     0.34  5396.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.12     1.17    22.34   616.97     1.05   596.57     0.92     0.91
MEAN    24.72     1.15    21.90   613.85     1.04   592.94     0.92     0.91
HUB     24.68     1.15    21.44   613.57     1.04   589.35     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.58    35.84    31.50     4.34     0.93     0.42     2.90
MEAN    38.48    27.92    23.50     4.42     0.93     0.42     3.28     0.91
HUB     42.41    10.97     6.50     4.47     0.93     0.42     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     505.354     313.518     396.345    1194.933       0.423       0.012

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.809      21.935     593.482      46.000      38.345      31.500      -6.845

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     403.007     313.518     510.596    1202.720       0.335       0.347

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.769      22.915     601.242     471.992       0.024       0.433

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.121     391.796       0.000     391.796    1203.464       0.326       0.340

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      22.936     601.986       0.000       0.060       0.052       0.354

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.874      24.685       1.147     614.800      26.907     212.393       1.646

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 167692.094       0.486    1287.739 1304795.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.990   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
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    135.889    3398.000      24.685     614.800       1.000       1.000       0.980
W Kg/sec =   61.76752

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.100    3121.151       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104536.672  106627.180       2.001     513.330     256.598     401.059       1.563

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   368.41    -0.13   368.41     0.31   524.57
 MEAN    16.97     0.00    -0.02   368.41    -0.13   368.41     0.31
 HUB     14.32     0.00    -0.02   368.41    -0.13   368.41     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.18    46.36    10.82   571.12   679.74    23.13   603.47     0.56
 MEAN    53.80    43.80    10.00   503.23   623.78    23.13   603.47     0.52
 HUB     49.06    37.84    11.22   424.63   562.27    23.13   603.47     0.47

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   475.81   295.32   373.07  1223.64     0.39
 MEAN    16.57   479.78   295.75   377.79  1220.18     0.39
 HUB     13.89   513.35   341.76   383.05  1216.70     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   457.34   264.53     0.37  5578.10
 MEAN   491.47   425.48   195.72     0.35  4903.80     1.60
 HUB    411.88   389.42    70.13     0.32  4748.81

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.23     1.14    25.43   641.33     1.04   622.44     0.92     0.91
 MEAN    27.78     1.13    24.97   638.12     1.04   618.91     0.92     0.91
 HUB     27.68     1.12    24.49   637.38     1.04   615.40     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.37    35.34    31.50     3.84     0.93     0.40     2.90
 MEAN    38.05    27.39    23.50     3.89     0.94     0.39     3.29     0.91
 HUB     41.74    10.37     6.50     3.87     0.94     0.38     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     474.943     297.409     370.295    1221.363       0.389       0.046

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.865      25.103     620.123      46.000      38.770      32.400      -6.370

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     382.441     297.409     484.472    1227.863       0.311       0.361

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.833      26.021     626.740     456.573       0.021       0.444

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     364.184       0.000     364.184    1228.977       0.296       0.342

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.106     627.878       0.000       0.060       0.050       0.390

    STAGE EXIT CONDITIONS, STAGE            4
```

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.867	27.747	1.124	638.945	24.145	217.640	1.687

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
150565.781	0.480	1156.223	1160932.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
RESET = 0.000BLEED = 0.000 DPInc =10.990 EfDer = 0.994

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
135.889	3398.000	27.747	638.945	1.000	1.000	0.980

W Kg/sec = 61.76752

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
79.901	3061.610	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
104536.672	106627.180	2.190	509.668	232.731	390.276	1.677

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	340.21	-0.12	340.21	0.28	489.45
MEAN	15.91	0.00	-0.02	340.21	-0.12	340.21	0.28	
HUB	13.07	0.00	-0.02	340.21	-0.12	340.21	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.95	47.36	10.59	543.25	641.08	26.31	629.29	0.52
MEAN	54.22	44.80	9.42	471.87	581.82	26.31	629.29	0.47
HUB	48.73	38.84	9.89	387.57	515.79	26.31	629.29	0.42

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	448.37	284.87	346.24	1246.94	0.36
MEAN	15.50	446.89	276.97	350.71	1243.29	0.36
HUB	12.59	470.56	308.23	355.56	1239.64	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	531.98	425.38	247.11	0.34	5112.68	
MEAN	459.55	395.39	182.58	0.32	4294.29	1.63
HUB	373.33	361.47	65.10	0.29	3882.12	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	31.25	1.13	28.57	663.25	1.04	646.48	0.92	0.91
MEAN	30.67	1.11	28.04	659.36	1.03	642.70	0.92	0.91
HUB	30.38	1.09	27.50	657.40	1.03	638.93	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.45	35.52	31.50	4.02	0.93	0.41	2.90	
MEAN	38.30	27.50	23.50	4.00	0.94	0.39	3.34	0.91
HUB	40.92	10.38	6.50	3.88	0.94	0.37	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.994

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	452.369	282.052	353.672	1243.514	0.364	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
30.709	28.024	642.931	46.000	38.572	33.000	-5.572

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	369.680	282.052	464.991	1248.984	0.296	0.299

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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.663      28.853     648.601     440.827       0.037       0.445

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     346.446       0.000     346.446    1250.320       0.277       0.374

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.043     649.988       0.000       0.060       0.047       0.368

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      30.635       1.104     659.999      21.054     230.840       1.789

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 131371.516       0.464    1008.826 1197366.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    854910.88   6565.0190    132.7495      2.0279      0.8564     10.9901      1.2624


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

   Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.545   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    133.191    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   60.54141

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    130.114    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 102461.570  104510.578       2.195     831.557     378.921     619.754       1.636

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   307.10    -0.11   307.10     0.28   609.32
  MEAN    17.06     0.00    -0.02   307.10    -0.11   307.10     0.28
  HUB     12.51     0.00    -0.02   307.10    -0.11   307.10     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.35    50.47    12.88   611.74   684.60    14.33   514.93     0.61
  MEAN    58.75    47.20    11.55   505.89   591.89    14.33   514.93     0.53
  HUB     50.39    38.62    11.77   370.96   481.67    14.33   514.93     0.43

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   562.31   394.92   400.29  1134.91     0.50
  MEAN    18.04   579.59   410.40   409.26  1129.39     0.51
  HUB     15.00   645.30   487.12   423.24  1121.74     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   455.24   216.82     0.40  8149.38
  MEAN   534.83   427.76   124.42     0.38  7403.81     1.57
  HUB    444.80   425.35    42.32     0.38  7308.11

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     18.93     1.25    16.00   561.63     1.07   535.22     0.92     0.90
 MEAN    18.55     1.23    15.50   558.08     1.07   530.02     0.92     0.90
 HUB     18.51     1.22    14.78   557.62     1.07   522.84     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.61    28.44    24.20     4.24     0.93     0.43     2.90
 MEAN    45.08    16.91    12.70     4.21     0.94     0.38     3.51     0.90
 HUB     49.01    -5.71    -9.30     3.59     0.94     0.23     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.983

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     586.071     409.604     419.170    1129.799       0.519       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.630      15.503     530.422      24.000      44.339      35.400      -8.939

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     434.959     409.604     597.465    1143.441       0.380       0.420

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.550      16.785     543.308     528.796       0.035       0.544

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     403.707       0.000     403.707    1145.742       0.352       0.444

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.939     545.497       0.000       0.060       0.062       0.467

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.852      18.460       1.222     559.110      36.300     186.499       1.446

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 225999.156       0.604    1701.039 1291335.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.545   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    133.191    3398.000      18.460     559.110       1.000       1.000       0.980
W Kg/sec =   60.54141

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    110.116    3272.901       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 102461.570  104510.578       1.841     590.487     320.691     474.134       1.478

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   385.39    -0.13   385.39     0.34   586.92
 MEAN    18.08     0.00    -0.02   385.39    -0.13   385.39     0.34
 HUB     15.21     0.00    -0.02   385.39    -0.13   385.39     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.69    46.36    11.33   609.37   721.13    17.07   546.71     0.63
 MEAN    54.29    42.30    11.99   536.08   660.34    17.07   546.71     0.58
 HUB     49.49    37.84    11.65   451.02   593.35    17.07   546.71     0.52

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	510.52	331.71	388.08	1170.73	0.44
MEAN	18.01	514.87	330.86	394.49	1166.36	0.44
HUB	15.22	552.11	378.73	401.73	1161.98	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	474.95	273.81	0.41	6776.18	
MEAN	534.05	443.74	203.19	0.38	5961.21	1.63
HUB	451.41	408.25	72.68	0.35	5767.46	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.01	1.19	19.31	591.37	1.06	569.61	0.92	0.90
MEAN	21.56	1.17	18.86	587.49	1.05	565.36	0.92	0.90
HUB	21.46	1.16	18.38	586.57	1.05	561.12	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.52	35.21	31.50	3.71	0.93	0.42	2.90	
MEAN	39.99	27.25	23.50	3.75	0.94	0.40	3.30	0.90
HUB	43.31	10.25	6.50	3.75	0.94	0.39	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.980

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	565.559	331.791	458.008	1162.643	0.486	-0.159

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.649	18.411	561.770	46.000	35.920	30.600	-5.320

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	457.574	331.791	565.207	1172.150	0.390	0.212

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	21.609	19.451	570.995	455.853	0.024	0.398

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	451.734	0.000	451.734	1172.605	0.385	0.367

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	19.448	571.439	0.000	0.060	0.046	0.211

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.863	21.547	1.167	588.478	29.368	206.305	1.599

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
182932.406	0.499	1376.886	1158391.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =11.545 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
133.191	3398.000	21.547	588.478	1.000	1.000	0.880

W Kg/sec = 60.54141

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
96.786	3190.188	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
102461.570	104510.578	1.738	489.817	281.883	384.470	1.364

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	422.30	-0.15	422.30	0.36	558.73
MEAN	17.74	0.00	-0.02	422.30	-0.15	422.30	0.36	

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 HUB     15.05     0.00    -0.02   422.30    -0.15   422.30     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.65    46.36     8.29   595.14   729.86    19.70   573.59     0.62
 MEAN    51.25    43.40     7.85   526.00   674.66    19.70   573.59     0.57
 HUB     46.59    38.84     7.75   446.28   614.52    19.70   573.59     0.52

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   491.70   314.87   377.66  1199.47     0.41
 MEAN    17.51   496.75   316.33   383.02  1195.70     0.42
 HUB     14.85   533.48   365.15   388.93  1191.97     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   465.74   272.55     0.39  6240.59
 MEAN   519.12   433.39   202.80     0.36  5540.37     1.69
 HUB    440.35   396.13    75.20     0.33  5424.64

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.22     1.17    22.46   618.17     1.05   597.99     0.92     0.91
 MEAN    24.79     1.15    22.01   614.84     1.04   594.24     0.92     0.91
 HUB     24.71     1.15    21.54   614.29     1.04   590.54     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.82    35.82    31.50     4.32     0.93     0.44     2.90
 MEAN    39.55    27.90    23.50     4.40     0.93     0.43     3.28     0.91
 HUB     43.19    10.94     6.50     4.44     0.93     0.43     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     501.497     318.403     387.452    1196.232       0.419       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.877      22.041     594.776      46.000      39.413      31.500      -7.913

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     393.583     318.403     506.249    1204.313       0.327       0.364

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.831      23.059     602.839     471.992       0.026       0.450

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     382.822       0.000     382.822    1205.009       0.318       0.353

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.067     603.537       0.000       0.060       0.057       0.367

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      24.740       1.148     615.770      27.292     207.726       1.610

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 170088.656       0.493    1280.215 1273956.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =11.545   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    133.191    3398.000      24.740     615.770       1.000       1.000       0.980
W Kg/sec =   60.54141
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
86.228	3118.690	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
102461.570	104510.578	2.044	513.330	251.146	401.059	1.597

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	360.09	-0.12	360.09	0.30	524.16
MEAN	16.97	0.00	-0.02	360.09	-0.12	360.09	0.30	
HUB	14.32	0.00	-0.02	360.09	-0.12	360.09	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.77	46.36	11.41	571.12	675.26	23.26	604.95	0.56
MEAN	54.42	43.80	10.62	503.23	618.90	23.26	604.95	0.51
HUB	49.71	37.84	11.87	424.63	556.85	23.26	604.95	0.46

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	473.02	301.39	364.57	1225.34	0.39
MEAN	16.57	475.91	300.21	369.27	1221.78	0.39
HUB	13.89	508.09	343.36	374.52	1218.20	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	446.89	258.46	0.36	5692.67	
MEAN	491.47	415.86	191.26	0.34	4977.76	1.63
HUB	411.88	380.73	68.52	0.31	4771.08	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	28.35	1.15	25.58	642.84	1.04	624.17	0.92	0.90
MEAN	27.88	1.13	25.10	639.44	1.04	620.54	0.92	0.90
HUB	27.74	1.12	24.61	638.46	1.04	616.92	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.58	35.33	31.50	3.83	0.93	0.41	2.90	
MEAN	39.11	27.38	23.50	3.88	0.94	0.40	3.29	0.90
HUB	42.52	10.37	6.50	3.87	0.94	0.39	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.988

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	471.375	301.899	362.010	1222.918	0.385	0.045

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
27.958	25.233	621.709	46.000	39.826	32.400	-7.426

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	373.556	301.899	480.299	1229.682	0.304	0.378

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	27.922	26.189	628.605	456.573	0.023	0.460

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	355.905	0.000	355.905	1230.732	0.289	0.354

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	26.258	629.680	0.000	0.060	0.055	0.402

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.862	27.829	1.125	640.249	24.479	212.962	1.651

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
152649.281	0.487	1148.953	1134105.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =11.545 EfDer = 0.991

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
133.191	3398.000	27.829	640.249	1.000	1.000	0.980

W Kg/sec = 60.54141

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
78.165	3058.490	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
102461.570	104510.578	2.239	509.668	227.678	390.276	1.714

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	332.57	-0.11	332.57	0.27	488.95
MEAN	15.91	0.00	-0.02	332.57	-0.11	332.57	0.27	
HUB	13.07	0.00	-0.02	332.57	-0.11	332.57	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.53	47.36	11.17	543.25	637.06	26.45	631.02	0.52
MEAN	54.83	44.80	10.03	471.87	577.38	26.45	631.02	0.47
HUB	49.38	38.84	10.54	387.57	510.78	26.45	631.02	0.41

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	446.01	290.54	338.41	1248.82	0.36
MEAN	15.50	443.36	281.13	342.83	1245.09	0.36
HUB	12.59	465.62	309.75	347.64	1241.35	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	531.98	415.71	241.44	0.33	5214.31	
MEAN	459.55	386.48	178.43	0.31	4358.61	1.65
HUB	373.33	353.41	63.58	0.28	3901.30	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	31.39	1.13	28.74	665.03	1.04	648.44	0.92	0.91
MEAN	30.79	1.11	28.20	660.96	1.03	644.57	0.92	0.91
HUB	30.47	1.09	27.64	658.79	1.03	640.71	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.65	35.51	31.50	4.01	0.93	0.43	2.90	
MEAN	39.35	27.49	23.50	3.99	0.94	0.40	3.34	0.91
HUB	41.70	10.36	6.50	3.86	0.94	0.38	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.991

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	448.875	286.282	345.734	1245.301	0.360	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
30.829	28.179	644.791	46.000	39.626	33.000	-6.626

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	361.129	286.282	460.838	1251.012	0.289	0.316

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	30.776	29.045	650.719	440.827	0.040	0.461

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    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     338.562       0.000     338.562    1252.278       0.270       0.388

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.221     652.036       0.000       0.060       0.051       0.381

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.868      30.745       1.105     661.596      21.347     225.878       1.751

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  133201.469       0.471    1002.574 1169738.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    864871.00   6509.6680    130.1144      2.0351      0.8513     11.5453      1.2655

**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.957   EfDer =  0.981

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    131.203    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   59.63782

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    128.172    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  100932.312  102950.742       2.228     831.557     373.266     619.754       1.660

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   302.15    -0.10   302.15     0.27   609.32
  MEAN    17.06     0.00    -0.02   302.15    -0.10   302.15     0.27
  HUB     12.51     0.00    -0.02   302.15    -0.10   302.15     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.72    50.47    13.25   611.74   682.39    14.35   515.18     0.61
  MEAN    59.16    47.20    11.96   505.89   589.34    14.35   515.18     0.53
  HUB     50.84    38.62    12.22   370.96   478.52    14.35   515.18     0.43

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   560.11   398.49   393.60  1135.50     0.49
  MEAN    18.04   576.25   412.41   402.47  1129.92     0.51
  HUB     15.00   640.08   486.36   416.12  1122.27     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   447.66   213.25     0.39  8223.08
  MEAN   534.83   420.68   122.42     0.37  7439.98     1.59
  HUB    444.80   418.19    41.56     0.37  7296.66

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.95     1.25    16.05   561.98     1.07   535.78     0.92     0.90
  MEAN    18.56     1.23    15.54   558.25     1.07   530.52     0.92     0.90
  HUB     18.49     1.22    14.83   557.57     1.07   523.35     0.92     0.90
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.35    28.45    24.20     4.25     0.93     0.44     2.90
 MEAN    45.70    16.92    12.70     4.22     0.94     0.39     3.51     0.90
 HUB     49.45    -5.70    -9.30     3.60     0.94     0.24     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     582.510     411.607     412.186    1130.335       0.515       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.637      15.545     530.925      24.000      44.960      35.400      -9.560

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     427.461     411.607     593.417    1144.173       0.374       0.430

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.552      16.846     544.005     528.796       0.036       0.554

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     397.020       0.000     397.020    1146.376       0.346       0.451

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.986     546.101       0.000       0.060       0.066       0.474

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4        Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.848      18.458       1.222     559.266      36.456     184.395       1.429

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 226971.953       0.607    1682.864 1270515.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =11.957   EfDer =  0.977

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    131.203    3398.000       18.458     559.266       1.000       1.000       0.980
W Kg/sec =   59.63782

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    108.500    3272.444        1.402       0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 100932.312  102950.742        1.869     590.487     315.984     474.134       1.501

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   379.09    -0.13   379.09      0.33   586.84
 MEAN    18.08      0.00    -0.02   379.09    -0.13   379.09      0.33
 HUB     15.21      0.00    -0.02   379.09    -0.13   379.09      0.33

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     58.12     46.36    11.76   609.37   717.78     17.11   547.27      0.63
 MEAN    54.74     42.30    12.44   536.08   656.68     17.11   547.27      0.57
 HUB     49.96     37.84    12.12   451.02   589.28     17.11   547.27      0.51

     ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     20.42   508.67    336.17    381.75   1171.50      0.43
 MEAN    18.01   512.14    334.15    388.12   1167.05      0.44
 HUB     15.22   548.26    379.90    395.31   1162.59      0.47
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   467.20   269.35     0.40  6867.29
 MEAN   534.05   436.57   199.90     0.37  6020.35     1.65
 HUB    451.41   401.73    71.51     0.35  5785.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.05     1.19    19.37   591.96     1.06   570.36     0.92     0.89
 MEAN    21.58     1.17    18.90   587.93     1.05   566.03     0.92     0.89
 HUB     21.45     1.16    18.42   586.81     1.05   561.71     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.37    35.21    31.50     3.71     0.93     0.43     2.90
 MEAN    40.73    27.25    23.50     3.75     0.94     0.41     3.30     0.89
 HUB     43.86    10.25     6.50     3.75     0.94     0.40     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     561.284     335.086     450.286    1163.495       0.482      -0.154

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.667      18.474     562.595      46.000      36.655      30.600      -6.055

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     449.544     335.086     560.690    1173.207       0.383       0.229

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      21.624      19.539     572.026     455.853       0.025       0.409

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     443.930       0.000     443.930    1173.636       0.378       0.377

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      19.529     572.445       0.000       0.060       0.049       0.226

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      21.558       1.168     588.901      29.635     203.229       1.575

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 184592.844       0.503    1368.647 1138761.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.957   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.203    3398.000      21.558     588.901       1.000       1.000       0.880
W Kg/sec =   59.63782

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.327    3189.043       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100932.312  102950.742       1.764     489.817     277.633     384.470       1.385

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   415.16    -0.14   415.16     0.35   558.52
 MEAN    17.74     0.00    -0.02   415.16    -0.14   415.16     0.35
 HUB     15.05     0.00    -0.02   415.16    -0.14   415.16     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.11    46.36     8.75   595.14   725.75    19.78   574.51     0.62
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 MEAN    51.72    43.40     8.32   526.00   670.21    19.78   574.51     0.57
 HUB     47.08    38.84     8.24   446.28   609.63    19.78   574.51     0.52

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   489.91   319.56   371.33  1200.48     0.41
 MEAN    17.51   494.13   319.79   376.69  1196.63     0.41
 HUB     14.85   529.79   366.47   382.60  1192.81     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   457.86   267.87     0.38  6333.42
 MEAN   519.12   426.18   199.33     0.36  5600.97     1.71
 HUB    440.35   389.67    73.88     0.33  5444.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.28     1.17    22.54   619.04     1.05   599.01     0.92     0.91
 MEAN    24.83     1.15    22.08   615.55     1.05   595.17     0.92     0.91
 HUB     24.73     1.15    21.60   614.81     1.04   591.38     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.71    35.81    31.50     4.31     0.93     0.44     2.90
 MEAN    40.33    27.89    23.50     4.39     0.93     0.44     3.28     0.91
 HUB     43.77    10.93     6.50     4.43     0.93     0.44     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     498.814     321.889     381.056    1197.155       0.417       0.012

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.919      22.110     595.698      46.000      40.189      31.500      -8.689

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     386.825     321.889     503.236    1205.446       0.321       0.377

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.870      23.155     603.977     471.992       0.027       0.462

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     376.388       0.000     376.388    1206.109       0.312       0.362

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.153     604.642       0.000       0.060       0.061       0.376

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.868      24.772       1.149     616.467      27.566     204.423       1.585

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 171799.016       0.498    1273.789 1251506.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =11.957   EfDer =  0.986

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    131.203    3398.000      24.772     616.467       1.000       1.000       0.980
W Kg/sec =   59.63782

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     84.878    3116.927       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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100932.312  102950.742       2.076     513.330     247.215     401.059       1.622

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   354.11    -0.12   354.11     0.29   523.86
MEAN    16.97     0.00    -0.02   354.11    -0.12   354.11     0.29
HUB     14.32     0.00    -0.02   354.11    -0.12   354.11     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.21    46.36    11.85   571.12   672.10    23.34   606.00     0.56
MEAN    54.87    43.80    11.07   503.23   615.44    23.34   606.00     0.51
HUB     50.18    37.84    12.34   424.63   553.00    23.34   606.00     0.46

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   471.15   305.71   358.50  1226.55     0.38
MEAN    16.57   473.24   303.40   363.18  1222.91     0.39
HUB     13.89   504.38   344.50   368.40  1219.27     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    559.85   439.44   254.14     0.36  5774.25
MEAN   491.47   408.99   188.07     0.33  5030.62     1.65
HUB    411.88   374.51    67.38     0.31  4786.89

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     28.42     1.15    25.67   643.93     1.04   625.41     0.92     0.90
MEAN    27.93     1.13    25.19   640.39     1.04   621.71     0.92     0.90
HUB     27.77     1.12    24.69   639.23     1.04   618.01     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.46    35.33    31.50     3.83     0.93     0.42     2.90
MEAN    39.88    27.38    23.50     3.88     0.94     0.41     3.29     0.90
HUB     43.08    10.36     6.50     3.86     0.94     0.40     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.986

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     468.918     305.109     356.080    1224.022       0.383       0.044

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    28.016      25.316     622.837      46.000      40.592      32.400      -8.192

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     367.211     305.109     477.426    1230.975       0.298       0.390

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.976      26.299     629.933     456.573       0.024       0.473

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     349.994       0.000     349.994    1231.981       0.284       0.364

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      26.356     630.963       0.000       0.060       0.059       0.410

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.858      27.877       1.125     641.184      24.717     209.660       1.625

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 154134.453       0.492    1142.816 1114551.000
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =11.957   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.203    3398.000      27.877     641.184       1.000       1.000       0.980
W Kg/sec =   59.63782

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     76.922    3056.259       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
100932.312  102950.742       2.275     509.668     224.056     390.276       1.742

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   327.11    -0.11   327.11     0.27   488.60
MEAN    15.91     0.00    -0.02   327.11    -0.11   327.11     0.27
HUB     13.07     0.00    -0.02   327.11    -0.11   327.11     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.95    47.36    11.59   543.25   634.22    26.55   632.26     0.51
MEAN    55.28    44.80    10.48   471.87   574.26    26.55   632.26     0.47
HUB     49.84    38.84    11.00   387.57   507.24    26.55   632.26     0.41

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   444.45   294.55   332.83  1250.15     0.36
MEAN    15.50   440.93   284.08   337.22  1246.37     0.35
HUB     12.59   462.12   310.80   341.99  1242.58     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    531.98   408.83   237.43     0.33  5286.31
MEAN   459.55   380.14   175.47     0.30  4404.38     1.67
HUB    373.33   347.66    62.54     0.28  3914.39

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     31.49     1.13    28.85   666.31     1.04   649.83     0.92     0.91
MEAN    30.86     1.11    28.30   662.12     1.03   645.90     0.92     0.91
HUB     30.52     1.09    27.74   659.79     1.03   641.98     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.51    35.50     31.50     4.00     0.93     0.43     2.90
MEAN    40.11    27.49     23.50     3.99     0.94     0.41     3.34     0.91
HUB     42.26    10.36      6.50     3.86     0.94     0.39     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     446.478     289.291     340.078    1246.569       0.358       -0.009

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    30.902      28.278     646.113      46.000      40.386      33.000      -7.386

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     355.053     289.291     457.987    1252.451       0.283       0.328

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      30.844      29.168     652.224     440.827       0.042       0.473

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     332.958       0.000     332.958    1253.667       0.266       0.397
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   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.335     653.492       0.000       0.060       0.055       0.391

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864      30.810       1.105     662.738      21.554     222.399       1.724

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 134494.891       0.475     997.201 1149601.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    871993.12   6465.3164    128.1724      2.0394      0.8471     11.9567      1.2676


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc =12.499   EfDer =  0.977

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    128.599    3398.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   58.45397

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    125.628    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  98928.742  100907.109       2.273     831.557     365.856     619.754       1.694

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   295.69    -0.10   295.69     0.27   609.32
 MEAN    17.06     0.00    -0.02   295.69    -0.10   295.69     0.27
 HUB     12.51     0.00    -0.02   295.69    -0.10   295.69     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     64.21    50.47    13.74   611.74   679.55    14.38   515.51     0.61
 MEAN    59.70    47.20    12.50   505.89   586.05    14.38   515.51     0.53
 HUB     51.45    38.62    12.83   370.96   474.47    14.38   515.51     0.43

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   557.38   403.10   384.94  1136.25     0.49
 MEAN    18.04   572.02   415.01   393.66  1130.58     0.51
 HUB     15.00   633.36   485.37   406.90  1122.96     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   437.84   208.64     0.39  8318.09
 MEAN   534.83   411.49   119.81     0.36  7486.92     1.62
 HUB    444.80   408.91    40.57     0.36  7281.78

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.99     1.26    16.10   562.43     1.08   536.49     0.92     0.89
 MEAN    18.57     1.23    15.59   558.47     1.07   531.15     0.92     0.89
 HUB     18.47     1.22    14.88   557.50     1.07   523.99     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.32    28.46    24.20     4.26     0.93     0.46     2.90
 MEAN    46.51    16.93    12.70     4.23     0.94     0.40     3.51     0.89
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 HUB     50.03    -5.69    -9.30     3.61     0.94     0.25     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     577.998     414.207     403.131    1131.015       0.511       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.645      15.598     531.564      24.000      45.776      35.400     -10.376

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     417.763     414.207     588.297    1145.105       0.365       0.443

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.554      16.922     544.891     528.796       0.039       0.567

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     388.358       0.000     388.358    1147.184       0.339       0.459

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.045     546.871       0.000       0.060       0.071       0.482

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.842      18.454       1.222     559.468      36.658     181.660       1.408

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 228227.844       0.610    1658.585 1243357.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =12.499   EfDer =  0.973

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    128.599    3398.000      18.454     559.468       1.000       1.000       0.980
W Kg/sec =   58.45397

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.390    3271.854       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  98928.742  100907.109       1.906     590.487     309.841     474.134       1.530

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   370.91    -0.13   370.91     0.32   586.73
 MEAN    18.08     0.00    -0.02   370.91    -0.13   370.91     0.32
 HUB     15.21     0.00    -0.02   370.91    -0.13   370.91     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.68    46.36    12.32   609.37   713.49    17.17   547.98     0.62
 MEAN    55.33    42.30    13.03   536.08   651.99    17.17   547.98     0.57
 HUB     50.57    37.84    12.73   451.02   584.05    17.17   547.98     0.51

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   506.41   341.91   373.57  1172.47     0.43
 MEAN    18.01   508.71   338.35   379.88  1167.93     0.44
 HUB     15.22   543.34   381.38   387.01  1163.37     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   457.21   263.61     0.39  6984.34
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 MEAN   534.05   427.32   195.70     0.37  6096.04     1.68
 HUB    451.41   393.29    70.03     0.34  5807.64

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.09     1.20    19.43   592.72     1.06   571.31     0.92     0.89
 MEAN    21.60     1.17    18.96   588.49     1.05   566.88     0.92     0.89
 HUB     21.45     1.16    18.47   587.12     1.05   562.47     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.47    35.21    31.50     3.71     0.93     0.44     2.90
 MEAN    41.69    27.26    23.50     3.76     0.94     0.42     3.30     0.89
 HUB     44.58    10.26     6.50     3.76     0.94     0.41     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     555.896     339.303     440.333    1164.575       0.477      -0.148

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.686      18.551     563.641      46.000      37.616      30.600      -7.016

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     439.229     339.303     555.022    1174.547       0.374       0.251

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      21.639      19.645     573.335     455.853       0.027       0.424

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     433.910       0.000     433.910    1174.944       0.369       0.389

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      19.627     573.723       0.000       0.060       0.053       0.244

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.853      21.568       1.169     589.444      29.976     199.306       1.545

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 186720.125       0.509    1356.938 1113245.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =12.499   EfDer =  0.996

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    128.599    3398.000      21.568     589.444       1.000       1.000       0.880
W Kg/sec =   58.45397

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     93.436    3187.573       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  98928.742  100907.109       1.800     489.817     272.126     384.470       1.413

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   405.98    -0.14   405.98     0.34   558.27
 MEAN    17.74     0.00    -0.02   405.98    -0.14   405.98     0.34
 HUB     15.05     0.00    -0.02   405.98    -0.14   405.98     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.71    46.36     9.35   595.14   720.54    19.86   575.69     0.61
 MEAN    52.35    43.40     8.95   526.00   664.57    19.86   575.69     0.56
 HUB     47.72    38.84     8.88   446.28   603.42    19.86   575.69     0.51
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      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   487.78   325.56   363.23  1201.76     0.41
 MEAN    17.51   490.89   324.24   368.58  1197.81     0.41
 HUB     14.85   525.14   368.17   374.46  1193.89     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   447.79   261.87     0.37  6452.08
 MEAN   519.12   416.93   194.89     0.35  5678.72     1.73
 HUB    440.35   381.36    72.18     0.32  5469.39

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.36     1.18    22.63   620.15     1.05   600.29     0.92     0.91
 MEAN    24.88     1.15    22.16   616.47     1.05   596.35     0.92     0.91
 HUB     24.75     1.15    21.67   615.47     1.04   592.45     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.87    35.79    31.50     4.29     0.93     0.46     2.90
 MEAN    41.34    27.87    23.50     4.37     0.93     0.45     3.28     0.91
 HUB     44.51    10.91     6.50     4.41     0.93     0.45     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     495.513     326.363     372.855    1198.325       0.414       0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.966      22.192     596.867      46.000      41.196      31.500      -9.696

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     378.179     326.363     499.531    1206.885       0.313       0.393

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.911      23.270     605.424     471.992       0.030       0.478

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     368.158       0.000     368.158    1207.507       0.305       0.374

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.255     606.048       0.000       0.060       0.067       0.388

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.863      24.805       1.150     617.362      27.917     200.240       1.552

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 173989.297       0.504    1264.420 1222424.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =12.499   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    128.599    3398.000      24.805     617.362       1.000       1.000       0.980
W Kg/sec =   58.45397

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.142    3114.668       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  98928.742  100907.109       2.120     513.330     242.160     401.059       1.656

     ROTOR LEADING EDGE CONDITIONS, STAGE            4
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   346.47    -0.12   346.47     0.29   523.48
MEAN    16.97     0.00    -0.02   346.47    -0.12   346.47     0.29
HUB     14.32     0.00    -0.02   346.47    -0.12   346.47     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.76    46.36    12.40   571.12   668.10    23.43   607.35     0.55
MEAN    55.46    43.80    11.66   503.23   611.07    23.43   607.35     0.51
HUB     50.80    37.84    12.96   424.63   548.14    23.43   607.35     0.45

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   468.93   311.23   350.76  1228.07     0.38
MEAN    16.57   469.93   307.46   355.40  1224.35     0.38
HUB     13.89   499.71   345.97   360.58  1220.63     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    559.85   429.94   248.62     0.35  5878.28
MEAN   491.47   400.21   184.01     0.33  5097.75     1.67
HUB    411.88   366.55    65.92     0.30  4807.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     28.51     1.15    25.78   645.32     1.05   626.97     0.92     0.90
MEAN    28.00     1.13    25.29   641.60     1.04   623.18     0.92     0.90
HUB     27.81     1.12    24.78   640.22     1.04   619.39     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.58    35.33    31.50     3.83     0.93     0.44     2.90
MEAN    40.86    27.37    23.50     3.87     0.94     0.42     3.29     0.90
HUB     43.82    10.36     6.50     3.86     0.94     0.41     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.982

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     465.885     309.184     348.503    1225.425       0.380       0.043

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    28.079      25.411     624.272      46.000      41.579      32.400      -9.179

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     359.123     309.184     473.882    1232.616       0.291       0.406

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      28.034      26.428     631.621     456.573       0.026       0.488

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     342.458       0.000     342.458    1233.568       0.278       0.375

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      26.470     632.596       0.000       0.060       0.064       0.420

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.852      27.927       1.126     642.381      25.020     205.494       1.593

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 156027.000       0.498    1133.884 1089182.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =12.499   EfDer =  0.986
```

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
128.599	3398.000	27.927	642.381	1.000	1.000	0.980

W Kg/sec = 58.45397

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
75.330	3053.409	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
98928.742	100907.109	2.323	509.668	219.420	390.276	1.779

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	320.15	-0.11	320.15	0.26	488.14
MEAN	15.91	0.00	-0.02	320.15	-0.11	320.15	0.26	
HUB	13.07	0.00	-0.02	320.15	-0.11	320.15	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.49	47.36	12.13	543.25	630.66	26.65	633.83	0.51
MEAN	55.85	44.80	11.05	471.87	570.32	26.65	633.83	0.46
HUB	50.45	38.84	11.61	387.57	502.78	26.65	633.83	0.41

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	442.58	299.62	325.74	1251.84	0.35
MEAN	15.50	437.94	287.82	330.07	1247.99	0.35
HUB	12.59	457.74	312.16	334.79	1244.13	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	531.98	400.12	232.35	0.32	5377.26	
MEAN	459.55	372.07	171.73	0.30	4462.32	1.70
HUB	373.33	340.33	61.17	0.27	3931.53	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	31.59	1.13	28.97	667.94	1.04	651.60	0.92	0.90
MEAN	30.94	1.11	28.41	663.59	1.03	647.59	0.92	0.90
HUB	30.57	1.09	27.84	661.07	1.03	643.59	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.61	35.50	31.50	4.00	0.93	0.45	2.90	
MEAN	41.09	27.49	23.50	3.99	0.94	0.42	3.34	0.90
HUB	43.00	10.36	6.50	3.86	0.94	0.40	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.986

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	443.527	293.100	332.879	1248.178	0.355	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
30.981	28.390	647.792	46.000	41.364	33.000	-8.364

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	347.337	293.100	454.478	1254.276	0.277	0.343

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	30.915	29.310	654.137	440.827	0.045	0.488

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	325.837	0.000	325.837	1255.432	0.260	0.409

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	29.464	655.344	0.000	0.060	0.059	0.402

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    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      30.878       1.106     664.198      21.816     218.026       1.690

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  136136.359       0.481     989.334 1123475.125

    OVERALL EXIT CONDITIONS; ALL          5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     881100.62   6403.1621    125.6281      2.0439      0.8412     12.4987      1.2704


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =13.033   EfDer =  0.973

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     126.046    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   57.29363

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     123.134    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   96964.961   98904.055       2.319     831.557     358.594     619.754       1.728

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   289.39    -0.10   289.39     0.26   609.32
  MEAN    17.06     0.00    -0.02   289.39    -0.10   289.39     0.26
  HUB     12.51     0.00    -0.02   289.39    -0.10   289.39     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.69    50.47    14.22   611.74   676.83    14.41   515.82     0.61
  MEAN    60.23    47.20    13.03   505.89   582.90    14.41   515.82     0.52
  HUB     52.05    38.62    13.43   370.96   470.57    14.41   515.82     0.42

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   554.86   407.53   376.55  1136.96     0.49
  MEAN    18.04   568.02   417.53   385.12  1131.22     0.50
  HUB     15.00   626.90   484.40   397.95  1123.61     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   428.36   204.21     0.38  8409.49
  MEAN   534.83   402.59   117.30     0.36  7532.21     1.65
  HUB    444.80   399.91    39.60     0.36  7267.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.02     1.26    16.16   562.87     1.08   537.15     0.92     0.89
  MEAN    18.58     1.23    15.64   558.69     1.07   531.74     0.92     0.89
  HUB     18.45     1.22    14.93   557.43     1.07   524.60     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     47.26    28.47    24.20     4.27     0.93     0.47     2.90
  MEAN    47.31    16.94    12.70     4.24     0.94     0.41     3.51     0.89
  HUB     50.60    -5.68    -9.30     3.62     0.94     0.27     4.78
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     573.730     416.715     394.353    1131.658       0.507       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.651      15.646     532.169      24.000      46.579      35.400     -11.179

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     408.387     416.715     583.465    1145.989       0.356       0.457

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.555      16.993     545.732     528.796       0.041       0.580

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     379.968       0.000     379.968    1147.952       0.331       0.467

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.098     547.603       0.000       0.060       0.076       0.490

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.836      18.448       1.221     559.662      36.852     179.005       1.388

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 229435.094       0.613    1634.260 1216867.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.033   EfDer =  0.969

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3398.000      18.448     559.662       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.331    3271.287       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       1.943     590.487     303.844     474.134       1.560

     ROTOR LEADING EDGE CONDITIONS, STAGE           2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   362.99    -0.13   362.99     0.32   586.63
 MEAN    18.08     0.00    -0.02   362.99    -0.13   362.99     0.32
 HUB     15.21     0.00    -0.02   362.99    -0.13   362.99     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.22    46.36    12.86   609.37   709.40    17.21   548.66     0.62
 MEAN    55.90    42.30    13.60   536.08   647.51    17.21   548.66     0.56
 HUB     51.18    37.84    13.34   451.02   579.05    17.21   548.66     0.50

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   504.40   347.42   365.68  1173.39     0.43
 MEAN    18.01   505.53   342.41   371.91  1168.76     0.43
 HUB     15.22   538.66   382.81   378.96  1164.11     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   447.59   258.10     0.38  7096.87
 MEAN   534.05   418.38   191.64     0.36  6169.09     1.70
 HUB    451.41   385.12    68.60     0.33  5829.36
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	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.13	1.20	19.49	593.45	1.06	572.21	0.92	0.89
MEAN	21.62	1.17	19.01	589.03	1.05	567.69	0.92	0.89
HUB	21.44	1.16	18.51	587.42	1.05	563.19	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.53	35.21	31.50	3.71	0.93	0.45	2.90	
MEAN	42.64	27.26	23.50	3.76	0.94	0.43	3.30	0.89
HUB	45.29	10.26	6.50	3.76	0.94	0.42	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.969

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	550.860	343.373	430.745	1165.594	0.473	-0.143

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.702	18.620	564.629	46.000	38.560	30.600	-7.960

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	429.321	343.373	549.747	1175.816	0.365	0.272

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	21.649	19.742	574.577	455.853	0.029	0.438

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	424.292	0.000	424.292	1176.183	0.361	0.401

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	19.715	574.935	0.000	0.060	0.057	0.262

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.847	21.572	1.169	589.967	30.305	195.557	1.516

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
188769.812	0.515	1344.602	1088445.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =13.033 EfDer = 0.993

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
126.046	3398.000	21.572	589.967	1.000	1.000	0.880

W Kg/sec = 57.29363

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
91.603	3186.160	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96964.961	98904.055	1.836	489.817	266.788	384.470	1.441

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	397.16	-0.14	397.16	0.34	558.02
MEAN	17.74	0.00	-0.02	397.16	-0.14	397.16	0.34	
HUB	15.05	0.00	-0.02	397.16	-0.14	397.16	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.29	46.36	9.93	595.14	715.60	19.94	576.80	0.61
MEAN	52.95	43.40	9.55	526.00	659.21	19.94	576.80	0.56
HUB	48.34	38.84	9.50	446.28	597.51	19.94	576.80	0.51

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

```
         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   485.90   331.27   355.48  1202.97     0.40
MEAN    17.51   487.92   328.47   360.79  1198.93     0.41
HUB     14.85   520.74   369.78   366.65  1194.91     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    587.43   438.16   256.16     0.36  6565.12
MEAN   519.12   408.07   190.66     0.34  5752.75     1.76
HUB    440.35   373.38    70.57     0.31  5493.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.42     1.18    22.71   621.21     1.05   601.50     0.92     0.91
MEAN    24.92     1.16    22.23   617.34     1.05   597.47     0.92     0.91
HUB     24.76     1.15    21.73   616.11     1.04   593.47     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.98    35.78    31.50     4.28     0.93     0.47     2.90
MEAN    42.31    27.85    23.50     4.35     0.94     0.46     3.28     0.91
HUB     45.24    10.89     6.50     4.39     0.94     0.45     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     492.473     330.622     364.991    1199.434       0.411       0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.004      22.261     597.975      46.000      42.171      31.500     -10.671

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     369.909     330.622     496.129    1208.250       0.306       0.409

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.942      23.371     606.798     471.992       0.032       0.494

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     360.285       0.000     360.285    1208.833       0.298       0.385

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.343     607.384       0.000       0.060       0.072       0.399

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      24.828       1.151     618.219      28.252     196.289       1.522

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 176075.625       0.510    1254.182 1194253.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =13.033   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3398.000      24.828     618.219       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.473    3112.507       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       2.163     513.330     237.299     401.059       1.690

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   339.14    -0.12   339.14     0.28   523.12
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 MEAN    16.97     0.00    -0.02   339.14    -0.12   339.14     0.28
 HUB     14.32     0.00    -0.02   339.14    -0.12   339.14     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.30    46.36    12.94   571.12   664.33    23.51   608.62     0.55
 MEAN    56.03    43.80    12.23   503.23   606.94    23.51   608.62     0.50
 HUB     51.39    37.84    13.55   424.63   543.54    23.51   608.62     0.45

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   466.96   316.45   343.37  1229.51     0.38
 MEAN    16.57   466.89   311.29   347.97  1225.72     0.38
 HUB     13.89   495.29   347.33   353.10  1221.91     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   420.89   243.40     0.34  5976.92
 MEAN   491.47   391.85   180.18     0.32  5161.28     1.70
 HUB    411.88   358.95    64.55     0.29  4826.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.58     1.15    25.87   646.64     1.05   628.45     0.92     0.90
 MEAN    28.05     1.13    25.38   642.76     1.04   624.58     0.92     0.90
 HUB     27.83     1.12    24.85   641.17     1.04   620.70     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.66    35.33    31.50     3.83     0.93     0.45     2.90
 MEAN    41.82    27.37    23.50     3.87     0.94     0.43     3.29     0.90
 HUB     44.53    10.36     6.50     3.86     0.94     0.42     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     463.094     313.042     341.264    1226.753       0.377       0.041

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.128      25.490     625.633      46.000      42.530      32.400     -10.130

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     351.415     313.042     470.624    1234.171       0.285       0.420

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.077      26.539     633.222     456.573       0.028       0.503

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     335.273       0.000     335.273    1235.072       0.271       0.385

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.565     634.147       0.000       0.060       0.069       0.430

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.846      27.963       1.126     643.526      25.307     201.579       1.563

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 157817.797       0.504    1124.132 1064573.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.033   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3398.000      27.963     643.526       1.000       1.000       0.980
W Kg/sec =   57.29363
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
73.806	3050.693	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96964.961	98904.055	2.371	509.668	214.984	390.276	1.815

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	313.50	-0.11	313.50	0.25	487.71
MEAN	15.91	0.00	-0.02	313.50	-0.11	313.50	0.25	
HUB	13.07	0.00	-0.02	313.50	-0.11	313.50	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.02	47.36	12.66	543.25	627.31	26.74	635.33	0.51
MEAN	56.41	44.80	11.61	471.87	566.61	26.74	635.33	0.46
HUB	51.04	38.84	12.20	387.57	498.57	26.74	635.33	0.40

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	440.96	304.45	318.99	1253.44	0.35
MEAN	15.50	435.21	291.38	323.27	1249.52	0.35
HUB	12.59	453.60	313.39	327.92	1245.60	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	531.98	391.82	227.52	0.31	5463.86	
MEAN	459.55	364.39	168.17	0.29	4517.48	1.73
HUB	373.33	333.35	59.94	0.27	3947.05	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	31.67	1.13	29.07	669.49	1.04	653.28	0.92	0.90
MEAN	31.00	1.11	28.51	665.00	1.03	649.20	0.92	0.90
HUB	30.61	1.09	27.93	662.28	1.03	645.13	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.66	35.50	31.50	4.00	0.93	0.46	2.90	
MEAN	42.03	27.48	23.50	3.98	0.94	0.43	3.34	0.90
HUB	43.70	10.36	6.50	3.86	0.94	0.41	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.983

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	440.840	296.728	326.026	1249.701	0.353	-0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
31.042	28.481	649.384	46.000	42.306	33.000	-9.306

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	340.008	296.728	451.279	1256.003	0.271	0.358

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	30.967	29.429	655.950	440.827	0.049	0.503

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	319.071	0.000	319.071	1257.104	0.254	0.420

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	29.570	657.101	0.000	0.060	0.064	0.412

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.853	30.927	1.106	665.591	22.065	213.921	1.658

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 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  137691.625       0.487     980.774 1098130.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     889789.94   6337.9497    123.1343      2.0472      0.8350     13.0332      1.2731



*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.453   EfDer =  0.970

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     124.053    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   56.38775

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     121.187    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   95431.844   97340.273       2.356     831.557     352.924     619.754       1.756

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   284.49    -0.10   284.49     0.26   609.32
  MEAN    17.06     0.00    -0.02   284.49    -0.10   284.49     0.26
  HUB     12.51     0.00    -0.02   284.49    -0.10   284.49     0.26

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     65.06    50.47    14.59   611.74   674.75    14.44   516.05     0.61
  MEAN    60.65    47.20    13.45   505.89   580.48    14.44   516.05     0.52
  HUB     52.52    38.62    13.90   370.96   467.57    14.44   516.05     0.42

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   553.01   410.94   370.06  1137.49     0.49
  MEAN    18.04   564.98   419.45   378.51  1131.70     0.50
  HUB     15.00   621.92   483.62   391.02  1124.10     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   421.03   200.80     0.37  8479.75
  MEAN   534.83   395.70   115.38     0.35  7566.82     1.67
  HUB    444.80   392.94    38.82     0.35  7255.49

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.04     1.26    16.19   563.20     1.08   537.66     0.92     0.89
  MEAN    18.59     1.23    15.67   558.85     1.07   532.19     0.92     0.89
  HUB     18.43     1.22    14.97   557.37     1.07   525.07     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     48.00    28.49    24.20     4.29     0.93     0.48     2.90
  MEAN    47.94    16.95    12.70     4.25     0.94     0.42     3.51     0.89
  HUB     51.04    -5.67    -9.30     3.63     0.94     0.28     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.970
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     570.489     418.632     387.563    1132.145       0.504       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.655      15.682     532.627      24.000      47.207      35.400     -11.807

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     401.150     418.632     579.805    1146.657       0.350       0.467

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.554      17.046     546.369     528.796       0.043       0.590

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     373.481       0.000     373.481    1148.534       0.325       0.473

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.137     548.159       0.000       0.060       0.079       0.496

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.832      18.442       1.221     559.810      37.000     176.951       1.372

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 230356.203       0.616    1614.878 1196272.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =13.453   EfDer =  0.966

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    124.053    3398.000      18.442     559.810       1.000       1.000       0.980
W Kg/sec =   56.38775

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.728    3270.854       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95431.844   97340.273       1.974     590.487     299.176     474.134       1.585

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   356.86    -0.12   356.86     0.31   586.55
 MEAN    18.08     0.00    -0.02   356.86    -0.12   356.86     0.31
 HUB     15.21     0.00    -0.02   356.86    -0.12   356.86     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.65    46.36    13.29   609.37   706.28    17.25   549.18     0.61
 MEAN    56.35    42.30    14.05   536.08   644.10    17.25   549.18     0.56
 HUB     51.66    37.84    13.82   451.02   575.22    17.25   549.18     0.50

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     20.42   502.95   351.64   359.60  1174.09     0.43
 MEAN    18.01   503.17   345.54   365.76  1169.39     0.43
 HUB     15.22   535.08   383.89   372.74  1164.68     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   440.19   253.88     0.37  7182.96
 MEAN   534.05   411.48   188.51     0.35  6225.41     1.72
 HUB    451.41   378.81    67.52     0.33  5845.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.15     1.20    19.53   594.01     1.06   572.89     0.92     0.88
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 MEAN    21.63     1.17    19.04   589.45     1.05   568.31     0.92     0.88
 HUB     21.43     1.16    18.54   587.64     1.05   563.74     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.36    35.22    31.50     3.72     0.93     0.46     2.90
 MEAN    43.37    27.27    23.50     3.77     0.95     0.44     3.30     0.88
 HUB     45.84    10.27     6.50     3.77     0.95     0.43     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     547.092     346.511     423.367    1166.362       0.469      -0.138

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.711      18.670     565.375      46.000      39.299      30.600      -8.699

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     421.714     346.511     545.814    1176.777       0.358       0.288

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      21.655      19.813     575.518     455.853       0.031       0.450

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     416.910       0.000     416.910    1177.121       0.354       0.410

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      19.778     575.854       0.000       0.060       0.061       0.275

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.842      21.572       1.170     590.367      30.557     192.697       1.494

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 190340.844       0.519    1334.356 1069224.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.453   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    124.053    3398.000      21.572     590.367       1.000       1.000       0.880
W Kg/sec =   56.38775

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     90.184    3185.080       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95431.844   97340.273       1.865     489.817     262.658     384.470       1.464

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   390.37    -0.13   390.37     0.33   557.83
 MEAN    17.74     0.00    -0.02   390.37    -0.13   390.37     0.33
 HUB     15.05     0.00    -0.02   390.37    -0.13   390.37     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.74    46.36    10.38   595.14   711.86    19.99   577.65     0.60
 MEAN    53.43    43.40    10.03   526.00   655.14    19.99   577.65     0.56
 HUB     48.83    38.84     9.99   446.28   593.02    19.99   577.65     0.50

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     19.81   484.59   335.63   349.54  1203.88     0.40
 MEAN    17.51   485.72   331.69   354.83  1199.78     0.40
 HUB     14.85   517.41   371.01   360.65  1195.69     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   430.80   251.80     0.36  6651.43
 MEAN   519.12   401.29   187.43     0.33  5809.13     1.78
 HUB    440.35   367.25    69.34     0.31  5511.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.46     1.18    22.77   622.02     1.05   602.42     0.92     0.91
 MEAN    24.94     1.16    22.28   618.01     1.05   598.32     0.92     0.91
 HUB     24.76     1.15    21.77   616.59     1.04   594.25     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.84    35.77    31.50     4.27     0.93     0.48     2.90
 MEAN    43.07    27.84    23.50     4.34     0.94     0.46     3.28     0.91
 HUB     45.81    10.88     6.50     4.38     0.94     0.46     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     490.224     333.866     358.960    1200.273       0.408       0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.027      22.308     598.815      46.000      42.926      31.500     -11.426

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     363.579     333.866     493.616    1209.284       0.301       0.421

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.961      23.442     607.840     471.992       0.034       0.506

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     354.257       0.000     354.257    1209.840       0.293       0.393

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.404     608.399       0.000       0.060       0.077       0.407

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854      24.840       1.151     618.874      28.507     193.298       1.498

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 177665.656       0.515    1245.499 1172479.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =13.453   EfDer =  0.976

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    124.053    3398.000      24.840     618.874       1.000       1.000       0.980
W Kg/sec =   56.38775

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.189    3110.859       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95431.844   97340.273       2.198     513.330     233.560     401.059       1.717

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   333.53    -0.11   333.53     0.28   522.84
 MEAN    16.97     0.00    -0.02   333.53    -0.11   333.53     0.28
 HUB     14.32     0.00    -0.02   333.53    -0.11   333.53     0.28
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.72    46.36    13.36   571.12   661.48    23.56   609.59     0.55
MEAN    56.47    43.80    12.67   503.23   603.83    23.56   609.59     0.50
HUB     51.86    37.84    14.02   424.63   540.05    23.56   609.59     0.45

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   465.55   320.42   337.73  1230.60     0.38
MEAN    16.57   464.64   314.22   342.29  1226.75     0.38
HUB     13.89   491.95   348.36   347.37  1222.89     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    559.85   413.99   239.43     0.34  6051.81
MEAN   491.47   385.46   177.25     0.31  5209.81     1.72
HUB    411.88   353.13    63.53     0.29  4840.30

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     28.63     1.15    25.94   647.65     1.05   629.57     0.92     0.89
MEAN    28.08     1.13    25.43   643.65     1.04   625.64     0.92     0.89
HUB     27.84     1.12    24.90   641.89     1.04   621.70     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.49    35.33    31.50     3.83     0.93     0.46     2.90
MEAN    42.55    27.38    23.50     3.88     0.94     0.44     3.29     0.89
HUB     45.08    10.36     6.50     3.86     0.94     0.43     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.976

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     461.043     315.988     335.727    1227.759       0.376       0.040

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    28.157      25.543     626.664      46.000      43.265      32.400     -10.865

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     345.528     315.988     468.229    1235.350       0.280       0.432

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      28.103      26.615     634.438     456.573       0.030       0.515

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     329.784       0.000     329.784    1236.213       0.267       0.394

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      26.630     635.325       0.000       0.060       0.074       0.437

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.841      27.982       1.126     644.399      25.525     198.621       1.540

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 159178.328       0.508    1115.896 1045527.312


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =13.453   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    124.053    3398.000      27.982     644.399       1.000       1.000       0.980
W Kg/sec =   56.38775

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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    72.639    3048.626       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 95431.844   97340.273       2.409     509.668     211.586     390.276       1.845

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   308.42    -0.11   308.42     0.25   487.38
MEAN    15.91     0.00    -0.02   308.42    -0.11   308.42     0.25
HUB     13.07     0.00    -0.02   308.42    -0.11   308.42     0.25

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.42    47.36    13.06   543.25   624.78    26.80   636.47     0.50
MEAN    56.84    44.80    12.04   471.87   563.81    26.80   636.47     0.46
HUB     51.50    38.84    12.66   387.57   495.39    26.80   636.47     0.40

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   439.81   308.10   313.85  1254.65     0.35
MEAN    15.50   433.18   294.05   318.08  1250.69     0.35
HUB     12.59   450.49   314.35   322.68  1246.71     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    531.98   385.52   223.87     0.31  5529.33
MEAN   459.55   358.56   165.50     0.29  4558.84     1.75
HUB    373.33   328.02    58.98     0.26  3959.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     31.72     1.13    29.14   670.68     1.04   654.55     0.92     0.90
MEAN    31.04     1.11    28.57   666.06     1.03   650.42     0.92     0.90
HUB     30.63     1.09    27.98   663.21     1.03   646.29     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.47    35.50    31.50     4.00     0.93     0.47     2.90
MEAN    42.75    27.49    23.50     3.99     0.94     0.44     3.34     0.90
HUB     44.25    10.36     6.50     3.86     0.94     0.41     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.980

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     438.837     299.447     320.795    1250.855       0.351      -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.078      28.541     650.593      46.000      43.029      33.000     -10.029

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     334.427     299.447     448.898    1257.311       0.266       0.369

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      30.997      29.509     657.325     440.827       0.052       0.515

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     313.915       0.000     313.915    1258.371       0.249       0.428

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      29.641     658.434       0.000       0.060       0.069       0.420

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.849      30.953       1.106     666.652      22.253     210.833       1.634

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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  138866.000       0.491     973.499 1078513.250

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     896407.06   6284.1279    121.1874      2.0489      0.8300     13.4528      1.2751


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.967

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     121.688    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   55.31266

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     118.877    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   93612.320   95484.359       2.402     831.557     346.195     619.754       1.790

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   278.70    -0.10   278.70     0.25   609.32
  MEAN    17.06     0.00    -0.02   278.70    -0.10   278.70     0.25
  HUB     12.51     0.00    -0.02   278.70    -0.10   278.70     0.25

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     65.51    50.47    15.04   611.74   672.33    14.46   516.32     0.60
  MEAN    61.15    47.20    13.95   505.89   577.66    14.46   516.32     0.52
  HUB     53.09    38.62    14.47   370.96   464.07    14.46   516.32     0.42

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   550.94   414.94   362.44  1138.11     0.48
  MEAN    18.04   561.49   421.71   370.72  1132.25     0.50
  HUB     15.00   616.10   482.70   382.86  1124.67     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   412.42   196.80     0.36  8562.19
  MEAN   534.83   387.60   113.11     0.34  7607.63     1.70
  HUB    444.80   384.73    37.90     0.34  7241.68

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.07     1.26    16.24   563.60     1.08   538.24     0.92     0.88
  MEAN    18.59     1.23    15.71   559.05     1.07   532.72     0.92     0.88
  HUB     18.41     1.22    15.01   557.31     1.07   525.60     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     48.86    28.50    24.20     4.30     0.93     0.49     2.90
  MEAN    48.68    16.97    12.70     4.27     0.95     0.44     3.51     0.88
  HUB     51.58    -5.65    -9.30     3.65     0.95     0.29     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.967

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
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    18.071     566.767     420.892     379.572    1132.705       0.500       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.659      15.723     533.154      24.000      47.955      35.400     -12.555

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     392.648     420.892     575.606    1147.431       0.342       0.479

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.552      17.106     547.107     528.796       0.045       0.602

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    18.083     365.847       0.000     365.847    1149.210       0.318       0.481

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.182     548.804       0.000       0.060       0.084       0.503

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.826      18.433       1.220     559.984      37.174     174.527       1.353

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 231437.672       0.618    1591.525 1171925.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.962

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.688    3398.000      18.433     559.984       1.000       1.000       0.980
W Kg/sec =   55.31266

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.830    3270.347       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93612.320   95484.359       2.011     590.487     293.648     474.134       1.615

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   349.64    -0.12   349.64     0.30   586.46
 MEAN    18.08     0.00    -0.02   349.64    -0.12   349.64     0.30
 HUB     15.21     0.00    -0.02   349.64    -0.12   349.64     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.16    46.36    13.80   609.37   702.66    17.29   549.78     0.61
 MEAN    56.89    42.30    14.59   536.08   640.12    17.29   549.78     0.56
 HUB     52.22    37.84    14.38   451.02   570.77    17.29   549.78     0.50

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   501.38   356.58   352.46  1174.89     0.43
 MEAN    18.01   500.47   349.18   358.54  1170.12     0.43
 HUB     15.22   530.92   385.15   365.42  1165.33     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   431.51   248.94     0.37  7283.82
 MEAN   534.05   403.39   184.88     0.34  6290.80     1.75
 HUB    451.41   371.38    66.26     0.32  5864.91

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.18     1.20    19.57   594.66     1.06   573.67     0.92     0.88
 MEAN    21.64     1.17    19.08   589.93     1.05   569.02     0.92     0.88
 HUB     21.41     1.16    18.57   587.91     1.05   564.37     0.92     0.88
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.33    35.23    31.50     3.73     0.93     0.47     2.90
 MEAN    44.24    27.28    23.50     3.78     0.95     0.45     3.30     0.88
 HUB     46.51    10.28     6.50     3.78     0.95     0.44     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.962

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     542.770     350.155     414.717    1167.248       0.465      -0.133

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.719      18.724     566.237      46.000      40.175      30.600      -9.575

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     412.818     350.155     541.320    1177.887       0.350       0.306

   BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.850      21.658      19.892     576.605     455.853       0.033       0.464

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     408.279       0.000     408.279    1178.205       0.347       0.420

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      19.848     576.917       0.000       0.060       0.066       0.290

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.836      21.569       1.170     590.835      30.851     189.373       1.468

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 192172.609       0.524    1321.511 1046561.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.989

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    121.688    3398.000      21.569     590.835       1.000       1.000       0.880
W Kg/sec =   55.31266

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     88.514    3183.819       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93612.320   95484.359       1.900     489.817     257.792     384.470       1.491

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   382.43    -0.13   382.43     0.32   557.61
 MEAN    17.74     0.00    -0.02   382.43    -0.13   382.43     0.32
 HUB     15.05     0.00    -0.02   382.43    -0.13   382.43     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.28    46.36    10.92   595.14   707.53    20.05   578.63     0.60
 MEAN    53.99    43.40    10.59   526.00   650.44    20.05   578.63     0.55
 HUB     49.41    38.84    10.57   446.28   587.83    20.05   578.63     0.50

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   483.18   340.70   342.62  1204.94      0.40
 MEAN    17.51   483.25   335.46   347.85  1200.76      0.40
 HUB     14.85   513.58   372.44   353.62  1196.59      0.43
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   422.21   246.73     0.35  6751.96
 MEAN   519.12   393.36   183.66     0.33  5875.13     1.81
 HUB    440.35   360.08    67.91     0.30  5532.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.50     1.18    22.83   622.96     1.05   603.48     0.92     0.90
 MEAN    24.97     1.16    22.33   618.79     1.05   599.30     0.92     0.90
 HUB     24.76     1.15    21.81   617.16     1.04   595.15     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.84    35.76    31.50     4.26     0.93     0.49     2.90
 MEAN    43.96    27.83    23.50     4.33     0.94     0.47     3.28     0.90
 HUB     46.48    10.87     6.50     4.37     0.94     0.47     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     487.707     337.664     351.911    1201.242       0.406       0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.048      22.358     599.786      46.000      43.816      31.500     -12.316

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     356.192     337.664     490.805    1210.483       0.294       0.435

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.977      23.519     609.050     471.992       0.036       0.520

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     347.218       0.000     347.218    1211.006       0.287       0.403

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.468     609.577       0.000       0.060       0.083       0.416

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.849      24.848       1.152     619.640      28.805     189.836       1.472

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 179521.703       0.520    1234.515 1146868.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.972

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.688    3398.000      24.848     619.640       1.000       1.000       0.980
W Kg/sec =   55.31266

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      78.683    3108.937       1.401       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93612.320   95484.359       2.240     513.330     229.177     401.059       1.750

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   326.98    -0.11   326.98     0.27   522.52
 MEAN    16.97     0.00    -0.02   326.98    -0.11   326.98     0.27
 HUB     14.32     0.00    -0.02   326.98    -0.11   326.98     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.21    46.36    13.85   571.12   658.19    23.62   610.72     0.54
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 MEAN    56.99    43.80    13.19   503.23   600.23    23.62   610.72     0.50
 HUB     52.41    37.84    14.57   424.63   536.02    23.62   610.72     0.44

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   464.02   325.03   331.16  1231.87     0.38
 MEAN    16.57   462.11   317.62   335.66  1227.95     0.38
 HUB     13.89   488.11   349.56   340.68  1224.02     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   405.97   234.82     0.33  6138.74
 MEAN   491.47   378.01   173.85     0.31  5266.05     1.75
 HUB    411.88   346.33    62.33     0.28  4856.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.68     1.15    26.00   648.83     1.05   630.87     0.92     0.89
 MEAN    28.11     1.13    25.49   644.68     1.04   626.87     0.92     0.89
 HUB     27.85     1.12    24.95   642.74     1.04   622.86     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.46    35.34    31.50     3.84     0.93     0.47     2.90
 MEAN    43.42    27.38    23.50     3.88     0.94     0.45     3.29     0.89
 HUB     45.74    10.37     6.50     3.87     0.94     0.44     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.972

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     458.731     319.403     329.265    1228.923       0.373       0.039

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.184      25.597     627.861      46.000      44.129      32.400     -11.729

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     338.671     319.403     465.528    1236.715       0.274       0.445

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.125      26.696     635.848     456.573       0.032       0.529

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     323.386       0.000     323.386    1237.536       0.261       0.403

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.696     636.692       0.000       0.060       0.079       0.445

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4         PR4       Texit        Del T       Ns        Ns nondim
      0.835      27.996       1.127     645.417      25.778     195.208       1.513

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 160757.984       0.513    1105.483 1023094.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.977

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.688    3398.000      27.996     645.417       1.000       1.000       0.980
W Kg/sec =   55.31266

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     71.275    3046.219       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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  93612.320   95484.359       2.455     509.668     207.613     390.276       1.880

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   302.50    -0.10   302.50     0.24   486.99
MEAN    15.91     0.00    -0.02   302.50    -0.10   302.50     0.24
HUB     13.07     0.00    -0.02   302.50    -0.10   302.50     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.89    47.36    13.53   543.25   621.88    26.86   637.79     0.50
MEAN    57.34    44.80    12.54   471.87   560.59    26.86   637.79     0.45
HUB     52.04    38.84    13.20   387.57   491.72    26.86   637.79     0.40

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   438.57   312.34   307.87  1256.05     0.35
MEAN    15.50   430.91   297.19   312.03  1252.03     0.34
HUB     12.59   446.91   315.46   316.57  1248.01     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    531.98   378.18   219.63     0.30  5605.37
MEAN   459.55   351.75   162.36     0.28  4607.36     1.77
HUB    373.33   321.81    57.87     0.26  3973.01

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     31.77     1.13    29.20   672.06     1.04   656.02     0.92     0.89
MEAN    31.07     1.11    28.63   667.31     1.03   651.83     0.92     0.89
HUB     30.64     1.09    28.04   664.30     1.03   647.64     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     45.41    35.50    31.50     4.00     0.93     0.48     2.90
MEAN    43.60    27.49    23.50     3.99     0.94     0.45     3.34     0.89
HUB     44.90    10.36     6.50     3.86     0.94     0.42     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     436.611     302.637     314.706    1252.191       0.349      -0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.110      28.600     651.993      46.000      43.880      33.000     -10.880

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     327.936     302.637     446.242    1258.827       0.261       0.381

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.021      29.591     658.921     440.827       0.055       0.529

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     307.916       0.000     307.916    1259.841       0.244       0.438

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.712     659.983       0.000       0.060       0.074       0.429

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.843      30.974       1.106     667.889      22.472     207.268       1.607

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 140235.047       0.496     964.353 1055404.625

   OVERALL EXIT CONDITIONS; ALL          5   STAGES
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   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     904125.06   6217.3877    118.8768      2.0503      0.8238     13.9533      1.2775


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =14.465   EfDer =  0.963

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     119.284    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   54.22009

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     116.529    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   91763.242   93598.312       2.450     831.557     339.357     619.754       1.826

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   272.84    -0.09   272.84     0.24   609.32
  MEAN    17.06     0.00    -0.02   272.84    -0.09   272.84     0.24
  HUB     12.51     0.00    -0.02   272.84    -0.09   272.84     0.24

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     65.97    50.47    15.50   611.74   669.92    14.49   516.59     0.60
  MEAN    61.66    47.20    14.46   505.89   574.86    14.49   516.59     0.52
  HUB     53.67    38.62    15.05   370.96   460.57    14.49   516.59     0.41

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   548.98   418.95   354.76  1138.71     0.48
  MEAN    18.04   558.05   423.96   362.88  1132.80     0.49
  HUB     15.00   610.29   481.76   374.65  1125.24     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   403.76   192.79     0.35  8644.98
  MEAN   534.83   379.44   110.86     0.33  7648.18     1.73
  HUB    444.80   376.46    36.97     0.33  7227.63

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.09     1.26    16.28   563.99     1.08   538.82     0.92     0.88
  MEAN    18.60     1.23    15.75   559.24     1.07   533.23     0.92     0.88
  HUB     18.39     1.22    15.05   557.24     1.07   526.13     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     49.74    28.52    24.20     4.32     0.93     0.51     2.90
  MEAN    49.44    16.99    12.70     4.29     0.95     0.45     3.51     0.88
  HUB     52.13    -5.64    -9.30     3.66     0.95     0.30     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.963

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     563.093     423.138     371.520    1133.258       0.497       0.004

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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    18.662      15.761     533.674      24.000      48.716      35.400     -13.316

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     384.098     423.138     571.469    1148.194       0.335       0.491

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.549      17.165     547.835     528.796       0.048       0.615

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    18.083     358.157       0.000     358.157    1149.878       0.311       0.488

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.224     549.443       0.000       0.060       0.089       0.510

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.820      18.424       1.220     560.157      37.347     172.080       1.334

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 232518.375       0.621    1567.374 1147284.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =14.465   EfDer =  0.957

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.284    3398.000      18.424     560.157       1.000       1.000       0.980
W Kg/sec =   54.22009

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     98.905    3269.840       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 91763.242   93598.312       2.050     590.487     288.041     474.134       1.646

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   342.36    -0.12   342.36     0.30   586.37
 MEAN    18.08     0.00    -0.02   342.36    -0.12   342.36     0.30
 HUB     15.21     0.00    -0.02   342.36    -0.12   342.36     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.68    46.36    14.32   609.37   699.06    17.33   550.37     0.61
 MEAN    57.44    42.30    15.14   536.08   636.17    17.33   550.37     0.55
 HUB     52.81    37.84    14.97   451.02   566.34    17.33   550.37     0.49

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   499.93   361.52   345.30  1175.68     0.43
 MEAN    18.01   497.86   352.81   351.27  1170.84     0.43
 HUB     15.22   526.78   386.39   358.05  1165.98     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   422.81   244.00     0.36  7384.66
 MEAN   534.05   395.27   181.24     0.34  6356.23     1.77
 HUB    451.41   363.91    65.02     0.31  5883.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.21     1.21    19.61   595.32     1.06   574.45     0.92     0.88
 MEAN    21.65     1.18    19.11   590.42     1.05   569.72     0.92     0.88
 HUB     21.40     1.16    18.60   588.17     1.05   565.00     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.31    35.25    31.50     3.75     0.93     0.48     2.90
 MEAN    45.13    27.29    23.50     3.79     0.95     0.46     3.30     0.88
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 HUB     47.18    10.29     6.50     3.79     0.95     0.44     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.957

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     538.556     353.801     406.039    1168.121       0.461      -0.129

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.724      18.775     567.084      46.000      41.067      30.600     -10.467

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     403.912     353.801     536.954    1178.983       0.343       0.325

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      21.657      19.966     577.680     455.853       0.035       0.478

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     399.639       0.000     399.639    1179.276       0.339       0.430

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      19.912     577.967       0.000       0.060       0.071       0.305

    STAGE EXIT CONDITIONS, STAGE            2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.829      21.562       1.170     591.302      31.145     186.063       1.442

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 194002.875       0.529    1307.746 1023690.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =14.465   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.284    3398.000      21.562     591.302       1.000       1.000       0.880
W Kg/sec =   54.22009

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.828    3182.561       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  91763.242   93598.312       1.937     489.817     252.884     384.470       1.520

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   374.47    -0.13   374.47     0.32   557.39
 MEAN    17.74     0.00    -0.02   374.47    -0.13   374.47     0.32
 HUB     15.05     0.00    -0.02   374.47    -0.13   374.47     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.83    46.36    11.47   595.14   703.26    20.11   579.60     0.60
 MEAN    54.56    43.40    11.16   526.00   645.79    20.11   579.60     0.55
 HUB     50.01    38.84    11.17   446.28   582.68    20.11   579.60     0.49

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   481.90   345.75   335.69  1205.97     0.40
 MEAN    17.51   480.87   339.19   340.87  1201.72     0.40
 HUB     14.85   509.78   373.85   346.58  1197.48     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   413.64   241.68     0.34  6851.93
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 MEAN   519.12   385.44   179.93     0.32  5940.36     1.83
 HUB    440.35   352.90    66.50     0.29  5553.55

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.54     1.18    22.88   623.91     1.06   604.52     0.92     0.90
 MEAN    24.98     1.16    22.37   619.57     1.05   600.27     0.92     0.90
 HUB     24.75     1.15    21.85   617.73     1.04   596.04     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.85    35.75    31.50     4.25     0.93     0.50     2.90
 MEAN    44.86    27.83    23.50     4.33     0.94     0.48     3.28     0.90
 HUB     47.17    10.86     6.50     4.36     0.94     0.48     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     485.274     341.417     344.855    1202.199       0.404       0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.064      22.400     600.746      46.000      44.713      31.500     -13.213

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     348.813     341.417     488.094    1211.667       0.288       0.449

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.987      23.588     610.247     471.992       0.038       0.535

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     340.182       0.000     340.182    1212.160       0.281       0.413

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.525     610.743       0.000       0.060       0.089       0.426

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.843      24.849       1.152     620.402      29.100     186.420       1.445

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 181360.562       0.526    1222.526 1121085.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =14.465   EfDer =  0.968

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    119.284    3398.000      24.849     620.402       1.000       1.000       0.980
W Kg/sec =   54.22009

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     77.172    3107.026       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  91763.242   93598.312       2.284     513.330     224.776     401.059       1.784

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   320.42    -0.11   320.42     0.26   522.20
 MEAN    16.97     0.00    -0.02   320.42    -0.11   320.42     0.26
 HUB     14.32     0.00    -0.02   320.42    -0.11   320.42     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.71    46.36    14.35   571.12   654.96    23.67   611.84     0.54
 MEAN    57.52    43.80    13.72   503.23   596.68    23.67   611.84     0.49
 HUB     52.97    37.84    15.13   424.63   532.05    23.67   611.84     0.44
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      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   462.63   329.63   324.61  1233.11     0.38
MEAN    16.57   459.66   320.97   329.04  1229.13     0.37
HUB     13.89   484.31   350.73   333.99  1225.14     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    559.85   397.96   230.23     0.32  6225.46
MEAN   491.47   370.59   170.50     0.30  5321.61     1.77
HUB    411.88   339.54    61.15     0.28  4873.20

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     28.72     1.16    26.05   650.01     1.05   632.15     0.92     0.89
MEAN    28.13     1.13    25.54   645.71     1.04   628.08     0.92     0.89
HUB     27.84     1.12    25.00   643.58     1.04   624.01     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     45.44    35.35    31.50     3.85     0.93     0.48     2.90
MEAN    44.29    27.39    23.50     3.89     0.94     0.46     3.29     0.89
HUB     46.40    10.38     6.50     3.88     0.94     0.45     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.968

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     456.498     322.776     322.809    1230.075       0.371       0.038

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.202      25.641     629.045      46.000      44.997      32.400     -12.597

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     331.831     322.776     462.922    1238.066       0.268       0.458

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.138      26.766     637.244     456.573       0.034       0.544

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     317.000       0.000     317.000    1238.845       0.256       0.412

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.753     638.047       0.000       0.060       0.085       0.453

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.829      28.001       1.127     646.431      26.029     191.840       1.487

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 162325.000       0.518    1094.210 1000481.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =14.465   EfDer =  0.973

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.284    3398.000      28.001     646.431       1.000       1.000       0.980
W Kg/sec =   54.22009

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     69.910    3043.831       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  91763.242   93598.312       2.503     509.668     203.637     390.276       1.917

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
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	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	296.58	-0.10	296.58	0.24	486.61
MEAN	15.91	0.00	-0.02	296.58	-0.10	296.58	0.24	
HUB	13.07	0.00	-0.02	296.58	-0.10	296.58	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.37	47.36	14.01	543.25	619.02	26.91	639.10	0.50
MEAN	57.86	44.80	13.06	471.87	557.42	26.91	639.10	0.45
HUB	52.58	38.84	13.74	387.57	488.10	26.91	639.10	0.39

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	437.44	316.55	301.91	1257.43	0.35
MEAN	15.50	428.72	300.28	306.00	1253.37	0.34
HUB	12.59	443.38	316.54	310.47	1249.29	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	531.98	370.89	215.43	0.29	5680.77	
MEAN	459.55	344.97	159.28	0.28	4655.19	1.80
HUB	373.33	315.62	56.79	0.25	3986.60	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	31.81	1.14	29.25	673.43	1.04	657.47	0.92	0.89
MEAN	31.10	1.11	28.68	668.55	1.03	653.23	0.92	0.89
HUB	30.64	1.09	28.08	665.38	1.03	648.98	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	46.36	35.51	31.50	4.01	0.93	0.49	2.90	
MEAN	44.46	27.50	23.50	4.00	0.94	0.46	3.34	0.89
HUB	45.56	10.37	6.50	3.87	0.94	0.43	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.973

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	434.461	305.782	308.632	1253.512	0.347	-0.012

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
31.131	28.647	653.379	46.000	44.734	33.000	-11.734

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	321.473	305.782	443.675	1260.325	0.255	0.394

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	31.034	29.660	660.501	440.827	0.059	0.543

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	301.939	0.000	301.939	1261.294	0.239	0.447

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	29.771	661.517	0.000	0.060	0.079	0.438

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.838	30.983	1.107	669.119	22.688	203.758	1.580

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
141587.656	0.500	954.422	1032107.125

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
911794.50	6146.2778	116.5287	2.0509	0.8172	14.4648	1.2799

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =14.972   EfDer =  0.959

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     116.916    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   53.14380

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     114.216    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   89941.703   91740.344       2.500     831.557     332.621     619.754       1.863

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   267.09    -0.09   267.09     0.24   609.32
  MEAN    17.06     0.00    -0.02   267.09    -0.09   267.09     0.24
  HUB     12.51     0.00    -0.02   267.09    -0.09   267.09     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     66.42    50.47    15.95   611.74   667.59    14.51   516.85     0.60
  MEAN    62.17    47.20    14.97   505.89   572.15    14.51   516.85     0.51
  HUB     54.25    38.62    15.63   370.96   457.19    14.51   516.85     0.41

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   547.16   422.84   347.27  1139.29     0.48
  MEAN    18.04   554.77   426.13   355.21  1133.32     0.49
  HUB     15.00   604.65   480.82   366.62  1125.77     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   395.33   188.91     0.35  8725.01
  MEAN   534.83   371.47   108.69     0.33  7687.30     1.76
  HUB    444.80   368.38    36.03     0.33  7213.49

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.11     1.27    16.32   564.37     1.08   539.37     0.92     0.88
  MEAN    18.60     1.23    15.78   559.43     1.07   533.72     0.92     0.88
  HUB     18.37     1.22    15.09   557.17     1.07   526.64     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     50.60    28.55    24.20     4.35     0.93     0.52     2.90
  MEAN    50.19    17.01    12.70     4.31     0.95     0.46     3.51     0.88
  HUB     52.68    -5.61    -9.30     3.69     0.95     0.31     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.959

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     559.580     425.305     363.656    1133.784       0.494       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.663      15.797     534.170      24.000      49.468      35.400     -14.068

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	375.762	425.305	567.522	1148.923	0.327	0.502

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.545	17.219	548.531	528.796	0.050	0.627

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	350.643	0.000	350.643	1150.518	0.305	0.495

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.263	550.055	0.000	0.060	0.094	0.517

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.814	18.413	1.219	560.324	37.514	169.689	1.315

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
233556.531	0.624	1543.120	1123107.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =14.972 EfDer = 0.953

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
116.916	3398.000	18.413	560.324	1.000	1.000	0.980

W Kg/sec = 53.14380

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
97.012	3269.354	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
89941.703	91740.344	2.090	590.487	282.529	474.134	1.678

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	335.24	-0.12	335.24	0.29	586.28
MEAN	18.08	0.00	-0.02	335.24	-0.12	335.24	0.29	
HUB	15.21	0.00	-0.02	335.24	-0.12	335.24	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.19	46.36	14.83	609.37	695.60	17.36	550.94	0.60
MEAN	57.99	42.30	15.69	536.08	632.37	17.36	550.94	0.55
HUB	53.38	37.84	15.54	451.02	562.06	17.36	550.94	0.49

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	498.63	366.30	338.31	1176.44	0.42
MEAN	18.01	495.42	356.35	344.18	1171.53	0.42
HUB	15.22	522.80	387.59	350.85	1166.60	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	414.34	239.22	0.35	7482.23	
MEAN	534.05	387.35	177.70	0.33	6419.87	1.80
HUB	451.41	356.61	63.82	0.31	5902.05	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.23	1.21	19.64	595.95	1.06	575.19	0.92	0.87
MEAN	21.65	1.18	19.14	590.89	1.05	570.40	0.92	0.87
HUB	21.38	1.16	18.62	588.42	1.05	565.60	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	47.27	35.26	31.50	3.76	0.93	0.49	2.90	
MEAN	46.00	27.31	23.50	3.81	0.95	0.47	3.30	0.87
HUB	47.85	10.31	6.50	3.81	0.95	0.45	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.953

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     534.584     357.347     397.598    1168.950       0.457      -0.124

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.725      18.819     567.892      46.000      41.948      30.600     -11.348

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     395.264     357.347     532.851    1180.031       0.335       0.343

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      21.653      20.033     578.709     455.853       0.038       0.492

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     391.249       0.000     391.249    1180.299       0.331       0.440

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      19.970     578.973       0.000       0.060       0.077       0.319

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.823      21.551       1.170     591.754      31.430     182.867       1.418

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 195776.828       0.534    1293.507 1001311.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =14.972   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    116.916    3398.000      21.551     591.754       1.000       1.000       0.880
W Kg/sec =   53.14380

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     85.179    3181.346       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  89941.703   91740.344       1.974     489.817     248.082     384.470       1.550

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   366.73    -0.13   366.73     0.31   557.18
 MEAN    17.74     0.00    -0.02   366.73    -0.13   366.73     0.31
 HUB     15.05     0.00    -0.02   366.73    -0.13   366.73     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.36    46.36    12.00   595.14   699.17    20.16   580.53     0.59
 MEAN    55.12    43.40    11.72   526.00   641.33    20.16   580.53     0.54
 HUB     50.60    38.84    11.76   446.28   577.73    20.16   580.53     0.49

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   480.79   350.62   328.97  1206.97     0.40
 MEAN    17.51   478.68   342.81   334.08  1202.65     0.40
 HUB     14.85   506.14   375.19   339.73  1198.34     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   405.34   236.81     0.34  6948.31
 MEAN   519.12   377.75   176.31     0.31  6003.69     1.86
 HUB    440.35   345.93    65.16     0.29  5573.40
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.57     1.19    22.92   624.82     1.06   605.52     0.92     0.90
MEAN    24.99     1.16    22.41   620.32     1.05   601.20     0.92     0.90
HUB     24.74     1.15    21.88   618.27     1.04   596.89     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.82    35.75    31.50     4.25     0.93     0.51     2.90
MEAN    45.74    27.82    23.50     4.32     0.94     0.49     3.28     0.90
HUB     47.84    10.86     6.50     4.36     0.94     0.48     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     483.026     345.061     338.005    1203.114       0.401        0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.073      22.435     601.665      46.000      45.592      31.500     -14.092

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     341.657     345.061     485.589    1212.803       0.282        0.462

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.990      23.648     611.395     471.992       0.041        0.550

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     333.353       0.000     333.353    1213.267       0.275        0.422

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      23.574     611.863       0.000       0.060       0.095        0.435

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.838      24.845       1.153     621.138      29.384     183.141        1.420

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 183135.438       0.531    1209.985 1095915.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =14.972   EfDer =  0.965

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    116.916     3398.000       24.845     621.138       1.000        1.000        0.980
W Kg/sec =   53.14380

   W cor       RPM cor         GAMMA        Cp          R           Blades       THK
     75.700     3105.184        1.401        0.249      53.349      56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  89941.703   91740.344        2.328     513.330     220.489     401.059        1.819

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   314.05    -0.11   314.05     0.26   521.89
 MEAN    16.97      0.00    -0.02   314.05    -0.11   314.05     0.26
 HUB     14.32      0.00    -0.02   314.05    -0.11   314.05     0.26

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     61.20     46.36    14.84   571.12   651.86     23.71   612.91     0.54
 MEAN    58.04     43.80    14.24   503.23   593.28     23.71   612.91     0.49
 HUB     53.52     37.84    15.68   424.63   528.23     23.71   612.91     0.44

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	461.38	334.04	318.26	1234.30	0.37
MEAN	16.57	457.39	324.23	322.62	1230.27	0.37
HUB	13.89	480.70	351.87	327.50	1226.22	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	390.23	225.81	0.32	6308.76	
MEAN	491.47	363.39	167.23	0.30	5375.64	1.80
HUB	411.88	332.95	60.01	0.27	4889.07	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	28.74	1.16	26.10	651.14	1.05	633.38	0.92	0.88
MEAN	28.14	1.13	25.58	646.70	1.04	629.25	0.92	0.88
HUB	27.83	1.12	25.03	644.39	1.04	625.11	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	46.39	35.36	31.50	3.86	0.93	0.49	2.90	
MEAN	45.14	27.40	23.50	3.90	0.95	0.47	3.29	0.88
HUB	47.05	10.38	6.50	3.88	0.95	0.45	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.965

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	454.440	326.057	316.548	1231.178	0.369	0.037

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
28.211	25.676	630.181	46.000	45.848	32.400	-13.448

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	325.206	326.057	460.513	1239.362	0.262	0.471

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	28.143	26.826	638.586	456.573	0.036	0.558

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	310.809	0.000	310.809	1240.103	0.251	0.421

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	26.799	639.350	0.000	0.060	0.090	0.461

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.823	27.997	1.127	647.409	26.271	188.605	1.462

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
163839.453	0.523	1082.495	978375.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =14.972 EfDer = 0.970

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
116.916	3398.000	27.997	647.409	1.000	1.000	0.980

W Kg/sec = 53.14380

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
68.582	3041.529	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
89941.703	91740.344	2.551	509.668	199.772	390.276	1.954

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	290.84	-0.10	290.84	0.23	486.24

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 MEAN    15.91     0.00    -0.02   290.84    -0.10   290.84     0.23
 HUB     13.07     0.00    -0.02   290.84    -0.10   290.84     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.84    47.36    14.48   543.25   616.29    26.95   640.36     0.50
 MEAN    58.36    44.80    13.56   471.87   554.38    26.95   640.36     0.45
 HUB     53.12    38.84    14.28   387.57   484.63    26.95   640.36     0.39

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   436.45   320.60   296.14  1258.76     0.35
 MEAN    15.50   426.70   303.27   300.16  1254.64     0.34
 HUB     12.59   440.01   317.58   304.55  1250.52     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   363.84   211.38     0.29  5753.41
 MEAN   459.55   338.41   156.28     0.27  4701.55     1.83
 HUB    373.33   309.61    55.76     0.25  3999.58

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.84     1.14    29.29   674.75     1.04   658.87     0.92     0.89
 MEAN    31.11     1.11    28.71   669.75     1.03   654.57     0.92     0.89
 HUB     30.63     1.09    28.11   666.42     1.03   650.27     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.27    35.52    31.50     4.02     0.93     0.50     2.90
 MEAN    45.30    27.50    23.50     4.00     0.94     0.47     3.34     0.89
 HUB     46.20    10.37     6.50     3.87     0.94     0.44     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     432.473     308.831     302.749    1254.779       0.345      -0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.141      28.683     654.711      46.000      45.570      33.000     -12.570

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     315.220     308.831     441.293    1261.765       0.250       0.406

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.036      29.716     662.021     440.827       0.062       0.556

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     296.152       0.000     296.152    1262.691       0.235       0.456

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.816     662.993       0.000       0.060       0.084       0.447

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.832      30.981       1.107     670.306      22.897     200.392       1.553

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  142892.578       0.505     944.098 1009326.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    919200.81   6073.2061    114.2156      2.0508      0.8105     14.9715      1.2821

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**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =15.471   EfDer =  0.954

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     114.596    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   52.08887

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     111.948    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   88156.312   89919.258       2.551     831.557     326.018     619.754       1.901

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   261.48    -0.09   261.48     0.23   609.32
  MEAN    17.06     0.00    -0.02   261.48    -0.09   261.48     0.23
  HUB     12.51     0.00    -0.02   261.48    -0.09   261.48     0.23

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     66.86    50.47    16.39   611.74   665.37    14.54   517.10     0.60
  MEAN    62.67    47.20    15.47   505.89   569.55    14.54   517.10     0.51
  HUB     54.83    38.62    16.21   370.96   453.93    14.54   517.10     0.41

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   545.50   426.58   339.99  1139.84     0.48
  MEAN    18.04   551.66   428.24   347.76  1133.81     0.49
  HUB     15.00   599.21   479.91   358.81  1126.29     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   387.15   185.17     0.34  8802.18
  MEAN   534.83   363.73   106.59     0.32  7725.22     1.80
  HUB    444.80   360.52    35.11     0.32  7199.74

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.13     1.27    16.35   564.74     1.08   539.89     0.92     0.87
  MEAN    18.60     1.23    15.82   559.61     1.07   534.19     0.92     0.87
  HUB     18.35     1.21    15.13   557.11     1.07   527.12     0.92     0.87

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     51.44    28.57    24.20     4.37     0.93     0.53     2.90
  MEAN    50.92    17.04    12.70     4.34     0.95     0.47     3.51     0.87
  HUB     53.22    -5.59    -9.30     3.71     0.95     0.33     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.954

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     556.254     427.404     356.012    1134.284       0.490       0.004

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      18.663      15.830     534.641      24.000      50.207      35.400     -14.807

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      18.071     367.669     427.404     563.786    1149.618       0.320       0.514
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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.540      17.269     549.194     528.796       0.052       0.639

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     343.334       0.000     343.334    1151.129       0.298       0.502

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.299     550.639       0.000       0.060       0.099       0.524

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.808      18.402       1.218     560.485      37.675     167.359       1.297

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 234558.203       0.627    1518.975 1099500.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =15.471   EfDer =  0.948

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    114.596    3398.000      18.402     560.485       1.000       1.000       0.980
W Kg/sec =   52.08887

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.159    3268.885       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88156.312   89919.258       2.131     590.487     277.134     474.134       1.711

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   328.31    -0.11   328.31     0.29   586.20
 MEAN    18.08     0.00    -0.02   328.31    -0.11   328.31     0.29
 HUB     15.21     0.00    -0.02   328.31    -0.11   328.31     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.69    46.36    15.33   609.37   692.29    17.39   551.48     0.60
 MEAN    58.52    42.30    16.22   536.08   628.72    17.39   551.48     0.55
 HUB     53.95    37.84    16.11   451.02   557.96    17.39   551.48     0.48

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   497.50   370.92   331.54  1177.16     0.42
 MEAN    18.01   493.14   359.75   337.30  1172.18     0.42
 HUB     15.22   519.00   388.75   343.85  1167.19     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   406.15   234.60     0.35  7576.53
 MEAN   534.05   379.67   174.31     0.32  6481.04     1.83
 HUB    451.41   349.51    62.66     0.30  5919.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.24     1.21    19.67   596.56     1.06   575.89     0.92     0.87
 MEAN    21.65     1.18    19.17   591.34     1.06   571.04     0.92     0.87
 HUB     21.36     1.16    18.64   588.67     1.05   566.18     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.21    35.28    31.50     3.78     0.93     0.51     2.90
 MEAN    46.84    27.33    23.50     3.83     0.95     0.48     3.30     0.87
 HUB     48.51    10.33     6.50     3.83     0.95     0.46     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.948
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     530.839     360.755     389.417    1169.740       0.454      -0.119

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.724      18.859     568.661      46.000      42.812      30.600     -12.212

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     386.900     360.755     528.995    1181.030       0.328       0.361

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      21.647      20.094     579.691     455.853       0.040       0.506

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     383.131       0.000     383.131    1181.277       0.324       0.449

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      20.022     579.933       0.000       0.060       0.082       0.333

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.816      21.537       1.170     592.190      31.705     179.790       1.394

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 197488.422       0.539    1278.915  979515.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =15.471   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    114.596    3398.000      21.537     592.190       1.000       1.000       0.880
W Kg/sec =   52.08887

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.573    3180.176       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88156.312   89919.258       2.012     489.817     243.404     384.470       1.580

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   359.24    -0.12   359.24     0.30   556.97
 MEAN    17.74     0.00    -0.02   359.24    -0.12   359.24     0.30
 HUB     15.05     0.00    -0.02   359.24    -0.12   359.24     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.89    46.36    12.53   595.14   695.26    20.20   581.42     0.59
 MEAN    55.67    43.40    12.27   526.00   637.07    20.20   581.42     0.54
 HUB     51.18    38.84    12.34   446.28   573.00    20.20   581.42     0.48

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   479.83   355.31   322.48  1207.91     0.40
 MEAN    17.51   476.65   346.30   327.52  1203.53     0.40
 HUB     14.85   502.67   376.47   333.10  1199.15     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   397.34   232.12     0.33  7041.08
 MEAN   519.12   370.32   172.82     0.31  6064.72     1.88
 HUB    440.35   339.17    63.88     0.28  5592.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.59     1.19    22.95   625.69     1.06   606.48     0.92     0.90
 MEAN    25.00     1.16    22.44   621.05     1.05   602.09     0.92     0.90
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 HUB     24.72     1.15    21.90   618.80     1.04   597.71     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.77    35.75    31.50     4.25     0.93     0.52     2.90
 MEAN    46.60    27.82    23.50     4.32     0.94     0.50     3.28     0.90
 HUB     48.50    10.86     6.50     4.36     0.94     0.49     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     480.949     348.573     331.375    1203.986       0.399       0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.076      22.462     602.542      46.000      46.449      31.500     -14.949

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     334.741     348.573     483.275    1213.890       0.276       0.476

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.988      23.701     612.496     471.992       0.043       0.564

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     326.746       0.000     326.746    1214.328       0.269       0.431

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.614     612.937       0.000       0.060       0.100       0.443

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.832      24.834       1.153     621.848      29.658     180.001       1.395

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 184843.734       0.536    1197.029 1071451.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =15.471   EfDer =  0.960

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    114.596    3398.000      24.834     621.848       1.000       1.000       0.980
W Kg/sec =   52.08887

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     74.270    3103.412       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88156.312   89919.258       2.373     513.330     216.325     401.059       1.854

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   307.88    -0.11   307.88     0.25   521.59
 MEAN    16.97     0.00    -0.02   307.88    -0.11   307.88     0.25
 HUB     14.32     0.00    -0.02   307.88    -0.11   307.88     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.68    46.36    15.32   571.12   648.91    23.75   613.94     0.53
 MEAN    58.55    43.80    14.75   503.23   590.04    23.75   613.94     0.49
 HUB     54.06    37.84    16.22   424.63   524.59    23.75   613.94     0.43

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   460.28   338.28   312.12  1235.44     0.37
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 MEAN    16.57   455.27   327.35   316.41  1231.35     0.37
 HUB     13.89   477.22   352.93   321.22  1227.25     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   382.77   221.57     0.31  6388.83
 MEAN   491.47   356.44   164.12     0.29  5427.28     1.83
 HUB    411.88   326.58    58.96     0.27  4903.67

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.76     1.16    26.13   652.23     1.05   634.56     0.92     0.88
 MEAN    28.14     1.13    25.61   647.66     1.04   630.36     0.92     0.88
 HUB     27.81     1.12    25.06   645.17     1.04   626.17     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.30    35.37    31.50     3.87     0.93     0.50     2.90
 MEAN    45.97    27.41    23.50     3.91     0.95     0.48     3.29     0.88
 HUB     47.69    10.40     6.50     3.90     0.95     0.46     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.960

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     452.519     329.192     310.494    1232.233       0.367       0.036

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    28.212      25.701     631.268      46.000      46.674      32.400     -14.274

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     318.809     329.192     458.265    1240.602       0.257       0.484

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      28.139      26.875     639.872     456.573       0.038       0.571

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     304.825       0.000     304.825    1241.307       0.246       0.429

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.835     640.599       0.000       0.060       0.096       0.469

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.817      27.986       1.127     648.351      26.503     185.517       1.438

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 165286.031       0.527    1070.375  956860.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =15.471   EfDer =  0.966

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    114.596    3398.000      27.986     648.351       1.000       1.000       0.980
W Kg/sec =   52.08887

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     67.297    3039.320       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88156.312   89919.258       2.600     509.668     196.028     390.276       1.991

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   285.28    -0.10   285.28     0.23   485.89
 MEAN    15.91     0.00    -0.02   285.28    -0.10   285.28     0.23
 HUB     13.07     0.00    -0.02   285.28    -0.10   285.28     0.23
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     62.30    47.36    14.94   543.25   613.68    26.98   641.56     0.49
MEAN    58.85    44.80    14.05   471.87   551.49    26.98   641.56     0.44
HUB     53.65    38.84    14.81   387.57   481.32    26.98   641.56     0.39

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   435.58   324.49   290.57  1260.02     0.35
MEAN    15.50   424.81   306.13   294.52  1255.87     0.34
HUB     12.59   436.80   318.58   298.83  1251.70     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    531.98   357.05   207.49     0.28  5823.15
MEAN   459.55   332.08   153.42     0.26  4745.92     1.85
HUB    373.33   303.80    54.75     0.24  4012.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     31.85     1.14    29.32   676.02     1.04   660.20     0.92     0.88
MEAN    31.11     1.11    28.74   670.90     1.03   655.86     0.92     0.88
HUB     30.61     1.09    28.14   667.42     1.03   651.51     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     48.16    35.53    31.50     4.03     0.93     0.51     2.90
MEAN    46.11    27.52    23.50     4.02     0.95     0.48     3.34     0.88
HUB     46.83    10.38     6.50     3.88     0.95     0.45     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     430.621     311.748     297.065    1255.991       0.343      -0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.141      28.707     655.987      46.000      46.382      33.000     -13.382

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     309.185     311.748     439.070    1263.142       0.245       0.418

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.028      29.760     663.478     440.827       0.066       0.570

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     290.565       0.000     290.565    1264.028       0.230       0.465

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.850     664.409       0.000       0.060       0.090       0.455

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.826      30.970       1.107     671.448      23.097     197.174       1.528

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  144145.984       0.509     933.474  987155.062

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     926322.38   5998.7676    111.9483      2.0500      0.8039     15.4709      1.2843


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
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****************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 90% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =15.963   EfDer =  0.950

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     112.321    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   51.05489

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     109.726    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   86406.375   88134.312       2.602     831.557     319.546     619.754       1.939

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   256.00    -0.09   256.00     0.23   609.32
  MEAN    17.06     0.00    -0.02   256.00    -0.09   256.00     0.23
  HUB     12.51     0.00    -0.02   256.00    -0.09   256.00     0.23

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     67.30    50.47    16.83   611.74   663.23    14.56   517.34     0.59
  MEAN    63.16    47.20    15.96   505.89   567.05    14.56   517.34     0.51
  HUB     55.40    38.62    16.78   370.96   450.79    14.56   517.34     0.40

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   543.99   430.22   332.92  1140.36     0.48
  MEAN    18.04   548.70   430.26   340.51  1134.29     0.48
  HUB     15.00   593.95   478.98   351.21  1126.77     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   379.19   181.53     0.33  8877.21
  MEAN   534.83   356.20   104.57     0.31  7761.68     1.83
  HUB    444.80   352.87    34.18     0.31  7185.82

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.15     1.27    16.38   565.10     1.08   540.38     0.92     0.87
  MEAN    18.60     1.23    15.85   559.78     1.07   534.64     0.92     0.87
  HUB     18.32     1.21    15.16   557.04     1.07   527.58     0.92     0.87

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     52.27    28.60    24.20     4.40     0.93     0.54     2.90
  MEAN    51.64    17.07    12.70     4.37     0.95     0.48     3.51     0.87
  HUB     53.75    -5.56    -9.30     3.74     0.95     0.34     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.950

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     553.092     429.424     348.577    1134.759       0.487       0.005

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      18.662      15.860     535.089      24.000      50.933      35.400     -15.533

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      18.071     359.807     429.424     560.238    1150.280       0.313       0.525

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      18.533      17.316     549.827     528.796       0.054       0.651
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	336.219	0.000	336.219	1151.713	0.292	0.508

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.332	551.198	0.000	0.060	0.104	0.530

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.802	18.389	1.217	560.640	37.830	165.086	1.280

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
235522.641	0.629	1494.944	1076448.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =15.963 EfDer = 0.943

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
112.321	3398.000	18.389	560.640	1.000	1.000	0.980

W Kg/sec = 51.05489

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
93.345	3268.433	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
86406.375	88134.312	2.172	590.487	271.852	474.134	1.744

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	321.57	-0.11	321.57	0.28	586.12
MEAN	18.08	0.00	-0.02	321.57	-0.11	321.57	0.28	
HUB	15.21	0.00	-0.02	321.57	-0.11	321.57	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.18	46.36	15.82	609.37	689.11	17.42	552.01	0.60
MEAN	59.05	42.30	16.75	536.08	625.22	17.42	552.01	0.54
HUB	54.52	37.84	16.68	451.02	554.01	17.42	552.01	0.48

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	496.50	375.38	324.97	1177.84	0.42
MEAN	18.01	491.02	363.04	330.61	1172.81	0.42
HUB	15.22	515.34	389.84	337.04	1167.75	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	398.21	230.14	0.34	7667.46	
MEAN	534.05	372.22	171.01	0.32	6540.28	1.86
HUB	451.41	342.62	61.57	0.29	5936.23	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.25	1.21	19.69	597.15	1.07	576.56	0.92	0.86
MEAN	21.65	1.18	19.19	591.78	1.06	571.65	0.92	0.86
HUB	21.33	1.16	18.66	588.90	1.05	566.73	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	49.12	35.31	31.50	3.81	0.93	0.52	2.90	
MEAN	47.68	27.35	23.50	3.85	0.95	0.49	3.30	0.86
HUB	49.15	10.35	6.50	3.85	0.95	0.47	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.943

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

```
     17.960     527.324     364.056     381.489    1170.489       0.451      -0.115

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.720      18.893     569.391      46.000      43.661      30.600     -13.061

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     378.804     364.056     525.385    1181.982       0.320       0.378

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      21.637      20.149     580.628     455.853       0.042       0.519

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     375.271       0.000     375.271    1182.209       0.317       0.458

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      20.067     580.850       0.000       0.060       0.088       0.346

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.808      21.521       1.170     592.609      31.969     176.827       1.371

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 199136.094       0.543    1263.986  958281.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =15.963   EfDer =  0.975

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    112.321    3398.000      21.521     592.609       1.000       1.000       0.880
W Kg/sec =   51.05489

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     82.007    3179.050       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  86406.375   88134.312       2.051     489.817     238.844     384.470       1.610

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   351.97    -0.12   351.97     0.30   556.77
 MEAN    17.74     0.00    -0.02   351.97    -0.12   351.97     0.30
 HUB     15.05     0.00    -0.02   351.97    -0.12   351.97     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.40    46.36    13.04   595.14   691.53    20.24   582.27     0.58
 MEAN    56.22    43.40    12.82   526.00   633.00    20.24   582.27     0.53
 HUB     51.75    38.84    12.91   446.28   568.47    20.24   582.27     0.48

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   479.01   359.82   316.20  1208.82     0.40
 MEAN    17.51   474.76   349.65   321.16  1204.38     0.39
 HUB     14.85   499.36   377.70   326.66  1199.93     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   389.60   227.61     0.32  7130.41
 MEAN   519.12   363.13   169.47     0.30  6123.34     1.91
 HUB    440.35   332.61    62.65     0.28  5610.69

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.61     1.19    22.98   626.54     1.06   607.39     0.92     0.89
 MEAN    25.00     1.16    22.46   621.75     1.05   602.93     0.92     0.89
 HUB     24.69     1.15    21.92   619.31     1.05   598.49     0.92     0.89
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.69    35.75    31.50     4.25     0.93     0.53     2.90
 MEAN    47.43    27.82    23.50     4.32     0.94     0.51     3.28     0.89
 HUB     49.14    10.86     6.50     4.36     0.94     0.50     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.975

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     479.019     351.945     324.952    1204.819       0.398       0.010

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.073      22.483     603.380      46.000      47.284      31.500     -15.784

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     328.049     351.945     481.125    1214.930       0.270       0.489

   BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.950      24.980      23.745     613.549     471.992       0.045       0.578

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     320.346       0.000     320.346    1215.342       0.264       0.440

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.648     613.966       0.000       0.060       0.106       0.452

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.826      24.819       1.153     622.531      29.922     176.992       1.372

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 186487.672       0.540    1183.702 1047663.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =15.963   EfDer =  0.956

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    112.321    3398.000       24.819     622.531       1.000        1.000       0.980
W Kg/sec =   51.05489

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     72.881    3101.709        1.401       0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  86406.375   88134.312        2.418     513.330     212.278     401.059       1.889

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   301.90    -0.10   301.90      0.25   521.30
 MEAN    16.97      0.00    -0.02   301.90    -0.10   301.90      0.25
 HUB     14.32      0.00    -0.02   301.90    -0.10   301.90      0.25

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     62.14     46.36    15.78   571.12   646.10     23.78   614.93      0.53
 MEAN    59.04     43.80    15.24   503.23   586.94     23.78   614.93      0.48
 HUB     54.59     37.84    16.75   424.63   521.10     23.78   614.93      0.43

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   459.32    342.38    306.19   1236.53      0.37
 MEAN    16.57   453.32    330.37    310.40   1232.39      0.37
 HUB     13.89   473.92    353.97    315.13   1228.23      0.39
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   375.56   217.47     0.30  6466.09
 MEAN   491.47   349.72   161.10     0.28  5477.28     1.85
 HUB    411.88   320.41    57.91     0.26  4918.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.77     1.16    26.15   653.28     1.05   635.68     0.92     0.88
 MEAN    28.14     1.13    25.63   648.58     1.04   631.43     0.92     0.88
 HUB     27.79     1.12    25.07   645.92     1.04   627.18     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.19    35.38    31.50     3.88     0.93     0.51     2.90
 MEAN    46.78    27.43    23.50     3.93     0.95     0.49     3.29     0.88
 HUB     48.32    10.41     6.50     3.91     0.95     0.47     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.956

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     450.750     332.228     304.631    1233.242       0.366       0.035

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.206      25.718     632.309      46.000      47.481      32.400     -15.081

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     312.621     332.228     456.188    1241.791       0.252       0.496

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.129      26.915     641.105     456.573       0.040       0.585

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     299.030       0.000     299.030    1242.462       0.241       0.438

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.862     641.799       0.000       0.060       0.101       0.476

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.811      27.968       1.127     649.258      26.727     182.547       1.415

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 166687.625       0.532    1058.024  935915.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =15.963   EfDer =  0.962

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    112.321    3398.000      27.968     649.258       1.000       1.000       0.980
W Kg/sec =   51.05489

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     66.049    3037.196       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  86406.375   88134.312       2.649     509.668     192.394     390.276       2.029

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   279.90    -0.10   279.90     0.23   485.55
 MEAN    15.91     0.00    -0.02   279.90    -0.10   279.90     0.23
 HUB     13.07     0.00    -0.02   279.90    -0.10   279.90     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.74    47.36    15.38   543.25   611.20    27.00   642.73     0.49
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MEAN    59.33    44.80    14.53   471.87   548.72    27.00   642.73     0.44
HUB     54.17    38.84    15.33   387.57   478.15    27.00   642.73     0.38

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   434.82   328.24   285.19  1261.23     0.34
MEAN    15.50   423.05   308.90   289.06  1257.04     0.34
HUB     12.59   433.73   319.54   293.29  1252.83     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    531.98   350.49   203.74     0.28  5890.35
MEAN   459.55   325.96   150.66     0.26  4788.69     1.88
HUB    373.33   298.18    53.79     0.24  4024.26

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     31.86     1.14    29.34   677.25     1.04   661.49     0.92     0.88
MEAN    31.10     1.11    28.75   672.01     1.04   657.09     0.92     0.88
HUB     30.59     1.09    28.15   668.38     1.03   652.70     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     49.01    35.54    31.50     4.04     0.93     0.52     2.90
MEAN    46.90    27.53    23.50     4.03     0.95     0.49     3.34     0.88
HUB     47.45    10.39     6.50     3.89     0.95     0.46     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.962

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     428.904     314.561     291.565    1257.153       0.341      -0.014

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    31.132      28.721     657.211      46.000      47.173      33.000     -14.173

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     303.351     314.561     437.001    1264.463       0.240       0.430

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      31.012      29.793     664.876     440.827       0.069       0.583

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     285.158       0.000     285.158    1265.311       0.225       0.473

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      29.873     665.769       0.000       0.060       0.095       0.462

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.820      30.950       1.107     672.548      23.290     194.090       1.505

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 145351.672       0.514     922.598  965563.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    933185.75   5923.2539    109.7261      2.0487      0.7972     15.9629      1.2864


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*******************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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Fan-Core + 4 Stage LPC 90% Stat 2 20% Ice Block 8-22-2011

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1

RESET = 0.000BLEED = 0.000 DPInc = 5.019 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
166.058	3398.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 75.48089

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
162.222	3384.617	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
127745.469	130300.102	1.760	831.557	472.426	619.754	1.312

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	392.24	-0.14	392.24	0.35	609.32
MEAN	17.06	0.00	-0.02	392.24	-0.14	392.24	0.35	
HUB	12.51	0.00	-0.02	392.24	-0.14	392.24	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.34	50.47	6.87	611.74	726.81	13.85	509.96	0.66
MEAN	52.22	47.20	5.02	505.89	640.24	13.85	509.96	0.58
HUB	43.41	38.62	4.79	370.96	539.97	13.85	509.96	0.49

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	618.61	327.42	524.85	1122.01	0.55
MEAN	18.04	650.82	372.26	533.85	1118.16	0.58
HUB	15.00	746.34	500.09	554.01	1110.30	0.67

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	611.74	596.92	284.32	0.53	6757.48	
MEAN	534.83	558.05	162.56	0.50	6716.47	1.27
HUB	444.80	556.76	55.30	0.50	7503.09	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.28	1.21	14.86	555.00	1.06	523.04	0.92	0.91
MEAN	18.26	1.21	14.51	554.80	1.06	519.43	0.92	0.91
HUB	18.66	1.23	13.78	558.55	1.07	512.05	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.96	28.45	24.20	4.25	0.93	0.26	2.90	
MEAN	34.89	16.94	12.70	4.24	0.92	0.21	3.51	0.91
HUB	42.07	-5.70	-9.30	3.60	0.92	0.07	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	662.249	371.541	548.207	1118.093	0.592	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.358	14.475	519.487	24.000	34.127	35.400	1.273

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	578.782	371.541	687.773	1127.365	0.513	0.225

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.303	15.287	528.139	528.796	0.024	0.386

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4

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     18.083     530.520       0.000     530.520    1132.128       0.469       0.303

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.692     532.610       0.000       0.060       0.039       0.326

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      18.242       1.208     556.118      33.308     224.817       1.743

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 207371.734       0.554    1945.994 1649330.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.019   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    166.058    3398.000      18.242     556.118       1.000       1.000       0.980
W Kg/sec =   75.48089

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    138.554    3281.693       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127745.469  130300.102       1.463     590.487     403.508     474.134       1.175

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   503.80    -0.17   503.80     0.44   588.50
 MEAN    18.08     0.00    -0.02   503.80    -0.17   503.80     0.44
 HUB     15.21     0.00    -0.02   503.80    -0.17   503.80     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.43    46.36     4.07   609.37   790.80    15.93   534.92     0.70
 MEAN    46.79    42.30     4.49   536.08   735.78    15.93   534.92     0.65
 HUB     41.85    37.84     4.01   451.02   676.31    15.93   534.92     0.60

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   568.12   241.12   514.42  1153.21     0.49
 MEAN    18.01   582.94   265.06   519.19  1150.98     0.51
 HUB     15.22   633.74   354.84   525.08  1148.74     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   630.40   364.39     0.55  4927.28
 MEAN   534.05   584.74   268.99     0.51  4776.85     1.36
 HUB    451.41   533.89    96.57     0.46  5404.33

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.81     1.14    17.62   579.58     1.04   552.63     0.92     0.91
 MEAN    20.72     1.14    17.39   578.86     1.04   550.49     0.92     0.91
 HUB     21.07     1.15    17.13   581.85     1.05   548.32     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.11    35.31    31.50     3.81     0.93     0.26     2.90
 MEAN    27.05    27.39    23.50     3.89     0.92     0.26     3.30     0.91
 HUB     34.05    10.42     6.50     3.92     0.92     0.28     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     799.494     265.804     754.015    1125.802       0.710      -0.722

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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    20.830      14.875     526.722      46.000      19.418      30.600      11.182

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     779.820     265.804     823.875    1128.572       0.691      -0.679

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      20.665      15.012     529.316     400.556       0.057       0.140

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.823     776.480       0.000     776.480    1129.085       0.688       0.001

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750      14.877     529.755       0.000       0.060       0.128      -0.718

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.762      20.420       1.119     580.097      23.979     274.621       2.129

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 149356.984       0.407    1401.579 1510490.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 5.019   EfDer =  0.824

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    166.058    3398.000      20.420     580.097       1.000       1.000       0.780
W Kg/sec =   75.48089

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    126.418    3213.151       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127745.469  130300.102       1.179     434.156     368.180     339.175       0.921

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   692.69    -0.24   692.69     0.61   562.75
 MEAN    17.74     0.00    -0.02   692.69    -0.24   692.69     0.61
 HUB     15.05     0.00    -0.02   692.69    -0.24   692.69     0.61

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     40.68    46.36    -5.68   595.14   913.39    15.91   540.04     0.80
 MEAN    37.22    43.40    -6.18   526.00   869.91    15.91   540.04     0.76
 HUB     32.81    38.84    -6.03   446.28   824.13    15.91   540.04     0.72

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   566.80   182.16   536.73  1171.62     0.48
 MEAN    17.51   580.66   217.73   538.30  1171.25     0.50
 HUB     14.85   630.77   321.19   542.88  1170.75     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   672.55   405.27     0.57  3613.45
 MEAN   519.12   616.93   301.40     0.53  3815.88     1.48
 HUB    440.35   555.80   119.16     0.47  4773.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.06     1.08    18.79   597.30     1.03   570.48     0.92     0.75
 MEAN    22.15     1.08    18.72   598.26     1.03   570.12     0.92     0.75
 HUB     22.60     1.11    18.55   602.82     1.04   569.61     0.92     0.75

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.75    37.06    31.50     5.56     0.93     0.30     2.90
 MEAN    22.02    29.24    23.50     5.74     0.87     0.33     3.28     0.75
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 HUB     30.61    12.38     6.50     5.88     0.87     0.38     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.824

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     588.036     219.155     545.671    1171.673       0.502      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.236      18.718     570.590      46.000      21.882      31.500       9.618

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     570.235     219.155     610.898    1173.439       0.486       0.042

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.144      18.838     572.312     471.992       0.036       0.185

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     553.074       0.000     553.074    1175.088       0.471       0.059

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.929     573.921       0.000       0.060       0.066       0.067

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.660      22.034       1.079     599.456      19.359     324.094       2.512

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 120630.172       0.350    1132.004 2030502.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.019   EfDer =  0.957

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    166.058    3398.000      22.034     599.456       1.000       1.000       0.980
W Kg/sec =   75.48089

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    119.096    3160.842       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127745.469  130300.102       1.480     513.330     346.871     401.059       1.156

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   515.79    -0.18   515.78     0.44   531.24
 MEAN    16.97     0.00    -0.02   515.79    -0.18   515.78     0.44
 HUB     14.32     0.00    -0.02   515.79    -0.18   515.78     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.92    46.36     1.56   571.12   769.68    19.31   577.26     0.65
 MEAN    44.30    43.80     0.50   503.23   720.73    19.31   577.26     0.61
 HUB     39.48    37.84     1.64   424.63   668.21    19.31   577.26     0.57

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   564.21   177.31   535.62  1190.23     0.47
 MEAN    16.57   576.82   210.39   537.08  1189.69     0.48
 HUB     13.89   622.85   310.29   540.06  1189.01     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   658.20   382.54     0.55  3351.08
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 MEAN   491.47   606.19   281.08     0.51  3489.98     1.27
 HUB    411.88   549.54   101.60     0.46  4312.43

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.88     1.08    20.47   615.40     1.03   588.84     0.92     0.88
 MEAN    23.96     1.09    20.40   616.06     1.03   588.30     0.92     0.88
 HUB     24.43     1.11    20.26   619.97     1.03   587.60     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.32    35.53    31.50     4.03     0.93     0.18     2.90
 MEAN    21.39    27.63    23.50     4.13     0.90     0.20     3.29     0.88
 HUB     29.88    10.65     6.50     4.15     0.90     0.24     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.957

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     565.851     211.572     524.809    1191.782       0.475       0.057

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.051      20.608     590.425      46.000      21.956      32.400      10.444

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     555.994     211.572     594.888    1192.713       0.466       0.071

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.954      20.637     591.348     456.573       0.036       0.194

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     527.316       0.000     527.316    1195.325       0.441       0.063

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.841     593.941       0.000       0.060       0.071       0.126

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.767      23.825       1.081     617.145      17.689     325.306       2.522

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 110259.305       0.352    1034.683 1516228.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.019   EfDer =  0.937

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    166.058    3398.000      23.825     617.145       1.000       1.000       0.980
W Kg/sec =   75.48089

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    111.760    3115.213       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127745.469  130300.102       1.566     509.668     325.519     390.276       1.199

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   488.61    -0.17   488.61     0.41   498.02
 MEAN    15.91     0.00    -0.02   488.61    -0.17   488.61     0.41
 HUB     13.07     0.00    -0.02   488.61    -0.17   488.61     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.04    47.36     0.68   543.25   730.78    21.25   597.23     0.61
 MEAN    44.01    44.80    -0.79   471.87   679.38    21.25   597.23     0.57
 HUB     38.43    38.84    -0.41   387.57   623.76    21.25   597.23     0.52
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      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   535.86   164.87   509.87  1208.62     0.44
MEAN    15.50   545.98   189.86   511.90  1207.64     0.45
HUB     12.59   584.55   276.15   515.21  1206.56     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    531.98   628.28   367.11     0.52  2960.81
MEAN   459.55   578.60   269.69     0.48  2945.10     1.27
HUB    373.33   524.30    97.18     0.43  3478.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.49     1.07    22.27   631.23     1.02   607.27     0.92     0.86
MEAN    25.48     1.07    22.15   631.15     1.02   606.29     0.92     0.86
HUB     25.79     1.08    21.96   633.69     1.03   605.19     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     17.92    35.75    31.50     4.25     0.93     0.18     2.90
MEAN    20.35    27.78    23.50     4.28     0.90     0.19     3.34     0.86
HUB     28.19    10.68     6.50     4.18     0.90     0.21     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.937

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      551.722     193.345     516.735    1207.949       0.457      -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.520      22.115      606.629      46.000      20.514      33.000      12.486

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219      557.070     193.345     589.669    1207.457       0.461      -0.075

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       25.305      21.867     606.135     440.827       0.082       0.182

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     516.791       0.000     516.791    1211.045       0.427       0.059

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       22.319     609.743       0.000       0.060       0.084       0.056

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.719      25.299       1.062     632.023      14.878     359.105       2.784

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  92775.344       0.328     870.612 1568900.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    680393.50   6384.8711    162.2220      1.6746      0.7627      5.0193      1.2089


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 90% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
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 RESET =  0.000BLEED =  0.000 DPInc = 5.494   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.580    3398.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    159.801    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.787     831.557     465.375     619.754       1.332

     ROTOR LEADING EDGE CONDITIONS, STAGE             1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   385.57    -0.13   385.57     0.35   609.32
 MEAN    17.06     0.00    -0.02   385.57    -0.13   385.57     0.35
 HUB     12.51     0.00    -0.02   385.57    -0.13   385.57     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.78    50.47     7.31   611.74   723.23    13.89   510.39     0.65
 MEAN    52.69    47.20     5.49   505.89   636.18    13.89   510.39     0.57
 HUB     43.90    38.62     5.28   370.96   535.14    13.89   510.39     0.48

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.63   612.72   333.22   514.20  1123.25     0.55
 MEAN    18.04   644.13   375.51   523.35  1119.22     0.58
 HUB     15.00   737.43   499.02   542.94  1111.37     0.66

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   584.79   278.53     0.52  6876.97
 MEAN   534.83   547.06   159.31     0.49  6775.05     1.29
 HUB    444.80   545.64    54.22     0.49  7486.92

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.34     1.21    14.98   555.57     1.06   524.22     0.92     0.91
 MEAN    18.29     1.21    14.61   555.08     1.06   520.44     0.92     0.91
 HUB     18.65     1.23    13.88   558.47     1.07   513.07     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.94    28.44    24.20     4.24     0.93     0.27     2.90
 MEAN    35.66    16.93    12.70     4.23     0.92     0.23     3.51     0.91
 HUB     42.59    -5.70    -9.30     3.60     0.92     0.09     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     655.042     374.785     537.230    1119.222       0.585      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.390      14.579     520.537      24.000      34.901      35.400       0.499

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     565.991     374.785     678.829    1128.944       0.501       0.242

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.339      15.443     529.619     528.796       0.023       0.398

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     519.209       0.000     519.209    1133.454       0.458       0.318

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      15.831     533.859       0.000       0.060       0.037       0.341

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      18.284       1.210     556.375      33.565     221.616       1.718

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 208972.266       0.558    1931.745 1621285.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.494   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.580    3398.000      18.284     556.375       1.000       1.000       0.980
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    136.204    3280.935       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.489     590.487     396.664     474.134       1.195

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   493.35    -0.17   493.35     0.43   588.36
 MEAN    18.08     0.00    -0.02   493.35    -0.17   493.35     0.43
 HUB     15.21     0.00    -0.02   493.35    -0.17   493.35     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.01    46.36     4.65   609.37   784.18    16.06   536.05     0.69
 MEAN    47.39    42.30     5.09   536.08   728.66    16.06   536.05     0.64
 HUB     42.44    37.84     4.60   451.02   668.55    16.06   536.05     0.59

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   561.12   249.71   502.50  1155.03     0.49
 MEAN    18.01   575.56   271.21   507.66  1152.54     0.50
 HUB     15.22   625.74   357.10   513.84  1150.04     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   615.72   355.81     0.53  5102.47
 MEAN   534.05   571.66   262.84     0.50  4887.57     1.38
 HUB    451.41   522.43    94.31     0.45  5438.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.95     1.15    17.83   580.67     1.04   554.38     0.92     0.91
 MEAN    20.84     1.14    17.57   579.65     1.04   551.99     0.92     0.91
 HUB     21.14     1.16    17.28   582.27     1.05   549.58     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.42    35.30    31.50     3.80     0.93     0.27     2.90
 MEAN    28.11    27.37    23.50     3.87     0.92     0.27     3.30     0.91
 HUB     34.80    10.40     6.50     3.90     0.92     0.29     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     779.299     271.972     730.300    1129.458       0.690      -0.685

    Pt3        Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.943      15.228     530.149      46.000      20.426      30.600      10.174

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
```

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	750.742	271.972	798.488	1133.338	0.662	-0.605

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	20.801	15.491	533.798	400.556	0.051	0.161

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	744.775	0.000	744.775	1134.154	0.657	0.056

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	15.419	534.545	0.000	0.060	0.109	-0.626

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.791	20.604	1.127	580.862	24.487	267.516	2.074

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
152522.766	0.416	1409.925	1481365.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 5.494 EfDer = 0.846

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
163.580	3398.000	20.604	580.862	1.000	1.000	0.780

W Kg/sec = 74.35432

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
123.502	3211.034	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
125838.836	128355.344	1.207	434.156	359.687	339.175	0.943

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	668.50	-0.23	668.50	0.58	562.38
MEAN	17.74	0.00	-0.02	668.50	-0.23	668.50	0.58	
HUB	15.05	0.00	-0.02	668.50	-0.23	668.50	0.58	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	41.69	46.36	-4.67	595.14	895.19	16.34	543.56	0.78
MEAN	38.21	43.40	-5.19	526.00	850.77	16.34	543.56	0.74
HUB	33.74	38.84	-5.10	446.28	803.91	16.34	543.56	0.70

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	554.85	196.22	519.00	1174.90	0.47
MEAN	17.51	568.85	227.98	521.17	1174.06	0.48
HUB	14.85	618.46	325.50	525.87	1173.15	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	649.93	391.21	0.55	3891.77	
MEAN	519.12	596.98	291.15	0.51	3995.18	1.50
HUB	440.35	538.27	114.85	0.46	4837.15	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.43	1.09	19.25	599.38	1.03	573.69	0.92	0.77
MEAN	22.48	1.09	19.14	599.88	1.03	572.87	0.92	0.77
HUB	22.89	1.11	18.94	603.88	1.04	571.96	0.92	0.77

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.71	37.01	31.50	5.51	0.93	0.31	2.90	
MEAN	23.63	29.19	23.50	5.69	0.88	0.34	3.28	0.77
HUB	31.76	12.32	6.50	5.82	0.88	0.38	3.87	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.846

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     575.789     229.473     528.086    1174.528       0.490       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.569      19.146     573.372      46.000      23.487      31.500       8.013

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     549.560     229.473     595.546    1177.049       0.467       0.075

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.498      19.373     575.836     471.992       0.030       0.208

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     532.905       0.000     532.905    1178.586       0.452       0.092

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.468     577.341       0.000       0.060       0.058       0.102

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.699      22.403       1.087     601.048      20.186     308.548       2.392

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 125785.656       0.365    1162.766 1972699.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.494   EfDer =  0.971

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.580    3398.000      22.403     601.048       1.000       1.000       0.980
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    115.543    3156.653       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.525     513.330     336.524     401.059       1.192

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   497.64    -0.17   497.64     0.42   530.54
 MEAN    16.97     0.00    -0.02   497.64    -0.17   497.64     0.42
 HUB     14.32     0.00    -0.02   497.64    -0.17   497.64     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.94    46.36     2.58   571.12   757.64    19.83   580.38     0.64
 MEAN    45.33    43.80     1.53   503.23   707.86    19.83   580.38     0.60
 HUB     40.49    37.84     2.65   424.63   654.30    19.83   580.38     0.55

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   549.08   192.98   514.05  1194.66     0.46
 MEAN    16.57   561.88   221.52   516.37  1193.60     0.47
 HUB     13.89   607.56   314.39   519.90  1192.45     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   631.54   366.87     0.53  3646.79
 MEAN   491.47   582.67   269.95     0.49  3674.38     1.30
 HUB    411.88   528.96    97.49     0.44  4369.32
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	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.47	1.09	21.17	618.40	1.03	593.24	0.92	0.89
MEAN	24.49	1.09	21.04	618.53	1.03	592.19	0.92	0.89
HUB	24.90	1.11	20.85	621.84	1.03	591.03	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.58	35.51	31.50	4.01	0.93	0.21	2.90	
MEAN	23.22	27.60	23.50	4.10	0.91	0.22	3.29	0.89
HUB	31.16	10.62	6.50	4.12	0.91	0.25	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.971

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	551.723	222.767	504.751	1195.573	0.461	0.057

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.584	21.242	594.186	46.000	23.814	32.400	8.586

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	532.299	222.767	577.033	1197.340	0.445	0.105

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.512	21.399	595.943	456.573	0.030	0.221

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	504.884	0.000	504.884	1199.721	0.421	0.100

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.600	598.316	0.000	0.060	0.061	0.161

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.804	24.402	1.089	619.588	18.540	308.461	2.391

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
115568.109	0.369	1068.315	1480477.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 5.494 EfDer = 0.956

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
163.580	3398.000	24.402	619.588	1.000	1.000	0.980

W Kg/sec = 74.35432

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
107.700	3109.066	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
125838.836	128355.344	1.625	509.668	313.693	390.276	1.244

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	468.50	-0.16	468.50	0.39	497.04
MEAN	15.91	0.00	-0.02	468.50	-0.16	468.50	0.39	
HUB	13.07	0.00	-0.02	468.50	-0.16	468.50	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.23	47.36	1.87	543.25	717.49	21.98	601.28	0.60
MEAN	45.21	44.80	0.41	471.87	665.06	21.98	601.28	0.55
HUB	39.61	38.84	0.77	387.57	608.14	21.98	601.28	0.51

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

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          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   519.22   182.25    486.18  1213.96      0.43
 MEAN    15.50   529.17   202.32    488.97  1212.47      0.44
 HUB     12.59   567.11   280.76    492.73  1210.91      0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   598.90   349.73     0.49  3272.53
 MEAN   459.55   552.50   257.23     0.46  3138.08     1.30
 HUB    373.33   501.35    92.57     0.41  3536.92

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.33     1.08    23.21   635.15     1.03   612.66     0.92     0.87
 MEAN    26.25     1.08    23.02   634.51     1.02   611.15     0.92     0.87
 HUB     26.49     1.09    22.79   636.41     1.03   609.58     0.92     0.87

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.55    35.73    31.50     4.23     0.93     0.21     2.90
 MEAN    22.48    27.75    23.50     4.25     0.90     0.21     3.34     0.87
 HUB     29.68    10.64     6.50     4.14     0.90     0.23     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.956

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     534.700     206.033     493.411    1212.795       0.441      -0.007

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      26.286      22.998     611.506      46.000      22.664      33.000      10.336

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     528.283     206.033     567.038    1213.359       0.435      -0.021

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      26.130      22.937     612.075     440.827       0.067       0.211

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     491.180       0.000     491.180    1216.483       0.404       0.102

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      23.340     615.230       0.000       0.060       0.070       0.099

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.772      26.117       1.070     635.357      15.769     336.613       2.609

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   98337.977       0.347     909.039 1530195.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     701186.81   6481.7891    159.8008      1.7288      0.7895      5.4939      1.2153


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 90% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 5.964   EfDer =  0.999

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
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    161.138    3398.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   73.24458

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    157.416    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123960.672  126439.617       1.814     831.557     458.429     619.754       1.352

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   379.04    -0.13   379.04     0.34   609.32
 MEAN    17.06     0.00    -0.02   379.04    -0.13   379.04     0.34
 HUB     12.51     0.00    -0.02   379.04    -0.13   379.04     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.22    50.47     7.75   611.74   719.77    13.93   510.81     0.65
 MEAN    53.16    47.20     5.96   505.89   632.24    13.93   510.81     0.57
 HUB     44.39    38.62     5.77   370.96   530.46    13.93   510.81     0.48

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   607.24   338.78   503.96  1124.43     0.54
 MEAN    18.04   637.78   378.63   513.23  1120.23     0.57
 HUB     15.00   728.91   497.98   532.28  1112.39     0.66

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   573.14   272.97     0.51  6991.64
 MEAN   534.83   536.47   156.19     0.48  6831.22     1.31
 HUB    444.80   534.93    53.18     0.48  7471.35

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.40     1.22    15.09   556.11     1.06   525.32     0.92     0.91
 MEAN    18.32     1.21    14.70   555.35     1.06   521.38     0.92     0.91
 HUB     18.65     1.23    13.97   558.40     1.07   514.04     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.91    28.44    24.20     4.24     0.93     0.28     2.90
 MEAN    36.42    16.93    12.70     4.23     0.92     0.24     3.51     0.91
 HUB     43.09    -5.71    -9.30     3.59     0.92     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     648.223     377.896     526.676    1120.285       0.579      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.420      14.677     521.526      24.000      35.660      35.400      -0.260

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     553.824     377.896     670.467    1130.418       0.490       0.258

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.371      15.587     531.003     528.796       0.023       0.410

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     508.589       0.000     508.589    1134.683       0.448       0.330

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.955     535.017       0.000       0.060       0.037       0.353

    STAGE EXIT CONDITIONS, STAGE            1
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Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	18.317	1.212	556.622	33.812	218.530	1.694

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
210507.453	0.563	1916.893	1593848.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 5.964 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
161.138	3398.000	18.317	556.622	1.000	1.000	0.980

W Kg/sec = 73.24458

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
133.962	3280.208	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
123960.672	126439.617	1.514	590.487	390.134	474.134	1.215

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	483.51	-0.17	483.51	0.43	588.23
MEAN	18.08	0.00	-0.02	483.51	-0.17	483.51	0.43	
HUB	15.21	0.00	-0.02	483.51	-0.17	483.51	0.43	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.58	46.36	5.22	609.37	778.02	16.17	537.10	0.68
MEAN	47.96	42.30	5.66	536.08	722.04	16.17	537.10	0.64
HUB	43.02	37.84	5.18	451.02	661.33	16.17	537.10	0.58

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	554.90	257.69	491.44	1156.69	0.48
MEAN	18.01	568.87	276.92	496.92	1153.96	0.49
HUB	15.22	618.36	359.17	503.35	1151.25	0.54

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	602.08	347.83	0.52	5265.37	
MEAN	534.05	559.50	257.13	0.48	4990.33	1.39
HUB	451.41	511.73	92.24	0.44	5470.25	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.08	1.15	18.01	581.69	1.05	555.98	0.92	0.91
MEAN	20.93	1.14	17.73	580.38	1.04	553.36	0.92	0.91
HUB	21.20	1.16	17.41	582.67	1.05	550.74	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.67	35.29	31.50	3.79	0.93	0.28	2.90	
MEAN	29.13	27.36	23.50	3.86	0.92	0.28	3.30	0.91
HUB	35.51	10.38	6.50	3.88	0.92	0.30	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	761.664	277.697	709.237	1132.635	0.672	-0.654

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.038	15.533	533.137	46.000	21.383	30.600	9.217

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	725.664	277.697	776.984	1137.375	0.638	-0.541

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	20.917	15.900	537.608	400.556	0.046	0.179

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	718.141	0.000	718.141	1138.348	0.631	0.101

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	15.870	538.516	0.000	0.060	0.094	-0.550

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.813	20.755	1.133	581.580	24.959	261.073	2.024

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
155461.078	0.424	1415.638	1453297.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 5.964 EfDer = 0.866

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
161.138	3398.000	20.755	581.580	1.000	1.000	0.780

W Kg/sec = 73.24458

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
120.846	3209.051	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
123960.672	126439.617	1.234	434.156	351.951	339.175	0.964

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	647.55	-0.22	647.55	0.56	562.03
MEAN	17.74	0.00	-0.02	647.55	-0.22	647.55	0.56	
HUB	15.05	0.00	-0.02	647.55	-0.22	647.55	0.56	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	42.60	46.36	-3.76	595.14	879.65	16.71	546.57	0.77
MEAN	39.10	43.40	-4.30	526.00	834.41	16.71	546.57	0.73
HUB	34.59	38.84	-4.25	446.28	786.57	16.71	546.57	0.69

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	544.81	208.66	503.27	1177.76	0.46
MEAN	17.51	558.72	237.06	505.93	1176.54	0.47
HUB	14.85	607.70	329.32	510.74	1175.27	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	629.88	378.77	0.53	4137.99	
MEAN	519.12	579.24	282.06	0.49	4154.14	1.52
HUB	440.35	522.67	111.03	0.44	4893.71	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.76	1.10	19.65	601.27	1.03	576.50	0.92	0.79
MEAN	22.77	1.10	19.51	601.35	1.03	575.29	0.92	0.79
HUB	23.14	1.12	19.28	604.87	1.04	574.04	0.92	0.79

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	22.52	36.97	31.50	5.47	0.93	0.32	2.90	
MEAN	25.11	29.14	23.50	5.64	0.88	0.35	3.28	0.79
HUB	32.81	12.26	6.50	5.76	0.88	0.39	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.866

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     565.302     238.620     512.471    1177.035       0.480       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.859      19.518     575.821      46.000      24.968      31.500       6.532

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     531.502     238.620     582.610    1180.194       0.450       0.104

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.804      19.838     578.916     471.992       0.026       0.230

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     515.326       0.000     515.326    1181.634       0.436       0.122

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.934     580.330       0.000       0.060       0.051       0.132

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.730      22.720       1.095     602.499      20.918     295.663       2.292

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 130350.648       0.378    1186.980 1920777.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.964   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.138    3398.000      22.720     602.499       1.000       1.000       0.980
W Kg/sec =   73.24458

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.365    3152.851       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123960.672  126439.617       1.569     513.330     327.266     401.059       1.225

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   481.75    -0.17   481.75     0.41   529.90
 MEAN    16.97     0.00    -0.02   481.75    -0.17   481.75     0.41
 HUB     14.32     0.00    -0.02   481.75    -0.17   481.75     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.86    46.36     3.50   571.12   747.30    20.27   583.13     0.63
 MEAN    46.26    43.80     2.46   503.23   696.78    20.27   583.13     0.59
 HUB     41.41    37.84     3.57   424.63   642.29    20.27   583.13     0.54

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   536.83   206.44   495.56  1198.44     0.45
 MEAN    16.57   549.49   231.16   498.50  1196.97     0.46
 HUB     13.89   594.61   317.96   502.45  1195.45     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   608.67   353.42     0.51  3900.69
 MEAN   491.47   562.37   260.31     0.47  3834.07     1.33
 HUB    411.88   511.15    93.92     0.43  4418.86

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.99     1.10    21.77   621.06     1.03   597.01     0.92     0.90
 MEAN    24.95     1.10    21.59   620.74     1.03   595.54     0.92     0.90
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 HUB     25.30     1.11    21.36   623.52     1.03   594.02     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.62    35.50    31.50     4.00     0.93     0.23     2.90
 MEAN    24.88    27.57    23.50     4.07     0.91     0.24     3.29     0.90
 HUB     32.33    10.59     6.50     4.09     0.91     0.27     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     540.041     232.462     487.448    1198.838       0.450       0.056

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.044      21.786     597.434      46.000      25.496      32.400       6.904

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     512.206     232.462     562.489    1201.288       0.426       0.136

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.991      22.051     599.878     456.573       0.025       0.245

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     485.882       0.000     485.882    1203.481       0.404       0.132

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.249     602.071       0.000       0.060       0.052       0.193

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.830      24.896       1.096     621.772      19.273     294.780       2.285

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 120146.555       0.383    1094.061 1447392.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.964   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.138    3398.000      24.896     621.772       1.000       1.000       0.980
W Kg/sec =   73.24458

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.172    3103.601       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123960.672  126439.617       1.680     509.668     303.418     390.276       1.286

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   451.38    -0.16   451.38     0.37   496.16
 MEAN    15.91     0.00    -0.02   451.38    -0.16   451.38     0.37
 HUB     13.07     0.00    -0.02   451.38    -0.16   451.38     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.28    47.36     2.92   543.25   706.42    22.60   604.77     0.59
 MEAN    46.28    44.80     1.48   471.87   653.11    22.60   604.77     0.54
 HUB     40.66    38.84     1.82   387.57   595.04    22.60   604.77     0.49

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   506.23   196.80   466.41  1218.44     0.42
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 MEAN    15.50   515.66   212.78   469.71  1216.55     0.42
 HUB     12.59   552.72   284.60   473.81  1214.63     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   574.35   335.18     0.47  3533.43
 MEAN   459.55   530.59   246.77     0.44  3300.08     1.34
 HUB    373.33   482.05    88.73     0.40  3585.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.04     1.09    24.01   638.57     1.03   617.20     0.92     0.89
 MEAN    26.90     1.08    23.77   637.47     1.03   615.28     0.92     0.89
 HUB     27.08     1.09    23.49   638.82     1.03   613.34     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.88    35.70    31.50     4.20     0.93     0.23     2.90
 MEAN    24.37    27.72    23.50     4.22     0.91     0.24     3.34     0.89
 HUB     30.99    10.61     6.50     4.11     0.91     0.25     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     521.069     216.683     473.879    1216.884       0.428       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.942      23.748     615.636      46.000      24.572      33.000       8.428

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     504.826     216.683     549.364    1218.257       0.414       0.024

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.828      23.835     617.026     440.827       0.055       0.238

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     470.089       0.000     470.089    1221.043       0.385       0.140

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.204     619.851       0.000       0.060       0.060       0.138

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.808      26.812       1.077     638.287      16.515     319.134       2.474

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102995.281       0.364     937.881 1494873.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    719461.00   6551.4536    157.4157      1.7748      0.8095      5.9641      1.2209


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 90% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.614    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   72.09729
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
154.950	3384.617	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
122018.992	124459.109	1.843	831.557	451.248	619.754	1.373

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	372.34	-0.13	372.34	0.34	609.32
MEAN	17.06	0.00	-0.02	372.34	-0.13	372.34	0.34	
HUB	12.51	0.00	-0.02	372.34	-0.13	372.34	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.68	50.47	8.21	611.74	716.26	13.97	511.23	0.65
MEAN	53.65	47.20	6.45	505.89	628.24	13.97	511.23	0.57
HUB	44.90	38.62	6.28	370.96	525.69	13.97	511.23	0.47

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	601.90	344.40	493.62	1125.58	0.53
MEAN	18.04	631.48	381.80	502.99	1121.22	0.56
HUB	15.00	720.37	496.94	521.52	1113.40	0.65

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	611.74	561.37	267.34	0.50	7107.68	
MEAN	534.83	525.75	153.02	0.47	6888.38	1.33
HUB	444.80	524.12	52.15	0.47	7455.77	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.46	1.22	15.20	556.67	1.06	526.41	0.92	0.91
MEAN	18.35	1.21	14.80	555.62	1.06	522.32	0.92	0.91
HUB	18.64	1.23	14.06	558.33	1.07	514.99	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.90	28.44	24.20	4.24	0.93	0.30	2.90	
MEAN	37.20	16.92	12.70	4.22	0.93	0.25	3.51	0.91
HUB	43.62	-5.71	-9.30	3.59	0.93	0.11	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	641.468	381.061	516.017	1121.335	0.572	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.449	14.774	522.504	24.000	36.445	35.400	-1.045

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	541.648	381.061	662.261	1131.870	0.479	0.274

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.401	15.728	532.368	528.796	0.023	0.422

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	497.951	0.000	497.951	1135.896	0.438	0.342

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.075	536.162	0.000	0.060	0.037	0.366

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	18.346	1.214	556.872	34.062	215.395	1.670

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
212065.438	0.567	1900.832	1565675.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 6.453 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
158.614	3398.000	18.346	556.872	1.000	1.000	0.980

W Kg/sec = 72.09729

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
131.682	3279.471	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
122018.992	124459.109	1.540	590.487	383.495	474.134	1.236

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	473.63	-0.16	473.63	0.42	588.10
MEAN	18.08	0.00	-0.02	473.63	-0.16	473.63	0.42	
HUB	15.21	0.00	-0.02	473.63	-0.16	473.63	0.42	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.15	46.36	5.79	609.37	771.92	16.28	538.14	0.68
MEAN	48.55	42.30	6.25	536.08	715.46	16.28	538.14	0.63
HUB	43.61	37.84	5.77	451.02	654.14	16.28	538.14	0.57

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	549.01	265.56	480.51	1158.30	0.47
MEAN	18.01	562.40	282.61	486.24	1155.36	0.49
HUB	15.22	611.10	361.25	492.89	1152.43	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	588.61	339.96	0.51	5426.08	
MEAN	534.05	547.40	251.44	0.47	5092.72	1.41
HUB	451.41	501.07	90.16	0.43	5501.83	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.21	1.16	18.18	582.71	1.05	557.54	0.92	0.91
MEAN	21.02	1.15	17.88	581.12	1.04	554.71	0.92	0.91
HUB	21.25	1.16	17.54	583.07	1.05	551.89	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.93	35.28	31.50	3.78	0.93	0.30	2.90	
MEAN	30.17	27.34	23.50	3.84	0.93	0.29	3.30	0.91
HUB	36.24	10.37	6.50	3.87	0.93	0.30	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	745.114	283.402	689.114	1135.606	0.656	-0.624

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.128	15.819	535.937	46.000	22.355	30.600	8.245

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	702.233	283.402	757.263	1141.083	0.615	-0.482

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	21.025	16.279	541.120	400.556	0.041	0.196

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	693.728	0.000	693.728	1142.135	0.607	0.140

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	16.280	542.111	0.000	0.060	0.082	-0.482

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.831	20.892	1.139	582.298	25.426	254.821	1.975

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
158374.266	0.432	1419.576	1424785.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 6.453 EfDer = 0.885

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
158.614	3398.000	20.892	582.298	1.000	1.000	0.780

W Kg/sec = 72.09729

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
118.247	3207.073	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
122018.992	124459.109	1.261	434.156	344.383	339.175	0.985

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	627.90	-0.22	627.90	0.55	561.68
MEAN	17.74	0.00	-0.02	627.90	-0.22	627.90	0.55	
HUB	15.05	0.00	-0.02	627.90	-0.22	627.90	0.55	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	43.48	46.36	-2.88	595.14	865.28	17.05	549.39	0.75
MEAN	39.96	43.40	-3.44	526.00	819.25	17.05	549.39	0.71
HUB	35.42	38.84	-3.42	446.28	770.47	17.05	549.39	0.67

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	535.73	220.47	488.26	1180.46	0.45
MEAN	17.51	549.38	245.73	491.36	1178.88	0.47
HUB	14.85	597.61	332.94	496.27	1177.30	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	610.78	366.95	0.52	4371.93	
MEAN	519.12	562.30	273.40	0.48	4305.64	1.54
HUB	440.35	507.76	107.41	0.43	4947.46	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.08	1.10	20.03	603.11	1.04	579.15	0.92	0.81
MEAN	23.04	1.10	19.85	602.79	1.04	577.60	0.92	0.81
HUB	23.38	1.12	19.60	605.84	1.04	576.03	0.92	0.81

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	24.30	36.93	31.50	5.43	0.93	0.34	2.90	
MEAN	26.57	29.09	23.50	5.59	0.89	0.36	3.28	0.81
HUB	33.86	12.21	6.50	5.71	0.89	0.40	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.885

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	555.659	247.338	497.575	1179.401	0.471	0.004

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.133      19.867     578.138      46.000      26.431      31.500       5.069

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     514.510     247.338     570.874    1183.144       0.435       0.133

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.090      20.273     581.814     471.992       0.023       0.252

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     498.826       0.000     498.826    1184.493       0.421       0.151

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.369     583.141       0.000       0.060       0.045       0.161

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.758      23.015       1.102     603.913      21.615     284.074       2.202

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 134692.422       0.390    1207.305 1870730.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.614    3398.000      23.015     603.913       1.000       1.000       0.980
W Kg/sec =   72.09729

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    109.314    3149.157       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 122018.992  124459.109       1.612     513.330     318.382     401.059       1.260

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   466.77    -0.16   466.77     0.39   529.28
 MEAN    16.97     0.00    -0.02   466.77    -0.16   466.77     0.39
 HUB     14.32     0.00    -0.02   466.77    -0.16   466.77     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.75    46.36     4.39   571.12   737.72    20.69   585.73     0.62
 MEAN    47.16    43.80     3.36   503.23   686.50    20.69   585.73     0.58
 HUB     42.30    37.84     4.46   424.63   631.13    20.69   585.73     0.53

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   526.15   218.88   478.46  1201.92     0.44
 MEAN    16.57   538.40   240.10   481.90  1200.10     0.45
 HUB     13.89   582.75   321.26   486.19  1198.25     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   587.52   340.97     0.49  4135.52
 MEAN   491.47   543.52   251.37     0.45  3982.08     1.36
 HUB    411.88   494.57    90.62     0.41  4464.62

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.47     1.11    22.33   623.59     1.03   600.49     0.92     0.90
 MEAN    25.38     1.10    22.10   622.86     1.03   598.67     0.92     0.90
 HUB     25.67     1.12    21.83   625.15     1.04   596.81     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     24.58    35.48    31.50     3.98     0.93     0.25     2.90
 MEAN    26.48    27.55    23.50     4.05     0.92     0.26     3.29     0.90
 HUB     33.46    10.56     6.50     4.06     0.92     0.28     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     529.602     241.448     471.361    1201.869       0.441       0.056

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.472      22.289     600.459      46.000      27.123      32.400       5.277

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     493.791     241.448     549.661    1204.926       0.410       0.165

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.432      22.652     603.517     456.573       0.022       0.269

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     468.496       0.000     468.496    1206.952       0.388       0.162

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.844     605.548       0.000       0.060       0.046       0.222

    STAGE EXIT CONDITIONS, STAGE             4
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.849       25.349       1.101     623.865      19.952     282.715       2.192

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 124383.469       0.397    1114.902 1414800.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.981

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    158.614    3398.000       25.349     623.865       1.000        1.000        0.980
W Kg/sec =   72.09729

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    100.877    3098.391        1.401       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 122018.992  124459.109        1.735     509.668     293.821     390.276       1.328

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   435.65    -0.15   435.65      0.36   495.33
 MEAN    15.91      0.00    -0.02   435.65    -0.15   435.65      0.36
 HUB     13.07      0.00    -0.02   435.65    -0.15   435.65      0.36

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     51.28     47.36     3.92   543.25   696.47     23.17   608.03      0.58
 MEAN    47.29     44.80     2.49   471.87   642.34     23.17   608.03      0.53
 HUB     41.67     38.84     2.83   387.57   583.19     23.17   608.03      0.48

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   495.26    209.94    448.56   1222.50      0.41
 MEAN    15.50   503.92    222.26    452.26   1220.28      0.41
 HUB     12.59   539.92    288.11    456.62   1218.05      0.44
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   552.19   322.04     0.45  3769.06
 MEAN   459.55   510.73   237.30     0.42  3446.82     1.37
 HUB    373.33   464.51    85.22     0.38  3629.25

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.71     1.09    24.74   641.79     1.03   621.33     0.92     0.90
 MEAN    27.50     1.08    24.45   640.25     1.03   619.07     0.92     0.90
 HUB     27.62     1.09    24.13   641.12     1.03   616.80     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.08    35.68    31.50     4.18     0.93     0.26     2.90
 MEAN    26.17    27.69    23.50     4.19     0.91     0.26     3.34     0.90
 HUB     32.25    10.57     6.50     4.07     0.91     0.26     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     509.256     226.331     456.197    1220.616       0.417      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.543      24.431     619.419      46.000      26.387      33.000       6.613

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     484.042     226.331     534.343    1222.673       0.396       0.065

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.462      24.647     621.509     440.827       0.046       0.264

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     451.267       0.000     451.267    1225.186       0.368       0.176

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.988     624.066       0.000       0.060       0.051       0.173

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.835      27.444       1.083     641.055      17.190     304.231       2.358

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 107211.195       0.379     960.979 1460431.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    736726.81   6603.5942    154.9500      1.8167      0.8255      6.4531      1.2262


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 90% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.044   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    151.988    3384.617       1.402       0.249      53.349      32.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
119686.578	122080.047	1.879	831.557	442.622	619.754	1.400

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	364.35	-0.13	364.35	0.33	609.32
MEAN	17.06	0.00	-0.02	364.35	-0.13	364.35	0.33	
HUB	12.51	0.00	-0.02	364.35	-0.13	364.35	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.23	50.47	8.76	611.74	712.14	14.02	511.72	0.64
MEAN	54.24	47.20	7.04	505.89	623.54	14.02	511.72	0.56
HUB	45.52	38.62	6.90	370.96	520.06	14.02	511.72	0.47

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	595.87	351.00	481.52	1126.91	0.53
MEAN	18.04	624.23	385.51	490.96	1122.36	0.56
HUB	15.00	710.41	495.70	508.88	1114.57	0.64

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	611.74	547.59	260.75	0.49	7243.62	
MEAN	534.83	513.16	149.32	0.46	6955.19	1.36
HUB	444.80	511.42	50.90	0.46	7437.09	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.53	1.23	15.32	557.32	1.07	527.66	0.92	0.91
MEAN	18.39	1.22	14.90	555.94	1.06	523.40	0.92	0.91
HUB	18.63	1.23	14.17	558.24	1.07	516.09	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.09	28.44	24.20	4.24	0.93	0.32	2.90	
MEAN	38.14	16.92	12.70	4.22	0.93	0.27	3.51	0.91
HUB	44.25	-5.71	-9.30	3.59	0.93	0.13	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	633.699	384.760	503.522	1122.536	0.565	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.481	14.883	523.623	24.000	37.385	35.400	-1.985

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	527.515	384.760	652.926	1133.521	0.465	0.293

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.432	15.887	533.922	528.796	0.023	0.436

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	485.568	0.000	485.568	1137.282	0.427	0.356

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.209	537.471	0.000	0.060	0.038	0.380

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	18.377	1.216	557.164	34.354	211.711	1.641

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
213884.875	0.572	1880.494	1532079.375

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 7.044   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3398.000      18.377     557.164       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    128.986    3278.611       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.572     590.487     375.645     474.134       1.262

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   462.12    -0.16   462.12     0.41   587.94
 MEAN    18.08     0.00    -0.02   462.12    -0.16   462.12     0.41
 HUB     15.21     0.00    -0.02   462.12    -0.16   462.12     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.83    46.36     6.47   609.37   764.90    16.41   539.33     0.67
 MEAN    49.25    42.30     6.95   536.08   707.88    16.41   539.33     0.62
 HUB     44.31    37.84     6.47   451.02   645.85    16.41   539.33     0.57

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   542.57   274.63   467.92  1160.12     0.47
 MEAN    18.01   555.16   289.17   473.91  1156.95     0.48
 HUB     15.22   602.80   363.63   480.77  1153.79     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   573.10   330.88     0.49  5611.27
 MEAN   534.05   533.44   244.88     0.46  5210.81     1.44
 HUB    451.41   488.72    87.78     0.42  5537.97

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.35     1.16    18.37   583.88     1.05   559.30     0.92     0.91
 MEAN    21.12     1.15    18.04   581.97     1.04   556.24     0.92     0.91
 HUB     21.30     1.16    17.68   583.53     1.05   553.19     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.41    35.27    31.50     3.77     0.93     0.31     2.90
 MEAN    31.39    27.33    23.50     3.83     0.93     0.31     3.30     0.91
 HUB     37.10    10.35     6.50     3.85     0.93     0.32     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     727.046     289.981     666.713    1138.834       0.638      -0.592

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.225      16.129     538.989      46.000      23.506      30.600       7.094

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     676.665     289.981     736.183    1145.056       0.591      -0.417

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      21.140      16.686     544.894     400.556       0.036       0.215

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     667.506       0.000     667.506    1146.139       0.582       0.181
```

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	16.713	545.923	0.000	0.060	0.069	-0.409

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.847	21.034	1.145	583.129	25.965	247.776	1.921

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
161729.703	0.441	1421.941	1391148.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 7.044 EfDer = 0.905

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
155.582	3398.000	21.034	583.129	1.000	1.000	0.780

W Kg/sec = 70.71914

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
115.284	3204.787	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
119686.578	122080.047	1.293	434.156	335.754	339.175	1.010

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	606.37	-0.21	606.37	0.53	561.28
MEAN	17.74	0.00	-0.02	606.37	-0.21	606.37	0.53	
HUB	15.05	0.00	-0.02	606.37	-0.21	606.37	0.53	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	44.47	46.36	-1.89	595.14	849.78	17.42	552.43	0.74
MEAN	40.95	43.40	-2.45	526.00	802.86	17.42	552.43	0.70
HUB	36.37	38.84	-2.47	446.28	753.02	17.42	552.43	0.65

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	526.29	233.57	471.62	1183.40	0.44
MEAN	17.51	539.41	255.31	475.17	1181.45	0.46
HUB	14.85	586.63	336.96	480.21	1179.53	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	589.61	353.86	0.50	4631.19	
MEAN	519.12	543.49	263.81	0.46	4473.38	1.57
HUB	440.35	491.21	103.39	0.42	5006.96	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.42	1.11	20.45	605.17	1.04	582.05	0.92	0.83
MEAN	23.34	1.11	20.23	604.42	1.04	580.13	0.92	0.83
HUB	23.63	1.12	19.95	606.96	1.04	578.23	0.92	0.83

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	26.35	36.88	31.50	5.38	0.93	0.35	2.90	
MEAN	28.25	29.04	23.50	5.54	0.89	0.37	3.28	0.83
HUB	35.06	12.15	6.50	5.65	0.89	0.41	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.905

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	545.389	256.990	481.046	1181.995	0.461	0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.430	20.245	580.684	46.000	28.112	31.500	3.388

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	495.901	256.990	558.535	1186.365	0.418	0.165

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.398	20.745	584.986	471.992	0.020	0.277

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	480.807	0.000	480.807	1187.612	0.405	0.182

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.838	586.216	0.000	0.060	0.041	0.194

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.785	23.331	1.109	605.515	22.386	271.912	2.108

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
139501.609	0.404	1226.510	1814373.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 7.044 EfDer = 0.994

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
155.582	3398.000	23.331	605.515	1.000	1.000	0.980

W Kg/sec = 70.71914

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
105.912	3144.988	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
119686.578	122080.047	1.664	513.330	308.473	401.059	1.300

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	450.35	-0.16	450.35	0.38	528.58
MEAN	16.97	0.00	-0.02	450.35	-0.16	450.35	0.38	
HUB	14.32	0.00	-0.02	450.35	-0.16	450.35	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.75	46.36	5.39	571.12	727.44	21.13	588.59	0.61
MEAN	48.18	43.80	4.38	503.23	675.44	21.13	588.59	0.57
HUB	43.33	37.84	5.49	424.63	619.08	21.13	588.59	0.52

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	515.38	232.28	460.07	1205.65	0.43
MEAN	16.57	526.91	249.77	463.95	1203.48	0.44
HUB	13.89	570.14	324.82	468.57	1201.29	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	564.77	327.57	0.47	4388.50	
MEAN	491.47	523.13	241.69	0.43	4142.35	1.39
HUB	411.88	476.59	87.06	0.40	4513.97	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.99	1.11	22.92	626.39	1.03	604.23	0.92	0.91
MEAN	25.83	1.11	22.64	625.22	1.03	602.05	0.92	0.91
HUB	26.07	1.12	22.34	626.99	1.04	599.86	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	26.79	35.45	31.50	3.95	0.93	0.28	2.90	
MEAN	28.30	27.52	23.50	4.02	0.92	0.28	3.29	0.91
HUB	34.73	10.53	6.50	4.03	0.92	0.30	3.90	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481      518.820     251.179     453.965     1205.145       0.431       0.055

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     25.929      22.825      603.737      46.000      28.956       32.400       3.444

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481      474.130     251.179     536.554     1208.835       0.392       0.198

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       25.900      23.291      607.440     456.573       0.019       0.296

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096      449.973       0.000     449.973     1210.687       0.372       0.195

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       23.475      609.303       0.000       0.060       0.041       0.253

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4           PR4        Texit        Del T        Ns         Ns nondim
      0.865       25.827        1.107      626.200      20.685      270.278       2.095

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 128956.109       0.411    1133.793 1377382.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.044   EfDer =  0.990

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    155.582     3398.000       25.827      626.200       1.000        1.000        0.980
W Kg/sec =   70.71914

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     97.298     3092.609        1.401        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 119686.578  122080.047        1.798      509.668     283.399      390.276       1.377

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   418.83    -0.14   418.83      0.35   494.41
 MEAN    15.91      0.00    -0.02   418.83    -0.14   418.83      0.35
 HUB     13.07      0.00    -0.02   418.83    -0.14   418.83      0.35

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     52.38     47.36     5.02   543.25   686.07     23.78   611.57      0.57
 MEAN    48.42     44.80     3.62   471.87   631.04     23.78   611.57      0.52
 HUB     42.79     38.84     3.95   387.57   570.73     23.78   611.57      0.47

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   484.56    223.74    429.81   1226.80      0.39
 MEAN    15.50   492.10    232.26    433.84   1224.27      0.40
 HUB     12.59   526.67    291.82    438.43   1221.73      0.43

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    531.98    528.91    308.23      0.43   4016.58
 MEAN   459.55    489.77    227.29      0.40   3601.84      1.41
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  HUB    373.33   445.94    81.51     0.37  3675.93

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     28.41     1.10    25.51   645.30     1.03   625.71     0.92     0.91
  MEAN    28.13     1.09    25.17   643.33     1.03   623.12     0.92     0.91
  HUB     28.18     1.09    24.80   643.68     1.03   620.54     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     27.50    35.65    31.50     4.15     0.93     0.28     2.90
  MEAN    28.16    27.65    23.50     4.15     0.92     0.28     3.34     0.91
  HUB     33.65    10.53     6.50     4.03     0.92     0.28     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.990

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     497.396     236.523     437.561    1224.588       0.406      -0.006

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      28.177      25.148     623.461      46.000      28.393      33.000       4.607

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     462.544     236.523     519.509    1227.326       0.377       0.109

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      28.121      25.493     626.252     440.827       0.038       0.293

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     431.694       0.000     431.694    1229.579       0.351       0.213

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      25.805     628.554       0.000       0.060       0.044       0.210

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.857      28.104       1.088     644.100      17.900     289.355       2.243

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  111652.195       0.395     981.656 1421207.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     755724.50   6644.3950     151.9881      1.8603      0.8397      7.0442      1.2320


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 90% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     150.961     3398.000       15.107     522.810       1.000        1.000       0.980
 W Kg/sec =   68.61877

    W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     147.474     3384.617        1.402       0.249      53.349      32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  116131.867  118454.250        1.936     831.557     429.477     619.754       1.443
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ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	352.30	-0.12	352.30	0.32	609.32
MEAN	17.06	0.00	-0.02	352.30	-0.12	352.30	0.32	
HUB	12.51	0.00	-0.02	352.30	-0.12	352.30	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.07	50.47	9.60	611.74	706.04	14.09	512.44	0.64
MEAN	55.15	47.20	7.95	505.89	616.57	14.09	512.44	0.56
HUB	46.49	38.62	7.87	370.96	511.68	14.09	512.44	0.46

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	587.46	360.70	463.68	1128.80	0.52
MEAN	18.04	613.80	391.00	473.15	1124.01	0.55
HUB	15.00	695.84	493.88	490.19	1116.24	0.62

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	611.74	527.27	251.04	0.47	7443.83	
MEAN	534.83	494.53	143.82	0.44	7054.16	1.40
HUB	444.80	492.64	49.08	0.44	7409.66	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.63	1.23	15.49	558.27	1.07	529.45	0.92	0.91
MEAN	18.43	1.22	15.05	556.41	1.06	524.95	0.92	0.91
HUB	18.61	1.23	14.32	558.11	1.07	517.67	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.88	28.43	24.20	4.23	0.93	0.34	2.90	
MEAN	39.57	16.91	12.70	4.21	0.93	0.29	3.51	0.91
HUB	45.21	-5.72	-9.30	3.58	0.93	0.15	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	622.556	390.241	485.065	1124.250	0.554	-0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.523	15.036	525.224	24.000	38.817	35.400	-3.417

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	506.874	390.241	639.694	1135.869	0.446	0.321

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.472	16.110	536.137	528.796	0.024	0.458

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	467.421	0.000	467.421	1139.265	0.410	0.377

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.395	539.347	0.000	0.060	0.041	0.400

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	18.413	1.219	557.596	34.786	206.238	1.599

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
216571.438	0.579	1847.562	1481373.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.953 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
150.961	3398.000	18.413	557.596	1.000	1.000	0.980

W Kg/sec = 68.61877

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
124.958	3277.342	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
116131.867	118454.250	1.623	590.487	363.912	474.134	1.303

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	445.19	-0.15	445.19	0.39	587.72
MEAN	18.08	0.00	-0.02	445.19	-0.15	445.19	0.39	
HUB	15.21	0.00	-0.02	445.19	-0.15	445.19	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.86	46.36	7.50	609.37	754.79	16.58	541.05	0.66
MEAN	50.30	42.30	8.00	536.08	696.95	16.58	541.05	0.61
HUB	45.38	37.84	7.54	451.02	633.84	16.58	541.05	0.56

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	533.91	287.70	449.77	1162.68	0.46
MEAN	18.01	545.11	298.65	456.02	1159.19	0.47
HUB	15.22	590.96	367.09	463.11	1155.71	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	550.72	317.81	0.47	5878.04	
MEAN	534.05	513.19	235.41	0.44	5381.38	1.48
HUB	451.41	470.72	84.32	0.41	5590.59	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.53	1.17	18.63	585.58	1.05	561.78	0.92	0.91
MEAN	21.25	1.15	18.26	583.22	1.05	558.41	0.92	0.91
HUB	21.37	1.16	17.87	584.21	1.05	555.05	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.61	35.25	31.50	3.75	0.93	0.34	2.90	
MEAN	33.22	27.30	23.50	3.80	0.93	0.33	3.30	0.91
HUB	38.40	10.32	6.50	3.82	0.93	0.33	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	702.550	299.484	635.520	1143.191	0.615	-0.549

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.353	16.544	543.122	46.000	25.232	30.600	5.368

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	641.827	299.484	708.261	1150.343	0.558	-0.328

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	21.289	17.228	549.939	400.556	0.031	0.243

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	632.319	0.000	632.319	1151.402	0.549	0.234

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	17.276	550.951	0.000	0.060	0.055	-0.313

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    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.863      21.212       1.152     584.338      26.742     237.872       1.844

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 166573.438       0.454    1421.031 1341027.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.933

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.961    3398.000      21.212     584.338       1.000       1.000       0.780
W Kg/sec =   68.61877

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.037    3201.470       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 116131.867  118454.250       1.343     434.156     323.384     339.175       1.049

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   576.88    -0.20   576.88     0.50   560.70
 MEAN    17.74     0.00    -0.02   576.88    -0.20   576.88     0.50
 HUB     15.05     0.00    -0.02   576.88    -0.20   576.88     0.50

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.90    46.36    -0.46   595.14   828.99    17.90   556.56     0.72
 MEAN    42.37    43.40    -1.03   526.00   780.82    17.90   556.56     0.67
 HUB     37.74    38.84    -1.10   446.28   729.48    17.90   556.56     0.63

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   514.38   251.62   448.64  1187.40     0.43
 MEAN    17.51   526.40   268.58   452.73  1184.97     0.44
 HUB     14.85   571.84   342.47   457.95  1182.60     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   560.39   335.81     0.47  4988.64
 MEAN   519.12   517.43   250.55     0.44  4705.42     1.61
 HUB    440.35   468.29    97.88     0.40  5088.70

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.89     1.13    21.00   608.08     1.04   585.99     0.92     0.85
 MEAN    23.73     1.12    20.72   606.73     1.04   583.60     0.92     0.85
 HUB     23.95     1.13    20.40   608.55     1.04   581.26     0.92     0.85

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.29    36.81    31.50     5.31     0.93     0.38     2.90
 MEAN    30.68    28.96    23.50     5.46     0.90     0.39     3.28     0.85
 HUB     36.79    12.06     6.50     5.56     0.90     0.42     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.933

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     531.999     270.341     458.190    1185.527       0.449       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.826      20.748     584.162      46.000      30.541      31.500       0.959

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     17.392     470.538     270.341     542.670    1190.735       0.395       0.210

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.802      21.370     589.305     471.992       0.018       0.313

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     456.344       0.000     456.344    1191.844       0.383       0.225

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.455     590.404       0.000       0.060       0.037       0.237

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.817      23.741       1.119     607.788      23.450     256.134       1.986

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 146137.344       0.423    1246.692 1734472.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.961    3398.000      23.741     607.788       1.000       1.000       0.980
W Kg/sec =   68.61877

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    101.181    3139.101       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 116131.867  118454.250       1.742     513.330     294.692     401.059       1.361

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   427.95    -0.15   427.95     0.36   527.59
 MEAN    16.97     0.00    -0.02   427.95    -0.15   427.95     0.36
 HUB     14.32     0.00    -0.02   427.95    -0.15   427.95     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.16    46.36     6.80   571.12   713.78    21.72   592.50     0.60
 MEAN    49.63    43.80     5.83   503.23   660.71    21.72   592.50     0.55
 HUB     44.79    37.84     6.95   424.63   602.98    21.72   592.50     0.51

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   502.27   250.13   435.56  1210.60     0.41
 MEAN    16.57   512.35   262.70   439.88  1208.01     0.42
 HUB     13.89   553.65   329.61   444.84  1205.42     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   534.45   309.72     0.44  4725.27
 MEAN   491.47   495.81   228.77     0.41  4356.47     1.44
 HUB    411.88   452.38    82.27     0.38  4580.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.66     1.12    23.68   630.27     1.04   609.21     0.92     0.91
 MEAN    26.43     1.11    23.35   628.51     1.03   606.60     0.92     0.91
 HUB     26.57     1.12    22.99   629.58     1.04   604.00     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.87    35.42    31.50     3.92     0.93     0.31     2.90
 MEAN    30.85    27.48    23.50     3.98     0.92     0.31     3.29     0.91
 HUB     36.54    10.48     6.50     3.98     0.92     0.32     3.90


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     505.196     264.178     430.619    1209.541       0.418       0.053

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.521      23.518     608.152      46.000      31.528      32.400       0.872

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     448.116     264.178     520.190    1214.048       0.369       0.242

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.500      24.118     612.693     456.573       0.016       0.334

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     425.537       0.000     425.537    1215.678       0.350       0.239

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.285     614.339       0.000       0.060       0.037       0.294

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      26.434       1.113     629.451      21.662     254.492       1.973

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 135059.219       0.431    1152.185 1323218.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    150.961    3398.000      26.434     629.451       1.000       1.000       0.980
W Kg/sec =   68.61877

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     92.477    3084.613       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 116131.867  118454.250       1.892     509.668     269.358     390.276       1.449

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   396.54    -0.14   396.54     0.33   493.13
 MEAN    15.91     0.00    -0.02   396.54    -0.14   396.54     0.33
 HUB     13.07     0.00    -0.02   396.54    -0.14   396.54     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.88    47.36     6.52   543.25   672.69    24.56   616.33     0.55
 MEAN    49.97    44.80     5.17   471.87   616.47    24.56   616.33     0.51
 HUB     44.35    38.84     5.51   387.57   554.58    24.56   616.33     0.46

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   472.02   241.63   405.48  1232.44     0.38
 MEAN    15.50   477.61   245.29   409.81  1229.53     0.39
 HUB     12.59   509.79   296.61   414.62  1226.62     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   498.71   290.34     0.40  4337.41
 MEAN   459.55   462.44   214.26     0.38  3803.56     1.46
 HUB    373.33   421.66    76.73     0.34  3736.06

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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  TIP     29.30     1.11    26.48   650.07     1.03   631.49     0.92     0.91
  MEAN    28.93     1.09    26.07   647.53     1.03   628.50     0.92     0.91
  HUB     28.89     1.09    25.65   647.21     1.03   625.53     0.92     0.91

          Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     30.79    35.60    31.50     4.10     0.93     0.32     2.90
  MEAN    30.90    27.60    23.50     4.10     0.92     0.31     3.34     0.91
  HUB     35.58    10.48     6.50     3.98     0.92     0.30     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.998

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     482.908     249.787     413.287    1229.832       0.393      -0.006

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      28.981      26.056     628.819      46.000      31.148      33.000       1.852

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     435.090     249.787     501.694    1233.407       0.353       0.165

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      28.946      26.558     632.481     440.827       0.032       0.333

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     406.584       0.000     406.584    1235.357       0.329       0.262

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      26.836     634.482       0.000       0.060       0.038       0.259

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.875      28.929       1.094     648.273      18.822     271.128       2.102

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  117412.516       0.415    1001.641 1364846.625

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     781754.00   6669.1113    147.4741      1.9149      0.8532      7.9534      1.2400


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 90% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     145.767    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   66.25780

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     142.400    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  112136.125  114378.609       2.005     831.557     414.700     619.754       1.494

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     20.63     0.00    -0.02   338.90    -0.12   338.90     0.30   609.32
MEAN    17.06     0.00    -0.02   338.90    -0.12   338.90     0.30
HUB     12.51     0.00    -0.02   338.90    -0.12   338.90     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.02    50.47    10.55   611.74   699.45    14.16   513.22     0.63
MEAN    56.19    47.20     8.99   505.89   609.01    14.16   513.22     0.55
HUB     47.59    38.62     8.97   370.96   502.55    14.16   513.22     0.45

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   579.00   371.18   444.37  1130.76     0.51
MEAN    18.04   602.89   396.93   453.79  1125.72     0.54
HUB     15.00   680.25   491.88   469.89  1117.99     0.61

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    611.74   505.31   240.56     0.45  7659.92
MEAN   534.83   474.28   137.89     0.42  7161.06     1.45
HUB    444.80   472.24    47.08     0.42  7379.62

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.73     1.24    15.66   559.30     1.07   531.30     0.92     0.91
MEAN    18.48     1.22    15.20   556.92     1.07   526.56     0.92     0.91
HUB     18.59     1.23    14.47   557.96     1.07   519.32     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.87    28.43    24.20     4.23     0.93     0.37     2.90
MEAN    41.18    16.90    12.70     4.20     0.93     0.32     3.51     0.91
HUB     46.31    -5.72    -9.30     3.58     0.93     0.17     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     610.915     396.160     465.053    1126.030       0.543      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.563      15.191     526.888      24.000      40.426      35.400      -5.026

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     484.775     396.160     626.059    1138.298       0.426       0.351

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.507      16.334     538.432     528.796       0.026       0.483

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     447.921       0.000     447.921    1141.329       0.392       0.398

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.580     541.303       0.000       0.060       0.045       0.422

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      18.441       1.221     558.061      35.251     200.274       1.553

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 219467.391       0.586    1807.848 1425047.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3398.000      18.441     558.061       1.000       1.000       0.980
```

W Kg/sec = 66.25780

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
120.527	3275.976	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
112136.125	114378.609	1.682	590.487	351.010	474.134	1.351

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	426.95	-0.15	426.95	0.37	587.47
MEAN	18.08	0.00	-0.02	426.95	-0.15	426.95	0.37	
HUB	15.21	0.00	-0.02	426.95	-0.15	426.95	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.99	46.36	8.63	609.37	744.17	16.74	542.84	0.65
MEAN	51.47	42.30	9.17	536.08	685.43	16.74	542.84	0.60
HUB	46.58	37.84	8.74	451.02	621.16	16.74	542.84	0.54

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	525.63	301.47	430.58	1165.29	0.45
MEAN	18.01	535.03	308.69	437.00	1161.50	0.46
HUB	15.22	578.63	370.76	444.24	1157.71	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	527.11	304.05	0.45	6159.03	
MEAN	534.05	491.69	225.36	0.42	5562.21	1.52
HUB	451.41	451.51	80.65	0.39	5646.30	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.71	1.18	18.87	587.39	1.05	564.32	0.92	0.91
MEAN	21.37	1.16	18.48	584.54	1.05	560.64	0.92	0.91
HUB	21.42	1.16	18.06	584.94	1.05	556.99	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.00	35.23	31.50	3.73	0.93	0.36	2.90	
MEAN	35.24	27.28	23.50	3.78	0.93	0.35	3.30	0.91
HUB	39.85	10.29	6.50	3.79	0.93	0.35	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	678.479	309.560	603.744	1147.457	0.591	-0.506

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.469	16.941	547.185	46.000	27.146	30.600	3.454

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	607.086	309.560	681.455	1155.465	0.525	-0.239

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	21.421	17.744	554.849	400.556	0.026	0.272

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	597.683	0.000	597.683	1156.450	0.517	0.285

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	17.804	555.795	0.000	0.060	0.044	-0.219

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.873      21.366       1.159     585.624      27.563     227.722       1.765

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 171689.312       0.468    1414.280 1286138.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  0.957

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3398.000      21.366     585.624       1.000       1.000       0.780
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    106.563    3197.952       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 112136.125  114378.609       1.399     434.156     310.355     339.175       1.093

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   547.29    -0.19   547.29     0.47   560.08
 MEAN    17.74     0.00    -0.02   547.29    -0.19   547.29     0.47
 HUB     15.05     0.00    -0.02   547.29    -0.19   547.29     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.41    46.36     1.05   595.14   808.67    18.35   560.62     0.70
 MEAN    43.87    43.40     0.47   526.00   759.21    18.35   560.62     0.65
 HUB     39.21    38.84     0.37   446.28   706.30    18.35   560.62     0.61

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   503.82   269.78   425.51  1191.33     0.42
 MEAN    17.51   514.24   281.95   430.06  1188.47     0.43
 HUB     14.85   557.43   348.01   435.46  1185.67     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   530.99   317.65     0.45  5348.15
 MEAN   519.12   491.12   237.18     0.41  4939.24     1.65
 HUB    440.35   445.14    92.34     0.38  5170.78

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.34      1.14    21.52   611.08     1.04   589.89     0.92     0.88
 MEAN    24.10      1.13    21.19   609.13     1.04   587.05     0.92     0.88
 HUB     24.24      1.13    20.83   610.23     1.04   584.29     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.38    36.74    31.50     5.24     0.93     0.40     2.90
 MEAN    33.25    28.88    23.50     5.38     0.90     0.41     3.28     0.88
 HUB     38.63    11.97     6.50     5.47     0.90     0.43     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.957

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     519.511     283.795     435.145    1189.023       0.437       0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.196      21.219     587.615      46.000      33.112      31.500      -1.612

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     445.342     283.795     528.081    1195.052       0.373       0.256

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      24.173      21.961     593.589     471.992       0.018       0.352

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     432.152       0.000     432.152    1196.024       0.361       0.266

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.030     594.555       0.000       0.060       0.037       0.279

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.842      24.113       1.129     610.145      24.521     241.257       1.870

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 152813.938       0.443    1258.795 1651067.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3398.000      24.113     610.145       1.000       1.000       0.980
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.381    3133.032       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 112136.125  114378.609       1.829     513.330     280.714     401.059       1.429

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   405.71    -0.14   405.71     0.34   526.57
 MEAN    16.97     0.00    -0.02   405.71    -0.14   405.71     0.34
 HUB     14.32     0.00    -0.02   405.71    -0.14   405.71     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.62    46.36     8.26   571.12   700.67    22.27   596.41     0.58
 MEAN    51.13    43.80     7.33   503.23   646.52    22.27   596.41     0.54
 HUB     46.32    37.84     8.48   424.63   587.39    22.27   596.41     0.49

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   490.99   267.38   411.80  1215.39     0.40
 MEAN    16.57   499.17   275.29   416.39  1212.44     0.41
 HUB     13.89   538.00   334.26   421.56  1209.48     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   505.09   292.47     0.42  5050.79
 MEAN   491.47   469.16   216.18     0.39  4565.00     1.50
 HUB    411.88   428.65    77.63     0.35  4644.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.28     1.13    24.38   634.17     1.04   614.05     0.92     0.91
 MEAN    26.96     1.12    23.99   631.86     1.04   611.07     0.92     0.91
 HUB     27.02     1.12    23.58   632.24     1.04   608.08     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.00    35.38    31.50     3.88     0.93     0.34     2.90
 MEAN    33.47    27.44    23.50     3.94     0.93     0.34     3.29     0.91
 HUB     38.41    10.43     6.50     3.93     0.93     0.34     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     492.904     276.839     407.818    1213.832       0.406       0.051

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.057      24.149     612.481      46.000      34.170      32.400      -1.770

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     423.055     276.839     505.584    1219.111       0.347       0.287

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.037      24.874     617.820     456.573       0.016       0.373

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     16.096     402.077       0.000     402.077    1220.536       0.329       0.279

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.016     619.264       0.000       0.060       0.038       0.333

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.880      26.971       1.119     632.755      22.610     239.948       1.860

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 140975.250       0.450    1161.275 1265481.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3398.000      26.971     632.755       1.000       1.000       0.980
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.749    3076.548       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 112136.125  114378.609       1.994     509.668     255.587     390.276       1.527

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   375.06    -0.13   375.06     0.31   491.84
 MEAN    15.91     0.00    -0.02   375.06    -0.13   375.06     0.31
 HUB     13.07     0.00    -0.02   375.06    -0.13   375.06     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.38    47.36     8.02   543.25   660.25    25.26   621.02     0.54
 MEAN    51.53    44.80     6.73   471.87   602.87    25.26   621.02     0.49
 HUB     45.95    38.84     7.11   387.57   539.43    25.26   621.02     0.44

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   461.66   258.45   382.54  1237.83     0.37
 MEAN    15.50   464.90   257.57   387.02  1234.60     0.38
 HUB     12.59   494.26   301.14   391.93  1231.38     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   470.27   273.53     0.38  4638.88
 MEAN   459.55   436.56   201.98     0.35  3993.80     1.52
 HUB    373.33   398.52    72.20     0.32  3792.99

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.09     1.12    27.34   654.81     1.03   637.03     0.92     0.91
 MEAN    29.65     1.10    26.88   651.74     1.03   633.71     0.92     0.91
 HUB     29.51     1.09    26.40   650.79     1.03   630.41     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.04    35.57    31.50     4.07     0.93     0.35     2.90
 MEAN    33.64    27.56    23.50     4.06     0.93     0.34     3.34     0.91
 HUB     37.54    10.44     6.50     3.94     0.93     0.33     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     470.236     262.295     390.287    1234.876       0.381      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.692      26.862     634.000      46.000      33.903      33.000      -0.903

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     409.562     262.295     486.353    1239.205       0.331       0.218

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.663      27.500     638.452     440.827       0.030       0.374

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     383.152       0.000     383.152    1240.899       0.309       0.307

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.745     640.199       0.000       0.060       0.037       0.303

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      29.643       1.099     652.445      19.690     254.902       1.976

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  122835.773       0.434    1011.852 1305104.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    807781.62   6654.0488    142.3999      1.9622      0.8599      8.9875      1.2480


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 90% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.991

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    140.741    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    137.490    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  108269.750  110434.914       2.077     831.557     400.401     619.754       1.548

     ROTOR LEADING EDGE CONDITIONS, STAGE             1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   326.09    -0.11   326.09     0.29   609.32
  MEAN    17.06     0.00    -0.02   326.09    -0.11   326.09     0.29
  HUB     12.51     0.00    -0.02   326.09    -0.11   326.09     0.29
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.94    50.47    11.47   611.74   693.33    14.23   513.93     0.62
MEAN    57.20    47.20    10.00   505.89   601.97    14.23   513.93     0.54
HUB     48.69    38.62    10.07   370.96   493.99    14.23   513.93     0.44

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   571.73   380.93   426.35  1132.52     0.50
MEAN    18.04   593.09   402.46   435.64  1127.27     0.53
HUB     15.00   665.84   489.96   450.87  1119.56     0.59

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    611.74   484.82   230.81     0.43  7860.93
MEAN   534.83   455.30   132.36     0.40  7260.77     1.49
HUB    444.80   453.12    45.16     0.40  7350.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.82     1.25    15.81   560.26     1.07   532.95     0.92     0.91
MEAN    18.51     1.23    15.33   557.40     1.07   528.02     0.92     0.91
HUB     18.56     1.23    14.60   557.83     1.07   520.80     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.78    28.43    24.20     4.23     0.93     0.40     2.90
MEAN    42.73    16.90    12.70     4.20     0.94     0.34     3.51     0.91
HUB     47.38    -5.72    -9.30     3.58     0.94     0.20     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.991

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     600.463     401.682     446.326    1127.620       0.533       0.000

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.595      15.326     528.378      24.000      41.986      35.400      -6.586

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     464.316     401.682     613.953    1140.467       0.407       0.379

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.530      16.529     540.486     528.796       0.029       0.507

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     429.806       0.000     429.806    1143.183       0.376       0.417

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.738     543.063       0.000       0.060       0.051       0.441

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.866      18.456       1.222     558.493      35.683     194.667       1.509

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 222155.500       0.594    1766.895 1371179.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.741    3398.000      18.456     558.493       1.000       1.000       0.980
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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   116.321    3274.709       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
108269.750  110434.914       1.743     590.487     338.761     474.134       1.400

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   409.95    -0.14   409.95     0.36   587.24
MEAN    18.08     0.00    -0.02   409.95    -0.14   409.95     0.36
HUB     15.21     0.00    -0.02   409.95    -0.14   409.95     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.08    46.36     9.72   609.37   734.55    16.89   544.46     0.64
MEAN    52.60    42.30    10.30   536.08   674.97    16.89   544.46     0.59
HUB     47.74    37.84     9.90   451.02   609.60    16.89   544.46     0.53

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   518.83   314.01   413.02  1167.60     0.44
MEAN    18.01   526.33   317.88   419.50  1163.55     0.45
HUB     15.22   567.53   374.08   426.79  1159.51     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    605.52   505.53   291.51     0.43  6415.00
MEAN   534.05   471.92   216.18     0.41  5727.49     1.56
HUB    451.41   433.74    77.33     0.37  5696.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.85     1.18    19.07   589.04     1.05   566.56     0.92     0.91
MEAN    21.46     1.16    18.65   585.76     1.05   562.63     0.92     0.91
HUB     21.45     1.16    18.20   585.62     1.05   558.72     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.24    35.21    31.50     3.71     0.93     0.39     2.90
MEAN    37.15    27.26    23.50     3.76     0.94     0.37     3.30     0.91
HUB     41.23    10.27     6.50     3.77     0.94     0.37     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.990

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     657.892     318.768     575.507    1151.096       0.572      -0.469

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.556      17.269     550.663      46.000      28.982      30.600       1.618

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     576.749     318.768     658.979    1159.806       0.497      -0.161

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      21.518      18.169     559.028     400.556       0.023       0.299

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     567.720       0.000     567.720    1160.701       0.489       0.327

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750      18.231     559.891       0.000       0.060       0.038      -0.140

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      21.475       1.164     586.805      28.312     218.703       1.695

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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 176352.969       0.481    1402.608 1234287.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.975

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.741    3398.000      21.475     586.805       1.000       1.000       0.780
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.469    3194.734       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 108269.750  110434.914       1.455     434.156     298.431     339.175       1.137

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   521.30    -0.18   521.30     0.45   559.52
 MEAN    17.74     0.00    -0.02   521.30    -0.18   521.30     0.45
 HUB     15.05     0.00    -0.02   521.30    -0.18   521.30     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.79    46.36     2.43   595.14   791.30    18.71   564.12     0.68
 MEAN    45.27    43.40     1.87   526.00   740.69    18.71   564.12     0.64
 HUB     40.58    38.84     1.74   446.28   686.35    18.71   564.12     0.59

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   495.81   285.63   405.27  1194.69     0.42
 MEAN    17.51   504.43   293.66   410.14  1191.48     0.42
 HUB     14.85   545.24   352.85   415.67  1188.34     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   505.30   301.80     0.42  5662.00
 MEAN   519.12   468.02   225.47     0.39  5144.13     1.70
 HUB    440.35   424.78    87.49     0.36  5242.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.70     1.15    21.94   613.75     1.05   593.23     0.92     0.89
 MEAN    24.39     1.14    21.56   611.28     1.04   590.04     0.92     0.89
 HUB     24.45     1.14    21.16   611.75     1.04   586.94     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.18    36.67    31.50     5.17     0.93     0.42     2.90
 MEAN    35.60    28.80    23.50     5.30     0.91     0.43     3.28     0.89
 HUB     40.33    11.89     6.50     5.39     0.91     0.45     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.975

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     509.450     295.585     414.932    1192.031       0.427       0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.488      21.595     590.596      46.000      35.465      31.500      -3.965

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     423.505     295.585     516.456    1198.767       0.353       0.297

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.460      22.436     597.290     471.992       0.019       0.388

    VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	411.265	0.000	411.265	1199.622	0.343	0.301

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.486	598.143	0.000	0.060	0.042	0.314

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.857	24.393	1.136	612.262	25.457	228.931	1.775

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
158652.141	0.460	1261.826	1575175.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =10.000 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
140.741	3398.000	24.393	612.262	1.000	1.000	0.980

W Kg/sec = 63.97328

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
92.148	3127.612	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
108269.750	110434.914	1.913	513.330	268.386	401.059	1.494

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	386.43	-0.13	386.43	0.32	525.66
MEAN	16.97	0.00	-0.02	386.43	-0.13	386.43	0.32	
HUB	14.32	0.00	-0.02	386.43	-0.13	386.43	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.92	46.36	9.56	571.12	689.68	22.70	599.80	0.57
MEAN	52.49	43.80	8.69	503.23	634.59	22.70	599.80	0.53
HUB	47.71	37.84	9.87	424.63	574.24	22.70	599.80	0.48

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	482.57	281.97	391.62	1219.45	0.40
MEAN	16.57	488.72	285.96	396.33	1216.21	0.40
HUB	13.89	525.01	338.18	401.59	1212.97	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	480.19	277.88	0.39	5326.20	
MEAN	491.47	446.44	205.51	0.37	4741.71	1.55
HUB	411.88	408.29	73.71	0.34	4699.18	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.76	1.14	24.92	637.59	1.04	618.16	0.92	0.91
MEAN	27.37	1.12	24.49	634.81	1.04	614.88	0.92	0.91
HUB	27.35	1.12	24.04	634.61	1.04	611.61	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.75	35.36	31.50	3.86	0.93	0.37	2.90	
MEAN	35.81	27.41	23.50	3.91	0.93	0.36	3.29	0.91
HUB	40.10	10.40	6.50	3.90	0.93	0.36	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	483.206	287.567	388.321	1217.495	0.397	0.048

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
27.464	24.636	616.190	46.000	36.521	32.400	-4.121

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	401.864	287.567	494.156	1223.416	0.328	0.325

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	27.439	25.462	622.198	456.573	0.018	0.409

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	382.291	0.000	382.291	1224.674	0.312	0.313

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	25.577	623.478	0.000	0.060	0.042	0.363

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.876	27.366	1.122	635.674	23.412	228.128	1.768

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
145982.484	0.466	1161.059	1212025.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =10.000 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
140.741	3398.000	27.366	635.674	1.000	1.000	0.980

W Kg/sec = 63.97328

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
83.692	3069.477	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
108269.750	110434.914	2.091	509.668	243.773	390.276	1.601

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	356.88	-0.12	356.88	0.29	490.71
MEAN	15.91	0.00	-0.02	356.88	-0.12	356.88	0.29	
HUB	13.07	0.00	-0.02	356.88	-0.12	356.88	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.70	47.36	9.34	543.25	650.09	25.80	625.05	0.53
MEAN	52.91	44.80	8.11	471.87	591.73	25.80	625.05	0.48
HUB	47.37	38.84	8.53	387.57	526.94	25.80	625.05	0.43

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	454.20	272.37	363.47	1242.34	0.37
MEAN	15.50	455.10	267.78	367.99	1238.88	0.37
HUB	12.59	481.68	304.89	372.90	1235.43	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	531.98	446.66	259.60	0.36	4888.64	
MEAN	459.55	414.96	191.78	0.33	4151.87	1.57
HUB	373.33	379.13	68.45	0.31	3840.14	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.69	1.12	27.98	658.91	1.04	641.70	0.92	0.91
MEAN	30.17	1.10	27.49	655.41	1.03	638.13	0.92	0.91
HUB	29.96	1.09	26.97	653.93	1.03	634.57	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.85	35.54	31.50	4.04	0.93	0.38	2.90	

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 MEAN    36.04    27.53    23.50     4.03     0.93     0.37     3.34     0.91
 HUB     39.27    10.40     6.50     3.90     0.93     0.35     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     460.506     272.688     371.090    1239.135       0.372       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.218      27.467     638.394      46.000      36.310      33.000      -3.310

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     388.549     272.688     474.688    1244.071       0.312       0.261

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.184      28.208     643.490     440.827       0.032       0.410

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     363.825       0.000     363.825    1245.570       0.292       0.343

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      28.425     645.042       0.000       0.060       0.040       0.338

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.879       30.161       1.102     656.083      20.409     242.031       1.876

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 127333.867       0.450    1012.739 1249958.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency      Rotor1Inc   TR
    830477.00   6605.1270     137.4901      1.9965      0.8601     10.0004      1.2549


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 90% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc =10.990   EfDer =  0.986

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    135.889    3398.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   61.76752

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    132.749    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104536.672  106627.180       2.151     831.557     386.595     619.754       1.603

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   313.85    -0.11   313.85     0.28   609.32
 MEAN    17.06     0.00    -0.02   313.85    -0.11   313.85     0.28
 HUB     12.51     0.00    -0.02   313.85    -0.11   313.85     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.84    50.47    12.37   611.74   687.65    14.29   514.58     0.62
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 MEAN    58.19    47.20    10.99   505.89   595.43    14.29   514.58     0.54
 HUB     49.78    38.62    11.16   370.96   486.00    14.29   514.58     0.44

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   565.48   390.01   409.47  1134.09     0.50
 MEAN    18.04   584.25   407.60   418.57  1128.66     0.52
 HUB     15.00   652.49   488.12   432.99  1120.98     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   465.65   221.74     0.41  8048.08
 MEAN   534.83   437.48   127.22     0.39  7353.39     1.54
 HUB    444.80   435.15    43.33     0.39  7323.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.89     1.25    15.94   561.15     1.07   534.44     0.92     0.90
 MEAN    18.54     1.23    15.44   557.84     1.07   529.33     0.92     0.90
 HUB     18.52     1.23    14.72   557.69     1.07   522.14     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.61    28.44    24.20     4.24     0.93     0.42     2.90
 MEAN    44.24    16.91    12.70     4.21     0.94     0.37     3.51     0.90
 HUB     48.43    -5.71    -9.30     3.59     0.94     0.22     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     591.035     406.812     428.750    1129.048       0.523       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.619      15.443     529.716      24.000      43.496      35.400      -8.096

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     445.280     406.812     603.133    1142.414       0.390       0.405

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.545      16.698     542.333     528.796       0.033       0.531

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083     412.897       0.000     412.897    1144.856       0.361       0.435

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.872     544.654       0.000       0.060       0.058       0.458

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      18.461       1.222     558.893      36.083     189.388       1.468

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 224648.266       0.600    1725.116 1319719.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.990   EfDer =  0.984

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    135.889    3398.000      18.461     558.893       1.000       1.000       0.980
W Kg/sec =   61.76752

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    112.320    3273.536       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
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104536.672  106627.180       1.805     590.487     327.109     474.134       1.449

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   394.05    -0.14   394.05     0.34   587.03
MEAN    18.08     0.00    -0.02   394.05    -0.14   394.05     0.34
HUB     15.21     0.00    -0.02   394.05    -0.14   394.05     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.12    46.36    10.76   609.37   725.79    17.01   545.93     0.63
MEAN    53.69    42.30    11.39   536.08   665.43    17.01   545.93     0.58
HUB     48.87    37.84    11.03   451.02   599.02    17.01   545.93     0.52

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   513.25   325.52   396.82  1169.66     0.44
MEAN    18.01   518.76   326.32   403.27  1165.39     0.45
HUB     15.22   557.46   377.11   410.55  1161.12     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    605.52   485.66   280.00     0.42  6649.94
MEAN   534.05   453.63   207.73     0.39  5879.49     1.61
HUB    451.41   417.22    74.30     0.36  5742.85

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.96     1.19    19.24   590.55     1.06   568.56     0.92     0.90
MEAN    21.53     1.17    18.79   586.89     1.05   564.42     0.92     0.90
HUB     21.46     1.16    18.32   586.24     1.05   560.29     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.36    35.21    31.50     3.71     0.93     0.41     2.90
MEAN    38.98    27.25    23.50     3.75     0.94     0.39     3.30     0.90
HUB     42.57    10.26     6.50     3.76     0.94     0.38     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.984

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     640.030     327.238     550.049    1154.249       0.554      -0.436

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.621      17.541     553.687      46.000      30.749      30.600      -0.149

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     549.763     327.238     639.784    1163.559       0.472      -0.091

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      21.587      18.523     562.655     400.556       0.022       0.325

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     541.402       0.000     541.402    1164.347       0.465       0.360

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750      18.574     563.417       0.000       0.060       0.037      -0.073

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.873      21.544       1.167     587.892      28.999     210.597       1.633

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 180633.234       0.493    1387.116 1185255.750
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COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
RESET = 0.000BLEED = 0.000 DPInc =10.990 EfDer = 0.987

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
135.889	3398.000	21.544	587.892	1.000	1.000	0.780

W Kg/sec = 61.76752

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
98.709	3191.778	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
104536.672	106627.180	1.510	434.156	287.482	339.175	1.180

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	498.23	-0.17	498.23	0.43	559.00
MEAN	17.74	0.00	-0.02	498.23	-0.17	498.23	0.43	
HUB	15.05	0.00	-0.02	498.23	-0.17	498.23	0.43	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.07	46.36	3.71	595.14	776.29	19.01	567.17	0.66
MEAN	46.56	43.40	3.16	526.00	724.63	19.01	567.17	0.62
HUB	41.86	38.84	3.02	446.28	668.99	19.01	567.17	0.57

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	489.75	299.58	387.43	1197.60	0.41
MEAN	17.51	496.45	303.99	392.50	1194.11	0.42
HUB	14.85	534.83	357.13	398.13	1190.69	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	482.66	287.85	0.40	5938.09	
MEAN	519.12	447.59	215.14	0.37	5324.84	1.74
HUB	440.35	406.73	83.22	0.34	5305.90	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.99	1.16	22.27	616.15	1.05	596.13	0.92	0.90
MEAN	24.61	1.14	21.85	613.23	1.04	592.66	0.92	0.90
HUB	24.60	1.14	21.42	613.14	1.04	589.26	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.71	36.61	31.50	5.11	0.93	0.44	2.90	
MEAN	37.76	28.73	23.50	5.23	0.91	0.45	3.28	0.90
HUB	41.89	11.81	6.50	5.31	0.91	0.46	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.987

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	501.277	305.983	397.055	1194.648	0.420	0.012

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.706	21.885	593.198	46.000	37.619	31.500	-6.119

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	404.368	305.983	507.089	1202.003	0.336	0.334

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.671	22.810	600.525	471.992	0.022	0.421

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	393.009	0.000	393.009	1202.760	0.327	0.330

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.838	601.281	0.000	0.060	0.049	0.343

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.865	24.593	1.142	614.174	26.282	218.516	1.694

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
163793.797	0.475	1257.803	1505442.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =10.990 EfDer = 0.992

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
135.889	3398.000	24.593	614.174	1.000	1.000	0.980

W Kg/sec = 61.76752

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
88.384	3122.740	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
104536.672	106627.180	1.994	513.330	257.425	401.059	1.558

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	369.53	-0.13	369.53	0.31	524.84
MEAN	16.97	0.00	-0.02	369.53	-0.13	369.53	0.31	
HUB	14.32	0.00	-0.02	369.53	-0.13	369.53	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.10	46.36	10.74	571.12	680.35	23.04	602.78	0.56
MEAN	53.72	43.80	9.92	503.23	624.44	23.04	602.78	0.52
HUB	48.98	37.84	11.14	424.63	563.00	23.04	602.78	0.47

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	476.19	294.51	374.20	1222.93	0.39
MEAN	16.57	480.31	295.15	378.92	1219.47	0.39
HUB	13.89	514.04	341.52	384.19	1216.01	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	458.73	265.34	0.38	5562.81	
MEAN	491.47	426.76	196.32	0.35	4893.87	1.60
HUB	411.88	390.58	70.36	0.32	4745.50	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	28.12	1.14	25.32	640.63	1.04	621.71	0.92	0.91
MEAN	27.67	1.13	24.87	637.45	1.04	618.20	0.92	0.91
HUB	27.58	1.12	24.39	636.74	1.04	614.69	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.20	35.34	31.50	3.84	0.93	0.40	2.90	
MEAN	37.92	27.39	23.50	3.89	0.94	0.39	3.29	0.91
HUB	41.63	10.38	6.50	3.88	0.94	0.38	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	475.425	296.805	371.396	1220.667	0.389	0.046

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
27.760	25.000	619.414	46.000	38.630	32.400	-6.230

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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     383.616     296.805     485.031    1227.134       0.313       0.359

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.729      25.911     625.995     456.573       0.021       0.442

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     365.278       0.000     365.278    1228.257       0.297       0.340

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.997     627.141       0.000       0.060       0.050       0.389

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.868      27.644       1.124     638.274      24.100     218.279       1.692

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 150283.281       0.479    1154.053 1162200.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.990   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.889    3398.000      27.644     638.274       1.000       1.000       0.980
W Kg/sec =   61.76752

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.158    3063.217       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104536.672  106627.180       2.183     509.668     233.480     390.276       1.672

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   341.22    -0.12   341.22     0.28   489.71
 MEAN    15.91     0.00    -0.02   341.22    -0.12   341.22     0.28
 HUB     13.07     0.00    -0.02   341.22    -0.12   341.22     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.87    47.36    10.51   543.25   641.62    26.20   628.56     0.52
 MEAN    54.14    44.80     9.34   471.87   582.41    26.20   628.56     0.47
 HUB     48.65    38.84     9.81   387.57   516.46    26.20   628.56     0.42

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   448.70   284.15   347.26  1246.21     0.36
 MEAN    15.50   447.35   276.41   351.73  1242.57     0.36
 HUB     12.59   471.23   308.06   356.60  1238.93     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   426.62   247.83     0.34  5099.81
 MEAN   459.55   396.56   183.14     0.32  4285.59     1.62
 HUB    373.33   362.52    65.28     0.29  3879.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.13     1.13    28.46   662.51     1.04   645.72     0.92     0.91
 MEAN    30.55     1.11    27.93   658.64     1.03   641.95     0.92     0.91
 HUB     30.27     1.09    27.39   656.72     1.03   638.19     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.29    35.51    31.50     4.01     0.93     0.41     2.90
 MEAN    38.16    27.51    23.50     4.01     0.93     0.39     3.34     0.91
 HUB     40.82    10.37     6.50     3.87     0.93     0.37     4.06
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      452.821     281.480     354.705     1242.798       0.364       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     30.593      27.910      642.189      46.000      38.434      33.000       -5.434

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      370.791     281.480     465.529     1248.239       0.297       0.297

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       30.548      28.732      647.824     440.827       0.036       0.443

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      347.468       0.000     347.468     1249.584       0.278       0.372

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       28.923      649.222       0.000       0.060       0.047       0.367

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.873       30.520        1.104      659.292       21.017      231.491       1.795

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  131137.094       0.463    1007.026 1198627.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    850495.75    6531.1138     132.7495      2.0203       0.8558      10.9901       1.2611


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

   Fan-Core + 4 Stage LPC 90% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.957   EfDer =  0.981

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    131.203     3398.000       15.107      522.810        1.000        1.000        0.980
 W Kg/sec =   59.63782

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
    128.172     3384.617        1.402        0.249       53.349       32.000        0.050

   CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
  100932.312  102950.742        2.228      831.557      373.266      619.754       1.660

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   302.15    -0.10   302.15      0.27   609.32
  MEAN    17.06      0.00    -0.02   302.15    -0.10   302.15      0.27
  HUB     12.51      0.00    -0.02   302.15    -0.10   302.15      0.27

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
  TIP     63.72     50.47    13.25   611.74   682.39     14.35   515.18      0.61
  MEAN    59.16     47.20    11.96   505.89   589.34     14.35   515.18      0.53
  HUB     50.84     38.62    12.22   370.96   478.52     14.35   515.18      0.43
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      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   560.11   398.49   393.60  1135.50     0.49
 MEAN    18.04   576.25   412.41   402.47  1129.92     0.51
 HUB     15.00   640.08   486.36   416.12  1122.27     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   447.66   213.25     0.39  8223.08
 MEAN   534.83   420.68   122.42     0.37  7439.98     1.59
 HUB    444.80   418.19    41.56     0.37  7296.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.95     1.25    16.05   561.98     1.07   535.78     0.92     0.90
 MEAN    18.56     1.23    15.54   558.25     1.07   530.52     0.92     0.90
 HUB     18.49     1.22    14.83   557.57     1.07   523.35     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.35    28.45    24.20     4.25     0.93     0.44     2.90
 MEAN    45.70    16.92    12.70     4.22     0.94     0.39     3.51     0.90
 HUB     49.45    -5.70    -9.30     3.60     0.94     0.24     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     582.510     411.607     412.186    1130.335       0.515       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.637      15.545     530.925      24.000      44.960      35.400      -9.560

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     427.461     411.607     593.417    1144.173       0.374       0.430

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.552      16.846     544.005     528.796       0.036       0.554

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     397.020       0.000     397.020    1146.376       0.346       0.451

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.986     546.101       0.000       0.060       0.066       0.474

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.848      18.458       1.222     559.266      36.456     184.395       1.429

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 226971.953       0.607    1682.864 1270515.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =11.957   EfDer =  0.977

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.203    3398.000      18.458     559.266       1.000       1.000       0.980
W Kg/sec =   59.63782

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.500    3272.444       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100932.312  102950.742       1.869     590.487     315.984     474.134       1.501

     ROTOR LEADING EDGE CONDITIONS, STAGE            2
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   379.09    -0.13   379.09     0.33   586.84
MEAN    18.08     0.00    -0.02   379.09    -0.13   379.09     0.33
HUB     15.21     0.00    -0.02   379.09    -0.13   379.09     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.12    46.36    11.76   609.37   717.78    17.11   547.27     0.63
MEAN    54.74    42.30    12.44   536.08   656.68    17.11   547.27     0.57
HUB     49.96    37.84    12.12   451.02   589.28    17.11   547.27     0.51

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   508.67   336.17   381.75  1171.50     0.43
MEAN    18.01   512.14   334.15   388.12  1167.05     0.44
HUB     15.22   548.26   379.90   395.31  1162.59     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    605.52   467.20   269.35     0.40  6867.29
MEAN   534.05   436.57   199.90     0.37  6020.35     1.65
HUB    451.41   401.73    71.51     0.35  5785.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.05     1.19    19.37   591.96     1.06   570.36     0.92     0.89
MEAN    21.58     1.17    18.90   587.93     1.05   566.03     0.92     0.89
HUB     21.45     1.16    18.42   586.81     1.05   561.71     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.37    35.21    31.50     3.71     0.93     0.43     2.90
MEAN    40.73    27.25    23.50     3.75     0.94     0.41     3.30     0.89
HUB     43.86    10.25     6.50     3.75     0.94     0.40     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.977

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     624.336     335.086     526.796    1157.022       0.540      -0.406

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.667      17.769     556.353      46.000      32.460      30.600      -1.860

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     525.374     335.086     623.137    1166.860       0.450      -0.027

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      21.634      18.821     565.853     400.556       0.022       0.351

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     517.641       0.000     517.641    1167.554       0.443       0.390

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750      18.860     566.527       0.000       0.060       0.038      -0.013

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.867      21.589       1.170     588.901      29.635     203.229       1.575

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 184592.844       0.503    1368.647 1138761.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =11.957   EfDer =  0.994
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
131.203	3398.000	21.589	588.901	1.000	1.000	0.780

W Kg/sec = 59.63782

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
95.189	3189.043	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
100932.312	102950.742	1.566	434.156	277.233	339.175	1.223

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	477.21	-0.16	477.21	0.41	558.52
MEAN	17.74	0.00	-0.02	477.21	-0.16	477.21	0.41	
HUB	15.05	0.00	-0.02	477.21	-0.16	477.21	0.41	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.28	46.36	4.92	595.14	762.97	19.25	569.89	0.65
MEAN	47.79	43.40	4.39	526.00	710.34	19.25	569.89	0.61
HUB	43.09	38.84	4.25	446.28	653.49	19.25	569.89	0.56

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	485.09	312.14	371.32	1200.17	0.40
MEAN	17.51	489.82	313.31	376.50	1196.45	0.41
HUB	14.85	525.69	360.95	382.18	1192.79	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	462.24	275.29	0.39	6186.71	
MEAN	519.12	429.08	205.81	0.36	5487.96	1.79
HUB	440.35	390.34	79.39	0.33	5362.65	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.21	1.17	22.53	618.34	1.05	598.70	0.92	0.91
MEAN	24.79	1.15	22.08	615.02	1.04	594.99	0.92	0.91
HUB	24.71	1.14	21.62	614.42	1.04	591.35	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.05	36.55	31.50	5.05	0.93	0.46	2.90	
MEAN	39.77	28.66	23.50	5.16	0.92	0.46	3.28	0.91
HUB	43.36	11.74	6.50	5.24	0.92	0.47	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.994

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	494.484	315.370	380.862	1196.973	0.413	0.012

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.875	22.115	595.515	46.000	39.626	31.500	-8.126

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	387.152	315.370	499.344	1204.885	0.321	0.367

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.830	23.114	603.414	471.992	0.026	0.452

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	376.611	0.000	376.611	1205.556	0.312	0.355

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.118	604.086	0.000	0.060	0.058	0.369

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.867	24.738	1.146	615.926	27.025	209.433	1.624

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
168425.078	0.488	1248.773	1440639.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =11.957 EfDer = 0.986

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
131.203	3398.000	24.738	615.926	1.000	1.000	0.980

W Kg/sec = 59.63782

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
84.957	3118.296	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
100932.312	102950.742	2.075	513.330	247.445	401.059	1.621

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	354.32	-0.12	354.32	0.29	524.09
MEAN	16.97	0.00	-0.02	354.32	-0.12	354.32	0.29	
HUB	14.32	0.00	-0.02	354.32	-0.12	354.32	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.19	46.36	11.83	571.12	672.20	23.30	605.45	0.56
MEAN	54.86	43.80	11.06	503.23	615.56	23.30	605.45	0.51
HUB	50.17	37.84	12.33	424.63	553.14	23.30	605.45	0.46

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	471.21	305.58	358.69	1226.00	0.38
MEAN	16.57	473.31	303.29	363.37	1222.37	0.39
HUB	13.89	504.50	344.47	368.60	1218.73	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	439.67	254.27	0.36	5771.67	
MEAN	491.47	409.21	188.18	0.33	5028.80	1.65
HUB	411.88	374.71	67.41	0.31	4786.46	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	28.39	1.15	25.64	643.37	1.04	624.85	0.92	0.90
MEAN	27.90	1.13	25.15	639.84	1.04	621.15	0.92	0.90
HUB	27.74	1.12	24.65	638.69	1.04	617.45	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.43	35.33	31.50	3.83	0.93	0.42	2.90	
MEAN	39.85	27.38	23.50	3.88	0.94	0.41	3.29	0.90
HUB	43.06	10.36	6.50	3.86	0.94	0.40	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.986

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	468.987	304.998	356.265	1223.481	0.383	0.044

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
27.980	25.280	622.283	46.000	40.567	32.400	-8.167

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	367.402	304.998	477.501	1230.430	0.299	0.390

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	27.940	26.262	629.372	456.573	0.024	0.472

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	350.171	0.000	350.171	1231.438	0.284	0.363

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	26.320	630.404	0.000	0.060	0.058	0.410

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.858	27.841	1.125	640.635	24.709	209.770	1.626

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
154086.812	0.492	1142.463	1115377.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =11.957 EfDer = 0.989

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
131.203	3398.000	27.841	640.635	1.000	1.000	0.980

W Kg/sec = 59.63782

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
76.987	3057.568	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
100932.312	102950.742	2.273	509.668	224.247	390.276	1.740

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	327.27	-0.11	327.27	0.27	488.81
MEAN	15.91	0.00	-0.02	327.27	-0.11	327.27	0.27	
HUB	13.07	0.00	-0.02	327.27	-0.11	327.27	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.94	47.36	11.58	543.25	634.31	26.51	631.70	0.51
MEAN	55.26	44.80	10.46	471.87	574.35	26.51	631.70	0.47
HUB	49.83	38.84	10.99	387.57	507.35	26.51	631.70	0.41

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	444.48	294.43	332.98	1249.62	0.36
MEAN	15.50	440.99	284.00	337.37	1245.83	0.35
HUB	12.59	462.21	310.76	342.15	1242.04	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	531.98	409.02	237.55	0.33	5284.18	
MEAN	459.55	380.31	175.55	0.31	4403.12	1.67
HUB	373.33	347.82	62.57	0.28	3913.98	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	31.45	1.13	28.81	665.75	1.04	649.27	0.92	0.91
MEAN	30.82	1.11	28.26	661.56	1.03	645.34	0.92	0.91
HUB	30.48	1.09	27.70	659.24	1.03	641.42	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.48	35.50	31.50	4.00	0.93	0.43	2.90	
MEAN	40.09	27.49	23.50	3.99	0.94	0.41	3.34	0.91
HUB	42.25	10.36	6.50	3.86	0.94	0.39	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.989

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     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     446.542     289.208     340.233    1246.033       0.358      -0.009

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      30.864      28.241     645.553      46.000      40.365      33.000      -7.365

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     355.213     289.208     458.058    1251.913       0.284       0.328

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      30.806      29.130     651.660     440.827       0.042       0.473

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     333.104       0.000     333.104    1253.132       0.266       0.397

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      29.296     652.929       0.000       0.060       0.055       0.390

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.864      30.772       1.105     662.183      21.548     222.500       1.725

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  134457.781       0.475     996.925 1150411.250

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     868534.50   6439.6724    128.1724      2.0370      0.8489     11.9567      1.2666


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 90% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.033   EfDer =  0.973

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     126.046    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   57.29363

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     123.134    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   96964.961   98904.055       2.319     831.557     358.594     619.754       1.728

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   289.39    -0.10   289.39     0.26   609.32
  MEAN    17.06     0.00    -0.02   289.39    -0.10   289.39     0.26
  HUB     12.51     0.00    -0.02   289.39    -0.10   289.39     0.26

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.69    50.47    14.22   611.74   676.83    14.41   515.82     0.61
  MEAN    60.23    47.20    13.03   505.89   582.90    14.41   515.82     0.52
  HUB     52.05    38.62    13.43   370.96   470.57    14.41   515.82     0.42

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000
```

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	554.86	407.53	376.55	1136.96	0.49
MEAN	18.04	568.02	417.53	385.12	1131.22	0.50
HUB	15.00	626.90	484.40	397.95	1123.61	0.56

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	611.74	428.36	204.21	0.38	8409.49	
MEAN	534.83	402.59	117.30	0.36	7532.21	1.65
HUB	444.80	399.91	39.60	0.36	7267.19	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.02	1.26	16.16	562.87	1.08	537.15	0.92	0.89
MEAN	18.58	1.23	15.64	558.69	1.07	531.74	0.92	0.89
HUB	18.45	1.22	14.93	557.43	1.07	524.60	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	47.26	28.47	24.20	4.27	0.93	0.47	2.90	
MEAN	47.31	16.94	12.70	4.24	0.94	0.41	3.51	0.89
HUB	50.60	-5.68	-9.30	3.62	0.94	0.27	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.973

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	573.730	416.715	394.353	1131.658	0.507	0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.651	15.646	532.169	24.000	46.579	35.400	-11.179

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	408.387	416.715	583.465	1145.989	0.356	0.457

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.555	16.993	545.732	528.796	0.041	0.580

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	379.968	0.000	379.968	1147.952	0.331	0.467

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.098	547.603	0.000	0.060	0.076	0.490

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.836	18.448	1.221	559.662	36.852	179.005	1.388

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
229435.094	0.613	1634.260	1216867.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =13.033 EfDer = 0.969

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
126.046	3398.000	18.448	559.662	1.000	1.000	0.980

W Kg/sec = 57.29363

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
104.331	3271.287	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96964.961	98904.055	1.943	590.487	303.844	474.134	1.560

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	362.99	-0.13	362.99	0.32	586.63

```
MEAN    18.08     0.00    -0.02   362.99    -0.13   362.99     0.32
HUB     15.21     0.00    -0.02   362.99    -0.13   362.99     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.22    46.36    12.86   609.37   709.40    17.21   548.66     0.62
MEAN    55.90    42.30    13.60   536.08   647.51    17.21   548.66     0.56
HUB     51.18    37.84    13.34   451.02   579.05    17.21   548.66     0.50

     ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   504.40   347.42   365.68  1173.39     0.43
MEAN    18.01   505.53   342.41   371.91  1168.76     0.43
HUB     15.22   538.66   382.81   378.96  1164.11     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    605.52   447.59   258.10     0.38  7096.87
MEAN   534.05   418.38   191.64     0.36  6169.09     1.70
HUB    451.41   385.12    68.60     0.33  5829.36

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.13     1.20    19.49   593.45     1.06   572.21     0.92     0.89
MEAN    21.62     1.17    19.01   589.03     1.05   567.69     0.92     0.89
HUB     21.44     1.16    18.51   587.42     1.05   563.19     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.53    35.21    31.50     3.71     0.93     0.45     2.90
MEAN    42.64    27.26    23.50     3.76     0.94     0.43     3.30     0.89
HUB     45.29    10.26     6.50     3.76     0.94     0.42     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.969

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     608.539     343.373     502.409    1159.816       0.525      -0.375

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.702      17.986     559.046      46.000      34.351      30.600      -3.751

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     500.033     343.373     606.579    1170.188       0.427       0.039

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      21.665      19.106     569.090     400.556       0.023       0.379

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     492.982       0.000     492.982    1170.789       0.421       0.420

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      19.131     569.674       0.000       0.060       0.041       0.048

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      21.616       1.172     589.967      30.305     195.557       1.516

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188769.812       0.515    1344.602 1088445.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.033   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3398.000      21.616     589.967       1.000       1.000       0.780
W Kg/sec =   57.29363
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
91.418	3186.160	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96964.961	98904.055	1.631	434.156	266.249	339.175	1.274

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	455.25	-0.16	455.25	0.39	558.02
MEAN	17.74	0.00	-0.02	455.25	-0.16	455.25	0.39	
HUB	15.05	0.00	-0.02	455.25	-0.16	455.25	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.59	46.36	6.23	595.14	749.42	19.48	572.67	0.64
MEAN	49.13	43.40	5.73	526.00	695.77	19.48	572.67	0.59
HUB	44.44	38.84	5.60	446.28	637.62	19.48	572.67	0.54

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	481.10	325.11	354.64	1202.78	0.40
MEAN	17.51	483.54	322.97	359.86	1198.83	0.40
HUB	14.85	516.51	364.91	365.54	1194.94	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	441.11	262.32	0.37	6443.52	
MEAN	519.12	409.85	196.15	0.34	5656.92	1.84
HUB	440.35	373.25	75.44	0.31	5421.22	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.42	1.18	22.76	620.63	1.05	601.31	0.92	0.91
MEAN	24.93	1.15	22.28	616.89	1.05	597.37	0.92	0.91
HUB	24.78	1.15	21.79	615.76	1.04	593.50	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.51	36.49	31.50	4.99	0.93	0.49	2.90	
MEAN	41.91	28.59	23.50	5.09	0.92	0.48	3.28	0.91
HUB	44.95	11.66	6.50	5.16	0.92	0.49	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	488.058	325.092	364.027	1199.337	0.407	0.012

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.015	22.316	597.877	46.000	41.766	31.500	-10.266

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	369.356	325.092	492.045	1207.828	0.306	0.402

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.958	23.389	606.372	471.992	0.031	0.487

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	359.671	0.000	359.671	1208.415	0.298	0.380

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.366	606.962	0.000	0.060	0.070	0.393

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.865	24.849	1.150	617.760	27.793	200.301	1.553

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
173213.047	0.502	1233.792	1371703.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =13.033 EfDer = 0.979

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
126.046	3398.000	24.849	617.760	1.000	1.000	0.980

W Kg/sec = 57.29363

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
81.374	3113.664	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96964.961	98904.055	2.166	513.330	237.010	401.059	1.692

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	338.57	-0.12	338.57	0.28	523.31
MEAN	16.97	0.00	-0.02	338.57	-0.12	338.57	0.28	
HUB	14.32	0.00	-0.02	338.57	-0.12	338.57	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.34	46.36	12.98	571.12	664.03	23.53	608.20	0.55
MEAN	56.07	43.80	12.27	503.23	606.62	23.53	608.20	0.50
HUB	51.44	37.84	13.60	424.63	543.18	23.53	608.20	0.45

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	466.81	316.88	342.78	1229.12	0.38
MEAN	16.57	466.65	311.60	347.37	1225.31	0.38
HUB	13.89	494.94	347.43	352.50	1221.50	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	420.16	242.97	0.34	5984.88	
MEAN	491.47	391.18	179.87	0.32	5166.31	1.70
HUB	411.88	358.34	64.45	0.29	4827.46	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	28.62	1.15	25.90	646.22	1.05	628.04	0.92	0.90
MEAN	28.08	1.13	25.40	642.33	1.04	624.16	0.92	0.90
HUB	27.86	1.12	24.88	640.72	1.04	620.28	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.75	35.33	31.50	3.83	0.93	0.45	2.90	
MEAN	41.89	27.38	23.50	3.88	0.94	0.43	3.29	0.90
HUB	44.59	10.36	6.50	3.86	0.94	0.42	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.979

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	462.871	313.347	340.681	1226.346	0.377	0.041

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
28.156	25.517	625.213	46.000	42.607	32.400	-10.207

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	350.786	313.347	470.359	1233.786	0.284	0.422

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	28.105	26.570	632.822	456.573	0.028	0.505

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	334.686	0.000	334.686	1234.684	0.271	0.386

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	26.595	633.743	0.000	0.060	0.070	0.431

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.846	27.990	1.126	643.089	25.330	201.272	1.560

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
157959.750	0.504	1125.143	1065050.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =13.033 EfDer = 0.982

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
126.046	3398.000	27.990	643.089	1.000	1.000	0.980

W Kg/sec = 57.29363

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
73.710	3051.729	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96964.961	98904.055	2.374	509.668	214.703	390.276	1.818

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	312.96	-0.11	312.96	0.25	487.87
MEAN	15.91	0.00	-0.02	312.96	-0.11	312.96	0.25	
HUB	13.07	0.00	-0.02	312.96	-0.11	312.96	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.06	47.36	12.70	543.25	627.04	26.77	634.92	0.51
MEAN	56.45	44.80	11.65	471.87	566.31	26.77	634.92	0.46
HUB	51.09	38.84	12.25	387.57	498.23	26.77	634.92	0.40

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	440.82	304.84	318.43	1253.07	0.35
MEAN	15.50	434.97	291.66	322.70	1249.15	0.35
HUB	12.59	453.26	313.50	327.35	1245.21	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	531.98	391.13	227.13	0.31	5470.86	
MEAN	459.55	363.76	167.89	0.29	4521.79	1.73
HUB	373.33	332.78	59.83	0.27	3948.40	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	31.71	1.13	29.10	669.09	1.04	652.88	0.92	0.90
MEAN	31.04	1.11	28.54	664.58	1.03	648.80	0.92	0.90
HUB	30.64	1.09	27.96	661.85	1.03	644.72	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.75	35.50	31.50	4.00	0.93	0.46	2.90	
MEAN	42.11	27.49	23.50	3.99	0.94	0.43	3.34	0.90
HUB	43.76	10.36	6.50	3.86	0.94	0.41	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.982

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

```
     15.219     440.608     297.011     325.454    1249.322       0.353      -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.076      28.513     648.985      46.000      42.384      33.000      -9.384

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     339.392     297.011     451.002    1255.643       0.270       0.359

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.001      29.465     655.569     440.827       0.049       0.505

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     318.500       0.000     318.500    1256.740       0.253       0.421

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.606     656.715       0.000       0.060       0.065       0.413

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.853      30.960       1.106     665.175      22.085     213.590       1.656

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 137816.469       0.487     981.663 1098586.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    887194.12   6319.4604    123.1343      2.0493      0.8389     13.0332      1.2723



**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

   Fan-Core + 4 Stage LPC 90% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.967

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    121.688    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   55.31266

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.877    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93612.320   95484.359       2.402     831.557     346.195     619.754       1.790

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   278.70    -0.10   278.70     0.25   609.32
  MEAN    17.06     0.00    -0.02   278.70    -0.10   278.70     0.25
  HUB     12.51     0.00    -0.02   278.70    -0.10   278.70     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     65.51    50.47    15.04   611.74   672.33    14.46   516.32     0.60
  MEAN    61.15    47.20    13.95   505.89   577.66    14.46   516.32     0.52
  HUB     53.09    38.62    14.47   370.96   464.07    14.46   516.32     0.42

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000
```

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	550.94	414.94	362.44	1138.11	0.48
MEAN	18.04	561.49	421.71	370.72	1132.25	0.50
HUB	15.00	616.10	482.70	382.86	1124.67	0.55

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	611.74	412.42	196.80	0.36	8562.19	
MEAN	534.83	387.60	113.11	0.34	7607.63	1.70
HUB	444.80	384.73	37.90	0.34	7241.68	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.07	1.26	16.24	563.60	1.08	538.24	0.92	0.88
MEAN	18.59	1.23	15.71	559.05	1.07	532.72	0.92	0.88
HUB	18.41	1.22	15.01	557.31	1.07	525.60	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	48.86	28.50	24.20	4.30	0.93	0.49	2.90	
MEAN	48.68	16.97	12.70	4.27	0.95	0.44	3.51	0.88
HUB	51.58	-5.65	-9.30	3.65	0.95	0.29	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.967

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	566.767	420.892	379.572	1132.705	0.500	0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.659	15.723	533.154	24.000	47.955	35.400	-12.555

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	392.648	420.892	575.606	1147.431	0.342	0.479

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.552	17.106	547.107	528.796	0.045	0.602

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	365.847	0.000	365.847	1149.210	0.318	0.481

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.182	548.804	0.000	0.060	0.084	0.503

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.826	18.433	1.220	559.984	37.174	174.527	1.353

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
231437.672	0.618	1591.525	1171925.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =13.953 EfDer = 0.962

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
121.688	3398.000	18.433	559.984	1.000	1.000	0.980

W Kg/sec = 55.31266

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
100.830	3270.347	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
93612.320	95484.359	2.011	590.487	293.648	474.134	1.615

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	349.64	-0.12	349.64	0.30	586.46
MEAN	18.08	0.00	-0.02	349.64	-0.12	349.64	0.30	

```
 HUB     15.21     0.00    -0.02   349.64    -0.12   349.64     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.16    46.36    13.80   609.37   702.66    17.29   549.78     0.61
 MEAN    56.89    42.30    14.59   536.08   640.12    17.29   549.78     0.56
 HUB     52.22    37.84    14.38   451.02   570.77    17.29   549.78     0.50

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   501.38   356.58   352.46  1174.89     0.43
 MEAN    18.01   500.47   349.18   358.54  1170.12     0.43
 HUB     15.22   530.92   385.15   365.42  1165.33     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   431.51   248.94     0.37  7283.82
 MEAN   534.05   403.39   184.88     0.34  6290.80     1.75
 HUB    451.41   371.38    66.26     0.32  5864.91

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.18     1.20    19.57   594.66     1.06   573.67     0.92     0.88
 MEAN    21.64     1.17    19.08   589.93     1.05   569.02     0.92     0.88
 HUB     21.41     1.16    18.57   587.91     1.05   564.37     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.33    35.23    31.50     3.73     0.93     0.47     2.90
 MEAN    44.24    27.28    23.50     3.78     0.95     0.45     3.30     0.88
 HUB     46.51    10.28     6.50     3.78     0.95     0.44     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.962

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     596.260     350.155     482.616    1161.993       0.513      -0.351

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.719      18.144     561.149      46.000      35.962      30.600      -5.362

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     479.616     350.155     593.835    1172.792       0.409       0.091

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      21.677      19.317     571.628     400.556       0.025       0.403

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     473.137       0.000     473.137    1173.321       0.403       0.443

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      19.328     572.143       0.000       0.060       0.046       0.095

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.849      21.622       1.173     590.835      30.851     189.373       1.468

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 192172.609       0.524    1321.511 1046561.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.688    3398.000      21.622     590.835       1.000       1.000       0.780
 W Kg/sec =   55.31266
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
88.298	3183.819	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
93612.320	95484.359	1.688	434.156	257.164	339.175	1.319

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	437.47	-0.15	437.47	0.37	557.61
MEAN	17.74	0.00	-0.02	437.47	-0.15	437.47	0.37	
HUB	15.05	0.00	-0.02	437.47	-0.15	437.47	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.69	46.36	7.33	595.14	738.75	19.65	574.86	0.63
MEAN	50.26	43.40	6.86	526.00	684.26	19.65	574.86	0.58
HUB	45.58	38.84	6.74	446.28	625.04	19.65	574.86	0.53

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	478.52	335.47	341.24	1204.82	0.40
MEAN	17.51	478.95	330.71	346.44	1200.71	0.40
HUB	14.85	509.34	368.05	352.09	1196.65	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	424.17	251.95	0.35	6648.78	
MEAN	519.12	394.37	188.41	0.33	5792.26	1.88
HUB	440.35	359.44	72.30	0.30	5467.74	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.55	1.18	22.91	622.47	1.05	603.36	0.92	0.91
MEAN	25.02	1.16	22.42	618.40	1.05	599.25	0.92	0.91
HUB	24.82	1.15	21.91	616.85	1.04	595.20	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.51	36.44	31.50	4.94	0.93	0.50	2.90	
MEAN	43.67	28.54	23.50	5.04	0.93	0.50	3.28	0.91
HUB	46.27	11.60	6.50	5.10	0.93	0.50	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	483.356	332.879	350.463	1201.198	0.402	0.012

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.100	22.448	599.740	46.000	43.526	31.500	-12.026

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	355.082	332.879	486.716	1210.155	0.293	0.430

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	25.033	23.579	608.717	471.992	0.035	0.515

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	346.078	0.000	346.078	1210.678	0.286	0.399

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.533	609.244	0.000	0.060	0.081	0.413

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.861	24.908	1.152	619.241	28.406	193.159	1.497

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
177039.656	0.513	1217.447	1315112.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =13.953 EfDer = 0.972

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
121.688	3398.000	24.908	619.241	1.000	1.000	0.980

W Kg/sec = 55.31266

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
78.469	3109.937	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
93612.320	95484.359	2.246	513.330	228.552	401.059	1.755

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	325.91	-0.11	325.91	0.27	522.69
MEAN	16.97	0.00	-0.02	325.91	-0.11	325.91	0.27	
HUB	14.32	0.00	-0.02	325.91	-0.11	325.91	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.29	46.36	13.93	571.12	657.67	23.69	610.38	0.54
MEAN	57.08	43.80	13.28	503.23	599.65	23.69	610.38	0.49
HUB	52.50	37.84	14.66	424.63	535.38	23.69	610.38	0.44

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	463.78	325.80	330.08	1231.57	0.38
MEAN	16.57	461.71	318.18	334.57	1227.64	0.38
HUB	13.89	487.49	349.75	339.58	1223.70	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	404.64	234.05	0.33	6153.20	
MEAN	491.47	376.78	173.29	0.31	5275.33	1.75
HUB	411.88	345.22	62.13	0.28	4859.69	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	28.76	1.15	26.07	648.50	1.05	630.56	0.92	0.89
MEAN	28.18	1.13	25.56	644.33	1.04	626.54	0.92	0.89
HUB	27.91	1.12	25.02	642.35	1.04	622.52	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.63	35.34	31.50	3.84	0.93	0.47	2.90	
MEAN	43.56	27.38	23.50	3.88	0.94	0.45	3.29	0.89
HUB	45.85	10.37	6.50	3.87	0.94	0.44	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.972

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	458.361	319.966	328.202	1228.608	0.373	0.039

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
28.258	25.666	627.532	46.000	44.272	32.400	-11.872

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	337.535	319.966	465.089	1236.437	0.273	0.447

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	28.198	26.773	635.555	456.573	0.032	0.532

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	322.326	0.000	322.326	1237.251	0.261	0.404

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	26.772	636.393	0.000	0.060	0.080	0.446

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.834	28.066	1.127	645.061	25.820	194.653	1.509

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
161019.609	0.514	1107.282	1023362.688

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =13.953 EfDer = 0.976

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
121.688	3398.000	28.066	645.061	1.000	1.000	0.980

W Kg/sec = 55.31266

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
71.076	3047.061	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
93612.320	95484.359	2.462	509.668	207.031	390.276	1.885

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	301.51	-0.10	301.51	0.24	487.13
MEAN	15.91	0.00	-0.02	301.51	-0.10	301.51	0.24	
HUB	13.07	0.00	-0.02	301.51	-0.10	301.51	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.97	47.36	13.61	543.25	621.40	26.93	637.48	0.50
MEAN	57.43	44.80	12.63	471.87	560.06	26.93	637.48	0.45
HUB	52.13	38.84	13.29	387.57	491.12	26.93	637.48	0.40

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	438.37	313.05	306.87	1255.79	0.35
MEAN	15.50	430.53	297.70	311.02	1251.76	0.34
HUB	12.59	446.32	315.64	315.55	1247.72	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	531.98	376.96	218.93	0.30	5618.01	
MEAN	459.55	350.61	161.85	0.28	4615.31	1.78
HUB	373.33	320.78	57.69	0.26	3975.29	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	31.86	1.14	29.28	671.76	1.04	655.74	0.92	0.89
MEAN	31.16	1.11	28.71	666.99	1.03	651.54	0.92	0.89
HUB	30.72	1.09	28.11	663.95	1.03	647.34	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.57	35.51	31.50	4.01	0.93	0.48	2.90	
MEAN	43.75	27.49	23.50	3.99	0.94	0.45	3.34	0.89
HUB	45.01	10.36	6.50	3.86	0.94	0.42	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.976

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	436.239	303.160	313.685	1251.916	0.348	-0.011

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     31.194      28.680     651.700      46.000      44.022      33.000     -11.022

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     326.844     303.160     445.795    1258.584       0.260       0.384

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      31.104      29.678     658.661     440.827       0.056       0.531

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     306.905       0.000     306.905    1259.590       0.244       0.440

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.798     659.715       0.000       0.060       0.075       0.431

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.842      31.056       1.107     667.569      22.508     206.680       1.602

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 140461.406       0.496     965.910 1055650.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    902131.00   6203.6753    118.8768      2.0557      0.8289     13.9533      1.2769


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 90% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.019   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    166.058    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   75.48089

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    162.222    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  127745.469  130300.102       1.760     831.557     472.426     619.754       1.312

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   392.24    -0.14   392.24     0.35   609.32
  MEAN    17.06     0.00    -0.02   392.24    -0.14   392.24     0.35
  HUB     12.51     0.00    -0.02   392.24    -0.14   392.24     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.34    50.47     6.87   611.74   726.81    13.85   509.96     0.66
  MEAN    52.22    47.20     5.02   505.89   640.24    13.85   509.96     0.58
  HUB     43.41    38.62     4.79   370.96   539.97    13.85   509.96     0.49

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   618.61   327.42   524.85  1122.01     0.55
  MEAN    18.04   650.82   372.26   533.85  1118.16     0.58
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 HUB     15.00   746.34   500.09   554.01  1110.30     0.67

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   596.92   284.32     0.53  6757.48
 MEAN   534.83   558.05   162.56     0.50  6716.47     1.27
 HUB    444.80   556.76    55.30     0.50  7503.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.28     1.21    14.86   555.00     1.06   523.04     0.92     0.91
 MEAN    18.26     1.21    14.51   554.80     1.06   519.43     0.92     0.91
 HUB     18.66     1.23    13.78   558.55     1.07   512.05     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.96    28.45    24.20     4.25     0.93     0.26     2.90
 MEAN    34.89    16.94    12.70     4.24     0.92     0.21     3.51     0.91
 HUB     42.07    -5.70    -9.30     3.60     0.92     0.07     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     662.249     371.541     548.207    1118.093       0.592      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.358      14.475     519.487      24.000      34.127      35.400       1.273

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     578.782     371.541     687.773    1127.365       0.513       0.225

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.303      15.287     528.139     528.796       0.024       0.386

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     530.520       0.000     530.520    1132.128       0.469       0.303

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.692     532.610       0.000       0.060       0.039       0.326

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      18.242       1.208     556.118      33.308     224.817       1.743

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 207371.734       0.554    1945.994 1649330.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.019   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    166.058    3398.000      18.242     556.118       1.000       1.000       0.980
W Kg/sec =   75.48089

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    138.554    3281.693       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127745.469  130300.102       1.463     590.487     403.508     474.134       1.175

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   503.80    -0.17   503.80     0.44   588.50
 MEAN    18.08     0.00    -0.02   503.80    -0.17   503.80     0.44
 HUB     15.21     0.00    -0.02   503.80    -0.17   503.80     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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 TIP     50.43    46.36     4.07   609.37   790.80    15.93   534.92     0.70
 MEAN    46.79    42.30     4.49   536.08   735.78    15.93   534.92     0.65
 HUB     41.85    37.84     4.01   451.02   676.31    15.93   534.92     0.60

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   568.12   241.12   514.42  1153.21     0.49
 MEAN    18.01   582.94   265.06   519.19  1150.98     0.51
 HUB     15.22   633.74   354.84   525.08  1148.74     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   630.40   364.39     0.55  4927.28
 MEAN   534.05   584.74   268.99     0.51  4776.85     1.36
 HUB    451.41   533.89    96.57     0.46  5404.33

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.81     1.14    17.62   579.58     1.04   552.63     0.92     0.91
 MEAN    20.72     1.14    17.39   578.86     1.04   550.49     0.92     0.91
 HUB     21.07     1.15    17.13   581.85     1.05   548.32     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.11    35.31    31.50     3.81     0.93     0.26     2.90
 MEAN    27.05    27.39    23.50     3.89     0.92     0.26     3.30     0.91
 HUB     34.05    10.42     6.50     3.92     0.92     0.28     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960    1002.538     265.804     966.659    1093.048       0.917      -1.524

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.830      12.081     496.219      46.000      15.375      30.600      15.225

    STATOR / VANED DIFFUSER THROAT IS CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960    1102.131     265.804    1133.730    1076.076       1.024      -1.966

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      20.515      10.527     479.110     361.848       0.100      -0.156

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     17.823    1248.071       0.000    1248.071    1056.154       1.182      -1.092

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680       8.273     452.991       0.000       0.060       0.362      -2.613

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.484      19.605       1.075     580.097      23.979     274.621       2.129

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 149356.984       0.407    1401.579 1510490.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
  RESET =  0.000BLEED =  0.000 DPInc = 5.019   EfDer =  0.806

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    166.058    3398.000      19.605     580.097       1.000       1.000       0.710
W Kg/sec =   75.48089

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    131.675    3213.151       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
127745.469	130300.102	1.030	395.194	383.499	307.469	0.802

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	909.15	-0.31	909.14	0.82	562.75
MEAN	17.74	0.00	-0.02	909.15	-0.31	909.14	0.82	
HUB	15.05	0.00	-0.02	909.15	-0.31	909.14	0.82	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	33.22	46.36	-13.14	595.14	1086.79	12.60	511.11	0.98
MEAN	30.07	43.40	-13.33	526.00	1050.50	12.60	511.11	0.95
HUB	26.16	38.84	-12.68	446.28	1012.91	12.60	511.11	0.91

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	587.80	134.12	572.29	1164.90	0.50
MEAN	17.51	598.90	180.22	571.14	1166.21	0.51
HUB	14.85	646.23	298.00	573.41	1167.40	0.55

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	730.07	453.31	0.63	2663.14	
MEAN	519.12	664.12	338.90	0.57	3160.67	1.64
HUB	440.35	590.82	142.35	0.51	4430.07	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.73	1.06	17.42	592.77	1.02	563.94	0.92	0.74
MEAN	20.95	1.07	17.49	595.14	1.03	565.21	0.92	0.74
HUB	21.50	1.10	17.46	601.18	1.04	566.33	0.92	0.74

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	13.19	38.38	31.50	6.88	0.93	0.35	2.90	
MEAN	17.51	30.68	23.50	7.18	0.83	0.39	3.28	0.74
HUB	27.46	13.94	6.50	7.44	0.83	0.45	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.806

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	607.133	181.407	579.398	1166.503	0.520	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.023	17.475	565.599	46.000	17.385	31.500	14.115

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	613.854	181.407	640.098	1165.796	0.527	-0.051

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.869	17.273	564.914	471.992	0.053	0.116

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	597.332	0.000	597.332	1167.519	0.512	-0.048

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.303	566.584	0.000	0.060	0.102	-0.043

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.555	20.690	1.055	596.366	16.269	403.620	3.129

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
101366.250	0.294	951.230	2558665.500

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.019   EfDer =  0.922

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    166.058    3398.000      20.690     596.366      1.000       1.000       0.980
W Kg/sec =   75.48089

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    126.508    3169.021       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 127745.469  130300.102       1.393     513.330     368.467     401.059       1.088

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   555.19    -0.19   555.19     0.47   532.62
 MEAN    16.97     0.00    -0.02   555.19    -0.19   555.19     0.47
 HUB     14.32     0.00    -0.02   555.19    -0.19   555.19     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.82    46.36    -0.54   571.12   796.64    17.74   570.65     0.68
 MEAN    42.20    43.80    -1.60   503.23   749.45    17.74   570.65     0.64
 HUB     37.42    37.84    -0.42   424.63   699.08    17.74   570.65     0.60

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   601.31   142.13   584.27  1180.27     0.51
 MEAN    16.57   612.09   185.60   583.27  1181.06     0.52
 HUB     13.89   657.84   301.26   584.81  1181.52     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   718.24   417.72     0.61  2687.10
 MEAN   491.47   658.60   305.87     0.56  3079.38     1.21
 HUB    411.88   595.18   110.63     0.50  4187.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.03     1.06    18.45   609.15     1.02   578.99     0.92     0.84
 MEAN    22.23     1.07    18.50   611.02     1.02   579.76     0.92     0.84
 HUB     22.80     1.10    18.47   616.29     1.03   580.19     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     13.67    35.56    31.50     4.06     0.93     0.13     2.90
 MEAN    17.65    27.67    23.50     4.17     0.89     0.16     3.29     0.84
 HUB     27.25    10.71     6.50     4.21     0.89     0.20     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.922

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     599.331     186.645     569.527    1183.404       0.506       0.057

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.312      18.725     582.183      46.000      18.145      32.400      14.255

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     610.690     186.645     638.576    1182.238       0.517      -0.003

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.149      18.461     581.036     456.573       0.052       0.138

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     579.673       0.000     579.673    1185.368       0.489      -0.021
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.645	584.117	0.000	0.060	0.100	0.044

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.651	21.961	1.061	612.154	15.788	367.578	2.849

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
98398.352	0.314	923.379	1546384.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 5.019 EfDer = 0.886

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
166.058	3398.000	21.961	612.154	1.000	1.000	0.980

W Kg/sec = 75.48089

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
120.752	3127.887	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
127745.469	130300.102	1.449	509.668	351.717	390.276	1.110

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	535.02	-0.18	535.02	0.45	500.05
MEAN	15.91	0.00	-0.02	535.02	-0.18	535.02	0.45	
HUB	13.07	0.00	-0.02	535.02	-0.18	535.02	0.45	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.45	47.36	-1.91	543.25	762.60	19.11	588.28	0.64
MEAN	41.42	44.80	-3.38	471.87	713.50	19.11	588.28	0.60
HUB	35.93	38.84	-2.91	387.57	660.76	19.11	588.28	0.56

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	579.76	123.53	566.44	1196.04	0.48
MEAN	15.50	588.47	160.52	566.16	1196.49	0.49
HUB	12.59	627.10	265.42	568.16	1196.65	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	531.98	698.35	408.45	0.58	2219.46	
MEAN	459.55	640.28	299.03	0.54	2490.63	1.19
HUB	373.33	578.32	107.91	0.48	3344.09	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.05	1.05	19.63	622.71	1.02	594.68	0.92	0.81
MEAN	23.19	1.06	19.65	624.00	1.02	595.12	0.92	0.81
HUB	23.62	1.08	19.59	628.06	1.03	595.26	0.92	0.81

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	12.30	35.79	31.50	4.29	0.93	0.11	2.90	
MEAN	15.83	27.84	23.50	4.34	0.89	0.14	3.34	0.81
HUB	25.04	10.75	6.50	4.25	0.89	0.17	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.886

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	595.074	163.465	572.182	1196.675	0.497	-0.013

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.213	19.602	595.388	46.000	15.944	33.000	17.056

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     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     629.622     163.465     650.495    1193.123       0.528      -0.199

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      22.841      18.891     591.859     440.827       0.122       0.117

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
      14.701     580.724       0.000     580.724    1198.088       0.485      -0.044

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      19.440     596.795       0.000       0.060       0.124      -0.049

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.537      22.833       1.040     624.926      12.771     421.434       3.267

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   79620.828       0.281     747.169 1606202.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     636114.12   5969.3491    162.2220      1.5114      0.6437      5.0193      1.1953


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 90% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.494   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     163.580    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   74.35432

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     159.801    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  125838.836  128355.344       1.787     831.557     465.375     619.754       1.332

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   385.57    -0.13   385.57     0.35   609.32
  MEAN    17.06     0.00    -0.02   385.57    -0.13   385.57     0.35
  HUB     12.51     0.00    -0.02   385.57    -0.13   385.57     0.35

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.78    50.47     7.31   611.74   723.23    13.89   510.39     0.65
  MEAN    52.69    47.20     5.49   505.89   636.18    13.89   510.39     0.57
  HUB     43.90    38.62     5.28   370.96   535.14    13.89   510.39     0.48

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   612.72   333.22   514.20  1123.25     0.55
  MEAN    18.04   644.13   375.51   523.35  1119.22     0.58
  HUB     15.00   737.43   499.02   542.94  1111.37     0.66

        U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
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 TIP    611.74   584.79   278.53     0.52  6876.97
 MEAN   534.83   547.06   159.31     0.49  6775.05     1.29
 HUB    444.80   545.64    54.22     0.49  7486.92

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.34     1.21    14.98   555.57     1.06   524.22     0.92     0.91
 MEAN    18.29     1.21    14.61   555.08     1.06   520.44     0.92     0.91
 HUB     18.65     1.23    13.88   558.47     1.07   513.07     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.94    28.44    24.20     4.24     0.93     0.27     2.90
 MEAN    35.66    16.93    12.70     4.23     0.92     0.23     3.51     0.91
 HUB     42.59    -5.70    -9.30     3.60     0.92     0.09     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     655.042     374.785     537.230    1119.222       0.585      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.390      14.579     520.537      24.000      34.901      35.400       0.499

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     565.991     374.785     678.829    1128.944       0.501       0.242

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.339      15.443     529.619     528.796       0.023       0.398

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     519.209       0.000     519.209    1133.454       0.458       0.318

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.831     533.859       0.000       0.060       0.037       0.341

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      18.284       1.210     556.375      33.565     221.616       1.718

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 208972.266       0.558    1931.745 1621285.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.494   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.580    3398.000      18.284     556.375       1.000       1.000       0.980
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    136.204    3280.935       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.489     590.487     396.664     474.134       1.195

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   493.35    -0.17   493.35     0.43   588.36
 MEAN    18.08     0.00    -0.02   493.35    -0.17   493.35     0.43
 HUB     15.21     0.00    -0.02   493.35    -0.17   493.35     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.01    46.36     4.65   609.37   784.18    16.06   536.05     0.69
 MEAN    47.39    42.30     5.09   536.08   728.66    16.06   536.05     0.64
 HUB     42.44    37.84     4.60   451.02   668.55    16.06   536.05     0.59
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     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   561.12   249.71   502.50  1155.03     0.49
MEAN    18.01   575.56   271.21   507.66  1152.54     0.50
HUB     15.22   625.74   357.10   513.84  1150.04     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    605.52   615.72   355.81     0.53  5102.47
MEAN   534.05   571.66   262.84     0.50  4887.57     1.38
HUB    451.41   522.43    94.31     0.45  5438.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.95     1.15    17.83   580.67     1.04   554.38     0.92     0.91
MEAN    20.84     1.14    17.57   579.65     1.04   551.99     0.92     0.91
HUB     21.14     1.16    17.28   582.27     1.05   549.58     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     26.42    35.30    31.50     3.80     0.93     0.27     2.90
MEAN    28.11    27.37    23.50     3.87     0.92     0.27     3.30     0.91
HUB     34.80    10.40     6.50     3.90     0.92     0.29     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      947.935     271.972     908.082    1103.351       0.859      -1.358

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.943      12.928      505.839      46.000      16.673      30.600      13.927

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960      973.494     271.972    1010.772    1099.138       0.886      -1.506

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680       20.683      12.413     501.772     361.848       0.086       0.038

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.823    1003.370      0.000    1003.370    1095.381       0.916      -0.363

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.680       11.688     497.060       0.000       0.060       0.249      -1.718

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4        Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.634       20.127       1.101     580.862      24.487     267.516       2.074

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 152522.766       0.416    1409.925 1481365.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 5.494   EfDer =  0.766

   W act       RPM act        Pt          Tt           POTS        POTH       AeroBl
    163.580     3398.000      20.127     580.862       1.000       1.000       0.710
W Kg/sec =   74.35432

   W cor       RPM cor        GAMMA       Cp          R           Blades       THK
    126.426     3211.034       1.402       0.249      53.349      56.000       0.050

   CFM         SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 125838.836  128355.344       1.073     395.194     368.207     307.469       0.835
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ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	821.62	-0.28	821.62	0.73	562.38
MEAN	17.74	0.00	-0.02	821.62	-0.28	821.62	0.73	
HUB	15.05	0.00	-0.02	821.62	-0.28	821.62	0.73	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	35.93	46.36	-10.43	595.14	1014.68	14.10	524.51	0.90
MEAN	32.64	43.40	-10.76	526.00	975.72	14.10	524.51	0.87
HUB	28.52	38.84	-10.32	446.28	935.13	14.10	524.51	0.83

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	566.35	162.46	542.55	1170.54	0.48
MEAN	17.51	579.50	201.21	543.44	1170.73	0.49
HUB	14.85	628.80	308.51	547.91	1170.82	0.54

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	689.18	424.97	0.59	3223.97	
MEAN	519.12	629.60	317.91	0.54	3527.57	1.62
HUB	440.35	563.55	131.84	0.48	4585.56	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.46	1.07	18.28	596.21	1.03	569.44	0.92	0.70
MEAN	21.59	1.07	18.25	597.65	1.03	569.62	0.92	0.70
HUB	22.04	1.09	18.11	602.69	1.04	569.69	0.92	0.70

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	16.67	38.07	31.50	6.57	0.93	0.35	2.90	
MEAN	20.32	30.33	23.50	6.83	0.84	0.39	3.28	0.70
HUB	29.38	13.53	6.50	7.03	0.84	0.44	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.766

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	587.206	202.533	551.172	1171.117	0.501	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.659	18.238	570.067	46.000	20.176	31.500	11.324

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	578.736	202.533	613.152	1171.964	0.494	0.007

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.551	18.239	570.891	471.992	0.041	0.159

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	561.708	0.000	561.708	1173.627	0.479	0.022

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.315	572.512	0.000	0.060	0.076	0.029

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.584	21.427	1.065	598.849	17.987	355.860	2.759

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
112074.758	0.325	1036.022	2368477.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 5.494 EfDer = 0.951

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
163.580	3398.000	21.427	598.849	1.000	1.000	0.980

W Kg/sec = 74.35432

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
120.580	3162.444	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
125838.836	128355.344	1.462	513.330	351.200	401.059	1.142

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	523.52	-0.18	523.52	0.44	531.51
MEAN	16.97	0.00	-0.02	523.52	-0.18	523.52	0.44	
HUB	14.32	0.00	-0.02	523.52	-0.18	523.52	0.44	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.50	46.36	1.14	571.12	774.89	18.70	575.98	0.66
MEAN	43.88	43.80	0.08	503.23	726.29	18.70	575.98	0.62
HUB	39.06	37.84	1.22	424.63	674.19	18.70	575.98	0.57

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	571.03	170.54	544.97	1188.34	0.48
MEAN	16.57	583.43	205.57	546.02	1188.04	0.49
HUB	13.89	629.54	308.55	548.74	1187.56	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	669.75	389.31	0.56	3223.20	
MEAN	491.47	616.34	285.89	0.52	3410.20	1.26
HUB	411.88	558.38	103.34	0.47	4288.29	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.14	1.08	19.76	614.19	1.03	586.98	0.92	0.87
MEAN	23.24	1.08	19.71	615.08	1.03	586.67	0.92	0.87
HUB	23.73	1.11	19.59	619.25	1.03	586.19	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	17.38	35.54	31.50	4.04	0.93	0.17	2.90	
MEAN	20.63	27.64	23.50	4.14	0.90	0.19	3.29	0.87
HUB	29.35	10.66	6.50	4.16	0.90	0.23	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.951

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	572.111	206.729	533.455	1190.181	0.481	0.057

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.334	19.919	588.859	46.000	21.183	32.400	11.217

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	566.359	206.729	602.909	1190.733	0.476	0.056

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.227	19.892	589.406	456.573	0.039	0.183

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	537.130	0.000	537.130	1193.448	0.450	0.047

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.093	592.097	0.000	0.060	0.076	0.111

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    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.749      23.092       1.078     616.171      17.322     332.938       2.581

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 107968.164       0.344     998.061 1499236.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.494   EfDer =  0.928

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    163.580    3398.000      23.092     616.171       1.000       1.000       0.980
W Kg/sec =   74.35432

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    113.495    3117.675       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 125838.836  128355.344       1.542     509.668     330.578     390.276       1.181

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   497.37    -0.17   497.37     0.42   498.41
 MEAN    15.91     0.00    -0.02   497.37    -0.17   497.37     0.42
 HUB     13.07     0.00    -0.02   497.37    -0.17   497.37     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.53    47.36     0.17   543.25   736.67    20.50   595.54     0.62
 MEAN    43.50    44.80    -1.30   471.87   685.71    20.50   595.54     0.57
 HUB     37.94    38.84    -0.90   387.57   630.65    20.50   595.54     0.53

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   543.57   157.21   520.34  1206.30     0.45
 MEAN    15.50   553.61   184.38   522.00  1205.56     0.46
 HUB     12.59   592.36   274.16   525.09  1204.69     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   641.25   374.77     0.53  2823.49
 MEAN   459.55   590.09   275.17     0.49  2860.24     1.25
 HUB    373.33   534.37    99.17     0.44  3453.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.62     1.07    21.41   629.60     1.02   604.96     0.92     0.85
 MEAN    24.64     1.07    21.32   629.78     1.02   604.21     0.92     0.85
 HUB     24.97     1.08    21.16   632.60     1.03   603.33     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.81    35.76    31.50     4.26     0.93     0.17     2.90
 MEAN    19.45    27.80    23.50     4.30     0.90     0.18     3.34     0.85
 HUB     27.57    10.70     6.50     4.20     0.90     0.21     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.928

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     559.470     187.765     527.021    1205.856       0.464      -0.010

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.674      21.287     604.548      46.000      19.610      33.000      13.390

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     15.219     570.062     187.765     600.189    1204.860       0.473      -0.099

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.435      20.960     603.550     440.827       0.089       0.169

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     528.235       0.000     528.235    1208.679       0.437       0.041

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.426     607.382       0.000       0.060       0.090       0.037

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.693      24.433       1.058     630.659      14.487     369.634       2.865

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  90332.055       0.319     835.032 1552208.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    671870.00   6210.7837    159.8008      1.6173      0.7165      5.4939      1.2063


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 90% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 5.964   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.138    3398.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   73.24458

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    157.416    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123960.672  126439.617       1.814     831.557     458.429     619.754       1.352

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   379.04    -0.13   379.04     0.34   609.32
 MEAN    17.06     0.00    -0.02   379.04    -0.13   379.04     0.34
 HUB     12.51     0.00    -0.02   379.04    -0.13   379.04     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.22    50.47     7.75   611.74   719.77    13.93   510.81     0.65
 MEAN    53.16    47.20     5.96   505.89   632.24    13.93   510.81     0.57
 HUB     44.39    38.62     5.77   370.96   530.46    13.93   510.81     0.48

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   607.24   338.78   503.96  1124.43     0.54
 MEAN    18.04   637.78   378.63   513.23  1120.23     0.57
 HUB     15.00   728.91   497.98   532.28  1112.39     0.66

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   573.14   272.97     0.51  6991.64
 MEAN   534.83   536.47   156.19     0.48  6831.22     1.31
 HUB    444.80   534.93    53.18     0.48  7471.35
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    18.40     1.22    15.09   556.11     1.06   525.32     0.92     0.91
 MEAN   18.32     1.21    14.70   555.35     1.06   521.38     0.92     0.91
 HUB    18.65     1.23    13.97   558.40     1.07   514.04     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    33.91    28.44    24.20     4.24     0.93     0.28     2.90
 MEAN   36.42    16.93    12.70     4.23     0.92     0.24     3.51     0.91
 HUB    43.09    -5.71    -9.30     3.59     0.92     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     648.223     377.896     526.676    1120.285       0.579      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.420      14.677     521.526      24.000      35.660      35.400      -0.260

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     553.824     377.896     670.467    1130.418       0.490       0.258

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.371      15.587     531.003     528.796       0.023       0.410

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     508.589       0.000     508.589    1134.683       0.448       0.330

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.955     535.017       0.000       0.060       0.037       0.353

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      18.317       1.212     556.622      33.812     218.530       1.694

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 210507.453       0.563    1916.893 1593848.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.964   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.138    3398.000      18.317     556.622       1.000       1.000       0.980
W Kg/sec =   73.24458

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    133.962    3280.208       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123960.672  126439.617       1.514     590.487     390.134     474.134       1.215

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP    20.55     0.00    -0.02   483.51    -0.17   483.51     0.43   588.23
 MEAN   18.08     0.00    -0.02   483.51    -0.17   483.51     0.43
 HUB    15.21     0.00    -0.02   483.51    -0.17   483.51     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP    51.58    46.36     5.22   609.37   778.02    16.17   537.10     0.68
 MEAN   47.96    42.30     5.66   536.08   722.04    16.17   537.10     0.64
 HUB    43.02    37.84     5.18   451.02   661.33    16.17   537.10     0.58

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
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     0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   554.90   257.69   491.44  1156.69     0.48
 MEAN    18.01   568.87   276.92   496.92  1153.96     0.49
 HUB     15.22   618.36   359.17   503.35  1151.25     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   602.08   347.83     0.52  5265.37
 MEAN   534.05   559.50   257.13     0.48  4990.33     1.39
 HUB    451.41   511.73    92.24     0.44  5470.25

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.08     1.15    18.01   581.69     1.05   555.98     0.92     0.91
 MEAN    20.93     1.14    17.73   580.38     1.04   553.36     0.92     0.91
 HUB     21.20     1.16    17.41   582.67     1.05   550.74     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.67    35.29    31.50     3.79     0.93     0.28     2.90
 MEAN    29.13    27.36    23.50     3.86     0.92     0.28     3.30     0.91
 HUB     35.51    10.38     6.50     3.88     0.92     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     909.003     277.697     865.546    1110.623       0.818      -1.247

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.038      13.542     512.586      46.000      17.788      30.600      12.812

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     907.161     277.697     948.714    1110.973       0.817      -1.278

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      20.819      13.427     512.870     361.848       0.075       0.095

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     915.925       0.000     915.925    1110.083       0.825      -0.146

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      13.052     511.598       0.000       0.060       0.196      -1.390

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.704      20.413       1.114     581.580      24.959     261.073       2.024

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 155461.078       0.424    1415.638 1453297.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 5.964   EfDer =  0.773

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.138    3398.000      20.413     581.580       1.000       1.000       0.710
W Kg/sec =   73.24458

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    122.871    3209.051       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123960.672  126439.617       1.104     395.194     357.851     307.469       0.859

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     20.07     0.00    -0.02   776.31    -0.27   776.31     0.69   562.03
MEAN    17.74     0.00    -0.02   776.31    -0.27   776.31     0.69
HUB     15.05     0.00    -0.02   776.31    -0.27   776.31     0.69

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     37.49    46.36    -8.87   595.14   978.35    14.89   531.27     0.87
MEAN    34.13    43.40    -9.27   526.00   937.88    14.89   531.27     0.83
HUB     29.91    38.84    -8.93   446.28   895.58    14.89   531.27     0.79

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   552.28   180.64   521.90  1174.37     0.47
MEAN    17.51   565.91   214.75   523.58  1173.95     0.48
HUB     14.85   615.17   314.87   528.48  1173.45     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    587.43   661.71   406.78     0.56  3583.94
MEAN   519.12   605.63   304.38     0.52  3764.23     1.62
HUB    440.35   543.18   125.48     0.46  4679.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.93     1.07    18.84   598.64     1.03   573.18     0.92     0.71
MEAN    22.01     1.08    18.77   599.50     1.03   572.77     0.92     0.71
HUB     22.41     1.10    18.58   603.85     1.04   572.27     0.92     0.71

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     19.09    37.93    31.50     6.43     0.93     0.36     2.90
MEAN    22.30    30.17    23.50     6.67     0.85     0.39     3.28     0.71
HUB     30.79    13.36     6.50     6.86     0.85     0.44     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.773

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     573.151     216.157     530.828    1174.380       0.488      -0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.081      18.758     573.241      46.000      22.156      31.500       9.344

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     554.365     216.157     595.016    1176.190       0.471       0.048

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.000      18.892     575.009     471.992       0.034       0.188

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     537.822       0.000     537.822    1177.731       0.457       0.064

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.975     576.517       0.000       0.060       0.065       0.072

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.618      21.895       1.073     600.663      19.082     330.898       2.565

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 118904.734       0.345    1082.753 2264769.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.964   EfDer =  0.968

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.138    3398.000      21.895     600.663       1.000       1.000       0.980
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W Kg/sec = 73.24458

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
116.418	3157.666	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
123960.672	126439.617	1.514	513.330	339.074	401.059	1.183

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	502.08	-0.17	502.08	0.43	530.71
MEAN	16.97	0.00	-0.02	502.08	-0.17	502.08	0.43	
HUB	14.32	0.00	-0.02	502.08	-0.17	502.08	0.43	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.69	46.36	2.33	571.12	760.56	19.33	579.63	0.64
MEAN	45.08	43.80	1.28	503.23	710.99	19.33	579.63	0.60
HUB	40.23	37.84	2.39	424.63	657.68	19.33	579.63	0.56

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	552.66	189.17	519.27	1193.58	0.46
MEAN	16.57	565.45	218.84	521.39	1192.65	0.47
HUB	13.89	611.25	313.40	524.79	1191.61	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	638.00	370.68	0.53	3574.93	
MEAN	491.47	588.37	272.63	0.49	3629.89	1.30
HUB	411.88	533.95	98.48	0.45	4355.58	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.87	1.09	20.61	617.67	1.03	592.19	0.92	0.89
MEAN	23.90	1.09	20.49	617.93	1.03	591.25	0.92	0.89
HUB	24.32	1.11	20.32	621.39	1.03	590.21	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.02	35.52	31.50	4.02	0.93	0.20	2.90	
MEAN	22.77	27.60	23.50	4.10	0.91	0.22	3.29	0.89
HUB	30.85	10.63	6.50	4.13	0.91	0.25	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.968

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	555.103	220.066	509.618	1194.649	0.465	0.057

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.997	20.694	593.284	46.000	23.356	32.400	9.044

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	538.004	220.066	581.272	1196.218	0.450	0.097

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.921	20.818	594.844	456.573	0.031	0.214

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	510.283	0.000	510.283	1198.654	0.426	0.091

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.016	597.269	0.000	0.060	0.063	0.153

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.795      23.808       1.087     618.997      18.334     312.443       2.422

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 114282.195       0.365    1040.660 1461504.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.964   EfDer =  0.952

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.138    3398.000      23.808     618.997       1.000       1.000       0.980
W Kg/sec =   73.24458

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    108.686    3110.551       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123960.672  126439.617       1.610     509.668     316.571     390.276       1.233

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   473.35    -0.16   473.35     0.39   497.28
 MEAN    15.91     0.00    -0.02   473.35    -0.16   473.35     0.39
 HUB     13.07     0.00    -0.02   473.35    -0.16   473.35     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.94    47.36     1.58   543.25   720.66    21.39   600.31     0.60
 MEAN    44.92    44.80     0.12   471.87   668.49    21.39   600.31     0.56
 HUB     39.32    38.84     0.48   387.57   611.88    21.39   600.31     0.51

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     17.94   523.09   178.09   491.85  1212.68     0.43
 MEAN    15.50   533.13   199.33   494.46  1211.30     0.44
 HUB     12.59   571.24   279.64   498.12  1209.86     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   605.93   353.89     0.50  3197.96
 MEAN   459.55   558.76   260.22     0.46  3091.76     1.29
 HUB    373.33   506.86    93.70     0.42  3522.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.64     1.08    22.56   634.21     1.02   611.38     0.92     0.87
 MEAN    25.57     1.07    22.38   633.70     1.02   609.99     0.92     0.87
 HUB     25.83     1.08    22.17   635.75     1.03   608.53     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.90    35.74    31.50     4.24     0.93     0.20     2.90
 MEAN    21.96    27.76    23.50     4.26     0.90     0.21     3.34     0.87
 HUB     29.31    10.65     6.50     4.15     0.90     0.23     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.952

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     538.702     202.987     498.995    1211.626       0.445      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.612      22.359     610.344      46.000      22.136      33.000      10.864

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     535.095     202.987     572.303    1211.946       0.442      -0.034

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      25.446      22.255     610.668     440.827       0.070       0.204

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     497.270       0.000     497.270    1215.175       0.409       0.092

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      22.662     613.925       0.000       0.060       0.074       0.089

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.760      25.435       1.068     634.553      15.556     341.838       2.650

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   97002.477       0.343     883.310 1510954.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     696157.94   6339.2544    157.4157      1.6836      0.7538      5.9641      1.2137


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*******************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 90% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     158.614    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   72.09729

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     154.950    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  122018.992  124459.109       1.843     831.557     451.248     619.754       1.373

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   372.34    -0.13   372.34     0.34   609.32
  MEAN    17.06     0.00    -0.02   372.34    -0.13   372.34     0.34
  HUB     12.51     0.00    -0.02   372.34    -0.13   372.34     0.34

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.68    50.47     8.21   611.74   716.26    13.97   511.23     0.65
  MEAN    53.65    47.20     6.45   505.89   628.24    13.97   511.23     0.57
  HUB     44.90    38.62     6.28   370.96   525.69    13.97   511.23     0.47

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
  TIP     20.63   601.90   344.40   493.62  1125.58     0.53
  MEAN    18.04   631.48   381.80   502.99  1121.22     0.56
  HUB     15.00   720.37   496.94   521.52  1113.40     0.65

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   561.37   267.34     0.50  7107.68
  MEAN   534.83   525.75   153.02     0.47  6888.38     1.33
  HUB    444.80   524.12    52.15     0.47  7455.77

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.46     1.22    15.20   556.67     1.06   526.41     0.92     0.91
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 MEAN    18.35     1.21    14.80   555.62     1.06   522.32     0.92     0.91
 HUB     18.64     1.23    14.06   558.33     1.07   514.99     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.90    28.44    24.20     4.24     0.93     0.30     2.90
 MEAN    37.20    16.92    12.70     4.22     0.93     0.25     3.51     0.91
 HUB     43.62    -5.71    -9.30     3.59     0.93     0.11     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     641.468     381.061     516.017    1121.335       0.572      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.449      14.774     522.504      24.000      36.445      35.400      -1.045

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     541.648     381.061     662.261    1131.870       0.479       0.274

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.401      15.728     532.368     528.796       0.023       0.422

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     497.951       0.000     497.951    1135.896       0.438       0.342

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.075     536.162       0.000       0.060       0.037       0.366

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      18.346       1.214     556.872      34.062     215.395       1.670

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 212065.438       0.567    1900.832 1565675.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    158.614    3398.000      18.346     556.872       1.000       1.000       0.980
W Kg/sec =   72.09729

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    131.682    3279.471       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 122018.992  124459.109       1.540     590.487     383.495     474.134       1.236

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   473.63    -0.16   473.63     0.42   588.10
 MEAN    18.08     0.00    -0.02   473.63    -0.16   473.63     0.42
 HUB     15.21     0.00    -0.02   473.63    -0.16   473.63     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.15    46.36     5.79   609.37   771.92    16.28   538.14     0.68
 MEAN    48.55    42.30     6.25   536.08   715.46    16.28   538.14     0.63
 HUB     43.61    37.84     5.77   451.02   654.14    16.28   538.14     0.57

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     20.42   549.01   265.56   480.51  1158.30     0.47
 MEAN    18.01   562.40   282.61   486.24  1155.36     0.49
 HUB     15.22   611.10   361.25   492.89  1152.43     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   588.61   339.96     0.51  5426.08
 MEAN   534.05   547.40   251.44     0.47  5092.72     1.41
 HUB    451.41   501.07    90.16     0.43  5501.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.21     1.16    18.18   582.71     1.05   557.54     0.92     0.91
 MEAN    21.02     1.15    17.88   581.12     1.04   554.71     0.92     0.91
 HUB     21.25     1.16    17.54   583.07     1.05   551.89     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.93    35.28    31.50     3.78     0.93     0.30     2.90
 MEAN    30.17    27.34    23.50     3.84     0.93     0.29     3.30     0.91
 HUB     36.24    10.37     6.50     3.87     0.93     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     876.721     283.402     829.653    1116.576       0.785      -1.159

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.128      14.058     518.115      46.000      18.860      30.600      11.740

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     858.547     283.402     904.113    1119.419       0.767      -1.118

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      20.942      14.183     520.749     361.848       0.067       0.129

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     858.319       0.000     858.319    1119.682       0.767      -0.024

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      13.978     520.804       0.000       0.060       0.161      -1.180

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.749      20.631       1.125     582.298      25.426     254.821       1.975

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 158374.266       0.432    1419.576 1424785.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.789

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     158.614    3398.000      20.631     582.298       1.000       1.000       0.710
W Kg/sec =   72.09729

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     119.742    3207.073       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 122018.992  124459.109       1.133     395.194     348.738     307.469       0.882

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   741.31    -0.26   741.31     0.65   561.68
 MEAN    17.74     0.00    -0.02   741.31    -0.26   741.31     0.65
 HUB     15.05     0.00    -0.02   741.31    -0.26   741.31     0.65
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     38.77    46.36    -7.59   595.14   950.81    15.49   536.42     0.84
MEAN    35.37    43.40    -8.03   526.00   909.11    15.49   536.42     0.80
HUB     31.06    38.84    -7.78   446.28   865.41    15.49   536.42     0.76

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   540.63   196.16   503.79  1177.67     0.46
MEAN    17.51   554.29   226.25   506.01  1176.76     0.47
HUB     14.85   603.05   320.14   511.05  1175.82     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    587.43   637.88   391.27     0.54  3891.02
MEAN   519.12   584.66   292.87     0.50  3965.45     1.63
HUB    440.35   525.00   120.21     0.45  4757.92

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.33     1.08    19.32   600.82     1.03   576.42     0.92     0.72
MEAN    22.37     1.08    19.21   601.17     1.03   575.53     0.92     0.72
HUB     22.72     1.10    18.99   604.94     1.04   574.59     0.92     0.72

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     21.27    37.83    31.50     6.33     0.93     0.36     2.90
MEAN    24.09    30.06    23.50     6.56     0.86     0.39     3.28     0.72
HUB     32.06    13.24     6.50     6.74     0.86     0.44     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.789

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     561.126     227.739     512.832    1177.234       0.477      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.441      19.205     576.027      46.000      23.945      31.500       7.555

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     533.294     227.739     579.885    1179.830       0.452       0.084

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.381      19.450     578.569     471.992       0.028       0.214

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     517.233       0.000     517.233    1181.265       0.438       0.101

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.538     579.978       0.000       0.060       0.055       0.110

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.652      22.291       1.080     602.310      20.012     312.012       2.419

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 124701.422       0.361    1117.752 2181057.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.980

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    158.614    3398.000      22.291     602.310       1.000       1.000       0.980
W Kg/sec =   72.09729

   W cor      RPM cor        GAMMA       Cp         R          Blades       THK
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   112.715    3153.344       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
122018.992  124459.109       1.564     513.330     328.289     401.059       1.222

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   483.48    -0.17   483.48     0.41   529.98
MEAN    16.97     0.00    -0.02   483.48    -0.17   483.48     0.41
HUB     14.32     0.00    -0.02   483.48    -0.17   483.48     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     49.76    46.36     3.40   571.12   748.41    19.87   582.80     0.63
MEAN    46.16    43.80     2.36   503.23   697.97    19.87   582.80     0.59
HUB     41.30    37.84     3.46   424.63   643.59    19.87   582.80     0.54

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   538.12   204.99   497.54  1197.99     0.45
MEAN    16.57   550.80   230.13   500.42  1196.57     0.46
HUB     13.89   595.98   317.55   504.33  1195.08     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    559.85   611.12   354.86     0.51  3873.44
MEAN   491.47   564.55   261.34     0.47  3816.99     1.33
HUB    411.88   513.08    94.33     0.43  4413.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.50     1.10    21.33   620.74     1.03   596.58     0.92     0.90
MEAN    24.47     1.10    21.16   620.47     1.03   595.16     0.92     0.90
HUB     24.82     1.11    20.94   623.31     1.03   593.67     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     22.39    35.50    31.50     4.00     0.93     0.23     2.90
MEAN    24.70    27.57    23.50     4.07     0.91     0.24     3.29     0.90
HUB     32.20    10.59     6.50     4.09     0.91     0.27     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.980

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481      541.279     231.426     489.311    1198.443       0.452       0.056

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.560      21.350      597.057      46.000      25.312      32.400       7.088

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481      514.354     231.426     564.019    1200.822       0.428       0.133

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.506      21.599     599.428     456.573       0.026       0.242

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     487.911       0.000     487.911    1203.035       0.406       0.129

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      21.794     601.640       0.000       0.060       0.053       0.189

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.827      24.411       1.095     621.505      19.195     296.222       2.296

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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119652.430       0.382    1072.495 1425957.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.969

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.614    3398.000      24.411     621.505       1.000       1.000       0.980
W Kg/sec =   72.09729

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.554    3104.268       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
122018.992  124459.109       1.674     509.668     304.534     390.276       1.282

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   453.21    -0.16   453.21     0.38   496.27
MEAN    15.91     0.00    -0.02   453.21    -0.16   453.21     0.38
HUB     13.07     0.00    -0.02   453.21    -0.16   453.21     0.38

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.17    47.36     2.81   543.25   707.59    22.14   604.37     0.59
MEAN    46.16    44.80     1.36   471.87   654.38    22.14   604.37     0.54
HUB     40.55    38.84     1.71   387.57   596.43    22.14   604.37     0.49

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   507.56   195.27   468.50  1217.92     0.42
MEAN    15.50   517.06   211.66   471.76  1216.07     0.43
HUB     12.59   554.23   284.19   475.82  1214.19     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    531.98   576.95   336.71     0.47  3505.94
MEAN   459.55   532.92   247.90     0.44  3282.66     1.33
HUB    373.33   484.10    89.14     0.40  3580.04

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.50     1.09    23.51   638.18     1.03   616.69     0.92     0.89
MEAN    26.36     1.08    23.28   637.12     1.03   614.81     0.92     0.89
HUB     26.54     1.09    23.01   638.53     1.03   612.91     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     22.63    35.70    31.50     4.20     0.93     0.23     2.90
MEAN    24.16    27.72    23.50     4.22     0.91     0.23     3.34     0.89
HUB     30.85    10.61     6.50     4.11     0.91     0.25     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.969

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     522.478     215.538     475.949    1216.406       0.430      -0.007

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.404      23.257     615.169      46.000      24.364      33.000       8.636

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     507.287     215.538     551.178    1217.696       0.417       0.019

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.289      23.327     616.474     440.827       0.056       0.235

   VANED DIFFUSER EXIT:
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   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     472.310       0.000     472.310    1220.515       0.387       0.136

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.693     619.332       0.000       0.060       0.061       0.134

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.805      26.274       1.076     637.941      16.436     320.938       2.488

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102500.484       0.362     918.755 1472838.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     717294.06   6429.4097    154.9500      1.7392      0.7809      6.4531      1.2202


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 90% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.044   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3398.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    151.988    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.879     831.557     442.622     619.754       1.400

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   364.35    -0.13   364.35     0.33   609.32
 MEAN    17.06     0.00    -0.02   364.35    -0.13   364.35     0.33
 HUB     12.51     0.00    -0.02   364.35    -0.13   364.35     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.23    50.47     8.76   611.74   712.14    14.02   511.72     0.64
 MEAN    54.24    47.20     7.04   505.89   623.54    14.02   511.72     0.56
 HUB     45.52    38.62     6.90   370.96   520.06    14.02   511.72     0.47

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   595.87   351.00   481.52  1126.91     0.53
 MEAN    18.04   624.23   385.51   490.96  1122.36     0.56
 HUB     15.00   710.41   495.70   508.88  1114.57     0.64

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   547.59   260.75     0.49  7243.62
 MEAN   534.83   513.16   149.32     0.46  6955.19     1.36
 HUB    444.80   511.42    50.90     0.46  7437.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.53     1.23    15.32   557.32     1.07   527.66     0.92     0.91
 MEAN    18.39     1.22    14.90   555.94     1.06   523.40     0.92     0.91
 HUB     18.63     1.23    14.17   558.24     1.07   516.09     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.09    28.44    24.20     4.24     0.93     0.32     2.90
 MEAN    38.14    16.92    12.70     4.22     0.93     0.27     3.51     0.91
 HUB     44.25    -5.71    -9.30     3.59     0.93     0.13     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     633.699     384.760     503.522    1122.536       0.565      -0.005

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.481      14.883     523.623      24.000      37.385      35.400      -1.985

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     527.515     384.760     652.926    1133.521       0.465       0.293

   BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.950      18.432       15.887     533.922     528.796       0.023       0.436

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     485.568       0.000     485.568    1137.282       0.427       0.356

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.209     537.471       0.000       0.060       0.038       0.380

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.879      18.377       1.216     557.164      34.354     211.711       1.641

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 213884.875       0.572    1880.494 1532079.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 7.044   EfDer =  1.000

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    155.582    3398.000      18.377     557.164       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    128.986    3278.611       1.402       0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 119686.578  122080.047       1.572     590.487     375.645     474.134       1.262

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   462.12    -0.16   462.12     0.41   587.94
 MEAN    18.08      0.00    -0.02   462.12    -0.16   462.12     0.41
 HUB     15.21      0.00    -0.02   462.12    -0.16   462.12     0.41

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     52.83     46.36     6.47   609.37   764.90     16.41   539.33     0.67
 MEAN    49.25     42.30     6.95   536.08   707.88     16.41   539.33     0.62
 HUB     44.31     37.84     6.47   451.02   645.85     16.41   539.33     0.57

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     20.42   542.57   274.63   467.92  1160.12      0.47
 MEAN    18.01   555.16   289.17   473.91  1156.95      0.48
 HUB     15.22   602.80   363.63   480.77  1153.79      0.52
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   573.10   330.88     0.49  5611.27
 MEAN   534.05   533.44   244.88     0.46  5210.81     1.44
 HUB    451.41   488.72    87.78     0.42  5537.97

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.35     1.16    18.37   583.88     1.05   559.30     0.92     0.91
 MEAN    21.12     1.15    18.04   581.97     1.04   556.24     0.92     0.91
 HUB     21.30     1.16    17.68   583.53     1.05   553.19     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.41    35.27    31.50     3.77     0.93     0.31     2.90
 MEAN    31.39    27.33    23.50     3.83     0.93     0.31     3.30     0.91
 HUB     37.10    10.35     6.50     3.85     0.93     0.32     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     844.527     289.981     793.181    1122.432       0.752      -1.074

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.225      14.576     523.572      46.000      20.082      30.600      10.518

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     812.946     289.981     863.117    1127.109       0.721      -0.972

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      21.072      14.896     527.943     361.848       0.058       0.159

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     807.480       0.000     807.480    1127.989       0.716       0.071

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      14.804     528.691       0.000       0.060       0.130      -1.001

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.787      20.838       1.134     583.129      25.965     247.776       1.921

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 161729.703       0.441    1421.941 1391148.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.044   EfDer =  0.813

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     155.582    3398.000      20.838     583.129       1.000       1.000       0.710
W Kg/sec =   70.71914

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     116.374    3204.787       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.166     395.194     338.928     307.469       0.907

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   707.14    -0.24   707.14     0.62   561.28
 MEAN    17.74     0.00    -0.02   707.14    -0.24   707.14     0.62
 HUB     15.05     0.00    -0.02   707.14    -0.24   707.14     0.62

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     40.10    46.36    -6.26   595.14   924.40    16.08   541.39     0.81
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 MEAN    36.66    43.40    -6.74   526.00   881.46    16.08   541.39     0.77
 HUB     32.27    38.84    -6.57   446.28   836.32    16.08   541.39     0.73

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   529.01   212.35   484.51  1181.13     0.45
 MEAN    17.51   542.40   238.32   487.24  1179.74     0.46
 HUB     14.85   590.26   325.60   492.34  1178.35     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   612.73   375.08     0.52  4211.56
 MEAN   519.12   562.37   280.80     0.48  4176.47     1.65
 HUB    440.35   505.53   114.75     0.43  4838.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.76     1.09    19.83   603.17     1.03   579.81     0.92     0.74
 MEAN    22.74     1.09    19.67   603.01     1.03   578.45     0.92     0.74
 HUB     23.05     1.11    19.42   606.16     1.04   577.08     0.92     0.74

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.67    37.74    31.50     6.24     0.93     0.38     2.90
 MEAN    26.06    29.96    23.50     6.46     0.87     0.40     3.28     0.74
 HUB     33.48    13.12     6.50     6.62     0.87     0.45     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.813

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     548.828     239.883     493.627    1180.238       0.465       0.001

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.817      19.671     578.968      46.000      25.918      31.500       5.582

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     511.221     239.883     564.704    1183.625       0.432       0.122

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.774      20.030     582.295     471.992       0.023       0.243

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     495.738       0.000     495.738    1184.947       0.418       0.140

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.120     583.597       0.000       0.060       0.047       0.150

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.689      22.698       1.089     604.112      20.983     294.091       2.280

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 130755.922       0.379    1149.617 2096084.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.044   EfDer =  0.990

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    155.582    3398.000      22.698     604.112       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.742    3148.638       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
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119686.578  122080.047       1.621     513.330     316.716     401.059       1.266

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   463.96    -0.16   463.96     0.39   529.19
MEAN    16.97     0.00    -0.02   463.96    -0.16   463.96     0.39
HUB     14.32     0.00    -0.02   463.96    -0.16   463.96     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.92    46.36     4.56   571.12   735.95    20.43   586.15     0.62
MEAN    47.33    43.80     3.53   503.23   684.59    20.43   586.15     0.58
HUB     42.48    37.84     4.64   424.63   629.05    20.43   586.15     0.53

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   524.23   221.20   475.28  1202.48     0.44
MEAN    16.57   536.38   241.77   478.80  1200.60     0.45
HUB     13.89   580.56   321.89   483.16  1198.69     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    559.85   583.59   338.65     0.49  4179.35
MEAN   491.47   540.00   249.70     0.45  4009.70     1.37
HUB    411.88   491.47    90.00     0.41  4473.28

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.15     1.11    22.07   623.99     1.03   601.06     0.92     0.91
MEAN    25.04     1.10    21.84   623.19     1.03   599.18     0.92     0.91
HUB     25.33     1.12    21.57   625.39     1.04   597.27     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     24.96    35.47    31.50     3.97     0.93     0.26     2.90
MEAN    26.79    27.54    23.50     4.04     0.92     0.26     3.29     0.91
HUB     33.67    10.55     6.50     4.05     0.92     0.28     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.990

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     527.702     243.125     468.358    1202.351       0.439       0.055

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.140      22.021     600.954      46.000      27.434      32.400       4.966

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     490.379     243.125     547.340    1205.519       0.407       0.171

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.102      22.396     604.125     456.573       0.021       0.273

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     465.277       0.000     465.277    1207.514       0.385       0.168

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      22.584     606.127       0.000       0.060       0.045       0.227

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.852      25.022       1.102     624.192      20.080     280.524       2.175

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 125175.438       0.399    1100.553 1386111.125
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.044   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3398.000      25.022     624.192       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.265    3097.580       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.745     509.668     292.040     390.276       1.336

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   432.73    -0.15   432.73     0.36   495.20
 MEAN    15.91     0.00    -0.02   432.73    -0.15   432.73     0.36
 HUB     13.07     0.00    -0.02   432.73    -0.15   432.73     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.47    47.36     4.11   543.25   694.65    22.90   608.57     0.57
 MEAN    47.49    44.80     2.69   471.87   640.36    22.90   608.57     0.53
 HUB     41.86    38.84     3.02   387.57   581.02    22.90   608.57     0.48

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   493.32   212.35   445.27  1223.17     0.40
 MEAN    15.50   501.81   224.00   449.04  1220.89     0.41
 HUB     12.59   537.58   288.76   453.45  1218.60     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   548.12   319.63     0.45  3812.30
 MEAN   459.55   507.07   235.56     0.42  3473.78     1.37
 HUB    373.33   461.27    84.58     0.38  3637.37

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.38     1.09    24.48   642.32     1.03   622.02     0.92     0.90
 MEAN    27.16     1.09    24.18   640.71     1.03   619.70     0.92     0.90
 HUB     27.27     1.09    23.85   641.49     1.03   617.38     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.50    35.67    31.50     4.17     0.93     0.26     2.90
 MEAN    26.51    27.68    23.50     4.18     0.91     0.26     3.34     0.90
 HUB     32.49    10.57     6.50     4.07     0.91     0.27     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.983

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     507.134     228.104     452.938    1221.223       0.415       -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.209      24.162     620.052      46.000      26.730      33.000       6.270

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     480.254     228.104     531.672    1223.402       0.393       0.073

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.134      24.396     622.266     440.827       0.044       0.269

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     447.824       0.000     447.824    1225.867       0.365       0.182
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   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.726     624.776       0.000       0.060       0.050       0.180

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.839      27.117       1.084     641.506      17.314     301.578       2.338

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 107985.703       0.382     949.420 1430686.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    739531.62   6502.0254    151.9881      1.7950      0.8044      7.0442      1.2270


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 90% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.961    3398.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   68.61877

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    147.474    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 116131.867  118454.250       1.936     831.557     429.477     619.754       1.443

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   352.30    -0.12   352.30     0.32   609.32
 MEAN    17.06     0.00    -0.02   352.30    -0.12   352.30     0.32
 HUB     12.51     0.00    -0.02   352.30    -0.12   352.30     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.07    50.47     9.60   611.74   706.04    14.09   512.44     0.64
 MEAN    55.15    47.20     7.95   505.89   616.57    14.09   512.44     0.56
 HUB     46.49    38.62     7.87   370.96   511.68    14.09   512.44     0.46

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   587.46   360.70   463.68  1128.80     0.52
 MEAN    18.04   613.80   391.00   473.15  1124.01     0.55
 HUB     15.00   695.84   493.88   490.19  1116.24     0.62

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   527.27   251.04     0.47  7443.83
 MEAN   534.83   494.53   143.82     0.44  7054.16     1.40
 HUB    444.80   492.64    49.08     0.44  7409.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.63     1.23    15.49   558.27     1.07   529.45     0.92     0.91
 MEAN    18.43     1.22    15.05   556.41     1.06   524.95     0.92     0.91
 HUB     18.61     1.23    14.32   558.11     1.07   517.67     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.88    28.43    24.20     4.23     0.93     0.34     2.90
 MEAN    39.57    16.91    12.70     4.21     0.93     0.29     3.51     0.91
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HUB     45.21    -5.72    -9.30     3.58     0.93     0.15     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     622.556     390.241     485.065    1124.250       0.554      -0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.523      15.036     525.224      24.000      38.817      35.400      -3.417

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     506.874     390.241     639.694    1135.869       0.446       0.321

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.472      16.110     536.137     528.796       0.024       0.458

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083     467.421       0.000     467.421    1139.265       0.410       0.377

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      16.395     539.347       0.000       0.060       0.041       0.400

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4        Pt4          PR4        Texit         Del T        Ns         Ns nondim
       0.877       18.413       1.219     557.596       34.786     206.238       1.599

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 216571.438       0.579    1847.562 1481373.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    150.961     3398.000       18.413     557.596       1.000        1.000       0.980
W Kg/sec =   68.61877

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    124.958     3277.342        1.402       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 116131.867  118454.250        1.623     590.487     363.912     474.134       1.303

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   445.19    -0.15   445.19     0.39   587.72
 MEAN    18.08      0.00    -0.02   445.19    -0.15   445.19     0.39
 HUB     15.21      0.00    -0.02   445.19    -0.15   445.19     0.39

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     53.86     46.36     7.50   609.37   754.79     16.58   541.05     0.66
 MEAN    50.30     42.30     8.00   536.08   696.95     16.58   541.05     0.61
 HUB     45.38     37.84     7.54   451.02   633.84     16.58   541.05     0.56

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     20.42   533.91   287.70   449.77  1162.68      0.46
 MEAN    18.01   545.11   298.65   456.02  1159.19      0.47
 HUB     15.22   590.96   367.09   463.11  1155.71      0.51

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   550.72   317.81     0.47  5878.04
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 MEAN   534.05   513.19   235.41     0.44  5381.38     1.48
 HUB    451.41   470.72    84.32     0.41  5590.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.53     1.17    18.63   585.58     1.05   561.78     0.92     0.91
 MEAN    21.25     1.15    18.26   583.22     1.05   558.41     0.92     0.91
 HUB     21.37     1.16    17.87   584.21     1.05   555.05     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.61    35.25    31.50     3.75     0.93     0.34     2.90
 MEAN    33.22    27.30    23.50     3.80     0.93     0.33     3.30     0.91
 HUB     38.40    10.32     6.50     3.82     0.93     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     804.237     299.484     746.396    1129.647       0.712      -0.971

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.353      15.224     530.328      46.000      21.863      30.600       8.737

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     757.839     299.484     814.869    1136.074       0.667      -0.799

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      21.237      15.753     536.380     361.848       0.047       0.193

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     748.907       0.000     748.907    1137.290       0.659       0.168

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      15.750     537.506       0.000       0.060       0.098      -0.800

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.824      21.079       1.145     584.338      26.742     237.872       1.844

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 166573.438       0.454    1421.031 1341027.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.850

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    150.961    3398.000      21.079     584.338       1.000       1.000       0.710
W Kg/sec =   68.61877

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    111.741    3201.470       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 116131.867  118454.250       1.214     395.194     325.437     307.469       0.945

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   664.41    -0.23   664.41     0.58   560.70
 MEAN    17.74     0.00    -0.02   664.41    -0.23   664.41     0.58
 HUB     15.05     0.00    -0.02   664.41    -0.23   664.41     0.58

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     41.86    46.36    -4.50   595.14   892.13    16.79   547.49     0.78
 MEAN    38.38    43.40    -5.02   526.00   847.56    16.79   547.49     0.74
 HUB     33.90    38.84    -4.94   446.28   800.50    16.79   547.49     0.70
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      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   514.77   233.86   458.58  1185.67     0.43
MEAN    17.51   527.28   254.27   461.92  1183.68     0.45
HUB     14.85   573.42   332.68   467.06  1181.74     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    587.43   579.06   353.57     0.49  4637.42
MEAN   519.12   532.46   264.86     0.45  4455.39     1.68
HUB    440.35   479.31   107.67     0.41  4943.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.32      1.11    20.48   606.41     1.04   584.29     0.92     0.78
MEAN    23.23      1.10    20.27   605.54     1.04   582.33     0.92     0.78
HUB     23.47      1.11    19.98   607.87     1.04   580.42     0.92     0.78

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     27.02    37.63    31.50     6.13     0.93     0.40     2.90
MEAN    28.83    29.83    23.50     6.33     0.88     0.42     3.28     0.78
HUB     35.46    12.98     6.50     6.48     0.88     0.45     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.850

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     533.201     255.935     467.761    1184.212       0.450       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.308      20.278     582.872      46.000      28.685      31.500       2.815

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     482.077     255.935     545.803    1188.605       0.406       0.175

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.281      20.784     587.205     471.992       0.019       0.284

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     467.493       0.000     467.493    1189.775       0.393       0.191

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.871     588.361       0.000       0.060       0.039       0.203

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.737      23.218       1.101     606.605      22.267     272.643       2.114

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 138760.188       0.402    1183.757 1985039.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.961    3398.000      23.218     606.605       1.000       1.000       0.980
W Kg/sec =   68.61877

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.362    3142.162       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 116131.867  118454.250       1.705     513.330     301.049     401.059       1.332

     ROTOR LEADING EDGE CONDITIONS, STAGE            4
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   438.17    -0.15   438.17     0.37   528.10
MEAN    16.97     0.00    -0.02   438.17    -0.15   438.17     0.37
HUB     14.32     0.00    -0.02   438.17    -0.15   438.17     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     52.51    46.36     6.15   571.12   719.96    21.15   590.58     0.60
MEAN    48.96    43.80     5.16   503.23   667.38    21.15   590.58     0.56
HUB     44.11    37.84     6.27   424.63   610.27    21.15   590.58     0.51

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   508.02   242.05   446.66  1208.22     0.42
MEAN    16.57   518.83   256.84   450.80  1205.81     0.43
HUB     13.89   561.08   327.46   455.62  1203.40     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    559.85   548.18   317.81     0.45  4572.74
MEAN   491.47   508.20   234.63     0.42  4259.34     1.42
HUB    411.88   463.37    84.43     0.39  4550.53

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.98     1.12    23.00   628.36     1.04   606.82     0.92     0.91
MEAN    25.78     1.11    22.70   626.87     1.03   604.40     0.92     0.91
HUB     25.97     1.12    22.37   628.25     1.04   601.98     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     28.45    35.43    31.50     3.93     0.93     0.30     2.90
MEAN    29.67    27.50    23.50     4.00     0.92     0.30     3.29     0.91
HUB     35.71    10.50     6.50     4.00     0.92     0.31     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     511.249     258.281     441.210    1207.402       0.423       0.054

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.878      22.873     606.014      46.000      30.344      32.400       2.056

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     459.867     258.281     527.434    1211.543       0.380       0.222

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.854      23.405     610.178     456.573       0.017       0.316

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     436.564       0.000     436.564    1213.272       0.360       0.219

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      23.578     611.921       0.000       0.060       0.038       0.276

   STAGE EXIT CONDITIONS, STAGE             4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.873      25.787       1.111     627.825      21.220     261.536       2.027

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 132295.797       0.422    1128.610 1329453.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.995
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
150.961	3398.000	25.787	627.825	1.000	1.000	0.980

W Kg/sec = 68.61877

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
94.675	3088.604	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
116131.867	118454.250	1.848	509.668	275.761	390.276	1.415

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	406.61	-0.14	406.61	0.33	493.77
MEAN	15.91	0.00	-0.02	406.61	-0.14	406.61	0.33	
HUB	13.07	0.00	-0.02	406.61	-0.14	406.61	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.19	47.36	5.83	543.25	678.68	23.86	614.03	0.56
MEAN	49.26	44.80	4.46	471.87	623.00	23.86	614.03	0.51
HUB	43.64	38.84	4.80	387.57	561.83	23.86	614.03	0.46

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	477.45	233.61	416.39	1229.76	0.39
MEAN	15.50	483.98	239.43	420.61	1227.01	0.39
HUB	12.59	517.32	294.47	425.33	1224.26	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	531.98	512.25	298.36	0.42	4193.60	
MEAN	459.55	474.73	220.13	0.39	3712.77	1.43
HUB	373.33	432.58	78.86	0.35	3709.24	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	28.49	1.10	25.67	647.76	1.03	628.75	0.92	0.91
MEAN	28.17	1.09	25.30	645.48	1.03	625.94	0.92	0.91
HUB	28.16	1.09	24.91	645.46	1.03	623.14	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	29.29	35.62	31.50	4.12	0.93	0.30	2.90	
MEAN	29.65	27.63	23.50	4.13	0.92	0.29	3.34	0.91
HUB	34.70	10.50	6.50	4.00	0.92	0.29	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	489.268	243.817	424.189	1227.323	0.399	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
28.213	25.284	626.265	46.000	29.890	33.000	3.110

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	447.350	243.817	509.479	1230.528	0.364	0.140

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	28.171	25.710	629.540	440.827	0.034	0.314

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	417.810	0.000	417.810	1232.610	0.339	0.240

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	25.999	631.672	0.000	0.060	0.040	0.237

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    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.868      28.153       1.092     646.234      18.409     279.170       2.164

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  114827.617       0.406     979.590 1371439.750

    OVERALL EXIT CONDITIONS; ALL          5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     769028.50   6560.5508    147.4741      1.8636      0.8277      7.9534      1.2361


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 90% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     145.767    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   66.25780

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     142.400    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  112136.125  114378.609       2.005     831.557     414.700     619.754       1.494

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   338.90    -0.12   338.90     0.30   609.32
  MEAN    17.06     0.00    -0.02   338.90    -0.12   338.90     0.30
  HUB     12.51     0.00    -0.02   338.90    -0.12   338.90     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.02    50.47    10.55   611.74   699.45    14.16   513.22     0.63
  MEAN    56.19    47.20     8.99   505.89   609.01    14.16   513.22     0.55
  HUB     47.59    38.62     8.97   370.96   502.55    14.16   513.22     0.45

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   579.00   371.18   444.37  1130.76     0.51
  MEAN    18.04   602.89   396.93   453.79  1125.72     0.54
  HUB     15.00   680.25   491.88   469.89  1117.99     0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   505.31   240.56     0.45  7659.92
  MEAN   534.83   474.28   137.89     0.42  7161.06     1.45
  HUB    444.80   472.24    47.08     0.42  7379.62

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.73     1.24    15.66   559.30     1.07   531.30     0.92     0.91
  MEAN    18.48     1.22    15.20   556.92     1.07   526.56     0.92     0.91
  HUB     18.59     1.23    14.47   557.96     1.07   519.32     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     39.87    28.43    24.20     4.23     0.93     0.37     2.90
  MEAN    41.18    16.90    12.70     4.20     0.93     0.32     3.51     0.91
  HUB     46.31    -5.72    -9.30     3.58     0.93     0.17     4.78
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     610.915     396.160     465.053    1126.030       0.543      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.563      15.191     526.888      24.000      40.426      35.400      -5.026

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     484.775     396.160     626.059    1138.298       0.426       0.351

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.507      16.334     538.432     528.796       0.026       0.483

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     447.921       0.000     447.921    1141.329       0.392       0.398

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.580     541.303       0.000       0.060       0.045       0.422

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      18.441       1.221     558.061      35.251     200.274       1.553

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 219467.391       0.586    1807.848 1425047.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3398.000      18.441     558.061       1.000       1.000       0.980
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.527    3275.976       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 112136.125  114378.609       1.682     590.487     351.010     474.134       1.351

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   426.95    -0.15   426.95     0.37   587.47
 MEAN    18.08     0.00    -0.02   426.95    -0.15   426.95     0.37
 HUB     15.21     0.00    -0.02   426.95    -0.15   426.95     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.99    46.36     8.63   609.37   744.17    16.74   542.84     0.65
 MEAN    51.47    42.30     9.17   536.08   685.43    16.74   542.84     0.60
 HUB     46.58    37.84     8.74   451.02   621.16    16.74   542.84     0.54

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   525.63   301.47   430.58  1165.29     0.45
 MEAN    18.01   535.03   308.69   437.00  1161.50     0.46
 HUB     15.22   578.63   370.76   444.24  1157.71     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   527.11   304.05     0.45  6159.03
 MEAN   534.05   491.69   225.36     0.42  5562.21     1.52
 HUB    451.41   451.51    80.65     0.39  5646.30
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	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.71	1.18	18.87	587.39	1.05	564.32	0.92	0.91
MEAN	21.37	1.16	18.48	584.54	1.05	560.64	0.92	0.91
HUB	21.42	1.16	18.06	584.94	1.05	556.99	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.00	35.23	31.50	3.73	0.93	0.36	2.90	
MEAN	35.24	27.28	23.50	3.78	0.93	0.35	3.30	0.91
HUB	39.85	10.29	6.50	3.79	0.93	0.35	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	767.134	309.560	701.902	1136.181	0.675	-0.878

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.469	15.813	536.483	46.000	23.799	30.600	6.801

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	707.699	309.560	772.441	1143.905	0.619	-0.645

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	21.385	16.514	543.803	361.848	0.038	0.226

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	697.467	0.000	697.467	1145.175	0.609	0.246

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	16.559	545.004	0.000	0.060	0.073	-0.630

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.848	21.278	1.154	585.624	27.563	227.722	1.765

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
171689.312	0.468	1414.280	1286138.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 8.987 EfDer = 0.888

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
145.767	3398.000	21.278	585.624	1.000	1.000	0.710

W Kg/sec = 66.25780

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
107.002	3197.952	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
112136.125	114378.609	1.268	395.194	311.634	307.469	0.987

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	624.44	-0.22	624.44	0.54	560.08
MEAN	17.74	0.00	-0.02	624.44	-0.22	624.44	0.54	
HUB	15.05	0.00	-0.02	624.44	-0.22	624.44	0.54	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	43.63	46.36	-2.73	595.14	862.77	17.43	553.07	0.75
MEAN	40.12	43.40	-3.28	526.00	816.60	17.43	553.07	0.71
HUB	35.57	38.84	-3.27	446.28	767.65	17.43	553.07	0.67

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   502.41   254.93   432.93  1190.03     0.42
MEAN    17.51   513.47   269.90   436.81  1187.52     0.43
HUB     14.85   557.36   339.53   442.01  1185.07     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    587.43   545.88   332.50     0.46  5054.40
MEAN   519.12   502.91   249.23     0.42  4728.76     1.72
HUB    440.35   453.37   100.82     0.38  5045.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.86     1.12    21.11   609.68     1.04   588.61     0.92     0.81
MEAN    23.69     1.11    20.83   608.13     1.04   586.12     0.92     0.81
HUB     23.86     1.12    20.50   609.63     1.04   583.70     0.92     0.81

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.49    37.53    31.50     6.03     0.93     0.42     2.90
MEAN    31.71    29.71    23.50     6.21     0.89     0.43     3.28     0.81
HUB     37.53    12.85     6.50     6.35     0.89     0.47     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.888

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     518.960     271.667     442.172    1188.057       0.437       0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.772      20.848     586.664      46.000      31.566      31.500      -0.066

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     453.789     271.667     528.893    1193.403       0.380       0.228

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.750      21.493     591.956     471.992       0.017       0.327

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     440.232       0.000     440.232    1194.423       0.369       0.241

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.568     592.968       0.000       0.060       0.037       0.253

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.779      23.692       1.113     609.146      23.522     253.658       1.966

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 146587.734       0.425    1207.507 1876097.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3398.000      23.692     609.146       1.000       1.000       0.980
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     98.011    3135.600       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 112136.125  114378.609       1.798     513.330     285.462     401.059       1.405

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   413.15    -0.14   413.15     0.35   527.00
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 MEAN    16.97     0.00    -0.02   413.15    -0.14   413.15     0.35
 HUB     14.32     0.00    -0.02   413.15    -0.14   413.15     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.12    46.36     7.76   571.12   705.00    21.81   594.90     0.59
 MEAN    50.62    43.80     6.82   503.23   651.21    21.81   594.90     0.54
 HUB     45.80    37.84     7.96   424.63   592.56    21.81   594.90     0.50

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   494.56   261.66   419.67  1213.60     0.41
 MEAN    16.57   503.43   271.12   424.19  1210.76     0.42
 HUB     13.89   543.14   332.72   429.31  1207.92     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   514.82   298.19     0.42  4942.94
 MEAN   491.47   478.01   220.35     0.39  4495.93     1.48
 HUB    411.88   436.54    79.17     0.36  4623.47

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.74     1.13    23.85   632.66     1.04   612.25     0.92     0.91
 MEAN    26.46     1.12    23.49   630.53     1.04   609.38     0.92     0.91
 HUB     26.54     1.12    23.10   631.14     1.04   606.52     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.94    35.39    31.50     3.89     0.93     0.33     2.90
 MEAN    32.58    27.45    23.50     3.95     0.93     0.33     3.29     0.91
 HUB     37.78    10.45     6.50     3.95     0.93     0.33     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     496.876     272.645     415.392    1212.198       0.410       0.051

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.548      23.645     610.841      46.000      33.279      32.400      -0.879

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     431.342     272.645     510.285    1217.225       0.354       0.272

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.529      24.321     615.917     456.573       0.016       0.360

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     409.826       0.000     409.826    1218.716       0.336       0.266

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.470     617.428       0.000       0.060       0.037       0.320

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      26.465       1.117     631.443      22.297     244.694       1.897

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 139015.375       0.444    1145.130 1269856.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3398.000      26.465     631.443       1.000       1.000       0.980
W Kg/sec =   66.25780
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
89.334	3079.743	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
112136.125	114378.609	1.959	509.668	260.203	390.276	1.500

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	382.17	-0.13	382.17	0.31	492.35
MEAN	15.91	0.00	-0.02	382.17	-0.13	382.17	0.31	
HUB	13.07	0.00	-0.02	382.17	-0.13	382.17	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.88	47.36	7.52	543.25	664.31	24.72	619.26	0.54
MEAN	51.00	44.80	6.20	471.87	607.32	24.72	619.26	0.50
HUB	45.41	38.84	6.57	387.57	544.39	24.72	619.26	0.45

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	464.89	252.94	390.06	1235.85	0.38
MEAN	15.50	468.95	253.53	394.51	1232.72	0.38
HUB	12.59	499.31	299.66	399.40	1229.60	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	531.98	479.59	279.04	0.39	4540.17	
MEAN	459.55	445.07	206.02	0.36	3931.21	1.50
HUB	373.33	406.14	73.68	0.33	3774.40	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	29.47	1.11	26.72	653.03	1.03	635.00	0.92	0.91
MEAN	29.05	1.10	26.29	650.13	1.03	631.79	0.92	0.91
HUB	28.95	1.09	25.84	649.39	1.03	628.59	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.96	35.58	31.50	4.08	0.93	0.34	2.90	
MEAN	32.73	27.57	23.50	4.07	0.93	0.33	3.34	0.91
HUB	36.88	10.45	6.50	3.95	0.93	0.32	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	474.273	258.180	397.842	1233.005	0.385	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
29.098	26.272	632.086	46.000	32.982	33.000	0.018

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	417.900	258.180	491.220	1237.090	0.338	0.201

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	29.069	26.859	636.281	440.827	0.030	0.360

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	390.812	0.000	390.812	1238.865	0.315	0.292

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	27.113	638.108	0.000	0.060	0.037	0.289

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.880	29.050	1.098	650.849	19.406	260.134	2.017

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 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  121057.383       0.428     997.202 1309635.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     797817.19   6571.9678    142.3999      1.9230      0.8420      8.9875      1.2449


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 90% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.991

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     140.741    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   63.97328

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     137.490    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  108269.750  110434.914       2.077     831.557     400.401     619.754       1.548

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   326.09    -0.11   326.09     0.29   609.32
  MEAN    17.06     0.00    -0.02   326.09    -0.11   326.09     0.29
  HUB     12.51     0.00    -0.02   326.09    -0.11   326.09     0.29

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.94    50.47    11.47   611.74   693.33    14.23   513.93     0.62
  MEAN    57.20    47.20    10.00   505.89   601.97    14.23   513.93     0.54
  HUB     48.69    38.62    10.07   370.96   493.99    14.23   513.93     0.44

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   571.73   380.93   426.35  1132.52     0.50
  MEAN    18.04   593.09   402.46   435.64  1127.27     0.53
  HUB     15.00   665.84   489.96   450.87  1119.56     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   484.82   230.81     0.43  7860.93
  MEAN   534.83   455.30   132.36     0.40  7260.77     1.49
  HUB    444.80   453.12    45.16     0.40  7350.83

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.82     1.25    15.81   560.26     1.07   532.95     0.92     0.91
  MEAN    18.51     1.23    15.33   557.40     1.07   528.02     0.92     0.91
  HUB     18.56     1.23    14.60   557.83     1.07   520.80     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     41.78    28.43    24.20     4.23     0.93     0.40     2.90
  MEAN    42.73    16.90    12.70     4.20     0.94     0.34     3.51     0.91
  HUB     47.38    -5.72    -9.30     3.58     0.94     0.20     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.991
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     600.463     401.682     446.326    1127.620       0.533       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.595      15.326     528.378      24.000      41.986      35.400      -6.586

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     464.316     401.682     613.953    1140.467       0.407       0.379

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.530      16.529     540.486     528.796       0.029       0.507

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     429.806       0.000     429.806    1143.183       0.376       0.417

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.738     543.063       0.000       0.060       0.051       0.441

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      18.456       1.222     558.493      35.683     194.667       1.509

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 222155.500       0.594    1766.895 1371179.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.741    3398.000      18.456     558.493       1.000       1.000       0.980
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    116.321    3274.709       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 108269.750  110434.914       1.743     590.487     338.761     474.134       1.400

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   409.95    -0.14   409.95     0.36   587.24
 MEAN    18.08     0.00    -0.02   409.95    -0.14   409.95     0.36
 HUB     15.21     0.00    -0.02   409.95    -0.14   409.95     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.08    46.36     9.72   609.37   734.55    16.89   544.46     0.64
 MEAN    52.60    42.30    10.30   536.08   674.97    16.89   544.46     0.59
 HUB     47.74    37.84     9.90   451.02   609.60    16.89   544.46     0.53

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   518.83   314.01   413.02  1167.60     0.44
 MEAN    18.01   526.33   317.88   419.50  1163.55     0.45
 HUB     15.22   567.53   374.08   426.79  1159.51     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   505.53   291.51     0.43  6415.00
 MEAN   534.05   471.92   216.18     0.41  5727.49     1.56
 HUB    451.41   433.74    77.33     0.37  5696.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.85     1.18    19.07   589.04     1.05   566.56     0.92     0.91
 MEAN    21.46     1.16    18.65   585.76     1.05   562.63     0.92     0.91
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 HUB     21.45     1.16    18.20   585.62     1.05   558.72     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.24    35.21    31.50     3.71     0.93     0.39     2.90
 MEAN    37.15    27.26    23.50     3.76     0.94     0.37     3.30     0.91
 HUB     41.23    10.27     6.50     3.77     0.94     0.37     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     736.735     318.768     664.203    1141.459       0.645      -0.803

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.556      16.285     541.481      46.000      25.638      30.600       4.962

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     666.434     318.768     738.747    1150.108       0.579      -0.518

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      21.494      17.116     549.718     361.848       0.031       0.254

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     656.010       0.000     656.010    1151.314       0.570       0.305

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      17.182     550.870       0.000       0.060       0.057      -0.496

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.860      21.419       1.161     586.805      28.312     218.703       1.695

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 176352.969       0.481    1402.608 1234287.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.920

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.741    3398.000      21.419     586.805       1.000       1.000       0.710
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.737    3194.734       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 108269.750  110434.914       1.321     395.194     299.212     307.469       1.028

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   590.90    -0.20   590.90     0.51   559.52
 MEAN    17.74     0.00    -0.02   590.90    -0.20   590.90     0.51
 HUB     15.05     0.00    -0.02   590.90    -0.20   590.90     0.51

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.21    46.36    -1.15   595.14   838.81    17.93   557.66     0.72
 MEAN    41.69    43.40    -1.71   526.00   791.24    17.93   557.66     0.68
 HUB     37.07    38.84    -1.77   446.28   740.62    17.93   557.66     0.64

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   493.20   273.04   410.72  1193.71     0.41
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 MEAN    17.51   502.53   283.36   415.02  1190.78     0.42
 HUB     14.85   544.00   345.38   420.30  1187.92     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   517.24   314.39     0.43  5412.97
 MEAN   519.12   477.31   235.76     0.40  4964.33     1.77
 HUB    440.35   430.89    94.97     0.36  5131.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.31     1.13    21.61   612.56     1.04   592.26     0.92     0.84
 MEAN    24.06     1.12    21.28   610.43     1.04   589.35     0.92     0.84
 HUB     24.15     1.13    20.92   611.23     1.04   586.52     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.61    37.43    31.50     5.93     0.93     0.44     2.90
 MEAN    34.32    29.60    23.50     6.10     0.89     0.45     3.28     0.84
 HUB     39.41    12.73     6.50     6.23     0.89     0.48     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.920

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     507.694     285.223     420.002    1191.316       0.426       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.146      21.309     589.890      46.000      34.180      31.500      -2.680

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     429.641     285.223     515.697    1197.467       0.359       0.274

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.123      22.068     595.997     471.992       0.018       0.367

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     417.076       0.000     417.076    1198.359       0.348       0.281

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.126     596.886       0.000       0.060       0.039       0.294

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.809      24.062       1.123     611.406      24.602     238.581       1.849

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 153319.641       0.444    1219.415 1780831.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.741    3398.000      24.062     611.406       1.000       1.000       0.980
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.351    3129.800       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 108269.750  110434.914       1.888     513.330     271.891     401.059       1.475

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   391.80    -0.13   391.80     0.33   526.03
 MEAN    16.97     0.00    -0.02   391.80    -0.13   391.80     0.33
 HUB     14.32     0.00    -0.02   391.80    -0.13   391.80     0.33
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.56    46.36     9.20   571.12   692.70    22.35   598.60     0.58
MEAN    52.10    43.80     8.30   503.23   637.88    22.35   598.60     0.53
HUB     47.31    37.84     9.47   424.63   577.87    22.35   598.60     0.48

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   484.79   277.95   397.19  1218.07     0.40
MEAN    16.57   491.53   283.01   401.88  1214.90     0.40
HUB     13.89   528.57   337.10   407.12  1211.74     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    559.85   487.06   281.90     0.40  5250.36
MEAN   491.47   452.73   208.46     0.37  4692.79     1.54
HUB    411.88   413.94    74.78     0.34  4684.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     27.34     1.14    24.51   636.38     1.04   616.77     0.92     0.91
MEAN    26.98     1.12    24.10   633.73     1.04   613.57     0.92     0.91
HUB     26.97     1.12    23.67   633.69     1.04   610.37     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.98    35.36    31.50     3.86     0.93     0.37     2.90
MEAN    35.15    27.42    23.50     3.92     0.93     0.36     3.29     0.91
HUB     39.62    10.41     6.50     3.91     0.93     0.36     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     485.806     284.597     393.715    1216.218       0.399       0.049

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    27.068      24.247     614.904      46.000      35.861      32.400      -3.461

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     407.704     284.597     497.210    1221.964       0.334       0.315

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.046      25.038     620.727     456.573       0.017       0.399

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     387.739       0.000     387.739    1223.267       0.317       0.303

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      25.160     622.052       0.000       0.060       0.041       0.355

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.878      26.976       1.121     634.597      23.191     231.351       1.793

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 144601.250       0.461    1150.074 1215145.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.741    3398.000      26.976     634.597       1.000       1.000       0.980
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     84.831    3072.079       1.401       0.249      53.349      56.000       0.050
```

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
108269.750	110434.914	2.063	509.668	247.090	390.276	1.579

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	361.89	-0.12	361.89	0.30	491.13
MEAN	15.91	0.00	-0.02	361.89	-0.12	361.89	0.30	
HUB	13.07	0.00	-0.02	361.89	-0.12	361.89	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.34	47.36	8.98	543.25	652.85	25.39	623.67	0.53
MEAN	52.52	44.80	7.72	471.87	594.77	25.39	623.67	0.49
HUB	46.97	38.84	8.13	387.57	530.35	25.39	623.67	0.43

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	456.13	268.56	368.69	1240.84	0.37
MEAN	15.50	457.71	264.98	373.20	1237.44	0.37
HUB	12.59	485.09	303.87	378.12	1234.05	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	531.98	453.12	263.41	0.37	4820.30	
MEAN	459.55	420.88	194.57	0.34	4108.56	1.56
HUB	373.33	384.45	69.47	0.31	3827.29	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.22	1.12	27.52	657.51	1.04	640.16	0.92	0.91
MEAN	29.72	1.10	27.04	654.13	1.03	636.65	0.92	0.91
HUB	29.53	1.09	26.54	652.79	1.03	633.16	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.07	35.54	31.50	4.04	0.93	0.38	2.90	
MEAN	35.38	27.54	23.50	4.04	0.93	0.36	3.34	0.91
HUB	38.79	10.41	6.50	3.91	0.93	0.34	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	463.089	269.840	376.348	1237.702	0.374	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
29.765	27.021	636.923	46.000	35.640	33.000	-2.640

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	394.279	269.840	477.775	1242.474	0.317	0.249

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	29.733	27.727	641.843	440.827	0.031	0.400

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	369.097	0.000	369.097	1244.025	0.297	0.333

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	27.950	643.447	0.000	0.060	0.039	0.329

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.881	29.712	1.101	654.810	20.213	245.506	1.903

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
126102.625	0.446	1002.946	1253145.750

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   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    822532.00   6541.9375    137.4901      1.9667      0.8477     10.0004      1.2525


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

   Fan-Core + 4 Stage LPC 90% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc =10.990   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.889    3398.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   61.76752

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    132.749    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104536.672  106627.180       2.151     831.557     386.595     619.754       1.603

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   313.85    -0.11   313.85     0.28   609.32
 MEAN    17.06     0.00    -0.02   313.85    -0.11   313.85     0.28
 HUB     12.51     0.00    -0.02   313.85    -0.11   313.85     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.84    50.47    12.37   611.74   687.65    14.29   514.58     0.62
 MEAN    58.19    47.20    10.99   505.89   595.43    14.29   514.58     0.54
 HUB     49.78    38.62    11.16   370.96   486.00    14.29   514.58     0.44

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

        R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   565.48   390.01   409.47  1134.09     0.50
 MEAN    18.04   584.25   407.60   418.57  1128.66     0.52
 HUB     15.00   652.49   488.12   432.99  1120.98     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   465.65   221.74     0.41  8048.08
 MEAN   534.83   437.48   127.22     0.39  7353.39     1.54
 HUB    444.80   435.15    43.33     0.39  7323.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.89     1.25    15.94   561.15     1.07   534.44     0.92     0.90
 MEAN    18.54     1.23    15.44   557.84     1.07   529.33     0.92     0.90
 HUB     18.52     1.23    14.72   557.69     1.07   522.14     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.61    28.44    24.20     4.24     0.93     0.42     2.90
 MEAN    44.24    16.91    12.70     4.21     0.94     0.37     3.51     0.90
 HUB     48.43    -5.71    -9.30     3.59     0.94     0.22     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     591.035     406.812     428.750    1129.048       0.523       0.001
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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.619      15.443     529.716      24.000      43.496      35.400      -8.096

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     445.280     406.812     603.133    1142.414       0.390       0.405

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.545      16.698     542.333     528.796       0.033       0.531

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     412.897       0.000     412.897    1144.856       0.361       0.435

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.872     544.654       0.000       0.060       0.058       0.458

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      18.461       1.222     558.893      36.083     189.388       1.468

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 224648.266       0.600    1725.116 1319719.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.990   EfDer =  0.984

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.889    3398.000      18.461     558.893       1.000       1.000       0.980
W Kg/sec =   61.76752

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.320    3273.536       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104536.672  106627.180       1.805     590.487     327.109     474.134       1.449

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   394.05    -0.14   394.05     0.34   587.03
 MEAN    18.08     0.00    -0.02   394.05    -0.14   394.05     0.34
 HUB     15.21     0.00    -0.02   394.05    -0.14   394.05     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.12    46.36    10.76   609.37   725.79    17.01   545.93     0.63
 MEAN    53.69    42.30    11.39   536.08   665.43    17.01   545.93     0.58
 HUB     48.87    37.84    11.03   451.02   599.02    17.01   545.93     0.52

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   513.25   325.52   396.82  1169.66     0.44
 MEAN    18.01   518.76   326.32   403.27  1165.39     0.45
 HUB     15.22   557.46   377.11   410.55  1161.12     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   485.66   280.00     0.42  6649.94
 MEAN   534.05   453.63   207.73     0.39  5879.49     1.61
 HUB    451.41   417.22    74.30     0.36  5742.85

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.96     1.19    19.24   590.55     1.06   568.56     0.92     0.90
 MEAN    21.53     1.17    18.79   586.89     1.05   564.42     0.92     0.90
 HUB     21.46     1.16    18.32   586.24     1.05   560.29     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     39.36    35.21    31.50     3.71     0.93     0.41     2.90
 MEAN    38.98    27.25    23.50     3.75     0.94     0.39     3.30     0.90
 HUB     42.57    10.26     6.50     3.76     0.94     0.38     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     711.077     327.238     631.305    1145.864       0.621       -0.739

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.621      16.671     545.671      46.000      27.400      30.600       3.200

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     631.129     327.238     710.921    1155.234       0.546       -0.410

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      21.573      17.607     554.631     361.848       0.027       0.281

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     620.959       0.000     620.959    1156.342       0.537       0.352

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      17.679     555.695       0.000       0.060       0.046       -0.385

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.865       21.518       1.166     587.892      28.999     210.597       1.633

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 180633.234       0.493    1387.116 1185255.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.990   EfDer =  0.946

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    135.889     3398.000       21.518     587.892       1.000        1.000        0.710
W Kg/sec =   61.76752

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
      98.832    3191.778        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 104536.672  106627.180        1.373     395.194     287.840     307.469        1.068

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   561.80    -0.19   561.80      0.48    559.00
 MEAN    17.74      0.00    -0.02   561.80    -0.19   561.80      0.48
 HUB     15.05      0.00    -0.02   561.80    -0.19   561.80      0.48

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     46.66     46.36      0.30   595.14   818.56     18.34   561.55      0.70
 MEAN    43.13     43.40     -0.27   526.00   769.74     18.34   561.55      0.66
 HUB     38.47     38.84     -0.37   446.28   717.60     18.34   561.55      0.62

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   486.31    288.93    391.16   1196.87      0.41
 MEAN    17.51   493.71    295.17    395.77   1193.60      0.41
 HUB     14.85   532.69    350.50    401.13   1190.41      0.45
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   492.05   298.49     0.41  5727.68
 MEAN   519.12   454.74   223.96     0.38  5170.79     1.81
 HUB    440.35   411.06    89.84     0.35  5207.90

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.68     1.15    22.03   615.15     1.05   595.41     0.92     0.87
 MEAN    24.36     1.13    21.65   612.50     1.04   592.15     0.92     0.87
 HUB     24.38     1.13    21.25   612.67     1.04   588.99     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.45    37.35    31.50     5.85     0.93     0.46     2.90
 MEAN    36.72    29.50    23.50     6.00     0.90     0.47     3.28     0.87
 HUB     41.15    12.62     6.50     6.12     0.90     0.49     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.946

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     498.628     297.104     400.448    1194.131       0.418       0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.448      21.681     592.686      46.000      36.573      31.500      -5.073

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     408.579     297.104     505.181    1200.981       0.340       0.316

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.419      22.537     599.505     471.992       0.020       0.404

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     396.952       0.000     396.952    1201.764       0.330       0.315

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.574     600.287       0.000       0.060       0.045       0.329

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.829      24.348       1.132     613.440      25.548     226.133       1.753

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 159221.984       0.461    1222.695 1695422.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.990   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.889    3398.000      24.348     613.440       1.000       1.000       0.980
W Kg/sec =   61.76752

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.222    3124.606       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104536.672  106627.180       1.975     513.330     259.866     401.059       1.543

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   373.18    -0.13   373.18     0.31   525.15
 MEAN    16.97     0.00    -0.02   373.18    -0.13   373.18     0.31
 HUB     14.32     0.00    -0.02   373.18    -0.13   373.18     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.84    46.36    10.48   571.12   682.34    22.78   601.82     0.57
 MEAN    53.45    43.80     9.65   503.23   626.61    22.78   601.82     0.52
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HUB     48.70    37.84    10.86   424.63   565.41    22.78   601.82     0.47

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   477.49   291.83   377.93  1221.87     0.39
MEAN    16.57   482.06   293.18   382.66  1218.46     0.40
HUB     13.89   516.38   340.82   387.93  1215.04     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    559.85   463.32   268.02     0.38  5512.25
MEAN   491.47   430.98   198.28     0.35  4861.39     1.59
HUB    411.88   394.39    71.06     0.32  4735.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     27.81     1.14    25.03   639.66     1.04   620.63     0.92     0.91
MEAN    27.38     1.12    24.58   636.56     1.04   617.17     0.92     0.91
HUB     27.30     1.12    24.11   635.96     1.04   613.71     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.67    35.34    31.50     3.84     0.93     0.39     2.90
MEAN    37.46    27.39    23.50     3.89     0.94     0.38     3.29     0.91
HUB     41.30    10.38     6.50     3.88     0.94     0.38     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.993

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481      477.047     294.833     375.029    1219.670       0.391        0.047

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.470      24.718      618.405      46.000      38.173      32.400      -5.773

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     16.481      387.517     294.833     486.925    1226.022       0.316        0.352

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950       27.441      25.603     624.864     456.573       0.020        0.435

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096     368.913       0.000     368.913    1227.174       0.301        0.334

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950       25.695     626.038       0.000       0.060       0.048        0.383

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.870       27.360       1.124     637.395       23.954     220.364        1.708

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 149366.625       0.477    1147.014 1164396.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.990   EfDer =  0.995

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    135.889     3398.000       27.360     637.395       1.000        1.000        0.980
W Kg/sec =   61.76752

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     80.935     3065.331        1.401       0.249       53.349      56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 104536.672  106627.180        2.162     509.668     235.743     390.276        1.656
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ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	344.57	-0.12	344.57	0.28	490.05
MEAN	15.91	0.00	-0.02	344.57	-0.12	344.57	0.28	
HUB	13.07	0.00	-0.02	344.57	-0.12	344.57	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.62	47.36	10.26	543.25	643.40	25.90	627.49	0.52
MEAN	53.87	44.80	9.07	471.87	584.38	25.90	627.49	0.48
HUB	48.37	38.84	9.53	387.57	518.68	25.90	627.49	0.42

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	449.79	281.64	350.70	1245.08	0.36
MEAN	15.50	448.96	274.60	355.19	1241.47	0.36
HUB	12.59	473.42	307.37	360.07	1237.87	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	531.98	430.88	250.33	0.35	5054.85	
MEAN	459.55	400.46	184.95	0.32	4257.53	1.61
HUB	373.33	366.06	65.96	0.30	3871.33	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.78	1.13	28.13	661.42	1.04	644.55	0.92	0.91
MEAN	30.22	1.10	27.61	657.63	1.03	640.82	0.92	0.91
HUB	29.96	1.09	27.08	655.80	1.03	637.10	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.77	35.52	31.50	4.02	0.93	0.41	2.90	
MEAN	37.71	27.51	23.50	4.01	0.93	0.38	3.34	0.91
HUB	40.49	10.38	6.50	3.88	0.93	0.37	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	454.417	279.635	358.188	1241.703	0.366	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
30.266	27.590	641.060	46.000	37.979	33.000	-4.979

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	374.549	279.635	467.421	1247.040	0.300	0.289

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	30.225	28.390	646.582	440.827	0.035	0.436

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	350.930	0.000	350.930	1248.418	0.281	0.366

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	28.584	648.012	0.000	0.060	0.045	0.361

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.875	30.198	1.104	658.283	20.889	233.705	1.812

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
130329.680	0.461	1000.826	1200850.125

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
844199.81	6482.7661	132.7495	1.9990	0.8478	10.9901	1.2591

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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Fan-Core + 4 Stage LPC 90% Stat 2 27% Ice Block 8-22-2011

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1

RESET = 0.000BLEED = 0.000 DPInc =11.957 EfDer = 0.981

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
131.203	3398.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 59.63782

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
128.172	3384.617	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
100932.312	102950.742	2.228	831.557	373.266	619.754	1.660

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	302.15	-0.10	302.15	0.27	609.32
MEAN	17.06	0.00	-0.02	302.15	-0.10	302.15	0.27	
HUB	12.51	0.00	-0.02	302.15	-0.10	302.15	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	63.72	50.47	13.25	611.74	682.39	14.35	515.18	0.61
MEAN	59.16	47.20	11.96	505.89	589.34	14.35	515.18	0.53
HUB	50.84	38.62	12.22	370.96	478.52	14.35	515.18	0.43

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	560.11	398.49	393.60	1135.50	0.49
MEAN	18.04	576.25	412.41	402.47	1129.92	0.51
HUB	15.00	640.08	486.36	416.12	1122.27	0.57

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	611.74	447.66	213.25	0.39	8223.08	
MEAN	534.83	420.68	122.42	0.37	7439.98	1.59
HUB	444.80	418.19	41.56	0.37	7296.66	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.95	1.25	16.05	561.98	1.07	535.78	0.92	0.90
MEAN	18.56	1.23	15.54	558.25	1.07	530.52	0.92	0.90
HUB	18.49	1.22	14.83	557.57	1.07	523.35	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.35	28.45	24.20	4.25	0.93	0.44	2.90	
MEAN	45.70	16.92	12.70	4.22	0.94	0.39	3.51	0.90
HUB	49.45	-5.70	-9.30	3.60	0.94	0.24	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.981

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	582.510	411.607	412.186	1130.335	0.515	0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.637	15.545	530.925	24.000	44.960	35.400	-9.560

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	427.461	411.607	593.417	1144.173	0.374	0.430

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.552	16.846	544.005	528.796	0.036	0.554

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	397.020	0.000	397.020	1146.376	0.346	0.451

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.986	546.101	0.000	0.060	0.066	0.474

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.848	18.458	1.222	559.266	36.456	184.395	1.429

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
226971.953	0.607	1682.864	1270515.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =11.957 EfDer = 0.977

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
131.203	3398.000	18.458	559.266	1.000	1.000	0.980

W Kg/sec = 59.63782

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
108.500	3272.444	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
100932.312	102950.742	1.869	590.487	315.984	474.134	1.501

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	379.09	-0.13	379.09	0.33	586.84
MEAN	18.08	0.00	-0.02	379.09	-0.13	379.09	0.33	
HUB	15.21	0.00	-0.02	379.09	-0.13	379.09	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.12	46.36	11.76	609.37	717.78	17.11	547.27	0.63
MEAN	54.74	42.30	12.44	536.08	656.68	17.11	547.27	0.57
HUB	49.96	37.84	12.12	451.02	589.28	17.11	547.27	0.51

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	508.67	336.17	381.75	1171.50	0.43
MEAN	18.01	512.14	334.15	388.12	1167.05	0.44
HUB	15.22	548.26	379.90	395.31	1162.59	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	467.20	269.35	0.40	6867.29	
MEAN	534.05	436.57	199.90	0.37	6020.35	1.65
HUB	451.41	401.73	71.51	0.35	5785.17	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.05	1.19	19.37	591.96	1.06	570.36	0.92	0.89
MEAN	21.58	1.17	18.90	587.93	1.05	566.03	0.92	0.89
HUB	21.45	1.16	18.42	586.81	1.05	561.71	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.37	35.21	31.50	3.71	0.93	0.43	2.90	
MEAN	40.73	27.25	23.50	3.75	0.94	0.41	3.30	0.89
HUB	43.86	10.25	6.50	3.75	0.94	0.40	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      688.945     335.086     601.966     1149.632       0.599       -0.684

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     21.667      16.992      549.268      46.000      29.103       30.600       1.497

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     17.960      600.099     335.086     687.315     1159.596       0.518       -0.316

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.680       21.628      18.014      558.831     361.848       0.024       0.306

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4        cp 3-4
     17.823      590.363       0.000     590.363     1160.600       0.509       0.391

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.680       18.087      559.799       0.000       0.060       0.039       -0.290

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4           PR4        Texit        Del T        Ns         Ns nondim
      0.866       21.585        1.169      588.901      29.635      203.229       1.575

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 184592.844       0.503    1368.647 1138761.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.957   EfDer =  0.965

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    131.203     3398.000       21.585      588.901       1.000        1.000       0.710
W Kg/sec =   59.63782

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     95.209     3189.043        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 100932.312  102950.742        1.425      395.194      277.290      307.469       1.109

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00     -0.02    535.92     -0.18    535.92      0.46    558.52
 MEAN    17.74      0.00     -0.02    535.92     -0.18    535.92      0.46
 HUB     15.05      0.00     -0.02    535.92     -0.18    535.92      0.46

       BetaFlo    BetaBlade Incid    U1        W1        Ps1       Ts1      Rel Mach
 TIP     48.01     46.36      1.65    595.14    801.01     18.67    564.93      0.69
 MEAN    44.47     43.40      1.07    526.00    751.05     18.67    564.93      0.64
 HUB     39.80     38.84      0.96    446.28    697.52     18.67    564.93      0.60

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500        0.050        0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP      19.81    481.16    303.11    373.69   1199.64      0.40
 MEAN     17.51    486.56    305.74    378.51   1196.08      0.41
 HUB      14.85    522.94    355.06    383.93   1192.61      0.44

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP     587.43    469.56    284.32      0.39   6008.24
 MEAN    519.12    434.51    213.39      0.36   5355.64      1.85
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 HUB    440.35   393.29    85.29     0.33  5275.37

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.99     1.16    22.37   617.49     1.05   598.17     0.92     0.88
 MEAN    24.60     1.14    21.95   614.39     1.04   594.63     0.92     0.88
 HUB     24.56     1.14    21.52   614.00     1.04   591.18     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.05    37.27    31.50     5.77     0.93     0.48     2.90
 MEAN    38.93    29.41    23.50     5.91     0.91     0.48     3.28     0.88
 HUB     42.76    12.53     6.50     6.03     0.91     0.50     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.965

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     491.272     307.741     382.941    1196.604       0.411       0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.689      21.981     595.148      46.000      38.786      31.500      -7.286

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     389.873     307.741     496.695    1204.078       0.324       0.353

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.651      22.922     602.606     471.992       0.024       0.439

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     379.122       0.000     379.122    1204.768       0.315       0.344

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.935     603.296       0.000       0.060       0.054       0.357

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.843      24.567       1.138     615.294      26.393     215.537       1.671

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 164489.891       0.477    1219.596 1617530.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.957   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.203    3398.000      24.567     615.294       1.000       1.000       0.980
W Kg/sec =   59.63782

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     85.507    3119.896       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100932.312  102950.742       2.061     513.330     249.047     401.059       1.610

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   356.65    -0.12   356.65     0.30   524.36
 MEAN    16.97     0.00    -0.02   356.65    -0.12   356.65     0.30
 HUB     14.32     0.00    -0.02   356.65    -0.12   356.65     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.02    46.36    11.66   571.12   673.44    23.12   604.68     0.56
 MEAN    54.68    43.80    10.88   503.23   616.90    23.12   604.68     0.51
 HUB     49.98    37.84    12.14   424.63   554.63    23.12   604.68     0.46

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   471.92   303.91   361.04  1225.18     0.39
MEAN    16.57   474.34   302.06   365.73  1221.57     0.39
HUB     13.89   505.93   344.01   370.97  1217.95     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    559.85   442.56   255.95     0.36  5740.11
MEAN   491.47   411.87   189.41     0.34  5008.33     1.64
HUB    411.88   377.13    67.87     0.31  4780.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     28.18     1.15    25.43   642.59     1.04   624.01     0.92     0.90
MEAN    27.70     1.13    24.96   639.11     1.04   620.34     0.92     0.90
HUB     27.55     1.12    24.46   638.03     1.04   616.67     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.09    35.33    31.50     3.83     0.93     0.42     2.90
MEAN    39.55    27.38    23.50     3.88     0.94     0.41     3.29     0.90
HUB     42.84    10.37     6.50     3.87     0.94     0.40     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.987

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     469.931     303.755     358.563    1222.696       0.384       0.044

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    27.780      25.086     621.485      46.000      40.269      32.400      -7.869

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     369.853     303.755     478.601    1229.574       0.301       0.385

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.741      26.052     628.498     456.573       0.023       0.468

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     352.454       0.000     352.454    1230.600       0.286       0.360

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      26.114     629.546       0.000       0.060       0.057       0.407

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.860      27.646       1.125     639.912      24.617     211.051       1.636

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 153509.453       0.490    1138.182 1116918.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =11.957   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.203    3398.000      27.646     639.912       1.000       1.000       0.980
W Kg/sec =   59.63782

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.489    3059.296       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100932.312  102950.742       2.258     509.668     225.707     390.276       1.729

    ROTOR LEADING EDGE CONDITIONS, STAGE            5
```

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	329.38	-0.11	329.38	0.27	489.08
MEAN	15.91	0.00	-0.02	329.38	-0.11	329.38	0.27	
HUB	13.07	0.00	-0.02	329.38	-0.11	329.38	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.78	47.36	11.42	543.25	635.40	26.30	630.86	0.52
MEAN	55.09	44.80	10.29	471.87	575.55	26.30	630.86	0.47
HUB	49.65	38.84	10.81	387.57	508.71	26.30	630.86	0.41

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	445.07	292.90	335.12	1248.76	0.36
MEAN	15.50	441.91	282.86	339.53	1244.99	0.35
HUB	12.59	463.55	310.35	344.32	1241.22	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	531.98	411.66	239.08	0.33	5256.66	
MEAN	459.55	382.75	176.69	0.31	4385.46	1.67
HUB	373.33	350.03	62.98	0.28	3908.85	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	31.21	1.13	28.59	664.90	1.04	648.38	0.92	0.91
MEAN	30.60	1.11	28.05	660.76	1.03	644.47	0.92	0.91
HUB	30.27	1.09	27.49	658.49	1.03	640.57	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.15	35.51	31.50	4.01	0.93	0.43	2.90	
MEAN	39.80	27.49	23.50	3.99	0.94	0.41	3.34	0.91
HUB	42.03	10.37	6.50	3.87	0.94	0.39	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.990

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	447.451	288.047	342.406	1245.193	0.359	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
30.642	28.024	644.683	46.000	40.072	33.000	-7.072

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	357.542	288.047	459.137	1251.009	0.286	0.323

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	30.586	28.898	650.719	440.827	0.041	0.468

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	335.251	0.000	335.251	1252.246	0.268	0.393

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	29.068	652.007	0.000	0.060	0.053	0.387

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.866	30.554	1.105	661.381	21.469	223.837	1.735

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
133960.266	0.473	993.237	1151959.875

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
863524.38	6402.5254	128.1724	2.0225	0.8443	11.9567	1.2651

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 90% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.033   EfDer =  0.973

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     126.046    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   57.29363

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     123.134    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       2.319     831.557     358.594     619.754       1.728

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   289.39    -0.10   289.39     0.26   609.32
  MEAN    17.06     0.00    -0.02   289.39    -0.10   289.39     0.26
  HUB     12.51     0.00    -0.02   289.39    -0.10   289.39     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.69    50.47    14.22   611.74   676.83    14.41   515.82     0.61
  MEAN    60.23    47.20    13.03   505.89   582.90    14.41   515.82     0.52
  HUB     52.05    38.62    13.43   370.96   470.57    14.41   515.82     0.42

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   554.86   407.53   376.55  1136.96     0.49
  MEAN    18.04   568.02   417.53   385.12  1131.22     0.50
  HUB     15.00   626.90   484.40   397.95  1123.61     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   428.36   204.21     0.38  8409.49
  MEAN   534.83   402.59   117.30     0.36  7532.21     1.65
  HUB    444.80   399.91    39.60     0.36  7267.19

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.02     1.26    16.16   562.87     1.08   537.15     0.92     0.89
  MEAN    18.58     1.23    15.64   558.69     1.07   531.74     0.92     0.89
  HUB     18.45     1.22    14.93   557.43     1.07   524.60     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     47.26    28.47    24.20     4.27     0.93     0.47     2.90
  MEAN    47.31    16.94    12.70     4.24     0.94     0.41     3.51     0.89
  HUB     50.60    -5.68    -9.30     3.62     0.94     0.27     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.973

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     573.730     416.715     394.353    1131.658       0.507       0.003

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      18.651      15.646     532.169      24.000      46.579      35.400     -11.179

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     408.387     416.715     583.465    1145.989       0.356       0.457

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.555      16.993     545.732     528.796       0.041       0.580

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     379.968       0.000     379.968    1147.952       0.331       0.467

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.098     547.603       0.000       0.060       0.076       0.490

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.836      18.448       1.221     559.662      36.852     179.005       1.388

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 229435.094       0.613    1634.260 1216867.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.033   EfDer =  0.969

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3398.000      18.448     559.662       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.331    3271.287       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       1.943     590.487     303.844     474.134       1.560

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   362.99    -0.13   362.99     0.32   586.63
 MEAN    18.08     0.00    -0.02   362.99    -0.13   362.99     0.32
 HUB     15.21     0.00    -0.02   362.99    -0.13   362.99     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.22    46.36    12.86   609.37   709.40    17.21   548.66     0.62
 MEAN    55.90    42.30    13.60   536.08   647.51    17.21   548.66     0.56
 HUB     51.18    37.84    13.34   451.02   579.05    17.21   548.66     0.50

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   504.40   347.42   365.68  1173.39     0.43
 MEAN    18.01   505.53   342.41   371.91  1168.76     0.43
 HUB     15.22   538.66   382.81   378.96  1164.11     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   447.59   258.10     0.38  7096.87
 MEAN   534.05   418.38   191.64     0.36  6169.09     1.70
 HUB    451.41   385.12    68.60     0.33  5829.36

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.13     1.20    19.49   593.45     1.06   572.21     0.92     0.89
 MEAN    21.62     1.17    19.01   589.03     1.05   567.69     0.92     0.89
 HUB     21.44     1.16    18.51   587.42     1.05   563.19     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.53    35.21    31.50     3.71     0.93     0.45     2.90
 MEAN    42.64    27.26    23.50     3.76     0.94     0.43     3.30     0.89
 HUB     45.29    10.26     6.50     3.76     0.94     0.42     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.680       1.000       0.969

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     666.966     343.373     571.786    1153.343       0.578      -0.628

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.702      17.297     552.823      46.000      30.986      30.600      -0.386

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     568.567     343.373     664.209    1163.884       0.489      -0.220

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      21.667      18.401     562.974     361.848       0.023       0.333

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     559.513       0.000     559.513    1164.766       0.480       0.429

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      18.466     563.827       0.000       0.060       0.037      -0.196

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      21.629       1.172     589.967      30.305     195.557       1.516

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188769.812       0.515    1344.602 1088445.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.033   EfDer =  0.981

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    126.046    3398.000      21.629     589.967       1.000       1.000       0.710
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     91.363    3186.160       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       1.485     395.194     266.089     307.469       1.156

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   509.44    -0.18   509.44     0.44   558.02
 MEAN    17.74     0.00    -0.02   509.44    -0.18   509.44     0.44
 HUB     15.05     0.00    -0.02   509.44    -0.18   509.44     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.44    46.36     3.08   595.14   783.54    18.98   568.30     0.67
 MEAN    45.93    43.40     2.53   526.00   732.39    18.98   568.30     0.63
 HUB     41.23    38.84     2.39   446.28   677.39    18.98   568.30     0.58

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   476.91   317.54   355.82  1202.40     0.40
 MEAN    17.51   479.95   316.52   360.79  1198.58     0.40
 HUB     14.85   513.35   359.70   366.26  1194.84     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   446.60   269.89     0.37  6293.96
 MEAN   519.12   413.79   202.61     0.35  5544.22     1.90
 HUB    440.35   375.03    80.65     0.31  5344.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     25.27     1.17    22.67   619.92     1.05   600.93     0.92     0.90
 MEAN    24.81     1.15    22.22   616.35     1.04   597.12     0.92     0.90
 HUB     24.69     1.14    21.75   615.40     1.04   593.40     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.75    37.18    31.50     5.68     0.93     0.50     2.90
 MEAN    41.26    29.32    23.50     5.82     0.91     0.50     3.28     0.90
 HUB     44.48    12.42     6.50     5.92     0.91     0.51     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     484.482     318.593     364.994    1199.089       0.404       0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.899      22.248     597.629      46.000      41.117      31.500      -9.617

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     370.826     318.593     488.890    1207.202       0.307       0.391

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.848      23.272     605.743     471.992       0.029       0.476

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     360.987       0.000     360.987    1207.801       0.299       0.372

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.257     606.344       0.000       0.060       0.066       0.385

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.851      24.746       1.144     617.221      27.254     205.144       1.590

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 169858.938       0.492    1209.901 1535917.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =13.033   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3398.000      24.746     617.221       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.677    3115.021       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       2.158     513.330     237.894     401.059       1.686

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   339.79    -0.12   339.79     0.28   523.54
 MEAN    16.97     0.00    -0.02   339.79    -0.12   339.79     0.28
 HUB     14.32     0.00    -0.02   339.79    -0.12   339.79     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.25    46.36    12.89   571.12   664.66    23.42   607.59     0.55
 MEAN    55.98    43.80    12.18   503.23   607.31    23.42   607.59     0.50
 HUB     51.34    37.84    13.50   424.63   543.94    23.42   607.59     0.45

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   467.12   316.02   343.99  1228.49     0.38
MEAN    16.57   467.14   310.96   348.60  1224.70     0.38
HUB     13.89   495.66   347.20   353.74  1220.90     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    559.85   421.65   243.83     0.34  5968.66
MEAN   491.47   392.56   180.51     0.32  5155.79     1.70
HUB    411.88   359.60    64.68     0.29  4824.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     28.49     1.15    25.78   645.61     1.05   627.40     0.92     0.90
MEAN    27.96     1.13    25.29   641.74     1.04   623.53     0.92     0.90
HUB     27.74     1.12    24.76   640.16     1.04   619.67     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.57    35.33    31.50     3.83     0.93     0.45     2.90
MEAN    41.73    27.38    23.50     3.88     0.94     0.43     3.29     0.90
HUB     44.47    10.36     6.50     3.86     0.94     0.42     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.979

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     463.320     312.708     341.876    1225.739       0.378       0.041

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    28.038      25.403     624.593      46.000      42.449      32.400     -10.049

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     352.051     312.708     470.878    1233.144       0.285       0.419

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.988      26.447     632.163     456.573       0.028       0.502

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    16.096     335.865       0.000     335.865    1234.050       0.272       0.385

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      26.474     633.092       0.000       0.060       0.069       0.429

   STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.847      27.874       1.126     642.504      25.283     201.919       1.565

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 157664.172       0.503    1123.038 1066082.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.033   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3398.000      27.874     642.504       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     73.982    3053.118       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       2.365     509.668     215.494     390.276       1.811

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   314.05    -0.11   314.05     0.25   488.09
 MEAN    15.91     0.00    -0.02   314.05    -0.11   314.05     0.25
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 HUB     13.07     0.00    -0.02   314.05    -0.11   314.05     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.97    47.36    12.61   543.25   627.58    26.65   634.28     0.51
 MEAN    56.36    44.80    11.56   471.87   566.91    26.65   634.28     0.46
 HUB     50.99    38.84    12.15   387.57   498.92    26.65   634.28     0.40

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   441.09   304.08   319.52  1252.43     0.35
 MEAN    15.50   435.42   291.10   323.81  1248.51     0.35
 HUB     12.59   453.94   313.32   328.47  1244.59     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   392.46   227.90     0.31  5457.19
 MEAN   459.55   365.00   168.45     0.29  4513.07     1.73
 HUB    373.33   333.91    60.01     0.27  3946.16

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.57     1.13    28.98   668.44     1.04   652.22     0.92     0.90
 MEAN    30.91     1.11    28.41   663.95     1.03   648.14     0.92     0.90
 HUB     30.52     1.09    27.83   661.26     1.03   644.07     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.58    35.50    31.50     4.00     0.93     0.46     2.90
 MEAN    41.96    27.48    23.50     3.98     0.94     0.43     3.34     0.90
 HUB     43.65    10.35     6.50     3.85     0.94     0.41     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.983

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     441.045     296.437     326.566    1248.692       0.353      -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.947      28.388     648.329      46.000      42.231      33.000      -9.231

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     340.575     296.437     451.516    1254.983       0.271       0.357

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.873      29.332     654.878     440.827       0.048       0.502

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     319.592       0.000     319.592    1256.089       0.254       0.419

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.474     656.033       0.000       0.060       0.064       0.412

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854      30.833       1.106     664.551      22.047     214.246       1.661

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  137572.797       0.486     979.927 1099616.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     883300.88   6291.7275    123.1343      2.0409      0.8372     13.0332      1.2711


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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
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*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 90%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 5.808   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.948    3398.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   73.61263

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    158.207    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 124583.594  127074.992       1.805     831.557     460.733     619.754       1.345

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   381.20    -0.13   381.20     0.34   609.32
MEAN    17.06     0.00    -0.02   381.20    -0.13   381.20     0.34
HUB     12.51     0.00    -0.02   381.20    -0.13   381.20     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.08    50.47     7.61   611.74   720.91    13.92   510.67     0.65
MEAN    53.01    47.20     5.81   505.89   633.54    13.92   510.67     0.57
HUB     44.23    38.62     5.61   370.96   532.00    13.92   510.67     0.48

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   609.02   336.94   507.33  1124.04     0.54
MEAN    18.04   639.86   377.61   516.56  1119.90     0.57
HUB     15.00   731.71   498.32   535.79  1112.06     0.66

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    611.74   576.97   274.80     0.51  6953.82
MEAN   534.83   539.96   157.22     0.48  6812.79     1.31
HUB    444.80   538.46    53.52     0.48  7476.45

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.38      1.22    15.05   555.93     1.06   524.96     0.92     0.91
MEAN    18.31      1.21    14.67   555.26     1.06   521.07     0.92     0.91
HUB     18.65      1.23    13.94   558.42     1.07   513.72     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.59    28.44    24.20     4.24     0.93     0.28     2.90
MEAN    36.17    16.93    12.70     4.23     0.92     0.24     3.51     0.91
HUB     42.92    -5.70    -9.30     3.60     0.92     0.09     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     650.456     376.874     530.150    1119.937       0.581      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.410      14.645     521.202      24.000      35.408      35.400      -0.008

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     557.815     376.874     673.195    1129.937       0.494       0.253

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      18.361      15.540     530.552     528.796       0.023       0.406

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     512.069       0.000     512.069    1134.282       0.451       0.326

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.915     534.639       0.000       0.060       0.037       0.349

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      18.307       1.212     556.540      33.730     219.548       1.702

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 210001.297       0.561    1921.893 1602928.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.808   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.948    3398.000      18.307     556.540       1.000       1.000       0.980
W Kg/sec =   73.61263

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    134.700    3280.448       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 124583.594  127074.992       1.505     590.487     392.285     474.134       1.209

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   486.73    -0.17   486.73     0.43   588.27
 MEAN    18.08     0.00    -0.02   486.73    -0.17   486.73     0.43
 HUB     15.21     0.00    -0.02   486.73    -0.17   486.73     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.39    46.36     5.03   609.37   780.03    16.14   536.76     0.69
 MEAN    47.77    42.30     5.47   536.08   724.20    16.14   536.76     0.64
 HUB     42.83    37.84     4.99   451.02   663.69    16.14   536.76     0.58

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   556.91   255.09   495.05  1156.15     0.48
 MEAN    18.01   571.03   275.05   500.43  1153.50     0.50
 HUB     15.22   620.76   358.49   506.78  1150.85     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   606.53   350.43     0.52  5212.32
 MEAN   534.05   563.48   259.00     0.49  4956.62     1.39
 HUB    451.41   515.23    92.92     0.45  5459.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.04     1.15    17.95   581.36     1.04   555.46     0.92     0.91
 MEAN    20.90     1.14    17.68   580.14     1.04   552.91     0.92     0.91
 HUB     21.18     1.16    17.37   582.54     1.05   550.36     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.26    35.29    31.50     3.79     0.93     0.28     2.90
 MEAN    28.79    27.36    23.50     3.86     0.92     0.28     3.30     0.91
 HUB     35.27    10.39     6.50     3.89     0.92     0.29     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960    1085.070     275.819    1049.429    1079.659       1.005      -1.970

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.008      11.027     483.265      46.000      14.726      30.600      15.874

    STATOR / VANED DIFFUSER THROAT IS CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960    1375.448     275.819    1402.831    1033.911       1.330      -3.116

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      20.655       7.146     428.844     345.258       0.115     -12.814

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     17.823   15082.023       0.000   15082.023     649.098      23.235      -3.266

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.650       0.000       5.310       0.000       0.060       0.653      -5.233

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.185      18.839       1.029     581.345      24.804     263.162       2.040

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 154500.891       0.421    1413.964 1462549.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 5.808   EfDer =  1.105

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.948    3398.000      18.839     581.345       1.000       1.000       0.680
W Kg/sec =   73.61263

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    133.784    3209.701       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 124583.594  127074.992       1.000     378.495     378.495     293.880       0.776

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02  1078.30    -0.37  1078.30     1.00   562.14
 MEAN    17.74     0.00    -0.02  1078.30    -0.37  1078.30     1.00
 HUB     15.05     0.00    -0.02  1078.30    -0.37  1078.30     1.00

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     28.91    46.36   -17.45   595.14  1231.81     9.96   484.31     1.14
 MEAN    26.02    43.40   -17.38   526.00  1199.92     9.96   484.31     1.11
 HUB     22.50    38.84   -16.34   446.28  1167.15     9.96   484.31     1.08

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   585.62   115.67   574.08  1164.58     0.50
 MEAN    17.51   591.96   166.21   568.15  1166.96     0.51
 HUB     14.85   630.59   286.35   561.83  1169.49     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   743.05   471.76     0.64  2298.80
 MEAN   519.12   668.84   352.92     0.57  2916.27     1.85
 HUB    440.35   582.55   154.00     0.50  4257.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.12     1.07    16.93   592.29     1.02   563.67     0.92     1.01
 MEAN    20.48     1.09    17.17   595.23     1.02   565.99     0.92     1.01
 HUB     21.26     1.13    17.44   601.61     1.03   568.43     0.92     1.01
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     11.39    39.41    31.50     7.91     0.93     0.41     2.90
 MEAN    16.31    31.85    23.50     8.35     0.80     0.46     3.28     1.01
 HUB     27.01    15.33     6.50     8.83     0.80     0.53     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.105

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     598.824     167.296     574.981    1167.339       0.513       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.584      17.199     566.450      46.000      16.223      31.500      15.277

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     610.837     167.296     633.332    1166.089       0.524      -0.070

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.425      16.939     565.238     471.992       0.056       0.100

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     594.833       0.000     594.833    1167.749       0.509      -0.071

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.953     566.848       0.000       0.060       0.110      -0.066

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.804      20.241       1.074     596.376      15.031     456.515       3.539

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93645.727       0.271     857.029 2905278.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.808   EfDer =  0.924

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.948    3398.000      20.241     596.376       1.000       1.000       0.980
W Kg/sec =   73.61263

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    126.115    3168.995       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 124583.594  127074.992       1.397     513.330     367.325     401.059       1.092

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   552.97    -0.19   552.97     0.47   532.61
 MEAN    16.97     0.00    -0.02   552.97    -0.19   552.97     0.47
 HUB     14.32     0.00    -0.02   552.97    -0.19   552.97     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.93    46.36    -0.43   571.12   795.10    17.38   570.86     0.68
 MEAN    42.31    43.80    -1.49   503.23   747.81    17.38   570.86     0.64
 HUB     37.53    37.84    -0.31   424.63   697.32    17.38   570.86     0.60

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   599.06   144.15   581.46  1180.67     0.51
 MEAN    16.57   609.99   187.03   580.62  1181.38     0.52
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HUB     13.89   655.79   301.75   582.24  1181.77     0.55

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    559.85   714.77   415.70     0.61  2725.28
MEAN   491.47   655.59   304.44     0.55  3102.98     1.22
HUB    411.88   592.57   110.13     0.50  4194.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.57     1.07    18.09   609.34     1.02   579.41     0.92     0.85
MEAN    21.76     1.08    18.14   611.14     1.02   580.10     0.92     0.85
HUB     22.31     1.10    18.10   616.33     1.03   580.46     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     13.92    35.56    31.50     4.06     0.93     0.13     2.90
MEAN    17.85    27.67    23.50     4.17     0.90     0.16     3.29     0.85
HUB     27.40    10.71     6.50     4.21     0.90     0.20     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.924

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     597.339     188.078     566.958    1183.712       0.505       0.057

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.843      18.354     582.503      46.000      18.352      32.400      14.048

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     607.471     188.078     635.920    1182.676       0.514       0.001

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.689      18.114     581.485     456.573       0.051       0.141

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     576.504       0.000     576.504    1185.783       0.486      -0.015

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.297     584.544       0.000       0.060       0.098       0.050

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.660      21.511       1.063     612.273      15.898     364.957       2.829

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  99077.086       0.316     906.735 1506765.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.808   EfDer =  0.889

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.948    3398.000      21.511     612.273       1.000       1.000       0.980
W Kg/sec =   73.61263

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.239    3127.583       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 124583.594  127074.992       1.455     509.668     350.227     390.276       1.114

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   532.23    -0.18   532.23     0.45   500.00
 MEAN    15.91     0.00    -0.02   532.23    -0.18   532.23     0.45
 HUB     13.07     0.00    -0.02   532.23    -0.18   532.23     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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TIP     45.60    47.36    -1.76   543.25   760.65    18.75   588.65     0.64
MEAN    41.57    44.80    -3.23   471.87   711.41    18.75   588.65     0.60
HUB     36.07    38.84    -2.77   387.57   658.50    18.75   588.65     0.55

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   576.90   126.05   562.96  1196.63     0.48
MEAN    15.50   585.77   162.29   562.84  1196.98     0.49
HUB     12.59   624.47   266.10   564.93  1197.07     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    531.98   694.05   405.93     0.58  2264.66
MEAN   459.55   636.51   297.26     0.53  2518.09     1.20
HUB    373.33   575.02   107.23     0.48  3352.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.61     1.05    19.28   623.05     1.02   595.29     0.92     0.81
MEAN    22.73     1.06    19.29   624.25     1.02   595.64     0.92     0.81
HUB     23.15     1.08    19.22   628.22     1.03   595.70     0.92     0.81

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     12.62    35.79    31.50     4.29     0.93     0.12     2.90
MEAN    16.08    27.84    23.50     4.34     0.89     0.14     3.34     0.81
HUB     25.22    10.75     6.50     4.25     0.89     0.18     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.889

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     592.302     165.270     568.777    1197.184       0.495      -0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.756      19.248     595.913      46.000      16.202      33.000      16.798

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     624.985     165.270     646.468    1193.846       0.524      -0.192

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.403      18.583     592.595     440.827       0.119       0.121

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     576.581       0.000     576.581    1198.723       0.481      -0.037

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.116     597.446       0.000       0.060       0.121      -0.042

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.552      22.398       1.041     625.174      12.901     417.185       3.234

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   80423.297       0.284     736.019 1564569.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     637648.31   5835.6406    158.2068      1.4826      0.6105      5.8079      1.1958


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*******************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 90%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 5.964   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.138    3398.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   73.24458

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    157.416    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123960.672  126439.617       1.814     831.557     458.429     619.754       1.352

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   379.04    -0.13   379.04     0.34   609.32
 MEAN    17.06     0.00    -0.02   379.04    -0.13   379.04     0.34
 HUB     12.51     0.00    -0.02   379.04    -0.13   379.04     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.22    50.47     7.75   611.74   719.77    13.93   510.81     0.65
 MEAN    53.16    47.20     5.96   505.89   632.24    13.93   510.81     0.57
 HUB     44.39    38.62     5.77   370.96   530.46    13.93   510.81     0.48

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   607.24   338.78   503.96  1124.43     0.54
 MEAN    18.04   637.78   378.63   513.23  1120.23     0.57
 HUB     15.00   728.91   497.98   532.28  1112.39     0.66

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   573.14   272.97     0.51  6991.64
 MEAN   534.83   536.47   156.19     0.48  6831.22     1.31
 HUB    444.80   534.93    53.18     0.48  7471.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.40     1.22    15.09   556.11     1.06   525.32     0.92     0.91
 MEAN    18.32     1.21    14.70   555.35     1.06   521.38     0.92     0.91
 HUB     18.65     1.23    13.97   558.40     1.07   514.04     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.91    28.44    24.20     4.24     0.93     0.28     2.90
 MEAN    36.42    16.93    12.70     4.23     0.92     0.24     3.51     0.91
 HUB     43.09    -5.71    -9.30     3.59     0.92     0.10     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     648.223     377.896     526.676    1120.285       0.579      -0.007

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.420      14.677     521.526      24.000      35.660      35.400      -0.260

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     553.824     377.896     670.467    1130.418       0.490       0.258

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.371      15.587     531.003     528.796       0.023       0.410

   VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	508.589	0.000	508.589	1134.683	0.448	0.330

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.955	535.017	0.000	0.060	0.037	0.353

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	18.317	1.212	556.622	33.812	218.530	1.694

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
210507.453	0.563	1916.893	1593848.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 5.964 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
161.138	3398.000	18.317	556.622	1.000	1.000	0.980

W Kg/sec = 73.24458

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
133.962	3280.208	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
123960.672	126439.617	1.514	590.487	390.134	474.134	1.215

ROTOR LEADING EDGE CONDITIONS, STAGE 2

R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP 20.55	0.00	-0.02	483.51	-0.17	483.51	0.43	588.23
MEAN 18.08	0.00	-0.02	483.51	-0.17	483.51	0.43	
HUB 15.21	0.00	-0.02	483.51	-0.17	483.51	0.43	

BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP 51.58	46.36	5.22	609.37	778.02	16.17	537.10	0.68
MEAN 47.96	42.30	5.66	536.08	722.04	16.17	537.10	0.64
HUB 43.02	37.84	5.18	451.02	661.33	16.17	537.10	0.58

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

R2	C2	Cu2	Cm2	Ao2	Mach2
TIP 20.42	554.90	257.69	491.44	1156.69	0.48
MEAN 18.01	568.87	276.92	496.92	1153.96	0.49
HUB 15.22	618.36	359.17	503.35	1151.25	0.54

U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP 605.52	602.08	347.83	0.52	5265.37	
MEAN 534.05	559.50	257.13	0.48	4990.33	1.39
HUB 451.41	511.73	92.24	0.44	5470.25	

Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP 21.08	1.15	18.01	581.69	1.05	555.98	0.92	0.91
MEAN 20.93	1.14	17.73	580.38	1.04	553.36	0.92	0.91
HUB 21.20	1.16	17.41	582.67	1.05	550.74	0.92	0.91

Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP 27.67	35.29	31.50	3.79	0.93	0.28	2.90	
MEAN 29.13	27.36	23.50	3.86	0.92	0.28	3.30	0.91
HUB 35.51	10.38	6.50	3.88	0.92	0.30	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	1053.065	277.697	1015.790	1085.646	0.970	-1.856

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.038	11.499	489.112	46.000	15.290	30.600	15.310

STATOR / VANED DIFFUSER THROAT IS CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	1202.869	277.697	1234.508	1060.764	1.134	-2.511

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	20.714	9.291	462.168	345.258	0.107	-0.385

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	1551.521	0.000	1551.521	1016.574	1.526	-1.899

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	5.128	396.159	0.000	0.060	0.448	-3.752

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.427	19.569	1.068	581.580	24.959	261.073	2.024

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
155461.078	0.424	1415.638	1453297.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 5.964 EfDer = 0.871

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
161.138	3398.000	19.569	581.580	1.000	1.000	0.680

W Kg/sec = 73.24458

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
128.172	3209.051	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
123960.672	126439.617	1.014	378.495	373.299	293.880	0.787

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	964.25	-0.33	964.25	0.88	562.03
MEAN	17.74	0.00	-0.02	964.25	-0.33	964.25	0.88	
HUB	15.05	0.00	-0.02	964.25	-0.33	964.25	0.88	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	31.70	46.36	-14.66	595.14	1133.30	11.87	503.98	1.03
MEAN	28.63	43.40	-14.77	526.00	1098.55	11.87	503.98	1.00
HUB	24.85	38.84	-13.99	446.28	1062.66	11.87	503.98	0.97

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	567.20	142.44	549.02	1169.24	0.49
MEAN	17.51	578.49	185.00	548.12	1170.17	0.49
HUB	14.85	624.11	296.31	549.29	1171.16	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	706.71	444.99	0.60	2828.37	
MEAN	519.12	641.93	334.13	0.55	3244.55	1.77
HUB	440.35	567.86	144.04	0.48	4405.17	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.86	1.07	17.75	595.04	1.02	568.20	0.92	0.80
MEAN	21.05	1.08	17.81	597.02	1.03	569.10	0.92	0.80
HUB	21.60	1.10	17.80	602.55	1.04	570.04	0.92	0.80

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	14.54	39.03	31.50	7.53	0.93	0.40	2.90	

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 MEAN    18.65    31.37    23.50     7.87     0.82     0.44     3.28     0.80
 HUB     28.34    14.69     6.50     8.19     0.82     0.50     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.871

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      585.853     186.211     555.472    1170.566       0.500        0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.138      17.811      569.559      46.000      18.533      31.500      12.967

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392      585.872     186.211     614.753    1170.565       0.501       -0.025

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.014      17.706      569.557     471.992       0.047       0.135

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121      569.093       0.000     569.093    1172.225       0.485       -0.013

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.766      571.174       0.000       0.060       0.087       -0.007

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.655       20.877       1.067      598.205       16.625     400.249       3.103

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 103582.594       0.300     943.229 2696764.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.964   EfDer =  0.946

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    161.138     3398.000       20.877      598.205       1.000        1.000        0.980
W Kg/sec =   73.24458

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    121.845     3164.146        1.401       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 123960.672  126439.617        1.446      513.330     354.887     401.059       1.130

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa     C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   530.11    -0.18   530.11      0.45   531.80
 MEAN    16.97      0.00    -0.02   530.11    -0.18   530.11      0.45
 HUB     14.32      0.00    -0.02   530.11    -0.18   530.11      0.45

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     47.14     46.36     0.78   571.12   779.36     18.16   574.76      0.66
 MEAN    43.52     43.80    -0.28   503.23   731.06     18.16   574.76      0.62
 HUB     38.71     37.84     0.87   424.63   679.33     18.16   574.76      0.58

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   577.02    164.70    553.01   1186.57      0.49
 MEAN    16.57   589.19    201.47    553.68   1186.48      0.50
 HUB     13.89   635.29    307.03    556.17   1186.19      0.54

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
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 TIP    559.85   679.68   395.15     0.57  3112.99
 MEAN   491.47   625.02   290.00     0.53  3342.23     1.25
 HUB    411.88   565.97   104.85     0.48  4267.26

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.48     1.08    19.12   613.02     1.02   585.24     0.92     0.87
 MEAN    22.60     1.08    19.09   614.11     1.03   585.15     0.92     0.87
 HUB     23.10     1.11    19.00   618.51     1.03   584.84     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.58    35.55    31.50     4.05     0.93     0.16     2.90
 MEAN    20.00    27.64    23.50     4.14     0.90     0.19     3.29     0.87
 HUB     28.90    10.68     6.50     4.18     0.90     0.22     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.946

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     577.573     202.602     540.873    1188.666       0.486       0.057

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.690      19.304     587.378      46.000      20.535      32.400      11.865

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     575.325     202.602     609.956    1188.885       0.484       0.044

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.575      19.230     587.594     456.573       0.042       0.173

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     545.614       0.000     545.614    1191.693       0.458       0.034

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.428     590.373       0.000       0.060       0.080       0.098

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.732      22.435       1.075     615.212      17.007     339.686       2.633

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 105998.773       0.338     965.231 1481939.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.964   EfDer =  0.920

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    161.138    3398.000      22.435     615.212       1.000       1.000       0.980
W Kg/sec =   73.24458

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    114.987    3120.104       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123960.672  126439.617       1.522     509.668     334.926     390.276       1.165

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   504.92    -0.17   504.92     0.42   498.80
 MEAN    15.91     0.00    -0.02   504.92    -0.17   504.92     0.42
 HUB     13.07     0.00    -0.02   504.92    -0.17   504.92     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.10    47.36    -0.26   543.25   741.79    19.84   593.95     0.62
 MEAN    43.07    44.80    -1.73   471.87   691.21    19.84   593.95     0.58
 HUB     37.52    38.84    -1.32   387.57   636.62    19.84   593.95     0.53
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      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   550.42   150.55   529.43  1204.14     0.46
 MEAN    15.50   560.33   179.63   530.76  1203.62     0.47
 HUB     12.59   599.16   272.43   533.65  1202.95     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   652.52   381.43     0.54  2704.03
 MEAN   459.55   600.05   279.92     0.50  2786.66     1.24
 HUB    373.33   543.10   100.90     0.45  3432.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.84     1.06    20.66   628.07     1.02   602.81     0.92     0.84
 MEAN    23.89     1.06    20.59   628.47     1.02   602.28     0.92     0.84
 HUB     24.23     1.08    20.45   631.54     1.03   601.60     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.87    35.77    31.50     4.27     0.93     0.15     2.90
 MEAN    18.70    27.81    23.50     4.31     0.89     0.17     3.34     0.84
 HUB     27.04    10.71     6.50     4.21     0.89     0.20     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.920

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     566.307     182.928     535.948    1203.903       0.470      -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.920      20.554     602.610      46.000      18.846      33.000      14.154

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     581.504     182.928     609.598    1202.449       0.484      -0.119

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.661      20.160     601.155     440.827       0.096       0.159

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     538.241       0.000     538.241    1206.484       0.446       0.025

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.640     605.195       0.000       0.060       0.095       0.021

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.669      23.664       1.055     629.360      14.148     379.133       2.939

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  88208.500       0.312     803.232 1535109.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    663758.38   6044.2227    157.4157      1.5664      0.6738      5.9641      1.2038




*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*******************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 90%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.614    3398.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   72.09729

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    154.950    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 122018.992  124459.109       1.843     831.557     451.248     619.754       1.373

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   372.34    -0.13   372.34     0.34   609.32
 MEAN    17.06     0.00    -0.02   372.34    -0.13   372.34     0.34
 HUB     12.51     0.00    -0.02   372.34    -0.13   372.34     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.68    50.47     8.21   611.74   716.26    13.97   511.23     0.65
 MEAN    53.65    47.20     6.45   505.89   628.24    13.97   511.23     0.57
 HUB     44.90    38.62     6.28   370.96   525.69    13.97   511.23     0.47

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   601.90   344.40   493.62  1125.58     0.53
 MEAN    18.04   631.48   381.80   502.99  1121.22     0.56
 HUB     15.00   720.37   496.94   521.52  1113.40     0.65

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   561.37   267.34     0.50  7107.68
 MEAN   534.83   525.75   153.02     0.47  6888.38     1.33
 HUB    444.80   524.12    52.15     0.47  7455.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.46     1.22    15.20   556.67     1.06   526.41     0.92     0.91
 MEAN    18.35     1.21    14.80   555.62     1.06   522.32     0.92     0.91
 HUB     18.64     1.23    14.06   558.33     1.07   514.99     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.90    28.44    24.20     4.24     0.93     0.30     2.90
 MEAN    37.20    16.92    12.70     4.22     0.93     0.25     3.51     0.91
 HUB     43.62    -5.71    -9.30     3.59     0.93     0.11     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     641.468     381.061     516.017    1121.335       0.572      -0.006

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.449      14.774     522.504      24.000      36.445      35.400      -1.045

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     541.648     381.061     662.261    1131.870       0.479       0.274

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.401      15.728     532.368     528.796       0.023       0.422

   VANED DIFFUSER EXIT:
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   R4          C4           Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     497.951       0.000     497.951    1135.896       0.438       0.342

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.075     536.162       0.000       0.060       0.037       0.366

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      18.346       1.214     556.872      34.062     215.395       1.670

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 212065.438       0.567    1900.832 1565675.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.614    3398.000      18.346     556.872       1.000       1.000       0.980
W Kg/sec =   72.09729

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    131.682    3279.471       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 122018.992  124459.109       1.540     590.487     383.495     474.134       1.236

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   473.63    -0.16   473.63     0.42   588.10
 MEAN    18.08      0.00    -0.02   473.63    -0.16   473.63     0.42
 HUB     15.21      0.00    -0.02   473.63    -0.16   473.63     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.15    46.36     5.79   609.37   771.92    16.28   538.14     0.68
 MEAN    48.55    42.30     6.25   536.08   715.46    16.28   538.14     0.63
 HUB     43.61    37.84     5.77   451.02   654.14    16.28   538.14     0.57

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   549.01   265.56   480.51  1158.30     0.47
 MEAN    18.01   562.40   282.61   486.24  1155.36     0.49
 HUB     15.22   611.10   361.25   492.89  1152.43     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   588.61   339.96     0.51  5426.08
 MEAN   534.05   547.40   251.44     0.47  5092.72     1.41
 HUB    451.41   501.07    90.16     0.43  5501.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.21     1.16    18.18   582.71     1.05   557.54     0.92     0.91
 MEAN    21.02     1.15    17.88   581.12     1.04   554.71     0.92     0.91
 HUB     21.25     1.16    17.54   583.07     1.05   551.89     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.93    35.28    31.50     3.78     0.93     0.30     2.90
 MEAN    30.17    27.34    23.50     3.84     0.93     0.29     3.30     0.91
 HUB     36.24    10.37     6.50     3.87     0.93     0.30     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3           Mach3       cp 2-3
     17.960     983.756     283.402     942.051    1098.729       0.895      -1.617
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Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.128	12.549	501.514	46.000	16.743	30.600	13.857

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	1011.947	283.402	1050.883	1094.092	0.925	-1.781

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	20.867	11.999	496.887	345.258	0.089	0.033

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	1045.711	0.000	1045.711	1090.114	0.959	-0.404

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	11.219	491.433	0.000	0.060	0.269	-2.018

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.637	20.275	1.105	582.298	25.426	254.821	1.975

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
158374.266	0.432	1419.576	1424785.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 6.453 EfDer = 0.767

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
158.614	3398.000	20.275	582.298	1.000	1.000	0.680

W Kg/sec = 72.09729

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
121.845	3207.073	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
122018.992	124459.109	1.067	378.495	354.865	293.880	0.828

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	833.99	-0.29	833.99	0.74	561.68
MEAN	17.74	0.00	-0.02	833.99	-0.29	833.99	0.74	
HUB	15.05	0.00	-0.02	833.99	-0.29	833.99	0.74	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	35.53	46.36	-10.83	595.14	1024.73	14.05	524.24	0.91
MEAN	32.25	43.40	-11.15	526.00	986.16	14.05	524.24	0.88
HUB	28.17	38.84	-10.67	446.28	946.02	14.05	524.24	0.84

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	546.73	176.35	517.51	1175.19	0.47
MEAN	17.51	560.11	210.54	519.04	1174.87	0.48
HUB	14.85	608.64	310.20	523.66	1174.52	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	660.91	411.08	0.56	3499.28	
MEAN	519.12	603.84	308.58	0.51	3690.95	1.70
HUB	440.35	539.59	130.15	0.46	4610.76	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.73	1.07	18.73	598.95	1.03	574.00	0.92	0.70
MEAN	21.81	1.08	18.67	599.87	1.03	573.68	0.92	0.70
HUB	22.21	1.10	18.49	604.24	1.04	573.33	0.92	0.70

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	18.82	38.46	31.50	6.96	0.93	0.38	2.90	

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 MEAN    22.08    30.73    23.50     7.23     0.84     0.42     3.28     0.70
 HUB     30.64    13.96     6.50     7.46     0.84     0.47     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.767

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     567.267     211.923     526.194    1175.310       0.483       -0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.884      18.657     574.160      46.000      21.937      31.500       9.563

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     549.857     211.923     589.283    1176.970       0.467       0.044

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.805      18.774     575.783     471.992       0.034       0.185

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     533.560       0.000     533.560    1178.476       0.453       0.059

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.851     577.257       0.000       0.060       0.066       0.067

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.611      21.701       1.070     601.020      18.722     340.477       2.639

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 116660.602       0.338    1045.678 2411406.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.970

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    158.614    3398.000       21.701     601.020       1.000        1.000        0.980
W Kg/sec =   72.09729

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    115.658    3156.726        1.401       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 122018.992  124459.109        1.524     513.330     336.863     401.059       1.191

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa     C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   498.24    -0.17   498.24      0.42   530.55
 MEAN    16.97      0.00    -0.02   498.24    -0.17   498.24      0.42
 HUB     14.32      0.00    -0.02   498.24    -0.17   498.24      0.42

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     48.91     46.36      2.55   571.12   758.03     19.20   580.31      0.64
 MEAN    45.30     43.80      1.50   503.23   708.28     19.20   580.31      0.60
 HUB     40.45     37.84      2.61   424.63   654.75     19.20   580.31      0.55

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88    549.55    192.47    514.74   1194.52      0.46
 MEAN    16.57    562.35    221.17    517.03   1193.48      0.47
 HUB     13.89    608.05    314.26    520.54   1192.35      0.51

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
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 TIP    559.85   632.40   367.38     0.53  3637.16
 MEAN   491.47   583.42   270.30     0.49  3668.57     1.30
 HUB    411.88   529.62    97.62     0.44  4367.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.70     1.09    20.50   618.33     1.03   593.13     0.92     0.89
 MEAN    23.72     1.09    20.37   618.48     1.03   592.09     0.92     0.89
 HUB     24.12     1.11    20.19   621.80     1.03   590.95     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.50    35.52    31.50     4.02     0.93     0.21     2.90
 MEAN    23.16    27.60    23.50     4.10     0.91     0.22     3.29     0.89
 HUB     31.12    10.62     6.50     4.12     0.91     0.25     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     552.169     222.415     505.393    1195.453       0.462       0.057

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.810      20.568     594.093      46.000      23.753      32.400       8.647

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     533.049     222.415     577.590    1197.193       0.445       0.104

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.740      20.716     595.824     456.573       0.030       0.220

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     505.594       0.000     505.594    1199.581       0.421       0.098

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.911     598.204       0.000       0.060       0.061       0.160

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.803      23.632       1.089     619.534      18.513     308.986       2.395

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 115397.492       0.368    1034.357 1435931.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.956

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    158.614    3398.000      23.632     619.534       1.000       1.000       0.980
W Kg/sec =   72.09729

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    107.828    3109.203       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 122018.992  124459.109       1.623     509.668     314.072     390.276       1.243

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   469.14    -0.16   469.14     0.39   497.06
 MEAN    15.91     0.00    -0.02   469.14    -0.16   469.14     0.39
 HUB     13.07     0.00    -0.02   469.14    -0.16   469.14     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.19    47.36     1.83   543.25   717.90    21.28   601.17     0.60
 MEAN    45.18    44.80     0.38   471.87   665.51    21.28   601.17     0.55
 HUB     39.57    38.84     0.73   387.57   608.63    21.28   601.17     0.51
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      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   519.72   181.72   486.92  1213.79     0.43
 MEAN    15.50   529.68   201.92   489.68  1212.31     0.44
 HUB     12.59   567.64   280.60   493.43  1210.78     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   599.81   350.25     0.49  3263.07
 MEAN   459.55   553.32   257.63     0.46  3131.81     1.30
 HUB    373.33   502.07    92.73     0.41  3534.86

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.49     1.08    22.47   635.05     1.03   612.52     0.92     0.87
 MEAN    25.41     1.08    22.29   634.43     1.02   611.03     0.92     0.87
 HUB     25.65     1.09    22.06   636.35     1.03   609.47     0.92     0.87

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.47    35.73    31.50     4.23     0.93     0.21     2.90
 MEAN    22.41    27.75    23.50     4.25     0.90     0.21     3.34     0.87
 HUB     29.63    10.64     6.50     4.14     0.90     0.23     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.956

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      535.212     205.620     494.138    1212.643       0.441      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.452      22.263      611.381      46.000      22.593      33.000      10.407

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      529.169     205.620     567.714    1213.175       0.436      -0.023

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.300      22.197     611.918     440.827       0.067       0.210

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     491.973       0.000     491.973    1216.312       0.404       0.101

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      22.590     615.086       0.000       0.060       0.071       0.098

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.770      25.287       1.070     635.276      15.742     337.294       2.615

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   98162.047       0.347     879.868 1484201.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    700659.81   6280.3105    154.9500      1.6739      0.7399      6.4531      1.2151


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 90%  Stat 2 30% Ice Block 9-1-2011
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 7.044   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3398.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    151.988    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.879     831.557     442.622     619.754       1.400

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   364.35    -0.13   364.35     0.33   609.32
 MEAN    17.06     0.00    -0.02   364.35    -0.13   364.35     0.33
 HUB     12.51     0.00    -0.02   364.35    -0.13   364.35     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.23    50.47     8.76   611.74   712.14    14.02   511.72     0.64
 MEAN    54.24    47.20     7.04   505.89   623.54    14.02   511.72     0.56
 HUB     45.52    38.62     6.90   370.96   520.06    14.02   511.72     0.47

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   595.87   351.00   481.52  1126.91     0.53
 MEAN    18.04   624.23   385.51   490.96  1122.36     0.56
 HUB     15.00   710.41   495.70   508.88  1114.57     0.64

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   547.59   260.75     0.49  7243.62
 MEAN   534.83   513.16   149.32     0.46  6955.19     1.36
 HUB    444.80   511.42    50.90     0.46  7437.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.53     1.23    15.32   557.32     1.07   527.66     0.92     0.91
 MEAN    18.39     1.22    14.90   555.94     1.06   523.40     0.92     0.91
 HUB     18.63     1.23    14.17   558.24     1.07   516.09     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.09    28.44    24.20     4.24     0.93     0.32     2.90
 MEAN    38.14    16.92    12.70     4.22     0.93     0.27     3.51     0.91
 HUB     44.25    -5.71    -9.30     3.59     0.93     0.13     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     633.699     384.760     503.522    1122.536       0.565      -0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.481      14.883     523.623      24.000      37.385      35.400      -1.985

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     527.515     384.760     652.926    1133.521       0.465       0.293

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.432      15.887     533.922     528.796       0.023       0.436

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     485.568       0.000     485.568    1137.282       0.427       0.356
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.209	537.471	0.000	0.060	0.038	0.380

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	18.377	1.216	557.164	34.354	211.711	1.641

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
213884.875	0.572	1880.494	1532079.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.044 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
155.582	3398.000	18.377	557.164	1.000	1.000	0.980

W Kg/sec = 70.71914

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
128.986	3278.611	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
119686.578	122080.047	1.572	590.487	375.645	474.134	1.262

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	462.12	-0.16	462.12	0.41	587.94
MEAN	18.08	0.00	-0.02	462.12	-0.16	462.12	0.41	
HUB	15.21	0.00	-0.02	462.12	-0.16	462.12	0.41	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.83	46.36	6.47	609.37	764.90	16.41	539.33	0.67
MEAN	49.25	42.30	6.95	536.08	707.88	16.41	539.33	0.62
HUB	44.31	37.84	6.47	451.02	645.85	16.41	539.33	0.57

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	542.57	274.63	467.92	1160.12	0.47
MEAN	18.01	555.16	289.17	473.91	1156.95	0.48
HUB	15.22	602.80	363.63	480.77	1153.79	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	573.10	330.88	0.49	5611.27	
MEAN	534.05	533.44	244.88	0.46	5210.81	1.44
HUB	451.41	488.72	87.78	0.42	5537.97	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.35	1.16	18.37	583.88	1.05	559.30	0.92	0.91
MEAN	21.12	1.15	18.04	581.97	1.04	556.24	0.92	0.91
HUB	21.30	1.16	17.68	583.53	1.05	553.19	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.41	35.27	31.50	3.77	0.93	0.31	2.90	
MEAN	31.39	27.33	23.50	3.83	0.93	0.31	3.30	0.91
HUB	37.10	10.35	6.50	3.85	0.93	0.32	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	929.020	289.981	882.603	1108.990	0.838	-1.439

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.225	13.397	511.065	46.000	18.188	30.600	12.412

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	918.574	289.981	963.259	1110.789	0.827	-1.432

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	21.016	13.412	512.682	345.258	0.075	0.110

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	923.905	0.000	923.905	1110.500	0.832	-0.093

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	13.098	511.929	0.000	0.060	0.195	-1.530

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.723	20.629	1.123	583.129	25.965	247.776	1.921

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
161729.703	0.441	1421.941	1391148.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 7.044 EfDer = 0.773

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
155.582	3398.000	20.629	583.129	1.000	1.000	0.680

W Kg/sec = 70.71914

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
117.549	3204.787	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
119686.578	122080.047	1.106	378.495	342.353	293.880	0.858

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	775.73	-0.27	775.73	0.69	561.28
MEAN	17.74	0.00	-0.02	775.73	-0.27	775.73	0.69	
HUB	15.05	0.00	-0.02	775.73	-0.27	775.73	0.69	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	37.51	46.36	-8.85	595.14	977.88	15.06	532.90	0.86
MEAN	34.15	43.40	-9.25	526.00	937.39	15.06	532.90	0.83
HUB	29.93	38.84	-8.91	446.28	895.07	15.06	532.90	0.79

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	532.02	197.95	493.82	1179.47	0.45
MEAN	17.51	545.47	226.78	496.10	1178.47	0.46
HUB	14.85	593.57	318.08	501.15	1177.47	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	628.93	389.47	0.53	3926.85	
MEAN	519.12	575.83	292.35	0.49	3974.80	1.71
HUB	440.35	515.85	122.27	0.44	4727.44	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.31	1.08	19.40	601.82	1.03	578.19	0.92	0.71
MEAN	22.33	1.08	19.28	602.05	1.03	577.21	0.92	0.71
HUB	22.66	1.10	19.05	605.63	1.04	576.22	0.92	0.71

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	21.84	38.26	31.50	6.76	0.93	0.39	2.90	
MEAN	24.57	30.51	23.50	7.01	0.85	0.42	3.28	0.71
HUB	32.40	13.71	6.50	7.21	0.85	0.47	3.87	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.773

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      552.166     228.264     502.775     1178.951       0.468       -0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     22.400      19.271      577.714      46.000      24.418       31.500       7.082

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     17.392      522.404     228.264     570.097     1181.672       0.442       0.093

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.347      19.537      580.383      471.992       0.027       0.221

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121      506.703       0.000     506.703     1183.044       0.428       0.110

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      19.622      581.732       0.000       0.060       0.053       0.119

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4           PR4       Texit        Del T       Ns        Ns nondim
      0.642      22.262        1.079     603.164      20.035     312.085       2.419

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 124846.555       0.362    1097.662 2276419.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.044   EfDer =  0.985

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    155.582     3398.000       22.262      603.164       1.000        1.000        0.980
W Kg/sec =   70.71914

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
    110.783     3151.111        1.401        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 119686.578  122080.047        1.591      513.330      322.664      401.059       1.243

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00     -0.02   473.93     -0.16   473.93      0.40    529.61
 MEAN    16.97      0.00     -0.02   473.93     -0.16   473.93      0.40
 HUB     14.32      0.00     -0.02   473.93     -0.16   473.93      0.40

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     50.32     46.36      3.96   571.12    742.28     19.94    584.42      0.63
 MEAN    46.73     43.80      2.93   503.23    691.39     19.94    584.42      0.58
 HUB     41.87     37.84      4.03   424.63    636.44     19.94    584.42      0.54

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88    531.14    212.97    486.58   1200.18      0.44
 MEAN    16.57    543.62    235.85    489.79   1198.52      0.45
 HUB     13.89    588.35    319.67    493.93   1196.83      0.49

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP     559.85    597.57    346.88      0.50   4023.96
 MEAN    491.47    552.48    255.61      0.46   3911.77      1.35
 HUB     411.88    502.46     92.21      0.42   4442.60
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.57     1.10    21.47   622.31     1.03   598.77     0.92     0.90
MEAN    24.50     1.10    21.27   621.77     1.03   597.12     0.92     0.90
HUB     24.81     1.11    21.03   624.30     1.04   595.42     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     23.64    35.49    31.50     3.99     0.93     0.24     2.90
MEAN    25.71    27.56    23.50     4.06     0.91     0.25     3.29     0.90
HUB     32.91    10.57     6.50     4.07     0.91     0.27     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     534.514     237.179     479.011    1200.338       0.445       0.056

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.592      21.460     598.954      46.000      26.342      32.400       6.058

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     502.518     237.179     555.678    1203.109       0.418       0.151

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.548      21.768     601.723     456.573       0.023       0.257

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     476.730       0.000     476.730    1205.214       0.396       0.148

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.958     603.830       0.000       0.060       0.049       0.208

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.841       24.461       1.099     622.794      19.630     288.387       2.236

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 122367.742       0.390    1075.868 1392531.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.044   EfDer =  0.976

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    155.582    3398.000       24.461     622.794       1.000        1.000        0.980
W Kg/sec =   70.71914

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    102.450    3101.053        1.401       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 119686.578  122080.047        1.708     509.668     298.406     390.276       1.308

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   443.11    -0.15   443.11     0.37   495.76
 MEAN    15.91      0.00    -0.02   443.11    -0.15   443.11     0.37
 HUB     13.07      0.00    -0.02   443.11    -0.15   443.11     0.37

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     50.80     47.36     3.44   543.25   701.16     22.29   606.42     0.58
 MEAN    46.81     44.80     2.01   471.87   647.42     22.29   606.42     0.54
 HUB     41.19     38.84     2.35   387.57   588.79     22.29   606.42     0.49

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
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      0.500       0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
  TIP     17.94   500.34   203.75   456.97  1220.49     0.41
  MEAN    15.50   509.40   217.78   460.50  1218.43     0.42
  HUB     12.59   545.92   286.44   464.74  1216.34     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    531.98   562.63   328.22     0.46  3658.13
  MEAN   459.55   520.11   241.77     0.43  3377.56     1.35
  HUB    373.33   472.79    86.89     0.39  3608.28

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     26.66     1.09    23.74   640.19     1.03   619.31     0.92     0.89
  MEAN    26.49     1.08    23.48   638.86     1.03   617.21     0.92     0.89
  HUB     26.63     1.09    23.19   639.95     1.03   615.09     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     24.03    35.69    31.50     4.19     0.93     0.25     2.90
  MEAN    25.31    27.70    23.50     4.20     0.91     0.25     3.34     0.89
  HUB     31.65    10.59     6.50     4.09     0.91     0.26     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.976

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     514.765     221.777     464.540    1218.761       0.422      -0.006

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      26.529      23.464     617.563      46.000      25.520      33.000       7.480

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     493.798     221.777     541.314    1220.500       0.405       0.046

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      26.436      23.615     619.327     440.827       0.050       0.252

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     460.115       0.000     460.115    1223.138       0.376       0.159

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      23.959     622.007       0.000       0.060       0.055       0.156

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.823      26.420       1.080     639.666      16.872     311.163       2.412

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  105222.617       0.372     925.126 1437775.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     728051.50   6401.0913    151.9881      1.7488      0.7777      7.0442      1.2235


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 90%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 7.500   EfDer =  0.999
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
153.260	3398.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 69.66364

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
149.720	3384.617	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
117900.242	120257.992	1.907	831.557	436.016	619.754	1.421

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	358.28	-0.12	358.28	0.32	609.32
MEAN	17.06	0.00	-0.02	358.28	-0.12	358.28	0.32	
HUB	12.51	0.00	-0.02	358.28	-0.12	358.28	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.65	50.47	9.18	611.74	709.04	14.05	512.09	0.64
MEAN	54.70	47.20	7.50	505.89	620.01	14.05	512.09	0.56
HUB	46.01	38.62	7.39	370.96	515.82	14.05	512.09	0.46

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	591.53	355.91	472.47	1127.88	0.52
MEAN	18.04	618.89	388.29	481.94	1123.20	0.55
HUB	15.00	703.00	494.78	499.40	1115.42	0.63

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	611.74	537.29	255.83	0.48	7345.07	
MEAN	534.83	503.72	146.54	0.45	7005.30	1.38
HUB	444.80	501.90	49.98	0.45	7423.19	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.58	1.23	15.40	557.80	1.07	528.58	0.92	0.91
MEAN	18.41	1.22	14.98	556.18	1.06	524.19	0.92	0.91
HUB	18.62	1.23	14.25	558.17	1.07	516.90	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.99	28.43	24.20	4.23	0.93	0.33	2.90	
MEAN	38.86	16.91	12.70	4.21	0.93	0.28	3.51	0.91
HUB	44.73	-5.71	-9.30	3.59	0.93	0.14	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	627.998	387.535	494.164	1123.413	0.559	-0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.503	14.961	524.443	24.000	38.104	35.400	-2.704

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	517.017	387.535	646.135	1134.724	0.456	0.307

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.454	16.002	535.056	528.796	0.023	0.447

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	476.347	0.000	476.347	1138.297	0.418	0.367

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.305	538.431	0.000	0.060	0.039	0.390

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	18.396	1.218	557.383	34.573	208.942	1.620

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
215245.641	0.575	1864.213	1506525.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.500 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
153.260	3398.000	18.396	557.383	1.000	1.000	0.980

W Kg/sec = 69.66364

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
126.951	3277.968	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
117900.242	120257.992	1.597	590.487	369.717	474.134	1.282

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	453.52	-0.16	453.52	0.40	587.83
MEAN	18.08	0.00	-0.02	453.52	-0.16	453.52	0.40	
HUB	15.21	0.00	-0.02	453.52	-0.16	453.52	0.40	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.35	46.36	6.99	609.37	759.74	16.49	540.21	0.67
MEAN	49.78	42.30	7.48	536.08	702.30	16.49	540.21	0.62
HUB	44.85	37.84	7.01	451.02	639.72	16.49	540.21	0.56

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	538.05	281.30	458.66	1161.44	0.46
MEAN	18.01	549.97	294.00	464.79	1158.10	0.47
HUB	15.22	596.74	365.40	471.78	1154.77	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	561.68	324.22	0.48	5747.37	
MEAN	534.05	523.12	240.05	0.45	5297.74	1.46
HUB	451.41	479.56	86.01	0.42	5564.87	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.44	1.17	18.51	584.75	1.05	560.57	0.92	0.91
MEAN	21.19	1.15	18.16	582.61	1.05	557.35	0.92	0.91
HUB	21.34	1.16	17.78	583.88	1.05	554.14	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.52	35.26	31.50	3.76	0.93	0.32	2.90	
MEAN	32.31	27.32	23.50	3.82	0.93	0.32	3.30	0.91
HUB	37.76	10.33	6.50	3.83	0.93	0.32	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	897.005	294.825	847.170	1114.903	0.805	-1.340

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.292	13.899	516.557	46.000	19.188	30.600	11.412

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	871.751	294.825	920.256	1118.931	0.779	-1.264

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	21.113	14.132	520.288	345.258	0.066	0.140

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	869.702	0.000	869.702	1119.519	0.777	0.020

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	13.961	520.613	0.000	0.060	0.161	-1.318

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.761	20.812	1.131	583.744	26.361	242.685	1.881

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
164200.625	0.448	1422.119	1365799.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 7.500 EfDer = 0.787

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
153.260	3398.000	20.812	583.744	1.000	1.000	0.680

W Kg/sec = 69.66364

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
114.836	3203.098	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
117900.242	120257.992	1.132	378.495	334.450	293.880	0.879

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	743.96	-0.26	743.96	0.65	560.99
MEAN	17.74	0.00	-0.02	743.96	-0.26	743.96	0.65	
HUB	15.05	0.00	-0.02	743.96	-0.26	743.96	0.65	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	38.67	46.36	-7.69	595.14	952.88	15.61	537.54	0.84
MEAN	35.27	43.40	-8.13	526.00	911.28	15.61	537.54	0.80
HUB	30.97	38.84	-7.87	446.28	867.69	15.61	537.54	0.76

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	523.25	211.20	478.74	1182.15	0.44
MEAN	17.51	536.42	236.68	481.38	1180.77	0.45
HUB	14.85	583.83	322.74	486.51	1179.41	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	608.88	376.23	0.52	4189.01	
MEAN	519.12	558.13	282.44	0.47	4148.07	1.71
HUB	440.35	500.53	117.61	0.42	4796.51	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.65	1.09	19.80	603.68	1.03	580.83	0.92	0.72
MEAN	22.64	1.09	19.65	603.49	1.03	579.47	0.92	0.72
HUB	22.93	1.10	19.39	606.57	1.04	578.12	0.92	0.72

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	23.81	38.16	31.50	6.66	0.93	0.40	2.90	
MEAN	26.18	30.40	23.50	6.90	0.86	0.43	3.28	0.72
HUB	33.56	13.59	6.50	7.09	0.86	0.47	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.787

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     542.817     238.237     487.743    1181.267       0.460       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.710      19.646     579.983      46.000      26.033      31.500       5.467

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     505.157     238.237     558.517    1184.617       0.426       0.124

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.669      20.002     583.278     471.992       0.023       0.245

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     489.904       0.000     489.904    1185.903       0.413       0.141

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.088     584.545       0.000       0.060       0.047       0.152

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.668      22.595       1.086     604.579      20.835     296.781       2.301

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 129834.078       0.376    1124.475 2198557.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.500   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.260    3398.000      22.595     604.579       1.000       1.000       0.980
W Kg/sec =   69.66364

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    107.647    3147.422       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117900.242  120257.992       1.637     513.330     313.531     401.059       1.279

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   458.65    -0.16   458.65     0.39   528.99
 MEAN    16.97     0.00    -0.02   458.65    -0.16   458.65     0.39
 HUB     14.32     0.00    -0.02   458.65    -0.16   458.65     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.24    46.36     4.88   571.12   732.61    20.39   587.03     0.62
 MEAN    47.66    43.80     3.86   503.23   681.00    20.39   587.03     0.57
 HUB     42.81    37.84     4.97   424.63   625.14    20.39   587.03     0.53

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   520.69   225.56   469.30  1203.64     0.43
 MEAN    16.57   532.62   244.91   472.97  1201.64     0.44
 HUB     13.89   576.46   323.04   477.44  1199.62     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   576.19   334.29     0.48  4261.61
 MEAN   491.47   533.38   246.56     0.44  4061.78     1.38
 HUB    411.88   485.63    88.84     0.40  4489.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.09     1.11    22.06   624.85     1.03   602.23     0.92     0.91
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 MEAN    24.97     1.10    21.81   623.90     1.03   600.23     0.92     0.91
 HUB     25.23     1.12    21.54   625.94     1.04   598.21     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.67    35.46    31.50     3.96     0.93     0.27     2.90
 MEAN    27.38    27.53    23.50     4.03     0.92     0.27     3.29     0.91
 HUB     34.08    10.54     6.50     4.04     0.92     0.29     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     524.174     246.287     462.711    1203.359       0.436       0.055

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.060      21.994     601.970      46.000      28.025      32.400       4.375

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     483.982     246.287     543.043    1206.734       0.401       0.181

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.027      22.399     605.352     456.573       0.020       0.282

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     459.248       0.000     459.248    1208.673       0.380       0.179

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.583     607.298       0.000       0.060       0.043       0.237

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      24.951       1.104     624.897      20.318     276.453       2.143

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 126662.500       0.404    1097.007 1362198.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.500   EfDer =  0.986

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    153.260    3398.000      24.951     624.897       1.000       1.000       0.980
W Kg/sec =   69.66364

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     99.107    3095.830       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 117900.242  120257.992       1.766     509.668     288.669     390.276       1.352

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   427.26    -0.15   427.26     0.35   494.92
 MEAN    15.91     0.00    -0.02   427.26    -0.15   427.26     0.35
 HUB     13.07     0.00    -0.02   427.26    -0.15   427.26     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.82    47.36     4.46   543.25   691.25    22.89   609.67     0.57
 MEAN    47.85    44.80     3.05   471.87   636.67    22.89   609.67     0.53
 HUB     42.22    38.84     3.38   387.57   576.95    22.89   609.67     0.48

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     17.94   489.78   216.86   439.15  1224.52     0.40
 MEAN    15.50   497.92   227.26   443.03  1222.13     0.41
 HUB     12.59   533.24   289.95   447.51  1219.74     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   540.51   315.12     0.44  3893.10
 MEAN   459.55   500.24   232.30     0.41  3524.27     1.39
 HUB    373.33   455.22    83.38     0.37  3652.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.36     1.10    24.50   643.41     1.03   623.40     0.92     0.90
 MEAN    27.12     1.09    24.19   641.66     1.03   620.98     0.92     0.90
 HUB     27.20     1.09    23.86   642.27     1.03   618.55     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.28    35.66    31.50     4.16     0.93     0.27     2.90
 MEAN    27.16    27.67    23.50     4.17     0.91     0.27     3.34     0.90
 HUB     32.94    10.55     6.50     4.05     0.91     0.27     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     503.228     231.424     446.857    1222.462       0.412      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.168      24.174     621.319      46.000      27.379      33.000       5.621

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     473.219     231.424     526.776    1224.864       0.386       0.087

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.102      24.448     623.764     440.827       0.042       0.278

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     441.423       0.000     441.423    1227.244       0.360       0.194

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.766     626.189       0.000       0.060       0.047       0.192

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.847      27.085       1.086     642.443      17.546     296.689       2.300

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 109432.133       0.387     947.777 1405795.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    745374.94   6455.5903    149.7197      1.7929      0.7963      7.4999      1.2288


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*******************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 90%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.961    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   68.61877
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
147.474	3384.617	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
116131.867	118454.250	1.936	831.557	429.477	619.754	1.443

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	352.30	-0.12	352.30	0.32	609.32
MEAN	17.06	0.00	-0.02	352.30	-0.12	352.30	0.32	
HUB	12.51	0.00	-0.02	352.30	-0.12	352.30	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.07	50.47	9.60	611.74	706.04	14.09	512.44	0.64
MEAN	55.15	47.20	7.95	505.89	616.57	14.09	512.44	0.56
HUB	46.49	38.62	7.87	370.96	511.68	14.09	512.44	0.46

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	587.46	360.70	463.68	1128.80	0.52
MEAN	18.04	613.80	391.00	473.15	1124.01	0.55
HUB	15.00	695.84	493.88	490.19	1116.24	0.62

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	611.74	527.27	251.04	0.47	7443.83	
MEAN	534.83	494.53	143.82	0.44	7054.16	1.40
HUB	444.80	492.64	49.08	0.44	7409.66	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.63	1.23	15.49	558.27	1.07	529.45	0.92	0.91
MEAN	18.43	1.22	15.05	556.41	1.06	524.95	0.92	0.91
HUB	18.61	1.23	14.32	558.11	1.07	517.67	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.88	28.43	24.20	4.23	0.93	0.34	2.90	
MEAN	39.57	16.91	12.70	4.21	0.93	0.29	3.51	0.91
HUB	45.21	-5.72	-9.30	3.58	0.93	0.15	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	622.556	390.241	485.065	1124.250	0.554	-0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.523	15.036	525.224	24.000	38.817	35.400	-3.417

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	506.874	390.241	639.694	1135.869	0.446	0.321

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.472	16.110	536.137	528.796	0.024	0.458

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	467.421	0.000	467.421	1139.265	0.410	0.377

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.395	539.347	0.000	0.060	0.041	0.400

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	18.413	1.219	557.596	34.786	206.238	1.599

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
216571.438	0.579	1847.562	1481373.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.953 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
150.961	3398.000	18.413	557.596	1.000	1.000	0.980

W Kg/sec = 68.61877

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
124.958	3277.342	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
116131.867	118454.250	1.623	590.487	363.912	474.134	1.303

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	445.19	-0.15	445.19	0.39	587.72
MEAN	18.08	0.00	-0.02	445.19	-0.15	445.19	0.39	
HUB	15.21	0.00	-0.02	445.19	-0.15	445.19	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.86	46.36	7.50	609.37	754.79	16.58	541.05	0.66
MEAN	50.30	42.30	8.00	536.08	696.95	16.58	541.05	0.61
HUB	45.38	37.84	7.54	451.02	633.84	16.58	541.05	0.56

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	533.91	287.70	449.77	1162.68	0.46
MEAN	18.01	545.11	298.65	456.02	1159.19	0.47
HUB	15.22	590.96	367.09	463.11	1155.71	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	550.72	317.81	0.47	5878.04	
MEAN	534.05	513.19	235.41	0.44	5381.38	1.48
HUB	451.41	470.72	84.32	0.41	5590.59	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.53	1.17	18.63	585.58	1.05	561.78	0.92	0.91
MEAN	21.25	1.15	18.26	583.22	1.05	558.41	0.92	0.91
HUB	21.37	1.16	17.87	584.21	1.05	555.05	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.61	35.25	31.50	3.75	0.93	0.34	2.90	
MEAN	33.22	27.30	23.50	3.80	0.93	0.33	3.30	0.91
HUB	38.40	10.32	6.50	3.82	0.93	0.33	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	870.282	299.484	817.130	1119.776	0.777	-1.260

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.353	14.319	521.094	46.000	20.128	30.600	10.472

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	834.704	299.484	886.804	1125.207	0.742	-1.135

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	21.198	14.703	526.159	345.258	0.059	0.163

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	828.781	0.000	828.781	1126.218	0.736	0.095

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	14.617	526.994	0.000	0.060	0.136	-1.163

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.788	20.957	1.138	584.338	26.742	237.872	1.844

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
166573.438	0.454	1421.031	1341027.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 7.953 EfDer = 0.805

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
150.961	3398.000	20.957	584.338	1.000	1.000	0.680

W Kg/sec = 68.61877

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
112.389	3201.470	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
116131.867	118454.250	1.156	378.495	327.323	293.880	0.898

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	717.60	-0.25	717.60	0.63	560.70
MEAN	17.74	0.00	-0.02	717.60	-0.25	717.60	0.63	
HUB	15.05	0.00	-0.02	717.60	-0.25	717.60	0.63	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	39.68	46.36	-6.68	595.14	932.43	16.05	541.35	0.82
MEAN	36.25	43.40	-7.15	526.00	889.88	16.05	541.35	0.78
HUB	31.89	38.84	-6.95	446.28	845.18	16.05	541.35	0.74

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	515.82	222.88	465.19	1184.52	0.44
MEAN	17.51	528.58	245.45	468.14	1182.82	0.45
HUB	14.85	575.12	326.75	473.28	1181.15	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	591.01	364.55	0.50	4420.24	
MEAN	519.12	542.26	273.68	0.46	4301.33	1.73
HUB	440.35	486.72	113.60	0.41	4856.00	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.96	1.10	20.15	605.37	1.04	583.16	0.92	0.74
MEAN	22.90	1.09	19.97	604.81	1.04	581.49	0.92	0.74
HUB	23.17	1.11	19.69	607.45	1.04	579.84	0.92	0.74

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.60	38.08	31.50	6.58	0.93	0.41	2.90	
MEAN	27.67	30.31	23.50	6.81	0.87	0.43	3.28	0.74
HUB	34.62	13.50	6.50	7.00	0.87	0.47	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.805

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

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     17.392     534.714     247.058     474.216    1183.331       0.452       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.980      19.973     582.010      46.000      27.519      31.500       3.981

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     489.838     247.058     548.615    1187.226       0.413       0.153

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.948      20.408     585.848     471.992       0.020       0.267

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     475.033       0.000     475.033    1188.433       0.400       0.170

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.493     587.040       0.000       0.060       0.042       0.181

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.692      22.881       1.092     605.877      21.539     284.296       2.204

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 134223.062       0.389    1145.051 2131604.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.996

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    150.961    3398.000      22.881     605.877       1.000       1.000       0.980
W Kg/sec =   68.61877

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    104.819    3144.049       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 116131.867  118454.250       1.681     513.330     305.292     401.059       1.314

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   445.07    -0.15   445.07     0.37   528.42
 MEAN    16.97     0.00    -0.02   445.07    -0.15   445.07     0.37
 HUB     14.32     0.00    -0.02   445.07    -0.15   445.07     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.08    46.36     5.72   571.12   724.18    20.78   589.35     0.61
 MEAN    48.52    43.80     4.72   503.23   671.93    20.78   589.35     0.56
 HUB     43.66    37.84     5.82   424.63   615.25    20.78   589.35     0.52

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   512.12   236.53   454.22  1206.65     0.42
 MEAN    16.57   523.35   252.85   458.22  1204.37     0.43
 HUB     13.89   566.19   325.99   462.93  1202.09     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   557.54   323.32     0.46  4468.62
 MEAN   491.47   516.63   238.62     0.43  4193.30     1.41
 HUB    411.88   470.84    85.90     0.39  4530.13

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.54     1.12    22.56   627.13     1.04   605.25     0.92     0.91
 MEAN    25.37     1.11    22.28   625.83     1.03   602.97     0.92     0.91
 HUB     25.58     1.12    21.97   627.43     1.04   600.68     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.51    35.44    31.50     3.94     0.93     0.29     2.90
 MEAN    28.89    27.51    23.50     4.01     0.92     0.29     3.29     0.91
 HUB     35.15    10.51     6.50     4.01     0.92     0.30     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     515.486     254.272     448.410    1206.007       0.427       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.462      22.454     604.622      46.000      29.555      32.400       2.845

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     467.902     254.272     532.529    1209.895       0.387       0.208

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.436      22.941     608.527     456.573       0.018       0.304

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     444.114       0.000     444.114    1211.694       0.367       0.206

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.117     610.337       0.000       0.060       0.039       0.263

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      25.367       1.109     626.796      20.919     266.438       2.065

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 130411.711       0.416    1112.537 1333621.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.961    3398.000      25.367     626.796       1.000       1.000       0.980
W Kg/sec =   68.61877

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.164    3091.139       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 116131.867  118454.250       1.820     509.668     280.097     390.276       1.393

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   413.49    -0.14   413.49     0.34   494.17
 MEAN    15.91     0.00    -0.02   413.49    -0.14   413.49     0.34
 HUB     13.07     0.00    -0.02   413.49    -0.14   413.49     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.73    47.36     5.37   543.25   682.82    23.41   612.53     0.56
 MEAN    48.78    44.80     3.98   471.87   627.51    23.41   612.53     0.52
 HUB     43.16    38.84     4.32   387.57   566.83    23.41   612.53     0.47

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   481.38   228.08   423.92  1227.98     0.39
 MEAN    15.50   488.50   235.39   428.04  1225.34     0.40
 HUB     12.59   522.54   292.96   432.69  1222.71     0.43
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   521.59   303.90     0.42  4094.39
 MEAN   459.55   483.18   224.16     0.39  3650.31     1.42
 HUB    373.33   440.09    80.37     0.36  3690.22

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.95     1.10    25.14   646.26     1.03   626.93     0.92     0.91
 MEAN    27.67     1.09    24.79   644.15     1.03   624.25     0.92     0.91
 HUB     27.69     1.09    24.42   644.34     1.03   621.57     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.28    35.64    31.50     4.14     0.93     0.29     2.90
 MEAN    28.81    27.64    23.50     4.14     0.92     0.29     3.34     0.91
 HUB     34.10    10.52     6.50     4.02     0.92     0.29     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     493.786     239.711     431.698    1225.665       0.403      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.711      24.777     624.581      46.000      29.042      33.000       3.958

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     455.860     239.711     515.043    1228.609       0.371       0.123

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.662      25.152     627.585     440.827       0.036       0.302

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     425.590       0.000     425.590    1230.786       0.346       0.225

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.449     629.811       0.000       0.060       0.042       0.222

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      27.645       1.090     644.919      18.124     284.852       2.208

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  113041.695       0.399     964.354 1375892.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    760821.31   6490.5356    147.4741      1.8300      0.8100      7.9534      1.2336


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 90%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.546   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     147.976    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   67.26170

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     144.557    3384.617       1.402       0.249      53.349      32.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
113835.133	116111.594	1.975	831.557	420.983	619.754	1.472

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	344.58	-0.12	344.58	0.31	609.32
MEAN	17.06	0.00	-0.02	344.58	-0.12	344.58	0.31	
HUB	12.51	0.00	-0.02	344.58	-0.12	344.58	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.61	50.47	10.14	611.74	702.22	14.13	512.89	0.63
MEAN	55.75	47.20	8.55	505.89	612.19	14.13	512.89	0.55
HUB	47.12	38.62	8.50	370.96	506.39	14.13	512.89	0.46

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	582.47	366.77	452.49	1129.95	0.52
MEAN	18.04	607.43	394.44	461.94	1125.01	0.54
HUB	15.00	686.79	492.73	478.44	1117.26	0.61

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	611.74	514.55	244.97	0.46	7568.97	
MEAN	534.83	482.80	140.38	0.43	7116.17	1.43
HUB	444.80	480.83	47.93	0.43	7392.38	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.69	1.24	15.59	558.86	1.07	530.53	0.92	0.91
MEAN	18.46	1.22	15.13	556.71	1.06	525.89	0.92	0.91
HUB	18.60	1.23	14.41	558.02	1.07	518.63	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.03	28.43	24.20	4.23	0.93	0.36	2.90	
MEAN	40.49	16.90	12.70	4.20	0.93	0.31	3.51	0.91
HUB	45.84	-5.72	-9.30	3.58	0.93	0.16	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	615.758	393.675	473.475	1125.291	0.547	-0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.547	15.127	526.197	24.000	39.742	35.400	-4.342

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	494.043	393.675	631.711	1137.291	0.434	0.339

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.493	16.242	537.479	528.796	0.025	0.473

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	456.108	0.000	456.108	1140.471	0.400	0.389

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.505	540.490	0.000	0.060	0.043	0.413

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.875	18.430	1.220	557.866	35.056	202.788	1.572

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
218251.031	0.583	1825.068	1448913.375

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.546   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3398.000      18.430     557.866       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    122.400    3276.550       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.657     590.487     356.463     474.134       1.330

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   434.61    -0.15   434.61     0.38   587.57
 MEAN    18.08     0.00    -0.02   434.61    -0.15   434.61     0.38
 HUB     15.21     0.00    -0.02   434.61    -0.15   434.61     0.38

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.51    46.36     8.15   609.37   748.60    16.68   542.09     0.66
 MEAN    50.98    42.30     8.68   536.08   690.24    16.68   542.09     0.60
 HUB     46.07    37.84     8.23   451.02   626.45    16.68   542.09     0.55

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   528.98   295.71   438.60  1164.21     0.45
 MEAN    18.01   539.17   304.50   444.96  1160.54     0.46
 HUB     15.22   583.76   369.23   452.15  1156.88     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   536.98   309.80     0.46  6041.54
 MEAN   534.05   500.68   229.55     0.43  5486.69     1.50
 HUB    451.41   459.56    82.18     0.40  5623.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.63     1.17    18.77   586.63     1.05   563.27     0.92     0.91
 MEAN    21.32     1.16    18.39   583.99     1.05   559.71     0.92     0.91
 HUB     21.40     1.16    17.98   584.64     1.05   556.18     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.99    35.24    31.50     3.74     0.93     0.35     2.90
 MEAN    34.38    27.29    23.50     3.79     0.93     0.34     3.30     0.91
 HUB     39.24    10.30     6.50     3.80     0.93     0.34     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     840.564     305.352     783.140    1125.122       0.747      -1.173

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.423      14.786     526.087      46.000      21.301      30.600       9.299

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     794.679     305.352     851.325    1131.802       0.702      -0.998

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.650      21.295      15.317     532.352     345.258       0.052       0.186

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     17.823     786.047       0.000     786.047    1133.070       0.694       0.167

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      15.298     533.497       0.000       0.060       0.112      -1.004

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.813      21.109       1.145     585.086      27.220     231.926       1.798

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 169552.312       0.462    1417.838 1309304.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.546   EfDer =  0.828

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3398.000      21.109     585.086       1.000       1.000       0.680
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    109.442    3199.423       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.187     378.495     318.740     293.880       0.922

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   688.04    -0.24   688.04     0.60   560.34
 MEAN    17.74     0.00    -0.02   688.04    -0.24   688.04     0.60
 HUB     15.05     0.00    -0.02   688.04    -0.24   688.04     0.60

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     40.87    46.36    -5.49   595.14   909.87    16.54   545.57     0.79
 MEAN    37.41    43.40    -5.99   526.00   866.21    16.54   545.57     0.76
 HUB     32.98    38.84    -5.86   446.28   820.23    16.54   545.57     0.72

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   507.56   236.63   449.02  1187.31     0.43
 MEAN    17.51   519.59   255.71   452.31  1185.24     0.44
 HUB     14.85   564.92   331.45   457.46  1183.23     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   569.81   350.80     0.48  4692.35
 MEAN   519.12   523.42   263.41     0.44  4480.87     1.75
 HUB    440.35   470.24   108.90     0.40  4925.62

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.32     1.10    20.56   607.42     1.04   585.91     0.92     0.76
 MEAN    23.22     1.10    20.34   606.41     1.04   583.87     0.92     0.76
 HUB     23.43     1.11    20.04   608.53     1.04   581.89     0.92     0.76

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.79    38.00    31.50     6.50     0.93     0.42     2.90
 MEAN    29.48    30.21    23.50     6.71     0.87     0.44     3.28     0.76
 HUB     35.93    13.39     6.50     6.89     0.87     0.48     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.828

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     525.429     257.392     458.067    1185.765       0.443       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     23.292      20.351     584.406      46.000      29.332      31.500       2.168

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     471.777     257.392     537.423    1190.287       0.396       0.187

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.267      20.877     588.872     471.992       0.018       0.294

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     457.561       0.000     457.561    1191.401       0.384       0.202

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.959     589.975       0.000       0.060       0.038       0.214

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.720      23.207       1.099     607.451      22.365     270.623       2.098

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 139376.250       0.404    1165.498 2054057.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.546   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3398.000      23.207     607.451       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.435    3139.972       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.738     513.330     295.436     401.059       1.358

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   429.07    -0.15   429.07     0.36   527.74
 MEAN    16.97     0.00    -0.02   429.07    -0.15   429.07     0.36
 HUB     14.32     0.00    -0.02   429.07    -0.15   429.07     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.09    46.36     6.73   571.12   714.45    21.22   592.09     0.60
 MEAN    49.56    43.80     5.76   503.23   661.43    21.22   592.09     0.55
 HUB     44.71    37.84     6.87   424.63   603.77    21.22   592.09     0.51

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   502.87   249.25   436.75  1210.13     0.42
 MEAN    16.57   513.05   262.09   441.05  1207.55     0.42
 HUB     13.89   554.44   329.38   446.00  1204.98     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   535.93   310.60     0.44  4708.65
 MEAN   491.47   497.14   229.38     0.41  4346.30     1.44
 HUB    411.88   453.57    82.51     0.38  4577.16

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.05     1.12    23.13   629.85     1.04   608.75     0.92     0.91
 MEAN    25.83     1.11    22.81   628.13     1.03   606.16     0.92     0.91
 HUB     25.97     1.12    22.46   629.22     1.04   603.57     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.71    35.42    31.50     3.92     0.93     0.31     2.90
 MEAN    30.72    27.48    23.50     3.98     0.92     0.31     3.29     0.91
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 HUB     36.45    10.48     6.50     3.98     0.92     0.32     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     505.845     263.560     431.758    1209.088       0.418       0.053

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.919      22.976     607.715      46.000      31.401      32.400       0.999

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     449.371     263.560     520.959    1213.558       0.370       0.240

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.898      23.556     612.217     456.573       0.017       0.332

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     426.713       0.000     426.713    1215.198       0.351       0.236

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.721     613.873       0.000       0.060       0.037       0.292

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      25.834       1.113     629.067      21.616     255.244       1.979

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 134762.188       0.430    1126.914 1298087.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.546   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3398.000      25.834     629.067       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.726    3085.553       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.887     509.668     270.085     390.276       1.445

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   397.62    -0.14   397.62     0.33   493.28
 MEAN    15.91     0.00    -0.02   397.62    -0.14   397.62     0.33
 HUB     13.07     0.00    -0.02   397.62    -0.14   397.62     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.81    47.36     6.45   543.25   673.32    23.99   615.88     0.55
 MEAN    49.89    44.80     5.09   471.87   617.16    23.99   615.88     0.51
 HUB     44.28    38.84     5.44   387.57   555.35    23.99   615.88     0.46

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   472.57   240.78   406.62  1231.94     0.38
 MEAN    15.50   478.27   244.66   410.95  1229.04     0.39
 HUB     12.59   510.58   296.40   415.75  1226.15     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   500.14   291.20     0.41  4322.11
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 MEAN   459.55   463.74   214.89     0.38  3793.89     1.46
 HUB    373.33   422.81    76.94     0.34  3733.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.62     1.11    25.86   649.62     1.03   630.99     0.92     0.91
 MEAN    28.27     1.09    25.47   647.10     1.03   628.02     0.92     0.91
 HUB     28.23     1.09    25.05   646.82     1.03   625.07     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.63    35.61    31.50     4.11     0.93     0.32     2.90
 MEAN    30.77    27.61    23.50     4.11     0.92     0.31     3.34     0.91
 HUB     35.49    10.48     6.50     3.98     0.92     0.30     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     483.562     249.151     414.434    1229.346       0.393      -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.318      25.451     628.341      46.000      31.014      33.000       1.986

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     436.374     249.151     502.492    1232.883       0.354       0.163

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.283      25.935     631.962     440.827       0.032       0.331

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     407.759       0.000     407.759    1234.847       0.330       0.260

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.209     633.977       0.000       0.060       0.038       0.257

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      28.266       1.094     647.846      18.779     271.969       2.108

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  117139.406       0.414     979.548 1338918.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    779081.25   6514.8662    144.5575      1.8710      0.8228      8.5462      1.2392


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 90%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    142.400    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  112136.125  114378.609       2.005     831.557     414.700     619.754       1.494
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ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	338.90	-0.12	338.90	0.30	609.32
MEAN	17.06	0.00	-0.02	338.90	-0.12	338.90	0.30	
HUB	12.51	0.00	-0.02	338.90	-0.12	338.90	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.02	50.47	10.55	611.74	699.45	14.16	513.22	0.63
MEAN	56.19	47.20	8.99	505.89	609.01	14.16	513.22	0.55
HUB	47.59	38.62	8.97	370.96	502.55	14.16	513.22	0.45

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	579.00	371.18	444.37	1130.76	0.51
MEAN	18.04	602.89	396.93	453.79	1125.72	0.54
HUB	15.00	680.25	491.88	469.89	1117.99	0.61

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	611.74	505.31	240.56	0.45	7659.92	
MEAN	534.83	474.28	137.89	0.42	7161.06	1.45
HUB	444.80	472.24	47.08	0.42	7379.62	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.73	1.24	15.66	559.30	1.07	531.30	0.92	0.91
MEAN	18.48	1.22	15.20	556.92	1.07	526.56	0.92	0.91
HUB	18.59	1.23	14.47	557.96	1.07	519.32	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.87	28.43	24.20	4.23	0.93	0.37	2.90	
MEAN	41.18	16.90	12.70	4.20	0.93	0.32	3.51	0.91
HUB	46.31	-5.72	-9.30	3.58	0.93	0.17	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	610.915	396.160	465.053	1126.030	0.543	-0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.563	15.191	526.888	24.000	40.426	35.400	-5.026

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	484.775	396.160	626.059	1138.298	0.426	0.351

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.507	16.334	538.432	528.796	0.026	0.483

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	447.921	0.000	447.921	1141.329	0.392	0.398

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.580	541.303	0.000	0.060	0.045	0.422

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.873	18.441	1.221	558.061	35.251	200.274	1.553

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
219467.391	0.586	1807.848	1425047.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

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 RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3398.000      18.441     558.061       1.000       1.000       0.980
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.527    3275.976       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
112136.125  114378.609       1.682     590.487     351.010     474.134       1.351

    ROTOR LEADING EDGE CONDITIONS, STAGE             2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   426.95    -0.15   426.95     0.37   587.47
MEAN    18.08     0.00    -0.02   426.95    -0.15   426.95     0.37
HUB     15.21     0.00    -0.02   426.95    -0.15   426.95     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.99    46.36     8.63   609.37   744.17    16.74   542.84     0.65
MEAN    51.47    42.30     9.17   536.08   685.43    16.74   542.84     0.60
HUB     46.58    37.84     8.74   451.02   621.16    16.74   542.84     0.54

     ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
TIP     20.42   525.63   301.47   430.58  1165.29     0.45
MEAN    18.01   535.03   308.69   437.00  1161.50     0.46
HUB     15.22   578.63   370.76   444.24  1157.71     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    605.52   527.11   304.05     0.45  6159.03
MEAN   534.05   491.69   225.36     0.42  5562.21     1.52
HUB    451.41   451.51    80.65     0.39  5646.30

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.71     1.18    18.87   587.39     1.05   564.32     0.92     0.91
MEAN    21.37     1.16    18.48   584.54     1.05   560.64     0.92     0.91
HUB     21.42     1.16    18.06   584.94     1.05   556.99     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.00    35.23    31.50     3.73     0.93     0.36     2.90
MEAN    35.24    27.28    23.50     3.78     0.93     0.35     3.30     0.91
HUB     39.85    10.29     6.50     3.79     0.93     0.35     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     821.205     309.560     760.625    1128.563       0.728      -1.118

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.469      15.088     529.312      46.000      22.145      30.600       8.455

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     768.965     309.560     828.935    1135.933       0.677      -0.911

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.650      21.357      15.707     536.248     345.258       0.047       0.202

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     759.236       0.000     759.236    1137.280       0.668       0.209

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.650      15.720     537.492       0.000       0.060       0.098      -0.907

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.827      21.203       1.150     585.624      27.563     227.722       1.765

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 171689.312       0.468    1414.280 1286138.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  0.846

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3398.000      21.203     585.624       1.000       1.000       0.680
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    107.383    3197.952       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 112136.125  114378.609       1.210     378.495     312.743     293.880       0.940

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   668.54    -0.23   668.54     0.58   560.08
 MEAN    17.74     0.00    -0.02   668.54    -0.23   668.54     0.58
 HUB     15.05     0.00    -0.02   668.54    -0.23   668.54     0.58

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     41.69    46.36    -4.67   595.14   895.22    16.85   548.31     0.78
 MEAN    38.21    43.40    -5.19   526.00   850.80    16.85   548.31     0.74
 HUB     33.74    38.84    -5.10   446.28   803.94    16.85   548.31     0.70

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   502.26   246.03   437.87  1189.20     0.42
 MEAN    17.51   513.67   262.74   441.39  1186.90     0.43
 HUB     14.85   558.02   334.64   446.54  1184.66     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   555.23   341.40     0.47  4878.54
 MEAN   519.12   510.45   256.39     0.43  4603.73     1.76
 HUB    440.35   458.88   105.71     0.39  4972.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.56     1.11    20.84   608.84     1.04   587.78     0.92     0.77
 MEAN    23.42     1.10    20.59   607.53     1.04   585.51     0.92     0.77
 HUB     23.61     1.11    20.28   609.29     1.04   583.30     0.92     0.77

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.33    37.94    31.50     6.44     0.93     0.43     2.90
 MEAN    30.76    30.15    23.50     6.65     0.88     0.45     3.28     0.77
 HUB     36.85    13.32     6.50     6.82     0.88     0.48     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.846

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     519.313     264.463     446.929    1187.424       0.437       0.004

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.501      20.605     586.042      46.000      30.614      31.500       0.886

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	459.443	264.463	530.121	1192.369	0.385	0.210

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.480	21.192	590.934	471.992	0.017	0.313

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	445.668	0.000	445.668	1193.418	0.373	0.224

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.269	591.974	0.000	0.060	0.037	0.237

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.739	23.422	1.105	608.555	22.930	261.816	2.030

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
142898.000	0.414	1177.113	2001480.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 8.987 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
145.767	3398.000	23.422	608.555	1.000	1.000	0.980

W Kg/sec = 66.25780

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
99.095	3137.125	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
112136.125	114378.609	1.779	513.330	288.622	401.059	1.390

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	418.14	-0.14	418.14	0.35	527.26
MEAN	16.97	0.00	-0.02	418.14	-0.14	418.14	0.35	
HUB	14.32	0.00	-0.02	418.14	-0.14	418.14	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.80	46.36	7.44	571.12	707.95	21.52	593.96	0.59
MEAN	50.28	43.80	6.48	503.23	654.40	21.52	593.96	0.55
HUB	45.45	37.84	7.61	424.63	596.05	21.52	593.96	0.50

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	497.07	257.79	425.00	1212.46	0.41
MEAN	16.57	506.38	268.30	429.46	1209.70	0.42
HUB	13.89	546.64	331.67	434.53	1206.94	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	521.41	302.06	0.43	4869.92	
MEAN	491.47	483.98	223.17	0.40	4449.20	1.47
HUB	411.88	441.87	80.22	0.37	4608.91	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.39	1.13	23.51	631.72	1.04	611.10	0.92	0.91
MEAN	26.13	1.12	23.16	629.72	1.03	608.32	0.92	0.91
HUB	26.23	1.12	22.78	630.48	1.04	605.54	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.24	35.40	31.50	3.90	0.93	0.33	2.90	
MEAN	31.99	27.46	23.50	3.96	0.93	0.32	3.29	0.91
HUB	37.35	10.46	6.50	3.96	0.93	0.33	3.90	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     499.623     269.808     420.508    1211.168       0.413       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.219      23.318     609.809      46.000      32.685      32.400      -0.285

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     436.958     269.808     513.546    1216.022       0.359       0.262

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.200      23.961     614.707     456.573       0.016       0.351

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     415.082       0.000     415.082    1217.559       0.341       0.257

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.115     616.262       0.000       0.060       0.037       0.311

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      26.137       1.116     630.639      22.084     247.948       1.922

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 137687.828       0.439    1134.195 1272706.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3398.000      26.137     630.639       1.000       1.000       0.980
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     90.398    3081.706       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 112136.125  114378.609       1.936     509.668     263.305     390.276       1.482

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   386.98    -0.13   386.98     0.32   492.66
 MEAN    15.91     0.00    -0.02   386.98    -0.13   386.98     0.32
 HUB     13.07     0.00    -0.02   386.98    -0.13   386.98     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.54    47.36     7.18   543.25   667.09    24.37   618.15     0.55
 MEAN    50.65    44.80     5.85   471.87   610.36    24.37   618.15     0.50
 HUB     45.05    38.84     6.21   387.57   547.78    24.37   618.15     0.45

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   467.20   249.19   395.19  1234.57     0.38
 MEAN    15.50   471.79   250.79   399.61  1231.52     0.38
 HUB     12.59   502.78   298.65   404.47  1228.46     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   485.95   282.78     0.39  4472.96
 MEAN   459.55   450.85   208.76     0.37  3888.83     1.48
 HUB    373.33   411.31    74.69     0.33  3761.72
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    29.06     1.11    26.32   651.90     1.03   633.70     0.92     0.91
 MEAN   28.67     1.10    25.90   649.13     1.03   630.56     0.92     0.91
 HUB    28.58     1.09    25.46   648.52     1.03   627.44     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    32.23    35.59    31.50     4.09     0.93     0.34     2.90
 MEAN   32.11    27.58    23.50     4.08     0.92     0.32     3.34     0.91
 HUB    36.44    10.46     6.50     3.96     0.92     0.31     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     477.100     255.393     402.988    1231.808       0.387       -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.711      25.887     630.865      46.000      32.364      33.000       0.636

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     423.603     255.393     494.637    1235.726       0.343       0.189

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.681      26.440     634.884     440.827       0.030       0.351

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     396.047       0.000     396.047    1237.558       0.320       0.282

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.698     636.768       0.000       0.060       0.037       0.279

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      28.663       1.097     649.851      19.213     263.745       2.045

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 119848.633       0.423     987.245 1312608.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    791591.12   6520.6812    142.3999      1.8973      0.8296      8.9875      1.2430


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 90%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 9.453   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    143.448    3398.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   65.20367

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    140.134    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 110352.086  112558.891       2.038     831.557     408.102     619.754       1.519

     ROTOR LEADING EDGE CONDITIONS, STAGE            1
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   332.97    -0.11   332.97     0.30   609.32
MEAN    17.06     0.00    -0.02   332.97    -0.11   332.97     0.30
HUB     12.51     0.00    -0.02   332.97    -0.11   332.97     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.45    50.47    10.98   611.74   696.59    14.19   513.55     0.63
MEAN    56.65    47.20     9.45   505.89   605.73    14.19   513.55     0.54
HUB     48.10    38.62     9.48   370.96   498.56    14.19   513.55     0.45

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   575.55   375.73   435.98  1131.59     0.51
MEAN    18.04   598.29   399.52   445.35  1126.45     0.53
HUB     15.00   673.53   491.00   461.04  1118.73     0.60

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    611.74   495.76   236.01     0.44  7753.70
MEAN   534.83   465.45   135.31     0.41  7207.66     1.47
HUB    444.80   463.35    46.20     0.41  7366.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.77     1.24    15.73   559.74     1.07   532.08     0.92     0.91
MEAN    18.49     1.22    15.26   557.14     1.07   527.25     0.92     0.91
HUB     18.57     1.23    14.53   557.90     1.07   520.01     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.76    28.43    24.20     4.23     0.93     0.38     2.90
MEAN    41.89    16.90    12.70     4.20     0.94     0.33     3.51     0.91
HUB     46.80    -5.72    -9.30     3.58     0.94     0.18     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.994

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     606.005     398.741     456.341    1126.779       0.538      -0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.579      15.255     527.590      24.000      41.146      35.400      -5.746

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     475.231     398.741     620.354    1139.320       0.417       0.364

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.518      16.426     539.400     528.796       0.027       0.494

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     439.478       0.000     439.478    1142.202       0.385       0.407

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.656     542.131       0.000       0.060       0.048       0.431

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.870      18.449       1.221     558.263      35.453     197.666       1.532

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 220724.812       0.590    1789.280 1400116.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.453   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
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    143.448    3398.000      18.449     558.263       1.000       1.000       0.980
W Kg/sec =   65.20367

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.577    3275.384       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 110352.086  112558.891       1.710     590.487     345.331     474.134       1.373

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   419.03    -0.14   419.03     0.37   587.37
 MEAN    18.08     0.00    -0.02   419.03    -0.14   419.03     0.37
 HUB     15.21     0.00    -0.02   419.03    -0.14   419.03     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.49    46.36     9.13   609.37   739.66    16.81   543.60     0.65
 MEAN    51.99    42.30     9.69   536.08   680.53    16.81   543.60     0.60
 HUB     47.12    37.84     9.28   451.02   615.74    16.81   543.60     0.54

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   522.35   307.33   422.37  1166.38     0.45
 MEAN    18.01   530.89   312.98   428.82  1162.46     0.46
 HUB     15.22   573.41   372.31   436.10  1158.56     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   517.02   298.18     0.44  6278.74
 MEAN   534.05   482.46   221.07     0.42  5639.30     1.54
 HUB    451.41   443.22    79.10     0.38  5669.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.77     1.18    18.97   588.16     1.05   565.37     0.92     0.91
 MEAN    21.42     1.16    18.56   585.11     1.05   561.58     0.92     0.91
 HUB     21.43     1.16    18.13   585.26     1.05   557.80     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.04    35.22    31.50     3.72     0.93     0.37     2.90
 MEAN    36.12    27.27    23.50     3.77     0.94     0.36     3.30     0.91
 HUB     40.49    10.28     6.50     3.78     0.94     0.36     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.993

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     802.712     313.855     738.811    1131.818       0.709      -1.065

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.512      15.375     532.371      46.000      23.016      30.600       7.584

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     744.523     313.855     807.973    1139.781       0.653      -0.829

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.650      21.415      16.073     539.889     345.258       0.042       0.216

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     734.126       0.000     734.126    1141.154       0.643       0.246

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.650      16.110     541.174       0.000       0.060       0.085      -0.817

   STAGE EXIT CONDITIONS, STAGE            2
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Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.837	21.287	1.154	586.176	27.913	223.477	1.732

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
173868.859	0.474	1409.447	1262067.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
RESET = 0.000BLEED = 0.000 DPInc = 9.453 EfDer = 0.864

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
143.448	3398.000	21.287	586.176	1.000	1.000	0.680

W Kg/sec = 65.20367

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
105.307	3196.447	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
110352.086	112558.891	1.234	378.495	306.698	293.880	0.958

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	649.69	-0.22	649.69	0.56	559.82
MEAN	17.74	0.00	-0.02	649.69	-0.22	649.69	0.56	
HUB	15.05	0.00	-0.02	649.69	-0.22	649.69	0.56	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	42.50	46.36	-3.86	595.14	881.23	17.15	550.94	0.77
MEAN	39.01	43.40	-4.39	526.00	836.07	17.15	550.94	0.73
HUB	34.50	38.84	-4.34	446.28	788.33	17.15	550.94	0.68

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	497.33	255.33	426.78	1191.05	0.42
MEAN	17.51	508.00	269.67	430.51	1188.53	0.43
HUB	14.85	551.25	337.74	435.68	1186.07	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	540.77	332.10	0.45	5062.58	
MEAN	519.12	497.56	249.45	0.42	4725.02	1.78
HUB	440.35	447.60	102.61	0.38	5018.79	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.80	1.12	21.11	610.27	1.04	589.62	0.92	0.79
MEAN	23.62	1.11	20.83	608.66	1.04	587.12	0.92	0.79
HUB	23.78	1.12	20.50	610.06	1.04	584.69	0.92	0.79

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.89	37.89	31.50	6.39	0.93	0.44	2.90	
MEAN	32.06	30.09	23.50	6.59	0.88	0.45	3.28	0.79
HUB	37.78	13.25	6.50	6.75	0.88	0.49	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.864

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	513.463	271.443	435.848	1189.056	0.432	0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.704	20.850	587.655	46.000	31.914	31.500	-0.414

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	447.265	271.443	523.190	1194.415	0.374	0.234

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.683	21.496	592.964	471.992	0.017	0.332

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	433.956	0.000	433.956	1195.401	0.363	0.246

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.567	593.943	0.000	0.060	0.037	0.258

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.757	23.626	1.110	609.663	23.487	253.492	1.965

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
146371.031	0.424	1186.539	1949556.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 9.453 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
143.448	3398.000	23.626	609.663	1.000	1.000	0.980

W Kg/sec = 65.20367

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
96.764	3134.270	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
110352.086	112558.891	1.821	513.330	281.831	401.059	1.423

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	407.37	-0.14	407.37	0.34	526.78
MEAN	16.97	0.00	-0.02	407.37	-0.14	407.37	0.34	
HUB	14.32	0.00	-0.02	407.37	-0.14	407.37	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.51	46.36	8.15	571.12	701.63	21.80	595.82	0.59
MEAN	51.02	43.80	7.22	503.23	647.56	21.80	595.82	0.54
HUB	46.20	37.84	8.36	424.63	588.54	21.80	595.82	0.49

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	491.76	266.11	413.54	1214.73	0.40
MEAN	16.57	500.09	274.36	418.11	1211.80	0.41
HUB	13.89	539.13	333.92	423.28	1208.86	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	507.24	293.74	0.42	5026.91	
MEAN	491.47	471.12	217.10	0.39	4549.63	1.49
HUB	411.88	430.40	77.96	0.36	4640.13	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.72	1.13	23.86	633.57	1.04	613.40	0.92	0.91
MEAN	26.41	1.12	23.49	631.30	1.04	610.44	0.92	0.91
HUB	26.47	1.12	23.09	631.73	1.04	607.48	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.76	35.39	31.50	3.89	0.93	0.34	2.90	
MEAN	33.27	27.44	23.50	3.94	0.93	0.34	3.29	0.91
HUB	38.27	10.44	6.50	3.94	0.93	0.34	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     493.767     275.905     409.490    1213.203       0.407       0.051

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.504      23.644     611.861      46.000      33.971      32.400      -1.571

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     424.878     275.905     506.602    1218.426       0.349       0.283

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.485      24.346     617.141     456.573       0.016       0.370

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     403.780       0.000     403.780    1219.866       0.331       0.276

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.488     618.600       0.000       0.060       0.037       0.330

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      26.420       1.118     632.205      22.541     240.996       1.868

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 140541.219       0.448    1139.281 1246743.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 9.453   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    143.448    3398.000      26.420     632.205       1.000       1.000       0.980
W Kg/sec =   65.20367

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.114    3077.887       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 110352.086  112558.891       1.986     509.668     256.653     390.276       1.521

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   376.62    -0.13   376.62     0.31   492.05
 MEAN    15.91      0.00    -0.02   376.62    -0.13   376.62     0.31
 HUB     13.07      0.00    -0.02   376.62    -0.13   376.62     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.27    47.36     7.91   543.25   661.14    24.73   620.37     0.54
 MEAN    51.41    44.80     6.61   471.87   603.85    24.73   620.37     0.49
 HUB     45.83    38.84     6.99   387.57   540.51    24.73   620.37     0.44

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   462.35   257.25   384.17  1237.13     0.37
 MEAN    15.50   465.77   256.69   388.65  1233.92     0.38
 HUB     12.59   495.35   300.81   393.56  1230.72     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   472.30   274.73     0.38  4617.40
 MEAN   459.55   438.41   202.86     0.36  3980.18     1.51
 HUB    373.33   400.18    72.52     0.33  3788.92

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.47     1.12    26.76   654.16     1.03   636.33     0.92     0.91
 MEAN    29.03     1.10    26.31   651.13     1.03   633.03     0.92     0.91
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 HUB     28.90     1.09    25.85   650.22     1.03   629.75     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.81    35.57    31.50     4.07     0.93     0.35     2.90
 MEAN    33.44    27.56    23.50     4.06     0.93     0.34     3.34     0.91
 HUB     37.39    10.44     6.50     3.94     0.93     0.33     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     471.106     261.399     391.933    1234.200       0.382      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     29.079      26.296     633.321      46.000      33.701      33.000      -0.701

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     411.372     261.399     487.397    1238.477       0.332       0.214

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      29.051      26.912     637.718     440.827       0.030       0.371

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     384.814       0.000     384.814    1240.188       0.310       0.304

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.155     639.481       0.000       0.060       0.037       0.300

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      29.032       1.099     651.833      19.629     256.037       1.985

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 122448.680       0.433     992.616 1285756.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    803954.69   6517.1631    140.1344      1.9217      0.8347      9.4533      1.2468


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 90%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.741    3398.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    137.490    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 108269.750  110434.914       2.077     831.557     400.401     619.754       1.548

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   326.09    -0.11   326.09     0.29   609.32
 MEAN    17.06     0.00    -0.02   326.09    -0.11   326.09     0.29
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 HUB     12.51     0.00    -0.02   326.09    -0.11   326.09     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.94    50.47    11.47   611.74   693.33    14.23   513.93     0.62
 MEAN    57.20    47.20    10.00   505.89   601.97    14.23   513.93     0.54
 HUB     48.69    38.62    10.07   370.96   493.99    14.23   513.93     0.44

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   571.73   380.93   426.35  1132.52     0.50
 MEAN    18.04   593.09   402.46   435.64  1127.27     0.53
 HUB     15.00   665.84   489.96   450.87  1119.56     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   484.82   230.81     0.43  7860.93
 MEAN   534.83   455.30   132.36     0.40  7260.77     1.49
 HUB    444.80   453.12    45.16     0.40  7350.83

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.82     1.25    15.81   560.26     1.07   532.95     0.92     0.91
 MEAN    18.51     1.23    15.33   557.40     1.07   528.02     0.92     0.91
 HUB     18.56     1.23    14.60   557.83     1.07   520.80     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.78    28.43    24.20     4.23     0.93     0.40     2.90
 MEAN    42.73    16.90    12.70     4.20     0.94     0.34     3.51     0.91
 HUB     47.38    -5.72    -9.30     3.58     0.94     0.20     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     600.463     401.682     446.326    1127.620       0.533       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.595      15.326     528.378      24.000      41.986      35.400      -6.586

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     464.316     401.682     613.953    1140.467       0.407       0.379

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.530      16.529     540.486     528.796       0.029       0.507

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     429.806       0.000     429.806    1143.183       0.376       0.417

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.738     543.063       0.000       0.060       0.051       0.441

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      18.456       1.222     558.493      35.683     194.667       1.509

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 222155.500       0.594    1766.895 1371179.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.741    3398.000      18.456     558.493       1.000       1.000       0.980
W Kg/sec =   63.97328
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
116.321	3274.709	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
108269.750	110434.914	1.743	590.487	338.761	474.134	1.400

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	409.95	-0.14	409.95	0.36	587.24
MEAN	18.08	0.00	-0.02	409.95	-0.14	409.95	0.36	
HUB	15.21	0.00	-0.02	409.95	-0.14	409.95	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.08	46.36	9.72	609.37	734.55	16.89	544.46	0.64
MEAN	52.60	42.30	10.30	536.08	674.97	16.89	544.46	0.59
HUB	47.74	37.84	9.90	451.02	609.60	16.89	544.46	0.53

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	518.83	314.01	413.02	1167.60	0.44
MEAN	18.01	526.33	317.88	419.50	1163.55	0.45
HUB	15.22	567.53	374.08	426.79	1159.51	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	505.53	291.51	0.43	6415.00	
MEAN	534.05	471.92	216.18	0.41	5727.49	1.56
HUB	451.41	433.74	77.33	0.37	5696.77	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.85	1.18	19.07	589.04	1.05	566.56	0.92	0.91
MEAN	21.46	1.16	18.65	585.76	1.05	562.63	0.92	0.91
HUB	21.45	1.16	18.20	585.62	1.05	558.72	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.24	35.21	31.50	3.71	0.93	0.39	2.90	
MEAN	37.15	27.26	23.50	3.76	0.94	0.37	3.30	0.91
HUB	41.23	10.27	6.50	3.77	0.94	0.37	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.990

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	783.055	318.768	715.235	1135.247	0.690	-1.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.556	15.677	535.603	46.000	24.022	30.600	6.578

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	718.526	318.768	786.062	1143.789	0.628	-0.743

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	21.475	16.456	543.694	345.258	0.038	0.232

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	707.745	0.000	707.745	1145.148	0.618	0.283

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	16.511	544.979	0.000	0.060	0.073	-0.724

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.847	21.370	1.158	586.805	28.312	218.703	1.695

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 176352.969       0.481    1402.608 1234287.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.883

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.741    3398.000      21.370     586.805       1.000       1.000       0.680
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.974    3194.734       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 108269.750  110434.914       1.262     378.495     299.903     293.880       0.980

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   629.34    -0.22   629.34     0.55   559.52
 MEAN    17.74     0.00    -0.02   629.34    -0.22   629.34     0.55
 HUB     15.05     0.00    -0.02   629.34    -0.22   629.34     0.55

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.41    46.36    -2.95   595.14   866.33    17.45   553.74     0.75
 MEAN    39.90    43.40    -3.50   526.00   820.35    17.45   553.74     0.71
 HUB     35.35    38.84    -3.49   446.28   771.64    17.45   553.74     0.67

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   492.29   265.58   414.51  1193.08     0.41
 MEAN    17.51   502.02   277.31   418.47  1190.31     0.42
 HUB     14.85   543.93   341.15   423.65  1187.63     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   524.79   321.85     0.44  5265.54
 MEAN   519.12   483.31   241.81     0.41  4858.67     1.80
 HUB    440.35   435.11    99.20     0.37  5069.30

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.06     1.13    21.39   611.86     1.04   591.63     0.92     0.81
 MEAN    23.84     1.12    21.09   609.93     1.04   588.89     0.92     0.81
 HUB     23.95     1.12    20.74   610.93     1.04   586.23     0.92     0.81

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.65    37.83    31.50     6.33     0.93     0.45     2.90
 MEAN    33.53    30.02    23.50     6.52     0.89     0.46     3.28     0.81
 HUB     38.84    13.18     6.50     6.68     0.89     0.49     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.883

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     507.290     279.135     423.588    1190.843       0.426       0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.920      21.111     589.424      46.000      33.384      31.500      -1.884

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     433.889     279.135     515.922    1196.654       0.363       0.260

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.900      21.822     595.190     471.992       0.017       0.355
```

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	421.121	0.000	421.121	1197.569	0.352	0.269

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.885	596.102	0.000	0.060	0.038	0.282

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.775	23.840	1.116	610.906	24.101	244.707	1.897

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
150197.672	0.435	1194.584	1892305.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =10.000 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
140.741	3398.000	23.840	610.906	1.000	1.000	0.980

W Kg/sec = 63.97328

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
94.179	3131.082	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
108269.750	110434.914	1.871	513.330	274.303	401.059	1.462

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	395.53	-0.14	395.53	0.33	526.24
MEAN	16.97	0.00	-0.02	395.53	-0.14	395.53	0.33	
HUB	14.32	0.00	-0.02	395.53	-0.14	395.53	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.30	46.36	8.94	571.12	694.82	22.11	597.85	0.58
MEAN	51.84	43.80	8.04	503.23	640.18	22.11	597.85	0.53
HUB	47.04	37.84	9.20	424.63	580.41	22.11	597.85	0.48

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	486.38	275.14	401.08	1217.19	0.40
MEAN	16.57	493.52	280.94	405.75	1214.08	0.41
HUB	13.89	531.08	336.35	410.99	1210.97	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	491.86	284.71	0.40	5197.22	
MEAN	491.47	457.12	210.52	0.38	4658.64	1.53
HUB	411.88	417.87	75.53	0.35	4673.89	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.06	1.14	24.24	635.63	1.04	615.89	0.92	0.91
MEAN	26.71	1.12	23.84	633.06	1.04	612.74	0.92	0.91
HUB	26.72	1.12	23.41	633.14	1.04	609.60	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.45	35.37	31.50	3.87	0.93	0.36	2.90	
MEAN	34.70	27.42	23.50	3.92	0.93	0.35	3.29	0.91
HUB	39.30	10.41	6.50	3.91	0.93	0.35	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	487.658	282.524	397.480	1215.417	0.401	0.050

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.803      23.986     614.099      46.000      35.405      32.400      -3.005

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     411.790     282.524     499.390    1221.039       0.337       0.307

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.781      24.752     619.793     456.573       0.017       0.392

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     391.553       0.000     391.553    1222.375       0.320       0.297

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.878     621.149       0.000       0.060       0.040       0.349

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      26.714       1.121     633.942      23.037     233.621       1.811

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 143636.094       0.458    1142.397 1217189.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.741    3398.000      26.714     633.942       1.000       1.000       0.980
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     85.620    3073.666       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 108269.750  110434.914       2.044     509.668     249.388     390.276       1.565

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   365.40    -0.13   365.40     0.30   491.38
 MEAN    15.91     0.00    -0.02   365.40    -0.13   365.40     0.30
 HUB     13.07     0.00    -0.02   365.40    -0.13   365.40     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.08    47.36     8.72   543.25   654.80    25.11   622.81     0.54
 MEAN    52.25    44.80     7.45   471.87   596.91    25.11   622.81     0.49
 HUB     46.70    38.84     7.86   387.57   532.75    25.11   622.81     0.44

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   457.55   265.91   372.35  1239.88     0.37
 MEAN    15.50   459.57   263.03   376.86  1236.53     0.37
 HUB     12.59   487.51   303.17   381.79  1233.17     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   457.64   266.07     0.37  4772.68
 MEAN   459.55   425.03   196.53     0.34  4078.30     1.55
 HUB    373.33   388.18    70.17     0.31  3818.52

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.89     1.12    27.21   656.63     1.04   639.17     0.92     0.91
 MEAN    29.41     1.10    26.74   653.33     1.03   635.71     0.92     0.91
 HUB     29.24     1.09    26.25   652.09     1.03   632.27     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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  TIP     35.53    35.55    31.50     4.05     0.93     0.37     2.90
  MEAN    34.91    27.54    23.50     4.04     0.93     0.35     3.34     0.91
  HUB     38.45    10.41     6.50     3.91     0.93     0.34     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.999

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
       R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
       15.219     464.945     267.851     380.039    1236.790       0.376       -0.006

       Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
       29.459       26.719      635.987      46.000      35.176      33.000      -2.176

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
       RCG          Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
       15.219     398.310     267.851     479.995    1241.447       0.321       0.241

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950       29.429      27.401     640.785     440.827       0.031       0.393

     VANED DIFFUSER EXIT:
    R4           C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     372.805       0.000     372.805    1243.035       0.300       0.326

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       27.628     642.426       0.000       0.060       0.038       0.322

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
       0.881       29.408       1.101     654.018      20.076     247.956       1.922

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  125246.312       0.443     996.136 1255246.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     817588.56   6502.6201     137.4901      1.9467      0.8386     10.0004      1.2510


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 90%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.453   EfDer =  0.989

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     138.516     3398.000       15.107     522.810        1.000        1.000        0.980
 W Kg/sec =   62.96178

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     135.316     3384.617        1.402        0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  106557.852  108688.789        2.110     831.557     394.070     619.754       1.573

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   320.46    -0.11   320.46      0.29   609.32
  MEAN    17.06      0.00    -0.02   320.46    -0.11   320.46      0.29
  HUB     12.51      0.00    -0.02   320.46    -0.11   320.46      0.29

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
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TIP     62.36    50.47    11.89   611.74   690.70    14.26   514.23     0.62
MEAN    57.65    47.20    10.45   505.89   598.94    14.26   514.23     0.54
HUB     49.19    38.62    10.57   370.96   490.30    14.26   514.23     0.44

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   568.78   385.13   418.55  1133.25     0.50
MEAN    18.04   588.97   404.85   427.76  1127.92     0.52
HUB     15.00   659.67   489.13   442.61  1120.22     0.59

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    611.74   475.96   226.61     0.42  7947.50
MEAN   534.83   447.07   129.98     0.40  7303.77     1.51
HUB    444.80   444.83    44.33     0.40  7338.36

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.85     1.25    15.87   560.67     1.07   533.65     0.92     0.91
MEAN    18.53     1.23    15.38   557.60     1.07   528.63     0.92     0.91
HUB     18.54     1.23    14.66   557.77     1.07   521.42     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.62    28.43    24.20     4.23     0.93     0.41     2.90
MEAN    43.42    16.90    12.70     4.20     0.94     0.35     3.51     0.91
HUB     47.86    -5.72    -9.30     3.58     0.94     0.21     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    18.071     596.066     404.064     438.210    1128.287       0.528       0.000

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.606      15.381     529.003      24.000      42.678      35.400      -7.278

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     455.506     404.064     608.895    1141.377       0.399       0.391

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.538      16.608     541.349     528.796       0.031       0.518

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    18.083     421.987       0.000     421.987    1143.964       0.369       0.425

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.801     543.805       0.000       0.060       0.054       0.449

   STAGE EXIT CONDITIONS, STAGE             1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.862      18.459       1.222     558.679      35.869     192.229       1.490

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 223313.344       0.597    1748.021 1347516.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =10.453   EfDer =  0.987

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   138.516    3398.000      18.459     558.679       1.000       1.000       0.980
W Kg/sec =   62.96178

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
   114.480    3274.164       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
106557.852	108688.789	1.771	590.487	333.398	474.134	1.422

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	402.60	-0.14	402.60	0.35	587.15
MEAN	18.08	0.00	-0.02	402.60	-0.14	402.60	0.35	
HUB	15.21	0.00	-0.02	402.60	-0.14	402.60	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.55	46.36	10.19	609.37	730.47	16.95	545.14	0.64
MEAN	53.10	42.30	10.80	536.08	670.53	16.95	545.14	0.59
HUB	48.26	37.84	10.42	451.02	604.68	16.95	545.14	0.53

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	516.16	319.36	405.51	1168.56	0.44
MEAN	18.01	522.76	321.79	411.98	1164.41	0.45
HUB	15.22	562.84	375.49	419.28	1160.26	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	496.31	286.16	0.42	6524.09	
MEAN	534.05	463.45	212.26	0.40	5797.92	1.58
HUB	451.41	426.09	75.91	0.37	5718.27	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.90	1.19	19.15	589.74	1.06	567.49	0.92	0.90
MEAN	21.50	1.16	18.72	586.28	1.05	563.46	0.92	0.90
HUB	21.45	1.16	18.26	585.90	1.05	559.45	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.22	35.21	31.50	3.71	0.93	0.40	2.90	
MEAN	37.99	27.26	23.50	3.76	0.94	0.38	3.30	0.90
HUB	41.85	10.26	6.50	3.76	0.94	0.37	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.987

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	768.153	322.693	697.086	1137.823	0.675	-0.968

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.588	15.902	538.039	46.000	24.840	30.600	5.760

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	698.776	322.693	769.687	1146.774	0.609	-0.677

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	21.517	16.740	546.537	345.258	0.035	0.245

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	687.890	0.000	687.890	1148.101	0.599	0.311

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	16.806	547.797	0.000	0.060	0.065	-0.655

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.852	21.428	1.161	587.310	28.631	214.920	1.666

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
178340.078	0.486	1395.985	1211684.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
RESET = 0.000BLEED = 0.000 DPInc =10.453 EfDer = 0.898

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
138.516	3398.000	21.428	587.310	1.000	1.000	0.680

W Kg/sec = 62.96178

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
101.116	3193.361	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
106557.852	108688.789	1.285	378.495	294.493	293.880	0.998

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	613.69	-0.21	613.69	0.53	559.28
MEAN	17.74	0.00	-0.02	613.69	-0.21	613.69	0.53	
HUB	15.05	0.00	-0.02	613.69	-0.21	613.69	0.53	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	44.13	46.36	-2.23	595.14	855.02	17.68	555.87	0.74
MEAN	40.61	43.40	-2.79	526.00	808.40	17.68	555.87	0.70
HUB	36.04	38.84	-2.80	446.28	758.93	17.68	555.87	0.66

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	488.66	273.57	404.90	1194.64	0.41
MEAN	17.51	497.55	283.27	409.03	1191.70	0.42
HUB	14.85	538.32	343.79	414.24	1188.84	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	512.30	313.86	0.43	5423.64	
MEAN	519.12	472.16	235.85	0.40	4962.89	1.82
HUB	440.35	425.34	96.55	0.36	5108.53	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.25	1.13	21.61	613.12	1.04	593.19	0.92	0.82
MEAN	24.00	1.12	21.29	610.93	1.04	590.26	0.92	0.82
HUB	24.08	1.12	20.92	611.62	1.04	587.43	0.92	0.82

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.04	37.78	31.50	6.28	0.93	0.46	2.90	
MEAN	34.70	29.97	23.50	6.47	0.89	0.47	3.28	0.82
HUB	39.69	13.12	6.50	6.62	0.89	0.50	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.898

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	502.680	285.132	413.989	1192.226	0.422	0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.084	21.309	590.796	46.000	34.557	31.500	-3.057

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	423.478	285.132	510.523	1198.389	0.353	0.281

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.061	22.069	596.919	471.992	0.018	0.372

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	411.154	0.000	411.154	1199.250	0.343	0.286

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.123	597.777	0.000	0.060	0.040	0.299

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.789	23.999	1.120	611.889	24.579	238.109	1.846

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
153179.078	0.444	1199.034	1847450.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =10.453 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
138.516	3398.000	23.999	611.889	1.000	1.000	0.980

W Kg/sec = 62.96178

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
92.150	3128.566	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
106557.852	108688.789	1.913	513.330	268.396	401.059	1.494

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	386.32	-0.13	386.32	0.32	525.82
MEAN	16.97	0.00	-0.02	386.32	-0.13	386.32	0.32	
HUB	14.32	0.00	-0.02	386.32	-0.13	386.32	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.93	46.36	9.57	571.12	689.62	22.34	599.44	0.57
MEAN	52.49	43.80	8.69	503.23	634.53	22.34	599.44	0.53
HUB	47.71	37.84	9.87	424.63	574.17	22.34	599.44	0.48

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	482.52	282.06	391.49	1219.08	0.40
MEAN	16.57	488.66	286.04	396.20	1215.84	0.40
HUB	13.89	524.93	338.19	401.47	1212.60	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	480.04	277.80	0.39	5327.79	
MEAN	491.47	446.29	205.43	0.37	4743.00	1.55
HUB	411.88	408.17	73.69	0.34	4699.37	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.31	1.14	24.52	637.23	1.04	617.80	0.92	0.91
MEAN	26.94	1.12	24.10	634.45	1.04	614.52	0.92	0.91
HUB	26.91	1.12	23.65	634.24	1.04	611.25	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.77	35.36	31.50	3.86	0.93	0.37	2.90	
MEAN	35.83	27.41	23.50	3.91	0.93	0.36	3.29	0.91
HUB	40.11	10.40	6.50	3.90	0.93	0.36	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	483.155	287.646	388.199	1217.125	0.397	0.048

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
27.023	24.239	615.827	46.000	36.538	32.400	-4.138

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	401.724	287.646	494.087	1223.052	0.328	0.326

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	26.999	25.054	621.840	456.573	0.018	0.409

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	382.159	0.000	382.159	1224.310	0.312	0.313

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	25.166	623.120	0.000	0.060	0.042	0.364

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.876	26.927	1.122	635.306	23.417	228.062	1.768

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
146012.656	0.466	1142.937	1193421.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =10.453 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
138.516	3398.000	26.927	635.306	1.000	1.000	0.980

W Kg/sec = 62.96178

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
83.688	3070.365	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
106557.852	108688.789	2.091	509.668	243.762	390.276	1.601

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	356.76	-0.12	356.76	0.29	490.85
MEAN	15.91	0.00	-0.02	356.76	-0.12	356.76	0.29	
HUB	13.07	0.00	-0.02	356.76	-0.12	356.76	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.71	47.36	9.35	543.25	650.02	25.39	624.69	0.53
MEAN	52.92	44.80	8.12	471.87	591.66	25.39	624.69	0.48
HUB	47.38	38.84	8.54	387.57	526.86	25.39	624.69	0.43

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	454.15	272.48	363.33	1241.99	0.37
MEAN	15.50	455.04	267.86	367.85	1238.53	0.37
HUB	12.59	481.58	304.91	372.76	1235.07	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	531.98	446.48	259.50	0.36	4890.51	
MEAN	459.55	414.80	191.70	0.33	4153.10	1.57
HUB	373.33	378.99	68.42	0.31	3840.42	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	30.20	1.12	27.54	658.55	1.04	641.35	0.92	0.91
MEAN	29.69	1.10	27.05	655.05	1.03	637.78	0.92	0.91
HUB	29.48	1.09	26.54	653.56	1.03	634.22	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.87	35.54	31.50	4.04	0.93	0.38	2.90	
MEAN	36.06	27.53	23.50	4.03	0.93	0.37	3.34	0.91
HUB	39.28	10.40	6.50	3.90	0.93	0.35	4.06	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      460.440     272.769     370.947     1238.777       0.372       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     29.735      27.028      638.038      46.000      36.328       33.000      -3.328

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      388.389     272.769     474.604     1243.720       0.312       0.261

   BlockageThr  PtTh        PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.950       29.702      27.759      643.139      440.827       0.032       0.410

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4        cp 3-4
     14.701      363.676       0.000     363.676     1245.218       0.292       0.343

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       27.972      644.690       0.000       0.060       0.040       0.339

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.879       29.679        1.102      655.721       20.415      241.942       1.876

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 127367.188       0.450     996.987 1230738.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    828212.31    6482.9644     135.3162      1.9646       0.8404      10.4528       1.2542


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 90%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.990   EfDer =  0.986

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    135.889     3398.000       15.107      522.810        1.000        1.000        0.980
 W Kg/sec =   61.76752

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
    132.749     3384.617        1.402        0.249       53.349       32.000       0.050

   CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
  104536.672  106627.180        2.151      831.557      386.595      619.754       1.603

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00     -0.02    313.85     -0.11    313.85      0.28    609.32
  MEAN    17.06      0.00     -0.02    313.85     -0.11    313.85      0.28
  HUB     12.51      0.00     -0.02    313.85     -0.11    313.85      0.28

       BetaFlo    BetaBlade Incid    U1        W1        Ps1       Ts1      Rel Mach
  TIP     62.84     50.47     12.37    611.74    687.65     14.29    514.58      0.62
  MEAN    58.19     47.20     10.99    505.89    595.43     14.29    514.58      0.54
  HUB     49.78     38.62     11.16    370.96    486.00     14.29    514.58      0.44
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      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   565.48   390.01   409.47  1134.09     0.50
 MEAN    18.04   584.25   407.60   418.57  1128.66     0.52
 HUB     15.00   652.49   488.12   432.99  1120.98     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   465.65   221.74     0.41  8048.08
 MEAN   534.83   437.48   127.22     0.39  7353.39     1.54
 HUB    444.80   435.15    43.33     0.39  7323.21

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.89     1.25    15.94   561.15     1.07   534.44     0.92     0.90
 MEAN    18.54     1.23    15.44   557.84     1.07   529.33     0.92     0.90
 HUB     18.52     1.23    14.72   557.69     1.07   522.14     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.61    28.44    24.20     4.24     0.93     0.42     2.90
 MEAN    44.24    16.91    12.70     4.21     0.94     0.37     3.51     0.90
 HUB     48.43    -5.71    -9.30     3.59     0.94     0.22     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071      591.035     406.812     428.750    1129.048       0.523        0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.619      15.443      529.716      24.000      43.496      35.400      -8.096

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     18.071      445.280     406.812     603.133    1142.414       0.390        0.405

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       18.545      16.698     542.333     528.796       0.033        0.531

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083      412.897       0.000     412.897    1144.856       0.361        0.435

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       16.872      544.654       0.000       0.060       0.058        0.458

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4        Pt4           PR4       Texit        Del T       Ns         Ns nondim
      0.857       18.461        1.222     558.893      36.083     189.388        1.468

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 224648.266       0.600    1725.116 1319719.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
  RESET =  0.000BLEED =  0.000 DPInc =10.990   EfDer =  0.984

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    135.889     3398.000       18.461      558.893       1.000        1.000        0.980
W Kg/sec =   61.76752

   W cor       RPM cor         GAMMA        Cp          R           Blades        THK
    112.320     3273.536        1.402        0.249       53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 104536.672  106627.180        1.805      590.487      327.109      474.134        1.449
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ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	394.05	-0.14	394.05	0.34	587.03
MEAN	18.08	0.00	-0.02	394.05	-0.14	394.05	0.34	
HUB	15.21	0.00	-0.02	394.05	-0.14	394.05	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.12	46.36	10.76	609.37	725.79	17.01	545.93	0.63
MEAN	53.69	42.30	11.39	536.08	665.43	17.01	545.93	0.58
HUB	48.87	37.84	11.03	451.02	599.02	17.01	545.93	0.52

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	513.25	325.52	396.82	1169.66	0.44
MEAN	18.01	518.76	326.32	403.27	1165.39	0.45
HUB	15.22	557.46	377.11	410.55	1161.12	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	485.66	280.00	0.42	6649.94	
MEAN	534.05	453.63	207.73	0.39	5879.49	1.61
HUB	451.41	417.22	74.30	0.36	5742.85	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.96	1.19	19.24	590.55	1.06	568.56	0.92	0.90
MEAN	21.53	1.17	18.79	586.89	1.05	564.42	0.92	0.90
HUB	21.46	1.16	18.32	586.24	1.05	560.29	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.36	35.21	31.50	3.71	0.93	0.41	2.90	
MEAN	38.98	27.25	23.50	3.75	0.94	0.39	3.30	0.90
HUB	42.57	10.26	6.50	3.76	0.94	0.38	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.984

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	751.799	327.238	676.844	1140.629	0.659	-0.922

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.621	16.147	540.697	46.000	25.803	30.600	4.797

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	676.976	327.238	751.918	1150.007	0.589	-0.605

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	21.559	17.048	549.624	345.258	0.031	0.260

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	666.125	0.000	666.125	1151.282	0.579	0.340

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	17.120	550.841	0.000	0.060	0.057	-0.580

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.857	21.485	1.164	587.892	28.999	210.597	1.633

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
180633.234	0.493	1387.116	1185255.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =10.990 EfDer = 0.915

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
135.889	3398.000	21.485	587.892	1.000	1.000	0.680

W Kg/sec = 61.76752

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
98.981	3191.778	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
104536.672	106627.180	1.313	378.495	288.276	293.880	1.019

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	596.23	-0.21	596.23	0.51	559.00
MEAN	17.74	0.00	-0.02	596.23	-0.21	596.23	0.51	
HUB	15.05	0.00	-0.02	596.23	-0.21	596.23	0.51	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	44.96	46.36	-1.40	595.14	842.57	17.93	558.22	0.73
MEAN	41.43	43.40	-1.97	526.00	795.23	17.93	558.22	0.69
HUB	36.83	38.84	-2.01	446.28	744.88	17.93	558.22	0.64

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	484.88	282.55	394.05	1196.39	0.41
MEAN	17.51	492.73	289.98	398.36	1193.24	0.41
HUB	14.85	532.11	346.77	403.59	1190.19	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	498.22	304.88	0.42	5601.48	
MEAN	519.12	459.56	229.14	0.39	5080.27	1.84
HUB	440.35	414.30	93.58	0.35	5152.61	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.47	1.14	21.85	614.55	1.05	594.92	0.92	0.84
MEAN	24.18	1.13	21.50	612.07	1.04	591.80	0.92	0.84
HUB	24.22	1.13	21.11	612.41	1.04	588.78	0.92	0.84

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.64	37.73	31.50	6.23	0.93	0.47	2.90	
MEAN	36.05	29.91	23.50	6.41	0.89	0.48	3.28	0.84
HUB	40.67	13.05	6.50	6.55	0.89	0.50	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.915

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	497.716	291.887	403.142	1193.772	0.417	0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.261	21.523	592.331	46.000	35.906	31.500	-4.406

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	411.777	291.887	504.736	1200.329	0.343	0.304

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.235	22.338	598.855	471.992	0.019	0.393

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	399.971	0.000	399.971	1201.130	0.333	0.306

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.380	599.655	0.000	0.060	0.043	0.319

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    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.803      24.168       1.125     613.009      25.117     230.916       1.790

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 156533.047       0.454    1202.046 1796618.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.990   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.889    3398.000      24.168     613.009       1.000       1.000       0.980
W Kg/sec =   61.76752

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.854    3125.705       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104536.672  106627.180       1.961     513.330     261.707     401.059       1.532

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   375.98    -0.13   375.98     0.31   525.34
 MEAN    16.97     0.00    -0.02   375.98    -0.13   375.98     0.31
 HUB     14.32     0.00    -0.02   375.98    -0.13   375.98     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.65    46.36    10.29   571.12   683.88    22.58   601.21     0.57
 MEAN    53.24    43.80     9.44   503.23   628.28    22.58   601.21     0.52
 HUB     48.49    37.84    10.65   424.63   567.26    22.58   601.21     0.47

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   478.50   289.76   380.80  1221.18     0.39
 MEAN    16.57   483.43   291.68   385.53  1217.80     0.40
 HUB     13.89   518.17   340.25   390.80  1214.42     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   466.86   270.09     0.38  5473.15
 MEAN   491.47   434.22   199.79     0.36  4836.43     1.58
 HUB    411.88   397.32    71.63     0.33  4727.90

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.59     1.14    24.81   639.04     1.04   619.94     0.92     0.91
 MEAN    27.17     1.12    24.37   636.01     1.04   616.51     0.92     0.91
 HUB     27.10     1.12    23.91   635.50     1.04   613.09     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.27    35.35    31.50     3.85     0.93     0.39     2.90
 MEAN    37.11    27.39    23.50     3.89     0.94     0.38     3.29     0.91
 HUB     41.04    10.39     6.50     3.89     0.94     0.38     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     478.313     293.318     377.820    1219.030       0.392       0.047

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.257      24.510     617.760      46.000      37.824      32.400      -5.424

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     16.481     390.519     293.318     488.406    1225.293       0.319       0.346

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.229      25.376     624.125     456.573       0.020       0.429

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     371.711       0.000     371.711    1226.467       0.303       0.330

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.473     625.321       0.000       0.060       0.047       0.379

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      27.150       1.123     636.850      23.841     221.981       1.721

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 148655.375       0.474    1141.552 1165894.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.990   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.889    3398.000      27.150     636.850       1.000       1.000       0.980
W Kg/sec =   61.76752

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.524    3066.642       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104536.672  106627.180       2.146     509.668     237.460     390.276       1.644

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   347.14    -0.12   347.14     0.28   490.26
 MEAN    15.91     0.00    -0.02   347.14    -0.12   347.14     0.28
 HUB     13.07     0.00    -0.02   347.14    -0.12   347.14     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.43    47.36    10.07   543.25   644.79    25.68   626.80     0.53
 MEAN    53.67    44.80     8.87   471.87   585.90    25.68   626.80     0.48
 HUB     48.16    38.84     9.32   387.57   520.39    25.68   626.80     0.42

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   450.67   279.72   353.35  1244.33     0.36
 MEAN    15.50   450.20   273.17   357.85  1240.75     0.36
 HUB     12.59   475.12   306.84   362.74  1237.17     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   434.16   252.26     0.35  5020.41
 MEAN   459.55   403.48   186.38     0.33  4235.40     1.60
 HUB    373.33   368.79    66.49     0.30  3864.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     30.53     1.12    27.88   660.71     1.04   643.77     0.92     0.91
 MEAN    29.98     1.10    27.37   656.98     1.03   640.08     0.92     0.91
 HUB     29.73     1.09    26.85   655.22     1.03   636.39     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.37    35.52    31.50     4.02     0.93     0.40     2.90
 MEAN    37.36    27.51    23.50     4.01     0.93     0.38     3.34     0.91
 HUB     40.23    10.39     6.50     3.89     0.93     0.36     4.06


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.996

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     455.647     278.180     360.874    1240.986       0.367      -0.007

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      30.024      27.353     640.322      46.000      37.627      33.000      -4.627

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     377.454     278.180     468.888    1246.240       0.303       0.283

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      29.985      28.135     645.756     440.827       0.035       0.430

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     353.606       0.000     353.606    1247.643       0.283       0.361

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      28.333     647.210       0.000       0.060       0.044       0.356

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.876      29.960       1.103     657.639      20.789     235.424       1.825

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  129705.047       0.458     996.029 1202375.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     840175.00   6451.8594    132.7495      1.9832      0.8411     10.9901      1.2579


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 90%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.957   EfDer =  0.981

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     131.203     3398.000       15.107     522.810       1.000        1.000        0.980
 W Kg/sec =   59.63782

    W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     128.172     3384.617        1.402       0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  100932.312  102950.742        2.228     831.557     373.266     619.754       1.660

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   302.15    -0.10   302.15      0.27   609.32
  MEAN    17.06      0.00    -0.02   302.15    -0.10   302.15      0.27
  HUB     12.51      0.00    -0.02   302.15    -0.10   302.15      0.27

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
  TIP     63.72     50.47    13.25   611.74   682.39     14.35   515.18      0.61
  MEAN    59.16     47.20    11.96   505.89   589.34     14.35   515.18      0.53
  HUB     50.84     38.62    12.22   370.96   478.52     14.35   515.18      0.43

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK         AeroBl     Blades2
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     0.700       0.050       0.950      32.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   560.11   398.49   393.60  1135.50     0.49
 MEAN    18.04   576.25   412.41   402.47  1129.92     0.51
 HUB     15.00   640.08   486.36   416.12  1122.27     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   447.66   213.25     0.39  8223.08
 MEAN   534.83   420.68   122.42     0.37  7439.98     1.59
 HUB    444.80   418.19    41.56     0.37  7296.66

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.95     1.25    16.05   561.98     1.07   535.78     0.92     0.90
 MEAN    18.56     1.23    15.54   558.25     1.07   530.52     0.92     0.90
 HUB     18.49     1.22    14.83   557.57     1.07   523.35     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.35    28.45    24.20     4.25     0.93     0.44     2.90
 MEAN    45.70    16.92    12.70     4.22     0.94     0.39     3.51     0.90
 HUB     49.45    -5.70    -9.30     3.60     0.94     0.24     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     582.510     411.607     412.186    1130.335       0.515       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.637      15.545     530.925      24.000      44.960      35.400      -9.560

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     427.461     411.607     593.417    1144.173       0.374       0.430

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.552      16.846     544.005     528.796       0.036       0.554

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     397.020       0.000     397.020    1146.376       0.346       0.451

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.986     546.101       0.000       0.060       0.066       0.474

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.848      18.458       1.222     559.266      36.456     184.395       1.429

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 226971.953       0.607    1682.864 1270515.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.957   EfDer =  0.977

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.203    3398.000      18.458     559.266       1.000       1.000       0.980
W Kg/sec =   59.63782

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.500    3272.444       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100932.312  102950.742       1.869     590.487     315.984     474.134       1.501

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     20.55     0.00    -0.02   379.09    -0.13   379.09     0.33   586.84
MEAN    18.08     0.00    -0.02   379.09    -0.13   379.09     0.33
HUB     15.21     0.00    -0.02   379.09    -0.13   379.09     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.12    46.36    11.76   609.37   717.78    17.11   547.27     0.63
MEAN    54.74    42.30    12.44   536.08   656.68    17.11   547.27     0.57
HUB     49.96    37.84    12.12   451.02   589.28    17.11   547.27     0.51

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   508.67   336.17   381.75  1171.50     0.43
MEAN    18.01   512.14   334.15   388.12  1167.05     0.44
HUB     15.22   548.26   379.90   395.31  1162.59     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    605.52   467.20   269.35     0.40  6867.29
MEAN   534.05   436.57   199.90     0.37  6020.35     1.65
HUB    451.41   401.73    71.51     0.35  5785.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.05     1.19    19.37   591.96     1.06   570.36     0.92     0.89
MEAN    21.58     1.17    18.90   587.93     1.05   566.03     0.92     0.89
HUB     21.45     1.16    18.42   586.81     1.05   561.71     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.37    35.21    31.50     3.71     0.93     0.43     2.90
MEAN    40.73    27.25    23.50     3.75     0.94     0.41     3.30     0.89
HUB     43.86    10.25     6.50     3.75     0.94     0.40     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.977

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      725.341     335.086     643.301    1145.125       0.633       -0.848

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.667      16.532      544.970      46.000      27.514      30.600       3.086

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960      641.314     335.086     723.579    1155.155       0.555       -0.488

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.650       21.619      17.531     554.558     345.258       0.027       0.285

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.823      630.789       0.000     630.789    1156.320       0.546       0.385

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.650       17.609      555.677       0.000       0.060       0.047       -0.460

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4        Pt4           PR4       Texit        Del T       Ns         Ns nondim
      0.860       21.564        1.168     588.901      29.635     203.229       1.575

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 184592.844       0.503    1368.647 1138761.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
  RESET =  0.000BLEED =  0.000 DPInc =11.957   EfDer =  0.941

    W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     131.203    3398.000      21.564     588.901       1.000       1.000       0.680
```

W Kg/sec = 59.63782

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
95.301	3189.043	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
100932.312	102950.742	1.364	378.495	277.558	293.880	1.059

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	567.30	-0.20	567.30	0.49	558.52
MEAN	17.74	0.00	-0.02	567.30	-0.20	567.30	0.49	
HUB	15.05	0.00	-0.02	567.30	-0.20	567.30	0.49	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.38	46.36	0.02	595.14	822.35	18.32	562.04	0.71
MEAN	42.85	43.40	-0.55	526.00	773.77	18.32	562.04	0.67
HUB	38.20	38.84	-0.64	446.28	721.92	18.32	562.04	0.62

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	479.41	297.61	375.84	1199.26	0.40
MEAN	17.51	485.22	301.21	380.42	1195.81	0.41
HUB	14.85	521.99	351.72	385.70	1192.46	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	587.43	474.61	289.82	0.40	5899.57	
MEAN	519.12	438.41	217.92	0.37	5276.60	1.89
HUB	440.35	395.75	88.62	0.33	5226.05	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.81	1.15	22.22	616.97	1.05	597.79	0.92	0.86
MEAN	24.46	1.13	21.83	614.01	1.04	594.36	0.92	0.86
HUB	24.43	1.13	21.41	613.77	1.04	591.03	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.37	37.64	31.50	6.14	0.93	0.48	2.90	
MEAN	38.37	29.81	23.50	6.31	0.90	0.49	3.28	0.86
HUB	42.36	12.94	6.50	6.44	0.90	0.51	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.941

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	489.985	303.185	384.920	1196.331	0.410	0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.538	21.858	594.878	46.000	38.226	31.500	-6.726

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	392.252	303.185	495.765	1203.547	0.326	0.343

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.503	22.763	602.075	471.992	0.023	0.429

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	381.348	0.000	381.348	1204.250	0.317	0.337

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.782	602.779	0.000	0.060	0.052	0.350

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

```
      0.822      24.423       1.133     614.918      26.017     219.370       1.701

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 162146.797       0.470    1202.223 1710597.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.957   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.203    3398.000      24.423     614.918       1.000       1.000       0.980
W Kg/sec =   59.63782

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     85.982    3120.849       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100932.312  102950.742       2.050     513.330     250.432     401.059       1.601

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   358.71    -0.12   358.71     0.30   524.52
 MEAN    16.97     0.00    -0.02   358.71    -0.12   358.71     0.30
 HUB     14.32     0.00    -0.02   358.71    -0.12   358.71     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.87    46.36    11.51   571.12   674.53    22.97   604.18     0.56
 MEAN    54.52    43.80    10.72   503.23   618.10    22.97   604.18     0.51
 HUB     49.82    37.84    11.98   424.63   555.96    22.97   604.18     0.46

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   472.57   302.43   363.13  1224.63     0.39
 MEAN    16.57   475.27   300.97   367.84  1221.04     0.39
 HUB     13.89   507.22   343.63   373.08  1217.45     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    559.85   445.12   257.42     0.36  5712.20
 MEAN   491.47   414.24   190.50     0.34  4990.30     1.63
 HUB    411.88   379.27    68.25     0.31  4774.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.00     1.15    25.26   642.09     1.04   623.45     0.92     0.90
 MEAN    27.53     1.13    24.80   638.65     1.04   619.80     0.92     0.90
 HUB     27.39     1.12    24.30   637.63     1.04   616.16     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.79    35.33    31.50     3.83     0.93     0.42     2.90
 MEAN    39.29    27.38    23.50     3.88     0.94     0.40     3.29     0.90
 HUB     42.65    10.37     6.50     3.87     0.94     0.40     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.988

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     470.788     302.660     360.608    1222.178       0.385       0.044

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    27.611      24.923     620.961      46.000      40.007      32.400      -7.607

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     372.038     302.660     479.599    1228.993       0.303       0.381

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      27.574      25.874     627.906     456.573       0.023       0.463

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     354.490       0.000     354.490    1230.034       0.288       0.357

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.940     628.970       0.000       0.060       0.056       0.404

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.861      27.481       1.125     639.455      24.537     212.187       1.645

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 153003.031       0.488    1134.427 1118028.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =11.957   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.203    3398.000      27.481     639.455       1.000       1.000       0.980
W Kg/sec =   59.63782

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.925    3060.388       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100932.312  102950.742       2.245     509.668     226.977     390.276       1.719

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   331.26    -0.11   331.26     0.27   489.26
 MEAN    15.91     0.00    -0.02   331.26    -0.11   331.26     0.27
 HUB     13.07     0.00    -0.02   331.26    -0.11   331.26     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.63    47.36    11.27   543.25   636.37    26.13   630.30     0.52
 MEAN    54.94    44.80    10.14   471.87   576.63    26.13   630.30     0.47
 HUB     49.49    38.84    10.65   387.57   509.93    26.13   630.30     0.41

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   445.62   291.52   337.03  1248.16     0.36
 MEAN    15.50   442.75   281.85   341.45  1244.41     0.36
 HUB     12.59   464.75   309.99   346.27  1240.66     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   414.01   240.45     0.33  5232.03
 MEAN   459.55   384.93   177.70     0.31  4369.82     1.66
 HUB    373.33   352.01    63.35     0.28  3904.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     31.02     1.13    28.40   664.32     1.04   647.76     0.92     0.91
 MEAN    30.41     1.11    27.86   660.22     1.03   643.88     0.92     0.91
 HUB     30.09     1.09    27.31   658.01     1.03   640.00     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.86    35.51    31.50     4.01     0.93     0.43     2.90
 MEAN    39.54    27.49    23.50     3.99     0.94     0.40     3.34     0.91
 HUB     41.84    10.37     6.50     3.87     0.94     0.38     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.991

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     448.281     287.019     344.349    1244.622       0.360      -0.008

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      30.453      27.840     644.093      46.000      39.812      33.000      -6.812

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     359.628     287.019     460.121    1250.380       0.288       0.319

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      30.400      28.702     650.067     440.827       0.040       0.464

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     337.174       0.000     337.174    1251.635       0.269       0.390

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      28.874     651.372       0.000       0.060       0.052       0.384

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.867      30.369       1.105     660.853      21.398     225.034       1.744

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  133516.250       0.472     989.945 1153081.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     860230.88   6378.1055    128.1724      2.0102      0.8395     11.9567      1.2640


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 90%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =12.229   EfDer =  0.979

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     129.894    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   59.04293

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     126.894    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   99925.508  101923.797       2.250     831.557     369.543     619.754       1.677

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   298.90    -0.10   298.90     0.27   609.32
  MEAN    17.06     0.00    -0.02   298.90    -0.10   298.90     0.27
  HUB     12.51     0.00    -0.02   298.90    -0.10   298.90     0.27

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.96    50.47    13.49   611.74   680.95    14.37   515.35     0.61
  MEAN    59.43    47.20    12.23   505.89   587.68    14.37   515.35     0.53
  HUB     51.15    38.62    12.53   370.96   476.48    14.37   515.35     0.43

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

           R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     20.63   558.71   400.82   389.23  1135.88     0.49
 MEAN    18.04   574.11   413.73   398.03  1130.26     0.51
 HUB     15.00   636.69   485.86   411.47  1122.62     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   442.71   210.93     0.39  8270.95
 MEAN   534.83   416.05   121.09     0.37  7463.87     1.61
 HUB    444.80   413.52    41.07     0.37  7289.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.97     1.26    16.08   562.21     1.08   536.14     0.92     0.90
 MEAN    18.57     1.23    15.57   558.36     1.07   530.84     0.92     0.90
 HUB     18.48     1.22    14.85   557.53     1.07   523.68     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.84    28.45    24.20     4.25     0.93     0.45     2.90
 MEAN    46.11    16.92    12.70     4.22     0.94     0.40     3.51     0.90
 HUB     49.74    -5.70    -9.30     3.60     0.94     0.25     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     580.231     412.930     407.624    1130.679       0.513       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.641      15.572     531.249      24.000      45.371      35.400      -9.971

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     422.570     412.930     590.827    1144.646       0.369       0.437

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.554      16.885     544.454     528.796       0.038       0.561

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     392.653       0.000     392.653    1146.785       0.342       0.455

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.016     546.491       0.000       0.060       0.068       0.478

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.845      18.456       1.222     559.368      36.558     183.016       1.419

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 227607.688       0.608    1670.744 1256851.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =12.229   EfDer =  0.975

    W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     129.894    3398.000      18.456     559.368       1.000       1.000       0.980
W Kg/sec =   59.04293

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     107.439    3272.145       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  99925.508  101923.797       1.887     590.487     312.894     474.134       1.515

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   374.97    -0.13   374.97     0.33   586.78
 MEAN    18.08     0.00    -0.02   374.97    -0.13   374.97     0.33
 HUB     15.21     0.00    -0.02   374.97    -0.13   374.97     0.33
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.40    46.36    12.04   609.37   715.61    17.14   547.63     0.62
MEAN    55.03    42.30    12.73   536.08   654.31    17.14   547.63     0.57
HUB     50.27    37.84    12.43   451.02   586.64    17.14   547.63     0.51

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   507.51   339.07   377.62  1171.99     0.43
MEAN    18.01   510.40   336.28   383.96  1167.49     0.44
HUB     15.22   545.78   380.65   391.13  1162.99     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    605.52   462.16   266.45     0.39  6926.42
MEAN   534.05   431.90   197.77     0.37  6058.70     1.66
HUB    451.41   397.47    70.76     0.34  5796.62

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.07     1.20    19.40   592.35     1.06   570.84     0.92     0.89
MEAN    21.59     1.17    18.93   588.21     1.05   566.46     0.92     0.89
HUB     21.45     1.16    18.44   586.97     1.05   562.09     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.92    35.21    31.50     3.71     0.93     0.44     2.90
MEAN    41.21    27.25    23.50     3.75     0.94     0.42     3.30     0.89
HUB     44.22    10.25     6.50     3.75     0.94     0.41     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.975

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     718.475     337.222     634.419    1146.282       0.627      -0.829

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.677      16.630     546.073      46.000      27.993      30.600       2.607

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     631.958     337.222     716.303    1156.476       0.546      -0.458

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.650      21.632      17.653     555.828     345.258       0.026       0.292

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     621.560       0.000     621.560    1157.609       0.537       0.396

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.650      17.732     556.917       0.000       0.060       0.045      -0.429

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.861      21.581       1.169     589.176      29.807     201.242       1.560

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 185669.625       0.506    1362.899 1125910.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =12.229   EfDer =  0.947

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    129.894    3398.000      21.581     589.176       1.000       1.000       0.680
W Kg/sec =   59.04293

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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    94.297    3188.299       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
99925.508  101923.797       1.378     378.495     274.635     293.880       1.070

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   559.64    -0.19   559.64     0.48   558.39
MEAN    17.74     0.00    -0.02   559.64    -0.19   559.64     0.48
HUB     15.05     0.00    -0.02   559.64    -0.19   559.64     0.48

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     46.77    46.36     0.41   595.14   817.08    18.42   563.03     0.70
MEAN    43.24    43.40    -0.16   526.00   768.16    18.42   563.03     0.66
HUB     38.58    38.84    -0.26   446.28   715.92    18.42   563.03     0.62

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   478.12   301.60   370.99  1200.01     0.40
MEAN    17.51   483.35   304.20   375.62  1196.49     0.40
HUB     14.85   519.38   353.06   380.92  1193.06     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    587.43   468.33   285.83     0.39  5978.61
MEAN   519.12   432.76   214.92     0.36  5328.95     1.90
HUB    440.35   390.80    87.29     0.33  5245.85

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.90     1.15    22.32   617.63     1.05   598.54     0.92     0.87
MEAN    24.52     1.14    21.91   614.53     1.04   595.03     0.92     0.87
HUB     24.48     1.13    21.48   614.14     1.04   591.62     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.11    37.61    31.50     6.11     0.93     0.49     2.90
MEAN    39.00    29.78    23.50     6.28     0.90     0.50     3.28     0.87
HUB     42.83    12.91     6.50     6.41     0.90     0.52     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.947

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     488.058     306.198     380.057    1197.005       0.408       0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.606      21.942     595.550      46.000      38.857      31.500      -7.357

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     387.065     306.198     493.535    1204.397       0.321       0.354

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.569      22.870     602.927     471.992       0.024       0.439

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     376.407       0.000     376.407    1205.075       0.312       0.345

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      22.882     603.606       0.000       0.060       0.055       0.358

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.827      24.485       1.135     615.433      26.257     216.389       1.677

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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 163641.281       0.474    1201.201 1687464.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =12.229   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    129.894    3398.000      24.485     615.433       1.000       1.000       0.980
W Kg/sec =   59.04293

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     84.946    3119.544       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 99925.508  101923.797       2.075     513.330     247.413     401.059       1.621

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   354.13    -0.12   354.13     0.29   524.30
MEAN    16.97     0.00    -0.02   354.13    -0.12   354.13     0.29
HUB     14.32     0.00    -0.02   354.13    -0.12   354.13     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.20    46.36    11.84   571.12   672.10    23.06   604.97     0.56
MEAN    54.87    43.80    11.07   503.23   615.45    23.06   604.97     0.51
HUB     50.18    37.84    12.34   424.63   553.01    23.06   604.97     0.46

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   471.14   305.74   358.47  1225.53     0.38
MEAN    16.57   473.22   303.40   363.16  1221.89     0.39
HUB     13.89   504.37   344.51   368.39  1218.25     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    559.85   439.40   254.11     0.36  5774.71
MEAN   491.47   408.97   188.06     0.33  5030.63     1.65
HUB    411.88   374.50    67.37     0.31  4786.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     28.10     1.15    25.38   642.90     1.04   624.38     0.92     0.90
MEAN    27.62     1.13    24.90   639.36     1.04   620.67     0.92     0.90
HUB     27.46     1.12    24.40   638.20     1.04   616.97     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.46    35.33    31.50     3.83     0.93     0.42     2.90
MEAN    39.88    27.38    23.50     3.88     0.94     0.41     3.29     0.90
HUB     43.08    10.36     6.50     3.86     0.94     0.40     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.986

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     468.899     305.109     356.055    1223.007       0.383       0.044

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    27.697      25.023     621.806      46.000      40.594      32.400      -8.194

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     367.168     305.109     477.393    1229.966       0.299       0.390

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.657      25.997     628.903     456.573       0.024       0.473

   VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	349.952	0.000	349.952	1230.973	0.284	0.364

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	26.054	629.933	0.000	0.060	0.059	0.410

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.858	27.559	1.126	640.152	24.719	209.659	1.625

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
154139.812	0.492	1131.456	1104903.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =12.229 EfDer = 0.989

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
129.894	3398.000	27.559	640.152	1.000	1.000	0.980

W Kg/sec = 59.04293

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
76.970	3058.723	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
99925.508	101923.797	2.273	509.668	224.197	390.276	1.741

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	327.07	-0.11	327.07	0.27	488.99
MEAN	15.91	0.00	-0.02	327.07	-0.11	327.07	0.27	
HUB	13.07	0.00	-0.02	327.07	-0.11	327.07	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.95	47.36	11.59	543.25	634.20	26.24	631.23	0.51
MEAN	55.28	44.80	10.48	471.87	574.23	26.24	631.23	0.47
HUB	49.85	38.84	11.01	387.57	507.22	26.24	631.23	0.41

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	444.42	294.59	332.75	1249.17	0.36
MEAN	15.50	440.89	284.10	337.15	1245.37	0.35
HUB	12.59	462.09	310.83	341.93	1241.58	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	531.98	408.75	237.39	0.33	5287.02	
MEAN	459.55	380.07	175.45	0.31	4404.71	1.67
HUB	373.33	347.59	62.51	0.28	3914.77	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	31.13	1.13	28.52	665.28	1.04	648.81	0.92	0.91
MEAN	30.52	1.11	27.98	661.09	1.03	644.88	0.92	0.91
HUB	30.18	1.09	27.42	658.76	1.03	640.95	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.52	35.50	31.50	4.00	0.93	0.43	2.90	
MEAN	40.12	27.49	23.50	3.99	0.94	0.41	3.34	0.91
HUB	42.27	10.36	6.50	3.86	0.94	0.39	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.989

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	446.438	289.313	340.008	1245.577	0.358	-0.009

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     30.555      27.957     645.086      46.000      40.394      33.000      -7.394

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     354.966     289.313     457.933    1251.466       0.284       0.328

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      30.497      28.839     651.200     440.827       0.042       0.473

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     332.874       0.000     332.874    1252.683       0.266       0.397

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      29.004     652.468       0.000       0.060       0.055       0.391

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864      30.464       1.105     661.709      21.557     222.367       1.724

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 134509.219       0.475     987.359 1139569.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    865567.62   6353.6582    126.8939      2.0165      0.8384     12.2286      1.2657


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 90%  Stat 2 35% Ice Block 8-31-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.153   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    149.951    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   68.15971

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    146.487    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 115354.938  117661.789       1.949     831.557     426.603     619.754       1.453

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   349.68    -0.12   349.68     0.31   609.32
  MEAN    17.06     0.00    -0.02   349.68    -0.12   349.68     0.31
  HUB     12.51     0.00    -0.02   349.68    -0.12   349.68     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.25    50.47     9.78   611.74   704.74    14.10   512.60     0.63
  MEAN    55.35    47.20     8.15   505.89   615.08    14.10   512.60     0.55
  HUB     46.70    38.62     8.08   370.96   509.88    14.10   512.60     0.46

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   585.73   362.78   459.86  1129.19     0.52
  MEAN    18.04   611.61   392.17   469.33  1124.35     0.54
  HUB     15.00   692.75   493.48   486.18  1116.59     0.62
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   522.93   248.96     0.46  7486.64
 MEAN   534.83   490.53   142.65     0.44  7075.26     1.41
 HUB    444.80   488.62    48.68     0.44  7403.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.65     1.23    15.52   558.47     1.07   529.82     0.92     0.91
 MEAN    18.44     1.22    15.08   556.51     1.06   525.27     0.92     0.91
 HUB     18.61     1.23    14.35   558.08     1.07   518.00     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.27    28.43    24.20     4.23     0.93     0.35     2.90
 MEAN    39.88    16.91    12.70     4.21     0.93     0.30     3.51     0.91
 HUB     45.43    -5.72    -9.30     3.58     0.93     0.15     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     620.221     391.409     481.116    1124.608       0.551      -0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.532      15.067     525.559      24.000      39.130      35.400      -3.730

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     502.492     391.409     636.946    1136.358       0.442       0.327

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.480      16.155     536.598     528.796       0.024       0.463

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     463.560       0.000     463.560    1139.679       0.407       0.381

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.433     539.740       0.000       0.060       0.041       0.405

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      18.419       1.219     557.688      34.878     205.064       1.590

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 217144.484       0.580    1840.058 1470366.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.153   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    149.951    3398.000      18.419     557.688       1.000       1.000       0.980
W Kg/sec =   68.15971

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    124.089    3277.072       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 115354.938  117661.789       1.634     590.487     361.381     474.134       1.312

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   441.58    -0.15   441.58     0.39   587.67
 MEAN    18.08     0.00    -0.02   441.58    -0.15   441.58     0.39
 HUB     15.21     0.00    -0.02   441.58    -0.15   441.58     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.08    46.36     7.72   609.37   752.67    16.61   541.41     0.66
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 MEAN    50.53    42.30     8.23   536.08   694.65    16.61   541.41     0.61
 HUB     45.62    37.84     7.78   451.02   631.31    16.61   541.41     0.55

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   532.19   290.45   445.94  1163.21     0.46
 MEAN    18.01   543.05   300.65   452.24  1159.65     0.47
 HUB     15.22   588.49   367.83   459.37  1156.12     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   546.02   315.07     0.47  5934.12
 MEAN   534.05   508.92   233.41     0.44  5417.35     1.48
 HUB    451.41   466.91    83.58     0.40  5601.75

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.57     1.17    18.68   585.94     1.05   562.29     0.92     0.91
 MEAN    21.28     1.16    18.31   583.48     1.05   558.86     0.92     0.91
 HUB     21.38     1.16    17.91   584.36     1.05   555.44     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.08    35.24    31.50     3.74     0.93     0.34     2.90
 MEAN    33.62    27.30    23.50     3.80     0.93     0.33     3.30     0.91
 HUB     38.69    10.31     6.50     3.81     0.93     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
      0.600       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960    1081.077     301.489    1038.186    1083.819       0.997      -2.247

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.377      11.320     487.196      46.000      16.193      30.600      14.407

    STATOR / VANED DIFFUSER THROAT IS CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960    1154.887     301.489    1193.591    1071.986       1.077      -2.621

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.600      21.087      10.150     474.043     317.610       0.103      -0.071

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823    1258.970       0.000    1258.970    1059.362       1.188      -0.919

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600       8.463     455.368       0.000       0.060       0.379      -3.164

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.565      20.230       1.098     584.594      26.906     235.824       1.828

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 167593.656       0.457    1420.170 1330241.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.153   EfDer =  0.789

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    149.951    3398.000      20.230     584.594       1.000       1.000       0.630
W Kg/sec =   68.15971

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    115.678    3200.770       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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115354.938  117661.789       1.041     350.665     336.908     271.233       0.805

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   886.93    -0.31   886.93     0.79   560.58
MEAN    17.74     0.00    -0.02   886.93    -0.31   886.93     0.79
HUB     15.05     0.00    -0.02   886.93    -0.31   886.93     0.79

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     33.88    46.36   -12.48   595.14  1068.27    13.35   518.94     0.96
MEAN    30.68    43.40   -12.72   526.00  1031.33    13.35   518.94     0.92
HUB     26.73    38.84   -12.11   446.28   993.02    13.35   518.94     0.89

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   520.68   190.44   484.60  1181.23     0.44
MEAN    17.51   533.70   219.26   486.58  1180.38     0.45
HUB     14.85   580.20   309.36   490.85  1179.65     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    587.43   626.45   396.99     0.53  3778.79
MEAN   519.12   571.55   299.86     0.48  3843.97     1.88
HUB    440.35   508.02   130.99     0.43  4598.56

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.84     1.08    19.11   602.58     1.03   579.95     0.92     0.72
MEAN    21.87     1.08    19.00   602.89     1.03   579.12     0.92     0.72
HUB     22.20     1.10    18.81   606.48     1.04   578.38     0.92     0.72

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     21.45    39.32    31.50     7.82     0.93     0.44     2.90
MEAN    24.26    31.64    23.50     8.14     0.83     0.48     3.28     0.72
HUB     32.22    14.94     6.50     8.44     0.83     0.53     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.789

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     540.146     220.703     492.999    1180.878       0.457       0.000

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.940      19.005     579.631      46.000      24.117      31.500       7.383

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     512.801     220.703     558.278    1183.323       0.433       0.087

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.890      19.237     582.034     471.992       0.027       0.216

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     497.537       0.000     497.537    1184.631       0.420       0.103

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      19.312     583.321       0.000       0.060       0.055       0.112

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.656      21.807       1.078     603.982      19.389     329.208       2.552

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 120815.586       0.350    1023.778 2541261.250
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.153   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    149.951    3398.000      21.807     603.982       1.000       1.000       0.980
W Kg/sec =   68.15971

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    109.076    3148.976       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
115354.938  117661.789        1.616     513.330     317.696     401.059       1.262

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   465.60    -0.16   465.60     0.39   529.25
MEAN    16.97     0.00    -0.02   465.60    -0.16   465.60     0.39
HUB     14.32     0.00    -0.02   465.60    -0.16   465.60     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.82    46.36     4.46   571.12   736.98    19.61   585.90     0.62
MEAN    47.23    43.80     3.43   503.23   685.70    19.61   585.90     0.58
HUB     42.38    37.84     4.54   424.63   630.26    19.61   585.90     0.53

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   525.33   219.85   477.11  1202.10     0.44
MEAN    16.57   537.55   240.81   480.59  1200.26     0.45
HUB     13.89   581.82   321.52   484.91  1198.38     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    559.85   585.86   340.00     0.49  4153.93
MEAN   491.47   542.03   250.66     0.45  3993.91     1.36
HUB    411.88   493.26    90.37     0.41  4468.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.15     1.11    21.17   623.75     1.03   600.72     0.92     0.90
MEAN    24.05     1.10    20.96   622.98     1.03   598.88     0.92     0.90
HUB     24.33     1.12    20.70   625.24     1.04   597.00     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     24.74    35.47    31.50     3.97     0.93     0.26     2.90
MEAN    26.61    27.54    23.50     4.04     0.92     0.26     3.29     0.90
HUB     33.55    10.56     6.50     4.06     0.92     0.28     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     528.803     242.166     470.093    1202.021       0.440       0.056

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.143      21.136     600.659      46.000      27.255      32.400       5.145

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     492.348     242.166     548.681    1205.124       0.409       0.168

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.106      21.486     603.765     456.573       0.021       0.271

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     467.134       0.000     467.134    1207.137       0.387       0.165
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.668	605.783	0.000	0.060	0.046	0.224

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.851	24.028	1.102	623.990	20.008	281.792	2.184

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
124717.320	0.398	1056.841	1336942.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 8.153 EfDer = 0.982

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
149.951	3398.000	24.028	623.990	1.000	1.000	0.980

W Kg/sec = 68.15971

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
100.618	3098.080	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
115354.938	117661.789	1.739	509.668	293.077	390.276	1.332

ROTOR LEADING EDGE CONDITIONS, STAGE 5

R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP 18.32	0.00	-0.02	434.42	-0.15	434.42	0.36	495.28
MEAN 15.91	0.00	-0.02	434.42	-0.15	434.42	0.36	
HUB 13.07	0.00	-0.02	434.42	-0.15	434.42	0.36	

BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP 51.36	47.36	4.00	543.25	695.70	21.98	608.25	0.58
MEAN 47.38	44.80	2.58	471.87	641.50	21.98	608.25	0.53
HUB 41.75	38.84	2.91	387.57	582.27	21.98	608.25	0.48

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

R2	C2	Cu2	Cm2	Ao2	Mach2
TIP 17.94	494.42	210.96	447.16	1222.73	0.40
MEAN 15.50	503.02	223.01	450.89	1220.49	0.41
HUB 12.59	538.92	288.39	455.27	1218.24	0.44

U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP 531.98	550.45	321.02	0.45	3787.40	
MEAN 459.55	509.17	236.55	0.42	3458.44	1.37
HUB 373.33	463.12	84.94	0.38	3632.78	

Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP 26.28	1.09	23.47	642.00	1.03	621.61	0.92	0.90
MEAN 26.07	1.09	23.20	640.44	1.03	619.33	0.92	0.90
HUB 26.18	1.09	22.89	641.27	1.03	617.04	0.92	0.90

Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP 25.26	35.67	31.50	4.17	0.93	0.26	2.90	
MEAN 26.32	27.68	23.50	4.18	0.91	0.26	3.34	0.90
HUB 32.35	10.57	6.50	4.07	0.91	0.26	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.982

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	508.352	227.095	454.807	1220.822	0.416	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
26.117	23.178	619.680	46.000	26.534	33.000	6.466

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     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     482.423     227.095     533.202    1222.931       0.394       0.069

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      26.042      23.391     621.823     440.827       0.045       0.266

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     449.796       0.000     449.796    1225.423       0.367       0.178

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      23.711     624.360       0.000       0.060       0.051       0.176

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4         PR4       Texit        Del T       Ns        Ns nondim
       0.837      26.026       1.083     641.234      17.244     303.098       2.350

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  107542.367       0.380     911.302 1380005.625

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     737813.44   6252.1475    146.4874      1.7228      0.7451      8.1535      1.2265


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 90%  Stat 2 35% Ice Block 8-31-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.546   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     147.976    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   67.26170

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     144.557    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  113835.133  116111.594       1.975     831.557     420.983     619.754       1.472

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   344.58    -0.12   344.58     0.31   609.32
  MEAN    17.06     0.00    -0.02   344.58    -0.12   344.58     0.31
  HUB     12.51     0.00    -0.02   344.58    -0.12   344.58     0.31

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.61    50.47    10.14   611.74   702.22    14.13   512.89     0.63
  MEAN    55.75    47.20     8.55   505.89   612.19    14.13   512.89     0.55
  HUB     47.12    38.62     8.50   370.96   506.39    14.13   512.89     0.46

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   582.47   366.77   452.49  1129.95     0.52
  MEAN    18.04   607.43   394.44   461.94  1125.01     0.54
  HUB     15.00   686.79   492.73   478.44  1117.26     0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   514.55   244.97     0.46  7568.97
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 MEAN   534.83   482.80   140.38     0.43  7116.17     1.43
 HUB    444.80   480.83    47.93     0.43  7392.38

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.69     1.24    15.59   558.86     1.07   530.53     0.92     0.91
 MEAN    18.46     1.22    15.13   556.71     1.06   525.89     0.92     0.91
 HUB     18.60     1.23    14.41   558.02     1.07   518.63     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.03    28.43    24.20     4.23     0.93     0.36     2.90
 MEAN    40.49    16.90    12.70     4.20     0.93     0.31     3.51     0.91
 HUB     45.84    -5.72    -9.30     3.58     0.93     0.16     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     615.758     393.675     473.475    1125.291       0.547      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.547      15.127     526.197      24.000      39.742      35.400      -4.342

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     494.043     393.675     631.711    1137.291       0.434       0.339

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.493      16.242     537.479     528.796       0.025       0.473

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     456.108       0.000     456.108    1140.471       0.400       0.389

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.505     540.490       0.000       0.060       0.043       0.413

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      18.430       1.220     557.866      35.056     202.788       1.572

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 218251.031       0.583    1825.068 1448913.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 8.546   EfDer =  0.997

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    147.976    3398.000      18.430     557.866       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    122.400    3276.550       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.657     590.487     356.463     474.134       1.330

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   434.61    -0.15   434.61     0.38   587.57
 MEAN    18.08     0.00    -0.02   434.61    -0.15   434.61     0.38
 HUB     15.21     0.00    -0.02   434.61    -0.15   434.61     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.51    46.36     8.15   609.37   748.60    16.68   542.09     0.66
 MEAN    50.98    42.30     8.68   536.08   690.24    16.68   542.09     0.60
 HUB     46.07    37.84     8.23   451.02   626.45    16.68   542.09     0.55
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      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   528.98   295.71   438.60  1164.21     0.45
MEAN    18.01   539.17   304.50   444.96  1160.54     0.46
HUB     15.22   583.76   369.23   452.15  1156.88     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    605.52   536.98   309.80     0.46  6041.54
MEAN   534.05   500.68   229.55     0.43  5486.69     1.50
HUB    451.41   459.56    82.18     0.40  5623.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.63     1.17    18.77   586.63     1.05   563.27     0.92     0.91
MEAN    21.32     1.16    18.39   583.99     1.05   559.71     0.92     0.91
HUB     21.40     1.16    17.98   584.64     1.05   556.18     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.99    35.24    31.50     3.74     0.93     0.35     2.90
MEAN    34.38    27.29    23.50     3.79     0.93     0.34     3.30     0.91
HUB     39.24    10.30     6.50     3.80     0.93     0.34     3.92


   blockage3   Cor/U1    Cor/Incid
      0.600       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960    1018.493     305.352     971.642    1095.599       0.930      -1.997

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.423      12.255     498.521      46.000      17.446      30.600      13.154

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960    1021.533     305.352    1066.194    1095.466       0.933      -2.052

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.600      21.183      12.079     498.063     317.610       0.088       0.081

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823    1037.976       0.000    1037.976    1094.370       0.948      -0.223

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600      11.570     495.519       0.000       0.060       0.259      -2.218

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.681      20.656       1.121     585.086      27.220     231.926       1.798

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 169552.312       0.462    1417.838 1309304.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.546   EfDer =  0.765

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3398.000      20.656     585.086       1.000       1.000       0.630
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.841    3199.423       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.077     350.665     325.733     271.233       0.833

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   819.29    -0.28   819.29     0.73   560.34
MEAN    17.74     0.00    -0.02   819.29    -0.28   819.29     0.73
HUB     15.05     0.00    -0.02   819.29    -0.28   819.29     0.73

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     36.01    46.36   -10.35   595.14  1012.80    14.54   529.06     0.90
MEAN    32.72    43.40   -10.68   526.00   973.76    14.54   529.06     0.86
HUB     28.59    38.84   -10.25   446.28   933.09    14.54   529.06     0.83

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   510.95   209.81   465.88  1184.44     0.43
MEAN    17.51   523.67   234.15   468.40  1183.05     0.44
HUB     14.85   569.82   317.28   473.32  1181.73     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    587.43   599.70   377.62     0.51  4162.07
MEAN   519.12   548.28   284.98     0.46  4104.09     1.86
HUB    440.35   489.06   123.07     0.41  4715.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.42     1.09    19.72   604.89     1.03   583.10     0.92     0.70
MEAN    22.39     1.08    19.57   604.62     1.03   581.73     0.92     0.70
HUB     22.66     1.10    19.32   607.53     1.04   580.43     0.92     0.70

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     24.24    39.03    31.50     7.53     0.93     0.44     2.90
MEAN    26.56    31.32    23.50     7.82     0.84     0.47     3.28     0.70
HUB     33.84    14.58     6.50     8.08     0.84     0.52     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.765

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     529.889     235.682     474.590    1183.550       0.448       0.000

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.460      19.570     582.244      46.000      26.409      31.500       5.091

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     491.484     235.682     545.071    1186.873       0.414       0.131

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.425      19.926     585.518     471.992       0.022       0.250

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.121     476.724       0.000     476.724    1188.082       0.401       0.148

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      20.006     586.711       0.000       0.060       0.045       0.158

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.651      22.355       1.082     605.680      20.595     302.396       2.344

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 128335.859       0.372    1073.176 2393456.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.546   EfDer =  0.996
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
147.976	3398.000	22.355	605.680	1.000	1.000	0.980

W Kg/sec = 67.26170

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
105.146	3144.559	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
113835.133	116111.594	1.676	513.330	306.249	401.059	1.310

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	446.61	-0.15	446.61	0.38	528.51
MEAN	16.97	0.00	-0.02	446.61	-0.15	446.61	0.38	
HUB	14.32	0.00	-0.02	446.61	-0.15	446.61	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.98	46.36	5.62	571.12	725.13	20.28	589.04	0.61
MEAN	48.42	43.80	4.62	503.23	672.95	20.28	589.04	0.57
HUB	43.57	37.84	5.73	424.63	616.37	20.28	589.04	0.52

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	513.06	235.30	455.92	1206.25	0.43
MEAN	16.57	524.38	251.96	459.88	1204.00	0.44
HUB	13.89	567.34	325.65	464.57	1201.75	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	559.64	324.55	0.46	4445.47	
MEAN	491.47	518.51	239.50	0.43	4178.62	1.40
HUB	411.88	472.51	86.23	0.39	4525.52	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.94	1.12	22.02	626.83	1.03	604.87	0.92	0.91
MEAN	24.78	1.11	21.75	625.56	1.03	602.62	0.92	0.91
HUB	24.99	1.12	21.45	627.21	1.04	600.35	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.30	35.45	31.50	3.95	0.93	0.28	2.90	
MEAN	28.72	27.51	23.50	4.01	0.92	0.29	3.29	0.91
HUB	35.03	10.52	6.50	4.02	0.92	0.30	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	516.451	253.380	450.023	1205.645	0.428	0.054

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.868	21.919	604.278	46.000	29.381	32.400	3.019

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	469.706	253.380	533.690	1209.476	0.388	0.205

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.842	22.386	608.125	456.573	0.018	0.302

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	445.810	0.000	445.810	1211.290	0.368	0.203

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.560	609.950	0.000	0.060	0.040	0.260

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.868	24.774	1.108	626.533	20.853	267.545	2.074

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
129992.664	0.415	1087.030	1308250.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 8.546 EfDer = 0.992

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
147.976	3398.000	24.774	626.533	1.000	1.000	0.980

W Kg/sec = 67.26170

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
96.498	3091.787	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
113835.133	116111.594	1.813	509.668	281.075	390.276	1.389

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	415.04	-0.14	415.04	0.34	494.28
MEAN	15.91	0.00	-0.02	415.04	-0.14	415.04	0.34	
HUB	13.07	0.00	-0.02	415.04	-0.14	415.04	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.63	47.36	5.27	543.25	683.76	22.85	612.17	0.56
MEAN	48.68	44.80	3.88	471.87	628.53	22.85	612.17	0.52
HUB	43.05	38.84	4.21	387.57	567.96	22.85	612.17	0.47

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	482.28	226.82	425.61	1227.53	0.39
MEAN	15.50	489.53	234.50	429.71	1224.92	0.40
HUB	12.59	523.73	292.64	434.34	1222.32	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	531.98	523.70	305.16	0.43	4071.77	
MEAN	459.55	485.07	225.05	0.40	3636.51	1.41
HUB	373.33	441.77	80.69	0.36	3686.21	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.29	1.10	24.53	645.89	1.03	626.49	0.92	0.91
MEAN	27.01	1.09	24.19	643.82	1.03	623.84	0.92	0.91
HUB	27.04	1.09	23.83	644.06	1.03	621.18	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.05	35.64	31.50	4.14	0.93	0.29	2.90	
MEAN	28.62	27.64	23.50	4.14	0.92	0.28	3.34	0.91
HUB	33.97	10.52	6.50	4.02	0.92	0.28	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	494.822	238.803	433.384	1225.243	0.404	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
27.054	24.177	624.171	46.000	28.856	33.000	4.144

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	457.776	238.803	516.319	1228.128	0.373	0.119

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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.005      24.533     627.114     440.827       0.037       0.299

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     427.340       0.000     427.340    1230.327       0.347       0.222

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.826     629.361       0.000       0.060       0.042       0.219

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.861      26.988       1.089     644.593      18.060     286.143       2.218

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 112641.914       0.398     941.939 1349748.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    758773.81   6345.0508    144.5575      1.7865      0.7771      8.5462      1.2329


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 90%  Stat 2 35% Ice Block 8-31-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3398.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    142.400    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 112136.125  114378.609       2.005     831.557     414.700     619.754       1.494

     ROTOR LEADING EDGE CONDITIONS, STAGE           1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   338.90    -0.12   338.90     0.30   609.32
 MEAN    17.06     0.00    -0.02   338.90    -0.12   338.90     0.30
 HUB     12.51     0.00    -0.02   338.90    -0.12   338.90     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.02    50.47    10.55   611.74   699.45    14.16   513.22     0.63
 MEAN    56.19    47.20     8.99   505.89   609.01    14.16   513.22     0.55
 HUB     47.59    38.62     8.97   370.96   502.55    14.16   513.22     0.45

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   579.00   371.18   444.37  1130.76     0.51
 MEAN    18.04   602.89   396.93   453.79  1125.72     0.54
 HUB     15.00   680.25   491.88   469.89  1117.99     0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   505.31   240.56     0.45  7659.92
 MEAN   534.83   474.28   137.89     0.42  7161.06     1.45
 HUB    444.80   472.24    47.08     0.42  7379.62
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	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.73	1.24	15.66	559.30	1.07	531.30	0.92	0.91
MEAN	18.48	1.22	15.20	556.92	1.07	526.56	0.92	0.91
HUB	18.59	1.23	14.47	557.96	1.07	519.32	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.87	28.43	24.20	4.23	0.93	0.37	2.90	
MEAN	41.18	16.90	12.70	4.20	0.93	0.32	3.51	0.91
HUB	46.31	-5.72	-9.30	3.58	0.93	0.17	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	610.915	396.160	465.053	1126.030	0.543	-0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.563	15.191	526.888	24.000	40.426	35.400	-5.026

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	484.775	396.160	626.059	1138.298	0.426	0.351

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.507	16.334	538.432	528.796	0.026	0.483

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	447.921	0.000	447.921	1141.329	0.392	0.398

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.580	541.303	0.000	0.060	0.045	0.422

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.873	18.441	1.221	558.061	35.251	200.274	1.553

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
219467.391	0.586	1807.848	1425047.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 8.987 EfDer = 0.995

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
145.767	3398.000	18.441	558.061	1.000	1.000	0.980

W Kg/sec = 66.25780

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
120.527	3275.976	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
112136.125	114378.609	1.682	590.487	351.010	474.134	1.351

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	426.95	-0.15	426.95	0.37	587.47
MEAN	18.08	0.00	-0.02	426.95	-0.15	426.95	0.37	
HUB	15.21	0.00	-0.02	426.95	-0.15	426.95	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.99	46.36	8.63	609.37	744.17	16.74	542.84	0.65
MEAN	51.47	42.30	9.17	536.08	685.43	16.74	542.84	0.60
HUB	46.58	37.84	8.74	451.02	621.16	16.74	542.84	0.54

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	525.63	301.47	430.58	1165.29	0.45
MEAN	18.01	535.03	308.69	437.00	1161.50	0.46
HUB	15.22	578.63	370.76	444.24	1157.71	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	527.11	304.05	0.45	6159.03	
MEAN	534.05	491.69	225.36	0.42	5562.21	1.52
HUB	451.41	451.51	80.65	0.39	5646.30	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.71	1.18	18.87	587.39	1.05	564.32	0.92	0.91
MEAN	21.37	1.16	18.48	584.54	1.05	560.64	0.92	0.91
HUB	21.42	1.16	18.06	584.94	1.05	556.99	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.00	35.23	31.50	3.73	0.93	0.36	2.90	
MEAN	35.24	27.28	23.50	3.78	0.93	0.35	3.30	0.91
HUB	39.85	10.29	6.50	3.79	0.93	0.35	3.92	

blockage3	Cor/U1	Cor/Incid
0.600	1.000	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	970.487	309.560	919.792	1104.632	0.879	-1.812

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.469	12.983	506.994	46.000	18.601	30.600	11.999

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	946.283	309.560	995.630	1108.902	0.853	-1.735

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.600	21.269	13.209	510.874	317.610	0.076	0.131

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	947.065	0.000	947.065	1109.530	0.854	-0.004

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.600	12.972	510.840	0.000	0.060	0.200	-1.814

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.738	20.892	1.133	585.624	27.563	227.722	1.765

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
171689.312	0.468	1414.280	1286138.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 8.987 EfDer = 0.772

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
145.767	3398.000	20.892	585.624	1.000	1.000	0.630

W Kg/sec = 66.25780

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
108.978	3197.952	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
112136.125	114378.609	1.105	350.665	317.391	271.233	0.855

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	778.36	-0.27	778.36	0.69	560.08

```
MEAN    17.74     0.00    -0.02   778.36    -0.27   778.36     0.69
HUB     15.05     0.00    -0.02   778.36    -0.27   778.36     0.69

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     37.41    46.36    -8.95   595.14   979.97    15.24   535.05     0.86
MEAN    34.06    43.40    -9.34   526.00   939.57    15.24   535.05     0.83
HUB     29.84    38.84    -9.00   446.28   897.35    15.24   535.05     0.79

     ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   503.58   223.87   451.08  1186.96     0.42
MEAN    17.51   515.75   244.87   453.91  1185.20     0.44
HUB     14.85   561.03   322.67   458.95  1183.51     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    587.43   579.35   363.56     0.49  4440.18
MEAN   519.12   530.33   274.25     0.45  4291.62     1.86
HUB    440.35   473.80   117.68     0.40  4795.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.81     1.09    20.15   606.76     1.04   585.59     0.92     0.71
MEAN    22.74     1.09    19.97   606.05     1.03   583.85     0.92     0.71
HUB     22.97     1.10    19.69   608.45     1.04   582.18     0.92     0.71

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     26.39    38.87    31.50     7.37     0.93     0.45     2.90
MEAN    28.35    31.14    23.50     7.64     0.85     0.48     3.28     0.71
HUB     35.11    14.38     6.50     7.88     0.85     0.52     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.772

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     521.730     246.479     459.837    1185.708       0.440       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.812      19.969     584.362      46.000      28.192      31.500       3.308

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     474.768     246.479     534.936    1189.664       0.399       0.165

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.786      20.415     588.269     471.992       0.019       0.276

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     460.496       0.000     460.496    1190.790       0.387       0.181

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.494     589.383       0.000       0.060       0.040       0.192

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.665      22.724       1.088     607.084      21.459     285.785       2.215

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 133728.422       0.388    1101.579 2296155.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3398.000      22.724     607.084       1.000       1.000       0.980
W Kg/sec =   66.25780
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
102.014	3140.922	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
112136.125	114378.609	1.728	513.330	297.127	401.059	1.350

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	431.76	-0.15	431.76	0.36	527.90
MEAN	16.97	0.00	-0.02	431.76	-0.15	431.76	0.36	
HUB	14.32	0.00	-0.02	431.76	-0.15	431.76	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.92	46.36	6.56	571.12	716.07	20.76	591.53	0.60
MEAN	49.38	43.80	5.58	503.23	663.18	20.76	591.53	0.56
HUB	44.53	37.84	6.69	424.63	605.68	20.76	591.53	0.51

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	504.36	247.14	439.65	1209.44	0.42
MEAN	16.57	514.72	260.54	443.92	1206.91	0.43
HUB	13.89	556.38	328.80	448.83	1204.38	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	539.52	312.71	0.45	4668.96	
MEAN	491.47	500.39	230.93	0.41	4320.60	1.44
HUB	411.88	456.45	83.08	0.38	4569.23	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.49	1.12	22.61	629.29	1.04	608.07	0.92	0.91
MEAN	25.27	1.11	22.30	627.64	1.03	605.53	0.92	0.91
HUB	25.43	1.12	21.96	628.82	1.04	602.99	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	29.34	35.42	31.50	3.92	0.93	0.31	2.90	
MEAN	30.41	27.48	23.50	3.98	0.92	0.30	3.29	0.91
HUB	36.23	10.49	6.50	3.99	0.92	0.31	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	507.409	262.000	434.534	1208.461	0.420	0.053

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.365	22.466	607.102	46.000	31.088	32.400	1.312

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	452.445	262.000	522.830	1212.834	0.373	0.235

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	25.344	23.020	611.504	456.573	0.017	0.327

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	429.597	0.000	429.597	1214.501	0.354	0.231

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.184	613.185	0.000	0.060	0.037	0.287

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.876	25.281	1.113	628.584	21.500	257.081	1.993

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 134037.578       0.428    1104.126 1280401.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.987   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3398.000      25.281     628.584       1.000       1.000       0.980
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     93.306    3086.739       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 112136.125  114378.609       1.875     509.668     271.776     390.276       1.436

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   400.25    -0.14   400.25     0.33   493.47
 MEAN    15.91     0.00    -0.02   400.25    -0.14   400.25     0.33
 HUB     13.07     0.00    -0.02   400.25    -0.14   400.25     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.62    47.36     6.26   543.25   674.88    23.45   615.22     0.55
 MEAN    49.70    44.80     4.90   471.87   618.86    23.45   615.22     0.51
 HUB     44.09    38.84     5.25   387.57   557.24    23.45   615.22     0.46

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   473.96   238.70   409.47  1231.17     0.38
 MEAN    15.50   479.91   243.14   413.76  1228.32     0.39
 HUB     12.59   512.53   295.83   418.54  1225.47     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   503.66   293.28     0.41  4284.75
 MEAN   459.55   466.94   216.41     0.38  3770.34     1.45
 HUB    373.33   425.66    77.51     0.35  3726.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.99     1.11    25.27   648.96     1.03   630.22     0.92     0.91
 MEAN    27.65     1.09    24.89   646.51     1.03   627.30     0.92     0.91
 HUB     27.62     1.09    24.49   646.30     1.03   624.39     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.24    35.61    31.50     4.11     0.93     0.31     2.90
 MEAN    30.44    27.61    23.50     4.11     0.92     0.30     3.34     0.91
 HUB     35.25    10.49     6.50     3.99     0.92     0.30     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     485.207     247.602     417.276    1228.623       0.395      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.697      24.872     627.620      46.000      30.684      33.000       2.316

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     439.560     247.602     504.500    1232.065       0.357       0.156

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.661      25.330     631.141     440.827       0.033       0.326
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     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     410.677       0.000     410.677    1234.062       0.333       0.254

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      25.602     633.189       0.000       0.060       0.038       0.251

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.873      27.644       1.093     647.256      18.672     274.050       2.124

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  116466.391       0.412     959.384 1320705.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     775389.06   6387.2173    142.3999      1.8299      0.7947      8.9875      1.2380


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 90%  Stat 2 35% Ice Block 8-31-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.453   EfDer =  0.994

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     143.448    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   65.20367

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     140.134    3384.617       1.402       0.249      53.349      32.000       0.050

    CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  110352.086  112558.891       2.038     831.557     408.102     619.754       1.519

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   332.97    -0.11   332.97     0.30   609.32
  MEAN    17.06     0.00    -0.02   332.97    -0.11   332.97     0.30
  HUB     12.51     0.00    -0.02   332.97    -0.11   332.97     0.30

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.45    50.47    10.98   611.74   696.59    14.19   513.55     0.63
  MEAN    56.65    47.20     9.45   505.89   605.73    14.19   513.55     0.54
  HUB     48.10    38.62     9.48   370.96   498.56    14.19   513.55     0.45

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   575.55   375.73   435.98  1131.59     0.51
  MEAN    18.04   598.29   399.52   445.35  1126.45     0.53
  HUB     15.00   673.53   491.00   461.04  1118.73     0.60

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   495.76   236.01     0.44  7753.70
  MEAN   534.83   465.45   135.31     0.41  7207.66     1.47
  HUB    444.80   463.35    46.20     0.41  7366.40

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.77     1.24    15.73   559.74     1.07   532.08     0.92     0.91
  MEAN    18.49     1.22    15.26   557.14     1.07   527.25     0.92     0.91
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 HUB     18.57     1.23    14.53   557.90     1.07   520.01     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.76    28.43    24.20     4.23     0.93     0.38     2.90
 MEAN    41.89    16.90    12.70     4.20     0.94     0.33     3.51     0.91
 HUB     46.80    -5.72    -9.30     3.58     0.94     0.18     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     606.005     398.741     456.341    1126.779       0.538      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.579      15.255     527.590      24.000      41.146      35.400      -5.746

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     475.231     398.741     620.354    1139.320       0.417       0.364

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.518      16.426     539.400     528.796       0.027       0.494

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     439.478       0.000     439.478    1142.202       0.385       0.407

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.656     542.131       0.000       0.060       0.048       0.431

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      18.449       1.221     558.263      35.453     197.666       1.532

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 220724.812       0.590    1789.280 1400116.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.453   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    143.448    3398.000      18.449     558.263       1.000       1.000       0.980
W Kg/sec =   65.20367

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.577    3275.384       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 110352.086  112558.891       1.710     590.487     345.331     474.134       1.373

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   419.03    -0.14   419.03     0.37   587.37
 MEAN    18.08     0.00    -0.02   419.03    -0.14   419.03     0.37
 HUB     15.21     0.00    -0.02   419.03    -0.14   419.03     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.49    46.36     9.13   609.37   739.66    16.81   543.60     0.65
 MEAN    51.99    42.30     9.69   536.08   680.53    16.81   543.60     0.60
 HUB     47.12    37.84     9.28   451.02   615.74    16.81   543.60     0.54

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   522.35   307.33   422.37  1166.38     0.45
```

MEAN	18.01	530.89	312.98	428.82	1162.46	0.46
HUB	15.22	573.41	372.31	436.10	1158.56	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	605.52	517.02	298.18	0.44	6278.74	
MEAN	534.05	482.46	221.07	0.42	5639.30	1.54
HUB	451.41	443.22	79.10	0.38	5669.94	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.77	1.18	18.97	588.16	1.05	565.37	0.92	0.91
MEAN	21.42	1.16	18.56	585.11	1.05	561.58	0.92	0.91
HUB	21.43	1.16	18.13	585.26	1.05	557.80	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.04	35.22	31.50	3.72	0.93	0.37	2.90	
MEAN	36.12	27.27	23.50	3.77	0.94	0.36	3.30	0.91
HUB	40.49	10.28	6.50	3.78	0.94	0.36	3.92	

blockage3	Cor/U1	Cor/Incid
0.600	1.000	0.993

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	932.291	313.855	877.874	1111.731	0.839	-1.670

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.512	13.566	513.604	46.000	19.673	30.600	10.927

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	893.402	313.855	946.927	1118.134	0.799	-1.520

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.600	21.343	14.009	519.533	317.610	0.066	0.160

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	888.007	0.000	888.007	1119.338	0.793	0.112

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.600	13.899	520.371	0.000	0.060	0.162	-1.556

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.773	21.057	1.141	586.176	27.913	223.477	1.732

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
173868.859	0.474	1409.447	1262067.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 9.453 EfDer = 0.786

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
143.448	3398.000	21.057	586.176	1.000	1.000	0.630

W Kg/sec = 65.20367

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
106.457	3196.447	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
110352.086	112558.891	1.131	350.665	310.050	271.233	0.875

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	746.32	-0.26	746.32	0.65	559.82
MEAN	17.74	0.00	-0.02	746.32	-0.26	746.32	0.65	
HUB	15.05	0.00	-0.02	746.32	-0.26	746.32	0.65	

```
      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     38.58    46.36    -7.78   595.14   954.72    15.78   539.68     0.84
MEAN    35.19    43.40    -8.21   526.00   913.20    15.78   539.68     0.80
HUB     30.89    38.84    -7.95   446.28   869.70    15.78   539.68     0.76

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   497.40   236.01   437.84  1189.20     0.42
MEAN    17.51   508.87   254.06   440.91  1187.13     0.43
HUB     14.85   553.11   327.17   445.97  1185.14     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    587.43   561.42   351.42     0.47  4680.58
MEAN   519.12   514.45   265.06     0.43  4452.35     1.86
HUB    440.35   460.11   113.18     0.39  4862.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.13     1.10    20.51   608.45     1.04   587.80     0.92     0.72
MEAN    23.03     1.09    20.29   607.36     1.04   585.75     0.92     0.72
HUB     23.22     1.10    20.00   609.32     1.04   583.78     0.92     0.72

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     28.33    38.75    31.50     7.25     0.93     0.45     2.90
MEAN    29.95    31.01    23.50     7.51     0.86     0.48     3.28     0.72
HUB     36.26    14.24     6.50     7.74     0.86     0.52     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.786

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     514.629     255.731     446.592    1187.644       0.433       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.099      20.300     586.270      46.000      29.797      31.500       1.703

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     459.964     255.731     526.275    1192.140       0.386       0.195

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.078      20.823     590.717     471.992       0.017       0.300

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     446.181       0.000     446.181    1193.191       0.374       0.209

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.899     591.760       0.000       0.060       0.038       0.221

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.683      23.020       1.093     608.377      22.201     272.797       2.115

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 138352.047       0.401    1121.534 2215308.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 9.453   EfDer =  1.000

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    143.448    3398.000      23.020     608.377       1.000       1.000       0.980
W Kg/sec =   65.20367

   W cor      RPM cor        GAMMA       Cp         R          Blades       THK
     99.205    3137.582       1.401       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
110352.086	112558.891	1.777	513.330	288.945	401.059	1.388

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	418.61	-0.14	418.61	0.35	527.33
MEAN	16.97	0.00	-0.02	418.61	-0.14	418.61	0.35	
HUB	14.32	0.00	-0.02	418.61	-0.14	418.61	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.77	46.36	7.41	571.12	708.22	21.15	593.76	0.59
MEAN	50.25	43.80	6.45	503.23	654.70	21.15	593.76	0.55
HUB	45.42	37.84	7.58	424.63	596.38	21.15	593.76	0.50

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	497.31	257.45	425.49	1212.22	0.41
MEAN	16.57	506.66	268.04	429.95	1209.47	0.42
HUB	13.89	546.98	331.59	435.01	1206.71	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	522.01	302.41	0.43	4863.34	
MEAN	491.47	484.54	223.43	0.40	4444.94	1.47
HUB	411.88	442.36	80.29	0.37	4607.92	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.94	1.13	23.10	631.51	1.04	610.88	0.92	0.91
MEAN	25.68	1.12	22.75	629.52	1.03	608.10	0.92	0.91
HUB	25.78	1.12	22.39	630.30	1.04	605.33	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.18	35.40	31.50	3.90	0.93	0.33	2.90	
MEAN	31.94	27.46	23.50	3.96	0.93	0.32	3.29	0.91
HUB	37.32	10.46	6.50	3.96	0.93	0.33	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	499.880	269.549	420.979	1210.940	0.413	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.768	22.914	609.593	46.000	32.631	32.400	-0.231

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	437.474	269.549	513.849	1215.778	0.360	0.261

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	25.749	23.543	614.474	456.573	0.016	0.350

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	415.565	0.000	415.565	1217.319	0.341	0.256

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.695	616.034	0.000	0.060	0.037	0.311

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	25.687	1.116	630.443	22.066	248.246	1.924

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
137570.859	0.439	1115.202	1252941.000

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 9.453   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    143.448    3398.000      25.687     630.443       1.000       1.000       0.980
W Kg/sec =   65.20367

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     90.503    3082.184       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 110352.086  112558.891       1.933     509.668     263.614     390.276       1.480

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   387.42    -0.13   387.42     0.32   492.74
 MEAN    15.91     0.00    -0.02   387.42    -0.13   387.42     0.32
 HUB     13.07     0.00    -0.02   387.42    -0.13   387.42     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.51    47.36     7.15   543.25   667.35    23.95   617.92     0.55
 MEAN    50.62    44.80     5.82   471.87   610.64    23.95   617.92     0.50
 HUB     45.02    38.84     6.18   387.57   548.09    23.95   617.92     0.45

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   467.40   248.85   395.65  1234.33     0.38
 MEAN    15.50   472.04   250.53   400.07  1231.27     0.38
 HUB     12.59   503.11   298.57   404.93  1228.23     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    531.98   486.52   283.13     0.39  4466.74
 MEAN   459.55   451.39   209.02     0.37  3884.72     1.48
 HUB    373.33   411.78    74.76     0.34  3760.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.56     1.11    25.86   651.68     1.03   633.46     0.92     0.91
 MEAN    28.17     1.10    25.45   648.91     1.03   630.33     0.92     0.91
 HUB     28.09     1.09    25.02   648.32     1.03   627.21     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.17    35.59    31.50     4.09     0.93     0.33     2.90
 MEAN    32.06    27.59    23.50     4.09     0.92     0.32     3.34     0.91
 HUB     36.40    10.46     6.50     3.96     0.92     0.31     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     477.348     255.123     403.452    1231.568       0.388      -0.006

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    28.216      25.436     630.633      46.000      32.307      33.000       0.693

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     424.119     255.123     494.939    1235.469       0.343       0.188

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      28.186      25.977     634.636     440.827       0.031       0.350

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     14.701     396.519       0.000     396.519    1237.307       0.320       0.281

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.232     636.525       0.000       0.060       0.037       0.278

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      28.168       1.097     649.639      19.195     264.079       2.047

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 119737.359       0.423     970.637 1292212.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    790254.00   6406.1001    140.1344      1.8646      0.8063      9.4533      1.2426


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 90%  Stat 2 35% Ice Block 8-31-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.741    3398.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    137.490    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 108269.750  110434.914       2.077     831.557     400.401     619.754       1.548

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   326.09    -0.11   326.09     0.29   609.32
 MEAN    17.06     0.00    -0.02   326.09    -0.11   326.09     0.29
 HUB     12.51     0.00    -0.02   326.09    -0.11   326.09     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.94    50.47    11.47   611.74   693.33    14.23   513.93     0.62
 MEAN    57.20    47.20    10.00   505.89   601.97    14.23   513.93     0.54
 HUB     48.69    38.62    10.07   370.96   493.99    14.23   513.93     0.44

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   571.73   380.93   426.35  1132.52     0.50
 MEAN    18.04   593.09   402.46   435.64  1127.27     0.53
 HUB     15.00   665.84   489.96   450.87  1119.56     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    611.74   484.82   230.81     0.43  7860.93
 MEAN   534.83   455.30   132.36     0.40  7260.77     1.49
 HUB    444.80   453.12    45.16     0.40  7350.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.82     1.25    15.81   560.26     1.07   532.95     0.92     0.91
 MEAN    18.51     1.23    15.33   557.40     1.07   528.02     0.92     0.91
 HUB     18.56     1.23    14.60   557.83     1.07   520.80     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     41.78    28.43    24.20     4.23     0.93     0.40     2.90
 MEAN    42.73    16.90    12.70     4.20     0.94     0.34     3.51     0.91
 HUB     47.38    -5.72    -9.30     3.58     0.94     0.20     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     600.463     401.682     446.326    1127.620       0.533       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.595      15.326     528.378      24.000      41.986      35.400      -6.586

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     464.316     401.682     613.953    1140.467       0.407       0.379

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.530      16.529     540.486     528.796       0.029       0.507

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     429.806       0.000     429.806    1143.183       0.376       0.417

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.738     543.063       0.000       0.060       0.051       0.441

    STAGE EXIT CONDITIONS, STAGE             1
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.866      18.456       1.222     558.493      35.683     194.667       1.509

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 222155.500       0.594    1766.895 1371179.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.990

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    140.741    3398.000       18.456     558.493       1.000        1.000        0.980
W Kg/sec =   63.97328

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    116.321    3274.709        1.402       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 108269.750  110434.914        1.743     590.487     338.761     474.134       1.400

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   409.95    -0.14   409.95      0.36   587.24
 MEAN    18.08      0.00    -0.02   409.95    -0.14   409.95      0.36
 HUB     15.21      0.00    -0.02   409.95    -0.14   409.95      0.36

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     56.08     46.36      9.72   609.37   734.55     16.89   544.46      0.64
 MEAN    52.60     42.30     10.30   536.08   674.97     16.89   544.46      0.59
 HUB     47.74     37.84      9.90   451.02   609.60     16.89   544.46      0.53

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     20.42   518.83    314.01    413.02  1167.60      0.44
 MEAN    18.01   526.33    317.88    419.50  1163.55      0.45
 HUB     15.22   567.53    374.08    426.79  1159.51      0.49
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   505.53   291.51     0.43  6415.00
 MEAN   534.05   471.92   216.18     0.41  5727.49     1.56
 HUB    451.41   433.74    77.33     0.37  5696.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.85     1.18    19.07   589.04     1.05   566.56     0.92     0.91
 MEAN    21.46     1.16    18.65   585.76     1.05   562.63     0.92     0.91
 HUB     21.45     1.16    18.20   585.62     1.05   558.72     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.24    35.21    31.50     3.71     0.93     0.39     2.90
 MEAN    37.15    27.26    23.50     3.76     0.94     0.37     3.30     0.91
 HUB     41.23    10.27     6.50     3.77     0.94     0.37     3.92


   blockage3   Cor/U1    Cor/Incid
      0.600       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     896.514     318.768     837.929    1118.272       0.802      -1.542

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.556      14.111     519.692      46.000      20.828      30.600       9.772

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     846.466     318.768     904.499    1126.079       0.752      -1.333

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.600      21.416      14.717     526.976     317.610       0.058       0.185

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     837.625       0.000     837.625    1127.556       0.743       0.196

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600      14.689     528.233       0.000       0.060       0.132      -1.343

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.799      21.198       1.149     586.805      28.312     218.703       1.695

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 176352.969       0.481    1402.608 1234287.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.806

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.741    3398.000      21.198     586.805       1.000       1.000       0.630
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.808    3194.734       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 108269.750  110434.914       1.160     350.665     302.334     271.233       0.897

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   715.51    -0.25   715.51     0.63   559.52
 MEAN    17.74     0.00    -0.02   715.51    -0.25   715.51     0.63
 HUB     15.05     0.00    -0.02   715.51    -0.25   715.51     0.63

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     39.76    46.36    -6.60   595.14   930.82    16.28   544.07     0.81
 MEAN    36.33    43.40    -7.07   526.00   888.19    16.28   544.07     0.78
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HUB     31.97    38.84    -6.87   446.28   843.41    16.28   544.07     0.74

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   491.35   248.51   423.87  1191.53     0.41
MEAN    17.51   501.92   263.52   427.18  1189.15     0.42
HUB     14.85   544.84   331.69   432.24  1186.86     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    587.43   542.71   338.92     0.46  4927.95
MEAN   519.12   497.82   255.61     0.42  4617.62     1.88
HUB    440.35   445.69   108.66     0.38  4929.30

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.46     1.11    20.87   610.26     1.04   590.10     0.92     0.74
MEAN    23.31     1.10    20.62   608.78     1.04   587.75     0.92     0.74
HUB     23.46     1.11    20.30   610.26     1.04   585.48     0.92     0.74

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.38    38.65    31.50     7.15     0.93     0.46     2.90
MEAN    31.67    30.89    23.50     7.39     0.87     0.48     3.28     0.74
HUB     37.50    14.11     6.50     7.61     0.87     0.52     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.806

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     507.451     265.245     432.610    1189.671       0.427       0.003

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.383      20.631     588.271      46.000      31.514      31.500      -0.014

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     444.504     265.245     517.628    1194.718       0.372       0.226

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      23.364      21.232     593.273     471.992       0.017       0.326

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.121     431.285       0.000     431.285    1195.690       0.361       0.238

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      21.302     594.239       0.000       0.060       0.037       0.251

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.705      23.308       1.100     609.766      22.961     260.441       2.019

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 143093.234       0.415    1138.080 2134108.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.741    3398.000      23.308     609.766       1.000       1.000       0.980
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.239    3134.007       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 108269.750  110434.914       1.831     513.330     280.305     401.059       1.431
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ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	404.90	-0.14	404.90	0.34	526.73
MEAN	16.97	0.00	-0.02	404.90	-0.14	404.90	0.34	
HUB	14.32	0.00	-0.02	404.90	-0.14	404.90	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.67	46.36	8.31	571.12	700.20	21.53	596.09	0.58
MEAN	51.19	43.80	7.39	503.23	646.01	21.53	596.09	0.54
HUB	46.37	37.84	8.53	424.63	586.84	21.53	596.09	0.49

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	490.60	268.02	410.92	1215.08	0.40
MEAN	16.57	498.70	275.76	415.52	1212.11	0.41
HUB	13.89	537.44	334.43	420.71	1209.14	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	559.85	504.01	291.83	0.41	5062.84	
MEAN	491.47	468.18	215.71	0.39	4572.73	1.50
HUB	411.88	427.78	77.45	0.35	4647.30	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.38	1.13	23.58	633.85	1.04	613.77	0.92	0.91
MEAN	26.07	1.12	23.20	631.52	1.04	610.77	0.92	0.91
HUB	26.12	1.12	22.80	631.87	1.04	607.77	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.11	35.38	31.50	3.88	0.93	0.35	2.90	
MEAN	33.57	27.44	23.50	3.94	0.93	0.34	3.29	0.91
HUB	38.48	10.43	6.50	3.93	0.93	0.34	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	492.471	277.308	406.974	1213.502	0.406	0.051

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
26.161	23.353	612.176	46.000	34.270	32.400	-1.870

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	422.127	277.308	505.065	1218.811	0.346	0.288

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	26.142	24.058	617.545	456.573	0.016	0.375

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	401.208	0.000	401.208	1220.228	0.329	0.281

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	24.195	618.982	0.000	0.060	0.038	0.334

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.880	26.078	1.119	632.413	22.647	239.431	1.856

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
141195.484	0.450	1122.986	1222213.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

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 RESET =  0.000BLEED =  0.000 DPInc =10.000   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.741    3398.000      26.078     632.413       1.000       1.000       0.980
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     87.601    3077.381       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 108269.750  110434.914       1.997     509.668     255.160     390.276       1.530

    ROTOR LEADING EDGE CONDITIONS, STAGE             5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   374.26    -0.13   374.26     0.31   491.97
MEAN    15.91     0.00    -0.02   374.26    -0.13   374.26     0.31
HUB     13.07     0.00    -0.02   374.26    -0.13   374.26     0.31

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.44    47.36     8.08   543.25   659.79    24.43   620.73     0.54
MEAN    51.59    44.80     6.79   471.87   602.38    24.43   620.73     0.49
HUB     46.01    38.84     7.17   387.57   538.87    24.43   620.73     0.44

     ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
TIP     17.94   461.30   259.10   381.67  1237.55     0.37
MEAN    15.50   464.44   258.04   386.16  1234.31     0.38
HUB     12.59   493.69   301.32   391.07  1231.07     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    531.98   469.19   272.88     0.38  4650.53
MEAN   459.55   435.58   201.51     0.35  4001.02     1.52
HUB    373.33   397.65    72.01     0.32  3795.32

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     29.11     1.12    26.44   654.52     1.03   636.77     0.92     0.91
MEAN    28.67     1.10    26.00   651.43     1.03   633.44     0.92     0.91
HUB     28.53     1.09    25.54   650.46     1.03   630.13     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.17    35.56    31.50     4.06     0.93     0.36     2.90
MEAN    33.75    27.56    23.50     4.06     0.93     0.34     3.34     0.91
HUB     37.61    10.43     6.50     3.93     0.93     0.33     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     469.779     262.769     389.416    1234.584       0.381      -0.006

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    28.716      25.983     633.730      46.000      34.011      33.000      -1.011

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     408.597     262.769     485.798    1238.942       0.330       0.220

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      28.687      26.604     638.212     440.827       0.030       0.375

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    14.701     382.263       0.000     382.263    1240.627       0.308       0.309

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      26.840     639.949       0.000       0.060       0.037       0.305

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      28.668       1.099     652.137      19.725     254.304       1.971

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  123045.398       0.435     978.631 1260432.625

    OVERALL EXIT CONDITIONS; ALL          5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     805842.56   6409.2002    137.4901      1.8977      0.8151     10.0004      1.2474

*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 90%  Stat 2 35% Ice Block 8-31-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =10.753   EfDer =  0.988

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     137.045    3398.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   62.29324

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     133.879    3384.617       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  105426.406  107534.711       2.133     831.557     389.886     619.754       1.590

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   316.76    -0.11   316.76     0.28   609.32
  MEAN    17.06     0.00    -0.02   316.76    -0.11   316.76     0.28
  HUB     12.51     0.00    -0.02   316.76    -0.11   316.76     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.63    50.47    12.16   611.74   688.98    14.28   514.43     0.62
  MEAN    57.95    47.20    10.75   505.89   596.96    14.28   514.43     0.54
  HUB     49.51    38.62    10.89   370.96   487.88    14.28   514.43     0.44

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   566.91   387.88   413.45  1133.72     0.50
  MEAN    18.04   586.30   406.40   422.60  1128.33     0.52
  HUB     15.00   655.63   488.57   437.21  1120.65     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    611.74   470.17   223.87     0.41  8004.20
  MEAN   534.83   441.69   128.43     0.39  7331.68     1.53
  HUB    444.80   439.40    43.77     0.39  7329.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.87     1.25    15.91   560.94     1.07   534.10     0.92     0.90
  MEAN    18.53     1.23    15.41   557.73     1.07   529.02     0.92     0.90
  HUB     18.53     1.23    14.69   557.73     1.07   521.83     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     43.17    28.43    24.20     4.23     0.93     0.41     2.90
  MEAN    43.88    16.90    12.70     4.20     0.94     0.36     3.51     0.90
  HUB     48.18    -5.72    -9.30     3.58     0.94     0.21     4.78
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     593.228     405.609     432.898    1128.717       0.526       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.614      15.416     529.406      24.000      43.136      35.400      -7.736

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     449.759     405.609     605.642    1141.962       0.394       0.399

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.542      16.659     541.904     528.796       0.032       0.525

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     416.880       0.000     416.880    1144.467       0.364       0.431

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.841     544.284       0.000       0.060       0.056       0.454

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      18.460       1.222     558.799      35.990     190.633       1.478

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 224065.734       0.599    1735.287 1331937.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.753   EfDer =  0.986

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    137.045    3398.000      18.460     558.799       1.000       1.000       0.980
W Kg/sec =   62.29324

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    113.269    3273.810       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 105426.406  107534.711       1.790     590.487     329.872     474.134       1.437

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   397.80    -0.14   397.80     0.35   587.08
 MEAN    18.08     0.00    -0.02   397.80    -0.14   397.80     0.35
 HUB     15.21     0.00    -0.02   397.80    -0.14   397.80     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.87    46.36    10.51   609.37   727.84    16.98   545.59     0.64
 MEAN    53.43    42.30    11.13   536.08   667.66    16.98   545.59     0.58
 HUB     48.60    37.84    10.76   451.02   601.49    16.98   545.59     0.52

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   514.51   322.84   400.62  1169.18     0.44
 MEAN    18.01   520.49   324.34   407.08  1164.96     0.45
 HUB     15.22   559.81   376.41   414.37  1160.75     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    605.52   490.31   282.68     0.42  6595.12
 MEAN   534.05   457.93   209.71     0.39  5843.76     1.59
 HUB    451.41   421.10    75.00     0.36  5732.14
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    21.93     1.19    19.20   590.20     1.06   568.10     0.92     0.90
 MEAN   21.52     1.17    18.76   586.62     1.05   564.00     0.92     0.90
 HUB    21.46     1.16    18.30   586.09     1.05   559.92     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    38.86    35.21    31.50     3.71     0.93     0.40     2.90
 MEAN   38.55    27.26    23.50     3.76     0.94     0.39     3.30     0.90
 HUB    42.25    10.26     6.50     3.76     0.94     0.38     3.92


   blockage3   Cor/U1    Cor/Incid
      0.600       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     856.706     325.247     792.565    1125.402       0.761      -1.402

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.607      14.714     526.353      46.000      22.312      30.600       8.288

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     795.576     325.247     859.492    1134.381       0.701      -1.136

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.600      21.497      15.474     534.786     317.610       0.048       0.211

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     784.645       0.000     784.645    1135.964       0.691       0.275

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600      15.507     536.233       0.000       0.060       0.102      -1.125

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.822      21.341       1.156     587.638      28.838     212.480       1.647

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 179632.453       0.490    1391.172 1196856.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =10.753   EfDer =  0.835

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.045    3398.000      21.341     587.638       1.000       1.000       0.630
W Kg/sec =   62.29324

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.478    3192.468       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 105426.406  107534.711       1.198     350.665     292.637     271.233       0.927

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP    20.07     0.00    -0.02   679.90    -0.23   679.90     0.59   559.12
 MEAN   17.74     0.00    -0.02   679.90    -0.23   679.90     0.59
 HUB    15.05     0.00    -0.02   679.90    -0.23   679.90     0.59

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP    41.21    46.36    -5.15   595.14   903.73    16.84   549.05     0.79
 MEAN   37.74    43.40    -5.66   526.00   859.76    16.84   549.05     0.75
 HUB    33.29    38.84    -5.55   446.28   813.41    16.84   549.05     0.71

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
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     0.500       0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   484.56   263.87   406.42  1194.38     0.41
 MEAN    17.51   493.75   275.07   410.03  1191.65     0.41
 HUB     14.85   534.73   337.12   415.07  1189.01     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    587.43   519.49   323.56     0.43  5231.93
 MEAN   519.12   477.17   244.06     0.40  4819.66     1.90
 HUB    440.35   427.71   103.23     0.36  5009.79

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.85     1.12    21.29   612.54     1.04   592.94     0.92     0.76
 MEAN    23.65     1.11    21.01   610.57     1.04   590.22     0.92     0.76
 HUB     23.74     1.11    20.66   611.48     1.04   587.61     0.92     0.76

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.99    38.52    31.50     7.02     0.93     0.48     2.90
 MEAN    33.86    30.76    23.50     7.26     0.87     0.49     3.28     0.76
 HUB     39.08    13.97     6.50     7.47     0.87     0.53     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.835

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     498.998     276.874     415.139    1192.168       0.419       0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.719      21.022     590.744      46.000      33.701      31.500      -2.201

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     425.395     276.874     507.562    1197.885       0.355       0.265

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.699      21.718     596.424     471.992       0.017       0.359

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     412.942       0.000     412.942    1198.760       0.344       0.273

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.775     597.295       0.000       0.060       0.038       0.286

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.732      23.641       1.108     611.529      23.891     246.426       1.910

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 148891.609       0.431    1153.098 2036487.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.753   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.045    3398.000      23.641     611.529       1.000       1.000       0.980
W Kg/sec =   62.29324

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.528    3129.486       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 105426.406  107534.711       1.905     513.330     269.496     401.059       1.488

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     19.26     0.00    -0.02   387.98    -0.13   387.98     0.32   525.97
MEAN    16.97     0.00    -0.02   387.98    -0.13   387.98     0.32
HUB     14.32     0.00    -0.02   387.98    -0.13   387.98     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.82    46.36     9.46   571.12   690.55    21.99   598.97     0.58
MEAN    52.38    43.80     8.58   503.23   635.54    21.99   598.97     0.53
HUB     47.59    37.84     9.75   424.63   575.28    21.99   598.97     0.48

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   483.18   280.83   393.19  1218.55     0.40
MEAN    16.57   489.52   285.14   397.90  1215.34     0.40
HUB     13.89   526.02   337.87   403.16  1212.12     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    559.85   482.14   279.02     0.40  5304.63
MEAN   491.47   448.22   206.33     0.37  4728.06     1.55
HUB    411.88   409.90    74.01     0.34  4694.92

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.90     1.14    24.13   636.76     1.04   617.28     0.92     0.91
MEAN    26.53     1.12    23.72   634.02     1.04   614.02     0.92     0.91
HUB     26.51     1.12    23.29   633.86     1.04   610.77     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.54    35.36    31.50     3.86     0.93     0.37     2.90
MEAN    35.63    27.41    23.50     3.91     0.93     0.36     3.29     0.91
HUB     39.96    10.40     6.50     3.90     0.93     0.36     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     483.944     286.739     389.850    1216.630       0.398       0.049

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.613      23.862     615.338      46.000      36.335      32.400      -3.935

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     403.508     286.739     495.013    1222.504       0.330       0.322

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.590      24.656     621.295     456.573       0.018       0.406

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     16.096     383.823       0.000     383.823    1223.776       0.314       0.310

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      24.770     622.588       0.000       0.060       0.042       0.361

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.876      26.520       1.122     634.880      23.351     229.044       1.776

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 145592.266       0.465    1127.546 1181838.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.753   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.045    3398.000      26.520     634.880       1.000       1.000       0.980
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W Kg/sec = 62.29324

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
84.042	3071.395	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
105426.406	107534.711	2.082	509.668	244.794	390.276	1.594

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	358.29	-0.12	358.29	0.29	491.02
MEAN	15.91	0.00	-0.02	358.29	-0.12	358.29	0.29	
HUB	13.07	0.00	-0.02	358.29	-0.12	358.29	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.60	47.36	9.24	543.25	650.86	24.99	624.17	0.53
MEAN	52.80	44.80	8.00	471.87	592.58	24.99	624.17	0.48
HUB	47.26	38.84	8.42	387.57	527.90	24.99	624.17	0.43

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	454.72	271.32	364.91	1241.43	0.37
MEAN	15.50	455.82	267.01	369.43	1237.98	0.37
HUB	12.59	482.62	304.60	374.35	1234.54	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	531.98	448.45	260.66	0.36	4869.70	
MEAN	459.55	416.60	192.55	0.34	4139.90	1.57
HUB	373.33	380.61	68.73	0.31	3836.52	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	29.74	1.12	27.10	658.03	1.04	640.78	0.92	0.91
MEAN	29.24	1.10	26.62	654.56	1.03	637.23	0.92	0.91
HUB	29.03	1.09	26.13	653.12	1.03	633.69	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.63	35.54	31.50	4.04	0.93	0.38	2.90	
MEAN	35.86	27.53	23.50	4.03	0.93	0.36	3.34	0.91
HUB	39.13	10.40	6.50	3.90	0.93	0.35	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	461.217	271.901	372.547	1238.238	0.372	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
29.280	26.603	637.494	46.000	36.124	33.000	-3.124

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	390.129	271.901	475.532	1243.130	0.314	0.258

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	29.248	27.316	642.542	440.827	0.032	0.407

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	365.276	0.000	365.276	1244.644	0.293	0.340

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	27.529	644.107	0.000	0.060	0.040	0.336

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.880      29.226       1.102     655.236      20.356     242.997       1.884

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  126992.070       0.449     983.496 1218775.000

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     825174.12   6390.5981    133.8794      1.9346      0.8223     10.7532      1.2533



*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 85% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.546   EfDer =  0.995

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     160.332    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   72.87835

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     156.629    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  123340.875  125807.422       1.823     831.557     456.137     619.754       1.359

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   376.90    -0.13   376.90     0.34   575.61
  MEAN    17.06     0.00    -0.02   376.90    -0.13   376.90     0.34
  HUB     12.51     0.00    -0.02   376.90    -0.13   376.90     0.34

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     56.89    50.47     6.42   577.90   690.05    13.94   510.95     0.62
  MEAN    51.75    47.20     4.55   477.90   608.74    13.94   510.95     0.55
  HUB     42.93    38.62     4.31   350.44   514.73    13.94   510.95     0.46

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   592.30   302.21   509.40  1120.42     0.53
  MEAN    18.04   622.87   348.07   516.55  1117.31     0.56
  HUB     15.00   713.30   473.40   533.57  1110.49     0.64

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   579.22   275.68     0.52  6237.36
  MEAN   505.23   539.93   157.17     0.48  6279.96     1.25
  HUB    420.19   536.22    53.21     0.48  7102.55

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.84     1.18    14.75   550.88     1.05   521.58     0.92     0.91
  MEAN    17.86     1.18    14.46   551.07     1.05   518.67     0.92     0.91
  HUB     18.25     1.21    13.82   554.77     1.06   512.29     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     30.68    28.42    24.20     4.22     0.93     0.24     2.90
  MEAN    33.97    16.92    12.70     4.22     0.92     0.20     3.51     0.91
  HUB     41.58    -5.69    -9.30     3.61     0.92     0.06     4.78


    blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     634.044     347.391     530.406    1117.205       0.568      -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.948      14.422     518.662      24.000      33.223      35.400       2.177

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     564.209     347.391     662.580    1124.707       0.502       0.200

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.900      15.070     525.651     528.796       0.023       0.366

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     517.635       0.000     517.635    1129.201       0.458       0.282

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.447     529.860       0.000       0.060       0.038       0.303

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      17.845       1.181     552.240      29.430     228.441       1.771

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 183224.469       0.549    1660.110 1584834.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 4.546   EfDer =  0.990

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    160.332    3210.000      17.845     552.240       1.000       1.000       0.980
W Kg/sec =   72.87835

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    136.279    3110.996       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123340.875  125807.422       1.488     590.487     396.880     474.134       1.195

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   491.84    -0.17   491.84     0.43   557.89
 MEAN    18.08     0.00    -0.02   491.84    -0.17   491.84     0.43
 HUB     15.21     0.00    -0.02   491.84    -0.17   491.84     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.50    46.36     3.14   575.66   757.29    15.67   532.04     0.67
 MEAN    45.85    42.30     3.55   506.42   706.07    15.67   532.04     0.62
 HUB     40.91    37.84     3.07   426.07   650.84    15.67   532.04     0.58

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   551.37   211.57   509.17  1146.59     0.48
 MEAN    18.01   565.39   239.14   512.33  1145.16     0.49
 HUB     15.22   613.78   331.38   516.64  1143.66     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   623.84   360.45     0.54  4323.65
 MEAN   504.50   576.97   265.36     0.50  4309.95     1.32
 HUB    426.43   525.31    95.05     0.46  5047.19

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     19.91     1.12    16.99   571.69     1.04   546.30     0.92     0.91
 MEAN    19.90     1.12    16.85   571.63     1.04   544.93     0.92     0.91
 HUB     20.27     1.14    16.66   574.94     1.04   543.49     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.56    35.30    31.50     3.80     0.93     0.22     2.90
 MEAN    25.02    27.38    23.50     3.88     0.92     0.23     3.30     0.91
 HUB     32.68    10.43     6.50     3.93     0.92     0.26     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     652.742     239.811     607.094    1136.921       0.574      -0.268

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.996      15.988     537.172      46.000      21.555      30.600       9.045

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     624.660     239.811     669.111    1140.087       0.548      -0.190

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      19.904      16.226     540.168     455.853       0.039       0.177

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     617.268       0.000     617.268    1140.897       0.541       0.072

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      16.218     540.935       0.000       0.060       0.073      -0.192

    STAGE EXIT CONDITIONS, STAGE            2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.813      19.796       1.109     572.753      20.513     288.184       2.234

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 127761.211       0.390    1157.584 1460211.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 4.546   EfDer =  0.908

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    160.332    3210.000      19.796     572.753       1.000       1.000       0.880
W Kg/sec =   72.87835

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    125.106    3054.778       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 123340.875  125807.422       1.344     489.817     364.354     384.470       1.055

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   570.12    -0.20   570.12     0.50   535.01
 MEAN    17.74     0.00    -0.02   570.12    -0.20   570.12     0.50
 HUB     15.05     0.00    -0.02   570.12    -0.20   570.12     0.50

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.61    46.36    -1.75   562.21   800.84    16.71   545.62     0.70
 MEAN    41.09    43.40    -2.31   496.90   756.40    16.71   545.62     0.66
 HUB     36.49    38.84    -2.35   421.59   709.19    16.71   545.62     0.62

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	551.87	172.74	524.13	1163.66	0.47
MEAN	17.51	564.93	208.29	525.13	1163.44	0.49
HUB	14.85	612.40	310.00	528.14	1163.09	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	648.68	382.18	0.56	3425.99	
MEAN	490.40	596.11	282.11	0.51	3650.00	1.35
HUB	415.99	538.67	105.99	0.46	4606.44	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.38	1.08	18.33	588.16	1.03	562.73	0.92	0.83
MEAN	21.49	1.09	18.29	589.17	1.03	562.52	0.92	0.83
HUB	21.95	1.11	18.17	593.47	1.04	562.16	0.92	0.83

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	18.24	36.10	31.50	4.60	0.93	0.23	2.90	
MEAN	21.64	28.25	23.50	4.75	0.89	0.25	3.28	0.83
HUB	30.41	11.35	6.50	4.85	0.89	0.30	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.908

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	571.834	209.661	532.011	1163.842	0.491	0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.575	18.289	562.963	46.000	21.509	31.500	9.991

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	556.538	209.661	594.721	1165.331	0.478	0.035

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.488	18.379	564.404	471.992	0.036	0.179

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	540.015	0.000	540.015	1166.891	0.463	0.050

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.457	565.917	0.000	0.060	0.068	0.059

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.729	21.379	1.080	590.263	17.511	318.119	2.466

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
109098.805	0.354	988.493	1656523.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 4.546 EfDer = 0.943

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
160.332	3210.000	21.379	590.263	1.000	1.000	0.980

W Kg/sec = 72.87835

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
117.600	3009.125	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
123340.875	125807.422	1.499	513.330	342.505	401.059	1.171

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	503.90	-0.17	503.90	0.43	505.74
MEAN	16.97	0.00	-0.02	503.90	-0.17	503.90	0.43	

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HUB     14.32     0.00    -0.02   503.90    -0.17   503.90     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     46.96    46.36     0.60   539.52   738.37    18.82   569.07     0.63
MEAN    43.34    43.80    -0.46   475.39   692.88    18.82   569.07     0.59
HUB     38.53    37.84     0.69   401.14   644.18    18.82   569.07     0.55

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   549.90   151.34   528.67  1179.15     0.47
MEAN    16.57   561.16   187.36   528.96  1179.23     0.48
HUB     13.89   604.52   289.12   530.90  1179.11     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    528.88   649.64   377.54     0.55  2860.58
MEAN   464.28   597.06   276.92     0.51  3108.22     1.24
HUB    389.09   540.23    99.98     0.46  4018.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.81     1.07    19.65   603.12     1.02   577.89     0.92     0.86
MEAN    22.94     1.07    19.64   604.24     1.02   577.95     0.92     0.86
HUB     23.41     1.10    19.57   608.33     1.03   577.83     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     15.97    35.53    31.50     4.03     0.93     0.16     2.90
MEAN    19.50    27.63    23.50     4.13     0.90     0.18     3.29     0.86
HUB     28.57    10.66     6.50     4.16     0.90     0.22     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.943

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     550.316     188.413     517.057    1181.209       0.466       0.056

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.023      19.838     579.951      46.000      20.022      32.400      12.378

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     550.276     188.413     581.638    1181.212       0.466       0.036

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.914      19.745     579.955     456.573       0.042       0.166

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     522.446       0.000     522.446    1183.747       0.441       0.023

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      19.917     582.446       0.000       0.060       0.083       0.086

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.719      22.771       1.065     605.229      14.965     344.371       2.670

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93266.945       0.333     845.048 1476477.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 4.546   EfDer =  0.912

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    160.332    3210.000      22.771     605.229       1.000       1.000       0.980
W Kg/sec =   72.87835
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
111.803	2971.690	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
123340.875	125807.422	1.565	509.668	325.634	390.276	1.199

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	484.09	-0.17	484.09	0.41	475.08
MEAN	15.91	0.00	-0.02	484.09	-0.17	484.09	0.41	
HUB	13.07	0.00	-0.02	484.09	-0.17	484.09	0.41	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.68	47.36	-0.68	513.19	705.60	20.30	585.67	0.59
MEAN	42.65	44.80	-2.15	445.76	658.18	20.30	585.67	0.55
HUB	37.11	38.84	-1.73	366.12	607.05	20.30	585.67	0.51

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	527.90	134.93	510.36	1194.26	0.44
MEAN	15.50	536.96	164.59	511.11	1194.04	0.45
HUB	12.59	573.44	255.58	513.33	1193.66	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	502.54	628.98	367.61	0.53	2423.70	
MEAN	434.13	577.83	269.53	0.48	2553.45	1.22
HUB	352.68	522.43	97.10	0.44	3219.97	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.99	1.05	20.97	616.12	1.02	592.87	0.92	0.83
MEAN	24.05	1.06	20.93	616.70	1.02	592.65	0.92	0.83
HUB	24.40	1.07	20.83	619.70	1.02	592.26	0.92	0.83

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	14.81	35.77	31.50	4.27	0.93	0.14	2.90	
MEAN	17.85	27.80	23.50	4.30	0.89	0.16	3.34	0.83
HUB	26.47	10.71	6.50	4.21	0.89	0.19	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.912

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	542.578	167.611	516.040	1194.303	0.454	-0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.081	20.899	592.943	46.000	17.994	33.000	15.006

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	560.133	167.611	584.673	1192.675	0.470	-0.132

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.829	20.484	591.327	440.827	0.098	0.147

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	519.366	0.000	519.366	1196.373	0.434	0.008

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.924	595.000	0.000	0.060	0.101	0.004

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.640	23.820	1.046	617.508	12.279	390.029	3.023

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 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   76550.781       0.303     693.590 1537030.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     589902.25   5344.8252    156.6287      1.5767      0.7700      4.5460      1.1811
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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 85% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.018   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     157.939    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   71.79063

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     154.291    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  121499.984  123929.727       1.851     831.557     449.329     619.754       1.379

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   370.56    -0.13   370.56     0.33   575.61
  MEAN    17.06     0.00    -0.02   370.56    -0.13   370.56     0.33
  HUB     12.51     0.00    -0.02   370.56    -0.13   370.56     0.33

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.34    50.47     6.87   577.90   686.61    13.98   511.34     0.62
  MEAN    52.22    47.20     5.02   477.90   604.83    13.98   511.34     0.55
  HUB     43.41    38.62     4.79   350.44   510.11    13.98   511.34     0.46

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   586.46   307.77   499.21  1121.58     0.52
  MEAN    18.04   616.35   351.17   506.53  1118.29     0.55
  HUB     15.00   704.83   472.39   523.09  1111.48     0.63

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   567.60   270.13     0.51  6352.00
  MEAN   505.23   529.44   154.07     0.47  6335.80     1.27
  HUB    420.19   525.69    52.21     0.47  7087.51

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.90     1.19    14.85   551.39     1.05   522.67     0.92     0.91
  MEAN    17.89     1.18    14.55   551.32     1.05   519.60     0.92     0.91
  HUB     18.25     1.21    13.92   554.70     1.06   513.22     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     31.65    28.42    24.20     4.22     0.93     0.25     2.90
  MEAN    34.73    16.92    12.70     4.22     0.92     0.21     3.51     0.91
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 HUB     42.08    -5.70    -9.30     3.60     0.92     0.08     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     627.045     350.483     519.949    1118.250       0.561      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.979      14.519     519.633      24.000      33.983      35.400       1.417

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     551.935     350.483     653.812    1126.180       0.490       0.217

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.935      15.215     527.029     528.796       0.022       0.378

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     506.867       0.000     506.867    1130.430       0.448       0.295

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.574     531.014       0.000       0.060       0.037       0.317

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      17.881       1.184     552.473      29.663     225.175       1.746

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 184676.047       0.553    1648.289 1558176.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 5.018   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    157.939    3210.000      17.881     552.473       1.000       1.000       0.980
W Kg/sec =   71.79063

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    133.999    3110.339       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 121499.984  123929.727       1.513     590.487     390.242     474.134       1.215

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   481.87    -0.17   481.87     0.43   557.77
 MEAN    18.08     0.00    -0.02   481.87    -0.17   481.87     0.43
 HUB     15.21     0.00    -0.02   481.87    -0.17   481.87     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.08    46.36     3.72   575.66   750.85    15.79   533.08     0.66
 MEAN    46.43    42.30     4.13   506.42   699.16    15.79   533.08     0.62
 HUB     41.49    37.84     3.65   426.07   643.33    15.79   533.08     0.57

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   543.95   219.97   497.49  1148.35     0.47
 MEAN    18.01   557.82   245.13   501.07  1146.65     0.49
 HUB     15.22   605.79   333.55   505.70  1144.90     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   609.46   352.05     0.53  4495.16
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 MEAN   504.50   564.22   259.37     0.49  4417.86     1.33
 HUB    426.43   514.16    92.89     0.45  5080.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.04     1.12    17.19   572.69     1.04   547.99     0.92     0.91
 MEAN    20.00     1.12    17.01   572.34     1.04   546.36     0.92     0.91
 HUB     20.34     1.14    16.80   575.32     1.04   544.68     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.85    35.28    31.50     3.78     0.93     0.24     2.90
 MEAN    26.07    27.37    23.50     3.87     0.92     0.25     3.30     0.91
 HUB     33.41    10.41     6.50     3.91     0.92     0.27     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     641.212     245.823     592.219    1138.980       0.563      -0.258

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.097      16.203     539.120      46.000      22.543      30.600       8.057

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     607.490     245.823     655.342    1142.688       0.532      -0.156

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      20.019      16.511     542.636     455.853       0.035       0.193

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     599.686       0.000     599.686    1143.517       0.524       0.101

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      16.520     543.423       0.000       0.060       0.064      -0.153

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.831      19.930       1.115     573.454      20.981     280.460       2.174

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 130677.555       0.399    1166.336 1432473.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.018   EfDer =  0.923

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    157.939    3210.000      19.930     573.454       1.000       1.000       0.880
W Kg/sec =   71.79063

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    122.490    3052.910       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 121499.984  123929.727       1.373     489.817     356.734     384.470       1.078

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   554.82    -0.19   554.82     0.48   534.68
 MEAN    17.74     0.00    -0.02   554.82    -0.19   554.82     0.48
 HUB     15.05     0.00    -0.02   554.82    -0.19   554.82     0.48

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.39    46.36    -0.97   562.21   790.01    16.98   547.75     0.69
 MEAN    41.86    43.40    -1.54   496.90   744.93    16.98   547.75     0.65
 HUB     37.24    38.84    -1.60   421.59   696.93    16.98   547.75     0.61
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      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   541.11   184.23   508.78  1166.44     0.46
MEAN    17.51   554.40   216.53   510.37  1165.84     0.48
HUB     14.85   601.61   313.21   513.65  1165.15     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    554.93   629.50   370.70     0.54  3653.45
MEAN   490.40   579.21   273.87     0.50  3794.11     1.37
HUB    415.99   523.83   102.78     0.45  4653.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.66     1.09    18.69   589.88     1.03   565.44     0.92     0.84
MEAN    21.73     1.09    18.61   590.51     1.03   564.86     0.92     0.84
HUB     22.16     1.11    18.47   594.38     1.04   564.17     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     19.91    36.08    31.50     4.58     0.93     0.24     2.90
MEAN    22.99    28.22    23.50     4.72     0.89     0.27     3.28     0.84
HUB     31.37    11.32     6.50     4.82     0.89     0.31     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.923

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     560.968     217.952     516.896    1166.276       0.481       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.819      18.621     565.320      46.000      22.863      31.500       8.637

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     538.897     217.952     581.303    1168.365       0.461       0.062

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.749      18.794     567.346     471.992       0.031       0.199

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     522.781       0.000     522.781    1169.835       0.447       0.078

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.876     568.775       0.000       0.060       0.061       0.088

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.760      21.653       1.086     591.592      18.139     305.632       2.369

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 113012.695       0.367    1008.672 1619440.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.018   EfDer =  0.957

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    157.939    3210.000      21.653     591.592       1.000       1.000       0.980
W Kg/sec =   71.79063

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    114.511    3005.743       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 121499.984  123929.727       1.539     513.330     333.509     401.059       1.203

     ROTOR LEADING EDGE CONDITIONS, STAGE            4
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   488.37    -0.17   488.37     0.42   505.18
MEAN    16.97     0.00    -0.02   488.37    -0.17   488.37     0.42
HUB     14.32     0.00    -0.02   488.37    -0.17   488.37     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     47.86    46.36     1.50   539.52   727.85    19.21   571.69     0.62
MEAN    44.24    43.80     0.44   475.39   681.66    19.21   571.69     0.58
HUB     39.41    37.84     1.57   401.14   632.10    19.21   571.69     0.54

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   535.94   164.93   509.93  1182.96     0.45
MEAN    16.57   547.67   197.02   511.00  1182.57     0.46
HUB     13.89   590.96   292.66   513.41  1182.05     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    528.88   626.49   363.95     0.53  3117.11
MEAN   464.28   576.67   267.26     0.49  3268.20     1.27
HUB    389.09   522.39    96.44     0.44  4067.41

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.26     1.07    20.20   605.60     1.02   581.63     0.92     0.88
MEAN    23.34     1.08    20.15   606.28     1.02   581.25     0.92     0.88
HUB     23.77     1.10    20.03   609.88     1.03   580.73     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     17.92    35.52    31.50     4.02     0.93     0.18     2.90
MEAN    21.08    27.61    23.50     4.11     0.90     0.20     3.29     0.88
HUB     29.68    10.64     6.50     4.14     0.90     0.23     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.957

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     537.497     198.126     499.649    1184.454       0.454       0.056

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.422      20.334     583.141      46.000      21.630      32.400      10.770

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     529.588     198.126     565.435    1185.169       0.447       0.066

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      23.338      20.346     583.845     456.573       0.036       0.189

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     502.775       0.000     502.775    1187.512       0.423       0.055

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      20.518     586.156       0.000       0.060       0.073       0.117

   STAGE EXIT CONDITIONS, STAGE             4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.760      23.213       1.072     607.255      15.662     327.631       2.540

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  97615.406       0.349     871.247 1443585.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.018   EfDer =  0.932
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
157.939	3210.000	23.213	607.255	1.000	1.000	0.980

W Kg/sec = 71.79063

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
108.221	2966.728	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
121499.984	123929.727	1.617	509.668	315.201	390.276	1.238

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	466.46	-0.16	466.46	0.39	474.28
MEAN	15.91	0.00	-0.02	466.46	-0.16	466.46	0.39	
HUB	13.07	0.00	-0.02	466.46	-0.16	466.46	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.74	47.36	0.38	513.19	693.63	20.88	589.10	0.58
MEAN	43.71	44.80	-1.09	445.76	645.32	20.88	589.10	0.54
HUB	38.14	38.84	-0.70	366.12	593.09	20.88	589.10	0.50

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	511.87	150.37	489.28	1198.94	0.43
MEAN	15.50	521.24	175.64	490.75	1198.24	0.44
HUB	12.59	557.54	259.64	493.39	1197.43	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	502.54	602.85	352.17	0.50	2700.63	
MEAN	434.13	554.66	258.48	0.46	2724.62	1.25
HUB	352.68	502.09	93.04	0.42	3271.00	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.62	1.06	21.72	619.39	1.02	597.53	0.92	0.85
MEAN	24.64	1.06	21.63	619.50	1.02	596.83	0.92	0.85
HUB	24.93	1.07	21.48	621.95	1.02	596.02	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	17.08	35.75	31.50	4.25	0.93	0.17	2.90	
MEAN	19.69	27.78	23.50	4.28	0.90	0.18	3.34	0.85
HUB	27.76	10.68	6.50	4.18	0.90	0.21	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.932

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	526.620	178.865	495.314	1198.523	0.439	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.666	21.600	597.139	46.000	19.855	33.000	13.145

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	534.128	178.865	563.281	1197.856	0.446	-0.085

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.470	21.345	596.475	440.827	0.083	0.172

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	496.336	0.000	496.336	1201.114	0.413	0.045

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.740	599.724	0.000	0.060	0.088	0.041

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    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.701      24.454       1.053     620.281      13.026     366.262       2.839

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   81211.555       0.322     724.837 1500993.625

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     607193.25   5419.3804    154.2909      1.6187      0.7943      5.0175      1.1864


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 85% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.485   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     155.582    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   70.71914

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     151.988    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  119686.578  122080.047       1.879     831.557     442.622     619.754       1.400

     ROTOR LEADING EDGE CONDITIONS, STAGE             1

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   364.35    -0.13   364.35     0.33   575.61
  MEAN    17.06     0.00    -0.02   364.35    -0.13   364.35     0.33
  HUB     12.51     0.00    -0.02   364.35    -0.13   364.35     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.77    50.47     7.30   577.90   683.28    14.02   511.72     0.62
  MEAN    52.68    47.20     5.48   477.90   601.05    14.02   511.72     0.54
  HUB     43.89    38.62     5.27   350.44   505.62    14.02   511.72     0.46

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   580.98   313.11   489.39  1122.67     0.52
  MEAN    18.04   610.17   354.17   496.86  1119.22     0.55
  HUB     15.00   696.70   471.42   512.98  1112.42     0.63

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   556.43   264.79     0.50  6462.03
  MEAN   505.23   519.31   151.06     0.46  6389.98     1.29
  HUB    420.19   515.53    51.23     0.46  7072.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.96     1.19    14.96   551.89     1.06   523.70     0.92     0.91
  MEAN    17.92     1.19    14.64   551.56     1.06   520.47     0.92     0.91
  HUB     18.25     1.21    14.00   554.64     1.06   514.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     32.61    28.42    24.20     4.22     0.93     0.26     2.90
  MEAN    35.48    16.91    12.70     4.21     0.92     0.22     3.51     0.91
  HUB     42.58    -5.70    -9.30     3.60     0.92     0.09     4.78
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     620.425     353.483     509.879    1119.233       0.554      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.007      14.611     520.547      24.000      34.732      35.400       0.668

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     540.228     353.483     645.598    1127.560       0.479       0.233

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.966      15.350     528.321     528.796       0.022       0.390

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     496.594       0.000     496.594    1131.585       0.439       0.308

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.691     532.100       0.000       0.060       0.037       0.330

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      17.913       1.186     552.697      29.887     222.023       1.721

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 186072.547       0.557    1635.966 1532079.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.485   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3210.000      17.913     552.697       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    131.792    3109.708       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.538     590.487     383.813     474.134       1.235

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   472.33    -0.16   472.33     0.42   557.66
 MEAN    18.08     0.00    -0.02   472.33    -0.16   472.33     0.42
 HUB     15.21     0.00    -0.02   472.33    -0.16   472.33     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.64    46.36     4.28   575.66   744.76    15.89   534.07     0.66
 MEAN    47.00    42.30     4.70   506.42   692.62    15.89   534.07     0.61
 HUB     42.06    37.84     4.22   426.07   636.22    15.89   534.07     0.56

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   537.22   227.89   486.49  1149.97     0.47
 MEAN    18.01   550.83   250.80   490.43  1148.04     0.48
 HUB     15.22   598.32   335.61   495.33  1146.07     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   595.90   344.12     0.52  4656.88
 MEAN   504.50   552.17   253.71     0.48  4519.76     1.35
 HUB    426.43   503.59    90.83     0.44  5111.45
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.17     1.13    17.36   573.64     1.04   549.55     0.92     0.91
MEAN    20.10     1.12    17.16   573.03     1.04   547.69     0.92     0.91
HUB     20.40     1.14    16.93   575.69     1.04   545.80     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.10    35.27    31.50     3.77     0.93     0.25     2.90
MEAN    27.08    27.35    23.50     3.85     0.92     0.26     3.30     0.91
HUB     34.12    10.39     6.50     3.89     0.92     0.28     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     630.628     251.499     578.307    1140.870       0.553      -0.249

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.189      16.400     540.910      46.000      23.504      30.600       7.096

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     591.639     251.499     642.876    1145.059       0.517      -0.125

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      20.122      16.769     544.890     455.853       0.032       0.208

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     17.823     583.603       0.000     583.603    1145.888       0.509       0.128

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      16.791     545.678       0.000       0.060       0.056      -0.118

    STAGE EXIT CONDITIONS, STAGE            2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.846      20.047       1.119     574.120      21.423     273.360       2.119

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 133432.328       0.408    1173.148 1405627.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 5.485   EfDer =  0.937

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3210.000      20.047     574.120       1.000       1.000       0.880
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.022    3051.137       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.401     489.817     349.547     384.470       1.100

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   540.71    -0.19   540.71     0.47   534.37
 MEAN    17.74     0.00    -0.02   540.71    -0.19   540.71     0.47
 HUB     15.05     0.00    -0.02   540.71    -0.19   540.71     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.13    46.36    -0.23   562.21   780.17    17.23   549.71     0.68
 MEAN    42.59    43.40    -0.81   496.90   734.48    17.23   549.71     0.64
 HUB     37.96    38.84    -0.88   421.59   685.76    17.23   549.71     0.60

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   531.67   194.74   494.72  1168.95     0.45
MEAN    17.51   545.01   224.12   496.80  1168.02     0.47
HUB     14.85   591.85   316.16   500.33  1167.03     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    554.93   611.95   360.19     0.52  3861.46
MEAN   490.40   563.67   266.29     0.48  3926.81     1.39
HUB    415.99   510.19    99.82     0.44  4697.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.92     1.09    19.02   591.48     1.03   567.89     0.92     0.86
MEAN    21.95     1.10    18.91   591.78     1.03   566.98     0.92     0.86
HUB     22.34     1.11    18.74   595.24     1.04   566.00     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     21.49    36.06    31.50     4.56     0.93     0.26     2.90
MEAN    24.28    28.19    23.50     4.69     0.90     0.28     3.28     0.86
HUB     32.29    11.28     6.50     4.78     0.90     0.32     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.937

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     551.304     225.587     503.037    1168.482       0.472       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.039      18.919     567.460      46.000      24.154      31.500       7.346

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     522.934     225.587     569.517    1171.099       0.447       0.088

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.983      19.168     570.004     471.992       0.028       0.217

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     507.213       0.000     507.213    1172.487       0.433       0.105

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.252     571.356       0.000       0.060       0.054       0.114

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.786      21.898       1.092     592.835      18.715     294.725       2.285

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 116604.031       0.379    1025.193 1584384.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.485   EfDer =  0.968

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3210.000      21.898     592.835       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.657    3002.591       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.579     513.330     325.198     401.059       1.233

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   474.27    -0.16   474.27     0.40   504.65
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 MEAN    16.97     0.00    -0.02   474.27    -0.16   474.27     0.40
 HUB     14.32     0.00    -0.02   474.27    -0.16   474.27     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.69    46.36     2.33   539.52   718.47    19.57   574.06     0.61
 MEAN    45.08    43.80     1.28   475.39   671.63    19.57   574.06     0.57
 HUB     40.24    37.84     2.40   401.14   621.27    19.57   574.06     0.53

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   524.05   177.07   493.23  1186.32     0.44
 MEAN    16.57   535.95   205.68   494.91  1185.56     0.45
 HUB     13.89   579.00   295.85   497.71  1184.69     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   605.84   351.81     0.51  3346.23
 MEAN   464.28   558.40   258.60     0.47  3411.69     1.29
 HUB    389.09   506.37    93.25     0.43  4111.64

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.66     1.08    20.69   607.88     1.03   584.96     0.92     0.89
 MEAN    23.70     1.08    20.60   608.17     1.03   584.20     0.92     0.89
 HUB     24.08     1.10    20.45   611.32     1.03   583.34     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.75    35.50    31.50     4.00     0.93     0.20     2.90
 MEAN    22.57    27.59    23.50     4.09     0.91     0.21     3.29     0.89
 HUB     30.73    10.61     6.50     4.11     0.91     0.25     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.968

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     526.390     206.837     484.050    1187.348       0.443       0.056

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.782      20.777     585.994      46.000      23.137      32.400       9.263

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     511.330     206.837     551.579    1188.669       0.430       0.093

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.716      20.880     587.298     456.573       0.031       0.210

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     485.421       0.000     485.421    1190.848       0.408       0.085

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.052     589.454       0.000       0.060       0.064       0.146

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.792      23.607       1.078     609.121      16.286     313.540       2.431

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 101507.328       0.363     892.461 1412601.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.485   EfDer =  0.948

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3210.000      23.607     609.121       1.000       1.000       0.980
W Kg/sec =   70.71914
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
104.988	2962.178	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
119686.578	122080.047	1.667	509.668	305.784	390.276	1.276

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	450.84	-0.16	450.84	0.38	473.56
MEAN	15.91	0.00	-0.02	450.84	-0.16	450.84	0.38	
HUB	13.07	0.00	-0.02	450.84	-0.16	450.84	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.71	47.36	1.35	513.19	683.21	21.39	592.16	0.57
MEAN	44.69	44.80	-0.11	445.76	634.11	21.39	592.16	0.53
HUB	39.09	38.84	0.25	366.12	580.88	21.39	592.16	0.49

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	498.59	163.88	470.89	1203.01	0.41
MEAN	15.50	507.93	185.31	472.92	1201.92	0.42
HUB	12.59	543.82	263.20	475.89	1200.75	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	502.54	580.03	338.67	0.48	2942.83	
MEAN	434.13	534.38	248.82	0.44	2874.35	1.28
HUB	352.68	484.23	89.48	0.40	3315.68	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.20	1.07	22.38	622.35	1.02	601.60	0.92	0.87
MEAN	25.16	1.07	22.25	622.04	1.02	600.51	0.92	0.87
HUB	25.40	1.08	22.06	624.02	1.02	599.34	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	19.19	35.72	31.50	4.22	0.93	0.19	2.90	
MEAN	21.40	27.75	23.50	4.25	0.90	0.20	3.34	0.87
HUB	28.95	10.65	6.50	4.15	0.90	0.22	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.948

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	513.147	188.709	477.189	1202.219	0.427	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.191	22.223	600.828	46.000	21.577	33.000	11.423

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	511.951	188.709	545.623	1202.321	0.426	-0.043

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	25.039	22.101	600.931	440.827	0.070	0.196

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	476.476	0.000	476.476	1205.245	0.395	0.079

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.461	603.857	0.000	0.060	0.077	0.076

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.747	25.019	1.060	622.801	13.680	347.085	2.691

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 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   85289.422       0.338     749.872 1467456.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     622905.69   5476.6401    151.9881      1.6561      0.8137      5.4850      1.1913


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 85% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     153.237    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   69.65320

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     149.697    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  117882.562  120239.961       1.907     831.557     435.951     619.754       1.422

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   358.22    -0.12   358.22     0.32   575.61
  MEAN    17.06     0.00    -0.02   358.22    -0.12   358.22     0.32
  HUB     12.51     0.00    -0.02   358.22    -0.12   358.22     0.32

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.21    50.47     7.74   577.90   680.02    14.05   512.09     0.61
  MEAN    53.15    47.20     5.95   477.90   597.35    14.05   512.09     0.54
  HUB     44.38    38.62     5.76   350.44   501.21    14.05   512.09     0.45

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   575.83   318.33   479.84  1123.72     0.51
  MEAN    18.04   604.23   357.10   487.42  1120.12     0.54
  HUB     15.00   688.82   470.47   503.13  1113.31     0.62

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   545.55   259.57     0.49  6569.64
  MEAN   505.23   509.43   148.14     0.45  6442.69     1.31
  HUB    420.19   505.63    50.28     0.45  7058.54

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.01     1.19    15.05   552.37     1.06   524.68     0.92     0.91
  MEAN    17.95     1.19    14.72   551.80     1.06   521.31     0.92     0.91
  HUB     18.24     1.21    14.09   554.57     1.06   514.95     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     33.56    28.41    24.20     4.21     0.93     0.28     2.90
  MEAN    36.23    16.91    12.70     4.21     0.92     0.23     3.51     0.91
  HUB     43.08    -5.71    -9.30     3.59     0.92     0.10     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.999
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     614.075     356.402     500.066    1120.172       0.548      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.033      14.697     521.420      24.000      35.478      35.400      -0.078

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     528.924     356.402     637.795    1128.870       0.469       0.249

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.994      15.478     529.549     528.796       0.021       0.401

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     486.649       0.000     486.649    1132.685       0.430       0.320

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.801     533.135       0.000       0.060       0.037       0.342

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      17.942       1.188     552.916      30.106     218.943       1.697

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 187435.969       0.561    1623.114 1506272.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3210.000      17.942     552.916       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    129.626    3109.092       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.564     590.487     377.504     474.134       1.256

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   463.08    -0.16   463.08     0.41   557.55
 MEAN    18.08     0.00    -0.02   463.08    -0.16   463.08     0.41
 HUB     15.21     0.00    -0.02   463.08    -0.16   463.08     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.19    46.36     4.83   575.66   738.93    15.99   535.01     0.65
 MEAN    47.57    42.30     5.27   506.42   686.34    15.99   535.01     0.60
 HUB     42.63    37.84     4.79   426.07   629.38    15.99   535.01     0.55

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   531.02   235.48   475.96  1151.50     0.46
 MEAN    18.01   544.29   256.23   480.20  1149.35     0.47
 HUB     15.22   591.21   337.61   485.34  1147.17     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   582.92   336.54     0.51  4811.71
 MEAN   504.50   540.58   248.27     0.47  4617.65     1.37
 HUB    426.43   493.40    88.82     0.43  5141.87

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.28     1.13    17.53   574.56     1.04   551.01     0.92     0.91
 MEAN    20.18     1.12    17.31   573.69     1.04   548.95     0.92     0.91
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 HUB     20.45     1.14    17.06   576.04     1.04   546.86     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.32    35.26    31.50     3.76     0.93     0.27     2.90
 MEAN    28.08    27.34    23.50     3.84     0.92     0.27     3.30     0.91
 HUB     34.82    10.37     6.50     3.87     0.92     0.28     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     620.759     256.953     565.081    1142.635       0.543      -0.241

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.273      16.582     542.585      46.000      24.452      30.600       6.148

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     576.738     256.953     631.388    1147.260       0.503      -0.095

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      20.217      17.009     546.987     455.853       0.029       0.223

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     568.593       0.000     568.593    1148.077       0.495       0.152

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      17.040     547.766       0.000       0.060       0.050      -0.085

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      20.153       1.123     574.764      21.848     266.717       2.068

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 136076.438       0.416    1178.363 1379340.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.948

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3210.000      20.153     574.764       1.000       1.000       0.880
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    117.657    3049.429       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.429     489.817     342.659     384.470       1.122

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   527.46    -0.18   527.46     0.46   534.07
 MEAN    17.74     0.00    -0.02   527.46    -0.18   527.46     0.46
 HUB     15.05     0.00    -0.02   527.46    -0.18   527.46     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.84    46.36     0.48   562.21   771.04    17.45   551.54     0.67
 MEAN    43.30    43.40    -0.10   496.90   724.78    17.45   551.54     0.63
 HUB     38.65    38.84    -0.19   421.59   675.36    17.45   551.54     0.59

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   523.25   204.56   481.61  1171.27     0.45
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 MEAN    17.51   536.49   231.20   484.11  1170.04     0.46
 HUB     14.85   582.85   318.92   487.86  1168.78     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   595.57   350.37     0.51  4055.89
 MEAN   490.40   549.14   259.20     0.47  4050.75     1.41
 HUB    415.99   497.42    97.06     0.43  4738.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.16     1.10    19.32   593.00     1.03   570.14     0.92     0.87
 MEAN    22.15     1.10    19.18   592.98     1.03   568.95     0.92     0.87
 HUB     22.51     1.12    18.99   596.07     1.04   567.71     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.01    36.04    31.50     4.54     0.93     0.27     2.90
 MEAN    25.53    28.17    23.50     4.67     0.90     0.29     3.28     0.87
 HUB     33.17    11.25     6.50     4.75     0.90     0.32     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.948

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     542.539     232.718     490.093    1170.521       0.464       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.242      19.193     569.442      46.000      25.400      31.500       6.100

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     508.195     232.718     558.945    1173.613       0.433       0.112

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.197      19.511     572.455     471.992       0.024       0.236

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     492.866       0.000     492.866    1174.926       0.419       0.129

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      19.595     573.736       0.000       0.060       0.049       0.140

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.807      22.120       1.098     594.017      19.253     284.964       2.209

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 119959.172       0.390    1038.794 1550712.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.977

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3210.000      22.120     594.017       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.977    2999.603       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.617     513.330     317.391     401.059       1.264

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   461.24    -0.16   461.24     0.39   504.14
 MEAN    16.97     0.00    -0.02   461.24    -0.16   461.24     0.39
 HUB     14.32     0.00    -0.02   461.24    -0.16   461.24     0.39
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     49.48    46.36     3.12   539.52   709.93    19.90   576.26     0.60
MEAN    45.88    43.80     2.08   475.39   662.49    19.90   576.26     0.56
HUB     41.02    37.84     3.18   401.14   611.38    19.90   576.26     0.52

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   513.72   188.12   478.03  1189.37     0.43
MEAN    16.57   525.58   213.62   480.21  1188.28     0.44
HUB     13.89   568.22   298.76   483.34  1187.11     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    528.88   587.05   340.75     0.49  3554.82
MEAN   464.28   541.69   250.65     0.46  3543.23     1.31
HUB    389.09   491.70    90.34     0.41  4152.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.03     1.09    21.14   610.00     1.03   587.97     0.92     0.89
MEAN    24.03     1.09    21.00   609.94     1.03   586.89     0.92     0.89
HUB     24.37     1.10    20.83   612.68     1.03   585.73     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     21.48    35.48    31.50     3.98     0.93     0.22     2.90
MEAN    23.98    27.56    23.50     4.06     0.91     0.23     3.29     0.89
HUB     31.72    10.59     6.50     4.09     0.91     0.26     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.977

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     516.577     214.823     469.790    1189.985       0.434       0.056

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.110      21.179     588.599      46.000      24.573      32.400       7.827

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     494.849     214.823     539.466    1191.838       0.415       0.119

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.058      21.364     590.434     456.573       0.026       0.231

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     469.773       0.000     469.773    1193.874       0.393       0.113

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      21.534     592.453       0.000       0.060       0.057       0.173

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.817      23.962       1.083     610.873      16.856     301.322       2.336

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 105061.453       0.376     909.786 1382924.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.962

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3210.000      23.962     610.873       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.016    2957.929       1.401       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
117882.562	120239.961	1.715	509.668	297.128	390.276	1.313

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	436.70	-0.15	436.70	0.37	472.88
MEAN	15.91	0.00	-0.02	436.70	-0.15	436.70	0.37	
HUB	13.07	0.00	-0.02	436.70	-0.15	436.70	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.61	47.36	2.25	513.19	673.96	21.85	594.96	0.56
MEAN	45.60	44.80	0.80	445.76	624.13	21.85	594.96	0.52
HUB	39.99	38.84	1.15	366.12	569.97	21.85	594.96	0.48

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	487.35	175.95	454.48	1206.65	0.40
MEAN	15.50	496.42	194.01	456.94	1205.23	0.41
HUB	12.59	531.73	266.39	460.19	1203.77	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	502.54	559.66	326.59	0.46	3159.32	
MEAN	434.13	516.19	240.12	0.43	3009.11	1.31
HUB	352.68	468.21	86.29	0.39	3355.82	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.72	1.07	22.98	625.07	1.02	605.25	0.92	0.88
MEAN	25.63	1.07	22.80	624.39	1.02	603.83	0.92	0.88
HUB	25.83	1.08	22.59	625.95	1.02	602.36	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	21.16	35.70	31.50	4.20	0.93	0.21	2.90	
MEAN	23.01	27.72	23.50	4.22	0.91	0.22	3.34	0.88
HUB	30.07	10.62	6.50	4.12	0.91	0.23	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.962

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	501.538	197.569	460.984	1205.535	0.416	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.667	22.782	604.148	46.000	23.199	33.000	9.801

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	492.520	197.569	530.669	1206.281	0.408	-0.005

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	25.550	22.776	604.896	440.827	0.060	0.218

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	458.937	0.000	458.937	1208.937	0.380	0.111

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.109	607.562	0.000	0.060	0.067	0.109

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.784	25.528	1.065	625.138	14.265	331.015	2.566

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
88944.188	0.352	770.218	1435636.875

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   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    637477.19   5520.2749    149.6973      1.6898      0.8294      5.9530      1.1957


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

   Fan-Core + 4 Stage LPC 85% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 7.014   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3210.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    144.557    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.975     831.557     420.983     619.754       1.472

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   344.58    -0.12   344.58     0.31   575.61
 MEAN    17.06     0.00    -0.02   344.58    -0.12   344.58     0.31
 HUB     12.51     0.00    -0.02   344.58    -0.12   344.58     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.20    50.47     8.73   577.90   672.93    14.13   512.89     0.61
 MEAN    54.21    47.20     7.01   477.90   589.26    14.13   512.89     0.53
 HUB     45.49    38.62     6.87   350.44   491.55    14.13   512.89     0.44

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   565.18   329.62   459.10  1125.91     0.50
 MEAN    18.04   591.64   363.44   466.85  1122.00     0.53
 HUB     15.00   671.88   468.41   481.68  1115.21     0.60

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    577.90   521.93   248.28     0.46  6802.58
 MEAN   505.23   487.91   141.80     0.43  6557.03     1.35
 HUB    420.19   484.09    48.22     0.43  7027.58

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.12     1.20    15.25   553.42     1.06   526.74     0.92     0.91
 MEAN    18.01     1.19    14.90   552.32     1.06   523.08     0.92     0.91
 HUB     18.23     1.21    14.26   554.43     1.06   516.73     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.68    28.40    24.20     4.20     0.93     0.31     2.90
 MEAN    37.90    16.90    12.70     4.20     0.93     0.26     3.51     0.91
 HUB     44.20    -5.72    -9.30     3.58     0.93     0.12     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     600.633     362.733     478.732    1122.145       0.535      -0.005
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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.086      14.878     523.259      24.000      37.151      35.400      -1.751

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     504.663     362.733     621.498    1131.605       0.446       0.283

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.047      15.741     532.118     528.796       0.022       0.427

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     465.238       0.000     465.238    1134.995       0.410       0.346

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.026     535.312       0.000       0.060       0.038       0.369

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      17.994       1.191     553.391      30.581     212.230       1.645

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 190390.438       0.570    1592.091 1448913.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.014   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3210.000      17.994     553.391       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    124.864    3107.759       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.624     590.487     363.639     474.134       1.304

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   443.12    -0.15   443.12     0.39   557.31
 MEAN    18.08     0.00    -0.02   443.12    -0.15   443.12     0.39
 HUB     15.21     0.00    -0.02   443.12    -0.15   443.12     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.42    46.36     6.06   575.66   726.57    16.20   536.99     0.64
 MEAN    48.82    42.30     6.52   506.42   673.03    16.20   536.99     0.59
 HUB     43.89    37.84     6.05   426.07   614.83    16.20   536.99     0.54

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   518.74   251.53   453.67  1154.65     0.45
 MEAN    18.01   530.93   267.82   458.43  1152.07     0.46
 HUB     15.22   576.31   341.82   463.99  1149.48     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   555.46   320.49     0.48  5139.35
 MEAN   504.50   515.93   236.68     0.45  4826.20     1.41
 HUB    426.43   471.65    84.62     0.41  5205.77

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.51     1.14    17.85   576.51     1.04   554.04     0.92     0.91
 MEAN    20.35     1.13    17.59   575.10     1.04   551.56     0.92     0.91
 HUB     20.54     1.14    17.30   576.81     1.04   549.07     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     29.01    35.24    31.50     3.74     0.93     0.30     2.90
 MEAN    30.29    27.31    23.50     3.81     0.93     0.29     3.30     0.91
 HUB     36.38    10.34     6.50     3.84     0.93     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      600.713     268.573     537.332     1146.228       0.524       -0.223

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.438       16.945      546.004      46.000      26.557      30.600       4.043

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960      545.942     268.573     608.427     1151.720       0.474       -0.033

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850       20.399      17.486     551.248      455.853       0.024       0.254

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823      538.154       0.000     538.154     1152.457       0.467       0.198

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850       17.518      551.953       0.000       0.060       0.042       -0.021

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4        Pt4          PR4         Texit        Del T       Ns        Ns nondim
       0.872       20.345       1.131      576.138      22.747     253.125       1.962

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 141680.609       0.433    1184.768 1321738.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.014   EfDer =  0.969

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    147.976     3210.000       20.345      576.138       1.000        1.000        0.880
W Kg/sec =   67.26170

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
    112.682     3045.790        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 113835.133  116111.594        1.493      489.817      328.169      384.470       1.172

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa     C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   500.38    -0.17   500.38      0.43    533.44
 MEAN    17.74      0.00    -0.02   500.38    -0.17   500.38      0.43
 HUB     15.05      0.00    -0.02   500.38    -0.17   500.38      0.43

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     48.34     46.36     1.98   562.21   752.77     17.88   555.23      0.65
 MEAN    44.81     43.40     1.41   496.90   705.31     17.88   555.23      0.61
 HUB     40.13     38.84     1.29   421.59   654.42     17.88   555.23      0.57

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   507.44    224.41    455.12   1175.87      0.43
 MEAN    17.51   520.01    245.58    458.36   1174.09      0.44
 HUB     14.85   565.02    324.53    462.53   1172.32      0.48
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   562.47   330.52     0.48  4448.97
 MEAN   490.40   519.65   244.82     0.44  4302.33     1.45
 HUB    415.99   471.48    91.46     0.40  4821.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.62     1.11    19.90   596.14     1.03   574.65     0.92     0.89
 MEAN    22.54     1.11    19.70   595.48     1.03   572.91     0.92     0.89
 HUB     22.81     1.12    19.46   597.82     1.04   571.17     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.25    35.99    31.50     4.49     0.93     0.30     2.90
 MEAN    28.18    28.11    23.50     4.61     0.91     0.32     3.28     0.89
 HUB     35.06    11.19     6.50     4.69     0.91     0.34     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.969

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     525.633     247.192     463.881    1174.595       0.448       0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.627      19.718     573.414      46.000      28.052      31.500       3.448

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     478.798     247.192     538.843    1178.610       0.406       0.163

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.599      20.168     577.342     471.992       0.019       0.274

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     464.348       0.000     464.348    1179.771       0.394       0.179

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.251     578.479       0.000       0.060       0.041       0.191

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.842      22.536       1.108     596.481      20.343     266.315       2.064

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 126755.578       0.412    1059.961 1478925.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.014   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3210.000      22.536     596.481       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.508    2993.400       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.703     513.330     301.464     401.059       1.330

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   435.21    -0.15   435.21     0.37   503.10
 MEAN    16.97     0.00    -0.02   435.21    -0.15   435.21     0.37
 HUB     14.32     0.00    -0.02   435.21    -0.15   435.21     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.12    46.36     4.76   539.52   693.29    20.52   580.67     0.59
 MEAN    47.54    43.80     3.74   475.39   644.63    20.52   580.67     0.55
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HUB     42.68    37.84     4.84   401.14   591.98    20.52   580.67     0.50

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   495.00   209.73   448.37  1195.28     0.41
MEAN    16.57   506.19   229.18   451.33  1193.61     0.42
HUB     13.89   547.52   304.53   455.02  1191.90     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    528.88   550.35   319.14     0.46  3962.68
MEAN   464.28   508.89   235.10     0.43  3800.95     1.37
HUB    389.09   462.81    84.57     0.39  4232.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.74     1.10    21.98   614.29     1.03   593.84     0.92     0.91
MEAN    24.64     1.09    21.77   613.56     1.03   592.18     0.92     0.91
HUB     24.89     1.10    21.54   615.50     1.03   590.48     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.07    35.44    31.50     3.94     0.93     0.26     2.90
MEAN    26.92    27.51    23.50     4.01     0.92     0.26     3.29     0.91
HUB     33.79    10.53     6.50     4.03     0.92     0.28     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.991

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     498.277     230.469     441.773    1195.157       0.417       0.054

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.729      21.938     593.730      46.000      27.551      32.400       4.849

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     462.998     230.469     517.188    1198.003       0.386       0.172

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.699      22.278     596.561     456.573       0.020       0.273

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     439.609       0.000     439.609    1199.771       0.366       0.168

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      22.442     598.323       0.000       0.060       0.045       0.226

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.854      24.625       1.093     614.453      17.972     278.942       2.162

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 112024.164       0.401     936.773 1319826.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.014   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3210.000      24.625     614.453       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.143    2949.299       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.820     509.668     280.024     390.276       1.394
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ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	409.30	-0.14	409.30	0.34	471.50
MEAN	15.91	0.00	-0.02	409.30	-0.14	409.30	0.34	
HUB	13.07	0.00	-0.02	409.30	-0.14	409.30	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.43	47.36	4.07	513.19	656.53	22.72	600.47	0.55
MEAN	47.45	44.80	2.65	445.76	605.27	22.72	600.47	0.50
HUB	41.82	38.84	2.98	366.12	549.25	22.72	600.47	0.46

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	467.74	198.88	423.36	1213.58	0.39
MEAN	15.50	475.63	210.55	426.48	1211.61	0.39
HUB	12.59	509.24	272.54	430.17	1209.61	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	502.54	521.00	303.67	0.43	3570.42	
MEAN	434.13	481.53	223.57	0.40	3265.30	1.37
HUB	352.68	437.57	80.14	0.36	3433.12	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.70	1.08	24.10	630.49	1.03	612.24	0.92	0.90
MEAN	26.52	1.08	23.84	629.12	1.02	610.25	0.92	0.90
HUB	26.62	1.08	23.56	629.88	1.03	608.24	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.16	35.65	31.50	4.15	0.93	0.26	2.90	
MEAN	26.28	27.66	23.50	4.16	0.91	0.26	3.34	0.90
HUB	32.36	10.55	6.50	4.05	0.91	0.26	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.983

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	480.618	214.413	430.140	1211.907	0.397	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
26.559	23.828	610.557	46.000	26.495	33.000	6.505

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	456.463	214.413	504.313	1213.781	0.376	0.069

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	26.494	24.028	612.446	440.827	0.043	0.264

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	426.124	0.000	426.124	1215.992	0.350	0.176

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	24.316	614.680	0.000	0.060	0.051	0.173

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.837	26.473	1.075	629.832	15.379	302.872	2.348

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
95897.969	0.380	801.922	1368739.500

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
666748.75	5575.5156	144.5575	1.7524	0.8525	7.0142	1.2047

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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Fan-Core + 4 Stage LPC 85% Stat 2 10% Ice Block 8-2-2011

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1

RESET = 0.000BLEED = 0.000 DPInc = 7.953 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
143.384	3210.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 65.17433

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
140.071	3197.358	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
110302.430	112508.234	2.039	831.557	407.918	619.754	1.519

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	332.81	-0.11	332.81	0.30	575.61
MEAN	17.06	0.00	-0.02	332.81	-0.11	332.81	0.30	
HUB	12.51	0.00	-0.02	332.81	-0.11	332.81	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.07	50.47	9.60	577.90	666.98	14.19	513.56	0.60
MEAN	55.15	47.20	7.95	477.90	582.46	14.19	513.56	0.52
HUB	46.49	38.62	7.87	350.44	483.37	14.19	513.56	0.43

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	556.85	339.08	441.70	1127.67	0.49
MEAN	18.04	581.43	368.78	449.51	1123.53	0.52
HUB	15.00	657.81	466.65	463.63	1116.75	0.59

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	577.90	502.13	238.81	0.45	6997.68	
MEAN	505.23	469.76	136.45	0.42	6653.37	1.39
HUB	420.19	465.95	46.46	0.42	7001.19	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.21	1.21	15.41	554.30	1.06	528.40	0.92	0.91
MEAN	18.05	1.19	15.03	552.75	1.06	524.52	0.92	0.91
HUB	18.21	1.21	14.40	554.32	1.06	518.18	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.51	28.40	24.20	4.20	0.93	0.33	2.90	
MEAN	39.37	16.89	12.70	4.19	0.93	0.29	3.51	0.91
HUB	45.19	-5.72	-9.30	3.58	0.93	0.15	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	589.753	368.069	460.798	1123.730	0.525	-0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.124	15.019	524.738	24.000	38.617	35.400	-3.217

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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     484.552     368.069     608.494    1133.792       0.427       0.312

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.084      15.947     534.178     528.796       0.023       0.450

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     447.429       0.000     447.429    1136.855       0.394       0.368

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.199     537.067       0.000       0.060       0.040       0.390

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      18.028       1.193     553.788      30.978     206.564       1.601

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 192865.359       0.577    1562.737 1399425.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    143.384    3210.000      18.028     553.788       1.000       1.000       0.980
W Kg/sec =   65.17433

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    120.807    3106.643       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 110302.430  112508.234       1.678     590.487     351.823     474.134       1.348

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   426.46    -0.15   426.46     0.37   557.11
 MEAN    18.08     0.00    -0.02   426.46    -0.15   426.46     0.37
 HUB     15.21     0.00    -0.02   426.46    -0.15   426.46     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.48    46.36     7.12   575.66   716.53    16.36   538.60     0.63
 MEAN    49.91    42.30     7.61   506.42   662.17    16.36   538.60     0.58
 HUB     44.98    37.84     7.14   426.07   602.93    16.36   538.60     0.53

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   509.59   264.60   435.51  1157.12     0.44
 MEAN    18.01   520.57   277.29   440.57  1154.23     0.45
 HUB     15.22   564.34   345.28   446.39  1151.32     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   533.08   307.42     0.46  5406.14
 MEAN   504.50   495.71   227.21     0.43  4996.63     1.45
 HUB    426.43   453.71    81.16     0.39  5258.37

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.68     1.15    18.10   578.11     1.04   556.42     0.92     0.91
 MEAN    20.47     1.14    17.80   576.26     1.04   553.63     0.92     0.91
 HUB     20.60     1.14    17.48   577.44     1.04   550.85     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.28    35.22    31.50     3.72     0.93     0.32     2.90
 MEAN    32.19    27.28    23.50     3.78     0.93     0.31     3.30     0.91
 HUB     37.72    10.30     6.50     3.80     0.93     0.32     3.92
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   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      585.191     278.068     514.904     1149.026       0.509       -0.209

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     20.557      17.219      548.673      46.000      28.371       30.600       2.229

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     17.960      521.468     278.068     590.975     1155.175       0.451       0.019

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850       20.527      17.845     554.562      455.853       0.021       0.281

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4        cp 3-4
     17.823      514.059       0.000     514.059     1155.842       0.445       0.235

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.850       17.875      555.203       0.000       0.060       0.038       0.029

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4           PR4        Texit        Del T        Ns         Ns nondim
      0.878       20.478        1.136      577.270      23.482      242.472       1.880

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 146255.062       0.447    1185.066 1272825.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.983

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    143.384     3210.000       20.478      577.270       1.000        1.000        0.880
W Kg/sec =   65.17433

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
    108.581     3042.803        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 110302.430  112508.234        1.549      489.817      316.228      384.470       1.216

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00     -0.02    478.77     -0.16    478.77      0.41    532.91
 MEAN    17.74      0.00     -0.02    478.77     -0.16    478.77      0.41
 HUB     15.05      0.00     -0.02    478.77     -0.16    478.77      0.41

       BetaFlo    BetaBlade Incid    U1        W1        Ps1       Ts1      Rel Mach
 TIP     49.59     46.36      3.23    562.21    738.57     18.21    558.13      0.64
 MEAN    46.07     43.40      2.67    496.90    690.14     18.21    558.13      0.60
 HUB     41.38     38.84      2.54    421.59    638.04     18.21    558.13      0.55

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500        0.050        0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP      19.81    496.23    240.02    434.32   1179.40      0.42
 MEAN     17.51    507.83    256.94    438.03   1177.23      0.43
 HUB      14.85    551.35    328.93    442.48   1175.07      0.47

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP     554.93    536.47    314.91      0.45   4758.10
 MEAN    490.40    496.36    233.46      0.42   4501.10      1.49
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 HUB    415.99   450.96    87.06     0.38  4887.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.96     1.12    20.32   598.66     1.04   578.11     0.92     0.90
 MEAN    22.82     1.11    20.08   597.51     1.04   575.98     0.92     0.90
 HUB     23.03     1.12    19.80   599.24     1.04   573.87     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.93    35.94    31.50     4.44     0.93     0.33     2.90
 MEAN    30.40    28.06    23.50     4.56     0.91     0.34     3.28     0.90
 HUB     36.63    11.13     6.50     4.63     0.91     0.36     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.983

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     513.167     258.628     443.228    1177.734       0.436       0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.908      20.104     576.486      46.000      30.264      31.500       1.236

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     456.006     258.628     524.242    1182.449       0.386       0.204

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.887      20.653     581.111     471.992       0.017       0.307

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     442.335       0.000     442.335    1183.492       0.374       0.218

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.729     582.136       0.000       0.060       0.037       0.230

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      22.830       1.115     598.472      21.202     252.542       1.958

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 132108.531       0.429    1070.440 1419431.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    143.384    3210.000      22.830     598.472       1.000       1.000       0.980
W Kg/sec =   65.17433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     99.167    2988.418       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 110302.430  112508.234       1.777     513.330     288.823     401.059       1.389

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   415.01    -0.14   415.01     0.35   502.26
 MEAN    16.97     0.00    -0.02   415.01    -0.14   415.01     0.35
 HUB     14.32     0.00    -0.02   415.01    -0.14   415.01     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.44    46.36     6.08   539.52   680.79    20.97   584.10     0.57
 MEAN    48.89    43.80     5.09   475.39   631.16    20.97   584.10     0.53
 HUB     44.04    37.84     6.20   401.14   577.29    20.97   584.10     0.49

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
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B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	482.23	226.06	425.96	1199.71	0.40
MEAN	16.57	492.38	240.99	429.37	1197.64	0.41
HUB	13.89	532.20	308.89	433.39	1195.56	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	528.88	522.63	302.82	0.44	4270.76	
MEAN	464.28	483.96	223.28	0.40	3996.59	1.41
HUB	389.09	440.75	80.20	0.37	4292.57	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.25	1.11	22.59	617.67	1.03	598.26	0.92	0.91
MEAN	25.09	1.10	22.33	616.43	1.03	596.20	0.92	0.91
HUB	25.26	1.11	22.05	617.76	1.03	594.12	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.96	35.41	31.50	3.91	0.93	0.29	2.90	
MEAN	29.30	27.48	23.50	3.98	0.92	0.29	3.29	0.91
HUB	35.48	10.48	6.50	3.98	0.92	0.30	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	485.292	242.347	420.448	1199.073	0.405	0.053

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.170	22.482	597.631	46.000	29.959	32.400	2.441

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	439.166	242.347	501.596	1202.638	0.365	0.214

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	25.151	22.935	601.190	456.573	0.017	0.309

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	417.123	0.000	417.123	1204.213	0.346	0.210

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.088	602.766	0.000	0.060	0.039	0.267

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.871	25.088	1.099	617.288	18.816	263.163	2.040

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
117293.609	0.419	950.399	1267638.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 7.953 EfDer = 0.993

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
143.384	3210.000	25.088	617.288	1.000	1.000	0.980

W Kg/sec = 65.17433

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
91.651	2942.519	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
110302.430	112508.234	1.909	509.668	266.943	390.276	1.462

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	388.77	-0.13	388.77	0.32	470.41
MEAN	15.91	0.00	-0.02	388.77	-0.13	388.77	0.32	
HUB	13.07	0.00	-0.02	388.77	-0.13	388.77	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.86	47.36	5.50	513.19	643.93	23.34	604.68	0.53
MEAN	48.92	44.80	4.12	445.76	591.58	23.34	604.68	0.49
HUB	43.29	38.84	4.45	366.12	534.13	23.34	604.68	0.44

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	454.94	215.60	400.60	1218.68	0.37
MEAN	15.50	461.39	222.71	404.08	1216.35	0.38
HUB	12.59	493.18	277.04	408.02	1214.00	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	502.54	492.77	286.94	0.40	3870.40	
MEAN	434.13	456.05	211.42	0.37	3453.57	1.42
HUB	352.68	414.97	75.64	0.34	3489.64	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.40	1.09	24.89	634.68	1.03	617.41	0.92	0.91
MEAN	27.15	1.08	24.58	632.80	1.03	615.04	0.92	0.91
HUB	27.17	1.08	24.25	632.97	1.03	612.67	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.29	35.61	31.50	4.11	0.93	0.29	2.90	
MEAN	28.86	27.62	23.50	4.12	0.92	0.28	3.34	0.91
HUB	34.18	10.50	6.50	4.00	0.92	0.29	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.993

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	466.354	226.791	407.495	1216.632	0.383	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
27.185	24.562	615.334	46.000	29.098	33.000	3.902

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	430.657	226.791	486.724	1219.271	0.353	0.124

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	27.147	24.901	618.006	440.827	0.034	0.301

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	402.486	0.000	402.486	1221.201	0.330	0.224

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	25.159	619.964	0.000	0.060	0.042	0.221

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.863	27.127	1.081	633.481	16.193	283.956	2.201

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
100985.500	0.400	818.259	1313939.750

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
689508.06	5586.8994	140.0713	1.7956	0.8633	7.9532	1.2117

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 85% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     138.557    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   62.98067

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     135.357    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  106589.836  108721.398       2.110     831.557     394.188     619.754       1.572

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   320.57    -0.11   320.57     0.29   575.61
  MEAN    17.06     0.00    -0.02   320.57    -0.11   320.57     0.29
  HUB     12.51     0.00    -0.02   320.57    -0.11   320.57     0.29

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.99    50.47    10.52   577.90   660.95    14.26   514.23     0.59
  MEAN    56.15    47.20     8.95   477.90   575.55    14.26   514.23     0.52
  HUB     47.56    38.62     8.94   350.44   475.02    14.26   514.23     0.43

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   548.98   348.69   424.03  1129.39     0.49
  MEAN    18.04   571.41   374.21   431.83  1125.02     0.51
  HUB     15.00   643.66   464.84   445.22  1118.25     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   482.01   229.21     0.43  7195.72
  MEAN   505.23   451.27   131.02     0.40  6751.20     1.44
  HUB    420.19   447.46    44.65     0.40  6973.93

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.29     1.21    15.56   555.19     1.06   530.02     0.92     0.91
  MEAN    18.08     1.20    15.16   553.19     1.06   525.92     0.92     0.91
  HUB     18.19     1.20    14.53   554.19     1.06   519.59     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     39.43    28.39    24.20     4.19     0.93     0.36     2.90
  MEAN    40.91    16.88    12.70     4.18     0.93     0.31     3.51     0.91
  HUB     46.23    -5.73    -9.30     3.57     0.93     0.17     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.996

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     579.080     373.486     442.540    1125.276       0.515      -0.002

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      18.159      15.154     526.183      24.000      40.163      35.400      -4.763

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     464.308     373.486     595.881    1135.920       0.409       0.341

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.114      16.143     536.185     528.796       0.024       0.474

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     429.451       0.000     429.451    1138.673       0.377       0.389

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.362     538.787       0.000       0.060       0.044       0.412

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      18.052       1.195     554.191      31.381     200.774       1.556

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 195373.719       0.585    1529.778 1347956.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    138.557    3210.000      18.052     554.191       1.000       1.000       0.980
W Kg/sec =   62.98067

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    116.625    3105.514       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106589.836  108721.398       1.739     590.487     339.644     474.134       1.396

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   409.59    -0.14   409.59     0.36   556.90
 MEAN    18.08     0.00    -0.02   409.59    -0.14   409.59     0.36
 HUB     15.21     0.00    -0.02   409.59    -0.14   409.59     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.57    46.36     8.21   575.66   706.62    16.51   540.18     0.62
 MEAN    51.04    42.30     8.74   506.42   651.44    16.51   540.18     0.57
 HUB     46.14    37.84     8.30   426.07   591.12    16.51   540.18     0.52

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   501.31   277.55   417.47  1159.50     0.43
 MEAN    18.01   510.79   286.70   422.74  1156.31     0.44
 HUB     15.22   552.63   348.69   428.73  1153.12     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   510.88   294.47     0.44  5670.38
 MEAN   504.50   475.55   217.81     0.41  5165.94     1.49
 HUB    426.43   435.72    77.74     0.38  5310.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.84     1.15    18.32   579.70     1.05   558.71     0.92     0.91
 MEAN    20.58     1.14    17.99   577.43     1.04   555.64     0.92     0.91
 HUB     20.65     1.14    17.64   578.08     1.04   552.58     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.62    35.20    31.50     3.70     0.93     0.34     2.90
 MEAN    34.14    27.26    23.50     3.76     0.93     0.34     3.30     0.91
 HUB     39.12    10.28     6.50     3.78     0.93     0.34     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.850       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     570.516     287.501     492.780    1151.688       0.495      -0.195

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.660      17.467     551.220      46.000      30.260      30.600       0.340

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     497.639     287.501     574.719    1158.459       0.430       0.070

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      20.634      18.173     557.721     455.853       0.019       0.309

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     490.660       0.000     490.660    1159.057       0.423       0.271

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      18.198     558.297       0.000       0.060       0.037       0.079

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      20.588       1.140     578.400      24.209     232.251       1.800

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 150788.750       0.461    1180.677 1222602.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.992

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    138.557    3210.000      20.588     578.400       1.000       1.000       0.880
W Kg/sec =   62.98067

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    104.469    3039.827       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 106589.836  108721.398       1.610     489.817     304.253     384.470       1.264

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   457.64    -0.16   457.64     0.39   532.39
 MEAN    17.74     0.00    -0.02   457.64    -0.16   457.64     0.39
 HUB     15.05     0.00    -0.02   457.64    -0.16   457.64     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.86    46.36     4.50   562.21   725.05    18.50   560.92     0.62
 MEAN    47.36    43.40     3.96   496.90   675.65    18.50   560.92     0.58
 HUB     42.66    38.84     3.82   421.59   622.34    18.50   560.92     0.54

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   486.50   255.01   414.31  1182.72     0.41
 MEAN    17.51   496.79   267.89   418.37  1180.20     0.42
 HUB     14.85   538.52   333.21   423.05  1177.70     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   511.47   299.92     0.43  5054.94
 MEAN   490.40   473.86   222.51     0.40  4692.70     1.54
 HUB    415.99   431.08    82.78     0.37  4950.48

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     23.27     1.13    20.71   601.13     1.04   581.37     0.92     0.91
 MEAN    23.07     1.12    20.42   599.50     1.04   578.90     0.92     0.91
 HUB     23.21     1.13    20.11   600.66     1.04   576.45     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.61    35.90    31.50     4.40     0.93     0.35     2.90
 MEAN    32.63    28.01    23.50     4.51     0.92     0.36     3.28     0.91
 HUB     38.22    11.07     6.50     4.57     0.92     0.38     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     501.883     269.652     423.290    1180.703       0.425       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.153      20.445     579.400      46.000      32.499      31.500      -0.999

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     434.270     269.652     511.178    1186.075       0.366       0.244

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.134      21.086     584.684     471.992       0.017       0.341

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     421.425       0.000     421.425    1187.006       0.355       0.255

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.150     585.602       0.000       0.060       0.037       0.267

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      23.078       1.121     600.429      22.028     239.922       1.860

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 137261.359       0.446    1074.758 1359422.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  1.000

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    138.557    3210.000      23.078     600.429       1.000       1.000       0.980
W Kg/sec =   62.98067

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.955    2983.543       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106589.836  108721.398       1.856     513.330     276.554     401.059       1.450

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   395.75    -0.14   395.75     0.33   501.44
 MEAN    16.97     0.00    -0.02   395.75    -0.14   395.75     0.33
 HUB     14.32     0.00    -0.02   395.75    -0.14   395.75     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.75    46.36     7.39   539.52   669.22    21.37   587.36     0.56
 MEAN    50.23    43.80     6.43   475.39   618.67    21.37   587.36     0.52
 HUB     45.40    37.84     7.56   401.14   563.60    21.37   587.36     0.47

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	471.45	241.25	405.05	1203.81	0.39
MEAN	16.57	480.23	252.05	408.76	1201.41	0.40
HUB	13.89	518.19	312.97	413.01	1199.01	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	528.88	496.78	287.62	0.41	4557.46	
MEAN	464.28	460.57	212.23	0.38	4179.77	1.46
HUB	389.09	419.97	76.13	0.35	4349.04	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.69	1.11	23.11	620.91	1.03	602.36	0.92	0.91
MEAN	25.47	1.10	22.81	619.21	1.03	599.97	0.92	0.91
HUB	25.57	1.11	22.48	619.97	1.03	597.56	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.78	35.38	31.50	3.88	0.93	0.32	2.90	
MEAN	31.66	27.44	23.50	3.94	0.93	0.32	3.29	0.91
HUB	37.15	10.44	6.50	3.94	0.93	0.32	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	473.903	253.468	400.422	1202.730	0.394	0.051

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.547	22.952	601.289	46.000	32.334	32.400	0.066

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	417.062	253.468	488.044	1206.950	0.346	0.254

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	25.532	23.506	605.515	456.573	0.015	0.344

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	396.338	0.000	396.338	1208.352	0.328	0.249

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.642	606.922	0.000	0.060	0.037	0.303

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	25.473	1.104	620.033	19.604	249.193	1.932

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
122208.867	0.437	956.896	1215021.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
138.557	3210.000	25.473	620.033	1.000	1.000	0.980

W Kg/sec = 62.98067

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
87.420	2935.998	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
106589.836	108721.398	2.002	509.668	254.619	390.276	1.533

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	369.73	-0.13	369.73	0.31	469.37
MEAN	15.91	0.00	-0.02	369.73	-0.13	369.73	0.31	

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 HUB     13.07     0.00    -0.02   369.73    -0.13   369.73     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.24    47.36     6.88   513.19   632.61    23.87   608.63     0.52
 MEAN    50.33    44.80     5.53   445.76   579.24    23.87   608.63     0.48
 HUB     44.73    38.84     5.89   366.12   520.43    23.87   608.63     0.43

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   444.53   230.81   379.91  1223.35     0.36
 MEAN    15.50   449.23   233.79   383.60  1220.72     0.37
 HUB     12.59   478.89   281.12   387.69  1218.08     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   467.09   271.74     0.38  4143.03
 MEAN   434.13   432.76   200.34     0.35  3625.23     1.47
 HUB    352.68   394.24    71.55     0.32  3541.02

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.00     1.10    25.55   638.64     1.03   622.16     0.92     0.91
 MEAN    27.67     1.09    25.20   636.32     1.03   619.48     0.92     0.91
 HUB     27.62     1.08    24.83   635.94     1.03   616.80     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.28    35.57    31.50     4.07     0.93     0.32     2.90
 MEAN    31.36    27.58    23.50     4.08     0.92     0.31     3.34     0.91
 HUB     35.95    10.46     6.50     3.96     0.92     0.31     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     454.212     238.078     386.817    1220.984       0.372      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.711      25.184     619.753      46.000      31.611      33.000       1.389

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     407.508     238.078     471.958    1224.287       0.333       0.174

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.686      25.640     623.112     440.827       0.030       0.338

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     381.209       0.000     381.209    1225.986       0.311       0.268

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.871     624.842       0.000       0.060       0.037       0.264

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      27.667       1.086     636.967      16.934     267.762       2.076

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  105614.062       0.418     826.959 1259000.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     711246.75   5569.0684    135.3568      1.8314      0.8676      8.9530      1.2184


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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
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*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 85% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     133.793    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   60.81521

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     130.703    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  102924.961  104983.242       2.185     831.557     380.635     619.754       1.628

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   308.61    -0.11   308.61     0.28   575.61
  MEAN    17.06     0.00    -0.02   308.61    -0.11   308.61     0.28
  HUB     12.51     0.00    -0.02   308.61    -0.11   308.61     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.90    50.47    11.43   577.90   655.23    14.32   514.86     0.59
  MEAN    57.15    47.20     9.95   477.90   568.97    14.32   514.86     0.51
  HUB     48.64    38.62    10.02   350.44   467.03    14.32   514.86     0.42

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   542.01   357.81   407.12  1130.96     0.48
  MEAN    18.04   562.16   379.38   414.84  1126.40     0.50
  HUB     15.00   630.27   463.08   427.55  1119.64     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   462.80   220.08     0.41  7383.91
  MEAN   505.23   433.51   125.85     0.38  6844.35     1.48
  HUB    420.19   429.70    42.90     0.38  6947.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.37     1.22    15.69   556.04     1.06   531.50     0.92     0.91
  MEAN    18.12     1.20    15.28   553.61     1.06   527.21     0.92     0.91
  HUB     18.16     1.20    14.64   554.07     1.06   520.90     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     41.31    28.40    24.20     4.20     0.93     0.39     2.90
  MEAN    42.44    16.88    12.70     4.18     0.94     0.34     3.51     0.91
  HUB     47.28    -5.73    -9.30     3.57     0.94     0.19     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     569.231     378.645     425.031    1126.694       0.505      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.186      15.274     527.510      24.000      41.697      35.400      -6.297

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     445.082     378.645     584.354    1137.871       0.391       0.369

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      18.135      16.317     538.028     528.796       0.027       0.498

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     412.333       0.000     412.333    1140.348       0.362       0.408

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.504     540.373       0.000       0.060       0.050       0.431

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      18.066       1.196     554.573      31.763     195.211       1.513

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 197755.156       0.592    1495.185 1297660.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    133.793    3210.000      18.066     554.573       1.000       1.000       0.980
W Kg/sec =   60.81521

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.566    3104.443       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 102924.961  104983.242       1.801     590.487     327.823     474.134       1.446

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   393.50    -0.14   393.50     0.34   556.71
 MEAN    18.08     0.00    -0.02   393.50    -0.14   393.50     0.34
 HUB     15.21     0.00    -0.02   393.50    -0.14   393.50     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.65    46.36     9.29   575.66   697.41    16.64   541.64     0.61
 MEAN    52.16    42.30     9.86   506.42   641.43    16.64   541.64     0.56
 HUB     47.29    37.84     9.45   426.07   580.08    16.64   541.64     0.51

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   494.29   289.64   400.54  1161.65     0.43
 MEAN    18.01   502.10   295.54   405.92  1158.21     0.43
 HUB     15.22   541.83   351.90   412.00  1154.77     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   490.08   282.38     0.42  5917.15
 MEAN   504.50   456.55   208.97     0.39  5325.02     1.53
 HUB    426.43   418.69    74.54     0.36  5359.03

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.96     1.16    18.51   581.19     1.05   560.79     0.92     0.91
 MEAN    20.66     1.14    18.15   578.53     1.04   557.47     0.92     0.91
 HUB     20.68     1.14    17.78   578.68     1.04   554.16     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.87    35.18    31.50     3.68     0.93     0.37     2.90
 MEAN    36.06    27.24    23.50     3.74     0.94     0.36     3.30     0.91
 HUB     40.50    10.25     6.50     3.75     0.94     0.36     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     557.433     296.364     472.122    1154.083       0.483      -0.182

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.741      17.678     553.517      46.000      32.118      30.600      -1.518

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     475.633     296.364     560.409    1161.416       0.410       0.117

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      20.716      18.454     560.573     455.853       0.019       0.336

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     17.823     469.111       0.000     469.111    1161.949       0.404       0.303

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      18.471     561.088       0.000       0.060       0.037       0.124

    STAGE EXIT CONDITIONS, STAGE            2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.876      20.669       1.144     579.464      24.891     222.951       1.728

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 155033.750       0.474    1172.178 1174067.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    133.793    3210.000      20.669     579.464       1.000       1.000       0.880
W Kg/sec =   60.81521

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.574    3037.035       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 102924.961  104983.242       1.672     489.817     292.910     384.470       1.313

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   438.07    -0.15   438.07     0.38   531.90
 MEAN    17.74     0.00    -0.02   438.07    -0.15   438.07     0.38
 HUB     15.05     0.00    -0.02   438.07    -0.15   438.07     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.08    46.36     5.72   562.21   712.85    18.74   563.44     0.61
 MEAN    48.61    43.40     5.21   496.90   662.55    18.74   563.44     0.57
 HUB     43.91    38.84     5.07   421.59   608.09    18.74   563.44     0.52

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   478.59   268.66   396.06  1185.67     0.40
 MEAN    17.51   487.36   277.91   400.36  1182.87     0.41
 HUB     14.85   527.09   337.09   405.21  1180.08     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   488.68   286.26     0.41  5325.25
 MEAN   490.40   453.26   212.50     0.38  4867.86     1.58
 HUB    415.99   412.81    78.89     0.35  5008.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.52     1.14    21.02   603.41     1.04   584.29     0.92     0.91
 MEAN    23.26     1.13    20.70   601.35     1.04   581.52     0.92     0.91
 HUB     23.34     1.13    20.35   601.98     1.04   578.79     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.15    35.86    31.50     4.36     0.93     0.38     2.90
 MEAN    34.77    27.96    23.50     4.46     0.92     0.38     3.28     0.91
 HUB     39.76    11.02     6.50     4.52     0.92     0.39     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     492.250     279.730     405.044    1183.363       0.416       0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.348      20.724     582.017      46.000      34.630      31.500      -3.130

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     414.580     279.730     500.125    1189.325       0.349       0.281

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.327      21.445     587.897     471.992       0.018       0.373

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     402.547       0.000     402.547    1190.155       0.338       0.287

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.495     588.718       0.000       0.060       0.040       0.300

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      23.268       1.126     602.246      22.782     228.887       1.774

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 141959.516       0.461    1073.326 1302252.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    133.793    3210.000      23.268     602.246       1.000       1.000       0.980
W Kg/sec =   60.81521

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     91.080    2979.038       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 102924.961  104983.242       1.935     513.330     265.271     401.059       1.512

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   378.31    -0.13   378.31     0.32   500.69
 MEAN    16.97     0.00    -0.02   378.31    -0.13   378.31     0.32
 HUB     14.32     0.00    -0.02   378.31    -0.13   378.31     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.97    46.36     8.61   539.52   659.05    21.70   590.30     0.55
 MEAN    51.50    43.80     7.70   475.39   607.65    21.70   590.30     0.51
 HUB     46.69    37.84     8.85   401.14   551.49    21.70   590.30     0.46

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   462.86   254.74   386.46  1207.42     0.38
 MEAN    16.57   470.05   261.88   390.34  1204.76     0.39
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 HUB     13.89   506.00   316.58   394.73  1202.09     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   473.81   274.13     0.39  4812.04
 MEAN   464.28   439.70   202.40     0.36  4342.53     1.50
 HUB    389.09   401.33    72.51     0.33  4399.22

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.04     1.12    23.53   623.87     1.04   605.99     0.92     0.91
 MEAN    25.76     1.11    23.19   621.76     1.03   603.32     0.92     0.91
 HUB     25.80     1.11    22.83   622.02     1.03   600.65     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.39    35.35    31.50     3.85     0.93     0.35     2.90
 MEAN    33.86    27.41    23.50     3.91     0.93     0.34     3.29     0.91
 HUB     38.73    10.41     6.50     3.91     0.93     0.34     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     464.400     263.350     382.510    1205.981       0.385       0.049

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.841      23.326     604.551      46.000      34.547      32.400      -2.147

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     397.491     263.350     476.815    1210.772       0.328       0.291

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.826      23.966     609.364     456.573       0.016       0.377

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     377.988       0.000     377.988    1212.026       0.312       0.283

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.084     610.626       0.000       0.060       0.038       0.335

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      25.766       1.107     622.550      20.304     237.310       1.840

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 126575.109       0.453     957.008 1164863.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    133.793    3210.000      25.766     622.550       1.000       1.000       0.980
W Kg/sec =   60.81521

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.625    2930.057       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 102924.961  104983.242       2.092     509.668     243.570     390.276       1.602

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   352.87    -0.12   352.87     0.29   468.42
 MEAN    15.91     0.00    -0.02   352.87    -0.12   352.87     0.29
 HUB     13.07     0.00    -0.02   352.87    -0.12   352.87     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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 TIP     55.49    47.36     8.13   513.19   622.90    24.30   612.16     0.51
 MEAN    51.64    44.80     6.84   445.76   568.62    24.30   612.16     0.47
 HUB     46.07    38.84     7.23   366.12   508.58    24.30   612.16     0.42

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   436.48   244.02   361.90  1227.43     0.36
 MEAN    15.50   439.32   243.45   365.69  1224.56     0.36
 HUB     12.59   466.73   284.68   369.85  1221.69     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   444.75   258.53     0.36  4379.94
 MEAN   434.13   412.42   190.68     0.34  3774.78     1.52
 HUB    352.68   376.05    68.00     0.31  3585.69

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.46     1.10    26.08   642.22     1.03   626.33     0.92     0.91
 MEAN    28.08     1.09    25.69   639.51     1.03   623.40     0.92     0.91
 HUB     27.96     1.09    25.28   638.66     1.03   620.48     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.99    35.54    31.50     4.04     0.93     0.35     2.90
 MEAN    33.65    27.54    23.50     4.04     0.93     0.34     3.34     0.91
 HUB     37.59    10.42     6.50     3.92     0.93     0.33     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     444.338     247.911     368.749    1224.811       0.363      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.116      25.670     623.656      46.000      33.913      33.000      -0.913

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     387.556     247.911     460.064    1228.675       0.315       0.217

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.095      26.221     627.597     440.827       0.029       0.372

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     362.833       0.000     362.833    1230.189       0.295       0.305

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.428     629.145       0.000       0.060       0.037       0.301

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      28.074       1.090     640.129      17.579     254.347       1.972

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  109640.320       0.434     828.967 1206811.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     730963.88   5526.6641    130.7028      1.8583      0.8665      9.9532      1.2244


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*******************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
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Fan-Core + 4 Stage LPC 85% Stat 2 10% Ice Block 8-2-2011

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1

RESET = 0.000BLEED = 0.000 DPInc =10.953 EfDer = 0.987

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
129.093	3210.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 58.67873

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
126.111	3197.358	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
99309.141	101295.109	2.264	831.557	367.263	619.754	1.687

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	296.92	-0.10	296.92	0.27	575.61
MEAN	17.06	0.00	-0.02	296.92	-0.10	296.92	0.27	
HUB	12.51	0.00	-0.02	296.92	-0.10	296.92	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.81	50.47	12.34	577.90	649.80	14.38	515.45	0.58
MEAN	58.15	47.20	10.95	477.90	562.71	14.38	515.45	0.51
HUB	49.73	38.62	11.11	350.44	459.39	14.38	515.45	0.41

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	535.87	366.54	390.89	1132.41	0.47
MEAN	18.04	553.62	384.33	398.48	1127.67	0.49
HUB	15.00	617.54	461.33	410.53	1120.93	0.55

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	577.90	444.37	211.36	0.39	7563.90	
MEAN	505.23	416.42	120.90	0.37	6933.53	1.53
HUB	420.19	412.58	41.14	0.37	6921.21	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.44	1.22	15.81	556.85	1.07	532.86	0.92	0.90
MEAN	18.14	1.20	15.38	554.01	1.06	528.41	0.92	0.90
HUB	18.13	1.20	14.75	553.96	1.06	522.10	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.16	28.40	24.20	4.20	0.93	0.41	2.90	
MEAN	43.96	16.88	12.70	4.18	0.94	0.36	3.51	0.90
HUB	48.33	-5.72	-9.30	3.58	0.94	0.22	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.987

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	560.139	383.584	408.190	1127.998	0.497	0.000

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.208	15.381	528.732	24.000	43.220	35.400	-7.820

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	426.733	383.584	573.793	1139.667	0.374	0.396

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.149	16.473	539.728	528.796	0.030	0.522

VANED DIFFUSER EXIT:

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   R4          C4           Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     395.956       0.000     395.956    1141.898       0.347       0.426

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.627     541.843       0.000       0.060       0.057       0.449

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      18.072       1.196     554.938      32.128     189.848       1.472

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 200022.594       0.599    1459.200 1248503.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    129.093    3210.000      18.072     554.938       1.000       1.000       0.980
W Kg/sec =   58.67873

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.615    3103.424       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  99309.141  101295.109       1.867     590.487     316.316     474.134       1.499

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   378.07    -0.13   378.07     0.33   556.53
 MEAN    18.08     0.00    -0.02   378.07    -0.13   378.07     0.33
 HUB     15.21     0.00    -0.02   378.07    -0.13   378.07     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.71    46.36    10.35   575.66   688.81    16.75   543.00     0.60
 MEAN    53.26    42.30    10.96   506.42   632.08    16.75   543.00     0.55
 HUB     48.42    37.84    10.58   426.07   569.72    16.75   543.00     0.50

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   488.34   301.01   384.54  1163.60     0.42
 MEAN    18.01   494.35   303.85   389.94  1159.95     0.43
 HUB     15.22   531.78   354.87   396.05  1156.29     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   470.44   271.01     0.40  6149.25
 MEAN   504.50   438.54   200.65     0.38  5474.71     1.58
 HUB    426.43   402.46    71.56     0.35  5404.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.07     1.17    18.66   582.60     1.05   562.68     0.92     0.90
 MEAN    20.73     1.15    18.29   579.56     1.04   559.16     0.92     0.90
 HUB     20.69     1.14    17.89   579.25     1.04   555.63     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.05    35.17    31.50     3.67     0.93     0.39     2.90
 MEAN    37.93    27.23    23.50     3.73     0.94     0.38     3.30     0.90
 HUB     41.86    10.24     6.50     3.74     0.94     0.37     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3           Mach3       cp 2-3
     17.960     545.671     304.704     452.673    1156.255       0.472      -0.170
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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.803      17.856     555.605      46.000      33.945      30.600      -3.345

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     455.106     304.704     547.691    1164.104       0.391       0.162

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      20.776      18.696     563.173     455.853       0.020       0.364

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     449.061       0.000     449.061    1164.576       0.386       0.332

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      18.703     563.630       0.000       0.060       0.040       0.165

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      20.725       1.147     580.469      25.531     214.413       1.662

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 159021.297       0.486    1160.088 1127074.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    129.093    3210.000      20.725     580.469       1.000       1.000       0.880
W Kg/sec =   58.67873

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.862    3034.406       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  99309.141  101295.109       1.736     489.817     282.099     384.470       1.363

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   419.79    -0.14   419.79     0.36   531.44
 MEAN    17.74     0.00    -0.02   419.79    -0.14   419.79     0.36
 HUB     15.05     0.00    -0.02   419.79    -0.14   419.79     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.26    46.36     6.90   562.21   701.76    18.95   565.76     0.60
 MEAN    49.82    43.40     6.42   496.90   650.60    18.95   565.76     0.56
 HUB     45.13    38.84     6.29   421.59   595.05    18.95   565.76     0.51

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   472.13   281.20   379.25  1188.33     0.40
 MEAN    17.51   479.24   287.15   383.69  1185.28     0.40
 HUB     14.85   516.81   340.67   388.63  1182.26     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   467.71   273.72     0.39  5573.56
 MEAN   490.40   434.20   203.25     0.37  5029.62     1.62
 HUB    415.99   395.86    75.31     0.33  5061.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.72     1.14    21.28   605.53     1.04   586.92     0.92     0.91
 MEAN    23.42     1.13    20.92   603.08     1.04   583.91     0.92     0.91
 HUB     23.44     1.13    20.55   603.22     1.04   580.93     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.56    35.82    31.50     4.32     0.93     0.40     2.90
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 MEAN    36.81    27.91    23.50     4.41     0.93     0.40     3.28     0.91
 HUB     41.24    10.97     6.50     4.47     0.93     0.41     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     483.961     289.037     388.170    1185.769       0.408        0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.500      20.951     584.391      46.000      36.672      31.500      -5.172

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     396.514     289.037     490.679    1192.272       0.333        0.316

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.474      21.742     590.819     471.992       0.020        0.404

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     385.271       0.000     385.271    1193.012       0.323        0.315

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      21.774     591.553       0.000       0.060       0.046        0.329

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.878      23.407       1.129     603.945      23.476     219.071        1.698

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 146285.078       0.475    1067.175 1247522.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.996

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    129.093     3210.000       23.407     603.945       1.000        1.000        0.980
W Kg/sec =   58.67873

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     87.481     2974.847        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  99309.141  101295.109        2.015     513.330     254.788     401.059        1.574

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa     C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   362.31    -0.12   362.31      0.30   499.98
 MEAN    16.97      0.00    -0.02   362.31    -0.12   362.31      0.30
 HUB     14.32      0.00    -0.02   362.31    -0.12   362.31      0.30

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     56.12     46.36      9.76   539.52   649.99     21.96   592.99      0.54
 MEAN    52.70     43.80      8.90   475.39   597.82     21.96   592.99      0.50
 HUB     47.92     37.84     10.08   401.14   540.63     21.96   592.99      0.45

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   455.91    266.86    369.65   1210.65      0.38
 MEAN    16.57   461.42    270.76    373.62   1207.77      0.38
 HUB     13.89   495.22    319.84    378.07   1204.88      0.41

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
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TIP	528.88	453.10	262.01	0.37	5040.75		
MEAN	464.28	420.77	193.52	0.35	4489.61	1.55	
HUB	389.09	384.36	69.25	0.32	4444.43		

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.32	1.12	23.86	626.60	1.04	609.25	0.92	0.91
MEAN	25.99	1.11	23.50	624.12	1.03	606.35	0.92	0.91
HUB	25.96	1.11	23.11	623.92	1.03	603.45	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.83	35.33	31.50	3.83	0.93	0.37	2.90	
MEAN	35.93	27.38	23.50	3.88	0.93	0.36	3.29	0.91
HUB	40.23	10.38	6.50	3.88	0.93	0.36	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	456.365	272.280	366.241	1208.908	0.378	0.047

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
26.065	23.621	607.497	46.000	36.629	32.400	-4.229

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	379.856	272.280	467.361	1214.209	0.313	0.325

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	26.046	24.336	612.836	456.573	0.017	0.409

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	361.489	0.000	361.489	1215.334	0.297	0.312

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	24.432	613.973	0.000	0.060	0.043	0.362

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.875	25.980	1.110	624.878	20.934	226.970	1.759

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
130506.805	0.467	952.070	1116782.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =10.953 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
129.093	3210.000	25.980	624.878	1.000	1.000	0.980

W Kg/sec = 58.67873

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
80.171	2924.593	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
99309.141	101295.109	2.183	509.668	233.510	390.276	1.671

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	337.68	-0.12	337.68	0.28	467.55
MEAN	15.91	0.00	-0.02	337.68	-0.12	337.68	0.28	
HUB	13.07	0.00	-0.02	337.68	-0.12	337.68	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.66	47.36	9.30	513.19	614.42	24.63	615.37	0.51
MEAN	52.86	44.80	8.06	445.76	559.32	24.63	615.37	0.46
HUB	47.32	38.84	8.48	366.12	498.15	24.63	615.37	0.41

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      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   430.13   255.69   345.89  1231.07     0.35
 MEAN    15.50   431.05   252.00   349.71  1228.01     0.35
 HUB     12.59   456.14   287.79   353.89  1224.94     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   424.94   246.86     0.35  4589.17
 MEAN   434.13   394.30   182.13     0.32  3907.21     1.56
 HUB    352.68   359.79    64.88     0.29  3624.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.82     1.11    26.48   645.49     1.03   630.06     0.92     0.91
 MEAN    28.38     1.09    26.06   642.43     1.03   626.93     0.92     0.91
 HUB     28.20     1.09    25.63   641.16     1.03   623.80     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.47    35.52    31.50     4.02     0.93     0.38     2.90
 MEAN    35.78    27.51    23.50     4.01     0.93     0.36     3.34     0.91
 HUB     39.12    10.39     6.50     3.89     0.93     0.35     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     436.125     256.618     352.636    1228.231       0.355       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.420      26.045     627.158      46.000      36.044      33.000      -3.044

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     369.947     256.618     450.237    1232.582       0.300       0.256

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.395      26.673     631.608     440.827       0.030       0.404

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     346.596       0.000     346.596    1233.943       0.281       0.337

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.858     633.004       0.000       0.060       0.040       0.332

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.880      28.372       1.092     643.027      18.148     242.924       1.883

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  113196.789       0.448     825.790 1156887.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     749032.56   5464.3237    126.1111      1.8781      0.8614     10.9531      1.2299


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

    Fan-Core + 4 Stage LPC 85% Stat 2 10% Ice Block 8-2-2011
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc =12.015   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    124.165    3210.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   56.43852

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    121.297    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 95517.758   97427.906       2.354     831.557     353.242     619.754       1.754

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   284.77    -0.10   284.77     0.26   575.61
MEAN    17.06     0.00    -0.02   284.77    -0.10   284.77     0.26
HUB     12.51     0.00    -0.02   284.77    -0.10   284.77     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     63.77    50.47    13.30   577.90   644.34    14.44   516.04     0.58
MEAN    59.22    47.20    12.02   477.90   556.39    14.44   516.04     0.50
HUB     50.91    38.62    12.29   350.44   451.63    14.44   516.04     0.41

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   530.12   375.40   374.30  1133.82     0.47
MEAN    18.04   545.22   389.34   381.69  1128.92     0.48
HUB     15.00   604.68   459.50   393.06  1122.20     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    577.90   425.56   202.50     0.38  7746.57
MEAN   505.23   398.90   115.90     0.35  7023.73     1.59
HUB    420.19   395.02    39.32     0.35  6893.78

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.50     1.22    15.92   557.67     1.07   534.20     0.92     0.90
MEAN    18.16     1.20    15.48   554.42     1.06   529.59     0.92     0.90
HUB     18.10     1.20    14.85   553.83     1.06   523.29     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     45.08    28.41    24.20     4.21     0.93     0.44     2.90
MEAN    45.57    16.89    12.70     4.19     0.94     0.39     3.51     0.90
HUB     49.46    -5.71    -9.30     3.59     0.94     0.24     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.980

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     551.196     388.579     390.927    1129.275       0.488       0.001

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.226      15.482     529.930      24.000      44.827      35.400      -9.427

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     408.055     388.579     563.473    1141.430       0.357       0.424

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.157      16.620     541.398     528.796       0.034       0.547

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     379.239       0.000     379.239    1143.425       0.332       0.444
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.742	543.293	0.000	0.060	0.065	0.467

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.848	18.069	1.196	555.306	32.496	184.342	1.429

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
202314.734	0.606	1419.574	1197425.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =12.015 EfDer = 0.980

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
124.165	3210.000	18.069	555.306	1.000	1.000	0.980

W Kg/sec = 56.43852

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
104.516	3102.395	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
95517.758	97427.906	1.940	590.487	304.380	474.134	1.558

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	362.29	-0.12	362.29	0.32	556.34
MEAN	18.08	0.00	-0.02	362.29	-0.12	362.29	0.32	
HUB	15.21	0.00	-0.02	362.29	-0.12	362.29	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.82	46.36	11.46	575.66	680.28	16.86	544.35	0.59
MEAN	54.43	42.30	12.13	506.42	622.77	16.86	544.35	0.54
HUB	49.63	37.84	11.79	426.07	559.37	16.86	544.35	0.49

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	483.03	312.44	368.37	1165.51	0.41
MEAN	18.01	487.00	312.24	373.73	1161.66	0.42
HUB	15.22	521.83	357.86	379.80	1157.79	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	572.02	450.64	259.57	0.39	6382.63	
MEAN	504.50	420.29	192.27	0.36	5625.61	1.62
HUB	426.43	385.94	68.57	0.33	5449.61	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.16	1.17	18.80	584.01	1.05	564.53	0.92	0.90
MEAN	20.78	1.15	18.41	580.61	1.05	560.81	0.92	0.90
HUB	20.69	1.14	17.99	579.82	1.04	557.08	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.30	35.17	31.50	3.67	0.93	0.42	2.90	
MEAN	39.88	27.22	23.50	3.72	0.94	0.40	3.30	0.90
HUB	43.30	10.23	6.50	3.73	0.94	0.39	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.980

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	534.416	313.112	433.084	1158.361	0.461	-0.158

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.851	18.017	557.632	46.000	35.866	30.600	-5.266

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	434.591	313.112	535.639	1166.720	0.372	0.208

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	20.820	18.915	565.710	455.853	0.023	0.393

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	429.067	0.000	429.067	1167.131	0.368	0.361

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	18.910	566.108	0.000	0.060	0.046	0.206

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.862	20.762	1.149	581.481	26.175	206.004	1.597

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
163033.812	0.498	1143.953	1078647.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =12.015 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
124.165	3210.000	20.762	581.481	1.000	1.000	0.880

W Kg/sec = 56.43852

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
93.079	3031.764	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
95517.758	97427.906	1.807	489.817	271.084	384.470	1.418

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	401.49	-0.14	401.49	0.34	530.98
MEAN	17.74	0.00	-0.02	401.49	-0.14	401.49	0.34	
HUB	15.05	0.00	-0.02	401.49	-0.14	401.49	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.48	46.36	8.12	562.21	690.96	19.13	568.02	0.59
MEAN	51.07	43.40	7.67	496.90	638.94	19.13	568.02	0.55
HUB	46.41	38.84	7.57	421.59	582.28	19.13	568.02	0.50

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	466.56	293.57	362.63	1190.91	0.39
MEAN	17.51	471.76	296.25	367.14	1187.63	0.40
HUB	14.85	506.89	344.17	372.13	1184.38	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	447.00	261.36	0.38	5818.34	
MEAN	490.40	415.31	194.15	0.35	5188.79	1.67
HUB	415.99	379.00	71.82	0.32	5113.02	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.90	1.15	21.49	607.64	1.04	589.47	0.92	0.91
MEAN	23.54	1.13	21.11	604.81	1.04	586.23	0.92	0.91
HUB	23.50	1.13	20.72	604.47	1.04	583.02	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.99	35.78	31.50	4.28	0.93	0.43	2.90	
MEAN	38.90	27.87	23.50	4.37	0.93	0.42	3.28	0.91
HUB	42.76	10.92	6.50	4.42	0.93	0.43	3.87	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      476.319     298.195     371.429     1188.102       0.401       0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     23.621      21.142      586.700      46.000      38.759       31.500      -7.259

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392      378.715     298.195     482.022     1195.135       0.317       0.351

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       23.588      22.000      593.666     471.992       0.023       0.437

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121      368.281       0.000     368.281     1195.790       0.308       0.342

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       22.011      594.317       0.000       0.060       0.054       0.356

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4           PR4        Texit        Del T        Ns         Ns nondim
      0.873       23.509        1.132      605.640      24.159      209.683       1.625

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 150541.312       0.489    1056.298 1191633.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =12.015   EfDer =  0.991

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    124.165     3210.000       23.509      605.640       1.000        1.000        0.980
W Kg/sec =   56.43852

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     83.893     2970.681        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  95517.758   97427.906        2.101      513.330      244.340      401.059       1.641

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   346.54    -0.12   346.54      0.29   499.28
 MEAN    16.97      0.00    -0.02   346.54    -0.12   346.54      0.29
 HUB     14.32      0.00    -0.02   346.54    -0.12   346.54      0.29

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     57.29     46.36     10.93   539.52    641.33     22.18    595.62      0.54
 MEAN    53.92     43.80     10.12   475.39    588.39     22.18    595.62      0.49
 HUB     49.19     37.84     11.35   401.14    530.19     22.18    595.62      0.44

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88    449.94    278.61    353.29   1213.76      0.37
 MEAN    16.57    453.53    279.36    357.29   1210.68      0.37
 HUB     13.89    484.94    322.97    361.75   1207.59      0.40

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    528.88    432.95    250.26      0.36   5262.51
 MEAN   464.28    402.30    184.92      0.33   4632.06      1.60
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 HUB    389.09   367.74    66.13     0.30  4487.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.54     1.13    24.14   629.29     1.04   612.39     0.92     0.91
 MEAN    26.17     1.11    23.75   626.45     1.03   609.29     0.92     0.91
 HUB     26.08     1.11    23.34   625.81     1.03   606.18     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.26    35.31    31.50     3.81     0.93     0.40     2.90
 MEAN    38.02    27.36    23.50     3.86     0.94     0.39     3.29     0.91
 HUB     41.76    10.36     6.50     3.86     0.94     0.38     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     449.058     280.928     350.331    1211.738       0.371       0.045

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.239      23.863     610.354      46.000      38.726      32.400      -6.326

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     362.724     280.928     458.791    1217.530       0.298       0.359

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.214      24.647     616.203     456.573       0.020       0.441

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     345.483       0.000     345.483    1218.536       0.284       0.339

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.718     617.222       0.000       0.060       0.050       0.387

    STAGE EXIT CONDITIONS, STAGE             4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      26.138       1.112     627.183      21.543     217.241       1.684

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 134312.109       0.480     942.423 1067599.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =12.015   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    124.165    3210.000      26.138     627.183       1.000       1.000       0.980
W Kg/sec =   56.43852

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     76.785    2919.214       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95517.758   97427.906       2.279     509.668     223.650     390.276       1.745

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   322.90    -0.11   322.90     0.26   466.69
 MEAN    15.91     0.00    -0.02   322.90    -0.11   322.90     0.26
 HUB     13.07     0.00    -0.02   322.90    -0.11   322.90     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.83    47.36    10.47   513.19   606.42    24.89   618.48     0.50
 MEAN    54.09    44.80     9.29   445.76   550.52    24.89   618.48     0.45
 HUB     48.60    38.84     9.76   366.12   488.26    24.89   618.48     0.40

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   424.78   266.84   330.50  1234.55     0.34
MEAN    15.50   423.62   260.18   334.31  1231.32     0.34
HUB     12.59   446.20   290.78   338.45  1228.09     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    502.54   405.94   235.70     0.33  4789.20
MEAN   434.13   376.85   173.95     0.31  4033.87     1.61
HUB    352.68   344.06    61.90     0.28  3662.33

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     29.10     1.11    26.81   648.69     1.03   633.64     0.92     0.91
MEAN    28.62     1.09    26.37   645.30     1.03   630.33     0.92     0.91
HUB     28.38     1.09    25.91   643.63     1.03   627.02     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.92    35.50    31.50     4.00     0.93     0.41     2.90
MEAN    37.89    27.49    23.50     3.99     0.93     0.39     3.34     0.91
HUB     40.67    10.36     6.50     3.86     0.93     0.37     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     428.761     264.946     337.105    1231.523       0.348      -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.653      26.346     630.539      46.000      38.165      33.000      -5.165

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     353.112     264.946     441.458    1236.332       0.286       0.292

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.620      27.042     635.474     440.827       0.034       0.437

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     331.059       0.000     331.059    1237.556       0.268       0.367

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.204     636.732       0.000       0.060       0.046       0.361

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      28.593       1.094     645.876      18.693     232.335       1.801

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  116597.820       0.462     818.128 1105881.250

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     766799.81   5380.3750    121.2965      1.8927      0.8527     12.0155      1.2354


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 85% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =12.953   EfDer =  0.974
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
119.869	3210.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 54.48574

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
117.100	3197.358	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
92212.828	94056.891	2.438	831.557	341.020	619.754	1.817

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	274.27	-0.09	274.27	0.25	575.61
MEAN	17.06	0.00	-0.02	274.27	-0.09	274.27	0.25	
HUB	12.51	0.00	-0.02	274.27	-0.09	274.27	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	64.61	50.47	14.14	577.90	639.76	14.48	516.53	0.57
MEAN	60.15	47.20	12.95	477.90	551.09	14.48	516.53	0.49
HUB	51.96	38.62	13.34	350.44	445.08	14.48	516.53	0.40

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	525.65	382.90	360.14	1134.98	0.46
MEAN	18.04	538.34	393.55	367.32	1129.95	0.48
HUB	15.00	593.81	457.87	378.11	1123.24	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	577.90	409.54	195.00	0.36	7901.24	
MEAN	505.23	383.93	111.68	0.34	7099.73	1.64
HUB	420.19	379.98	37.69	0.34	6869.28	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.55	1.23	16.01	558.37	1.07	535.29	0.92	0.89
MEAN	18.18	1.20	15.56	554.76	1.06	530.55	0.92	0.89
HUB	18.07	1.20	14.93	553.72	1.06	524.27	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	46.76	28.43	24.20	4.23	0.93	0.46	2.90	
MEAN	46.97	16.91	12.70	4.21	0.94	0.41	3.51	0.89
HUB	50.45	-5.69	-9.30	3.61	0.94	0.26	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.974

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	543.861	392.788	376.168	1130.319	0.481	0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.237	15.562	530.910	24.000	46.238	35.400	-10.838

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	392.172	392.788	555.051	1142.874	0.343	0.448

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.160	16.737	542.769	528.796	0.038	0.570

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	364.984	0.000	364.984	1144.682	0.319	0.459

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.831	544.489	0.000	0.060	0.073	0.482

```
    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.838      18.062       1.196     555.615      32.805     179.630       1.392

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 204239.797       0.612    1383.497 1153266.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =12.953   EfDer =  0.973

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.869    3210.000      18.062     555.615       1.000       1.000       0.980
W Kg/sec =   54.48574

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.971    3101.531       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 92212.828   94056.891       2.008     590.487     294.056     474.134       1.612

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   348.81    -0.12   348.81     0.30   556.19
 MEAN    18.08     0.00    -0.02   348.81    -0.12   348.81     0.30
 HUB     15.21     0.00    -0.02   348.81    -0.12   348.81     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.79    46.36    12.43   575.66   673.19    16.94   545.46     0.59
 MEAN    55.45    42.30    13.15   506.42   615.02    16.94   545.46     0.54
 HUB     50.70    37.84    12.86   426.07   550.73    16.94   545.46     0.48

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   479.06   322.01   354.69  1167.06     0.41
 MEAN    18.01   481.16   319.28   359.97  1163.05     0.41
 HUB     15.22   513.59   360.35   365.96  1159.03     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   433.94   250.00     0.37  6578.01
 MEAN   504.50   404.83   185.23     0.35  5752.34     1.67
 HUB    426.43   371.88    66.09     0.32  5487.39

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.23     1.18    18.90   585.20     1.05   566.04     0.92     0.89
 MEAN    20.81     1.15    18.49   581.49     1.05   562.16     0.92     0.89
 HUB     20.68     1.14    18.07   580.30     1.04   558.27     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.24    35.18    31.50     3.68     0.93     0.44     2.90
 MEAN    41.57    27.23    23.50     3.73     0.94     0.42     3.30     0.89
 HUB     44.56    10.24     6.50     3.74     0.94     0.41     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     525.391     320.173     416.562    1160.068       0.453      -0.148

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.881      18.137     559.280      46.000      37.546      30.600      -6.946

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     17.960     417.400     320.173     526.055    1168.852       0.357       0.246

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      20.843      19.083     567.782     455.853       0.026       0.419

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     412.340       0.000     412.340    1169.213       0.353       0.383

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      19.064     568.132       0.000       0.060       0.053       0.238

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.852      20.778       1.150     582.330      26.715     199.066       1.543

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 166394.594       0.509    1127.138 1037072.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =12.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.869    3210.000      20.778     582.330       1.000       1.000       0.880
W Kg/sec =   54.48574

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     89.856    3029.554       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92212.828   94056.891       1.872     489.817     261.697     384.470       1.469

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   386.12    -0.13   386.12     0.33   530.59
 MEAN    17.74     0.00    -0.02   386.12    -0.13   386.12     0.33
 HUB     15.05     0.00    -0.02   386.12    -0.13   386.12     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.53    46.36     9.17   562.21   682.15    19.27   569.88     0.58
 MEAN    52.16    43.40     8.76   496.90   629.39    19.27   569.88     0.54
 HUB     47.52    38.84     8.68   421.59   571.79    19.27   569.88     0.49

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   462.54   303.76   348.82  1192.99     0.39
 MEAN    17.51   465.98   303.79   353.34  1189.54     0.39
 HUB     14.85   498.86   347.07   358.33  1186.11     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   429.84   251.17     0.36  6020.10
 MEAN   490.40   399.59   186.61     0.34  5320.72     1.71
 HUB    415.99   364.89    68.91     0.31  5156.04

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.02     1.16    21.65   609.40     1.05   591.54     0.92     0.91
 MEAN    23.62     1.14    21.25   606.25     1.04   588.13     0.92     0.91
 HUB     23.53     1.13    20.83   605.51     1.04   584.74     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.05    35.76    31.50     4.26     0.93     0.45     2.90
 MEAN    40.69    27.84    23.50     4.34     0.93     0.44     3.28     0.91
 HUB     44.09    10.89     6.50     4.39     0.93     0.44     3.87


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     470.420     305.786     357.477    1189.998       0.395       0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.698      21.275     588.579      46.000      40.544      31.500      -9.044

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     363.961     305.786     475.365    1197.471       0.304       0.381

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.656      22.186     595.995     471.992       0.027       0.465

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     354.209       0.000     354.209    1198.058       0.296       0.364

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.178     596.579       0.000       0.060       0.063       0.377

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      23.566       1.134     607.053      24.723     202.100       1.567

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 154059.328       0.500    1043.580 1143999.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =12.953   EfDer =  0.985

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    119.869    3210.000      23.566     607.053       1.000       1.000       0.980
W Kg/sec =   54.48574

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     80.888    2967.221       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92212.828   94056.891       2.179     513.330     235.591     401.059       1.702

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   333.45    -0.11   333.45     0.28   498.70
 MEAN    16.97     0.00    -0.02   333.45    -0.11   333.45     0.28
 HUB     14.32     0.00    -0.02   333.45    -0.11   333.45     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.29    46.36    11.93   539.52   634.35    22.33   597.77     0.53
 MEAN    54.96    43.80    11.16   475.39   580.77    22.33   597.77     0.48
 HUB     50.27    37.84    12.43   401.14   521.72    22.33   597.77     0.44

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   445.59   288.18   339.85  1216.28     0.37
 MEAN    16.57   447.47   286.40   343.82  1213.05     0.37
 HUB     13.89   476.68   325.49   348.25  1209.80     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   416.46   240.70     0.34  5443.05
 MEAN   464.28   387.11   177.88     0.32  4748.64     1.64
 HUB    389.09   354.01    63.60     0.29  4522.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     26.69     1.13    24.33   631.51     1.04   614.94     0.92     0.90
 MEAN    26.28     1.12    23.92   628.39     1.04   611.68     0.92     0.90
 HUB     26.14     1.11    23.49   627.38     1.03   608.41     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.30    35.31    31.50     3.81     0.93     0.42     2.90
 MEAN    39.79    27.36    23.50     3.86     0.94     0.41     3.29     0.90
 HUB     43.07    10.35     6.50     3.85     0.94     0.40     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     443.462     288.006     337.210    1214.036       0.365       0.043

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.347      24.025     612.682      46.000      40.500      32.400      -8.100

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     348.668     288.006     452.236    1220.229       0.286       0.387

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.316      24.864     618.948     456.573       0.023       0.469

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     332.359       0.000     332.359    1221.142       0.272       0.360

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.911     619.875       0.000       0.060       0.058       0.407

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      26.229       1.113     629.093      22.040     209.482       1.624

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 137413.828       0.491     930.826 1025599.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =12.953   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.869    3210.000      26.229     629.093       1.000       1.000       0.980
W Kg/sec =   54.48574

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     73.986    2914.779       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92212.828   94056.891       2.365     509.668     215.497     390.276       1.811

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   310.77    -0.11   310.77     0.25   465.98
 MEAN    15.91     0.00    -0.02   310.77    -0.11   310.77     0.25
 HUB     13.07     0.00    -0.02   310.77    -0.11   310.77     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.81    47.36    11.45   513.19   600.04    25.07   621.04     0.49
 MEAN    55.12    44.80    10.32   445.76   543.49    25.07   621.04     0.44
 HUB     49.68    38.84    10.84   366.12   480.31    25.07   621.04     0.39

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   420.97   275.87   317.97  1237.36     0.34
 MEAN    15.50   417.97   266.82   321.73  1234.01     0.34
 HUB     12.59   438.28   293.15   325.81  1230.64     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   390.50   226.67     0.32  4951.16
 MEAN   434.13   362.63   167.31     0.29  4136.73     1.66
 HUB    352.68   331.21    59.53     0.27  3692.13

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.28     1.12    27.02   651.33     1.04   636.55     0.92     0.91
 MEAN    28.76     1.10    26.56   647.67     1.03   633.10     0.92     0.91
 HUB     28.48     1.09    26.09   645.68     1.03   629.65     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.94    35.48    31.50     3.98     0.93     0.43     2.90
 MEAN    39.67    27.48    23.50     3.98     0.94     0.41     3.34     0.91
 HUB     41.98    10.35     6.50     3.85     0.94     0.38     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     423.180     271.710     324.431    1234.189       0.343      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.795      26.544     633.287      46.000      39.946      33.000      -6.946

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     339.458     271.710     434.808    1239.368       0.274       0.321

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.753      27.291     638.614     440.827       0.039       0.464

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     318.448       0.000     318.448    1240.487       0.257       0.390

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.433     639.767       0.000       0.060       0.053       0.383

    STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.866      28.721       1.095     648.226      19.133     223.976       1.736

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 119348.734       0.473     808.455 1062350.000

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     781456.25   5293.4951    117.0996      1.9011      0.8432     12.9533      1.2399


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 85% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.991   EfDer =  0.966

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     115.171    3210.000      15.107     522.810       1.000       1.000       0.980
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W Kg/sec = 52.35062

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
112.511	3197.358	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
88599.312	90371.109	2.538	831.557	327.656	619.754	1.891

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	262.87	-0.09	262.87	0.24	575.61
MEAN	17.06	0.00	-0.02	262.87	-0.09	262.87	0.24	
HUB	12.51	0.00	-0.02	262.87	-0.09	262.87	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	65.54	50.47	15.07	577.90	634.96	14.53	517.04	0.57
MEAN	61.19	47.20	13.99	477.90	545.50	14.53	517.04	0.49
HUB	53.13	38.62	14.51	350.44	438.14	14.53	517.04	0.39

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	521.31	390.88	344.94	1136.16	0.46
MEAN	18.04	531.27	398.03	351.87	1131.00	0.47
HUB	15.00	582.30	456.08	362.02	1124.32	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	577.90	392.38	187.02	0.35	8065.68	
MEAN	505.23	367.84	107.20	0.33	7180.46	1.69
HUB	420.19	363.80	35.89	0.32	6842.35	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.60	1.23	16.09	559.11	1.07	536.41	0.92	0.88
MEAN	18.19	1.20	15.63	555.12	1.06	531.55	0.92	0.88
HUB	18.03	1.19	15.02	553.60	1.06	525.28	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	48.57	28.47	24.20	4.27	0.93	0.49	2.90	
MEAN	48.52	16.94	12.70	4.24	0.95	0.43	3.51	0.88
HUB	51.56	-5.66	-9.30	3.64	0.95	0.29	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.966

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	536.314	397.259	360.303	1131.392	0.474	0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.245	15.640	531.918	24.000	47.793	35.400	-12.393

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	375.173	397.259	546.415	1144.364	0.328	0.473

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.158	16.854	544.186	528.796	0.042	0.595

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	349.682	0.000	349.682	1145.986	0.305	0.475

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.918	545.729	0.000	0.060	0.083	0.497

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.826      18.048       1.195     555.942      33.132     174.554       1.353

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 206278.094       0.618    1342.548 1105350.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =13.991   EfDer =  0.964

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.171    3210.000      18.048     555.942       1.000       1.000       0.980
W Kg/sec =   52.35062

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     97.116    3100.618       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88599.312   90371.109       2.088     590.487     282.829     474.134       1.676

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   334.32    -0.12   334.32     0.29   556.03
 MEAN    18.08     0.00    -0.02   334.32    -0.12   334.32     0.29
 HUB     15.21     0.00    -0.02   334.32    -0.12   334.32     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.86    46.36    13.50   575.66   665.80    17.01   546.61     0.58
 MEAN    56.57    42.30    14.27   506.42   606.91    17.01   546.61     0.53
 HUB     51.89    37.84    14.05   426.07   541.67    17.01   546.61     0.47

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   475.39   332.16   340.10  1168.66     0.41
 MEAN    18.01   475.34   326.72   345.26  1164.49     0.41
 HUB     15.22   504.97   362.93   351.11  1160.31     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   416.17   239.86     0.36  6785.03
 MEAN   504.50   388.34   177.78     0.33  5886.31     1.72
 HUB    426.43   356.81    63.51     0.31  5526.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.29     1.18    18.99   586.46     1.05   567.59     0.92     0.88
 MEAN    20.83     1.15    18.57   582.42     1.05   563.55     0.92     0.88
 HUB     20.66     1.14    18.13   580.80     1.04   559.51     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.32    35.19    31.50     3.69     0.93     0.46     2.90
 MEAN    43.42    27.25    23.50     3.75     0.95     0.44     3.30     0.88
 HUB     45.95    10.25     6.50     3.75     0.95     0.43     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.964

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     516.271     327.638     398.985    1161.818       0.444      -0.138

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.902      18.249     560.971      46.000      39.392      30.600      -8.792

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     399.206     327.638     516.442    1171.048       0.341       0.287

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.850      20.856      19.243     569.920     455.853       0.029       0.448

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     394.657       0.000     394.657    1171.358       0.337       0.406

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      19.208     570.221       0.000       0.060       0.062       0.272

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.840      20.780       1.151     583.227      27.285     191.826       1.487

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 169945.438       0.519    1106.079  992227.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =13.991   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.171    3210.000      20.780     583.227       1.000       1.000       0.880
W Kg/sec =   52.35062

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.393    3027.222       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88599.312   90371.109       1.947     489.817     251.613     384.470       1.528

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   369.84    -0.13   369.84     0.32   530.18
 MEAN    17.74     0.00    -0.02   369.84    -0.13   369.84     0.32
 HUB     15.05     0.00    -0.02   369.84    -0.13   369.84     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.67    46.36    10.31   562.21   673.06    19.39   571.81     0.57
 MEAN    53.35    43.40     9.95   496.90   619.53    19.39   571.81     0.53
 HUB     48.75    38.84     9.91   421.59   560.91    19.39   571.81     0.48

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   458.94   314.42   334.31  1195.12     0.38
 MEAN    17.51   460.35   311.68   338.79  1191.51     0.39
 HUB     14.85   490.60   350.05   343.73  1187.91     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   411.83   240.51     0.34  6231.27
 MEAN   490.40   383.04   178.73     0.32  5458.62     1.76
 HUB    415.99   349.99    65.93     0.29  5200.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.12     1.16    21.78   611.24     1.05   593.66     0.92     0.91
 MEAN    23.68     1.14    21.36   607.77     1.04   590.08     0.92     0.91
 HUB     23.54     1.13    20.93   606.61     1.04   586.52     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.24    35.73    31.50     4.23     0.93     0.47     2.90
 MEAN    42.61    27.81    23.50     4.31     0.94     0.46     3.28     0.91
 HUB     45.52    10.86     6.50     4.36     0.94     0.46     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     464.661     313.721     342.767    1191.948       0.390       0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.755      21.389     590.516      46.000      42.467      31.500     -10.967

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     348.472     313.721     468.885    1199.881       0.290       0.412

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.704      22.355     598.403     471.992       0.031       0.496

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     17.121     339.438       0.000     339.438    1200.401       0.283       0.386

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.323     598.921       0.000       0.060       0.074       0.399

    STAGE EXIT CONDITIONS, STAGE            3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.856      23.599       1.136     608.539      25.312     194.328       1.506

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 157731.719       0.512    1026.587 1092920.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =13.991   EfDer =  0.978

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.171    3210.000      23.599     608.539       1.000       1.000       0.980
W Kg/sec =   52.35062

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.705    2963.595       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88599.312   90371.109       2.268     513.330     226.320     401.059       1.772

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   319.69    -0.11   319.69     0.27   498.09
 MEAN    16.97     0.00    -0.02   319.69    -0.11   319.69     0.27
 HUB     14.32     0.00    -0.02   319.69    -0.11   319.69     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.36    46.36    13.00   539.52   627.22    22.46   600.01     0.52
 MEAN    56.09    43.80    12.29   475.39   572.98    22.46   600.01     0.48
 HUB     51.45    37.84    13.61   401.14   513.03    22.46   600.01     0.43

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   441.63   298.11   325.83  1218.85     0.36
 MEAN    16.57   441.55   293.68   329.73  1215.48     0.36
 HUB     13.89   468.26   328.10   334.09  1212.09     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   399.27   230.76     0.33  5630.47
 MEAN   464.28   371.25   170.60     0.31  4869.25     1.69
 HUB    389.09   339.61    60.99     0.28  4558.95

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.81     1.14    24.48   633.84     1.04   617.57     0.92     0.90
 MEAN    26.36     1.12    24.06   630.42     1.04   614.15     0.92     0.90
 HUB     26.18     1.11    23.61   629.03     1.03   610.73     0.92     0.90
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.46    35.31    31.50     3.81     0.93     0.44     2.90
 MEAN    41.69    27.36    23.50     3.86     0.94     0.43     3.29     0.90
 HUB     44.48    10.35     6.50     3.85     0.94     0.42     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     438.011     295.329     323.472    1216.404       0.360       0.041

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.425      24.158     615.085      46.000      42.396      32.400      -9.996

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     334.014     295.329     445.853    1223.011       0.273       0.417

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.386      25.052     621.785     456.573       0.026       0.499

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     318.676       0.000     318.676    1223.832       0.260       0.382

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.073     622.621       0.000       0.060       0.068       0.426

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.846      26.285       1.114     631.095      22.556     201.587       1.563

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 140628.625       0.503     915.273  980471.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.991   EfDer =  0.984

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    115.171    3210.000      26.285     631.095       1.000       1.000       0.980
W Kg/sec =   52.35062

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     71.046    2910.153       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  88599.312   90371.109       2.463     509.668     206.938     390.276       1.886

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   298.10    -0.10   298.10     0.24   465.24
 MEAN    15.91     0.00    -0.02   298.10    -0.10   298.10     0.24
 HUB     13.07     0.00    -0.02   298.10    -0.10   298.10     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.85    47.36    12.49   513.19   593.58    25.22   623.68     0.48
 MEAN    56.23    44.80    11.43   445.76   536.34    25.22   623.68     0.44
 HUB     50.86    38.84    12.02   366.12   472.21    25.22   623.68     0.39

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   417.54   285.17   304.99  1240.25     0.34
 MEAN    15.50   412.51   273.67   308.66  1236.77     0.33
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 HUB     12.59   430.26   295.59   312.65  1233.28     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   374.53   217.38     0.30  5117.74
 MEAN   434.13   347.87   160.46     0.28  4242.85     1.71
 HUB    352.68   317.82    57.09     0.26  3722.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.42     1.12    27.20   654.08     1.04   639.54     0.92     0.90
 MEAN    28.87     1.10    26.72   650.15     1.03   635.96     0.92     0.90
 HUB     28.54     1.09    26.23   647.81     1.03   632.37     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.08    35.48    31.50     3.98     0.93     0.45     2.90
 MEAN    41.56    27.47    23.50     3.97     0.94     0.43     3.34     0.90
 HUB     43.39    10.35     6.50     3.85     0.94     0.40     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     417.792     278.687     311.262    1236.931       0.338      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.897      26.701     636.122      46.000      41.840      33.000      -8.840

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     325.338     278.687     428.382    1242.491       0.262       0.351

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.842      27.498     641.852     440.827       0.045       0.494

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     305.395       0.000     305.395    1243.506       0.246       0.413

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.619     642.902       0.000       0.060       0.062       0.405

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.856      28.804       1.096     650.681      19.586     215.536       1.671

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 122182.508       0.484     795.217 1015588.438

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    796766.38   5185.7056    112.5109      1.9067      0.8311     13.9913      1.2446


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 85% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =15.004   EfDer =  0.958

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    110.644    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   50.29289
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
108.088	3197.358	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85116.758	86818.906	2.642	831.557	314.777	619.754	1.969

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	251.97	-0.09	251.97	0.23	575.61
MEAN	17.06	0.00	-0.02	251.97	-0.09	251.97	0.23	
HUB	12.51	0.00	-0.02	251.97	-0.09	251.97	0.23	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	66.45	50.47	15.98	577.90	630.52	14.58	517.51	0.57
MEAN	62.20	47.20	15.00	477.90	540.33	14.58	517.51	0.48
HUB	54.29	38.62	15.67	350.44	431.69	14.58	517.51	0.39

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	517.64	398.35	330.55	1137.23	0.46
MEAN	18.04	524.87	402.22	337.21	1131.96	0.46
HUB	15.00	571.52	454.31	346.75	1125.30	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	577.90	376.17	179.55	0.33	8219.77	
MEAN	505.23	352.59	103.01	0.31	7255.95	1.76
HUB	420.19	348.43	34.13	0.31	6815.80	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.64	1.23	16.16	559.80	1.07	537.42	0.92	0.88
MEAN	18.19	1.20	15.70	555.46	1.06	532.45	0.92	0.88
HUB	18.00	1.19	15.09	553.48	1.06	526.20	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	50.31	28.51	24.20	4.31	0.93	0.51	2.90	
MEAN	50.02	16.99	12.70	4.29	0.95	0.46	3.51	0.88
HUB	52.65	-5.62	-9.30	3.68	0.95	0.31	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.958

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	529.487	401.440	345.257	1132.362	0.468	0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.249	15.707	532.831	24.000	49.303	35.400	-13.903

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	359.110	401.440	538.622	1145.720	0.313	0.497

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.153	16.956	545.476	528.796	0.047	0.620

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	335.173	0.000	335.173	1147.176	0.292	0.489

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.992	546.864	0.000	0.060	0.093	0.511

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.814	18.030	1.194	556.247	33.437	169.728	1.316

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
208174.281	0.623	1301.633	1059510.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =15.004 EfDer = 0.955

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
110.644	3210.000	18.030	556.247	1.000	1.000	0.980

W Kg/sec = 50.29289

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
93.415	3099.769	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85116.758	86818.906	2.170	590.487	272.053	474.134	1.743

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	320.56	-0.11	320.56	0.28	555.87
MEAN	18.08	0.00	-0.02	320.56	-0.11	320.56	0.28	
HUB	15.21	0.00	-0.02	320.56	-0.11	320.56	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.89	46.36	14.53	575.66	658.99	17.08	547.67	0.57
MEAN	57.67	42.30	15.37	506.42	599.44	17.08	547.67	0.52
HUB	53.05	37.84	15.21	426.07	533.28	17.08	547.67	0.46

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	472.46	341.63	326.35	1170.10	0.40
MEAN	18.01	470.25	333.68	331.35	1165.80	0.40
HUB	15.22	497.04	365.31	337.04	1161.48	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	572.02	399.48	230.38	0.34	6978.39	
MEAN	504.50	372.79	170.82	0.32	6011.60	1.77
HUB	426.43	342.54	61.12	0.29	5562.82	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.33	1.18	19.06	587.64	1.06	569.00	0.92	0.87
MEAN	20.85	1.16	18.63	583.29	1.05	564.82	0.92	0.87
HUB	20.63	1.14	18.18	581.27	1.04	560.64	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	46.31	35.22	31.50	3.72	0.93	0.48	2.90	
MEAN	45.20	27.27	23.50	3.77	0.95	0.46	3.30	0.87
HUB	47.30	10.28	6.50	3.78	0.95	0.45	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.955

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	508.176	334.619	382.457	1163.398	0.437	-0.128

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.911	18.339	562.500	46.000	41.183	30.600	-10.583

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	382.174	334.619	507.964	1173.045	0.326	0.325

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	20.856	19.376	571.868	455.853	0.034	0.476

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	378.111	0.000	378.111	1173.310	0.322	0.427

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	19.325	572.126	0.000	0.060	0.072	0.303

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.827	20.768	1.152	584.064	27.817	185.137	1.435

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
173258.922	0.530	1083.321	949564.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =15.004 EfDer = 0.986

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
110.644	3210.000	20.768	584.064	1.000	1.000	0.880

W Kg/sec = 50.29289

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
83.104	3025.053	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85116.758	86818.906	2.024	489.817	242.034	384.470	1.588

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	354.56	-0.12	354.56	0.30	529.80
MEAN	17.74	0.00	-0.02	354.56	-0.12	354.56	0.30	
HUB	15.05	0.00	-0.02	354.56	-0.12	354.56	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.77	46.36	11.41	562.21	664.78	19.49	573.57	0.57
MEAN	54.50	43.40	11.10	496.90	610.53	19.49	573.57	0.52
HUB	49.94	38.84	11.10	421.59	550.96	19.49	573.57	0.47

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	456.14	324.28	320.79	1197.05	0.38
MEAN	17.51	455.52	318.98	325.19	1193.30	0.38
HUB	14.85	483.10	352.79	330.05	1189.55	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	395.10	230.65	0.33	6426.44	
MEAN	490.40	367.60	171.42	0.31	5586.47	1.82
HUB	415.99	336.04	63.20	0.28	5240.74	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.19	1.16	21.88	612.96	1.05	595.59	0.92	0.90
MEAN	23.72	1.14	21.45	609.18	1.04	591.86	0.92	0.90
HUB	23.53	1.13	21.00	607.63	1.04	588.14	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.31	35.72	31.50	4.22	0.93	0.49	2.90	
MEAN	44.45	27.80	23.50	4.30	0.94	0.48	3.28	0.90
HUB	46.91	10.84	6.50	4.34	0.94	0.47	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.986

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	459.724	321.076	329.023	1193.718	0.385	0.010

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.786      21.470     592.279      46.000      44.300      31.500     -12.800

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     334.053     321.076     463.337    1202.080       0.278       0.441

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.726      22.485     600.605     471.992       0.035       0.526

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     325.677       0.000     325.677    1202.542       0.271       0.406

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.432     601.067       0.000       0.060       0.086       0.418

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.845      23.606       1.137     609.920      25.857     187.258       1.452

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 161126.625       0.523    1007.462 1044573.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =15.004   EfDer =  0.971

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    110.644    3210.000      23.606     609.920       1.000       1.000       0.980
W Kg/sec =   50.29289

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     74.713    2960.238       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85116.758   86818.906       2.359     513.330     217.608     401.059       1.843

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   306.86    -0.11   306.86     0.25   497.53
 MEAN    16.97     0.00    -0.02   306.86    -0.11   306.86     0.25
 HUB     14.32     0.00    -0.02   306.86    -0.11   306.86     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.38    46.36    14.02   539.52   620.77    22.56   602.06     0.52
 MEAN    57.16    43.80    13.36   475.39   565.91    22.56   602.06     0.47
 HUB     52.59    37.84    14.75   401.14   505.13    22.56   602.06     0.42

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   438.47   307.23   312.83  1221.20     0.36
 MEAN    16.57   436.45   300.38   316.64  1217.70     0.36
 HUB     13.89   460.63   330.45   320.90  1214.18     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   383.39   221.64     0.31  5802.61
 MEAN   464.28   356.54   163.90     0.29  4980.26     1.75
 HUB    389.09   326.21    58.64     0.27  4591.53

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.89     1.14    24.59   635.99     1.04   619.95     0.92     0.89
 MEAN    26.40     1.12    24.16   632.30     1.04   616.40     0.92     0.89
 HUB     26.18     1.11    23.70   630.55     1.03   612.85     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     44.48    35.32    31.50     3.82     0.93     0.47     2.90
 MEAN    43.49    27.37    23.50     3.87     0.94     0.45     3.29     0.89
 HUB     45.84    10.36     6.50     3.86     0.94     0.44     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     433.338     302.070     310.702    1218.560       0.356       0.039

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.466      24.249     617.280      46.000      44.193      32.400     -11.793

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     320.442     302.070     440.374    1225.549       0.261       0.445

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.419      25.191     624.380     456.573       0.030       0.528

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     305.993       0.000     305.993    1226.290       0.250       0.401

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.188     625.136       0.000       0.060       0.079       0.443

    STAGE EXIT CONDITIONS, STAGE             4
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.834       26.304       1.114     632.949      23.028     194.448       1.507

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 143577.125       0.513     897.732  937665.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =15.004   EfDer =  0.977

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    110.644     3210.000       26.304     632.949       1.000        1.000        0.980
W Kg/sec =   50.29289

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     68.305     2905.889        1.401       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  85116.758   86818.906        2.562     509.668     198.956     390.276        1.962

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   286.34    -0.10   286.34     0.23   464.56
 MEAN    15.91      0.00    -0.02   286.34    -0.10   286.34     0.23
 HUB     13.07      0.00    -0.02   286.34    -0.10   286.34     0.23

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     60.84     47.36    13.48   513.19   587.75     25.32   626.11     0.48
 MEAN    57.29     44.80    12.49   445.76   529.89     25.32   626.11     0.43
 HUB     51.98     38.84    13.14   366.12   464.88     25.32   626.11     0.38

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     17.94   414.86   293.69   293.00  1242.87      0.33
 MEAN    15.50   407.81   279.92   296.57  1239.29      0.33
 HUB     12.59   423.04   297.80   300.46  1235.69      0.34
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   359.82   208.85     0.29  5270.63
 MEAN   434.13   334.27   154.21     0.27  4339.59     1.76
 HUB    352.68   305.43    54.87     0.25  3750.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     29.51     1.12    27.31   656.62     1.04   642.26     0.92     0.89
 MEAN    28.92     1.10    26.83   652.44     1.03   638.57     0.92     0.89
 HUB     28.56     1.09    26.33   649.79     1.03   634.87     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.07    35.48    31.50     3.98     0.93     0.47     2.90
 MEAN    43.35    27.47    23.50     3.97     0.94     0.45     3.34     0.89
 HUB     44.75    10.35     6.50     3.85     0.94     0.42     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     413.164     285.048     299.086    1239.430       0.333      -0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.950      26.805     638.712      46.000      43.623      33.000     -10.623

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     312.333     285.048     422.852    1245.336       0.251       0.378

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.882      27.644     644.813     440.827       0.052       0.523

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     293.363       0.000     293.363    1246.261       0.235       0.433

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.745     645.771       0.000       0.060       0.072       0.425

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.844      28.837       1.096     652.950      20.001     207.943       1.612

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  124773.359       0.494     780.159  971236.562

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    810910.31   5070.3081    108.0884      1.9089      0.8182     15.0041      1.2489


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 85% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =15.988   EfDer =  0.950

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    106.295    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   48.31603

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.840    3197.358       1.402       0.249      53.349      32.000       0.050
```

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
81771.078	83406.328	2.750	831.557	302.404	619.754	2.049

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	241.57	-0.08	241.57	0.22	575.61
MEAN	17.06	0.00	-0.02	241.57	-0.08	241.57	0.22	
HUB	12.51	0.00	-0.02	241.57	-0.08	241.57	0.22	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	67.32	50.47	16.85	577.90	626.43	14.62	517.94	0.56
MEAN	63.19	47.20	15.99	477.90	535.56	14.62	517.94	0.48
HUB	55.43	38.62	16.81	350.44	425.70	14.62	517.94	0.38

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	514.54	405.33	316.95	1138.20	0.45
MEAN	18.04	519.09	406.10	323.32	1132.83	0.46
HUB	15.00	561.48	452.60	332.29	1126.19	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	577.90	360.88	172.57	0.32	8363.64	
MEAN	505.23	338.17	99.13	0.30	7325.90	1.82
HUB	420.19	333.86	32.41	0.30	6789.98	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.67	1.24	16.22	560.45	1.07	538.33	0.92	0.87
MEAN	18.20	1.20	15.75	555.78	1.06	533.27	0.92	0.87
HUB	17.96	1.19	15.15	553.36	1.06	527.03	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	51.98	28.57	24.20	4.37	0.93	0.54	2.90	
MEAN	51.48	17.05	12.70	4.35	0.95	0.48	3.51	0.87
HUB	53.71	-5.57	-9.30	3.73	0.95	0.34	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.950

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	523.304	405.314	331.011	1133.239	0.462	0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.248	15.763	533.656	24.000	50.762	35.400	-15.362

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	343.944	405.314	531.580	1146.950	0.300	0.521

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.143	17.044	546.648	528.796	0.051	0.644

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	321.426	0.000	321.426	1148.262	0.280	0.503

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.054	547.900	0.000	0.060	0.103	0.525

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.801	18.009	1.192	556.529	33.719	165.144	1.280

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
209929.859	0.629	1261.016	1015769.750

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =15.988   EfDer =  0.946

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    106.295    3210.000      18.009     556.529       1.000       1.000       0.980
W Kg/sec =   48.31603

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     89.870    3098.984       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 81771.078   83406.328       2.256     590.487     261.730     474.134       1.812

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   307.51    -0.11   307.51     0.27   555.73
MEAN    18.08     0.00    -0.02   307.51    -0.11   307.51     0.27
HUB     15.21     0.00    -0.02   307.51    -0.11   307.51     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.89    46.36    15.53   575.66   652.74    17.13   548.63     0.57
MEAN    58.74    42.30    16.44   506.42   592.56    17.13   548.63     0.52
HUB     54.19    37.84    16.35   426.07   525.54    17.13   548.63     0.46

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   470.14   350.45   313.40  1171.40     0.40
MEAN    18.01   465.81   340.17   318.22  1166.99     0.40
HUB     15.22   489.73   367.48   323.72  1162.54     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    572.02   383.81   221.57     0.33  7158.28
MEAN   504.50   358.15   164.34     0.31  6128.28     1.83
HUB    426.43   329.05    58.96     0.28  5595.75

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.36     1.19    19.11   588.73     1.06   570.27     0.92     0.87
MEAN    20.85     1.16    18.68   584.09     1.05   565.98     0.92     0.87
HUB     20.59     1.14    18.22   581.70     1.05   561.67     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     48.19    35.26    31.50     3.76     0.93     0.50     2.90
MEAN    46.91    27.31    23.50     3.81     0.95     0.48     3.30     0.87
HUB     48.62    10.32     6.50     3.82     0.95     0.46     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.946

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     500.990     341.120     366.916    1164.823       0.430      -0.119

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.909      18.410     563.882      46.000      42.913      30.600     -12.313

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     366.219     341.120     500.479    1174.860       0.312       0.361

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      20.845      19.486     573.641     455.853       0.038       0.504

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     362.608       0.000     362.608    1175.084       0.309       0.446
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	19.417	573.861	0.000	0.060	0.083	0.330

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.813	20.745	1.152	584.840	28.311	178.951	1.387

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
176336.609	0.539	1059.226	909051.938

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =15.988 EfDer = 0.979

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
106.295	3210.000	20.745	584.840	1.000	1.000	0.880

W Kg/sec = 48.31603

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
79.981	3023.045	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
81771.078	83406.328	2.103	489.817	232.940	384.470	1.651

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	340.22	-0.12	340.22	0.29	529.45
MEAN	17.74	0.00	-0.02	340.22	-0.12	340.22	0.29	
HUB	15.05	0.00	-0.02	340.22	-0.12	340.22	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.83	46.36	12.47	562.21	657.24	19.57	575.18	0.56
MEAN	55.61	43.40	12.21	496.90	602.31	19.57	575.18	0.51
HUB	51.10	38.84	12.26	421.59	541.83	19.57	575.18	0.46

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	454.01	333.42	308.16	1198.80	0.38
MEAN	17.51	451.37	325.75	312.45	1194.92	0.38
HUB	14.85	476.28	355.29	317.20	1191.04	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	379.51	221.51	0.32	6607.39	
MEAN	490.40	353.18	164.66	0.30	5704.80	1.87
HUB	415.99	322.95	60.70	0.27	5277.78	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.23	1.17	21.94	614.55	1.05	597.34	0.92	0.90
MEAN	23.73	1.14	21.50	610.49	1.04	593.48	0.92	0.90
HUB	23.50	1.13	21.04	608.57	1.04	589.63	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	47.25	35.71	31.50	4.21	0.93	0.51	2.90	
MEAN	46.19	27.79	23.50	4.29	0.94	0.50	3.28	0.90
HUB	48.24	10.83	6.50	4.33	0.94	0.49	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.979

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	455.478	327.885	316.151	1195.328	0.381	0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.796	21.525	593.883	46.000	46.044	31.500	-14.544

```
    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     320.589     327.885     458.569    1204.089       0.266       0.468

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.726      22.584     602.622     471.992       0.040       0.555

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     312.809       0.000     312.809    1204.500       0.260       0.424

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.510     603.033       0.000       0.060       0.098       0.437

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.833      23.592       1.137     611.201      26.361     180.794       1.402

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 164267.656       0.533     986.730  998862.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =15.988   EfDer =  0.963

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    106.295    3210.000      23.592     611.201       1.000       1.000       0.980
W Kg/sec =   48.31603

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     71.895    2957.136       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  81771.078   83406.328       2.451     513.330     209.400     401.059       1.915

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   294.83    -0.10   294.83     0.24   497.01
 MEAN    16.97     0.00    -0.02   294.83    -0.10   294.83     0.24
 HUB     14.32     0.00    -0.02   294.83    -0.10   294.83     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.35    46.36    14.99   539.52   614.91    22.63   603.95     0.51
 MEAN    58.20    43.80    14.40   475.39   559.48    22.63   603.95     0.46
 HUB     53.69    37.84    15.85   401.14   497.92    22.63   603.95     0.41

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   435.98   315.66   300.72  1223.33     0.36
 MEAN    16.57   432.04   306.57   304.42  1219.72     0.35
 HUB     13.89   453.68   332.58   308.57  1216.09     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   368.64   213.21     0.30  5961.66
 MEAN   464.28   342.84   157.70     0.28  5082.86     1.80
 HUB    389.09   313.70    56.51     0.26  4621.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.93     1.14    24.66   637.99     1.04   622.13     0.92     0.88
 MEAN    26.42     1.12    24.22   634.04     1.04   618.47     0.92     0.88
 HUB     26.15     1.11    23.75   631.96     1.03   614.79     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.39    35.34    31.50     3.84     0.93     0.49     2.90
 MEAN    45.20    27.39    23.50     3.89     0.95     0.47     3.29     0.88
 HUB     47.15    10.38     6.50     3.88     0.95     0.45     3.90
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.963

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     429.320     308.299     298.776    1220.527       0.352       0.036

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.477      24.304     619.285      46.000      45.899      32.400     -13.499

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     307.804     308.299     435.651    1227.869       0.251       0.471

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.422      25.291     626.759     456.573       0.034       0.556

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     294.168       0.000     294.168    1228.540       0.239       0.419

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.263     627.444       0.000       0.060       0.091       0.459

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.821      26.293       1.114     634.664      23.464     187.938       1.457

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 146295.844       0.523     878.776  897111.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =15.988   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    106.295    3210.000      26.293     634.664       1.000       1.000       0.980
W Kg/sec =   48.31603

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     65.737    2901.958       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  81771.078   83406.328       2.662     509.668     191.476     390.276       2.038

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   275.36    -0.09   275.36     0.22   463.93
 MEAN    15.91     0.00    -0.02   275.36    -0.09   275.36     0.22
 HUB     13.07     0.00    -0.02   275.36    -0.09   275.36     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.79    47.36    14.43   513.19   582.48    25.39   628.34     0.47
 MEAN    58.30    44.80    13.50   445.76   524.04    25.39   628.34     0.43
 HUB     53.06    38.84    14.22   366.12   458.19    25.39   628.34     0.37

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   412.76   301.52   281.87  1245.26     0.33
 MEAN    15.50   403.76   285.69   285.32  1241.59     0.33
 HUB     12.59   416.49   299.82   289.09  1237.90     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   346.21   201.02     0.28  5411.05
 MEAN   434.13   321.63   148.44     0.26  4428.95     1.82
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  HUB    352.68   293.88    52.86     0.24  3776.01

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     29.55     1.12    27.38   658.96     1.04   644.76     0.92     0.89
  MEAN    28.94     1.10    26.89   654.55     1.03   640.96     0.92     0.89
  HUB     28.54     1.09    26.38   651.62     1.03   637.15     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     46.93    35.50    31.50     4.00     0.93     0.49     2.90
  MEAN    45.04    27.49    23.50     3.99     0.94     0.47     3.34     0.89
  HUB     46.04    10.36     6.50     3.86     0.94     0.44     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.970

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     409.194     290.924     287.755    1241.711       0.330      -0.013

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      28.965      26.865     641.082      46.000      45.314      33.000     -12.314

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     300.264     290.924     418.085    1247.938       0.241       0.403

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      28.883      27.742     647.527     440.827       0.058       0.550

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     282.186       0.000     282.186    1248.784       0.226       0.452

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      27.823     648.406       0.000       0.060       0.083       0.442

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.833      28.831       1.097     655.047      20.382     201.046       1.558

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  127155.938       0.503     763.806  929215.062

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     823985.94   4949.5532     103.8398      1.9085      0.8049     15.9884      1.2529


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 85% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =16.470   EfDer =  0.945

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     104.185    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   47.35693

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     101.779    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   80147.875   81750.664       2.806     831.557     296.401     619.754       2.091
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ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	236.54	-0.08	236.54	0.21	575.61
MEAN	17.06	0.00	-0.02	236.54	-0.08	236.54	0.21	
HUB	12.51	0.00	-0.02	236.54	-0.08	236.54	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	67.74	50.47	17.27	577.90	624.51	14.64	518.14	0.56
MEAN	63.67	47.20	16.47	477.90	533.31	14.64	518.14	0.48
HUB	55.99	38.62	17.37	350.44	422.87	14.64	518.14	0.38

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	513.18	408.64	310.42	1138.65	0.45
MEAN	18.04	516.41	407.94	316.64	1133.24	0.46
HUB	15.00	556.69	451.73	325.34	1126.61	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	577.90	353.57	169.26	0.31	8431.92	
MEAN	505.23	331.25	97.29	0.29	7359.09	1.85
HUB	420.19	326.86	31.54	0.29	6776.97	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.68	1.24	16.25	560.75	1.07	538.76	0.92	0.87
MEAN	18.20	1.20	15.78	555.93	1.06	533.65	0.92	0.87
HUB	17.94	1.19	15.18	553.31	1.06	527.42	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	52.78	28.60	24.20	4.40	0.93	0.55	2.90	
MEAN	52.18	17.08	12.70	4.38	0.95	0.49	3.51	0.87
HUB	54.24	-5.54	-9.30	3.76	0.95	0.35	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.945

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	520.442	407.152	324.171	1133.645	0.459	0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.246	15.788	534.039	24.000	51.474	35.400	-16.074

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	336.675	407.152	528.321	1147.523	0.293	0.532

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.137	17.084	547.194	528.796	0.053	0.656

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	314.818	0.000	314.818	1148.769	0.274	0.510

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.082	548.384	0.000	0.060	0.108	0.531

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.795	17.998	1.191	556.662	33.852	162.937	1.263

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
210755.969	0.631	1240.848	994647.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =16.470 EfDer = 0.941

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
104.185	3210.000	17.998	556.662	1.000	1.000	0.980

W Kg/sec = 47.35693

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
88.153	3098.614	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
80147.875	81750.664	2.300	590.487	256.730	474.134	1.847

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	301.24	-0.10	301.24	0.26	555.67
MEAN	18.08	0.00	-0.02	301.24	-0.10	301.24	0.26	
HUB	15.21	0.00	-0.02	301.24	-0.10	301.24	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.38	46.36	16.02	575.66	649.80	17.16	549.08	0.57
MEAN	59.26	42.30	16.96	506.42	589.33	17.16	549.08	0.51
HUB	54.75	37.84	16.91	426.07	521.89	17.16	549.08	0.45

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	469.20	354.64	307.21	1172.01	0.40
MEAN	18.01	463.82	343.26	311.93	1167.54	0.40
HUB	15.22	486.31	368.52	317.33	1163.04	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	572.02	376.33	217.38	0.32	7243.88	
MEAN	504.50	351.14	161.24	0.30	6183.98	1.86
HUB	426.43	322.57	57.92	0.28	5611.49	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.36	1.19	19.13	589.24	1.06	570.86	0.92	0.86
MEAN	20.85	1.16	18.70	584.48	1.05	566.51	0.92	0.86
HUB	20.57	1.14	18.24	581.90	1.05	562.15	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	49.10	35.28	31.50	3.78	0.93	0.51	2.90	
MEAN	47.74	27.34	23.50	3.84	0.95	0.49	3.30	0.86
HUB	49.27	10.34	6.50	3.84	0.95	0.47	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.941

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	497.718	344.224	359.490	1165.484	0.427	-0.115

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.904	18.438	564.523	46.000	43.757	30.600	-13.157

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	358.608	344.224	497.081	1175.707	0.305	0.378

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	20.836	19.533	574.470	455.853	0.040	0.518

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	355.209	0.000	355.209	1175.914	0.302	0.454

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	19.456	574.673	0.000	0.060	0.088	0.344

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    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.806      20.729       1.152     585.208      28.546     176.018       1.364

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 177802.859       0.543    1046.833  889554.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =16.470   EfDer =  0.975

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    104.185    3210.000      20.729     585.208       1.000       1.000       0.880
W Kg/sec =   47.35693

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     78.478    3022.094       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  80147.875   81750.664       2.143     489.817     228.562     384.470       1.682

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   333.36    -0.11   333.36     0.28   529.29
 MEAN    17.74     0.00    -0.02   333.36    -0.11   333.36     0.28
 HUB     15.05     0.00    -0.02   333.36    -0.11   333.36     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.34    46.36    12.98   562.21   653.71    19.60   575.93     0.56
 MEAN    56.15    43.40    12.75   496.90   598.46    19.60   575.93     0.51
 HUB     51.67    38.84    12.83   421.59   537.55    19.60   575.93     0.46

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   453.15   337.72   302.14  1199.62     0.38
 MEAN    17.51   449.51   328.94   306.37  1195.68     0.38
 HUB     14.85   473.10   356.47   311.05  1191.75     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   372.11   217.21     0.31  6692.50
 MEAN   490.40   346.31   161.46     0.29  5760.63     1.89
 HUB    415.99   316.70    59.52     0.27  5295.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.24     1.17    21.97   615.30     1.05   598.16     0.92     0.89
 MEAN    23.73     1.14    21.52   611.11     1.04   594.24     0.92     0.89
 HUB     23.48     1.13    21.06   609.01     1.04   590.33     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.18    35.71    31.50     4.21     0.93     0.52     2.90
 MEAN    47.04    27.79    23.50     4.29     0.94     0.50     3.28     0.89
 HUB     48.89    10.83     6.50     4.33     0.94     0.50     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.975

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     453.575     331.098     310.007    1196.079       0.379       0.009

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.793      21.543     594.634      46.000      46.884      31.500     -15.384

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     17.392     314.175     331.098     456.434    1205.030       0.261       0.482

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.719      22.623     603.567     471.992       0.042       0.569

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     306.670       0.000     306.670    1205.418       0.254       0.433

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.539     603.956       0.000       0.060       0.103       0.445

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.827      23.578       1.137     611.806      26.598     177.764       1.378

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 165746.812       0.538     975.851  976923.812


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =16.470   EfDer =  0.959

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    104.185    3210.000      23.578     611.806       1.000       1.000       0.980
W Kg/sec =   47.35693

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     70.543    2955.673       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  80147.875   81750.664       2.498     513.330     205.465     401.059       1.952

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   289.09    -0.10   289.09     0.24   496.76
 MEAN    16.97     0.00    -0.02   289.09    -0.10   289.09     0.24
 HUB     14.32     0.00    -0.02   289.09    -0.10   289.09     0.24

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.82    46.36    15.46   539.52   612.18    22.65   604.83     0.51
 MEAN    58.70    43.80    14.90   475.39   556.48    22.65   604.83     0.46
 HUB     54.23    37.84    16.39   401.14   494.54    22.65   604.83     0.41

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   434.93   319.64   294.96  1224.32     0.36
 MEAN    16.57   430.06   309.50   298.60  1220.67     0.35
 HUB     13.89   450.44   333.59   302.68  1216.99     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   361.64   209.24     0.30  6036.64
 MEAN   464.28   336.33   154.77     0.28  5131.33     1.83
 HUB    389.09   307.73    55.50     0.25  4635.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.94     1.14    24.69   638.93     1.04   623.15     0.92     0.88
 MEAN    26.42     1.12    24.24   634.86     1.04   619.43     0.92     0.88
 HUB     26.13     1.11    23.77   632.63     1.03   615.70     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.30    35.35    31.50     3.85     0.93     0.50     2.90
 MEAN    46.03    27.40    23.50     3.90     0.95     0.48     3.29     0.88
 HUB     47.78    10.39     6.50     3.89     0.95     0.46     3.90


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.959

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     427.522     311.242     293.093    1221.447       0.350       0.035

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.473      24.320     620.225      46.000      46.720      32.400     -14.320

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     301.792     311.242     433.532    1228.958       0.246       0.484

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.414      25.327     627.876     456.573       0.036       0.570

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     288.535       0.000     288.535    1229.596       0.235       0.428

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.289     628.529       0.000       0.060       0.096       0.467

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.815      26.278       1.114     635.475      23.669     184.885       1.433

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 147579.766       0.528     868.891  877620.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =16.470   EfDer =  0.966

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    104.185    3210.000      26.278     635.475       1.000       1.000       0.980
W Kg/sec =   47.35693

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     64.509    2900.105       1.401       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
  80147.875   81750.664       2.712     509.668     187.901     390.276       2.077

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   270.13    -0.09   270.13     0.22   463.63
 MEAN    15.91     0.00    -0.02   270.13    -0.09   270.13     0.22
 HUB     13.07     0.00    -0.02   270.13    -0.09   270.13     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.24    47.36    14.88   513.19   580.02    25.41   629.39     0.47
 MEAN    58.79    44.80    13.99   445.76   521.30    25.41   629.39     0.42
 HUB     53.59    38.84    14.75   366.12   455.07    25.41   629.39     0.37

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   411.88   305.21   276.58  1246.38     0.33
 MEAN    15.50   401.94   288.40   279.97  1242.67     0.32
 HUB     12.59   413.43   300.75   283.67  1238.94     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   339.76   197.34     0.27  5477.12
 MEAN   434.13   315.63   145.73     0.25  4470.96     1.84
 HUB    352.68   288.39    51.93     0.23  3787.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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```
  TIP     29.56     1.12    27.40   660.07     1.04   645.92     0.92     0.88
  MEAN    28.93     1.10    26.91   655.55     1.03   642.08     0.92     0.88
  HUB     28.52     1.09    26.40   652.49     1.03   638.23     0.92     0.88

          Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     47.82    35.51    31.50     4.01     0.93     0.50     2.90
  MEAN    45.85    27.50    23.50     4.00     0.95     0.48     3.34     0.88
  HUB     46.67    10.37     6.50     3.87     0.95     0.45     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.966

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     407.408     293.686     282.363    1242.780       0.328      -0.013

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      28.959      26.881     642.194      46.000      46.126      33.000     -13.126

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     294.531     293.686     415.933    1249.157       0.236       0.415

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      28.872      27.775     648.802     440.827       0.062       0.564

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     276.872       0.000     276.872    1249.967       0.222       0.461

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      27.848     649.644       0.000       0.060       0.088       0.450

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.827      28.817       1.097     656.037      20.561     197.823       1.534

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  128274.406       0.508     755.229  909017.312

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     830159.75   4887.6514    101.7785      1.9075      0.7983     16.4700      1.2548


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 85% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.018   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     157.939    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   71.79063

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     154.291    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  121499.984  123929.727       1.851     831.557     449.329     619.754       1.379

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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```
TIP     20.63     0.00    -0.02   370.56    -0.13   370.56     0.33   575.61
MEAN    17.06     0.00    -0.02   370.56    -0.13   370.56     0.33
HUB     12.51     0.00    -0.02   370.56    -0.13   370.56     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.34    50.47     6.87   577.90   686.61    13.98   511.34     0.62
MEAN    52.22    47.20     5.02   477.90   604.83    13.98   511.34     0.55
HUB     43.41    38.62     4.79   350.44   510.11    13.98   511.34     0.46

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   586.46   307.77   499.21  1121.58     0.52
MEAN    18.04   616.35   351.17   506.53  1118.29     0.55
HUB     15.00   704.83   472.39   523.09  1111.48     0.63

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    577.90   567.60   270.13     0.51  6352.00
MEAN   505.23   529.44   154.07     0.47  6335.80     1.27
HUB    420.19   525.69    52.21     0.47  7087.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.90     1.19    14.85   551.39     1.05   522.67     0.92     0.91
MEAN    17.89     1.18    14.55   551.32     1.05   519.60     0.92     0.91
HUB     18.25     1.21    13.92   554.70     1.06   513.22     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.65    28.42    24.20     4.22     0.93     0.25     2.90
MEAN    34.73    16.92    12.70     4.22     0.92     0.21     3.51     0.91
HUB     42.08    -5.70    -9.30     3.60     0.92     0.08     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     627.045     350.483     519.949    1118.250       0.561      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.979      14.519     519.633      24.000      33.983      35.400       1.417

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     551.935     350.483     653.812    1126.180       0.490       0.217

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.935      15.215     527.029     528.796       0.022       0.378

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     506.867       0.000     506.867    1130.430       0.448       0.295

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.574     531.014       0.000       0.060       0.037       0.317

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.873      17.881       1.184     552.473      29.663     225.175       1.746

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 184676.047       0.553    1648.289 1558176.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.018   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    157.939    3210.000      17.881     552.473       1.000       1.000       0.980
```

W Kg/sec = 71.79063

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
133.999	3110.339	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
121499.984	123929.727	1.513	590.487	390.242	474.134	1.215

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	481.87	-0.17	481.87	0.43	557.77
MEAN	18.08	0.00	-0.02	481.87	-0.17	481.87	0.43	
HUB	15.21	0.00	-0.02	481.87	-0.17	481.87	0.43	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.08	46.36	3.72	575.66	750.85	15.79	533.08	0.66
MEAN	46.43	42.30	4.13	506.42	699.16	15.79	533.08	0.62
HUB	41.49	37.84	3.65	426.07	643.33	15.79	533.08	0.57

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	543.95	219.97	497.49	1148.35	0.47
MEAN	18.01	557.82	245.13	501.07	1146.65	0.49
HUB	15.22	605.79	333.55	505.70	1144.90	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	572.02	609.46	352.05	0.53	4495.16	
MEAN	504.50	564.22	259.37	0.49	4417.86	1.33
HUB	426.43	514.16	92.89	0.45	5080.09	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.04	1.12	17.19	572.69	1.04	547.99	0.92	0.91
MEAN	20.00	1.12	17.01	572.34	1.04	546.36	0.92	0.91
HUB	20.34	1.14	16.80	575.32	1.04	544.68	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	23.85	35.28	31.50	3.78	0.93	0.24	2.90	
MEAN	26.07	27.37	23.50	3.87	0.92	0.25	3.30	0.91
HUB	33.41	10.41	6.50	3.91	0.92	0.27	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.993

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	759.964	245.823	719.108	1124.207	0.676	-0.709

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.097	14.793	525.225	46.000	18.873	30.600	11.727

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	746.344	245.823	785.785	1126.039	0.663	-0.687

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	19.950	14.852	526.938	400.556	0.057	0.132

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	741.740	0.000	741.740	1126.676	0.658	-0.013

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	14.752	527.512	0.000	0.060	0.124	-0.719

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

```
      0.757      19.740       1.104     573.454      20.981     280.460       2.174

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 130677.555       0.399    1166.336 1432473.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.018   EfDer =  0.815

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    157.939    3210.000      19.740     573.454       1.000       1.000       0.780
W Kg/sec =   71.79063

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    123.667    3052.910       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 121499.984  123929.727       1.205     434.156     360.163     339.175       0.942

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   665.57    -0.23   665.57     0.59   534.68
 MEAN    17.74     0.00    -0.02   665.57    -0.23   665.57     0.59
 HUB     15.05     0.00    -0.02   665.57    -0.23   665.57     0.59

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     40.20    46.36    -6.16   562.21   871.39    15.64   536.47     0.77
 MEAN    36.76    43.40    -6.64   496.90   830.73    15.64   536.47     0.73
 HUB     32.37    38.84    -6.47   421.59   787.98    15.64   536.47     0.69

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   547.28   160.75   523.14  1163.71     0.47
 MEAN    17.51   559.99   197.68   523.94  1163.78     0.48
 HUB     14.85   607.24   300.63   527.60  1163.70     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   655.02   394.18     0.56  3189.08
 MEAN   490.40   600.17   292.72     0.52  3464.74     1.46
 HUB    415.99   540.06   115.35     0.46  4467.83

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.05     1.07    18.09   587.79     1.03   562.79     0.92     0.75
 MEAN    21.17     1.07    18.07   589.03     1.03   562.86     0.92     0.75
 HUB     21.60     1.09    17.94   593.54     1.04   562.76     0.92     0.75

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.08    37.00    31.50     5.50     0.93     0.28     2.90
 MEAN    20.67    29.19    23.50     5.69     0.87     0.31     3.28     0.75
 HUB     29.67    12.33     6.50     5.83     0.87     0.36     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.815

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     567.193     198.976     531.147    1164.148       0.487      -0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.242      18.055     563.266      46.000      20.537      31.500      10.963

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     557.028     198.976     591.499    1165.133       0.478       0.016

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      21.148      18.082     564.220     471.992       0.039       0.164

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     540.754       0.000     540.754    1166.672       0.464       0.029

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.151     565.711       0.000       0.060       0.074       0.037

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.631      21.033       1.066     590.124      16.670     335.761       2.603

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 103861.797       0.337     926.997 1924235.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.018   EfDer =  0.942

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    157.939    3210.000      21.033     590.124       1.000       1.000       0.980
W Kg/sec =   71.79063

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    117.737    3009.480       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 121499.984  123929.727       1.497     513.330     342.907     401.059       1.170

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   504.56    -0.17   504.56     0.43   505.80
 MEAN    16.97     0.00    -0.02   504.56    -0.17   504.56     0.43
 HUB     14.32     0.00    -0.02   504.56    -0.17   504.56     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.93    46.36     0.57   539.52   738.82    18.51   568.88     0.63
 MEAN    43.31    43.80    -0.49   475.39   693.36    18.51   568.88     0.59
 HUB     38.50    37.84     0.66   401.14   644.70    18.51   568.88     0.55

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   550.51   150.75   529.47  1178.89     0.47
 MEAN    16.57   561.75   186.95   529.73  1178.99     0.48
 HUB     13.89   605.09   288.95   531.64  1178.89     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   650.63   378.13     0.55  2849.46
 MEAN   464.28   597.93   277.33     0.51  3101.39     1.24
 HUB    389.09   540.99   100.15     0.46  4015.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.44     1.07    19.32   602.93     1.02   577.64     0.92     0.86
 MEAN    22.57     1.07    19.32   604.07     1.02   577.73     0.92     0.86
 HUB     23.03     1.10    19.24   608.18     1.03   577.62     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.89    35.53    31.50     4.03     0.93     0.15     2.90
 MEAN    19.44    27.63    23.50     4.13     0.90     0.18     3.29     0.86
 HUB     28.52    10.67     6.50     4.17     0.90     0.22     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.942

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
```

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	550.873	187.999	517.801	1180.972	0.466	0.056

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.646	19.506	579.732	46.000	19.955	32.400	12.445

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	551.167	187.999	582.348	1180.945	0.467	0.035

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.538	19.410	579.705	456.573	0.042	0.165

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	523.292	0.000	523.292	1183.488	0.442	0.022

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.580	582.205	0.000	0.060	0.084	0.085

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.717	22.397	1.065	605.059	14.935	345.125	2.675

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
93077.289	0.333	830.742	1455099.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 5.018 EfDer = 0.911

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
157.939	3210.000	22.397	605.059	1.000	1.000	0.980

W Kg/sec = 71.79063

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
111.961	2972.105	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
121499.984	123929.727	1.563	509.668	326.097	390.276	1.197

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	484.84	-0.17	484.84	0.41	475.14
MEAN	15.91	0.00	-0.02	484.84	-0.17	484.84	0.41	
HUB	13.07	0.00	-0.02	484.84	-0.17	484.84	0.41	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.64	47.36	-0.72	513.19	706.12	19.96	585.44	0.60
MEAN	42.61	44.80	-2.19	445.76	658.73	19.96	585.44	0.56
HUB	37.07	38.84	-1.77	366.12	607.65	19.96	585.44	0.51

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	528.61	134.27	511.27	1193.96	0.44
MEAN	15.50	537.64	164.12	511.98	1193.76	0.45
HUB	12.59	574.12	255.39	514.19	1193.40	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	502.54	630.10	368.28	0.53	2411.78	
MEAN	434.13	578.82	270.01	0.48	2546.09	1.22
HUB	352.68	523.31	97.29	0.44	3217.53	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.59	1.05	20.61	615.90	1.02	592.58	0.92	0.83
MEAN	23.65	1.06	20.58	616.50	1.02	592.38	0.92	0.83
HUB	23.99	1.07	20.48	619.52	1.02	592.02	0.92	0.83

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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     14.71    35.77    31.50     4.27     0.93     0.14     2.90
 MEAN    17.77    27.81    23.50     4.31     0.89     0.16     3.34     0.83
 HUB     26.41    10.71     6.50     4.21     0.89     0.19     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.911

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     543.276     167.127     516.931    1194.024       0.455      -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.680      20.543     592.679      46.000      17.916      33.000      15.084

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     561.271     167.127     585.624    1192.353       0.471      -0.134

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.429      20.127     591.021     440.827       0.099       0.146

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     520.364       0.000     520.364    1196.071       0.435       0.006

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.562     594.713       0.000       0.060       0.101       0.002

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.637      23.421       1.046     617.306      12.247     391.112       3.032

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   76347.414       0.302     681.423 1514852.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     588640.06   5253.7881    154.2909      1.5503      0.7412      5.0175      1.1807


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 85% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.485   EfDer =  0.998

    W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
     155.582    3210.000       15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   70.71914

    W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     151.988    3197.358        1.402       0.249       53.349      32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*     AthrRotor  ChokeMargin
  119686.578  122080.047        1.879     831.557     442.622     619.754       1.400

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   364.35    -0.13   364.35     0.33   575.61
  MEAN    17.06     0.00    -0.02   364.35    -0.13   364.35     0.33
  HUB     12.51     0.00    -0.02   364.35    -0.13   364.35     0.33
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.77    50.47     7.30   577.90   683.28    14.02   511.72     0.62
MEAN    52.68    47.20     5.48   477.90   601.05    14.02   511.72     0.54
HUB     43.89    38.62     5.27   350.44   505.62    14.02   511.72     0.46

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   580.98   313.11   489.39  1122.67     0.52
MEAN    18.04   610.17   354.17   496.86  1119.22     0.55
HUB     15.00   696.70   471.42   512.98  1112.42     0.63

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    577.90   556.43   264.79     0.50  6462.03
MEAN   505.23   519.31   151.06     0.46  6389.98     1.29
HUB    420.19   515.53    51.23     0.46  7072.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.96     1.19    14.96   551.89     1.06   523.70     0.92     0.91
MEAN    17.92     1.19    14.64   551.56     1.06   520.47     0.92     0.91
HUB     18.25     1.21    14.00   554.64     1.06   514.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.61    28.42    24.20     4.22     0.93     0.26     2.90
MEAN    35.48    16.91    12.70     4.21     0.92     0.22     3.51     0.91
HUB     42.58    -5.70    -9.30     3.60     0.92     0.09     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     620.425     353.483     509.879    1119.233       0.554      -0.008

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.007      14.611     520.547      24.000      34.732      35.400       0.668

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     540.228     353.483     645.598    1127.560       0.479       0.233

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.966      15.350     528.321     528.796       0.022       0.390

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     496.594       0.000     496.594    1131.585       0.439       0.308

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.691     532.100       0.000       0.060       0.037       0.330

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.876      17.913       1.186     552.697      29.887     222.023       1.721

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 186072.547       0.557    1635.966 1532079.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.485   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3210.000      17.913     552.697       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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   131.792    3109.708       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
119686.578  122080.047       1.538     590.487     383.813     474.134       1.235

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   472.33    -0.16   472.33     0.42   557.66
MEAN    18.08     0.00    -0.02   472.33    -0.16   472.33     0.42
HUB     15.21     0.00    -0.02   472.33    -0.16   472.33     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.64    46.36     4.28   575.66   744.76    15.89   534.07     0.66
MEAN    47.00    42.30     4.70   506.42   692.62    15.89   534.07     0.61
HUB     42.06    37.84     4.22   426.07   636.22    15.89   534.07     0.56

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   537.22   227.89   486.49  1149.97     0.47
MEAN    18.01   550.83   250.80   490.43  1148.04     0.48
HUB     15.22   598.32   335.61   495.33  1146.07     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    572.02   595.90   344.12     0.52  4656.88
MEAN   504.50   552.17   253.71     0.48  4519.76     1.35
HUB    426.43   503.59    90.83     0.44  5111.45

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.17     1.13    17.36   573.64     1.04   549.55     0.92     0.91
MEAN    20.10     1.12    17.16   573.03     1.04   547.69     0.92     0.91
HUB     20.40     1.14    16.93   575.69     1.04   545.80     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.10    35.27    31.50     3.77     0.93     0.25     2.90
MEAN    27.08    27.35    23.50     3.85     0.92     0.26     3.30     0.91
HUB     34.12    10.39     6.50     3.89     0.92     0.28     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     742.392     251.499     698.494    1127.275       0.659      -0.678

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.189      15.084     528.096      46.000      19.802      30.600      10.798

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     721.303     251.499     763.892    1130.023       0.638      -0.622

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      20.061      15.245     530.673     400.556       0.052       0.150

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     714.865       0.000     714.865    1130.859       0.632       0.035

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750      15.191     531.446       0.000       0.060       0.108      -0.640

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.785      19.888       1.110     574.120      21.423     273.360       2.119

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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 133432.328       0.408    1173.148 1405627.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 5.485   EfDer =  0.833

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3210.000      19.888     574.120       1.000       1.000       0.780
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.983    3051.137       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
119686.578  122080.047       1.232     434.156     352.348     339.175       0.963

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   644.46    -0.22   644.46     0.57   534.37
MEAN    17.74     0.00    -0.02   644.46    -0.22   644.46     0.57
HUB     15.05     0.00    -0.02   644.46    -0.22   644.46     0.57

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     41.11    46.36    -5.25   562.21   855.37    16.00   539.45     0.75
MEAN    37.65    43.40    -5.75   496.90   813.91    16.00   539.45     0.71
HUB     33.21    38.84    -5.63   421.59   770.23    16.00   539.45     0.68

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   536.08   173.20   507.34  1166.57     0.46
MEAN    17.51   549.07   206.75   508.66  1166.24     0.47
HUB     14.85   596.04   304.42   512.44  1165.80     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    554.93   634.91   381.73     0.54  3435.45
MEAN   490.40   582.40   283.65     0.50  3623.39     1.47
HUB    415.99   524.44   111.56     0.45  4524.03

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.35     1.07    18.47   589.57     1.03   565.58     0.92     0.76
MEAN    21.43     1.08    18.41   590.41     1.03   565.25     0.92     0.76
HUB     21.83     1.10    18.26   594.46     1.04   564.81     0.92     0.76

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     18.85    36.96    31.50     5.46     0.93     0.29     2.90
MEAN    22.12    29.15    23.50     5.65     0.87     0.32     3.28     0.76
HUB     30.71    12.28     6.50     5.78     0.87     0.37     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.833

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     555.894     208.105     515.471    1166.644       0.476      -0.001

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.504      18.405     565.683      46.000      21.985      31.500       9.515

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     538.610     208.105     577.415    1168.271       0.461       0.045

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.430      18.521     567.262     471.992       0.034       0.185

   VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	522.712	0.000	522.712	1169.721	0.447	0.060

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.594	568.671	0.000	0.060	0.066	0.068

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.669	21.328	1.072	591.482	17.361	320.476	2.484

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
108168.906	0.351	951.030	1873392.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 5.485 EfDer = 0.957

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
155.582	3210.000	21.328	591.482	1.000	1.000	0.980

W Kg/sec = 70.71914

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
114.507	3006.025	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
119686.578	122080.047	1.539	513.330	333.500	401.059	1.203

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	488.30	-0.17	488.30	0.42	505.22
MEAN	16.97	0.00	-0.02	488.30	-0.17	488.30	0.42	
HUB	14.32	0.00	-0.02	488.30	-0.17	488.30	0.42	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.86	46.36	1.50	539.52	727.81	18.93	571.58	0.62
MEAN	44.24	43.80	0.44	475.39	681.61	18.93	571.58	0.58
HUB	39.41	37.84	1.57	401.14	632.05	18.93	571.58	0.54

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	535.88	164.98	509.85	1182.84	0.45
MEAN	16.57	547.61	197.08	510.92	1182.46	0.46
HUB	13.89	590.90	292.68	513.33	1181.94	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	528.88	626.39	363.89	0.53	3118.15	
MEAN	464.28	576.57	267.20	0.49	3269.17	1.27
HUB	389.09	522.31	96.42	0.44	4067.69	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.91	1.07	19.90	605.50	1.02	581.53	0.92	0.88
MEAN	22.99	1.08	19.85	606.18	1.02	581.15	0.92	0.88
HUB	23.41	1.10	19.73	609.77	1.03	580.63	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	17.93	35.52	31.50	4.02	0.93	0.18	2.90	
MEAN	21.09	27.61	23.50	4.11	0.90	0.20	3.29	0.88
HUB	29.69	10.64	6.50	4.14	0.90	0.23	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.957

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	537.446	198.184	499.571	1184.339	0.454	0.056

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.072	20.030	583.040	46.000	21.639	32.400	10.761

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	529.494	198.184	565.368	1185.057	0.447	0.066

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.989	20.042	583.748	456.573	0.035	0.189

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	502.684	0.000	502.684	1187.399	0.423	0.055

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.212	586.057	0.000	0.060	0.073	0.117

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.761	22.866	1.072	607.148	15.666	327.558	2.539

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
97636.180	0.349	858.426	1422243.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 5.485 EfDer = 0.932

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
155.582	3210.000	22.866	607.148	1.000	1.000	0.980

W Kg/sec = 70.71914

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
108.212	2966.990	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
119686.578	122080.047	1.617	509.668	315.179	390.276	1.238

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	466.38	-0.16	466.38	0.39	474.33
MEAN	15.91	0.00	-0.02	466.38	-0.16	466.38	0.39	
HUB	13.07	0.00	-0.02	466.38	-0.16	466.38	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.74	47.36	0.38	513.19	693.57	20.57	589.00	0.58
MEAN	43.72	44.80	-1.08	445.76	645.26	20.57	589.00	0.54
HUB	38.15	38.84	-0.69	366.12	593.02	20.57	589.00	0.50

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	511.79	150.44	489.18	1198.83	0.43
MEAN	15.50	521.16	175.69	490.65	1198.13	0.43
HUB	12.59	557.46	259.65	493.29	1197.32	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	502.54	602.72	352.10	0.50	2701.86	
MEAN	434.13	554.55	258.43	0.46	2725.40	1.25
HUB	352.68	501.99	93.03	0.42	3271.13	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.26	1.06	21.40	619.29	1.02	597.43	0.92	0.85
MEAN	24.27	1.06	21.31	619.40	1.02	596.73	0.92	0.85
HUB	24.56	1.07	21.16	621.85	1.02	595.92	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	17.09	35.75	31.50	4.25	0.93	0.17	2.90	

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 MEAN    19.70    27.78    23.50     4.28     0.90     0.18     3.34     0.85
 HUB     27.76    10.68     6.50     4.18     0.90     0.21     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.932

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     526.542     178.916     495.213    1198.414       0.439       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.299      21.279     597.044      46.000      19.864      33.000      13.136

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     534.005     178.916     563.180    1197.751       0.446       -0.085

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.106      21.028     596.384     440.827       0.083       0.172

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     496.224       0.000     496.224    1201.008       0.413       0.045

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.417     599.631       0.000       0.060       0.088       0.041

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.701      24.090       1.054     620.178      13.030     366.161       2.838

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  81231.664       0.322     714.196 1478782.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    606541.62   5332.7661     151.9881      1.5946      0.7687      5.4850      1.1862


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 85% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3210.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    149.697    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.907     831.557     435.951     619.754       1.422

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   358.22    -0.12   358.22     0.32   575.61
 MEAN    17.06     0.00    -0.02   358.22    -0.12   358.22     0.32
 HUB     12.51     0.00    -0.02   358.22    -0.12   358.22     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.21    50.47     7.74   577.90   680.02    14.05   512.09     0.61
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 MEAN    53.15    47.20     5.95   477.90   597.35    14.05   512.09     0.54
 HUB     44.38    38.62     5.76   350.44   501.21    14.05   512.09     0.45

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   575.83   318.33   479.84  1123.72     0.51
 MEAN    18.04   604.23   357.10   487.42  1120.12     0.54
 HUB     15.00   688.82   470.47   503.13  1113.31     0.62

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    577.90   545.55   259.57     0.49  6569.64
 MEAN   505.23   509.43   148.14     0.45  6442.69     1.31
 HUB    420.19   505.63    50.28     0.45  7058.54

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.01     1.19    15.05   552.37     1.06   524.68     0.92     0.91
 MEAN    17.95     1.19    14.72   551.80     1.06   521.31     0.92     0.91
 HUB     18.24     1.21    14.09   554.57     1.06   514.95     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.56    28.41    24.20     4.21     0.93     0.28     2.90
 MEAN    36.23    16.91    12.70     4.21     0.92     0.23     3.51     0.91
 HUB     43.08    -5.71    -9.30     3.59     0.92     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     614.075     356.402     500.066    1120.172       0.548      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.033      14.697     521.420      24.000      35.478      35.400      -0.078

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     528.924     356.402     637.795    1128.870       0.469       0.249

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.994      15.478     529.549     528.796       0.021       0.401

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     486.649       0.000     486.649    1132.685       0.430       0.320

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.801     533.135       0.000       0.060       0.037       0.342

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      17.942       1.188     552.916      30.106     218.943       1.697

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 187435.969       0.561    1623.114 1506272.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3210.000      17.942     552.916       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    129.626    3109.092       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 117882.562  120239.961       1.564     590.487     377.504     474.134       1.256

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   463.08    -0.16   463.08     0.41   557.55
MEAN    18.08     0.00    -0.02   463.08    -0.16   463.08     0.41
HUB     15.21     0.00    -0.02   463.08    -0.16   463.08     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.19    46.36     4.83   575.66   738.93    15.99   535.01     0.65
MEAN    47.57    42.30     5.27   506.42   686.34    15.99   535.01     0.60
HUB     42.63    37.84     4.79   426.07   629.38    15.99   535.01     0.55

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   531.02   235.48   475.96  1151.50     0.46
MEAN    18.01   544.29   256.23   480.20  1149.35     0.47
HUB     15.22   591.21   337.61   485.34  1147.17     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    572.02   582.92   336.54     0.51  4811.71
MEAN   504.50   540.58   248.27     0.47  4617.65     1.37
HUB    426.43   493.40    88.82     0.43  5141.87

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.28     1.13    17.53   574.56     1.04   551.01     0.92     0.91
MEAN    20.18     1.12    17.31   573.69     1.04   548.95     0.92     0.91
HUB     20.45     1.14    17.06   576.04     1.04   546.86     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     26.32    35.26    31.50     3.76     0.93     0.27     2.90
MEAN    28.08    27.34    23.50     3.84     0.92     0.27     3.30     0.91
HUB     34.82    10.37     6.50     3.87     0.92     0.28     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     726.378     256.953     679.412    1130.055       0.643      -0.650

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.273      15.349     530.703      46.000      20.717      30.600       9.883

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     698.664     256.953     744.417    1133.561       0.616      -0.564

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      20.163      15.599     534.001     400.556       0.047       0.167

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     691.056       0.000     691.056    1134.505       0.609       0.076

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750      15.578     534.885       0.000       0.060       0.094      -0.571

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.808      20.019       1.116     574.764      21.848     266.717       2.068

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 136076.438       0.416    1178.363 1379340.500
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.852

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3210.000      20.019     574.764       1.000       1.000       0.780
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.445    3049.429       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.259     434.156     344.956     339.175       0.983

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   625.31    -0.22   625.31     0.55   534.07
 MEAN    17.74     0.00    -0.02   625.31    -0.22   625.31     0.55
 HUB     15.05     0.00    -0.02   625.31    -0.22   625.31     0.55

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     41.97    46.36    -4.39   562.21   841.04    16.32   542.12     0.74
 MEAN    38.48    43.40    -4.92   496.90   798.84    16.32   542.12     0.70
 HUB     34.00    38.84    -4.84   421.59   754.28    16.32   542.12     0.66

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   526.19   184.71   492.70  1169.19     0.45
 MEAN    17.51   539.26   215.17   494.47  1168.49     0.46
 HUB     14.85   585.82   307.93   498.36  1167.73     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   616.30   370.22     0.53  3663.37
 MEAN   490.40   565.91   275.24     0.48  3770.63     1.49
 HUB    415.99   509.94   108.05     0.44  4576.06

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.62     1.08    18.81   591.24     1.03   568.12     0.92     0.78
 MEAN    21.67     1.08    18.72   591.72     1.03   567.44     0.92     0.78
 HUB     22.04     1.10    18.55   595.34     1.04   566.69     0.92     0.78

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.55    36.92    31.50     5.42     0.93     0.30     2.90
 MEAN    23.52    29.10    23.50     5.60     0.88     0.33     3.28     0.78
 HUB     31.71    12.23     6.50     5.73     0.88     0.38     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.852

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     545.758     216.578     500.945    1168.928       0.467       0.001

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.747      18.727     567.898      46.000      23.381      31.500       8.119

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     521.783     216.578     564.945    1171.125       0.446       0.073

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.688      18.922     570.035     471.992       0.029       0.206

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     506.257       0.000     506.257    1172.493       0.432       0.088
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.998	571.368	0.000	0.060	0.058	0.098

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.702	21.598	1.079	592.765	18.001	307.220	2.382

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
112158.836	0.364	971.247	1826160.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 5.953 EfDer = 0.968

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
153.237	3210.000	21.598	592.765	1.000	1.000	0.980

W Kg/sec = 69.65320

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
111.492	3002.769	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
117882.562	120239.961	1.581	513.330	324.717	401.059	1.235

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	473.41	-0.16	473.41	0.40	504.68
MEAN	16.97	0.00	-0.02	473.41	-0.16	473.41	0.40	
HUB	14.32	0.00	-0.02	473.41	-0.16	473.41	0.40	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.74	46.36	2.38	539.52	717.89	19.31	574.06	0.61
MEAN	45.13	43.80	1.33	475.39	671.02	19.31	574.06	0.57
HUB	40.29	37.84	2.45	401.14	620.61	19.31	574.06	0.53

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	523.34	177.82	492.20	1186.37	0.44
MEAN	16.57	535.25	206.23	493.92	1185.58	0.45
HUB	13.89	578.27	296.05	496.74	1184.70	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	528.88	604.57	351.06	0.51	3360.30	
MEAN	464.28	557.26	258.04	0.47	3420.85	1.29
HUB	389.09	505.38	93.04	0.43	4114.47	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.35	1.08	20.43	607.87	1.03	585.01	0.92	0.89
MEAN	23.38	1.08	20.33	608.14	1.03	584.23	0.92	0.89
HUB	23.76	1.10	20.18	611.26	1.03	583.35	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	19.86	35.50	31.50	4.00	0.93	0.20	2.90	
MEAN	22.66	27.58	23.50	4.08	0.91	0.22	3.29	0.89
HUB	30.79	10.61	6.50	4.11	0.91	0.25	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.968

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	525.723	207.393	483.086	1187.366	0.443	0.056

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.463	20.506	586.023	46.000	23.234	32.400	9.166

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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     510.208     207.393     550.748    1188.724       0.429       0.095

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.399      20.613     587.364     456.573       0.030       0.211

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     484.353       0.000     484.353    1190.894       0.407       0.087

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.782     589.511       0.000       0.060       0.064       0.148

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.794      23.292       1.078     609.091      16.326     312.689       2.424

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 101751.180       0.364     881.121 1391044.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.949

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3210.000      23.292     609.091       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.797    2962.253       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.670     509.668     305.231     390.276       1.279

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   449.88    -0.15   449.88     0.38   473.57
 MEAN    15.91     0.00    -0.02   449.88    -0.15   449.88     0.38
 HUB     13.07     0.00    -0.02   449.88    -0.15   449.88     0.38

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.77    47.36     1.41   513.19   682.58    21.11   592.20     0.57
 MEAN    44.75    44.80    -0.05   445.76   633.43    21.11   592.20     0.53
 HUB     39.15    38.84     0.31   366.12   580.13    21.11   592.20     0.49

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   497.80   164.72   469.76  1203.10     0.41
 MEAN    15.50   507.13   185.93   471.81  1201.99     0.42
 HUB     12.59   542.99   263.44   474.81  1200.80     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   578.62   337.83     0.48  2957.83
 MEAN   434.13   533.12   248.20     0.44  2883.88     1.28
 HUB    352.68   483.12    89.24     0.40  3318.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.87     1.07    22.10   622.38     1.02   601.71     0.92     0.87
 MEAN    24.83     1.07    21.97   622.05     1.02   600.59     0.92     0.87
 HUB     25.07     1.08    21.78   624.00     1.02   599.40     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.32    35.72    31.50     4.22     0.93     0.19     2.90
 MEAN    21.51    27.75    23.50     4.25     0.90     0.20     3.34     0.87
 HUB     29.02    10.64     6.50     4.14     0.90     0.22     4.06
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.949

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     512.339     189.336     476.071    1202.288       0.426      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.863      21.942     600.909      46.000      21.688      33.000      11.312

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     510.598     189.336     544.571    1202.437       0.425      -0.041

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.715      21.830     601.058     440.827       0.070       0.197

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     475.256       0.000     475.256    1205.341       0.394       0.081

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.184     603.965       0.000       0.060       0.076       0.078

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.750      24.696       1.060     622.812      13.721     345.932       2.682

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   85546.414       0.339     740.795 1444971.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    622968.88   5394.6387    149.6973      1.6347      0.7911      5.9530      1.1913


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

   Fan-Core + 4 Stage LPC 85% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.746    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   68.52104

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    147.264    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  115966.477  118285.555       1.939     831.557     428.865     619.754       1.445

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   351.74    -0.12   351.74     0.32   575.61
  MEAN    17.06     0.00    -0.02   351.74    -0.12   351.74     0.32
  HUB     12.51     0.00    -0.02   351.74    -0.12   351.74     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.68    50.47     8.21   577.90   676.63    14.09   512.48     0.61
  MEAN    53.65    47.20     6.45   477.90   593.48    14.09   512.48     0.53
  HUB     44.90    38.62     6.28   350.44   496.60    14.09   512.48     0.45
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      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   570.63   323.74   469.91  1124.78     0.51
MEAN    18.04   598.14   360.13   477.58  1121.03     0.53
HUB     15.00   680.68   469.48   492.87  1114.23     0.61

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    577.90   534.24   254.16     0.47  6681.23
MEAN   505.23   499.14   145.11     0.45  6497.30     1.33
HUB    420.19   495.33    49.29     0.44  7043.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.06     1.20    15.15   552.88     1.06   525.68     0.92     0.91
MEAN    17.98     1.19    14.81   552.05     1.06   522.17     0.92     0.91
HUB     18.24     1.21    14.17   554.51     1.06   515.81     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.56    28.41    24.20     4.21     0.93     0.29     2.90
MEAN    37.02    16.90    12.70     4.20     0.93     0.25     3.51     0.91
HUB     43.61    -5.71    -9.30     3.59     0.93     0.11     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     607.572     359.426     489.853    1121.128       0.542      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.059      14.785     522.311      24.000      36.269      35.400      -0.869

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     517.261     359.426     629.878    1130.197       0.458       0.265

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.021      15.607     530.796     528.796       0.021       0.413

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     476.367       0.000     476.367    1133.805       0.420       0.333

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.911     534.189       0.000       0.060       0.037       0.355

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      17.968       1.189     553.143      30.333     215.735       1.672

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188849.547       0.565    1608.773 1479027.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.746    3210.000      17.968     553.143       1.000       1.000       0.980
W Kg/sec =   68.52104

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    127.356    3108.454       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 115966.477  118285.555       1.592     590.487     370.893     474.134       1.278

     ROTOR LEADING EDGE CONDITIONS, STAGE            2
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   453.51    -0.16   453.51     0.40   557.43
MEAN    18.08     0.00    -0.02   453.51    -0.16   453.51     0.40
HUB     15.21     0.00    -0.02   453.51    -0.16   453.51     0.40

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.78    46.36     5.42   575.66   732.96    16.10   535.97     0.65
MEAN    48.16    42.30     5.86   506.42   679.91    16.10   535.97     0.60
HUB     43.22    37.84     5.38   426.07   622.36    16.10   535.97     0.55

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   524.95   243.24   465.19  1153.04     0.46
MEAN    18.01   537.75   261.83   469.71  1150.67     0.47
HUB     15.22   583.98   339.64   475.06  1148.29     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    572.02   569.65   328.77     0.49  4970.19
MEAN   504.50   528.69   242.67     0.46  4718.42     1.39
HUB    426.43   482.93    86.80     0.42  5172.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.39     1.13    17.69   575.50     1.04   552.49     0.92     0.91
MEAN    20.26     1.13    17.44   574.37     1.04   550.22     0.92     0.91
HUB     20.50     1.14    17.18   576.41     1.04   547.93     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     27.60    35.25    31.50     3.75     0.93     0.28     2.90
MEAN    29.14    27.32    23.50     3.82     0.92     0.28     3.30     0.91
HUB     35.56    10.35     6.50     3.85     0.92     0.29     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     710.735     262.568     660.456    1132.755       0.627      -0.623

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.355      15.607     533.243      46.000      21.681      30.600       8.919

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     676.605     262.568     725.766    1136.947       0.595      -0.507

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      20.261      15.941     537.197     400.556       0.042       0.183

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.823     668.218       0.000     668.218    1137.947       0.587       0.115

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750      15.945     538.139       0.000       0.060       0.082      -0.506

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.826      20.143       1.121     575.426      22.283     260.071       2.016

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 138785.188       0.424    1182.285 1351848.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.871
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
150.746	3210.000	20.143	575.426	1.000	1.000	0.780

W Kg/sec = 68.52104

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
115.872	3047.674	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
115966.477	118285.555	1.287	434.156	337.461	339.175	1.005

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	606.61	-0.21	606.61	0.53	533.77
MEAN	17.74	0.00	-0.02	606.61	-0.21	606.61	0.53	
HUB	15.05	0.00	-0.02	606.61	-0.21	606.61	0.53	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	42.84	46.36	-3.52	562.21	827.22	16.63	544.70	0.72
MEAN	39.33	43.40	-4.07	496.90	784.28	16.63	544.70	0.69
HUB	34.81	38.84	-4.03	421.59	738.84	16.63	544.70	0.65

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	516.83	196.09	478.19	1171.74	0.44
MEAN	17.51	529.81	223.51	480.36	1170.71	0.45
HUB	14.85	575.81	311.39	484.35	1169.64	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	597.85	358.83	0.51	3888.80	
MEAN	490.40	549.53	266.89	0.47	3916.57	1.51
HUB	415.99	495.51	104.60	0.42	4627.27	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.90	1.09	19.16	592.91	1.03	570.61	0.92	0.80
MEAN	21.91	1.09	19.03	593.04	1.03	569.60	0.92	0.80
HUB	22.24	1.10	18.84	596.23	1.04	568.55	0.92	0.80

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	22.30	36.88	31.50	5.38	0.93	0.32	2.90	
MEAN	24.95	29.06	23.50	5.56	0.88	0.34	3.28	0.80
HUB	32.74	12.19	6.50	5.69	0.88	0.38	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.871

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	536.020	224.975	486.522	1171.164	0.458	0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.986	19.041	570.073	46.000	24.817	31.500	6.683

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	505.284	224.975	553.106	1173.905	0.430	0.101

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.940	19.314	572.745	471.992	0.025	0.226

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	490.160	0.000	490.160	1175.193	0.417	0.117

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.392	574.002	0.000	0.060	0.051	0.127

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.733	21.861	1.085	594.060	18.634	294.844	2.286

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
116104.711	0.377	989.074	1778895.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.453 EfDer = 0.979

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
150.746	3210.000	21.861	594.060	1.000	1.000	0.980

W Kg/sec = 68.52104

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
108.480	2999.494	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
115966.477	118285.555	1.625	513.330	315.945	401.059	1.269

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	458.77	-0.16	458.77	0.39	504.13
MEAN	16.97	0.00	-0.02	458.77	-0.16	458.77	0.39	
HUB	14.32	0.00	-0.02	458.77	-0.16	458.77	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.63	46.36	3.27	539.52	708.33	19.69	576.49	0.60
MEAN	46.03	43.80	2.23	475.39	660.77	19.69	576.49	0.56
HUB	41.18	37.84	3.34	401.14	609.52	19.69	576.49	0.52

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	511.83	190.21	475.17	1189.74	0.43
MEAN	16.57	523.66	215.11	477.44	1188.59	0.44
HUB	13.89	566.21	299.33	480.62	1187.38	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	528.88	583.51	338.66	0.49	3594.25	
MEAN	464.28	538.54	249.16	0.45	3567.91	1.32
HUB	389.09	488.93	89.76	0.41	4160.00	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.78	1.09	20.93	610.22	1.03	588.35	0.92	0.90
MEAN	23.76	1.09	20.79	610.10	1.03	587.21	0.92	0.90
HUB	24.09	1.10	20.61	612.76	1.03	586.00	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	21.82	35.48	31.50	3.98	0.93	0.22	2.90	
MEAN	24.25	27.56	23.50	4.06	0.91	0.23	3.29	0.90
HUB	31.91	10.58	6.50	4.08	0.91	0.26	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.979

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	514.758	216.321	467.099	1190.286	0.432	0.056

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.844	20.965	588.909	46.000	24.850	32.400	7.550

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	491.759	216.321	537.235	1192.237	0.412	0.124

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.796	21.163	590.841	456.573	0.026	0.235

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	466.841	0.000	466.841	1194.247	0.391	0.118

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.331	592.834	0.000	0.060	0.055	0.178

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.821	23.704	1.084	611.024	16.964	299.080	2.318

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
105734.469	0.378	900.732	1359265.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 6.453 EfDer = 0.964

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
150.746	3210.000	23.704	611.024	1.000	1.000	0.980

W Kg/sec = 68.52104

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
101.466	2957.563	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
115966.477	118285.555	1.725	509.668	295.529	390.276	1.321

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	434.04	-0.15	434.04	0.36	472.82
MEAN	15.91	0.00	-0.02	434.04	-0.15	434.04	0.36	
HUB	13.07	0.00	-0.02	434.04	-0.15	434.04	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.78	47.36	2.42	513.19	672.24	21.64	595.30	0.56
MEAN	45.77	44.80	0.97	445.76	622.28	21.64	595.30	0.52
HUB	40.16	38.84	1.32	366.12	567.93	21.64	595.30	0.47

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	485.32	178.20	451.42	1207.13	0.40
MEAN	15.50	494.31	195.62	453.95	1205.66	0.41
HUB	12.59	529.49	266.99	457.25	1204.14	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	502.54	555.85	324.34	0.46	3199.71	
MEAN	434.13	512.80	238.51	0.43	3033.95	1.31
HUB	352.68	465.21	85.69	0.39	3363.36	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.47	1.07	22.78	625.40	1.02	605.75	0.92	0.88
MEAN	25.37	1.07	22.60	624.66	1.02	604.27	0.92	0.88
HUB	25.56	1.08	22.38	626.14	1.02	602.74	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	21.54	35.70	31.50	4.20	0.93	0.22	2.90	
MEAN	23.31	27.72	23.50	4.22	0.91	0.22	3.34	0.88
HUB	30.28	10.61	6.50	4.11	0.91	0.24	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.964

```
     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     499.403     199.203     457.954    1205.963       0.414      -0.007

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      25.408      22.577     604.588      46.000      23.508      33.000       9.492

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     488.929     199.203     527.952    1206.824       0.405       0.002

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      25.298      22.591     605.452     440.827       0.058       0.222

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     455.681       0.000     455.681    1209.433       0.377       0.118

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      22.915     608.072       0.000       0.060       0.066       0.115

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.790      25.277       1.066     625.398      14.374     328.128       2.544

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   89623.758       0.355     763.488 1410891.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     639097.69   5444.3516    147.2640      1.6732      0.8105      6.4535      1.1962


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 85% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.014   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     147.976    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   67.26170

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     144.557    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  113835.133  116111.594       1.975     831.557     420.983     619.754       1.472

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   344.58    -0.12   344.58     0.31   575.61
  MEAN    17.06     0.00    -0.02   344.58    -0.12   344.58     0.31
  HUB     12.51     0.00    -0.02   344.58    -0.12   344.58     0.31

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.20    50.47     8.73   577.90   672.93    14.13   512.89     0.61
  MEAN    54.21    47.20     7.01   477.90   589.26    14.13   512.89     0.53
  HUB     45.49    38.62     6.87   350.44   491.55    14.13   512.89     0.44

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	565.18	329.62	459.10	1125.91	0.50
MEAN	18.04	591.64	363.44	466.85	1122.00	0.53
HUB	15.00	671.88	468.41	481.68	1115.21	0.60

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	577.90	521.93	248.28	0.46	6802.58	
MEAN	505.23	487.91	141.80	0.43	6557.03	1.35
HUB	420.19	484.09	48.22	0.43	7027.58	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.12	1.20	15.25	553.42	1.06	526.74	0.92	0.91
MEAN	18.01	1.19	14.90	552.32	1.06	523.08	0.92	0.91
HUB	18.23	1.21	14.26	554.43	1.06	516.73	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.68	28.40	24.20	4.20	0.93	0.31	2.90	
MEAN	37.90	16.90	12.70	4.20	0.93	0.26	3.51	0.91
HUB	44.20	-5.72	-9.30	3.58	0.93	0.12	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	600.633	362.733	478.732	1122.145	0.535	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.086	14.878	523.259	24.000	37.151	35.400	-1.751

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	504.663	362.733	621.498	1131.605	0.446	0.283

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.047	15.741	532.118	528.796	0.022	0.427

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	465.238	0.000	465.238	1134.995	0.410	0.346

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.026	535.312	0.000	0.060	0.038	0.369

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	17.994	1.191	553.391	30.581	212.230	1.645

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
190390.438	0.570	1592.091	1448913.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.014 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
147.976	3210.000	17.994	553.391	1.000	1.000	0.980

W Kg/sec = 67.26170

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
124.864	3107.759	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
113835.133	116111.594	1.624	590.487	363.639	474.134	1.304

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	443.12	-0.15	443.12	0.39	557.31

```
MEAN    18.08     0.00    -0.02   443.12    -0.15   443.12     0.39
HUB     15.21     0.00    -0.02   443.12    -0.15   443.12     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     52.42    46.36     6.06   575.66   726.57    16.20   536.99     0.64
MEAN    48.82    42.30     6.52   506.42   673.03    16.20   536.99     0.59
HUB     43.89    37.84     6.05   426.07   614.83    16.20   536.99     0.54

     ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   518.74   251.53   453.67  1154.65     0.45
MEAN    18.01   530.93   267.82   458.43  1152.07     0.46
HUB     15.22   576.31   341.82   463.99  1149.48     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    572.02   555.46   320.49     0.48  5139.35
MEAN   504.50   515.93   236.68     0.45  4826.20     1.41
HUB    426.43   471.65    84.62     0.41  5205.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.51     1.14    17.85   576.51     1.04   554.04     0.92     0.91
MEAN    20.35     1.13    17.59   575.10     1.04   551.56     0.92     0.91
HUB     20.54     1.14    17.30   576.81     1.04   549.07     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     29.01    35.24    31.50     3.74     0.93     0.30     2.90
MEAN    30.29    27.31    23.50     3.81     0.93     0.29     3.30     0.91
HUB     36.38    10.34     6.50     3.84     0.93     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     694.711     268.573     640.697    1135.505       0.612      -0.595

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.438      15.870     535.835      46.000      22.743      30.600       7.857

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     654.013     268.573     707.011    1140.351       0.574      -0.448

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      20.359      16.286     540.419     400.556       0.037       0.201

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     645.135       0.000     645.135    1141.369       0.565       0.152

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      16.310     541.383       0.000       0.060       0.070      -0.440

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.843      20.264       1.126     576.138      22.747     253.125       1.962

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 141680.609       0.433    1184.768 1321738.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.014   EfDer =  0.891

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3210.000      20.264     576.138       1.000       1.000       0.780
W Kg/sec =   67.26170
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
113.134	3045.790	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
113835.133	116111.594	1.318	434.156	329.489	339.175	1.029

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	587.39	-0.20	587.39	0.51	533.44
MEAN	17.74	0.00	-0.02	587.39	-0.20	587.39	0.51	
HUB	15.05	0.00	-0.02	587.39	-0.20	587.39	0.51	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	43.76	46.36	-2.60	562.21	813.23	16.94	547.33	0.71
MEAN	40.24	43.40	-3.16	496.90	769.51	16.94	547.33	0.67
HUB	35.68	38.84	-3.16	421.59	723.14	16.94	547.33	0.63

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	507.63	207.91	463.09	1174.35	0.43
MEAN	17.51	520.33	232.15	465.67	1172.98	0.44
HUB	14.85	565.59	314.99	469.76	1171.61	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	578.68	347.01	0.49	4122.85	
MEAN	490.40	532.48	258.25	0.45	4067.82	1.53
HUB	415.99	480.49	101.00	0.41	4680.62	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.18	1.09	19.50	594.68	1.03	573.16	0.92	0.81
MEAN	22.15	1.09	19.35	594.43	1.03	571.83	0.92	0.81
HUB	22.45	1.11	19.14	597.18	1.04	570.48	0.92	0.81

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	24.18	36.85	31.50	5.35	0.93	0.33	2.90	
MEAN	26.50	29.01	23.50	5.51	0.89	0.35	3.28	0.81
HUB	33.84	12.13	6.50	5.63	0.89	0.39	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.891

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	526.250	233.678	471.522	1173.458	0.448	0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.230	19.361	572.309	46.000	26.362	31.500	5.138

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	488.332	233.678	541.363	1176.746	0.415	0.131

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.195	19.712	575.520	471.992	0.022	0.249

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	473.664	0.000	473.664	1177.950	0.402	0.147

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.791	576.698	0.000	0.060	0.046	0.158

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.762	22.126	1.092	595.429	19.292	282.688	2.191

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 120201.359       0.390    1005.153 1729139.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.014   EfDer =  0.987

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    147.976    3210.000      22.126     595.429      1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    105.332    2996.043       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.673     513.330     306.776     401.059       1.307

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   443.73    -0.15   443.73     0.38   503.55
 MEAN    16.97     0.00    -0.02   443.73    -0.15   443.73     0.38
 HUB     14.32     0.00    -0.02   443.73    -0.15   443.73     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.57    46.36     4.21   539.52   698.67    20.07   579.00     0.59
 MEAN    46.98    43.80     3.18   475.39   650.41    20.07   579.00     0.55
 HUB     42.13    37.84     4.29   401.14   598.27    20.07   579.00     0.51

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   500.83   202.73   457.96  1193.13     0.42
 MEAN    16.57   512.32   224.12   460.70  1191.64     0.43
 HUB     13.89   554.16   302.64   464.22  1190.10     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   562.23   326.14     0.47  3830.54
 MEAN   464.28   519.54   240.15     0.44  3717.15     1.35
 HUB    389.09   472.20    86.45     0.40  4205.90

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.21     1.09    21.44   612.65     1.03   591.71     0.92     0.90
 MEAN    24.15     1.09    21.26   612.14     1.03   590.23     0.92     0.90
 HUB     24.42     1.10    21.05   614.33     1.03   588.70     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.88    35.46    31.50     3.96     0.93     0.24     2.90
 MEAN    25.94    27.53    23.50     4.03     0.92     0.25     3.29     0.90
 HUB     33.10    10.55     6.50     4.05     0.92     0.27     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     504.058     225.382     450.864    1193.239       0.422       0.055

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.228      21.427     591.834      46.000      26.560      32.400       5.840

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     473.260     225.382     524.187    1195.768       0.396       0.154

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.193      21.714     594.346     456.573       0.022       0.259
```

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	449.313	0.000	449.313	1197.622	0.375	0.150

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.879	596.190	0.000	0.060	0.048	0.209

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.844	24.114	1.090	613.039	17.610	285.998	2.217

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
109763.789	0.392	917.872	1325283.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 7.014 EfDer = 0.977

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
147.976	3210.000	24.114	613.039	1.000	1.000	0.980

W Kg/sec = 67.26170

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
98.068	2952.698	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
113835.133	116111.594	1.784	509.668	285.633	390.276	1.366

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	418.13	-0.14	418.13	0.35	472.04
MEAN	15.91	0.00	-0.02	418.13	-0.14	418.13	0.35	
HUB	13.07	0.00	-0.02	418.13	-0.14	418.13	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.84	47.36	3.48	513.19	662.08	22.17	598.45	0.55
MEAN	46.84	44.80	2.04	445.76	611.28	22.17	598.45	0.51
HUB	41.22	38.84	2.38	366.12	555.86	22.17	598.45	0.46

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	473.74	191.55	433.28	1211.12	0.39
MEAN	15.50	482.10	205.26	436.22	1209.32	0.40
HUB	12.59	516.36	270.58	439.79	1207.49	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	502.54	533.34	310.99	0.44	3439.11	
MEAN	434.13	492.62	228.86	0.41	3183.37	1.35
HUB	352.68	447.38	82.10	0.37	3408.45	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.06	1.08	23.45	628.49	1.03	609.77	0.92	0.89
MEAN	25.91	1.07	23.22	627.34	1.02	607.95	0.92	0.89
HUB	26.05	1.08	22.97	628.35	1.02	606.11	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	23.85	35.67	31.50	4.17	0.93	0.24	2.90	
MEAN	25.20	27.68	23.50	4.18	0.91	0.24	3.34	0.89
HUB	31.60	10.57	6.50	4.07	0.91	0.25	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.977

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

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     15.219     487.122     209.027     439.995    1209.621       0.403      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.952      23.207     608.263      46.000      25.411      33.000       7.589

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     467.862     209.027     512.432    1211.146       0.386       0.045

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.874      23.341     609.798     440.827       0.048       0.249

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     436.527       0.000     436.527    1213.492       0.360       0.155

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.639     612.163       0.000       0.060       0.056       0.152

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.822      25.853       1.072     628.063      15.023     311.553       2.415

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93675.805       0.371     783.340 1374770.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    655712.06   5483.2231    144.5575      1.7113      0.8273      7.0142      1.2013


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 85% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    143.384    3210.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   65.17433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    140.071    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 110302.430  112508.234       2.039     831.557     407.918     619.754       1.519

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   332.81    -0.11   332.81     0.30   575.61
 MEAN    17.06     0.00    -0.02   332.81    -0.11   332.81     0.30
 HUB     12.51     0.00    -0.02   332.81    -0.11   332.81     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.07    50.47     9.60   577.90   666.98    14.19   513.56     0.60
 MEAN    55.15    47.20     7.95   477.90   582.46    14.19   513.56     0.52
 HUB     46.49    38.62     7.87   350.44   483.37    14.19   513.56     0.43

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   556.85   339.08   441.70  1127.67     0.49
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 MEAN    18.04   581.43   368.78   449.51  1123.53     0.52
 HUB     15.00   657.81   466.65   463.63  1116.75     0.59

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    577.90   502.13   238.81     0.45  6997.68
 MEAN   505.23   469.76   136.45     0.42  6653.37     1.39
 HUB    420.19   465.95    46.46     0.42  7001.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.21     1.21    15.41   554.30     1.06   528.40     0.92     0.91
 MEAN    18.05     1.19    15.03   552.75     1.06   524.52     0.92     0.91
 HUB     18.21     1.21    14.40   554.32     1.06   518.18     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.51    28.40    24.20     4.20     0.93     0.33     2.90
 MEAN    39.37    16.89    12.70     4.19     0.93     0.29     3.51     0.91
 HUB     45.19    -5.72    -9.30     3.58     0.93     0.15     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     589.753     368.069     460.798    1123.730       0.525      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.124      15.019     524.738      24.000      38.617      35.400      -3.217

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     484.552     368.069     608.494    1133.792       0.427       0.312

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.084      15.947     534.178     528.796       0.023       0.450

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     447.429       0.000     447.429    1136.855       0.394       0.368

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.199     537.067       0.000       0.060       0.040       0.390

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      18.028       1.193     553.788      30.978     206.564       1.601

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 192865.359       0.577    1562.737 1399425.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    143.384    3210.000      18.028     553.788       1.000       1.000       0.980
W Kg/sec =   65.17433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.807    3106.643       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 110302.430  112508.234       1.678     590.487     351.823     474.134       1.348

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   426.46    -0.15   426.46     0.37   557.11
 MEAN    18.08     0.00    -0.02   426.46    -0.15   426.46     0.37
 HUB     15.21     0.00    -0.02   426.46    -0.15   426.46     0.37
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.48    46.36     7.12   575.66   716.53    16.36   538.60     0.63
MEAN    49.91    42.30     7.61   506.42   662.17    16.36   538.60     0.58
HUB     44.98    37.84     7.14   426.07   602.93    16.36   538.60     0.53

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   509.59   264.60   435.51  1157.12     0.44
MEAN    18.01   520.57   277.29   440.57  1154.23     0.45
HUB     15.22   564.34   345.28   446.39  1151.32     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    572.02   533.08   307.42     0.46  5406.14
MEAN   504.50   495.71   227.21     0.43  4996.63     1.45
HUB    426.43   453.71    81.16     0.39  5258.37

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.68     1.15    18.10   578.11     1.04   556.42     0.92     0.91
MEAN    20.47     1.14    17.80   576.26     1.04   553.63     0.92     0.91
HUB     20.60     1.14    17.48   577.44     1.04   550.85     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.28    35.22    31.50     3.72     0.93     0.32     2.90
MEAN    32.19    27.28    23.50     3.78     0.93     0.31     3.30     0.91
HUB     37.72    10.30     6.50     3.80     0.93     0.32     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     670.803     278.068     610.455    1139.585       0.589      -0.553

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.557      16.255     539.694      46.000      24.490      30.600       6.110

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     620.106     278.068     679.598    1145.340       0.541      -0.360

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      20.499      16.789     545.159     400.556       0.031       0.228

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     610.942       0.000     610.942    1146.330       0.533       0.207

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      16.834     546.101       0.000       0.060       0.055      -0.343

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.861      20.430       1.133     577.270      23.482     242.472       1.880

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 146255.062       0.447    1185.066 1272825.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.920

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    143.384    3210.000      20.430     577.270       1.000       1.000       0.780
W Kg/sec =   65.17433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.836    3042.803       1.402       0.249      53.349      56.000       0.050
```

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
110302.430	112508.234	1.370	434.156	316.970	339.175	1.070

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	558.44	-0.19	558.44	0.48	532.91
MEAN	17.74	0.00	-0.02	558.44	-0.19	558.44	0.48	
HUB	15.05	0.00	-0.02	558.44	-0.19	558.44	0.48	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.20	46.36	-1.16	562.21	792.56	17.39	551.23	0.69
MEAN	41.67	43.40	-1.73	496.90	747.63	17.39	551.23	0.65
HUB	37.06	38.84	-1.78	421.59	699.82	17.39	551.23	0.61

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	494.71	225.89	440.13	1178.24	0.42
MEAN	17.51	506.63	245.36	443.25	1176.40	0.43
HUB	14.85	550.42	320.45	447.52	1174.58	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	549.53	329.04	0.47	4478.68	
MEAN	490.40	506.48	245.05	0.43	4298.78	1.57
HUB	415.99	457.60	95.54	0.39	4761.58	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.60	1.11	20.02	597.41	1.03	576.98	0.92	0.84
MEAN	22.51	1.10	19.81	596.60	1.03	575.17	0.92	0.84
HUB	22.74	1.11	19.56	598.68	1.04	573.39	0.92	0.84

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.17	36.78	31.50	5.28	0.93	0.36	2.90	
MEAN	28.97	28.94	23.50	5.44	0.89	0.37	3.28	0.84
HUB	35.61	12.05	6.50	5.55	0.89	0.40	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.920

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	512.163	246.968	448.684	1176.890	0.435	0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.590	19.831	575.662	46.000	28.830	31.500	2.670

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	462.870	246.968	524.635	1180.985	0.392	0.177

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.567	20.296	579.675	471.992	0.018	0.285

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	448.983	0.000	448.983	1182.061	0.380	0.192

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.373	580.732	0.000	0.060	0.039	0.204

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.801	22.508	1.102	597.562	20.292	265.373	2.057

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
126437.195	0.411	1024.487	1651767.375

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    143.384    3210.000      22.508     597.562       1.000       1.000       0.980
W Kg/sec =   65.17433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.511    2990.693       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 110302.430  112508.234       1.754     513.330     292.736     401.059       1.370

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   421.12    -0.15   421.12     0.36   502.65
 MEAN    16.97     0.00    -0.02   421.12    -0.15   421.12     0.36
 HUB     14.32     0.00    -0.02   421.12    -0.15   421.12     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.03    46.36     5.67   539.52   684.53    20.62   582.76     0.58
 MEAN    48.47    43.80     4.67   475.39   635.20    20.62   582.76     0.54
 HUB     43.62    37.84     5.78   401.14   581.69    20.62   582.76     0.49

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   485.92   221.17   432.67  1198.08     0.41
 MEAN    16.57   496.43   237.43   435.96  1196.13     0.42
 HUB     13.89   536.76   307.59   439.89  1194.15     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   530.93   307.70     0.44  4178.53
 MEAN   464.28   491.45   226.84     0.41  3937.67     1.40
 HUB    389.09   447.38    81.51     0.37  4274.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.84     1.10    22.18   616.34     1.03   596.64     0.92     0.91
 MEAN    24.70     1.10    21.94   615.26     1.03   594.69     0.92     0.91
 HUB     24.89     1.11    21.67   616.77     1.03   592.73     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.08    35.42    31.50     3.92     0.93     0.28     2.90
 MEAN    28.57    27.49    23.50     3.99     0.92     0.28     3.29     0.91
 HUB     34.96    10.50     6.50     4.00     0.92     0.30     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     489.089     238.769     426.845    1197.591       0.408       0.054

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.782      22.091     596.160      46.000      29.222      32.400       3.178

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     446.279     238.769     506.138    1200.943       0.372       0.201

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.760      22.506     599.502     456.573       0.018       0.298

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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    16.096     423.825       0.000     423.825    1202.575       0.352       0.198

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950     22.661     601.133       0.000       0.060       0.040       0.255

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867     24.695       1.097     616.125      18.564     267.803       2.076

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 115713.039       0.414     937.592 1271512.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    143.384    3210.000      24.695     616.125       1.000       1.000       0.980
W Kg/sec =   65.17433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.020    2945.294       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 110302.430  112508.234       1.881     509.668     270.929     390.276       1.441

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   394.90    -0.14   394.90     0.33   470.86
 MEAN    15.91     0.00    -0.02   394.90    -0.14   394.90     0.33
 HUB     13.07     0.00    -0.02   394.90    -0.14   394.90     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.43    47.36     5.07   513.19   647.65    22.92   603.11     0.54
 MEAN    48.47    44.80     3.67   445.76   595.63    22.92   603.11     0.49
 HUB     42.85    38.84     4.01   366.12   538.60    22.92   603.11     0.45

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   458.58   210.66   407.33  1216.86     0.38
 MEAN    15.50   465.51   219.10   410.72  1214.63     0.38
 HUB     12.59   497.89   275.70   414.59  1212.39     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   501.11   291.88     0.41  3781.79
 MEAN   434.13   463.60   215.02     0.38  3397.75     1.40
 HUB    352.68   421.68    76.98     0.35  3472.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.92     1.09    24.40   633.12     1.03   615.57     0.92     0.91
 MEAN    26.69     1.08    24.11   631.39     1.02   613.31     0.92     0.91
 HUB     26.73     1.08    23.80   631.73     1.03   611.04     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.35    35.62    31.50     4.12     0.93     0.28     2.90
 MEAN    28.08    27.63    23.50     4.13     0.92     0.28     3.34     0.91
 HUB     33.62    10.52     6.50     4.02     0.92     0.28     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.990

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     470.475     223.121     414.202    1214.921       0.387      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     26.725      24.097     613.609      46.000      28.310      33.000       4.690

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     438.246     223.121     491.775    1217.337       0.360       0.108

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.681      24.393     616.052     440.827       0.037       0.290

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     409.445       0.000     409.445    1219.348       0.336       0.210

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.657     618.090       0.000       0.060       0.044       0.207

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.856      26.661       1.080     632.078      15.953     289.427       2.244

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  99479.664       0.394     806.057 1318104.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    680750.38   5515.9380    140.0713      1.7648      0.8463      7.9532      1.2090


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 85% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    138.557    3210.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   62.98067

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    135.357    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106589.836  108721.398       2.110     831.557     394.188     619.754       1.572

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   320.57    -0.11   320.57     0.29   575.61
 MEAN    17.06     0.00    -0.02   320.57    -0.11   320.57     0.29
 HUB     12.51     0.00    -0.02   320.57    -0.11   320.57     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.99    50.47    10.52   577.90   660.95    14.26   514.23     0.59
 MEAN    56.15    47.20     8.95   477.90   575.55    14.26   514.23     0.52
 HUB     47.56    38.62     8.94   350.44   475.02    14.26   514.23     0.43

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   548.98   348.69   424.03  1129.39     0.49
 MEAN    18.04   571.41   374.21   431.83  1125.02     0.51
 HUB     15.00   643.66   464.84   445.22  1118.25     0.58
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    577.90   482.01   229.21     0.43  7195.72
 MEAN   505.23   451.27   131.02     0.40  6751.20     1.44
 HUB    420.19   447.46    44.65     0.40  6973.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.29     1.21    15.56   555.19     1.06   530.02     0.92     0.91
 MEAN    18.08     1.20    15.16   553.19     1.06   525.92     0.92     0.91
 HUB     18.19     1.20    14.53   554.19     1.06   519.59     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.43    28.39    24.20     4.19     0.93     0.36     2.90
 MEAN    40.91    16.88    12.70     4.18     0.93     0.31     3.51     0.91
 HUB     46.23    -5.73    -9.30     3.57     0.93     0.17     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     579.080     373.486     442.540    1125.276       0.515      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.159      15.154     526.183      24.000      40.163      35.400      -4.763

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     464.308     373.486     595.881    1135.920       0.409       0.341

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.114      16.143     536.185     528.796       0.024       0.474

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     429.451       0.000     429.451    1138.673       0.377       0.389

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.362     538.787       0.000       0.060       0.044       0.412

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      18.052       1.195     554.191      31.381     200.774       1.556

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 195373.719       0.585    1529.778 1347956.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    138.557    3210.000      18.052     554.191       1.000       1.000       0.980
W Kg/sec =   62.98067

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    116.625    3105.514       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106589.836  108721.398       1.739     590.487     339.644     474.134       1.396

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   409.59    -0.14   409.59     0.36   556.90
 MEAN    18.08     0.00    -0.02   409.59    -0.14   409.59     0.36
 HUB     15.21     0.00    -0.02   409.59    -0.14   409.59     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.57    46.36     8.21   575.66   706.62    16.51   540.18     0.62
 MEAN    51.04    42.30     8.74   506.42   651.44    16.51   540.18     0.57
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HUB     46.14    37.84     8.30   426.07   591.12    16.51   540.18     0.52

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   501.31   277.55   417.47  1159.50     0.43
MEAN    18.01   510.79   286.70   422.74  1156.31     0.44
HUB     15.22   552.63   348.69   428.73  1153.12     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    572.02   510.88   294.47     0.44  5670.38
MEAN   504.50   475.55   217.81     0.41  5165.94     1.49
HUB    426.43   435.72    77.74     0.38  5310.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.84     1.15    18.32   579.70     1.05   558.71     0.92     0.91
MEAN    20.58     1.14    17.99   577.43     1.04   555.64     0.92     0.91
HUB     20.65     1.14    17.64   578.08     1.04   552.58     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.62    35.20    31.50     3.70     0.93     0.34     2.90
MEAN    34.14    27.26    23.50     3.76     0.93     0.34     3.30     0.91
HUB     39.12    10.28     6.50     3.78     0.93     0.34     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     648.554     287.501     581.348    1143.359       0.567      -0.514

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.660      16.604     543.276      46.000      26.314      30.600       4.286

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     588.120     287.501     654.631    1149.907       0.511      -0.275

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      20.617      17.243     549.517     400.556       0.026       0.256

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.823     579.058       0.000     579.058    1150.831       0.503       0.257

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750      17.298     550.400       0.000       0.060       0.044      -0.254

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.872      20.567       1.139     578.400      24.209     232.251       1.800

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 150788.750       0.461    1180.677 1222602.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.945

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    138.557    3210.000      20.567     578.400       1.000       1.000       0.780
W Kg/sec =   62.98067

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.575    3039.827       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106589.836  108721.398       1.426     434.156     304.561     339.175       1.114
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ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	530.98	-0.18	530.98	0.46	532.39
MEAN	17.74	0.00	-0.02	530.98	-0.18	530.98	0.46	
HUB	15.05	0.00	-0.02	530.98	-0.18	530.98	0.46	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.65	46.36	0.29	562.21	773.45	17.79	554.86	0.67
MEAN	43.11	43.40	-0.29	496.90	727.35	17.79	554.86	0.63
HUB	38.46	38.84	-0.38	421.59	678.11	17.79	554.86	0.59

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	483.72	242.99	418.26	1181.86	0.41
MEAN	17.51	494.43	257.92	421.83	1179.60	0.42
HUB	14.85	536.42	325.65	426.26	1177.38	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	521.77	311.94	0.44	4817.34	
MEAN	490.40	481.65	232.48	0.41	4518.56	1.61
HUB	415.99	435.73	90.34	0.37	4838.61	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.99	1.12	20.48	600.06	1.04	580.53	0.92	0.87
MEAN	22.83	1.11	20.23	598.72	1.04	578.31	0.92	0.87
HUB	23.00	1.12	19.94	600.16	1.04	576.13	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.15	36.72	31.50	5.22	0.93	0.38	2.90	
MEAN	31.44	28.86	23.50	5.36	0.90	0.39	3.28	0.87
HUB	37.38	11.97	6.50	5.47	0.90	0.42	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.945

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	499.640	259.614	426.896	1180.094	0.423	0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.912	20.251	578.803	46.000	31.306	31.500	0.194

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	438.932	259.614	509.961	1184.933	0.370	0.222

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.894	20.822	583.560	471.992	0.017	0.322

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	425.888	0.000	425.888	1185.889	0.359	0.234

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.889	584.501	0.000	0.060	0.037	0.247

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.830	22.839	1.110	599.644	21.244	250.017	1.938

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
132371.406	0.430	1036.469	1575697.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

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 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    138.557    3210.000      22.839     599.644       1.000       1.000       0.980
W Kg/sec =   62.98067

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.886    2985.495       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
106589.836  108721.398       1.838     513.330     279.267     401.059       1.436

    ROTOR LEADING EDGE CONDITIONS, STAGE             4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   399.87    -0.14   399.87     0.34   501.77
MEAN    16.97     0.00    -0.02   399.87    -0.14   399.87     0.34
HUB     14.32     0.00    -0.02   399.87    -0.14   399.87     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.46    46.36     7.10   539.52   671.66    21.11   586.30     0.57
MEAN    49.94    43.80     6.14   475.39   621.31    21.11   586.30     0.52
HUB     45.10    37.84     7.26   401.14   566.50    21.11   586.30     0.48

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
TIP     18.88   473.63   238.04   409.47  1202.58     0.39
MEAN    16.57   482.72   249.69   413.13  1200.25     0.40
HUB     13.89   521.13   312.11   417.33  1197.91     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    528.88   502.24   290.83     0.42  4496.89
MEAN   464.28   465.53   214.58     0.39  4140.74     1.45
HUB    389.09   424.38    76.99     0.35  4337.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.39     1.11    22.81   619.85     1.03   601.13     0.92     0.91
MEAN    25.18     1.10    22.52   618.25     1.03   598.81     0.92     0.91
HUB     25.30     1.11    22.21   619.14     1.03   596.47     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.17    35.39    31.50     3.89     0.93     0.31     2.90
MEAN    31.15    27.45    23.50     3.95     0.93     0.31     3.29     0.91
HUB     36.79    10.45     6.50     3.95     0.93     0.32     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     476.236     251.098     404.661    1201.591       0.396       0.052

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.263      22.668     600.153      46.000      31.820      32.400       0.580

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     421.717     251.098     490.811    1205.674       0.350       0.245

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.248      23.197     604.239     456.573       0.016       0.336

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     400.709       0.000     400.709    1207.112       0.332       0.241

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      23.337     605.681       0.000       0.060       0.037       0.296

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      25.189       1.103     619.082      19.438     252.097       1.954

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 121167.789       0.433     948.745 1217708.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    138.557    3210.000      25.189     619.082       1.000       1.000       0.980
W Kg/sec =   62.98067

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.339    2938.253       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106589.836  108721.398       1.981     509.668     257.296     390.276       1.517

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   373.74    -0.13   373.74     0.31   469.73
 MEAN    15.91     0.00    -0.02   373.74    -0.13   373.74     0.31
 HUB     13.07     0.00    -0.02   373.74    -0.13   373.74     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.94    47.36     6.58   513.19   634.96    23.57   607.43     0.53
 MEAN    50.03    44.80     5.23   445.76   581.81    23.57   607.43     0.48
 HUB     44.42    38.84     5.58   366.12   523.28    23.57   607.43     0.43

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   446.60   227.65   384.22  1222.01     0.37
 MEAN    15.50   451.70   231.47   387.88  1219.44     0.37
 HUB     12.59   481.83   280.25   391.94  1216.86     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   472.44   274.90     0.39  4086.31
 MEAN   434.13   437.63   202.66     0.36  3589.30     1.46
 HUB    352.68   398.58    72.42     0.33  3530.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.65     1.10    25.21   637.44     1.03   620.80     0.92     0.91
 MEAN    27.34     1.09    24.87   635.21     1.03   618.18     0.92     0.91
 HUB     27.31     1.08    24.51   634.94     1.03   615.57     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.65    35.58    31.50     4.08     0.93     0.32     2.90
 MEAN    30.83    27.59    23.50     4.09     0.92     0.31     3.34     0.91
 HUB     35.57    10.47     6.50     3.97     0.92     0.30     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     456.670     235.716     391.134    1219.708       0.374      -0.006

    Pt3        Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    27.382     24.854     618.461      46.000      31.075      33.000       1.925

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     412.309     235.716     474.932    1222.875       0.337       0.164

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.355      25.283     621.678     440.827       0.030       0.330

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     385.623       0.000     385.623    1224.621       0.315       0.259

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.519     623.454       0.000       0.060       0.038       0.255

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      27.336       1.085     635.862      16.780     271.074       2.101

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 104646.516       0.414     819.383 1261824.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     704348.19   5515.0522    135.3568      1.8095      0.8572      8.9530      1.2162

*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 85% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    133.793    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   60.81521

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    130.703    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 102924.961  104983.242       2.185     831.557     380.635     619.754       1.628

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   308.61    -0.11   308.61     0.28   575.61
 MEAN    17.06     0.00    -0.02   308.61    -0.11   308.61     0.28
 HUB     12.51     0.00    -0.02   308.61    -0.11   308.61     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.90    50.47    11.43   577.90   655.23    14.32   514.86     0.59
 MEAN    57.15    47.20     9.95   477.90   568.97    14.32   514.86     0.51
 HUB     48.64    38.62    10.02   350.44   467.03    14.32   514.86     0.42

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   542.01   357.81   407.12  1130.96     0.48
 MEAN    18.04   562.16   379.38   414.84  1126.40     0.50
 HUB     15.00   630.27   463.08   427.55  1119.64     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    577.90   462.80   220.08     0.41  7383.91
 MEAN   505.23   433.51   125.85     0.38  6844.35     1.48
 HUB    420.19   429.70    42.90     0.38  6947.60
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.37     1.22    15.69   556.04     1.06   531.50     0.92     0.91
 MEAN    18.12     1.20    15.28   553.61     1.06   527.21     0.92     0.91
 HUB     18.16     1.20    14.64   554.07     1.06   520.90     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.31    28.40    24.20     4.20     0.93     0.39     2.90
 MEAN    42.44    16.88    12.70     4.18     0.94     0.34     3.51     0.91
 HUB     47.28    -5.73    -9.30     3.57     0.94     0.19     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     569.231     378.645     425.031    1126.694       0.505      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.186      15.274     527.510      24.000      41.697      35.400      -6.297

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     445.082     378.645     584.354    1137.871       0.391       0.369

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.135      16.317     538.028     528.796       0.027       0.498

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     412.333       0.000     412.333    1140.348       0.362       0.408

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.504     540.373       0.000       0.060       0.050       0.431

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      18.066       1.196     554.573      31.763     195.211       1.513

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 197755.156       0.592    1495.185 1297660.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    133.793    3210.000      18.066     554.573       1.000       1.000       0.980
W Kg/sec =   60.81521

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.566    3104.443       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 102924.961  104983.242       1.801     590.487     327.823     474.134       1.446

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   393.50    -0.14   393.50     0.34   556.71
 MEAN    18.08     0.00    -0.02   393.50    -0.14   393.50     0.34
 HUB     15.21     0.00    -0.02   393.50    -0.14   393.50     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.65    46.36     9.29   575.66   697.41    16.64   541.64     0.61
 MEAN    52.16    42.30     9.86   506.42   641.43    16.64   541.64     0.56
 HUB     47.29    37.84     9.45   426.07   580.08    16.64   541.64     0.51

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
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     0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   494.29   289.64   400.54  1161.65     0.43
 MEAN    18.01   502.10   295.54   405.92  1158.21     0.43
 HUB     15.22   541.83   351.90   412.00  1154.77     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   490.08   282.38     0.42  5917.15
 MEAN   504.50   456.55   208.97     0.39  5325.02     1.53
 HUB    426.43   418.69    74.54     0.36  5359.03

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.96     1.16    18.51   581.19     1.05   560.79     0.92     0.91
 MEAN    20.66     1.14    18.15   578.53     1.04   557.47     0.92     0.91
 HUB     20.68     1.14    17.78   578.68     1.04   554.16     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.87    35.18    31.50     3.68     0.93     0.37     2.90
 MEAN    36.06    27.24    23.50     3.74     0.94     0.36     3.30     0.91
 HUB     40.50    10.25     6.50     3.75     0.94     0.36     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     628.914     296.364     554.708    1146.677       0.548      -0.478

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.741      16.901     546.435      46.000      28.114      30.600       2.486

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     559.311     296.364     632.978    1153.900       0.485      -0.197

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      20.707      17.630     553.341     400.556       0.023       0.282

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     550.713       0.000     550.713    1154.731       0.477       0.298

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      17.683     554.138       0.000       0.060       0.039      -0.177

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      20.666       1.144     579.464      24.891     222.951       1.728

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 155033.750       0.474    1172.178 1174067.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.965

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    133.793    3210.000      20.666     579.464       1.000       1.000       0.780
W Kg/sec =   60.81521

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.591    3037.035       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 102924.961  104983.242       1.482     434.156     292.960     339.175       1.158

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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 TIP     20.07     0.00    -0.02   506.26    -0.17   506.26     0.44   531.90
 MEAN    17.74     0.00    -0.02   506.26    -0.17   506.26     0.44
 HUB     15.05     0.00    -0.02   506.26    -0.17   506.26     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.01    46.36     1.65   562.21   756.69    18.12   558.07     0.65
 MEAN    44.48    43.40     1.08   496.90   709.49    18.12   558.07     0.61
 HUB     39.80    38.84     0.96   421.59   658.92    18.12   558.07     0.57

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   475.00   258.35   398.60  1185.03     0.40
 MEAN    17.51   484.25   269.24   402.50  1182.43     0.41
 HUB     14.85   524.23   330.31   407.08  1179.88     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   496.82   296.57     0.42  5121.48
 MEAN   490.40   459.26   221.16     0.39  4716.59     1.65
 HUB    415.99   416.00    85.67     0.35  4907.80

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.31     1.13    20.86   602.49     1.04   583.66     0.92     0.88
 MEAN    23.09     1.12    20.57   600.67     1.04   581.09     0.92     0.88
 HUB     23.19     1.12    20.25   601.53     1.04   578.59     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.95    36.65    31.50     5.15     0.93     0.40     2.90
 MEAN    33.78    28.79    23.50     5.29     0.91     0.41     3.28     0.88
 HUB     39.06    11.88     6.50     5.38     0.91     0.43     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.965

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     489.200     271.009     407.273    1182.923       0.414       0.010

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.172      20.596     581.585      46.000      33.641      31.500      -2.141

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     417.622     271.009     497.849    1188.421       0.351       0.263

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.154      21.256     587.004     471.992       0.017       0.357

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     17.121     405.415       0.000     405.415    1189.270       0.341       0.271

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.311     587.842       0.000       0.060       0.038       0.284

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.850      23.097       1.118     601.564      22.100     236.997       1.837

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 137707.453       0.447    1041.177 1504688.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
  RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     133.793    3210.000      23.097     601.564       1.000       1.000       0.980
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W Kg/sec = 60.81521

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
91.700	2980.727	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
102924.961	104983.242	1.922	513.330	267.077	401.059	1.502

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	380.96	-0.13	380.96	0.32	500.97
MEAN	16.97	0.00	-0.02	380.96	-0.13	380.96	0.32	
HUB	14.32	0.00	-0.02	380.96	-0.13	380.96	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.78	46.36	8.42	539.52	660.57	21.51	589.45	0.55
MEAN	51.30	43.80	7.50	475.39	609.31	21.51	589.45	0.51
HUB	46.49	37.84	8.65	401.14	553.31	21.51	589.45	0.46

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	464.08	252.71	389.25	1206.47	0.38
MEAN	16.57	471.53	260.39	393.12	1203.85	0.39
HUB	13.89	507.82	316.04	397.49	1201.22	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	528.88	477.27	276.17	0.40	4773.62	
MEAN	464.28	442.84	203.89	0.37	4317.85	1.50
HUB	389.09	404.15	73.06	0.34	4391.65	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.83	1.12	23.33	623.02	1.04	605.04	0.92	0.91
MEAN	25.56	1.11	23.00	620.97	1.03	602.41	0.92	0.91
HUB	25.61	1.11	22.64	621.30	1.03	599.78	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.99	35.36	31.50	3.86	0.93	0.34	2.90	
MEAN	33.52	27.41	23.50	3.91	0.93	0.34	3.29	0.91
HUB	38.49	10.41	6.50	3.91	0.93	0.34	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	465.778	261.852	385.205	1205.087	0.387	0.050

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.642	23.129	603.656	46.000	34.207	32.400	-1.807

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	400.420	261.852	478.438	1209.794	0.331	0.285

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	25.627	23.753	608.381	456.573	0.016	0.372

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	380.731	0.000	380.731	1211.070	0.314	0.278

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.873	609.664	0.000	0.060	0.038	0.330

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

```
      0.880      25.567       1.107     621.762      20.198     239.076       1.853

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 125914.805       0.450     952.015 1166743.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    133.793    3210.000      25.567     621.762       1.000       1.000       0.980
W Kg/sec =   60.81521

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     84.221    2931.912       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 102924.961  104983.242       2.078     509.668     245.303     390.276       1.591

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   355.39    -0.12   355.39     0.29   468.72
 MEAN    15.91     0.00    -0.02   355.39    -0.12   355.39     0.29
 HUB     13.07     0.00    -0.02   355.39    -0.12   355.39     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.30    47.36     7.94   513.19   624.33    24.09   611.22     0.51
 MEAN    51.44    44.80     6.64   445.76   570.19    24.09   611.22     0.47
 HUB     45.86    38.84     7.02   366.12   510.33    24.09   611.22     0.42

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   437.60   242.05   364.56  1226.43     0.36
 MEAN    15.50   440.74   242.02   368.35  1223.59     0.36
 HUB     12.59   468.50   284.14   372.50  1220.75     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   448.06   260.49     0.37  4344.70
 MEAN   434.13   415.43   192.11     0.34  3752.71     1.51
 HUB    352.68   378.76    68.54     0.31  3578.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.22      1.10    25.84   641.28     1.03   625.30     0.92     0.91
 MEAN    27.85      1.09    25.46   638.62     1.03   622.41     0.92     0.91
 HUB     27.74      1.09    25.06   637.84     1.03   619.53     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.58    35.55    31.50     4.05     0.93     0.35     2.90
 MEAN    33.31    27.54    23.50     4.04     0.93     0.33     3.34     0.91
 HUB     37.34    10.43     6.50     3.93     0.93     0.33     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     445.759     246.460     371.427    1223.839       0.364      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.889      25.444     622.668      46.000      33.566      33.000      -0.566

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     390.495     246.460     461.767    1227.623       0.318       0.211

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      27.868      25.979     626.523     440.827       0.029       0.367

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     365.540       0.000     365.540    1229.164       0.297       0.300

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      26.189     628.097       0.000       0.060       0.037       0.296

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.881      27.848       1.089     639.246      17.484     256.303       1.987

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  109042.406       0.432     824.447 1208754.250

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     725453.62   5485.0024    130.7028      1.8433      0.8606      9.9532      1.2227


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 85% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.987

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     129.093    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   58.67873

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     126.111    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   99309.141  101295.109       2.264     831.557     367.263     619.754       1.687

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   296.92    -0.10   296.92     0.27   575.61
  MEAN    17.06     0.00    -0.02   296.92    -0.10   296.92     0.27
  HUB     12.51     0.00    -0.02   296.92    -0.10   296.92     0.27

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.81    50.47    12.34   577.90   649.80    14.38   515.45     0.58
  MEAN    58.15    47.20    10.95   477.90   562.71    14.38   515.45     0.51
  HUB     49.73    38.62    11.11   350.44   459.39    14.38   515.45     0.41

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
  TIP     20.63   535.87   366.54   390.89  1132.41     0.47
  MEAN    18.04   553.62   384.33   398.48  1127.67     0.49
  HUB     15.00   617.54   461.33   410.53  1120.93     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   444.37   211.36     0.39  7563.90
  MEAN   505.23   416.42   120.90     0.37  6933.53     1.53
  HUB    420.19   412.58    41.14     0.37  6921.21

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.44     1.22    15.81   556.85     1.07   532.86     0.92     0.90
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 MEAN    18.14     1.20    15.38   554.01     1.06   528.41     0.92     0.90
 HUB     18.13     1.20    14.75   553.96     1.06   522.10     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.16    28.40    24.20     4.20     0.93     0.41     2.90
 MEAN    43.96    16.88    12.70     4.18     0.94     0.36     3.51     0.90
 HUB     48.33    -5.72    -9.30     3.58     0.94     0.22     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     560.139     383.584     408.190    1127.998       0.497       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.208      15.381     528.732      24.000      43.220      35.400      -7.820

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     426.733     383.584     573.793    1139.667       0.374       0.396

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.149      16.473     539.728     528.796       0.030       0.522

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     395.956       0.000     395.956    1141.898       0.347       0.426

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.627     541.843       0.000       0.060       0.057       0.449

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      18.072       1.196     554.938      32.128     189.848       1.472

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 200022.594       0.599    1459.200 1248503.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    129.093    3210.000      18.072     554.938       1.000       1.000       0.980
W Kg/sec =   58.67873

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.615    3103.424       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  99309.141  101295.109       1.867     590.487     316.316     474.134       1.499

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   378.07    -0.13   378.07     0.33   556.53
 MEAN    18.08     0.00    -0.02   378.07    -0.13   378.07     0.33
 HUB     15.21     0.00    -0.02   378.07    -0.13   378.07     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.71    46.36    10.35   575.66   688.81    16.75   543.00     0.60
 MEAN    53.26    42.30    10.96   506.42   632.08    16.75   543.00     0.55
 HUB     48.42    37.84    10.58   426.07   569.72    16.75   543.00     0.50

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     20.42   488.34   301.01   384.54  1163.60     0.42
 MEAN    18.01   494.35   303.85   389.94  1159.95     0.43
 HUB     15.22   531.78   354.87   396.05  1156.29     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   470.44   271.01     0.40  6149.25
 MEAN   504.50   438.54   200.65     0.38  5474.71     1.58
 HUB    426.43   402.46    71.56     0.35  5404.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.07     1.17    18.66   582.60     1.05   562.68     0.92     0.90
 MEAN    20.73     1.15    18.29   579.56     1.04   559.16     0.92     0.90
 HUB     20.69     1.14    17.89   579.25     1.04   555.63     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.05    35.17    31.50     3.67     0.93     0.39     2.90
 MEAN    37.93    27.23    23.50     3.73     0.94     0.38     3.30     0.90
 HUB     41.86    10.24     6.50     3.74     0.94     0.37     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     611.369     304.704     530.026    1149.631       0.532      -0.445

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.803      17.155     549.257      46.000      29.894      30.600       0.706

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     532.966     304.704     613.920    1157.445       0.460      -0.126

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      20.775      17.961     556.749     400.556       0.021       0.308

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     524.951       0.000     524.951    1158.181       0.453       0.334

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      18.006     557.457       0.000       0.060       0.037      -0.108

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.874      20.735       1.147     580.469      25.531     214.413       1.662

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 159021.297       0.486    1160.088 1127074.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    129.093    3210.000      20.735     580.469       1.000       1.000       0.780
W Kg/sec =   58.67873

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.818    3034.406       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  99309.141  101295.109       1.540     434.156     281.972     339.175       1.203

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   483.56    -0.17   483.56     0.42   531.44
 MEAN    17.74     0.00    -0.02   483.56    -0.17   483.56     0.42
 HUB     15.05     0.00    -0.02   483.56    -0.17   483.56     0.42
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     49.31    46.36     2.95   562.21   741.69    18.40   560.95     0.64
MEAN    45.79    43.40     2.39   496.90   693.48    18.40   560.95     0.60
HUB     41.09    38.84     2.25   421.59   641.65    18.40   560.95     0.55

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   468.04   272.33   380.65  1187.86     0.39
MEAN    17.51   475.64   279.58   384.79  1184.97     0.40
HUB     14.85   513.45   334.56   389.49  1182.14     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    554.93   474.08   282.59     0.40  5398.28
MEAN   490.40   438.76   210.82     0.37  4897.43     1.70
HUB    415.99   397.91    81.42     0.34  4970.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.58     1.14    21.18   604.74     1.04   586.45     0.92     0.90
MEAN    23.30     1.12    20.85   602.49     1.04   583.60     0.92     0.90
HUB     23.34     1.13    20.50   602.82     1.04   580.81     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.58    36.59    31.50     5.09     0.93     0.42     2.90
MEAN    36.00    28.72    23.50     5.22     0.91     0.43     3.28     0.90
HUB     40.66    11.81     6.50     5.31     0.91     0.45     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.980

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     480.377     281.414     389.317    1185.457       0.405       0.011

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.381      20.878     584.084      46.000      35.861      31.500      -4.361

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     398.303     281.414     487.688    1191.551       0.334       0.302

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      23.359      21.618     590.104     471.992       0.019       0.391

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     386.917       0.000     386.917    1192.304       0.325       0.303

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      21.655     590.851       0.000       0.060       0.043       0.317

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.861      23.296       1.124     603.348      22.880     225.675       1.749

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 142569.406       0.463    1040.069 1437692.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    129.093    3210.000      23.296     603.348       1.000       1.000       0.980
W Kg/sec =   58.67873

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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    87.854    2976.316       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 99309.141  101295.109       2.006     513.330     255.875     401.059       1.567

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   363.84    -0.13   363.84     0.30   500.23
MEAN    16.97     0.00    -0.02   363.84    -0.13   363.84     0.30
HUB     14.32     0.00    -0.02   363.84    -0.13   363.84     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.01    46.36     9.65   539.52   650.84    21.84   592.30     0.55
MEAN    52.58    43.80     8.78   475.39   598.74    21.84   592.30     0.50
HUB     47.80    37.84     9.96   401.14   541.66    21.84   592.30     0.45

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   456.53   265.73   371.23  1209.92     0.38
MEAN    16.57   462.19   269.91   375.20  1207.06     0.38
HUB     13.89   496.22   319.54   379.65  1204.18     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    528.88   455.03   263.15     0.38  5019.40
MEAN   464.28   422.55   194.37     0.35  4475.55     1.55
HUB    389.09   385.96    69.55     0.32  4440.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.19     1.12    23.73   625.91     1.04   608.51     0.92     0.91
MEAN    25.86     1.11    23.37   623.46     1.03   605.63     0.92     0.91
HUB     25.84     1.11    22.99   623.30     1.03   602.75     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.60    35.33    31.50     3.83     0.93     0.37     2.90
MEAN    35.73    27.39    23.50     3.89     0.93     0.36     3.29     0.91
HUB     40.09    10.38     6.50     3.88     0.93     0.36     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     457.084     271.426     367.768    1208.202       0.378       0.048

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.938      23.495     606.787      46.000      36.429      32.400      -4.029

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     381.501     271.426     468.204    1213.456       0.314       0.322

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.919      24.201     612.076     456.573       0.017       0.406

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     363.026       0.000     363.026    1214.594       0.299       0.309

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      24.299     613.224       0.000       0.060       0.042       0.359

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      25.854       1.110     624.223      20.875     227.931       1.767

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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 130136.719       0.465     949.370 1118089.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    129.093    3210.000      25.854     624.223       1.000       1.000       0.980
W Kg/sec =   58.67873

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.520    2926.128       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 99309.141  101295.109       2.173     509.668     234.527     390.276       1.664

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   339.09    -0.12   339.09     0.28   467.79
 MEAN    15.91     0.00    -0.02   339.09    -0.12   339.09     0.28
 HUB     13.07     0.00    -0.02   339.09    -0.12   339.09     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.55    47.36     9.19   513.19   615.20    24.49   614.63     0.51
 MEAN    52.75    44.80     7.95   445.76   560.17    24.49   614.63     0.46
 HUB     47.20    38.84     8.36   366.12   499.11    24.49   614.63     0.41

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   430.69   254.63   347.36  1230.31     0.35
 MEAN    15.50   431.79   251.22   351.19  1227.26     0.35
 HUB     12.59   457.11   287.51   355.36  1224.21     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   426.75   247.92     0.35  4570.18
 MEAN   434.13   395.96   182.91     0.32  3895.12     1.56
 HUB    352.68   361.29    65.16     0.30  3621.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.67     1.11    26.34   644.75     1.03   629.28     0.92     0.91
 MEAN    28.24     1.09    25.92   641.72     1.03   626.16     0.92     0.91
 HUB     28.07     1.09    25.49   640.49     1.03   623.06     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.24    35.52    31.50     4.02     0.93     0.38     2.90
 MEAN    35.58    27.51    23.50     4.01     0.93     0.36     3.34     0.91
 HUB     38.98    10.39     6.50     3.89     0.93     0.35     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     436.860     255.823     354.120    1227.488       0.356      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.278      25.905     626.398      46.000      35.845      33.000      -2.845

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     371.557     255.823     451.110    1231.796       0.302       0.252

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.253      26.524     630.802     440.827       0.030       0.401

    VANED DIFFUSER EXIT:
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   R4          C4           Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     348.080       0.000     348.080    1233.171       0.282       0.334

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.710     632.212       0.000       0.060       0.039       0.329

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      28.231       1.092     642.320      18.097     243.955       1.891

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 112873.625       0.447     823.433 1158217.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    744623.62   5432.1592    126.1111      1.8687      0.8590     10.9531      1.2286


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 85% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =12.015   EfDer =  0.980

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    124.165    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   56.43852

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    121.297    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95517.758   97427.906       2.354     831.557     353.242     619.754       1.754

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   284.77    -0.10   284.77     0.26   575.61
  MEAN    17.06     0.00    -0.02   284.77    -0.10   284.77     0.26
  HUB     12.51     0.00    -0.02   284.77    -0.10   284.77     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.77    50.47    13.30   577.90   644.34    14.44   516.04     0.58
  MEAN    59.22    47.20    12.02   477.90   556.39    14.44   516.04     0.50
  HUB     50.91    38.62    12.29   350.44   451.63    14.44   516.04     0.41

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   530.12   375.40   374.30  1133.82     0.47
  MEAN    18.04   545.22   389.34   381.69  1128.92     0.48
  HUB     15.00   604.68   459.50   393.06  1122.20     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   425.56   202.50     0.38  7746.57
  MEAN   505.23   398.90   115.90     0.35  7023.73     1.59
  HUB    420.19   395.02    39.32     0.35  6893.78

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.50     1.22    15.92   557.67     1.07   534.20     0.92     0.90
  MEAN    18.16     1.20    15.48   554.42     1.06   529.59     0.92     0.90
  HUB     18.10     1.20    14.85   553.83     1.06   523.29     0.92     0.90
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.08    28.41    24.20     4.21     0.93     0.44     2.90
 MEAN    45.57    16.89    12.70     4.19     0.94     0.39     3.51     0.90
 HUB     49.46    -5.71    -9.30     3.59     0.94     0.24     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     551.196     388.579     390.927    1129.275       0.488       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.226      15.482     529.930      24.000      44.827      35.400      -9.427

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     408.055     388.579     563.473    1141.430       0.357       0.424

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.157      16.620     541.398     528.796       0.034       0.547

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     379.239       0.000     379.239    1143.425       0.332       0.444

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.742     543.293       0.000       0.060       0.065       0.467

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.848      18.069       1.196     555.306      32.496     184.342       1.429

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 202314.734       0.606    1419.574 1197425.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =12.015   EfDer =  0.980

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    124.165    3210.000       18.069     555.306       1.000        1.000       0.980
W Kg/sec =   56.43852

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    104.516    3102.395        1.402       0.249      53.349       56.000       0.050

   CFM        SCFM             A1/A*       Area1        A*      AthrRotor  ChokeMargin
  95517.758   97427.906        1.940     590.487     304.380     474.134       1.558

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   362.29    -0.12   362.29      0.32   556.34
 MEAN    18.08      0.00    -0.02   362.29    -0.12   362.29      0.32
 HUB     15.21      0.00    -0.02   362.29    -0.12   362.29      0.32

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     57.82     46.36    11.46   575.66   680.28     16.86   544.35      0.59
 MEAN    54.43     42.30    12.13   506.42   622.77     16.86   544.35      0.54
 HUB     49.63     37.84    11.79   426.07   559.37     16.86   544.35      0.49

     ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     20.42   483.03    312.44    368.37   1165.51      0.41
 MEAN    18.01   487.00    312.24    373.73   1161.66      0.42
 HUB     15.22   521.83    357.86    379.80   1157.79      0.45
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   450.64   259.57     0.39  6382.63
 MEAN   504.50   420.29   192.27     0.36  5625.61     1.62
 HUB    426.43   385.94    68.57     0.33  5449.61

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.16     1.17    18.80   584.01     1.05   564.53     0.92     0.90
 MEAN    20.78     1.15    18.41   580.61     1.05   560.81     0.92     0.90
 HUB     20.69     1.14    17.99   579.82     1.04   557.08     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.30    35.17    31.50     3.67     0.93     0.42     2.90
 MEAN    39.88    27.22    23.50     3.72     0.94     0.40     3.30     0.90
 HUB     43.30    10.23     6.50     3.73     0.94     0.39     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     594.619     313.112     505.503    1152.450       0.516      -0.413

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.851      17.385     551.956      46.000      31.774      30.600      -1.174

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     507.074     313.112     595.956    1160.828       0.437      -0.055

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      20.825      18.264     560.010     400.556       0.020       0.336

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     499.661       0.000     499.661    1161.474       0.430       0.369

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      18.299     560.633       0.000       0.060       0.037      -0.041

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      20.784       1.150     581.481      26.175     206.004       1.597

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 163033.812       0.498    1143.953 1078647.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =12.015   EfDer =  0.991

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    124.165    3210.000      20.784     581.481       1.000       1.000       0.780
W Kg/sec =   56.43852

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      92.981    3031.764       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95517.758   97427.906       1.603     434.156     270.796     339.175       1.253

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   461.11    -0.16   461.11     0.40   530.98
 MEAN    17.74     0.00    -0.02   461.11    -0.16   461.11     0.40
 HUB     15.05     0.00    -0.02   461.11    -0.16   461.11     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.65    46.36     4.29   562.21   727.24    18.65   563.73     0.62
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MEAN    47.15    43.40     3.75   496.90   678.00    18.65   563.73     0.58
HUB     42.45    38.84     3.61   421.59   624.89    18.65   563.73     0.54

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   462.18   286.04   363.03  1190.57     0.39
MEAN    17.51   467.86   289.75   367.34  1187.42     0.39
HUB     14.85   503.19   338.73   372.11  1184.32     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    554.93   451.76   268.89     0.38  5669.69
MEAN   490.40   418.57   200.65     0.35  5075.31     1.74
HUB    415.99   380.05    77.26     0.32  5032.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.81     1.15    21.46   606.97     1.04   589.14     0.92     0.91
MEAN    23.48     1.13    21.10   604.30     1.04   586.03     0.92     0.91
HUB     23.46     1.13    20.72   604.11     1.04   582.97     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.24    36.53    31.50     5.03     0.93     0.45     2.90
MEAN    38.27    28.65    23.50     5.15     0.92     0.45     3.28     0.91
HUB     42.31    11.73     6.50     5.23     0.92     0.46     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.991

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     472.413     291.650     371.637    1187.896       0.398       0.011

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.558      21.123     586.495      46.000      38.124      31.500      -6.624

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     379.423     291.650     478.562    1194.574       0.318       0.340

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      23.529      21.938     593.108     471.992       0.022       0.426

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.121     368.882       0.000     368.882    1195.237       0.309       0.334

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      21.955     593.766       0.000       0.060       0.051       0.347

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4         PR4       Texit        Del T       Ns        Ns nondim
     0.867      23.456       1.129     605.126      23.645     214.997       1.667

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 147341.516       0.478    1033.846 1370038.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =12.015   EfDer =  0.991

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
   124.165    3210.000      23.456     605.126       1.000       1.000       0.980
W Kg/sec =   56.43852

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    84.049    2971.941       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 95517.758   97427.906       2.097     513.330     244.795     401.059       1.638

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   347.10    -0.12   347.10     0.29   499.49
MEAN    16.97     0.00    -0.02   347.10    -0.12   347.10     0.29
HUB     14.32     0.00    -0.02   347.10    -0.12   347.10     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.25    46.36    10.89   539.52   641.63    22.12   595.07     0.54
MEAN    53.87    43.80    10.07   475.39   588.72    22.12   595.07     0.49
HUB     49.14    37.84    11.30   401.14   530.55    22.12   595.07     0.44

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   450.11   278.19   353.85  1213.21     0.37
MEAN    16.57   453.79   279.06   357.85  1210.13     0.37
HUB     13.89   485.29   322.85   362.31  1207.05     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    528.88   433.65   250.68     0.36  5254.59
MEAN   464.28   402.94   185.22     0.33  4627.15     1.60
HUB    389.09   368.32    66.24     0.31  4486.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.48     1.13    24.08   628.74     1.04   611.83     0.92     0.91
MEAN    26.11     1.11    23.69   625.92     1.03   608.73     0.92     0.91
HUB     26.02     1.11    23.28   625.29     1.03   605.63     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.17    35.32    31.50     3.82     0.93     0.40     2.90
MEAN    37.95    27.37    23.50     3.87     0.94     0.39     3.29     0.91
HUB     41.70    10.36     6.50     3.86     0.94     0.38     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.991

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     449.298     280.630     350.878    1211.191       0.371       0.045

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.179      23.804     609.801      46.000      38.653      32.400      -6.253

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     363.305     280.630     459.068    1216.968       0.299       0.358

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.155      24.585     615.633     456.573       0.020       0.440

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     346.025       0.000     346.025    1217.979       0.284       0.338

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      24.656     616.656       0.000       0.060       0.050       0.386

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.867      26.079       1.112     626.648      21.522     217.580       1.687

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 134177.078       0.480     941.475 1068455.375
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =12.015   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    124.165    3210.000      26.079     626.648       1.000       1.000       0.980
W Kg/sec =   56.43852

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     76.926    2920.460       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 95517.758   97427.906       2.275     509.668     224.060     390.276       1.742

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   323.40    -0.11   323.40     0.27   466.89
MEAN    15.91     0.00    -0.02   323.40    -0.11   323.40     0.27
HUB     13.07     0.00    -0.02   323.40    -0.11   323.40     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.79    47.36    10.43   513.19   606.68    24.83   617.92     0.50
MEAN    54.05    44.80     9.25   445.76   550.81    24.83   617.92     0.45
HUB     48.55    38.84     9.71   366.12   488.59    24.83   617.92     0.40

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   424.94   266.48   331.00  1233.99     0.34
MEAN    15.50   423.86   259.91   334.81  1230.77     0.34
HUB     12.59   446.53   290.68   338.96  1227.54     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    502.54   406.56   236.06     0.33  4782.71
MEAN   434.13   377.43   174.22     0.31  4029.75     1.61
HUB    352.68   344.58    62.00     0.28  3661.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     29.03     1.11    26.74   648.13     1.03   633.07     0.92     0.91
MEAN    28.55     1.09    26.30   644.75     1.03   629.76     0.92     0.91
HUB     28.32     1.09    25.84   643.09     1.03   626.46     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.84    35.50    31.50     4.00     0.93     0.40     2.90
MEAN    37.82    27.49    23.50     3.99     0.93     0.38     3.34     0.91
HUB     40.61    10.37     6.50     3.87     0.93     0.37     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     428.997     264.676     337.617    1230.969       0.349       -0.008

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    28.588      26.283     629.970      46.000      38.095      33.000      -5.095

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     353.661     264.676     441.734    1235.766       0.286       0.291

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      28.556      26.976     634.889     440.827       0.034       0.435

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     331.564       0.000     331.564    1236.995       0.268       0.366
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   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.138     636.152       0.000       0.060       0.045       0.360

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      28.529       1.094     645.323      18.675     232.680       1.804

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 116486.672       0.461     817.348 1106738.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    763353.81   5356.1958    121.2965      1.8884      0.8533     12.0155      1.2343


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 85% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc =12.953   EfDer =  0.974

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.869    3210.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   54.48574

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    117.100    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92212.828   94056.891       2.438     831.557     341.020     619.754       1.817

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   274.27    -0.09   274.27     0.25   575.61
 MEAN    17.06     0.00    -0.02   274.27    -0.09   274.27     0.25
 HUB     12.51     0.00    -0.02   274.27    -0.09   274.27     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     64.61    50.47    14.14   577.90   639.76    14.48   516.53     0.57
 MEAN    60.15    47.20    12.95   477.90   551.09    14.48   516.53     0.49
 HUB     51.96    38.62    13.34   350.44   445.08    14.48   516.53     0.40

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   525.65   382.90   360.14  1134.98     0.46
 MEAN    18.04   538.34   393.55   367.32  1129.95     0.48
 HUB     15.00   593.81   457.87   378.11  1123.24     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    577.90   409.54   195.00     0.36  7901.24
 MEAN   505.23   383.93   111.68     0.34  7099.73     1.64
 HUB    420.19   379.98    37.69     0.34  6869.28

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.55     1.23    16.01   558.37     1.07   535.29     0.92     0.89
 MEAN    18.18     1.20    15.56   554.76     1.06   530.55     0.92     0.89
 HUB     18.07     1.20    14.93   553.72     1.06   524.27     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.76    28.43    24.20     4.23     0.93     0.46     2.90
 MEAN    46.97    16.91    12.70     4.21     0.94     0.41     3.51     0.89
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 HUB     50.45    -5.69    -9.30     3.61     0.94     0.26     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     543.861     392.788     376.168    1130.319       0.481       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.237      15.562     530.910      24.000      46.238      35.400     -10.838

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     392.172     392.788     555.051    1142.874       0.343       0.448

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.160      16.737     542.769     528.796       0.038       0.570

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     364.984       0.000     364.984    1144.682       0.319       0.459

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.831     544.489       0.000       0.060       0.073       0.482

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.838      18.062       1.196     555.615      32.805     179.630       1.392

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 204239.797       0.612    1383.497 1153266.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =12.953   EfDer =  0.973

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.869    3210.000      18.062     555.615       1.000       1.000       0.980
W Kg/sec =   54.48574

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.971    3101.531       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92212.828   94056.891       2.008     590.487     294.056     474.134       1.612

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   348.81    -0.12   348.81     0.30   556.19
 MEAN    18.08     0.00    -0.02   348.81    -0.12   348.81     0.30
 HUB     15.21     0.00    -0.02   348.81    -0.12   348.81     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.79    46.36    12.43   575.66   673.19    16.94   545.46     0.59
 MEAN    55.45    42.30    13.15   506.42   615.02    16.94   545.46     0.54
 HUB     50.70    37.84    12.86   426.07   550.73    16.94   545.46     0.48

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   479.06   322.01   354.69  1167.06     0.41
 MEAN    18.01   481.16   319.28   359.97  1163.05     0.41
 HUB     15.22   513.59   360.35   365.96  1159.03     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   433.94   250.00     0.37  6578.01
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 MEAN   504.50   404.83   185.23     0.35  5752.34     1.67
 HUB    426.43   371.88    66.09     0.32  5487.39

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.23     1.18    18.90   585.20     1.05   566.04     0.92     0.89
 MEAN    20.81     1.15    18.49   581.49     1.05   562.16     0.92     0.89
 HUB     20.68     1.14    18.07   580.30     1.04   558.27     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.24    35.18    31.50     3.68     0.93     0.44     2.90
 MEAN    41.57    27.23    23.50     3.73     0.94     0.42     3.30     0.89
 HUB     44.56    10.24     6.50     3.74     0.94     0.41     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     581.191     320.173     485.048    1154.709       0.503      -0.386

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.881      17.560     554.124      46.000      33.428      30.600      -2.828

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     485.669     320.173     581.709    1163.541       0.417       0.003

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      20.854      18.495     562.634     400.556       0.021       0.361

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     478.783       0.000     478.783    1164.115       0.411       0.397

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      18.520     563.188       0.000       0.060       0.039       0.014

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      20.810       1.152     582.330      26.715     199.066       1.543

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 166394.594       0.509    1127.138 1037072.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =12.953   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.869    3210.000      20.810     582.330       1.000       1.000       0.780
W Kg/sec =   54.48574

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.717    3029.554       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92212.828   94056.891       1.662     434.156     261.293     339.175       1.298

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   442.44    -0.15   442.44     0.38   530.59
 MEAN    17.74     0.00    -0.02   442.44    -0.15   442.44     0.38
 HUB     15.05     0.00    -0.02   442.44    -0.15   442.44     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.81    46.36     5.45   562.21   715.55    18.84   565.99     0.61
 MEAN    48.33    43.40     4.93   496.90   665.45    18.84   565.99     0.57
 HUB     43.63    38.84     4.79   421.59   611.25    18.84   565.99     0.52
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      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   458.10   297.32   348.51  1192.75     0.38
MEAN    17.51   461.97   298.12   352.90  1189.41     0.39
HUB     14.85   495.01   342.16   357.71  1186.10     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    554.93   433.39   257.61     0.36  5892.90
MEAN   490.40   401.89   192.28     0.34  5221.72     1.79
HUB    415.99   365.25    73.83     0.31  5083.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.98     1.15    21.66   608.82     1.05   591.31     0.92     0.91
MEAN    23.60     1.13    21.27   605.81     1.04   587.99     0.92     0.91
HUB     23.53     1.13    20.87   605.18     1.04   584.73     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.47    36.47    31.50     4.97     0.93     0.47     2.90
MEAN    40.19    28.58    23.50     5.08     0.92     0.46     3.28     0.91
HUB     43.73    11.66     6.50     5.16     0.92     0.47     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     466.382     300.074     357.026    1189.866       0.392       0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.680      21.297     588.447      46.000      40.046      31.500      -8.546

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     363.914     300.074     471.675    1197.025       0.304       0.372

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.643      22.173     595.549     471.992       0.025       0.457

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     354.087       0.000     354.087    1197.617       0.296       0.357

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.169     596.138       0.000       0.060       0.060       0.371

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.868      23.557       1.132     606.605      24.275     206.488       1.601

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 151268.453       0.491    1024.675 1312892.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =12.953   EfDer =  0.985

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    119.869    3210.000      23.557     606.605       1.000       1.000       0.980
W Kg/sec =   54.48574

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.890    2968.317       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92212.828   94056.891       2.179     513.330     235.596     401.059       1.702

     ROTOR LEADING EDGE CONDITIONS, STAGE            4
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   333.34    -0.11   333.34     0.28   498.89
MEAN    16.97     0.00    -0.02   333.34    -0.11   333.34     0.28
HUB     14.32     0.00    -0.02   333.34    -0.11   333.34     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.30    46.36    11.94   539.52   634.29    22.32   597.33     0.53
MEAN    54.97    43.80    11.17   475.39   580.71    22.32   597.33     0.48
HUB     50.28    37.84    12.44   401.14   521.65    22.32   597.33     0.44

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   445.55   288.28   339.72  1215.85     0.37
MEAN    16.57   447.42   286.47   343.69  1212.62     0.37
HUB     13.89   476.61   325.53   348.12  1209.37     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    528.88   416.29   240.60     0.34  5444.86
MEAN   464.28   386.96   177.81     0.32  4749.79     1.64
HUB    389.09   353.87    63.56     0.29  4523.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.69     1.13    24.32   631.07     1.04   614.51     0.92     0.90
MEAN    26.27     1.12    23.91   627.95     1.04   611.24     0.92     0.90
HUB     26.14     1.11    23.48   626.93     1.03   607.97     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.32    35.31    31.50     3.81     0.93     0.42     2.90
MEAN    39.81    27.36    23.50     3.86     0.94     0.41     3.29     0.90
HUB     43.08    10.35     6.50     3.85     0.94     0.40     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.985

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     443.409     288.076     337.081    1213.605       0.365       0.043

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.339      24.017     612.243      46.000      40.518      32.400      -8.118

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     348.523     288.076     452.168    1219.804       0.286       0.387

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.308      24.857     618.514     456.573       0.023       0.469

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     332.223       0.000     332.223    1220.717       0.272       0.361

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      24.904     619.440       0.000       0.060       0.058       0.407

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.858      26.221       1.113     628.651      22.046     209.408       1.623

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 137446.406       0.491     931.046 1026163.062


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =12.953   EfDer =  0.990
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   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.869    3210.000      26.221     628.651       1.000       1.000       0.980
W Kg/sec =   54.48574

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     73.982    2915.805       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 92212.828   94056.891       2.365     509.668     215.485     390.276       1.811

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   310.64    -0.11   310.64     0.25   466.14
MEAN    15.91     0.00    -0.02   310.64    -0.11   310.64     0.25
HUB     13.07     0.00    -0.02   310.64    -0.11   310.64     0.25

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.82    47.36    11.46   513.19   599.98    25.07   620.60     0.49
MEAN    55.13    44.80    10.33   445.76   543.41    25.07   620.60     0.44
HUB     49.69    38.84    10.85   366.12   480.23    25.07   620.60     0.39

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   420.92   275.97   317.83  1236.95     0.34
MEAN    15.50   417.91   266.89   321.59  1233.59     0.34
HUB     12.59   438.21   293.19   325.67  1230.22     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    502.54   390.32   226.57     0.32  4952.90
MEAN   434.13   362.47   167.24     0.29  4137.81     1.66
HUB    352.68   331.06    59.48     0.27  3692.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     29.27     1.12    27.02   650.90     1.04   636.12     0.92     0.91
MEAN    28.76     1.10    26.56   647.23     1.03   632.67     0.92     0.91
HUB     28.47     1.09    26.08   645.24     1.03   629.22     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.97    35.48    31.50     3.98     0.93     0.43     2.90
MEAN    39.69    27.48    23.50     3.98     0.94     0.41     3.34     0.91
HUB     42.00    10.35     6.50     3.85     0.94     0.38     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.990

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     423.117     271.781     324.288    1233.771       0.343      -0.009

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    28.789      26.537     632.854      46.000      39.966      33.000      -6.966

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     339.301     271.781     434.730    1238.956       0.274       0.321

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      28.746      27.285     638.185     440.827       0.039       0.465

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    14.701     318.301       0.000     318.301    1240.074       0.257       0.390

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      27.427     639.337       0.000       0.060       0.053       0.383
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    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      28.714       1.095     647.789      19.138     223.885       1.736

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  119380.570       0.473     808.670 1062902.875

    OVERALL EXIT CONDITIONS; ALL          5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     778729.81   5275.0269    117.0996      1.9007      0.8458     12.9533      1.2391


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 85% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =13.991   EfDer =  0.966

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     115.171    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   52.35062

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     112.511    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   88599.312   90371.109       2.538     831.557     327.656     619.754       1.891

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   262.87    -0.09   262.87     0.24   575.61
  MEAN    17.06     0.00    -0.02   262.87    -0.09   262.87     0.24
  HUB     12.51     0.00    -0.02   262.87    -0.09   262.87     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     65.54    50.47    15.07   577.90   634.96    14.53   517.04     0.57
  MEAN    61.19    47.20    13.99   477.90   545.50    14.53   517.04     0.49
  HUB     53.13    38.62    14.51   350.44   438.14    14.53   517.04     0.39

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   521.31   390.88   344.94  1136.16     0.46
  MEAN    18.04   531.27   398.03   351.87  1131.00     0.47
  HUB     15.00   582.30   456.08   362.02  1124.32     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   392.38   187.02     0.35  8065.68
  MEAN   505.23   367.84   107.20     0.33  7180.46     1.69
  HUB    420.19   363.80    35.89     0.32  6842.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.60     1.23    16.09   559.11     1.07   536.41     0.92     0.88
  MEAN    18.19     1.20    15.63   555.12     1.06   531.55     0.92     0.88
  HUB     18.03     1.19    15.02   553.60     1.06   525.28     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     48.57    28.47    24.20     4.27     0.93     0.49     2.90
  MEAN    48.52    16.94    12.70     4.24     0.95     0.43     3.51     0.88
  HUB     51.56    -5.66    -9.30     3.64     0.95     0.29     4.78
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     536.314     397.259     360.303    1131.392       0.474       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.245      15.640     531.918      24.000      47.793      35.400     -12.393

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     375.173     397.259     546.415    1144.364       0.328       0.473

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.158      16.854     544.186     528.796       0.042       0.595

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     349.682       0.000     349.682    1145.986       0.305       0.475

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.918     545.729       0.000       0.060       0.083       0.497

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.826      18.048       1.195     555.942      33.132     174.554       1.353

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 206278.094       0.618    1342.548 1105350.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.991   EfDer =  0.964

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.171    3210.000      18.048     555.942       1.000       1.000       0.980
W Kg/sec =   52.35062

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.116    3100.618       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88599.312   90371.109       2.088     590.487     282.829     474.134       1.676

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   334.32    -0.12   334.32     0.29   556.03
 MEAN    18.08     0.00    -0.02   334.32    -0.12   334.32     0.29
 HUB     15.21     0.00    -0.02   334.32    -0.12   334.32     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.86    46.36    13.50   575.66   665.80    17.01   546.61     0.58
 MEAN    56.57    42.30    14.27   506.42   606.91    17.01   546.61     0.53
 HUB     51.89    37.84    14.05   426.07   541.67    17.01   546.61     0.47

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   475.39   332.16   340.10  1168.66     0.41
 MEAN    18.01   475.34   326.72   345.26  1164.49     0.41
 HUB     15.22   504.97   362.93   351.11  1160.31     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   416.17   239.86     0.36  6785.03
 MEAN   504.50   388.34   177.78     0.33  5886.31     1.72
 HUB    426.43   356.81    63.51     0.31  5526.59
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.29     1.18    18.99   586.46     1.05   567.59     0.92     0.88
MEAN    20.83     1.15    18.57   582.42     1.05   563.55     0.92     0.88
HUB     20.66     1.14    18.13   580.80     1.04   559.51     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.32    35.19    31.50     3.69     0.93     0.46     2.90
MEAN    43.42    27.25    23.50     3.75     0.95     0.44     3.30     0.88
HUB     45.95    10.25     6.50     3.75     0.95     0.43     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.964

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     567.598     327.638     463.488    1156.998       0.491       -0.359

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.902      17.727     556.326      46.000      35.256      30.600      -4.656

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     463.273     327.638     567.423    1166.298       0.397       0.065

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      20.871      18.718     565.306     400.556       0.023       0.388

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.823     456.968       0.000     456.968    1166.798       0.392       0.425

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      18.730     565.790       0.000       0.060       0.044       0.070

    STAGE EXIT CONDITIONS, STAGE            2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.852      20.822       1.154     583.227      27.285     191.826       1.487

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 169945.438       0.519    1106.079  992227.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =13.991   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.171    3210.000      20.822     583.227       1.000       1.000       0.780
W Kg/sec =   52.35062

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.220    3027.222       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88599.312   90371.109       1.729     434.156     251.107     339.175       1.351

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   422.84    -0.15   422.84     0.36   530.18
 MEAN    17.74     0.00    -0.02   422.84    -0.15   422.84     0.36
 HUB     15.05     0.00    -0.02   422.84    -0.15   422.84     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.06    46.36     6.70   562.21   703.59    19.02   568.30     0.60
 MEAN    49.61    43.40     6.21   496.90   652.57    19.02   568.30     0.56
 HUB     44.92    38.84     6.08   421.59   597.21    19.02   568.30     0.51

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
```

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	454.56	309.00	333.39	1194.97	0.38
MEAN	17.51	456.34	306.81	337.81	1191.43	0.38
HUB	14.85	486.71	345.69	342.62	1187.93	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	414.28	245.92	0.35	6124.29	
MEAN	490.40	384.48	183.60	0.32	5373.69	1.84
HUB	415.99	349.75	70.29	0.29	5135.76	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.13	1.16	21.84	610.76	1.05	593.51	0.92	0.91
MEAN	23.71	1.14	21.42	607.39	1.04	590.00	0.92	0.91
HUB	23.57	1.13	21.00	606.32	1.04	586.54	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.83	36.41	31.50	4.91	0.93	0.49	2.90	
MEAN	42.25	28.52	23.50	5.02	0.93	0.48	3.28	0.91
HUB	45.26	11.59	6.50	5.09	0.93	0.49	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	460.615	308.819	341.756	1191.877	0.386	0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.780	21.450	590.444	46.000	42.102	31.500	-10.602

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	347.783	308.819	465.104	1199.537	0.290	0.406

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.733	22.386	598.058	471.992	0.030	0.490

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	338.705	0.000	338.705	1200.059	0.282	0.381

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.359	598.578	0.000	0.060	0.072	0.394

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.864	23.632	1.135	608.155	24.928	197.882	1.534

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
155337.672	0.504	1011.006	1252068.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =13.991 EfDer = 0.978

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
115.171	3210.000	23.632	608.155	1.000	1.000	0.980

W Kg/sec = 52.35062

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
77.573	2964.531	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
88599.312	90371.109	2.272	513.330	225.935	401.059	1.775

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	319.01	-0.11	319.01	0.27	498.25

```
 MEAN    16.97     0.00    -0.02   319.01    -0.11   319.01     0.27
 HUB     14.32     0.00    -0.02   319.01    -0.11   319.01     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.41    46.36    13.05   539.52   626.87    22.50   599.66     0.52
 MEAN    56.14    43.80    12.34   475.39   572.60    22.50   599.66     0.48
 HUB     51.51    37.84    13.67   401.14   512.61    22.50   599.66     0.43

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   441.44   298.61   325.12  1218.53     0.36
 MEAN    16.57   441.27   294.05   329.02  1215.15     0.36
 HUB     13.89   467.84   328.23   333.37  1211.75     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   398.40   230.27     0.33  5639.85
 MEAN   464.28   370.45   170.23     0.30  4875.34     1.70
 HUB    389.09   338.89    60.86     0.28  4560.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.85     1.14    24.52   633.50     1.04   617.24     0.92     0.89
 MEAN    26.40     1.12    24.10   630.06     1.04   613.81     0.92     0.89
 HUB     26.21     1.11    23.65   628.65     1.03   610.38     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.57    35.31    31.50     3.81     0.93     0.45     2.90
 MEAN    41.79    27.36    23.50     3.86     0.94     0.43     3.29     0.89
 HUB     44.55    10.35     6.50     3.85     0.94     0.42     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     437.749     295.699     322.778    1216.073       0.360       0.041

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.466      24.197     614.746      46.000      42.493      32.400     -10.093

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     333.269     295.699     445.540    1222.703       0.273       0.419

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.426      25.095     621.468     456.573       0.027       0.501

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     317.980       0.000     317.980    1223.521       0.260       0.383

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.115     622.299       0.000       0.060       0.069       0.427

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.845      26.324       1.114     630.737      22.581     201.198       1.560

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 140789.625       0.503     916.321  980803.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.991   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.171    3210.000      26.324     630.736       1.000       1.000       0.980
W Kg/sec =   52.35062
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
70.920	2910.980	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
88599.312	90371.109	2.467	509.668	206.571	390.276	1.889

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	297.45	-0.10	297.45	0.24	465.37
MEAN	15.91	0.00	-0.02	297.45	-0.10	297.45	0.24	
HUB	13.07	0.00	-0.02	297.45	-0.10	297.45	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.91	47.36	12.55	513.19	593.25	25.26	623.36	0.48
MEAN	56.29	44.80	11.49	445.76	535.98	25.26	623.36	0.44
HUB	50.92	38.84	12.08	366.12	471.80	25.26	623.36	0.39

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	417.38	285.66	304.32	1239.95	0.34
MEAN	15.50	412.24	274.02	307.98	1236.47	0.33
HUB	12.59	429.87	295.73	311.97	1232.97	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	502.54	373.69	216.89	0.30	5126.61	
MEAN	434.13	347.11	160.11	0.28	4248.25	1.71
HUB	352.68	317.13	56.95	0.26	3724.61	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	29.47	1.12	27.24	653.76	1.04	639.23	0.92	0.90
MEAN	28.91	1.10	26.77	649.82	1.03	635.64	0.92	0.90
HUB	28.58	1.09	26.28	647.46	1.03	632.05	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.19	35.48	31.50	3.98	0.93	0.45	2.90	
MEAN	41.66	27.47	23.50	3.97	0.94	0.43	3.34	0.90
HUB	43.47	10.34	6.50	3.84	0.94	0.40	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.983

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	417.524	279.043	310.582	1236.629	0.338	-0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
28.944	26.747	635.806	46.000	41.938	33.000	-8.938

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	324.606	279.043	428.058	1242.210	0.261	0.352

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	28.888	27.548	641.558	440.827	0.045	0.496

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	304.718	0.000	304.718	1243.220	0.245	0.414

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	27.668	642.602	0.000	0.060	0.062	0.406

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.855	28.850	1.096	650.347	19.610	215.105	1.667

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 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  122332.148       0.484     796.191 1015902.812

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     794682.94   5172.1460    112.5109      1.9097      0.8355     13.9913      1.2439


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 85% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =15.004   EfDer =  0.958

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     110.644    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   50.29289

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     108.088    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   85116.758   86818.906       2.642     831.557     314.777     619.754       1.969

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   251.97    -0.09   251.97     0.23   575.61
  MEAN    17.06     0.00    -0.02   251.97    -0.09   251.97     0.23
  HUB     12.51     0.00    -0.02   251.97    -0.09   251.97     0.23

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     66.45    50.47    15.98   577.90   630.52    14.58   517.51     0.57
  MEAN    62.20    47.20    15.00   477.90   540.33    14.58   517.51     0.48
  HUB     54.29    38.62    15.67   350.44   431.69    14.58   517.51     0.39

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   517.64   398.35   330.55  1137.23     0.46
  MEAN    18.04   524.87   402.22   337.21  1131.96     0.46
  HUB     15.00   571.52   454.31   346.75  1125.30     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   376.17   179.55     0.33  8219.77
  MEAN   505.23   352.59   103.01     0.31  7255.95     1.76
  HUB    420.19   348.43    34.13     0.31  6815.80

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.64     1.23    16.16   559.80     1.07   537.42     0.92     0.88
  MEAN    18.19     1.20    15.70   555.46     1.06   532.45     0.92     0.88
  HUB     18.00     1.19    15.09   553.48     1.06   526.20     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     50.31    28.51    24.20     4.31     0.93     0.51     2.90
  MEAN    50.02    16.99    12.70     4.29     0.95     0.46     3.51     0.88
  HUB     52.65    -5.62    -9.30     3.68     0.95     0.31     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.958
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ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	529.487	401.440	345.257	1132.362	0.468	0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.249	15.707	532.831	24.000	49.303	35.400	-13.903

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	359.110	401.440	538.622	1145.720	0.313	0.497

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.153	16.956	545.476	528.796	0.047	0.620

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	335.173	0.000	335.173	1147.176	0.292	0.489

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.992	546.864	0.000	0.060	0.093	0.511

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.814	18.030	1.194	556.247	33.437	169.728	1.316

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
208174.281	0.623	1301.633	1059510.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =15.004 EfDer = 0.955

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
110.644	3210.000	18.030	556.247	1.000	1.000	0.980

W Kg/sec = 50.29289

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
93.415	3099.769	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85116.758	86818.906	2.170	590.487	272.053	474.134	1.743

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	320.56	-0.11	320.56	0.28	555.87
MEAN	18.08	0.00	-0.02	320.56	-0.11	320.56	0.28	
HUB	15.21	0.00	-0.02	320.56	-0.11	320.56	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.89	46.36	14.53	575.66	658.99	17.08	547.67	0.57
MEAN	57.67	42.30	15.37	506.42	599.44	17.08	547.67	0.52
HUB	53.05	37.84	15.21	426.07	533.28	17.08	547.67	0.46

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	472.46	341.63	326.35	1170.10	0.40
MEAN	18.01	470.25	333.68	331.35	1165.80	0.40
HUB	15.22	497.04	365.31	337.04	1161.48	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	572.02	399.48	230.38	0.34	6978.39	
MEAN	504.50	372.79	170.82	0.32	6011.60	1.77
HUB	426.43	342.54	61.12	0.29	5562.82	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.33	1.18	19.06	587.64	1.06	569.00	0.92	0.87
MEAN	20.85	1.16	18.63	583.29	1.05	564.82	0.92	0.87

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 HUB     20.63     1.14    18.18   581.27     1.04   560.64     0.92     0.87

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.31    35.22    31.50     3.72     0.93     0.48     2.90
 MEAN    45.20    27.27    23.50     3.77     0.95     0.46     3.30     0.87
 HUB     47.30    10.28     6.50     3.78     0.95     0.45     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.955

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     555.481     334.619     443.384    1159.045       0.479      -0.333

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.911      17.866     558.299      46.000      37.042      30.600      -6.442

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     442.522     334.619     554.793    1168.775       0.379       0.121

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      20.874      18.906     567.712     400.556       0.026       0.415

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     436.780       0.000     436.780    1169.209       0.374       0.449

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      18.903     568.134       0.000       0.060       0.050       0.120

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.841      20.818       1.155     584.064      27.817     185.137       1.435

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 173258.922       0.530    1083.321  949564.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =15.004   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    110.644    3210.000      20.818     584.064       1.000       1.000       0.780
W Kg/sec =   50.29289

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     82.907    3025.053       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85116.758   86818.906       1.798     434.156     241.459     339.175       1.405

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   404.62    -0.14   404.62     0.35   529.80
 MEAN    17.74     0.00    -0.02   404.62    -0.14   404.62     0.35
 HUB     15.05     0.00    -0.02   404.62    -0.14   404.62     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.26    46.36     7.90   562.21   692.79    19.17   570.40     0.59
 MEAN    50.85    43.40     7.45   496.90   640.91    19.17   570.40     0.55
 HUB     46.19    38.84     7.35   421.59   584.44    19.17   570.40     0.50

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   451.94   319.72   319.43  1196.96     0.38
```

MEAN	17.51	451.63	314.81	323.83	1193.27	0.38
HUB	14.85	479.29	348.92	328.60	1189.60	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	396.69	235.21	0.33	6336.37	
MEAN	490.40	368.37	175.59	0.31	5513.70	1.89
HUB	415.99	335.37	67.07	0.28	5183.50	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.24	1.16	21.97	612.55	1.05	595.50	0.92	0.91
MEAN	23.78	1.14	21.54	608.85	1.04	591.83	0.92	0.91
HUB	23.59	1.13	21.09	607.37	1.04	588.19	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.03	36.37	31.50	4.87	0.93	0.51	2.90	
MEAN	44.19	28.47	23.50	4.97	0.93	0.50	3.28	0.91
HUB	46.72	11.54	6.50	5.04	0.93	0.50	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	455.792	316.875	327.622	1193.691	0.382	0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.846	21.561	592.249	46.000	44.045	31.500	-12.545

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	332.912	316.875	459.608	1201.816	0.277	0.437

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.789	22.552	600.339	471.992	0.034	0.521

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	324.517	0.000	324.517	1202.277	0.270	0.403

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.502	600.800	0.000	0.060	0.084	0.415

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.858	23.672	1.137	609.591	25.527	190.153	1.474

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
159071.578	0.517	994.613	1194875.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =15.004 EfDer = 0.970

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
110.644	3210.000	23.672	609.591	1.000	1.000	0.980

W Kg/sec = 50.29289

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
74.485	2961.038	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85116.758	86818.906	2.366	513.330	216.943	401.059	1.849

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	305.77	-0.11	305.77	0.25	497.66
MEAN	16.97	0.00	-0.02	305.77	-0.11	305.77	0.25	
HUB	14.32	0.00	-0.02	305.77	-0.11	305.77	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.46	46.36	14.10	539.52	620.24	22.63	601.79	0.52
MEAN	57.26	43.80	13.46	475.39	565.33	22.63	601.79	0.47
HUB	52.69	37.84	14.85	401.14	504.47	22.63	601.79	0.42

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	438.22	308.01	311.72	1220.96	0.36
MEAN	16.57	436.03	300.95	315.52	1217.45	0.36
HUB	13.89	459.99	330.66	319.78	1213.92	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	528.88	382.04	220.87	0.31	5817.19	
MEAN	464.28	355.29	163.33	0.29	4989.62	1.75
HUB	389.09	325.07	58.44	0.27	4594.34	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.97	1.14	24.67	635.73	1.04	619.71	0.92	0.89
MEAN	26.48	1.12	24.23	632.01	1.04	616.15	0.92	0.89
HUB	26.25	1.11	23.77	630.24	1.03	612.58	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.66	35.32	31.50	3.82	0.93	0.47	2.90	
MEAN	43.65	27.37	23.50	3.87	0.94	0.45	3.29	0.89
HUB	45.96	10.36	6.50	3.86	0.94	0.44	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.970

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	432.956	302.638	309.614	1218.306	0.355	0.038

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
26.545	24.323	617.017	46.000	44.347	32.400	-11.947

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	319.282	302.638	439.921	1225.330	0.261	0.447

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	26.497	25.274	624.152	456.573	0.031	0.531

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	304.908	0.000	304.908	1226.065	0.249	0.403

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	25.268	624.901	0.000	0.060	0.080	0.445

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.833	26.380	1.114	632.659	23.068	193.851	1.503

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
143827.234	0.514	899.296	937841.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =15.004 EfDer = 0.977

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
110.644	3210.000	26.380	632.659	1.000	1.000	0.980

W Kg/sec = 50.29289

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
68.093	2906.554	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85116.758	86818.906	2.570	509.668	198.336	390.276	1.968

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	285.33	-0.10	285.33	0.23	464.66
MEAN	15.91	0.00	-0.02	285.33	-0.10	285.33	0.23	
HUB	13.07	0.00	-0.02	285.33	-0.10	285.33	0.23	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.93	47.36	13.57	513.19	587.26	25.40	625.87	0.48
MEAN	57.38	44.80	12.58	445.76	529.35	25.40	625.87	0.43
HUB	52.08	38.84	13.24	366.12	464.25	25.40	625.87	0.38

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	414.65	294.42	291.97	1242.67	0.33
MEAN	15.50	407.43	280.46	295.53	1239.08	0.33
HUB	12.59	422.43	298.00	299.41	1235.47	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	502.54	358.56	208.12	0.29	5283.73	
MEAN	434.13	333.09	153.67	0.27	4348.05	1.77
HUB	352.68	304.36	54.68	0.25	3753.08	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	29.60	1.12	27.40	656.39	1.04	642.05	0.92	0.89
MEAN	29.01	1.10	26.91	652.19	1.03	638.34	0.92	0.89
HUB	28.64	1.09	26.41	649.51	1.03	634.63	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.24	35.48	31.50	3.98	0.93	0.48	2.90	
MEAN	43.50	27.47	23.50	3.97	0.94	0.45	3.34	0.89
HUB	44.86	10.35	6.50	3.85	0.94	0.42	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.977

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	412.791	285.605	298.037	1239.214	0.333	-0.012

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
29.039	26.890	638.483	46.000	43.780	33.000	-10.780

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	311.209	285.605	422.399	1245.153	0.250	0.380

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	28.969	27.736	644.617	440.827	0.052	0.525

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	292.322	0.000	292.322	1246.071	0.235	0.435

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	27.835	645.568	0.000	0.060	0.073	0.426

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.843	28.923	1.096	652.696	20.037	207.298	1.607

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
124997.289	0.495	781.560	971391.312

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   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    809329.31   5060.4229    108.0884      1.9146      0.8239     15.0041      1.2484



**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

   Fan-Core + 4 Stage LPC 85% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 5.485   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3210.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    151.988    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.879     831.557     442.622     619.754       1.400

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   364.35    -0.13   364.35     0.33   575.61
 MEAN    17.06     0.00    -0.02   364.35    -0.13   364.35     0.33
 HUB     12.51     0.00    -0.02   364.35    -0.13   364.35     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.77    50.47     7.30   577.90   683.28    14.02   511.72     0.62
 MEAN    52.68    47.20     5.48   477.90   601.05    14.02   511.72     0.54
 HUB     43.89    38.62     5.27   350.44   505.62    14.02   511.72     0.46

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   580.98   313.11   489.39  1122.67     0.52
 MEAN    18.04   610.17   354.17   496.86  1119.22     0.55
 HUB     15.00   696.70   471.42   512.98  1112.42     0.63

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    577.90   556.43   264.79     0.50  6462.03
 MEAN   505.23   519.31   151.06     0.46  6389.98     1.29
 HUB    420.19   515.53    51.23     0.46  7072.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.96     1.19    14.96   551.89     1.06   523.70     0.92     0.91
 MEAN    17.92     1.19    14.64   551.56     1.06   520.47     0.92     0.91
 HUB     18.25     1.21    14.00   554.64     1.06   514.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.61    28.42    24.20     4.22     0.93     0.26     2.90
 MEAN    35.48    16.91    12.70     4.21     0.92     0.22     3.51     0.91
 HUB     42.58    -5.70    -9.30     3.60     0.92     0.09     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
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    18.071     620.425     353.483     509.879    1119.233       0.554      -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.007      14.611     520.547      24.000      34.732      35.400       0.668

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     540.228     353.483     645.598    1127.560       0.479       0.233

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.966      15.350     528.321     528.796       0.022       0.390

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    18.083     496.594       0.000     496.594    1131.585       0.439       0.308

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.691     532.100       0.000       0.060       0.037       0.330

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.876      17.913       1.186     552.697      29.887     222.023       1.721

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 186072.547       0.557    1635.966 1532079.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.485   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3210.000      17.913     552.697       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    131.792    3109.708       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.538     590.487     383.813     474.134       1.235

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   472.33    -0.16   472.33     0.42   557.66
 MEAN    18.08     0.00    -0.02   472.33    -0.16   472.33     0.42
 HUB     15.21     0.00    -0.02   472.33    -0.16   472.33     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.64    46.36     4.28   575.66   744.76    15.89   534.07     0.66
 MEAN    47.00    42.30     4.70   506.42   692.62    15.89   534.07     0.61
 HUB     42.06    37.84     4.22   426.07   636.22    15.89   534.07     0.56

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   537.22   227.89   486.49  1149.97     0.47
 MEAN    18.01   550.83   250.80   490.43  1148.04     0.48
 HUB     15.22   598.32   335.61   495.33  1146.07     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   595.90   344.12     0.52  4656.88
 MEAN   504.50   552.17   253.71     0.48  4519.76     1.35
 HUB    426.43   503.59    90.83     0.44  5111.45

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.17     1.13    17.36   573.64     1.04   549.55     0.92     0.91
 MEAN    20.10     1.12    17.16   573.03     1.04   547.69     0.92     0.91
 HUB     20.40     1.14    16.93   575.69     1.04   545.80     0.92     0.91
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	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.10	35.27	31.50	3.77	0.93	0.25	2.90	
MEAN	27.08	27.35	23.50	3.85	0.92	0.26	3.30	0.91
HUB	34.12	10.39	6.50	3.89	0.92	0.28	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	884.723	251.499	848.223	1106.466	0.800	-1.279

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.189	13.243	508.759	46.000	16.515	30.600	14.085

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	901.389	251.499	935.818	1103.818	0.817	-1.394

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	19.971	12.879	506.280	361.848	0.081	0.063

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	913.228	0.000	913.228	1102.444	0.828	-0.254

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	12.464	504.550	0.000	0.060	0.216	-1.530

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.658	19.558	1.092	574.120	21.423	273.360	2.119

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
133432.328	0.408	1173.148	1405627.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 5.485 EfDer = 0.765

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
155.582	3210.000	19.558	574.120	1.000	1.000	0.710

W Kg/sec = 70.71914

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
123.024	3051.137	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
119686.578	122080.047	1.103	395.194	358.295	307.469	0.858

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	773.14	-0.27	773.14	0.69	534.37
MEAN	17.74	0.00	-0.02	773.14	-0.27	773.14	0.69	
HUB	15.05	0.00	-0.02	773.14	-0.27	773.14	0.69	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	36.04	46.36	-10.32	562.21	956.10	14.24	524.22	0.85
MEAN	32.74	43.40	-10.66	496.90	919.19	14.24	524.22	0.82
HUB	28.62	38.84	-10.22	421.59	880.74	14.24	524.22	0.78

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	543.93	146.97	523.70	1163.44	0.47
MEAN	17.51	556.07	185.72	524.14	1163.86	0.48
HUB	14.85	602.47	290.55	527.78	1164.18	0.52

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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   663.85   407.96     0.57  2916.78
 MEAN   490.40   606.26   304.69     0.52  3255.97     1.58
 HUB    415.99   542.48   125.44     0.47  4318.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.67     1.06    17.79   587.24     1.02   562.54     0.92     0.70
 MEAN    20.80     1.06    17.79   588.76     1.03   562.95     0.92     0.70
 HUB     21.22     1.09    17.68   593.54     1.03   563.24     0.92     0.70

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.68    37.92    31.50     6.42     0.93     0.33     2.90
 MEAN    19.51    30.17    23.50     6.67     0.84     0.37     3.28     0.70
 HUB     28.83    13.37     6.50     6.87     0.84     0.43     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.765

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     563.437     186.935     531.523    1164.216       0.484      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.868      17.776     563.344      46.000      19.377      31.500      12.123

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     559.020     186.935     589.447    1164.643       0.480      -0.006

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.767      17.735     563.758     471.992       0.042       0.148

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     543.003       0.000     543.003    1166.164       0.466       0.005

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.790     565.231       0.000       0.060       0.082       0.011

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.569      20.643       1.055     589.846      15.726     360.699       2.796

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  97976.391       0.318     861.417 2210183.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.485   EfDer =  0.940

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3210.000      20.643     589.846       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.142    3010.189       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 119686.578  122080.047       1.492     513.330     344.091     401.059       1.166

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   506.58    -0.17   506.58     0.43   505.92
 MEAN    16.97     0.00    -0.02   506.58    -0.17   506.58     0.43
 HUB     14.32     0.00    -0.02   506.58    -0.17   506.58     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.81    46.36     0.45   539.52   740.20    18.14   568.43     0.63
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MEAN    43.19    43.80    -0.61   475.39   694.83    18.14   568.43     0.59
HUB     38.39    37.84     0.55   401.14   646.28    18.14   568.43     0.55

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   552.40   148.98   531.93  1178.27     0.47
MEAN    16.57   563.55   185.69   532.08  1178.43     0.48
HUB     13.89   606.88   288.49   533.92  1178.38     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    528.88   653.66   379.90     0.55  2816.05
MEAN   464.28   600.60   278.59     0.51  3080.56     1.24
HUB    389.09   543.32   100.61     0.46  4009.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.00     1.07    18.93   602.51     1.02   577.04     0.92     0.86
MEAN    22.14     1.07    18.93   603.70     1.02   577.19     0.92     0.86
HUB     22.60     1.09    18.86   607.87     1.03   577.14     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     15.65    35.53    31.50     4.03     0.93     0.15     2.90
MEAN    19.24    27.64    23.50     4.14     0.90     0.18     3.29     0.86
HUB     28.38    10.67     6.50     4.17     0.90     0.22     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.940

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     552.581     186.734     520.074    1180.424       0.468       0.056

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.213      19.114     579.208      46.000      19.751      32.400      12.649

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     553.898     186.734     584.527    1180.301       0.469       0.031

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.104      19.006     579.086     456.573       0.043       0.162

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    16.096     525.886       0.000     525.886    1182.870       0.445       0.018

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      19.173     581.611       0.000       0.060       0.085       0.081

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.712      21.963       1.064     604.691      14.845     347.400       2.693

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  92511.352       0.331     813.368 1435034.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.485   EfDer =  0.908

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    155.582    3210.000      21.963     604.691       1.000       1.000       0.980
W Kg/sec =   70.71914

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.434    2973.010       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
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119686.578  122080.047       1.556     509.668     327.477     390.276       1.192

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   487.16    -0.17   487.16     0.41   475.29
MEAN    15.91     0.00    -0.02   487.16    -0.17   487.16     0.41
HUB     13.07     0.00    -0.02   487.16    -0.17   487.16     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     46.50    47.36    -0.86   513.19   707.71    19.55   584.89     0.60
MEAN    42.47    44.80    -2.33   445.76   660.44    19.55   584.89     0.56
HUB     36.94    38.84    -1.90   366.12   609.50    19.55   584.89     0.51

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   530.79   132.20   514.06  1193.22     0.44
MEAN    15.50   539.77   162.68   514.67  1193.09     0.45
HUB     12.59   576.24   254.85   516.82  1192.79     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    502.54   633.57   370.34     0.53  2374.79
MEAN   434.13   581.87   271.45     0.49  2523.81     1.22
HUB    352.68   525.99    97.82     0.44  3210.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.11     1.05    20.17   615.36     1.02   591.86     0.92     0.83
MEAN    23.18     1.06    20.14   616.03     1.02   591.73     0.92     0.83
HUB     23.52     1.07    20.05   619.12     1.02   591.42     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     14.42    35.77    31.50     4.27     0.93     0.14     2.90
MEAN    17.54    27.81    23.50     4.31     0.89     0.16     3.34     0.83
HUB     26.25    10.72     6.50     4.22     0.89     0.19     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.908

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     545.440     165.662     519.674    1193.344       0.457      -0.011

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.207      20.107     592.018      46.000      17.681      33.000      15.319

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     564.771     165.662     588.567    1191.537       0.474      -0.140

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.953      19.677     590.227     440.827       0.101       0.143

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    14.701     523.436       0.000     523.436    1195.320       0.438       0.002

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      20.112     593.980       0.000       0.060       0.103      -0.002

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.628      22.946       1.045     616.840      12.149     394.434       3.058

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  75731.461       0.300     665.837 1494209.125

   OVERALL EXIT CONDITIONS; ALL          5   STAGES
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   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     585724.06   5149.7363    151.9881      1.5189      0.7079      5.4850      1.1799


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 85% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     153.237    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   69.65320

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     149.697    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  117882.562  120239.961       1.907     831.557     435.951     619.754       1.422

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   358.22    -0.12   358.22     0.32   575.61
  MEAN    17.06     0.00    -0.02   358.22    -0.12   358.22     0.32
  HUB     12.51     0.00    -0.02   358.22    -0.12   358.22     0.32

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.21    50.47     7.74   577.90   680.02    14.05   512.09     0.61
  MEAN    53.15    47.20     5.95   477.90   597.35    14.05   512.09     0.54
  HUB     44.38    38.62     5.76   350.44   501.21    14.05   512.09     0.45

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   575.83   318.33   479.84  1123.72     0.51
  MEAN    18.04   604.23   357.10   487.42  1120.12     0.54
  HUB     15.00   688.82   470.47   503.13  1113.31     0.62

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   545.55   259.57     0.49  6569.64
  MEAN   505.23   509.43   148.14     0.45  6442.69     1.31
  HUB    420.19   505.63    50.28     0.45  7058.54

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.01     1.19    15.05   552.37     1.06   524.68     0.92     0.91
  MEAN    17.95     1.19    14.72   551.80     1.06   521.31     0.92     0.91
  HUB     18.24     1.21    14.09   554.57     1.06   514.95     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     33.56    28.41    24.20     4.21     0.93     0.28     2.90
  MEAN    36.23    16.91    12.70     4.21     0.92     0.23     3.51     0.91
  HUB     43.08    -5.71    -9.30     3.59     0.92     0.10     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.999

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     614.075     356.402     500.066    1120.172       0.548      -0.007

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     18.033      14.697     521.420      24.000      35.478      35.400      -0.078

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     528.924     356.402     637.795    1128.870       0.469       0.249

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.994      15.478     529.549     528.796       0.021       0.401

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     486.649       0.000     486.649    1132.685       0.430       0.320

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.801     533.135       0.000       0.060       0.037       0.342

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      17.942       1.188     552.916      30.106     218.943       1.697

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 187435.969       0.561    1623.114 1506272.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3210.000      17.942     552.916       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    129.626    3109.092       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.564     590.487     377.504     474.134       1.256

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   463.08    -0.16   463.08     0.41   557.55
 MEAN    18.08     0.00    -0.02   463.08    -0.16   463.08     0.41
 HUB     15.21     0.00    -0.02   463.08    -0.16   463.08     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.19    46.36     4.83   575.66   738.93    15.99   535.01     0.65
 MEAN    47.57    42.30     5.27   506.42   686.34    15.99   535.01     0.60
 HUB     42.63    37.84     4.79   426.07   629.38    15.99   535.01     0.55

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   531.02   235.48   475.96  1151.50     0.46
 MEAN    18.01   544.29   256.23   480.20  1149.35     0.47
 HUB     15.22   591.21   337.61   485.34  1147.17     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   582.92   336.54     0.51  4811.71
 MEAN   504.50   540.58   248.27     0.47  4617.65     1.37
 HUB    426.43   493.40    88.82     0.43  5141.87

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.28     1.13    17.53   574.56     1.04   551.01     0.92     0.91
 MEAN    20.18     1.12    17.31   573.69     1.04   548.95     0.92     0.91
 HUB     20.45     1.14    17.06   576.04     1.04   546.86     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.32    35.26    31.50     3.76     0.93     0.27     2.90
 MEAN    28.08    27.34    23.50     3.84     0.92     0.27     3.30     0.91
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 HUB     34.82    10.37     6.50     3.87     0.92     0.28     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     854.747     256.953     815.210    1111.872       0.769      -1.197

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.273      13.706     513.755      46.000      17.495      30.600      13.105

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     854.583     256.953     892.377    1111.911       0.769      -1.235

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      20.085      13.582     513.780     361.848       0.072       0.098

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     856.756       0.000     856.756    1111.818       0.771      -0.123

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      13.338     513.493       0.000       0.060       0.180      -1.316

    STAGE EXIT CONDITIONS, STAGE            2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.711      19.763       1.102     574.764      21.848     266.717       2.068

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 136076.438       0.416    1178.363 1379340.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.771

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    153.237    3210.000      19.763     574.764       1.000       1.000       0.710
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    119.982    3049.429       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.131     395.194     349.433     307.469       0.880

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   739.07    -0.25   739.07     0.66   534.07
 MEAN    17.74     0.00    -0.02   739.07    -0.25   739.07     0.66
 HUB     15.05     0.00    -0.02   739.07    -0.25   739.07     0.66

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     37.27    46.36    -9.09   562.21   928.76    14.81   529.16     0.82
 MEAN    33.93    43.40    -9.47   496.90   890.72    14.81   529.16     0.79
 HUB     29.72    38.84    -9.12   421.59   850.99    14.81   529.16     0.75

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   531.75   161.63   506.59  1166.57     0.46
 MEAN    17.51   544.38   196.56   507.66  1166.51     0.47
 HUB     14.85   590.83   295.48   511.64  1166.37     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   641.35   393.30     0.55  3206.92
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 MEAN   490.40   586.57   293.84     0.50  3445.58     1.59
 HUB    415.99   525.64   120.51     0.45  4391.64

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.01     1.06    18.22   589.18     1.03   565.58     0.92     0.71
 MEAN    21.10     1.07    18.18   590.26     1.03   565.52     0.92     0.71
 HUB     21.48     1.09    18.03   594.51     1.03   565.37     0.92     0.71

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.70    37.82    31.50     6.32     0.93     0.34     2.90
 MEAN    21.17    30.06    23.50     6.56     0.85     0.37     3.28     0.71
 HUB     30.01    13.25     6.50     6.75     0.85     0.43     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.771

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     551.378     197.848     514.659    1166.896       0.473      -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.169      18.165     565.937      46.000      21.028      31.500      10.472

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     539.002     197.848     574.167    1168.057       0.461       0.027

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.090      18.222     567.064     471.992       0.036       0.171

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     523.326       0.000     523.326    1169.488       0.447       0.039

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.285     568.454       0.000       0.060       0.071       0.047

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.601      20.982       1.062     591.318      16.554     339.341       2.631

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 103137.961       0.335     893.130 2130747.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.956

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3210.000      20.982     591.318       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    114.627    3006.441       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.538     513.330     333.852     401.059       1.201

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   488.86    -0.17   488.86     0.42   505.29
 MEAN    16.97     0.00    -0.02   488.86    -0.17   488.86     0.42
 HUB     14.32     0.00    -0.02   488.86    -0.17   488.86     0.42

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.83    46.36     1.47   539.52   728.18    18.61   571.37     0.62
 MEAN    44.21    43.80     0.41   475.39   682.01    18.61   571.37     0.58
 HUB     39.38    37.84     1.54   401.14   632.48    18.61   571.37     0.54
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      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   536.35   164.51   510.50  1182.58     0.45
MEAN    16.57   548.08   196.73   511.55  1182.21     0.46
HUB     13.89   591.37   292.54   513.94  1181.70     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    528.88   627.20   364.37     0.53  3109.13
MEAN   464.28   577.29   267.54     0.49  3263.46     1.26
HUB    389.09   522.93    96.55     0.44  4065.78

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.54     1.07    19.57   605.29     1.02   581.29     0.92     0.87
MEAN    22.61     1.08    19.51   605.99     1.02   580.92     0.92     0.87
HUB     23.03     1.10    19.41   609.60     1.03   580.41     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     17.86    35.52    31.50     4.02     0.93     0.18     2.90
MEAN    21.04    27.61    23.50     4.11     0.90     0.20     3.29     0.87
HUB     29.65    10.64     6.50     4.14     0.90     0.23     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.956

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     537.883     197.838     500.179    1184.096       0.454       0.056

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.695      19.696     582.813      46.000      21.580      32.400      10.820

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     530.212     197.838     565.919    1184.790       0.448       0.065

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.612      19.705     583.497     456.573       0.036       0.188

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     503.366       0.000     503.366    1187.139       0.424       0.054

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.872     585.813       0.000       0.060       0.073       0.116

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.759      22.490       1.072     606.959      15.642     328.134       2.544

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  97480.969       0.349     844.143 1401419.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.931

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    153.237    3210.000      22.490     606.959       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.346    2967.449       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.615     509.668     315.571     390.276       1.237

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   466.99    -0.16   466.99     0.39   474.40
MEAN    15.91     0.00    -0.02   466.99    -0.16   466.99     0.39
HUB     13.07     0.00    -0.02   466.99    -0.16   466.99     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     47.71    47.36     0.35   513.19   693.98    20.22   588.76     0.58
MEAN    43.68    44.80    -1.12   445.76   645.70    20.22   588.76     0.54
HUB     38.11    38.84    -0.73   366.12   593.50    20.22   588.76     0.50

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   512.33   149.93   489.90  1198.54     0.43
MEAN    15.50   521.69   175.30   491.35  1197.85     0.44
HUB     12.59   557.99   259.50   493.98  1197.06     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    502.54   603.60   352.61     0.50  2692.70
MEAN   434.13   555.35   258.83     0.46  2719.30     1.25
HUB    352.68   502.69    93.18     0.42  3269.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.85     1.06    21.03   619.06     1.02   597.16     0.92     0.85
MEAN    23.87     1.06    20.95   619.18     1.02   596.47     0.92     0.85
HUB     24.15     1.07    20.81   621.65     1.02   595.67     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     17.02    35.75    31.50     4.25     0.93     0.17     2.90
MEAN    19.64    27.78    23.50     4.28     0.90     0.18     3.34     0.85
HUB     27.71    10.68     6.50     4.18     0.90     0.21     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.931

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     527.071     178.515     495.920    1198.141       0.440      -0.009

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.896      20.919     596.785      46.000      19.797      33.000      13.203

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     534.885     178.515     563.888    1197.446       0.447      -0.087

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      23.704      20.667     596.093     440.827       0.084       0.171

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    14.701     497.006       0.000     497.006    1200.717       0.414       0.043

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      21.051     599.354       0.000       0.060       0.089       0.040

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.699      23.688       1.053     619.964      13.004     366.946       2.845

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  81070.750       0.321     702.037 1457175.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    605202.12   5240.7861    149.6973      1.5680      0.7408      5.9530      1.1858
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 85% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     150.746    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   68.52104

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     147.264    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  115966.477  118285.555       1.939     831.557     428.865     619.754       1.445

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   351.74    -0.12   351.74     0.32   575.61
  MEAN    17.06     0.00    -0.02   351.74    -0.12   351.74     0.32
  HUB     12.51     0.00    -0.02   351.74    -0.12   351.74     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.68    50.47     8.21   577.90   676.63    14.09   512.48     0.61
  MEAN    53.65    47.20     6.45   477.90   593.48    14.09   512.48     0.53
  HUB     44.90    38.62     6.28   350.44   496.60    14.09   512.48     0.45

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   570.63   323.74   469.91  1124.78     0.51
  MEAN    18.04   598.14   360.13   477.58  1121.03     0.53
  HUB     15.00   680.68   469.48   492.87  1114.23     0.61

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   534.24   254.16     0.47  6681.23
  MEAN   505.23   499.14   145.11     0.45  6497.30     1.33
  HUB    420.19   495.33    49.29     0.44  7043.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.06     1.20    15.15   552.88     1.06   525.68     0.92     0.91
  MEAN    17.98     1.19    14.81   552.05     1.06   522.17     0.92     0.91
  HUB     18.24     1.21    14.17   554.51     1.06   515.81     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     34.56    28.41    24.20     4.21     0.93     0.29     2.90
  MEAN    37.02    16.90    12.70     4.20     0.93     0.25     3.51     0.91
  HUB     43.61    -5.71    -9.30     3.59     0.93     0.11     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     607.572     359.426     489.853    1121.128       0.542      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.059      14.785     522.311      24.000      36.269      35.400      -0.869

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	517.261	359.426	629.878	1130.197	0.458	0.265

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.021	15.607	530.796	528.796	0.021	0.413

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	476.367	0.000	476.367	1133.805	0.420	0.333

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.911	534.189	0.000	0.060	0.037	0.355

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	17.968	1.189	553.143	30.333	215.735	1.672

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
188849.547	0.565	1608.773	1479027.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 6.453 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
150.746	3210.000	17.968	553.143	1.000	1.000	0.980

W Kg/sec = 68.52104

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
127.356	3108.454	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
115966.477	118285.555	1.592	590.487	370.893	474.134	1.278

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	453.51	-0.16	453.51	0.40	557.43
MEAN	18.08	0.00	-0.02	453.51	-0.16	453.51	0.40	
HUB	15.21	0.00	-0.02	453.51	-0.16	453.51	0.40	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.78	46.36	5.42	575.66	732.96	16.10	535.97	0.65
MEAN	48.16	42.30	5.86	506.42	679.91	16.10	535.97	0.60
HUB	43.22	37.84	5.38	426.07	622.36	16.10	535.97	0.55

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	524.95	243.24	465.19	1153.04	0.46
MEAN	18.01	537.75	261.83	469.71	1150.67	0.47
HUB	15.22	583.98	339.64	475.06	1148.29	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	572.02	569.65	328.77	0.49	4970.19	
MEAN	504.50	528.69	242.67	0.46	4718.42	1.39
HUB	426.43	482.93	86.80	0.42	5172.68	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.39	1.13	17.69	575.50	1.04	552.49	0.92	0.91
MEAN	20.26	1.13	17.44	574.37	1.04	550.22	0.92	0.91
HUB	20.50	1.14	17.18	576.41	1.04	547.93	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.60	35.25	31.50	3.75	0.93	0.28	2.90	
MEAN	29.14	27.32	23.50	3.82	0.92	0.28	3.30	0.91
HUB	35.56	10.35	6.50	3.85	0.92	0.29	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     827.575     262.568     784.818    1116.703       0.741      -1.125

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.355      14.128     518.234      46.000      18.498      30.600      12.102

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     814.936     262.568     856.191    1118.572       0.729      -1.104

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      20.194      14.180     519.967     361.848       0.065       0.125

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     811.756       0.000     811.756    1119.145       0.725      -0.029

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      14.043     520.409       0.000       0.060       0.151      -1.151

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.752      19.940       1.110     575.426      22.283     260.071       2.016

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 138785.188       0.424    1182.285 1351848.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.784

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.746    3210.000      19.940     575.426       1.000       1.000       0.710
W Kg/sec =   68.52104

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    117.054    3047.674       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 115966.477  118285.555       1.159     395.194     340.905     307.469       0.902

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   709.16    -0.24   709.16     0.63   533.77
 MEAN    17.74     0.00    -0.02   709.16    -0.24   709.16     0.63
 HUB     15.05     0.00    -0.02   709.16    -0.24   709.16     0.63

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     38.42    46.36    -7.94   562.21   905.13    15.31   533.44     0.80
 MEAN    35.03    43.40    -8.37   496.90   866.06    15.31   533.44     0.76
 HUB     30.75    38.84    -8.09   421.59   825.14    15.31   533.44     0.73

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   520.66   175.38   490.23  1169.51     0.45
 MEAN    17.51   533.47   206.76   491.77  1169.02     0.46
 HUB     14.85   579.64   300.09   495.92  1168.48     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   619.98   379.55     0.53  3479.24
 MEAN   490.40   567.71   283.64     0.49  3624.07     1.60
 HUB    415.99   509.28   115.89     0.44  4460.03
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.33     1.07    18.61   591.07     1.03   568.44     0.92     0.72
MEAN    21.39     1.07    18.54   591.72     1.03   567.96     0.92     0.72
HUB     21.73     1.09    18.37   595.48     1.03   567.43     0.92     0.72

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     19.69    37.75    31.50     6.25     0.93     0.35     2.90
MEAN    22.80    29.98    23.50     6.48     0.86     0.38     3.28     0.72
HUB     31.18    13.15     6.50     6.65     0.86     0.43     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.784

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     540.118     208.121     498.410    1169.438       0.462      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.454      18.532     568.403      46.000      22.664      31.500       8.836

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     520.045     208.121     560.144    1171.265       0.444       0.059

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.392      18.682     570.179     471.992       0.031       0.195

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     17.121     504.735       0.000     504.735    1172.609       0.430       0.073

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.750     571.489       0.000       0.060       0.062       0.082

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.634      21.299       1.068     592.757      17.332     321.145       2.489

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 107986.930       0.351     919.920 2058646.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.746    3210.000      21.299     592.757       1.000       1.000       0.980
W Kg/sec =   68.52104

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.219    3002.788       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 115966.477  118285.555       1.585     513.330     323.926     401.059       1.238

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   472.02    -0.16   472.02     0.40   504.68
 MEAN    16.97     0.00    -0.02   472.02    -0.16   472.02     0.40
 HUB     14.32     0.00    -0.02   472.02    -0.16   472.02     0.40

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.83    46.36     2.47   539.52   716.98    19.06   574.16     0.61
 MEAN    45.21    43.80     1.41   475.39   670.04    19.06   574.16     0.57
 HUB     40.37    37.84     2.53   401.14   619.56    19.06   574.16     0.53

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   522.21   179.00   490.57  1186.55     0.44
MEAN    16.57   534.12   207.07   492.35  1185.73     0.45
HUB     13.89   577.10   296.34   495.20  1184.81     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    528.88   602.56   349.88     0.51  3382.66
MEAN   464.28   555.48   257.21     0.47  3434.65     1.29
HUB    389.09   503.82    92.75     0.43  4118.53

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.04     1.08    20.17   607.96     1.03   585.21     0.92     0.89
MEAN    23.07     1.08    20.07   608.20     1.03   584.39     0.92     0.89
HUB     23.43     1.10    19.92   611.27     1.03   583.48     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     20.05    35.50    31.50     4.00     0.93     0.20     2.90
MEAN    22.81    27.58    23.50     4.08     0.91     0.22     3.29     0.89
HUB     30.90    10.61     6.50     4.11     0.91     0.25     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.970

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     524.652     208.231     481.559    1187.504       0.442       0.056

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.148      20.241     586.171      46.000      23.384      32.400       9.016

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     508.436     208.231     549.424    1188.919       0.428       0.098

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.086      20.356     587.569     456.573       0.030       0.214

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     482.670       0.000     482.670    1191.073       0.405       0.090

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.522     589.701       0.000       0.060       0.063       0.151

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.797      22.982       1.079     609.144      16.386     311.371       2.414

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102126.734       0.365     869.998 1367814.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.951

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    150.746    3210.000      22.982     609.144       1.000       1.000       0.980
W Kg/sec =   68.52104

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.489    2962.124       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 115966.477  118285.555       1.675     509.668     304.335     390.276       1.282

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   448.35    -0.15   448.35     0.38   473.55
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MEAN    15.91     0.00    -0.02   448.35    -0.15   448.35     0.38
HUB     13.07     0.00    -0.02   448.35    -0.15   448.35     0.38

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     48.87    47.36     1.51   513.19   681.57    20.85   592.37     0.57
MEAN    44.84    44.80     0.04   445.76   632.35    20.85   592.37     0.53
HUB     39.25    38.84     0.41   366.12   578.95    20.85   592.37     0.49

     ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   496.55   166.03   467.98  1203.35     0.41
MEAN    15.50   505.86   186.85   470.09  1202.20     0.42
HUB     12.59   541.67   263.76   473.11  1200.98     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    502.54   576.41   336.52     0.48  2981.33
MEAN   434.13   531.16   247.28     0.44  2898.14     1.29
HUB    352.68   481.39    88.92     0.40  3322.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.55     1.07    21.84   622.54     1.02   601.97     0.92     0.87
MEAN    24.51     1.07    21.70   622.17     1.02   600.82     0.92     0.87
HUB     24.74     1.08    21.51   624.08     1.02   599.60     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     19.53    35.72    31.50     4.22     0.93     0.20     2.90
MEAN    21.68    27.75    23.50     4.25     0.90     0.20     3.34     0.87
HUB     29.14    10.64     6.50     4.14     0.90     0.22     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.951

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     511.056     190.273     474.315    1202.503       0.425      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.543      21.674     601.136      46.000      21.858      33.000      11.142

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     508.481     190.273     542.915    1202.722       0.423      -0.036

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.401      21.576     601.355     440.827       0.069       0.199

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     473.349       0.000     473.349    1205.596       0.393       0.085

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.921     604.233       0.000       0.060       0.075       0.082

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.754      24.381       1.061     622.928      13.784     344.167       2.668

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   85937.484       0.340     732.085 1420718.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     623685.94   5313.0610    147.2640      1.6139      0.7682      6.4535      1.1915


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**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 85% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 7.014   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     147.976    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   67.26170

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     144.557    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.975     831.557     420.983     619.754       1.472

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   344.58    -0.12   344.58     0.31   575.61
 MEAN    17.06     0.00    -0.02   344.58    -0.12   344.58     0.31
 HUB     12.51     0.00    -0.02   344.58    -0.12   344.58     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.20    50.47     8.73   577.90   672.93    14.13   512.89     0.61
 MEAN    54.21    47.20     7.01   477.90   589.26    14.13   512.89     0.53
 HUB     45.49    38.62     6.87   350.44   491.55    14.13   512.89     0.44

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   565.18   329.62   459.10  1125.91     0.50
 MEAN    18.04   591.64   363.44   466.85  1122.00     0.53
 HUB     15.00   671.88   468.41   481.68  1115.21     0.60

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    577.90   521.93   248.28     0.46  6802.58
 MEAN   505.23   487.91   141.80     0.43  6557.03     1.35
 HUB    420.19   484.09    48.22     0.43  7027.58

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.12     1.20    15.25   553.42     1.06   526.74     0.92     0.91
 MEAN    18.01     1.19    14.90   552.32     1.06   523.08     0.92     0.91
 HUB     18.23     1.21    14.26   554.43     1.06   516.73     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.68    28.40    24.20     4.20     0.93     0.31     2.90
 MEAN    37.90    16.90    12.70     4.20     0.93     0.26     3.51     0.91
 HUB     44.20    -5.72    -9.30     3.58     0.93     0.12     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     600.633     362.733     478.732    1122.145       0.535      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.086      14.878     523.259      24.000      37.151      35.400      -1.751

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     504.663     362.733     621.498    1131.605       0.446       0.283
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BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.047	15.741	532.118	528.796	0.022	0.427

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	465.238	0.000	465.238	1134.995	0.410	0.346

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.026	535.312	0.000	0.060	0.038	0.369

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	17.994	1.191	553.391	30.581	212.230	1.645

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
190390.438	0.570	1592.091	1448913.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.014 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
147.976	3210.000	17.994	553.391	1.000	1.000	0.980

W Kg/sec = 67.26170

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
124.864	3107.759	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
113835.133	116111.594	1.624	590.487	363.639	474.134	1.304

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	443.12	-0.15	443.12	0.39	557.31
MEAN	18.08	0.00	-0.02	443.12	-0.15	443.12	0.39	
HUB	15.21	0.00	-0.02	443.12	-0.15	443.12	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.42	46.36	6.06	575.66	726.57	16.20	536.99	0.64
MEAN	48.82	42.30	6.52	506.42	673.03	16.20	536.99	0.59
HUB	43.89	37.84	6.05	426.07	614.83	16.20	536.99	0.54

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	518.74	251.53	453.67	1154.65	0.45
MEAN	18.01	530.93	267.82	458.43	1152.07	0.46
HUB	15.22	576.31	341.82	463.99	1149.48	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	572.02	555.46	320.49	0.48	5139.35	
MEAN	504.50	515.93	236.68	0.45	4826.20	1.41
HUB	426.43	471.65	84.62	0.41	5205.77	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.51	1.14	17.85	576.51	1.04	554.04	0.92	0.91
MEAN	20.35	1.13	17.59	575.10	1.04	551.56	0.92	0.91
HUB	20.54	1.14	17.30	576.81	1.04	549.07	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	29.01	35.24	31.50	3.74	0.93	0.30	2.90	
MEAN	30.29	27.31	23.50	3.81	0.93	0.29	3.30	0.91
HUB	36.38	10.34	6.50	3.84	0.93	0.30	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	801.312	268.573	754.963	1121.307	0.715	-1.057

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.438	14.536	522.518	46.000	19.583	30.600	11.017

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	778.078	268.573	823.126	1124.591	0.692	-0.985

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	20.302	14.737	525.583	361.848	0.057	0.149

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	771.630	0.000	771.630	1125.531	0.686	0.048

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	14.673	526.421	0.000	0.060	0.126	-1.007

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.785	20.103	1.117	576.138	22.747	253.125	1.962

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
141680.609	0.433	1184.768	1321738.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 7.014 EfDer = 0.803

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
147.976	3210.000	20.103	576.138	1.000	1.000	0.710

W Kg/sec = 67.26170

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
114.041	3045.790	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
113835.133	116111.594	1.190	395.194	332.131	307.469	0.926

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	680.62	-0.23	680.62	0.60	533.44
MEAN	17.74	0.00	-0.02	680.62	-0.23	680.62	0.60	
HUB	15.05	0.00	-0.02	680.62	-0.23	680.62	0.60	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	39.57	46.36	-6.79	562.21	882.94	15.77	537.46	0.78
MEAN	36.15	43.40	-7.25	496.90	842.84	15.77	537.46	0.74
HUB	31.79	38.84	-7.05	421.59	800.73	15.77	537.46	0.70

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	509.97	189.26	473.55	1172.44	0.43
MEAN	17.51	522.72	217.07	475.52	1171.55	0.45
HUB	14.85	568.31	304.68	479.74	1170.64	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	598.30	365.67	0.51	3753.94	
MEAN	490.40	548.48	273.34	0.47	3804.26	1.62
HUB	415.99	492.48	111.31	0.42	4528.02	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.65	1.08	19.01	593.02	1.03	571.31	0.92	0.73
MEAN	21.67	1.08	18.90	593.24	1.03	570.43	0.92	0.73

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 HUB     21.98     1.09    18.71   596.50     1.04   569.54     0.92     0.73

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.78    37.67    31.50     6.17     0.93     0.36     2.90
 MEAN    24.54    29.89    23.50     6.39     0.86     0.39     3.28     0.73
 HUB     32.42    13.06     6.50     6.56     0.86     0.43     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.803

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     529.025     218.492     481.797    1171.994       0.451       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.741      18.901     570.888      46.000      24.394      31.500       7.106

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     500.958     218.492     546.532    1174.469       0.427       0.093

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.695      19.141     573.302     471.992       0.026       0.220

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     486.070       0.000     486.070    1175.725       0.413       0.108

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.214     574.529       0.000       0.060       0.053       0.118

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.668      21.615       1.075     594.253      18.115     304.351       2.359

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 112869.844       0.367     943.845 1987643.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.014   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3210.000      21.615     594.253       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    107.715    2999.007       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.636     513.330     313.721     401.059       1.278

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   455.05    -0.16   455.05     0.39   504.04
 MEAN    16.97     0.00    -0.02   455.05    -0.16   455.05     0.39
 HUB     14.32     0.00    -0.02   455.05    -0.16   455.05     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.86    46.36     3.50   539.52   705.92    19.50   576.97     0.60
 MEAN    46.26    43.80     2.46   475.39   658.19    19.50   576.97     0.56
 HUB     41.41    37.84     3.57   401.14   606.72    19.50   576.97     0.51

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   509.02   193.34   470.87  1190.44     0.43
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 MEAN    16.57   520.79   217.36   473.26  1189.20     0.44
 HUB     13.89   563.18   300.14   476.54  1187.90     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   578.19   335.54     0.49  3653.26
 MEAN   464.28   533.80   246.92     0.45  3605.13     1.33
 HUB    389.09   484.77    88.96     0.41  4171.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.54     1.09    20.76   610.67     1.03   589.05     0.92     0.90
 MEAN    23.52     1.09    20.61   610.46     1.03   587.82     0.92     0.90
 HUB     23.83     1.10    20.43   613.00     1.03   586.53     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.32    35.47    31.50     3.97     0.93     0.23     2.90
 MEAN    24.67    27.55    23.50     4.05     0.91     0.24     3.29     0.90
 HUB     32.20    10.57     6.50     4.07     0.91     0.26     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     512.048     218.580     463.050    1190.868       0.430       0.055

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.600      20.781     589.496      46.000      25.269      32.400       7.131

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     487.124     218.580     533.917    1192.966       0.408       0.131

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.556      20.998     591.574     456.573       0.025       0.241

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     462.445       0.000     462.445    1194.936       0.387       0.126

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.163     593.530       0.000       0.060       0.053       0.186

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.827      23.468       1.086     611.378      17.125     295.763       2.293

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 106736.773       0.382     892.559 1332304.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.014   EfDer =  0.967

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3210.000      23.468     611.378       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.629    2956.706       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.739     509.668     293.094     390.276       1.332

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   430.05    -0.15   430.05     0.36   472.68
 MEAN    15.91     0.00    -0.02   430.05    -0.15   430.05     0.36
 HUB     13.07     0.00    -0.02   430.05    -0.15   430.05     0.36
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.05     47.36     2.69   513.19   669.67    21.46   595.95     0.56
MEAN    46.04     44.80     1.24   445.76   619.50    21.46   595.95     0.52
HUB     40.42     38.84     1.58   366.12   564.89    21.46   595.95     0.47

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   482.32   181.57   446.84  1207.98     0.40
MEAN    15.50   491.19   198.06   449.48  1206.42     0.41
HUB     12.59   526.17   267.92   452.85  1204.82     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    502.54   550.17   320.98     0.46  3260.02
MEAN   434.13   507.70   236.06     0.42  3071.86     1.32
HUB    352.68   460.72    84.76     0.38  3375.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.25     1.08    22.62   626.03     1.02   606.62     0.92     0.89
MEAN    25.15     1.07    22.43   625.18     1.02   605.05     0.92     0.89
HUB     25.32     1.08    22.21   626.54     1.02   603.44     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     22.11    35.69    31.50     4.19     0.93     0.22     2.90
MEAN    23.78    27.71    23.50     4.21     0.91     0.23     3.34     0.89
HUB     30.61    10.60     6.50     4.10     0.91     0.24     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     496.261     201.695     453.425    1206.729       0.411      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.182      22.412     605.369      46.000      23.981      33.000       9.019

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     483.577     201.695     523.954    1207.762       0.400       0.013

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.082      22.457     606.406     440.827       0.055       0.229

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     450.824       0.000     450.824    1210.302       0.372       0.127

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.770     608.960       0.000       0.060       0.063       0.124

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.799      25.061       1.068     625.917      14.539     323.841       2.510

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   90650.016       0.359     758.037 1382661.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     642327.69   5371.3003    144.5575      1.6589      0.7920      7.0142      1.1972


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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 85% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 7.464   EfDer =  0.999

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    145.767    3210.000      15.107     522.810      1.000       1.000       0.980
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    142.400    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 112136.125  114378.609       2.005     831.557     414.700     619.754       1.494

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   338.90    -0.12   338.90     0.30   575.61
 MEAN    17.06     0.00    -0.02   338.90    -0.12   338.90     0.30
 HUB     12.51     0.00    -0.02   338.90    -0.12   338.90     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.62    50.47     9.15   577.90   670.04    14.16   513.22     0.60
 MEAN    54.66    47.20     7.46   477.90   585.96    14.16   513.22     0.53
 HUB     45.97    38.62     7.35   350.44   487.59    14.16   513.22     0.44

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   561.06   334.22   450.66  1126.77     0.50
 MEAN    18.04   586.65   366.04   458.44  1122.75     0.52
 HUB     15.00   665.04   467.56   472.93  1115.96     0.60

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    577.90   512.32   243.68     0.45  6897.29
 MEAN   505.23   479.11   139.20     0.43  6603.83     1.37
 HUB    420.19   475.30    47.37     0.43  7014.87

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.17     1.20    15.33   553.85     1.06   527.56     0.92     0.91
 MEAN    18.03     1.19    14.96   552.53     1.06   523.78     0.92     0.91
 HUB     18.22     1.21    14.33   554.38     1.06   517.44     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.56    28.40    24.20     4.20     0.93     0.32     2.90
 MEAN    38.60    16.89    12.70     4.19     0.93     0.27     3.51     0.91
 HUB     44.67    -5.72    -9.30     3.58     0.93     0.13     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     595.310     365.325     470.033    1122.922       0.530      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.105      14.947     523.984      24.000      37.856      35.400      -2.456

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     494.877     365.325     615.115    1132.678       0.437       0.297

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.066      15.843     533.128     528.796       0.022       0.438
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	456.579	0.000	456.579	1135.907	0.402	0.357

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.112	536.172	0.000	0.060	0.039	0.379

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	18.012	1.192	553.584	30.774	209.484	1.624

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
191592.750	0.574	1578.233	1425047.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.464 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
145.767	3210.000	18.012	553.584	1.000	1.000	0.980

W Kg/sec = 66.25780

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
122.903	3107.216	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
112136.125	114378.609	1.650	590.487	357.925	474.134	1.325

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	435.02	-0.15	435.02	0.38	557.21
MEAN	18.08	0.00	-0.02	435.02	-0.15	435.02	0.38	
HUB	15.21	0.00	-0.02	435.02	-0.15	435.02	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.93	46.36	6.57	575.66	721.66	16.28	537.78	0.63
MEAN	49.35	42.30	7.05	506.42	667.72	16.28	537.78	0.59
HUB	44.41	37.84	6.57	426.07	609.02	16.28	537.78	0.54

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	514.17	257.92	444.80	1155.87	0.44
MEAN	18.01	525.81	272.43	449.72	1153.13	0.46
HUB	15.22	570.44	343.51	455.42	1150.38	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	572.02	544.52	314.10	0.47	5269.78	
MEAN	504.50	506.07	232.07	0.44	4909.18	1.43
HUB	426.43	462.91	82.93	0.40	5231.49	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.59	1.14	17.98	577.29	1.04	555.21	0.92	0.91
MEAN	20.41	1.13	17.69	575.67	1.04	552.58	0.92	0.91
HUB	20.58	1.14	17.39	577.12	1.04	549.94	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.11	35.23	31.50	3.73	0.93	0.31	2.90	
MEAN	31.21	27.30	23.50	3.80	0.93	0.30	3.30	0.91
HUB	37.03	10.32	6.50	3.82	0.93	0.31	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	782.619	273.196	733.387	1124.546	0.696	-1.010

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.498      14.826     525.542      46.000      20.431      30.600      10.169

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     752.367     273.196     800.433    1128.687       0.667      -0.903

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      20.380      15.123     529.420     361.848       0.052       0.166

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     744.391       0.000     744.391    1129.776       0.659       0.096

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      15.099     530.419       0.000       0.060       0.110      -0.911

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.805      20.213       1.122     576.689      23.106     247.877       1.922

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 143913.656       0.440    1185.479 1298067.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.464   EfDer =  0.819

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3210.000      20.213     576.689       1.000       1.000       0.710
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.776    3044.333       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 112136.125  114378.609       1.214     395.194     325.534     307.469       0.945

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   660.35    -0.23   660.35     0.58   533.18
 MEAN    17.74     0.00    -0.02   660.35    -0.23   660.35     0.58
 HUB     15.05     0.00    -0.02   660.35    -0.23   660.35     0.58

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     40.42    46.36    -5.94   562.21   867.41    16.10   540.29     0.76
 MEAN    36.97    43.40    -6.43   496.90   826.55    16.10   540.29     0.72
 HUB     32.57    38.84    -6.27   421.59   783.57    16.10   540.29     0.69

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   502.45   199.48   461.16  1174.59     0.43
 MEAN    17.51   514.99   224.64   463.41  1173.41     0.44
 HUB     14.85   559.98   308.02   467.66  1172.23     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   582.25   355.45     0.50  3956.24
 MEAN   490.40   534.21   265.76     0.46  3936.73     1.63
 HUB    415.99   479.96   107.97     0.41  4577.47

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.89     1.08    19.30   594.48     1.03   573.40     0.92     0.75
 MEAN    21.88     1.08    19.17   594.39     1.03   572.25     0.92     0.75
 HUB     22.16     1.10    18.96   597.27     1.04   571.09     0.92     0.75

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     23.39    37.62    31.50     6.12     0.93     0.37     2.90
 MEAN    25.86    29.83    23.50     6.33     0.87     0.39     3.28     0.75
 HUB     33.37    13.00     6.50     6.50     0.87     0.44     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.819

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     521.049     226.115     469.429    1173.868       0.444       0.001

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.951      19.171     572.715      46.000      25.719      31.500       5.781

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     486.925     226.115     536.865    1176.807       0.414       0.118

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.915      19.476     575.586     471.992       0.023       0.239

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     472.388       0.000     472.388    1177.997       0.401       0.134

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.550     576.750       0.000       0.060       0.048       0.144

    STAGE EXIT CONDITIONS, STAGE            3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.694      21.844       1.081     595.380      18.691     292.831       2.270

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 116457.727       0.378     959.313 1935861.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.464   EfDer =  0.988

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    145.767    3210.000      21.844     595.380       1.000       1.000       0.980
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    105.097    2996.167       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 112136.125  114378.609       1.677     513.330     306.095     401.059       1.310

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   442.56    -0.15   442.56     0.37   503.57
 MEAN    16.97     0.00    -0.02   442.56    -0.15   442.56     0.37
 HUB     14.32     0.00    -0.02   442.56    -0.15   442.56     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.65    46.36     4.29   539.52   697.93    19.82   579.03     0.59
 MEAN    47.06    43.80     3.26   475.39   649.62    19.82   579.03     0.55
 HUB     42.20    37.84     4.36   401.14   597.40    19.82   579.03     0.51

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   500.01   203.71   456.63  1193.22     0.42
 MEAN    16.57   511.46   224.82   459.40  1191.70     0.43
 HUB     13.89   553.23   302.90   462.94  1190.14     0.46
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   560.57   325.16     0.47  3849.02
 MEAN   464.28   518.07   239.46     0.43  3728.66     1.35
 HUB    389.09   470.90    86.19     0.40  4209.48

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.91     1.09    21.19   612.68     1.03   591.82     0.92     0.90
 MEAN    23.85     1.09    21.01   612.14     1.03   590.31     0.92     0.90
 HUB     24.11     1.10    20.79   614.30     1.03   588.76     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.04    35.45    31.50     3.95     0.93     0.25     2.90
 MEAN    26.08    27.53    23.50     4.03     0.92     0.25     3.29     0.90
 HUB     33.20    10.55     6.50     4.05     0.92     0.28     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     503.244     226.080     449.602    1193.299       0.422       0.055

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.927      21.169     591.904      46.000      26.695      32.400       5.705

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     471.831     226.080     523.198    1195.873       0.395       0.157

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.893      21.459     594.461     456.573       0.021       0.261

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     447.960       0.000     447.960    1197.715       0.374       0.153

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.621     596.293       0.000       0.060       0.048       0.211

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.845      23.816       1.090     613.041      17.661     285.012       2.209

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 110076.898       0.394     906.751 1305118.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.464   EfDer =  0.977

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3210.000      23.816     613.041       1.000       1.000       0.980
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.814    2952.694       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 112136.125  114378.609       1.789     509.668     284.894     390.276       1.370

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   416.90    -0.14   416.90     0.35   472.04
 MEAN    15.91     0.00    -0.02   416.90    -0.14   416.90     0.35
 HUB     13.07     0.00    -0.02   416.90    -0.14   416.90     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.92    47.36     3.56   513.19   661.30    21.91   598.54     0.55
 MEAN    46.93    44.80     2.13   445.76   610.44    21.91   598.54     0.51
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 HUB     41.30    38.84     2.46   366.12   554.94    21.91   598.54     0.46

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   472.88   192.59   431.88  1211.26     0.39
 MEAN    15.50   481.18   206.00   434.85  1209.43     0.40
 HUB     12.59   515.35   270.84   438.44  1207.58     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   531.60   309.95     0.44  3457.71
 MEAN   434.13   491.06   228.12     0.41  3194.83     1.35
 HUB    352.68   446.01    81.84     0.37  3411.78

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.75     1.08    23.18   628.58     1.03   609.92     0.92     0.89
 MEAN    25.60     1.08    22.95   627.40     1.02   608.08     0.92     0.89
 HUB     25.73     1.08    22.70   628.37     1.03   606.21     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.03    35.67    31.50     4.17     0.93     0.25     2.90
 MEAN    25.35    27.68    23.50     4.18     0.91     0.25     3.34     0.89
 HUB     31.71    10.57     6.50     4.07     0.91     0.26     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     486.194     209.780     438.608    1209.737       0.402      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.640      22.937     608.391      46.000      25.561      33.000       7.439

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219     466.251     209.780     511.271    1211.312       0.385       0.049

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.565      23.079     609.976     440.827       0.047       0.251

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     435.056       0.000     435.056    1213.639       0.358       0.158

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.371     612.322       0.000       0.060       0.055       0.155

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.824      25.544       1.073     628.115      15.074     310.318       2.406

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93987.984       0.372     774.220 1353779.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    656029.00   5403.9971    142.3999      1.6909      0.8069      7.4643      1.2014


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 85% Stat 2 27% Ice Block 8-22-2011
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    143.384    3210.000      15.107     522.810      1.000       1.000       0.980
W Kg/sec =   65.17433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    140.071    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 110302.430  112508.234       2.039     831.557     407.918     619.754       1.519

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   332.81    -0.11   332.81     0.30   575.61
 MEAN    17.06     0.00    -0.02   332.81    -0.11   332.81     0.30
 HUB     12.51     0.00    -0.02   332.81    -0.11   332.81     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.07    50.47     9.60   577.90   666.98    14.19   513.56     0.60
 MEAN    55.15    47.20     7.95   477.90   582.46    14.19   513.56     0.52
 HUB     46.49    38.62     7.87   350.44   483.37    14.19   513.56     0.43

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   556.85   339.08   441.70  1127.67     0.49
 MEAN    18.04   581.43   368.78   449.51  1123.53     0.52
 HUB     15.00   657.81   466.65   463.63  1116.75     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    577.90   502.13   238.81     0.45  6997.68
 MEAN   505.23   469.76   136.45     0.42  6653.37     1.39
 HUB    420.19   465.95    46.46     0.42  7001.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.21     1.21    15.41   554.30     1.06   528.40     0.92     0.91
 MEAN    18.05     1.19    15.03   552.75     1.06   524.52     0.92     0.91
 HUB     18.21     1.21    14.40   554.32     1.06   518.18     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.51    28.40    24.20     4.20     0.93     0.33     2.90
 MEAN    39.37    16.89    12.70     4.19     0.93     0.29     3.51     0.91
 HUB     45.19    -5.72    -9.30     3.58     0.93     0.15     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     589.753     368.069     460.798    1123.730       0.525      -0.004

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.124      15.019     524.738      24.000      38.617      35.400      -3.217

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     484.552     368.069     608.494    1133.792       0.427       0.312

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.084      15.947     534.178     528.796       0.023       0.450

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     447.429       0.000     447.429    1136.855       0.394       0.368
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.199	537.067	0.000	0.060	0.040	0.390

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	18.028	1.193	553.788	30.978	206.564	1.601

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
192865.359	0.577	1562.737	1399425.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.953 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
143.384	3210.000	18.028	553.788	1.000	1.000	0.980

W Kg/sec = 65.17433

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
120.807	3106.643	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
110302.430	112508.234	1.678	590.487	351.823	474.134	1.348

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	426.46	-0.15	426.46	0.37	557.11
MEAN	18.08	0.00	-0.02	426.46	-0.15	426.46	0.37	
HUB	15.21	0.00	-0.02	426.46	-0.15	426.46	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.48	46.36	7.12	575.66	716.53	16.36	538.60	0.63
MEAN	49.91	42.30	7.61	506.42	662.17	16.36	538.60	0.58
HUB	44.98	37.84	7.14	426.07	602.93	16.36	538.60	0.53

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	509.59	264.60	435.51	1157.12	0.44
MEAN	18.01	520.57	277.29	440.57	1154.23	0.45
HUB	15.22	564.34	345.28	446.39	1151.32	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	572.02	533.08	307.42	0.46	5406.14	
MEAN	504.50	495.71	227.21	0.43	4996.63	1.45
HUB	426.43	453.71	81.16	0.39	5258.37	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.68	1.15	18.10	578.11	1.04	556.42	0.92	0.91
MEAN	20.47	1.14	17.80	576.26	1.04	553.63	0.92	0.91
HUB	20.60	1.14	17.48	577.44	1.04	550.85	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.28	35.22	31.50	3.72	0.93	0.32	2.90	
MEAN	32.19	27.28	23.50	3.78	0.93	0.31	3.30	0.91
HUB	37.72	10.30	6.50	3.80	0.93	0.32	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	764.226	278.068	711.842	1127.703	0.678	-0.964

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.557	15.109	528.498	46.000	21.337	30.600	9.263

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	727.284	278.068	778.629	1132.602	0.642	-0.823

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	20.455	15.496	533.100	361.848	0.047	0.182

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	718.289	0.000	718.289	1133.769	0.634	0.140

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	15.502	534.187	0.000	0.060	0.096	-0.821

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.823	20.318	1.127	577.270	23.482	242.472	1.880

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
146255.062	0.447	1185.066	1272825.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 7.953 EfDer = 0.837

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
143.384	3210.000	20.318	577.270	1.000	1.000	0.710

W Kg/sec = 65.17433

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
109.438	3042.803	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
110302.430	112508.234	1.240	395.194	318.724	307.469	0.965

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	640.32	-0.22	640.32	0.56	532.91
MEAN	17.74	0.00	-0.02	640.32	-0.22	640.32	0.56	
HUB	15.05	0.00	-0.02	640.32	-0.22	640.32	0.56	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	41.29	46.36	-5.07	562.21	852.26	16.42	543.04	0.75
MEAN	37.82	43.40	-5.58	496.90	810.64	16.42	543.04	0.71
HUB	33.37	38.84	-5.47	421.59	766.77	16.42	543.04	0.67

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	495.19	209.87	448.51	1176.75	0.42
MEAN	17.51	507.37	232.34	451.04	1175.29	0.43
HUB	14.85	551.62	311.41	455.32	1173.85	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	565.89	345.06	0.48	4161.96	
MEAN	490.40	519.65	258.06	0.44	4071.43	1.65
HUB	415.99	467.17	104.58	0.40	4627.73	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.13	1.09	19.59	595.98	1.03	575.51	0.92	0.77
MEAN	22.09	1.09	19.43	595.58	1.03	574.09	0.92	0.77
HUB	22.34	1.10	19.20	598.08	1.04	572.67	0.92	0.77

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.08	37.57	31.50	6.07	0.93	0.38	2.90	
MEAN	27.25	29.78	23.50	6.28	0.87	0.40	3.28	0.77
HUB	34.37	12.94	6.50	6.44	0.87	0.44	3.87	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.837

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      513.194     233.867     456.808    1175.757       0.436       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.163      19.441      574.558      46.000      27.111      31.500       4.389

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392      472.742     233.867     527.427    1179.158       0.401       0.144

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.134      19.811      577.888     471.992       0.020       0.259

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121      458.598       0.000     458.598    1180.280       0.389       0.160

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.886     578.988       0.000       0.060       0.043       0.171

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.719      22.070       1.086     596.546      19.276     281.762       2.184

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 120106.523       0.390     973.191 1883557.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    143.384    3210.000      22.070     596.546       1.000       1.000       0.980
W Kg/sec =   65.17433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.417    2993.238       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 110302.430  112508.234       1.721     513.330     298.288     401.059       1.345

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   429.93    -0.15   429.93     0.36   503.07
 MEAN    16.97     0.00    -0.02   429.93    -0.15   429.93     0.36
 HUB     14.32     0.00    -0.02   429.93    -0.15   429.93     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.46    46.36     5.10   539.52   689.99    20.14   581.12     0.58
 MEAN    47.88    43.80     4.08   475.39   641.08    20.14   581.12     0.54
 HUB     43.03    37.84     5.19   401.14   588.11    20.14   581.12     0.50

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   491.50   214.05   442.44  1195.99     0.41
 MEAN    16.57   502.46   232.29   445.55  1194.20     0.42
 HUB     13.89   543.44   305.67   449.33  1192.40     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   543.02   314.82     0.45  4044.17
 MEAN   464.28   502.33   231.99     0.42  3852.39     1.38
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 HUB    389.09   457.01    83.43     0.38  4247.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.28     1.10    21.61   614.72     1.03   594.56     0.92     0.91
 MEAN    24.17     1.10    21.40   613.86     1.03   592.79     0.92     0.91
 HUB     24.39     1.11    21.15   615.64     1.03   590.99     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.82    35.43    31.50     3.93     0.93     0.27     2.90
 MEAN    27.54    27.51    23.50     4.01     0.92     0.27     3.29     0.91
 HUB     34.23    10.52     6.50     4.02     0.92     0.29     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     494.766     233.592     436.151    1195.722       0.414       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.251      21.552     594.311      46.000      28.172      32.400       4.228

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     456.680     233.592     512.954    1198.760       0.381       0.183

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.225      21.914     597.335     456.573       0.019       0.282

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     433.638       0.000     433.638    1200.477       0.361       0.179

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.071     599.047       0.000       0.060       0.043       0.237

    STAGE EXIT CONDITIONS, STAGE             4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      24.156       1.095     614.741      18.195     274.698       2.129

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 113413.086       0.405     918.956 1276690.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    143.384    3210.000      24.156     614.741       1.000       1.000       0.980
W Kg/sec =   65.17433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.990    2948.608       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 110302.430  112508.234       1.842     509.668     276.668     390.276       1.411

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   403.85    -0.14   403.85     0.34   471.39
 MEAN    15.91     0.00    -0.02   403.85    -0.14   403.85     0.34
 HUB     13.07     0.00    -0.02   403.85    -0.14   403.85     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.81    47.36     4.45   513.19   653.15    22.34   601.13     0.54
 MEAN    47.83    44.80     3.03   445.76   601.60    22.34   601.13     0.50
 HUB     42.21    38.84     3.37   366.12   545.20    22.34   601.13     0.45

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   464.18   203.37   417.25  1214.48     0.38
MEAN    15.50   471.73   213.82   420.49  1212.40     0.39
HUB     12.59   504.90   273.73   424.26  1210.31     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    502.54   513.43   299.18     0.42  3650.97
MEAN   434.13   474.71   220.31     0.39  3315.91     1.38
HUB    352.68   431.54    78.95     0.36  3448.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.25     1.09    23.73   631.14     1.03   613.17     0.92     0.90
MEAN    26.05     1.08    23.47   629.64     1.02   611.07     0.92     0.90
HUB     26.13     1.08    23.18   630.23     1.03   608.96     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.98    35.64    31.50     4.14     0.93     0.27     2.90
MEAN    26.95    27.65    23.50     4.15     0.91     0.26     3.34     0.90
HUB     32.83    10.54     6.50     4.04     0.91     0.27     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     476.712     217.741     424.079    1212.701       0.393      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.088      23.450     611.378      46.000      27.178      33.000       5.822

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     449.502     217.741     499.463    1214.785       0.370       0.084

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.034      23.683     613.481     440.827       0.040       0.274

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     419.754       0.000     419.754    1216.919       0.345       0.189

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.956     615.638       0.000       0.060       0.048       0.186

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.845      26.013       1.077     630.339      15.598     297.680       2.308

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   97262.352       0.385     788.091 1323758.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     669902.44   5428.0400    140.0713      1.7219      0.8198      7.9532      1.2057

*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 85% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
138.557	3210.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 62.98067

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
135.357	3197.358	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
106589.836	108721.398	2.110	831.557	394.188	619.754	1.572

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	320.57	-0.11	320.57	0.29	575.61
MEAN	17.06	0.00	-0.02	320.57	-0.11	320.57	0.29	
HUB	12.51	0.00	-0.02	320.57	-0.11	320.57	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.99	50.47	10.52	577.90	660.95	14.26	514.23	0.59
MEAN	56.15	47.20	8.95	477.90	575.55	14.26	514.23	0.52
HUB	47.56	38.62	8.94	350.44	475.02	14.26	514.23	0.43

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	548.98	348.69	424.03	1129.39	0.49
MEAN	18.04	571.41	374.21	431.83	1125.02	0.51
HUB	15.00	643.66	464.84	445.22	1118.25	0.58

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	577.90	482.01	229.21	0.43	7195.72	
MEAN	505.23	451.27	131.02	0.40	6751.20	1.44
HUB	420.19	447.46	44.65	0.40	6973.93	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.29	1.21	15.56	555.19	1.06	530.02	0.92	0.91
MEAN	18.08	1.20	15.16	553.19	1.06	525.92	0.92	0.91
HUB	18.19	1.20	14.53	554.19	1.06	519.59	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.43	28.39	24.20	4.19	0.93	0.36	2.90	
MEAN	40.91	16.88	12.70	4.18	0.93	0.31	3.51	0.91
HUB	46.23	-5.73	-9.30	3.57	0.93	0.17	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	579.080	373.486	442.540	1125.276	0.515	-0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.159	15.154	526.183	24.000	40.163	35.400	-4.763

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	464.308	373.486	595.881	1135.920	0.409	0.341

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.114	16.143	536.185	528.796	0.024	0.474

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	429.451	0.000	429.451	1138.673	0.377	0.389

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.362	538.787	0.000	0.060	0.044	0.412

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.873	18.052	1.195	554.191	31.381	200.774	1.556

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
195373.719	0.585	1529.778	1347956.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.996

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
138.557	3210.000	18.052	554.191	1.000	1.000	0.980

W Kg/sec = 62.98067

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
116.625	3105.514	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
106589.836	108721.398	1.739	590.487	339.644	474.134	1.396

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	409.59	-0.14	409.59	0.36	556.90
MEAN	18.08	0.00	-0.02	409.59	-0.14	409.59	0.36	
HUB	15.21	0.00	-0.02	409.59	-0.14	409.59	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.57	46.36	8.21	575.66	706.62	16.51	540.18	0.62
MEAN	51.04	42.30	8.74	506.42	651.44	16.51	540.18	0.57
HUB	46.14	37.84	8.30	426.07	591.12	16.51	540.18	0.52

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	501.31	277.55	417.47	1159.50	0.43
MEAN	18.01	510.79	286.70	422.74	1156.31	0.44
HUB	15.22	552.63	348.69	428.73	1153.12	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	572.02	510.88	294.47	0.44	5670.38	
MEAN	504.50	475.55	217.81	0.41	5165.94	1.49
HUB	426.43	435.72	77.74	0.38	5310.29	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.84	1.15	18.32	579.70	1.05	558.71	0.92	0.91
MEAN	20.58	1.14	17.99	577.43	1.04	555.64	0.92	0.91
HUB	20.65	1.14	17.64	578.08	1.04	552.58	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.62	35.20	31.50	3.70	0.93	0.34	2.90	
MEAN	34.14	27.26	23.50	3.76	0.93	0.34	3.30	0.91
HUB	39.12	10.28	6.50	3.78	0.93	0.34	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	731.323	287.501	672.441	1133.278	0.645	-0.882

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.660	15.609	533.739	46.000	23.149	30.600	7.451

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	682.638	287.501	740.710	1139.365	0.599	-0.681

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	20.584	16.145	539.487	361.848	0.038	0.212

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	672.724	0.000	672.724	1140.554	0.590	0.214

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	16.187	540.609	0.000	0.060	0.073	-0.665

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.847	20.490	1.135	578.400	24.209	232.251	1.800

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
150788.750	0.461	1180.677	1222602.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.873

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
138.557	3210.000	20.490	578.400	1.000	1.000	0.710

W Kg/sec = 62.98067

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
104.970	3039.827	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
106589.836	108721.398	1.293	395.194	305.711	307.469	1.006

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	604.15	-0.21	604.15	0.53	532.39
MEAN	17.74	0.00	-0.02	604.15	-0.21	604.15	0.53	
HUB	15.05	0.00	-0.02	604.15	-0.21	604.15	0.53	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	42.95	46.36	-3.41	562.21	825.42	16.96	547.93	0.72
MEAN	39.45	43.40	-3.95	496.90	782.38	16.96	547.93	0.68
HUB	34.92	38.84	-3.92	421.59	736.83	16.96	547.93	0.64

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	482.72	229.17	424.85	1180.69	0.41
MEAN	17.51	493.87	246.65	427.86	1178.74	0.42
HUB	14.85	536.36	317.64	432.19	1176.84	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	535.37	325.76	0.45	4544.01	
MEAN	490.40	492.43	243.75	0.42	4321.65	1.68
HUB	415.99	443.24	98.35	0.38	4720.07	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.58	1.10	20.12	598.83	1.04	579.38	0.92	0.80
MEAN	22.47	1.10	19.91	597.83	1.03	577.47	0.92	0.80
HUB	22.66	1.11	19.65	599.62	1.04	575.61	0.92	0.80

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.34	37.48	31.50	5.98	0.93	0.40	2.90	
MEAN	29.96	29.67	23.50	6.17	0.88	0.42	3.28	0.80
HUB	36.31	12.82	6.50	6.32	0.88	0.45	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.873

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     499.285     248.267     433.185    1179.221       0.423       0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.546      19.928     577.950      46.000      29.818      31.500       1.682

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     446.535     248.267     510.911    1183.463       0.377       0.194

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.527      20.416     582.116     471.992       0.017       0.299

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     433.221       0.000     433.221    1184.456       0.366       0.209

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.486     583.094       0.000       0.060       0.038       0.220

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.762      22.472       1.097     598.762      20.362     262.665       2.036

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 126873.445       0.412     993.420 1786098.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    138.557    3210.000      22.472     598.762       1.000       1.000       0.980
W Kg/sec =   62.98067

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.381    2987.694       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106589.836  108721.398       1.810     513.330     283.621     401.059       1.414

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   406.62    -0.14   406.62     0.34   502.14
 MEAN    16.97     0.00    -0.02   406.62    -0.14   406.62     0.34
 HUB     14.32     0.00    -0.02   406.62    -0.14   406.62     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.00    46.36     6.64   539.52   675.70    20.72   584.96     0.57
 MEAN    49.47    43.80     5.67   475.39   625.68    20.72   584.96     0.53
 HUB     44.62    37.84     6.78   401.14   571.28    20.72   584.96     0.48

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   477.36   232.75   416.77  1200.94     0.40
 MEAN    16.57   486.95   245.84   420.33  1198.73     0.41
 HUB     13.89   526.01   310.68   424.47  1196.50     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   511.26   296.13     0.43  4396.97
 MEAN   464.28   473.70   218.44     0.40  4076.86     1.43
 HUB    389.09   431.65    78.42     0.36  4317.30

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.93     1.11    22.35   618.52     1.03   599.51     0.92     0.91
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 MEAN    24.74     1.10    22.08   617.09     1.03   597.30     0.92     0.91
 HUB     24.88     1.11    21.79   618.17     1.03   595.07     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.18    35.40    31.50     3.90     0.93     0.30     2.90
 MEAN    30.32    27.46    23.50     3.96     0.92     0.30     3.29     0.91
 HUB     36.20    10.47     6.50     3.97     0.92     0.31     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     480.193     247.220     411.664    1200.109       0.400       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.823      22.228     598.681      46.000      30.986      32.400       1.414

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     429.434     247.220     495.511    1203.965       0.357       0.231

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.807      22.716     602.534     456.573       0.016       0.324

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     407.961       0.000     407.961    1205.463       0.338       0.227

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.860     604.035       0.000       0.060       0.037       0.283

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      24.748       1.101     617.925      19.163     256.950       1.992

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 119453.094       0.427     935.319 1221514.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    138.557    3210.000      24.748     617.925       1.000       1.000       0.980
W Kg/sec =   62.98067

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.831    2941.001       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106589.836  108721.398       1.948     509.668     261.643     390.276       1.492

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   380.39    -0.13   380.39     0.32   470.17
 MEAN    15.91     0.00    -0.02   380.39    -0.13   380.39     0.32
 HUB     13.07     0.00    -0.02   380.39    -0.13   380.39     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.46    47.36     6.10   513.19   638.90    23.10   605.85     0.53
 MEAN    49.53    44.80     4.73   445.76   586.10    23.10   605.85     0.49
 HUB     43.92    38.84     5.08   366.12   528.05    23.10   605.85     0.44

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     17.94   450.18   222.37   391.42  1220.19     0.37
 MEAN    15.50   455.90   227.62   395.01  1217.71     0.37
 HUB     12.59   486.79   278.83   399.02  1215.23     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   481.35   280.17     0.39  3991.81
 MEAN   434.13   445.73   206.50     0.37  3529.70     1.44
 HUB    352.68   405.80    73.85     0.33  3512.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.11     1.10    24.67   635.86     1.03   618.95     0.92     0.91
 MEAN    26.83     1.08    24.35   633.78     1.03   616.44     0.92     0.91
 HUB     26.82     1.08    24.01   633.70     1.03   613.93     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.60    35.59    31.50     4.09     0.93     0.31     2.90
 MEAN    29.95    27.60    23.50     4.10     0.92     0.30     3.34     0.91
 HUB     34.94    10.49     6.50     3.99     0.92     0.30     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     460.865     231.797     398.330    1217.990       0.378      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.866      24.336     616.727      46.000      30.196      33.000       2.804

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     420.348     231.797     480.023    1220.928       0.344       0.146

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.836      24.721     619.706     440.827       0.032       0.317

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     393.013       0.000     393.013    1222.754       0.321       0.243

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.963     621.561       0.000       0.060       0.039       0.240

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.870       26.817       1.084     634.448      16.523     276.665       2.145

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 103039.953       0.408     806.804 1265883.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    695528.94   5445.9976     135.3568      1.7751      0.8376      8.9530      1.2135


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 85% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.992

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    133.793    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   60.81521
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
130.703	3197.358	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
102924.961	104983.242	2.185	831.557	380.635	619.754	1.628

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	308.61	-0.11	308.61	0.28	575.61
MEAN	17.06	0.00	-0.02	308.61	-0.11	308.61	0.28	
HUB	12.51	0.00	-0.02	308.61	-0.11	308.61	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.90	50.47	11.43	577.90	655.23	14.32	514.86	0.59
MEAN	57.15	47.20	9.95	477.90	568.97	14.32	514.86	0.51
HUB	48.64	38.62	10.02	350.44	467.03	14.32	514.86	0.42

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	542.01	357.81	407.12	1130.96	0.48
MEAN	18.04	562.16	379.38	414.84	1126.40	0.50
HUB	15.00	630.27	463.08	427.55	1119.64	0.56

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	577.90	462.80	220.08	0.41	7383.91	
MEAN	505.23	433.51	125.85	0.38	6844.35	1.48
HUB	420.19	429.70	42.90	0.38	6947.60	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.37	1.22	15.69	556.04	1.06	531.50	0.92	0.91
MEAN	18.12	1.20	15.28	553.61	1.06	527.21	0.92	0.91
HUB	18.16	1.20	14.64	554.07	1.06	520.90	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.31	28.40	24.20	4.20	0.93	0.39	2.90	
MEAN	42.44	16.88	12.70	4.18	0.94	0.34	3.51	0.91
HUB	47.28	-5.73	-9.30	3.57	0.94	0.19	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	569.231	378.645	425.031	1126.694	0.505	-0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.186	15.274	527.510	24.000	41.697	35.400	-6.297

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	445.082	378.645	584.354	1137.871	0.391	0.369

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.135	16.317	538.028	528.796	0.027	0.498

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	412.333	0.000	412.333	1140.348	0.362	0.408

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.504	540.373	0.000	0.060	0.050	0.431

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.866	18.066	1.196	554.573	31.763	195.211	1.513

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 197755.156       0.592    1495.185 1297660.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    133.793    3210.000      18.066     554.573       1.000       1.000       0.980
W Kg/sec =   60.81521

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    112.566    3104.443       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 102924.961  104983.242       1.801     590.487     327.823     474.134       1.446

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   393.50    -0.14   393.50     0.34   556.71
 MEAN    18.08     0.00    -0.02   393.50    -0.14   393.50     0.34
 HUB     15.21     0.00    -0.02   393.50    -0.14   393.50     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.65    46.36     9.29   575.66   697.41    16.64   541.64     0.61
 MEAN    52.16    42.30     9.86   506.42   641.43    16.64   541.64     0.56
 HUB     47.29    37.84     9.45   426.07   580.08    16.64   541.64     0.51

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   494.29   289.64   400.54  1161.65     0.43
 MEAN    18.01   502.10   295.54   405.92  1158.21     0.43
 HUB     15.22   541.83   351.90   412.00  1154.77     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   490.08   282.38     0.42  5917.15
 MEAN   504.50   456.55   208.97     0.39  5325.02     1.53
 HUB    426.43   418.69    74.54     0.36  5359.03

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.96     1.16    18.51   581.19     1.05   560.79     0.92     0.91
 MEAN    20.66     1.14    18.15   578.53     1.04   557.47     0.92     0.91
 HUB     20.68     1.14    17.78   578.68     1.04   554.16     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.87    35.18    31.50     3.68     0.93     0.37     2.90
 MEAN    36.06    27.24    23.50     3.74     0.94     0.36     3.30     0.91
 HUB     40.50    10.25     6.50     3.75     0.94     0.36     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     703.190     296.364     637.687    1137.975       0.618      -0.812

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.741      16.026     538.173      46.000      24.927      30.600       5.673

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     644.281     296.364     709.175    1144.961       0.563      -0.560

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      20.685      16.680     544.802     361.848       0.031       0.239
```

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	634.247	0.000	634.247	1146.088	0.553	0.273

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	16.741	545.873	0.000	0.060	0.057	-0.537

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.860	20.618	1.141	579.464	24.891	222.951	1.728

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
155033.750	0.474	1172.178	1174067.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 9.953 EfDer = 0.906

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
133.793	3210.000	20.618	579.464	1.000	1.000	0.710

W Kg/sec = 60.81521

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
100.824	3037.035	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
102924.961	104983.242	1.346	395.194	293.638	307.469	1.047

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	572.60	-0.20	572.60	0.50	531.90
MEAN	17.74	0.00	-0.02	572.60	-0.20	572.60	0.50	
HUB	15.05	0.00	-0.02	572.60	-0.20	572.60	0.50	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	44.49	46.36	-1.87	562.21	802.60	17.41	552.09	0.70
MEAN	40.96	43.40	-2.44	496.90	758.27	17.41	552.09	0.66
HUB	36.38	38.84	-2.46	421.59	711.18	17.41	552.09	0.62

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	472.86	246.44	403.57	1184.13	0.40
MEAN	17.51	482.66	259.49	406.97	1181.78	0.41
HUB	14.85	523.15	323.20	411.38	1179.49	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	507.97	308.49	0.43	4885.95	
MEAN	490.40	467.92	230.92	0.40	4546.22	1.72
HUB	415.99	421.71	92.79	0.36	4802.43	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.97	1.11	20.58	601.43	1.04	582.77	0.92	0.83
MEAN	22.80	1.11	20.32	599.90	1.04	580.46	0.92	0.83
HUB	22.93	1.11	20.03	601.06	1.04	578.21	0.92	0.83

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.41	37.39	31.50	5.89	0.93	0.42	2.90	
MEAN	32.52	29.57	23.50	6.07	0.89	0.43	3.28	0.83
HUB	38.15	12.71	6.50	6.21	0.89	0.47	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.906

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

```
     17.392     487.756     261.190     411.929    1182.261       0.413       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.872      20.340     580.937      46.000      32.377      31.500      -0.877

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     423.279     261.190     497.378    1187.241       0.357       0.240

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.855      20.931     585.840     471.992       0.016       0.338

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     410.817       0.000     410.817    1188.120       0.346       0.251

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.990     586.708       0.000       0.060       0.037       0.263

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4           PR4       Texit        Del T       Ns        Ns nondim
      0.795      22.802       1.106     600.798      21.333     246.921       1.914

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 132932.719       0.432    1005.076 1697933.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  1.000

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    133.793     3210.000       22.802     600.798       1.000        1.000       0.980
W Kg/sec =   60.81521

   W cor       RPM cor         GAMMA        Cp          R           Blades       THK
     92.829     2982.627        1.402       0.249      53.349      56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*     AthrRotor  ChokeMargin
 102924.961  104983.242        1.899     513.330     270.366     401.059       1.483

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   385.96    -0.13   385.96      0.32   501.29
 MEAN    16.97      0.00    -0.02   385.96    -0.13   385.96      0.32
 HUB     14.32      0.00    -0.02   385.96    -0.13   385.96      0.32

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     54.43     46.36      8.07   539.52   663.47     21.20   588.37      0.56
 MEAN    50.94     43.80      7.14   475.39   612.44     21.20   588.37      0.51
 HUB     46.11     37.84      8.27   401.14   556.76     21.20   588.37      0.47

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP      18.88   466.48    248.89    394.54  1205.20      0.39
 MEAN     16.57   474.39    257.59    398.36  1202.65      0.39
 HUB      13.89   511.28    315.02    402.70  1200.09      0.43

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP     528.88    483.79    279.99      0.40  4701.54
 MEAN    464.28    448.79    206.69      0.37  4271.44      1.48
 HUB     389.09    409.46     74.08      0.34  4377.48

         Pt2        PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP      25.47      1.12     22.96    621.93      1.04    603.77      0.92      0.91
 MEAN     25.21      1.11     22.65    619.99      1.03    601.21      0.92      0.91
 HUB      25.28      1.11     22.31    620.47      1.03    598.66      0.92      0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.25    35.36    31.50     3.86     0.93     0.33     2.90
 MEAN    32.89    27.42    23.50     3.92     0.93     0.33     3.29     0.91
 HUB     38.03    10.42     6.50     3.92     0.93     0.34     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     468.442     259.034     390.307    1203.912       0.389       0.050

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.292      22.782     602.484      46.000      33.571      32.400      -1.171

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     405.982     259.034     481.581    1208.457       0.336       0.275

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.277      23.376     607.042     456.573       0.015       0.362

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     385.942       0.000     385.942    1209.775       0.319       0.268

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.500     608.367       0.000       0.060       0.037       0.321

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      25.219       1.106     620.798      20.000     242.428       1.879

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 124675.953       0.446     942.649 1169512.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    133.793    3210.000      25.219     620.798       1.000       1.000       0.980
W Kg/sec =   60.81521

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     85.316    2934.188       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 102924.961  104983.242       2.051     509.668     248.496     390.276       1.571

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   360.18    -0.12   360.18     0.30   469.08
 MEAN    15.91     0.00    -0.02   360.18    -0.12   360.18     0.30
 HUB     13.07     0.00    -0.02   360.18    -0.12   360.18     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.94    47.36     7.58   513.19   627.07    23.72   609.97     0.52
 MEAN    51.07    44.80     6.27   445.76   573.19    23.72   609.97     0.47
 HUB     45.48    38.84     6.64   366.12   513.68    23.72   609.97     0.42

     ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   439.82   238.33   369.65  1225.02     0.36
 MEAN    15.50   443.50   239.28   373.42  1222.25     0.36
 HUB     12.59   471.94   283.15   377.56  1219.48     0.39
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   454.37   264.22     0.37  4277.87
 MEAN   434.13   421.20   194.85     0.34  3710.21     1.49
 HUB    352.68   383.91    69.53     0.31  3566.47

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.80     1.10    25.43   640.02     1.03   623.88     0.92     0.91
 MEAN    27.45     1.09    25.06   637.46     1.03   621.05     0.92     0.91
 HUB     27.36     1.08    24.67   636.82     1.03   618.24     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.81    35.56    31.50     4.06     0.93     0.34     2.90
 MEAN    32.65    27.56    23.50     4.06     0.93     0.33     3.34     0.91
 HUB     36.87    10.43     6.50     3.93     0.93     0.32     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     448.502     243.665     376.538    1222.507       0.367      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.487      25.045     621.317      46.000      32.908      33.000       0.092

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     396.123     243.665     465.066    1226.133       0.323       0.199

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.465      25.548     625.008     440.827       0.029       0.357

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     370.724       0.000     370.724    1227.725       0.302       0.289

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.762     626.633       0.000       0.060       0.037       0.285

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      27.446       1.088     638.100      17.302     260.063       2.016

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  107904.391       0.427     815.842 1211657.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    718301.94   5430.9307    130.7028      1.8168      0.8467      9.9532      1.2205


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 85% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.987

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     129.093    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   58.67873

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     126.111    3197.358       1.402       0.249      53.349      32.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
99309.141	101295.109	2.264	831.557	367.263	619.754	1.687

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	296.92	-0.10	296.92	0.27	575.61
MEAN	17.06	0.00	-0.02	296.92	-0.10	296.92	0.27	
HUB	12.51	0.00	-0.02	296.92	-0.10	296.92	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.81	50.47	12.34	577.90	649.80	14.38	515.45	0.58
MEAN	58.15	47.20	10.95	477.90	562.71	14.38	515.45	0.51
HUB	49.73	38.62	11.11	350.44	459.39	14.38	515.45	0.41

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	535.87	366.54	390.89	1132.41	0.47
MEAN	18.04	553.62	384.33	398.48	1127.67	0.49
HUB	15.00	617.54	461.33	410.53	1120.93	0.55

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	577.90	444.37	211.36	0.39	7563.90	
MEAN	505.23	416.42	120.90	0.37	6933.53	1.53
HUB	420.19	412.58	41.14	0.37	6921.21	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.44	1.22	15.81	556.85	1.07	532.86	0.92	0.90
MEAN	18.14	1.20	15.38	554.01	1.06	528.41	0.92	0.90
HUB	18.13	1.20	14.75	553.96	1.06	522.10	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.16	28.40	24.20	4.20	0.93	0.41	2.90	
MEAN	43.96	16.88	12.70	4.18	0.94	0.36	3.51	0.90
HUB	48.33	-5.72	-9.30	3.58	0.94	0.22	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.987

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	560.139	383.584	408.190	1127.998	0.497	0.000

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.208	15.381	528.732	24.000	43.220	35.400	-7.820

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	426.733	383.584	573.793	1139.667	0.374	0.396

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.149	16.473	539.728	528.796	0.030	0.522

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	395.956	0.000	395.956	1141.898	0.347	0.426

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.627	541.843	0.000	0.060	0.057	0.449

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.858	18.072	1.196	554.938	32.128	189.848	1.472

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
200022.594	0.599	1459.200	1248503.500

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    129.093    3210.000      18.072     554.938       1.000       1.000       0.980
W Kg/sec =   58.67873

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.615    3103.424       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 99309.141  101295.109       1.867     590.487     316.316     474.134       1.499

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   378.07    -0.13   378.07     0.33   556.53
MEAN    18.08     0.00    -0.02   378.07    -0.13   378.07     0.33
HUB     15.21     0.00    -0.02   378.07    -0.13   378.07     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.71    46.36    10.35   575.66   688.81    16.75   543.00     0.60
MEAN    53.26    42.30    10.96   506.42   632.08    16.75   543.00     0.55
HUB     48.42    37.84    10.58   426.07   569.72    16.75   543.00     0.50

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   488.34   301.01   384.54  1163.60     0.42
MEAN    18.01   494.35   303.85   389.94  1159.95     0.43
HUB     15.22   531.78   354.87   396.05  1156.29     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    572.02   470.44   271.01     0.40  6149.25
MEAN   504.50   438.54   200.65     0.38  5474.71     1.58
HUB    426.43   402.46    71.56     0.35  5404.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.07     1.17    18.66   582.60     1.05   562.68     0.92     0.90
MEAN    20.73     1.15    18.29   579.56     1.04   559.16     0.92     0.90
HUB     20.69     1.14    17.89   579.25     1.04   555.63     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.05    35.17    31.50     3.67     0.93     0.39     2.90
MEAN    37.93    27.23    23.50     3.73     0.94     0.38     3.30     0.90
HUB     41.86    10.24     6.50     3.74     0.94     0.37     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.987

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     678.600     304.704     606.344    1142.027       0.594      -0.750

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.803      16.379     542.015      46.000      26.681      30.600       3.919

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     610.345     304.704     682.178    1149.741       0.531      -0.452

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      20.760      17.131     549.362     361.848       0.027       0.265

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     17.823     600.560       0.000     600.560    1150.776       0.522       0.322

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      17.199     550.351       0.000       0.060       0.046      -0.425

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      20.711       1.146     580.469      25.531     214.413       1.662

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 159021.297       0.486    1160.088 1127074.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.933

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    129.093    3210.000      20.711     580.469       1.000       1.000       0.710
W Kg/sec =   58.67873

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     96.926    3034.406       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  99309.141  101295.109       1.400     395.194     282.287     307.469       1.089

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   544.34    -0.19   544.34     0.47   531.44
 MEAN    17.74     0.00    -0.02   544.34    -0.19   544.34     0.47
 HUB     15.05     0.00    -0.02   544.34    -0.19   544.34     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.93    46.36    -0.43   562.21   782.69    17.79   555.73     0.68
 MEAN    42.40    43.40    -1.00   496.90   737.16    17.79   555.73     0.64
 HUB     37.77    38.84    -1.07   421.59   688.63    17.79   555.73     0.60

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   465.10   262.13   384.20  1187.17     0.39
 MEAN    17.51   473.27   271.12   387.92  1184.49     0.40
 HUB     14.85   511.56   328.20   392.40  1181.87     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   483.05   292.80     0.41  5196.49
 MEAN   490.40   445.60   219.28     0.38  4749.76     1.76
 HUB    415.99   402.10    87.79     0.34  4876.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.30     1.13    20.96   603.83     1.04   585.77     0.92     0.85
 MEAN    23.07     1.11    20.67   601.82     1.04   583.12     0.92     0.85
 HUB     23.14     1.12    20.34   602.39     1.04   580.55     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.30    37.31    31.50     5.81     0.93     0.44     2.90
 MEAN    34.95    29.48    23.50     5.98     0.90     0.45     3.28     0.85
 HUB     39.91    12.61     6.50     6.11     0.90     0.48     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.933

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     478.107     272.903     392.569    1184.965       0.403       0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     23.146      20.688     583.601      46.000      34.806      31.500      -3.306

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     402.328     272.903     486.152    1190.607       0.338       0.283

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.127      21.368     589.170     471.992       0.017       0.374

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     390.716       0.000     390.716    1191.383       0.328       0.288

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.412     589.939       0.000       0.060       0.040       0.301

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.820      23.070       1.114     602.683      22.215     233.550       1.810

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 138426.219       0.450    1009.843 1616595.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    129.093    3210.000      23.070     602.683       1.000       1.000       0.980
W Kg/sec =   58.67873

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.668    2977.958       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 99309.141  101295.109       1.988     513.330     258.247     401.059       1.553

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   367.36    -0.13   367.36     0.31   500.51
 MEAN    16.97     0.00    -0.02   367.36    -0.13   367.36     0.31
 HUB     14.32     0.00    -0.02   367.36    -0.13   367.36     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.76    46.36     9.40   539.52   652.82    21.60   591.42     0.55
 MEAN    52.31    43.80     8.51   475.39   600.89    21.60   591.42     0.50
 HUB     47.53    37.84     9.69   401.14   544.03    21.60   591.42     0.46

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   458.00   263.09   374.89  1208.92     0.38
 MEAN    16.57   464.05   267.98   378.85  1206.10     0.38
 HUB     13.89   498.57   318.83   383.29  1203.28     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   459.55   265.79     0.38  4969.59
 MEAN   464.28   426.68   196.29     0.35  4443.68     1.53
 HUB    389.09   389.68    70.26     0.32  4430.37

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.91     1.12    23.46   625.02     1.04   607.51     0.92     0.91
 MEAN    25.60     1.11    23.11   622.65     1.03   604.68     0.92     0.91
 HUB     25.59     1.11    22.73   622.59     1.03   601.85     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.06    35.34    31.50     3.84     0.93     0.36     2.90
 MEAN    35.27    27.39    23.50     3.89     0.93     0.36     3.29     0.91
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 HUB     39.75    10.39     6.50     3.89     0.93     0.36     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     458.813     269.491     371.327    1207.268       0.380       0.048

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.672      23.234     605.853      46.000      35.970      32.400      -3.570

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     385.346     269.491     470.231    1212.414       0.318       0.314

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.655      23.919     611.029     456.573       0.017       0.399

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096     366.621       0.000     366.621    1213.579       0.302       0.303

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.020     612.204       0.000       0.060       0.041       0.354

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.877      25.592       1.109     623.422      20.738     230.167       1.784

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 129281.719       0.462     943.133 1120081.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    129.093    3210.000      25.592     623.422       1.000       1.000       0.980
W Kg/sec =   58.67873

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.293    2928.008       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  99309.141  101295.109       2.153     509.668     236.777     390.276       1.648

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   342.40    -0.12   342.40     0.28   468.09
 MEAN    15.91     0.00    -0.02   342.40    -0.12   342.40     0.28
 HUB     13.07     0.00    -0.02   342.40    -0.12   342.40     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.29    47.36     8.93   513.19   617.03    24.22   613.64     0.51
 MEAN    52.48    44.80     7.68   445.76   562.18    24.22   613.64     0.46
 HUB     46.93    38.84     8.09   366.12   501.37    24.22   613.64     0.41

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   432.00   252.09   350.82  1229.23     0.35
 MEAN    15.50   433.54   249.36   354.65  1226.22     0.35
 HUB     12.59   459.38   286.83   358.83  1223.21     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   431.05   250.46     0.35  4524.64
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 MEAN   434.13   399.90   184.77     0.33  3866.34     1.55
 HUB    352.68   364.82    65.85     0.30  3612.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.36     1.11    26.03   643.75     1.03   628.18     0.92     0.91
 MEAN    27.94     1.09    25.62   640.79     1.03   625.11     0.92     0.91
 HUB     27.78     1.09    25.20   639.65     1.03   622.04     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.70    35.52    31.50     4.02     0.93     0.37     2.90
 MEAN    35.11    27.52    23.50     4.02     0.93     0.35     3.34     0.91
 HUB     38.64    10.40     6.50     3.90     0.93     0.34     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     438.599     253.931     357.614    1226.454       0.358      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.978      25.609      625.346      46.000      35.377      33.000      -2.377

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     375.363     253.931     453.187    1230.658       0.305       0.244

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.955      26.206     629.640     440.827       0.030       0.394

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     351.590       0.000     351.590    1232.066       0.285       0.327

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.396     631.082       0.000       0.060       0.039       0.323

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      27.933       1.091     641.395      17.973     246.414       1.910

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  112098.406       0.444     817.777 1160278.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    738850.25   5390.0415    126.1111      1.8490      0.8497     10.9531      1.2268


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 85% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =12.015   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    124.165    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   56.43852

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    121.297    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95517.758   97427.906       2.354     831.557     353.242     619.754       1.754
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ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	284.77	-0.10	284.77	0.26	575.61
MEAN	17.06	0.00	-0.02	284.77	-0.10	284.77	0.26	
HUB	12.51	0.00	-0.02	284.77	-0.10	284.77	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	63.77	50.47	13.30	577.90	644.34	14.44	516.04	0.58
MEAN	59.22	47.20	12.02	477.90	556.39	14.44	516.04	0.50
HUB	50.91	38.62	12.29	350.44	451.63	14.44	516.04	0.41

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	530.12	375.40	374.30	1133.82	0.47
MEAN	18.04	545.22	389.34	381.69	1128.92	0.48
HUB	15.00	604.68	459.50	393.06	1122.20	0.54

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	577.90	425.56	202.50	0.38	7746.57	
MEAN	505.23	398.90	115.90	0.35	7023.73	1.59
HUB	420.19	395.02	39.32	0.35	6893.78	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.50	1.22	15.92	557.67	1.07	534.20	0.92	0.90
MEAN	18.16	1.20	15.48	554.42	1.06	529.59	0.92	0.90
HUB	18.10	1.20	14.85	553.83	1.06	523.29	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.08	28.41	24.20	4.21	0.93	0.44	2.90	
MEAN	45.57	16.89	12.70	4.19	0.94	0.39	3.51	0.90
HUB	49.46	-5.71	-9.30	3.59	0.94	0.24	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.980

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	551.196	388.579	390.927	1129.275	0.488	0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.226	15.482	529.930	24.000	44.827	35.400	-9.427

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	408.055	388.579	563.473	1141.430	0.357	0.424

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.157	16.620	541.398	528.796	0.034	0.547

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	379.239	0.000	379.239	1143.425	0.332	0.444

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.742	543.293	0.000	0.060	0.065	0.467

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.848	18.069	1.196	555.306	32.496	184.342	1.429

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
202314.734	0.606	1419.574	1197425.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

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 RESET =  0.000BLEED =  0.000 DPInc =12.015   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    124.165    3210.000      18.069     555.306       1.000       1.000       0.980
W Kg/sec =   56.43852

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.516    3102.395       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 95517.758   97427.906       1.940     590.487     304.380     474.134       1.558

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   362.29    -0.12   362.29     0.32   556.34
MEAN    18.08     0.00    -0.02   362.29    -0.12   362.29     0.32
HUB     15.21     0.00    -0.02   362.29    -0.12   362.29     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.82    46.36    11.46   575.66   680.28    16.86   544.35     0.59
MEAN    54.43    42.30    12.13   506.42   622.77    16.86   544.35     0.54
HUB     49.63    37.84    11.79   426.07   559.37    16.86   544.35     0.49

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   483.03   312.44   368.37  1165.51     0.41
MEAN    18.01   487.00   312.24   373.73  1161.66     0.42
HUB     15.22   521.83   357.86   379.80  1157.79     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    572.02   450.64   259.57     0.39  6382.63
MEAN   504.50   420.29   192.27     0.36  5625.61     1.62
HUB    426.43   385.94    68.57     0.33  5449.61

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.16     1.17    18.80   584.01     1.05   564.53     0.92     0.90
MEAN    20.78     1.15    18.41   580.61     1.05   560.81     0.92     0.90
HUB     20.69     1.14    17.99   579.82     1.04   557.08     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.30    35.17    31.50     3.67     0.93     0.42     2.90
MEAN    39.88    27.22    23.50     3.72     0.94     0.40     3.30     0.90
HUB     43.30    10.23     6.50     3.73     0.94     0.39     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.980

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     655.474     313.112     575.853    1145.800       0.572      -0.691

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.851      16.697     545.604      46.000      28.535      30.600       2.065

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     577.824     313.112     657.206    1154.166       0.501      -0.348

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      20.818      17.539     553.601     361.848       0.023       0.293

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     568.485       0.000     568.485    1155.097       0.492       0.367

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.680      17.607     554.495       0.000       0.060       0.038      -0.321

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.868      20.782       1.150     581.481      26.175     206.004       1.597

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 163033.812       0.498    1143.953 1078647.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =12.015   EfDer =  0.957

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    124.165    3210.000      20.782     581.481       1.000       1.000       0.710
W Kg/sec =   56.43852

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.993    3031.764       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95517.758   97427.906       1.459     395.194     270.831     307.469       1.135

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   516.98    -0.18   516.98     0.45   530.98
 MEAN    17.74     0.00    -0.02   516.98    -0.18   516.98     0.45
 HUB     15.05     0.00    -0.02   516.98    -0.18   516.98     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.41    46.36     1.05   562.21   763.91    18.13   559.17     0.66
 MEAN    43.88    43.40     0.48   496.90   717.19    18.13   559.17     0.62
 HUB     39.21    38.84     0.37   421.59   667.20    18.13   559.17     0.58

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   458.67   277.35   365.31  1190.07     0.39
 MEAN    17.51   464.92   282.45   369.29  1187.08     0.39
 HUB     14.85   500.69   333.06   373.84  1184.16     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   458.81   277.58     0.39  5497.93
 MEAN   490.40   423.81   207.95     0.36  4947.92     1.81
 HUB    415.99   382.93    82.92     0.32  4948.69

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.61     1.14    21.31   606.20     1.04   588.64     0.92     0.88
 MEAN    23.31     1.12    20.97   603.73     1.04   585.68     0.92     0.88
 HUB     23.31     1.12    20.61   603.73     1.04   582.80     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.21    37.23    31.50     5.73     0.93     0.46     2.90
 MEAN    37.41    29.38    23.50     5.88     0.90     0.47     3.28     0.88
 HUB     41.70    12.51     6.50     6.01     0.90     0.49     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.957

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     469.525     284.305     373.663    1187.545       0.395       0.010

    Pt3        Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.388      20.996     586.148      46.000      37.266      31.500      -5.766

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	382.048	284.305	476.225	1193.828	0.320	0.325

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.363	21.760	592.367	471.992	0.020	0.412

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	371.322	0.000	371.322	1194.507	0.311	0.322

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.784	593.042	0.000	0.060	0.048	0.335

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.838	23.295	1.121	604.552	23.071	221.236	1.715

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
143765.203	0.467	1008.752	1535871.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =12.015 EfDer = 0.992

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
124.165	3210.000	23.295	604.552	1.000	1.000	0.980

W Kg/sec = 56.43852

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
84.588	2973.351	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
95517.758	97427.906	2.084	513.330	246.364	401.059	1.628

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	349.36	-0.12	349.36	0.29	499.73
MEAN	16.97	0.00	-0.02	349.36	-0.12	349.36	0.29	
HUB	14.32	0.00	-0.02	349.36	-0.12	349.36	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.08	46.36	10.72	539.52	642.86	21.95	594.37	0.54
MEAN	53.69	43.80	9.89	475.39	590.06	21.95	594.37	0.49
HUB	48.95	37.84	11.11	401.14	532.04	21.95	594.37	0.44

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	450.93	276.53	356.18	1212.44	0.37
MEAN	16.57	454.89	277.84	360.18	1209.39	0.38
HUB	13.89	486.74	322.41	364.64	1206.33	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	528.88	436.51	252.34	0.36	5223.26	
MEAN	464.28	405.57	186.43	0.34	4607.00	1.59
HUB	389.09	370.69	66.68	0.31	4479.99	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.29	1.13	23.89	628.02	1.04	611.06	0.92	0.91
MEAN	25.92	1.11	23.51	625.26	1.03	607.99	0.92	0.91
HUB	25.85	1.11	23.10	624.68	1.03	604.91	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.83	35.32	31.50	3.82	0.93	0.39	2.90	
MEAN	37.65	27.37	23.50	3.87	0.94	0.38	3.29	0.91
HUB	41.48	10.36	6.50	3.86	0.94	0.38	3.90	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     450.311     279.407     353.146    1210.458       0.372       0.046

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.994      23.623     609.066      46.000      38.351      32.400      -5.951

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     365.736     279.407     460.251    1216.168       0.301       0.353

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.970      24.389     614.825     456.573       0.019       0.435

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     348.295       0.000     348.295    1217.196       0.286       0.334

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.464     615.865       0.000       0.060       0.048       0.383

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      25.897       1.112     625.988      21.436     218.947       1.697

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 133639.000       0.478     937.700 1069845.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =12.015   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    124.165    3210.000      25.897     625.988       1.000       1.000       0.980
W Kg/sec =   56.43852

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.427    2921.999       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95517.758   97427.906       2.260     509.668     225.519     390.276       1.731

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   325.50    -0.11   325.50     0.27   467.13
 MEAN    15.91     0.00    -0.02   325.50    -0.11   325.50     0.27
 HUB     13.07     0.00    -0.02   325.50    -0.11   325.50     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.62    47.36    10.26   513.19   607.81    24.64   617.15     0.50
 MEAN    53.87    44.80     9.07   445.76   552.04    24.64   617.15     0.45
 HUB     48.37    38.84     9.53   366.12   489.98    24.64   617.15     0.40

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   425.66   264.93   333.17  1233.18     0.35
 MEAN    15.50   424.88   258.77   336.98  1229.97     0.35
 HUB     12.59   447.92   290.27   341.14  1226.76     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   409.22   237.61     0.33  4754.91
 MEAN   434.13   379.88   175.36     0.31  4012.07     1.61
 HUB    352.68   346.80    62.41     0.28  3655.98
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    28.82     1.11    26.54   647.35     1.03   632.23     0.92     0.91
 MEAN   28.35     1.09    26.10   644.01     1.03   628.95     0.92     0.91
 HUB    28.12     1.09    25.65   642.41     1.03   625.67     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    38.49    35.50    31.50     4.00     0.93     0.40     2.90
 MEAN   37.52    27.49    23.50     3.99     0.93     0.38     3.34     0.91
 HUB    40.39    10.37     6.50     3.87     0.93     0.36     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     430.008     263.513     339.805    1230.179       0.350       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.382      26.080     629.162      46.000      37.793      33.000      -4.793

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     356.022     263.513     442.934    1234.913       0.288       0.285

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.351      26.760     634.014     440.827       0.033       0.431

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     333.743       0.000     333.743    1236.161       0.270       0.362

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.924     635.296       0.000       0.060       0.044       0.356

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      28.325       1.094     644.588      18.600     234.145       1.815

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 116014.492       0.459     814.035 1108161.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    758767.25   5324.0137    121.2965      1.8749      0.8479     12.0155      1.2329


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 85% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =12.953   EfDer =  0.974

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.869    3210.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   54.48574

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    117.100    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92212.828   94056.891       2.438     831.557     341.020     619.754       1.817

     ROTOR LEADING EDGE CONDITIONS, STAGE            1
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   274.27    -0.09   274.27     0.25   575.61
MEAN    17.06     0.00    -0.02   274.27    -0.09   274.27     0.25
HUB     12.51     0.00    -0.02   274.27    -0.09   274.27     0.25

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     64.61    50.47    14.14   577.90   639.76    14.48   516.53     0.57
MEAN    60.15    47.20    12.95   477.90   551.09    14.48   516.53     0.49
HUB     51.96    38.62    13.34   350.44   445.08    14.48   516.53     0.40

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   525.65   382.90   360.14  1134.98     0.46
MEAN    18.04   538.34   393.55   367.32  1129.95     0.48
HUB     15.00   593.81   457.87   378.11  1123.24     0.53

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    577.90   409.54   195.00     0.36  7901.24
MEAN   505.23   383.93   111.68     0.34  7099.73     1.64
HUB    420.19   379.98    37.69     0.34  6869.28

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.55     1.23    16.01   558.37     1.07   535.29     0.92     0.89
MEAN    18.18     1.20    15.56   554.76     1.06   530.55     0.92     0.89
HUB     18.07     1.20    14.93   553.72     1.06   524.27     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.76    28.43    24.20     4.23     0.93     0.46     2.90
MEAN    46.97    16.91    12.70     4.21     0.94     0.41     3.51     0.89
HUB     50.45    -5.69    -9.30     3.61     0.94     0.26     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.974

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     543.861     392.788     376.168    1130.319       0.481       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.237      15.562     530.910      24.000      46.238      35.400     -10.838

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     392.172     392.788     555.051    1142.874       0.343       0.448

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.160      16.737     542.769     528.796       0.038       0.570

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     364.984       0.000     364.984    1144.682       0.319       0.459

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.831     544.489       0.000       0.060       0.073       0.482

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.838      18.062       1.196     555.615      32.805     179.630       1.392

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 204239.797       0.612    1383.497 1153266.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =12.953   EfDer =  0.973

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
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    119.869    3210.000      18.062     555.615       1.000       1.000       0.980
W Kg/sec =   54.48574

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.971    3101.531       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 92212.828   94056.891       2.008     590.487     294.056     474.134       1.612

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   348.81    -0.12   348.81     0.30   556.19
MEAN    18.08     0.00    -0.02   348.81    -0.12   348.81     0.30
HUB     15.21     0.00    -0.02   348.81    -0.12   348.81     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.79    46.36    12.43   575.66   673.19    16.94   545.46     0.59
MEAN    55.45    42.30    13.15   506.42   615.02    16.94   545.46     0.54
HUB     50.70    37.84    12.86   426.07   550.73    16.94   545.46     0.48

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   479.06   322.01   354.69  1167.06     0.41
MEAN    18.01   481.16   319.28   359.97  1163.05     0.41
HUB     15.22   513.59   360.35   365.96  1159.03     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    572.02   433.94   250.00     0.37  6578.01
MEAN   504.50   404.83   185.23     0.35  5752.34     1.67
HUB    426.43   371.88    66.09     0.32  5487.39

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.23     1.18    18.90   585.20     1.05   566.04     0.92     0.89
MEAN    20.81     1.15    18.49   581.49     1.05   562.16     0.92     0.89
HUB     20.68     1.14    18.07   580.30     1.04   558.27     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.24    35.18    31.50     3.68     0.93     0.44     2.90
MEAN    41.57    27.23    23.50     3.73     0.94     0.42     3.30     0.89
HUB     44.56    10.24     6.50     3.74     0.94     0.41     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.973

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     637.123     320.173     550.831    1148.765       0.555      -0.643

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.881      16.939     548.434      46.000      30.168      30.600       0.432

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     551.448     320.173     637.656    1157.636       0.476      -0.264

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      20.853      17.849     556.937     361.848       0.022       0.316

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     542.775       0.000     542.775    1158.459       0.469       0.400

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.680      17.907     557.729       0.000       0.060       0.037      -0.240

   STAGE EXIT CONDITIONS, STAGE            2
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Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.864	20.817	1.153	582.330	26.715	199.066	1.543

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
166394.594	0.509	1127.138	1037072.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
RESET = 0.000BLEED = 0.000 DPInc =12.953 EfDer = 0.973

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
119.869	3210.000	20.817	582.330	1.000	1.000	0.710

W Kg/sec = 54.48574

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
89.689	3029.554	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
92212.828	94056.891	1.513	395.194	261.211	307.469	1.177

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	494.78	-0.17	494.78	0.43	530.59
MEAN	17.74	0.00	-0.02	494.78	-0.17	494.78	0.43	
HUB	15.05	0.00	-0.02	494.78	-0.17	494.78	0.43	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.66	46.36	2.30	562.21	749.05	18.38	561.89	0.64
MEAN	45.13	43.40	1.73	496.90	701.34	18.38	561.89	0.60
HUB	40.45	38.84	1.61	421.59	650.14	18.38	561.89	0.56

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	454.32	289.70	349.98	1192.36	0.38
MEAN	17.51	458.76	291.67	354.10	1189.14	0.39
HUB	14.85	492.19	337.01	358.71	1185.99	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	439.12	265.23	0.37	5742.44	
MEAN	490.40	406.06	198.73	0.34	5109.18	1.85
HUB	415.99	367.30	78.97	0.31	5007.22	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.83	1.14	21.55	608.15	1.04	590.92	0.92	0.89
MEAN	23.48	1.13	21.19	605.30	1.04	587.73	0.92	0.89
HUB	23.43	1.13	20.80	604.84	1.04	584.62	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.62	37.16	31.50	5.66	0.93	0.48	2.90	
MEAN	39.48	29.30	23.50	5.80	0.91	0.48	3.28	0.89
HUB	43.21	12.42	6.50	5.92	0.91	0.50	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.973

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	463.198	293.585	358.274	1189.602	0.389	0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.555	21.214	588.186	46.000	39.333	31.500	-7.833

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	365.650	293.585	468.927	1196.408	0.306	0.360

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.522	22.045	594.935	471.992	0.024	0.445

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	355.672	0.000	355.672	1197.012	0.297	0.348

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.048	595.536	0.000	0.060	0.057	0.361

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.849	23.443	1.126	606.096	23.767	211.662	1.641

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
148101.094	0.481	1003.220	1468638.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =12.953 EfDer = 0.986

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
119.869	3210.000	23.443	606.096	1.000	1.000	0.980

W Kg/sec = 54.48574

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
81.251	2969.561	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
92212.828	94056.891	2.169	513.330	236.648	401.059	1.695

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	334.81	-0.12	334.81	0.28	499.09
MEAN	16.97	0.00	-0.02	334.81	-0.12	334.81	0.28	
HUB	14.32	0.00	-0.02	334.81	-0.12	334.81	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.18	46.36	11.82	539.52	635.06	22.20	596.74	0.53
MEAN	54.85	43.80	11.05	475.39	581.56	22.20	596.74	0.49
HUB	50.16	37.84	12.32	401.14	522.59	22.20	596.74	0.44

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	446.00	287.21	341.21	1215.22	0.37
MEAN	16.57	448.06	285.67	345.19	1212.00	0.37
HUB	13.89	477.51	325.23	349.63	1208.77	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	528.88	418.13	241.67	0.34	5424.71	
MEAN	464.28	388.66	178.61	0.32	4736.54	1.64
HUB	389.09	355.41	63.86	0.29	4519.10	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.55	1.13	24.19	630.47	1.04	613.87	0.92	0.90
MEAN	26.14	1.12	23.78	627.38	1.04	610.63	0.92	0.90
HUB	26.01	1.11	23.36	626.40	1.03	607.38	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.09	35.31	31.50	3.81	0.93	0.42	2.90	
MEAN	39.61	27.36	23.50	3.86	0.94	0.41	3.29	0.90
HUB	42.93	10.35	6.50	3.85	0.94	0.40	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.986

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481      444.001     287.272      338.544    1213.002       0.366        0.043

     Pt3          Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     26.208       23.889      611.635       46.000      40.316       32.400      -7.916

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     16.481      350.084     287.272      452.862    1219.157       0.287        0.384

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       26.178      24.720      617.859     456.573       0.022        0.466

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096      333.680       0.000      333.680    1220.081       0.273        0.358

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       24.770      618.795       0.000       0.060       0.057        0.405

    STAGE EXIT CONDITIONS, STAGE             4
       Eff4        Pt4           PR4        Texit        Del T        Ns         Ns nondim
       0.859       26.092        1.113      628.086      21.990      210.273        1.630

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 137095.312       0.490     928.668 1027190.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =12.953   EfDer =  0.990

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    119.869     3210.000       26.092      628.086       1.000        1.000        0.980
W Kg/sec =   54.48574

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     74.313     2917.115        1.401        0.249       53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  92212.828   94056.891        2.355      509.668      216.450      390.276        1.803

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00     -0.02    311.99     -0.11    311.99      0.26    466.35
 MEAN    15.91      0.00     -0.02    311.99     -0.11    311.99      0.26
 HUB     13.07      0.00     -0.02    311.99     -0.11    311.99      0.26

       BetaFlo    BetaBlade Incid    U1        W1        Ps1       Ts1      Rel Mach
 TIP     58.71     47.36     11.35    513.19    600.68     24.93    619.97      0.49
 MEAN    55.02     44.80     10.22    445.76    544.19     24.93    619.97      0.45
 HUB     49.57     38.84     10.73    366.12    481.10     24.93    619.97      0.39

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94    421.32    274.99    319.21   1236.29      0.34
 MEAN    15.50    418.52    266.17    322.97   1232.95      0.34
 HUB     12.59    439.06    292.92    327.07   1229.59      0.36

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    502.54    392.01    227.55      0.32   4935.29
 MEAN   434.13    364.03    167.96      0.30   4126.66      1.66
 HUB    352.68    332.48     59.76      0.27   3689.27

         Pt2        PR       Ps2      Tt2        TR       Ts2       Eff2uCor   Eff2incCor
 TIP     29.12      1.12     26.87    650.25      1.04    635.44      0.92      0.91
 MEAN    28.61      1.10     26.42    646.62      1.03    632.01      0.92      0.91
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 HUB     28.34     1.09    25.94   644.66     1.03   628.58     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.74    35.48    31.50     3.98     0.93     0.43     2.90
 MEAN    39.49    27.48    23.50     3.98     0.94     0.40     3.34     0.91
 HUB     41.85    10.35     6.50     3.85     0.94     0.38     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     423.718     271.048     325.684    1233.133       0.344      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.645      26.396     632.200      46.000      39.769      33.000      -6.769

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     340.797     271.048     435.442    1238.280       0.275       0.318

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.603      27.136     637.488     440.827       0.038       0.462

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     319.682       0.000     319.682    1239.409       0.258       0.388

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.279     638.651       0.000       0.060       0.052       0.381

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      28.572       1.095     647.177      19.090     224.794       1.743

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 119080.266       0.472     806.636 1063947.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    774911.00   5249.1587    117.0996      1.8913      0.8428     12.9533      1.2379

*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 85% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =13.991   EfDer =  0.966

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.171    3210.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   52.35062

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.511    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88599.312   90371.109       2.538     831.557     327.656     619.754       1.891

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   262.87    -0.09   262.87     0.24   575.61
 MEAN    17.06     0.00    -0.02   262.87    -0.09   262.87     0.24
 HUB     12.51     0.00    -0.02   262.87    -0.09   262.87     0.24
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     65.54    50.47    15.07   577.90   634.96    14.53   517.04     0.57
MEAN    61.19    47.20    13.99   477.90   545.50    14.53   517.04     0.49
HUB     53.13    38.62    14.51   350.44   438.14    14.53   517.04     0.39

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   521.31   390.88   344.94  1136.16     0.46
MEAN    18.04   531.27   398.03   351.87  1131.00     0.47
HUB     15.00   582.30   456.08   362.02  1124.32     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    577.90   392.38   187.02     0.35  8065.68
MEAN   505.23   367.84   107.20     0.33  7180.46     1.69
HUB    420.19   363.80    35.89     0.32  6842.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.60     1.23    16.09   559.11     1.07   536.41     0.92     0.88
MEAN    18.19     1.20    15.63   555.12     1.06   531.55     0.92     0.88
HUB     18.03     1.19    15.02   553.60     1.06   525.28     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     48.57    28.47    24.20     4.27     0.93     0.49     2.90
MEAN    48.52    16.94    12.70     4.24     0.95     0.43     3.51     0.88
HUB     51.56    -5.66    -9.30     3.64     0.95     0.29     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.966

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     536.314     397.259     360.303    1131.392       0.474       0.003

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.245      15.640     531.918      24.000      47.793      35.400     -12.393

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     375.173     397.259     546.415    1144.364       0.328       0.473

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.158      16.854     544.186     528.796       0.042       0.595

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     349.682       0.000     349.682    1145.986       0.305       0.475

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.918     545.729       0.000       0.060       0.083       0.497

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.826      18.048       1.195     555.942      33.132     174.554       1.353

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 206278.094       0.618    1342.548 1105350.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.991   EfDer =  0.964

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.171    3210.000      18.048     555.942       1.000       1.000       0.980
W Kg/sec =   52.35062

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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    97.116    3100.618       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 88599.312   90371.109       2.088     590.487     282.829     474.134       1.676

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   334.32    -0.12   334.32     0.29   556.03
MEAN    18.08     0.00    -0.02   334.32    -0.12   334.32     0.29
HUB     15.21     0.00    -0.02   334.32    -0.12   334.32     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.86    46.36    13.50   575.66   665.80    17.01   546.61     0.58
MEAN    56.57    42.30    14.27   506.42   606.91    17.01   546.61     0.53
HUB     51.89    37.84    14.05   426.07   541.67    17.01   546.61     0.47

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   475.39   332.16   340.10  1168.66     0.41
MEAN    18.01   475.34   326.72   345.26  1164.49     0.41
HUB     15.22   504.97   362.93   351.11  1160.31     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    572.02   416.17   239.86     0.36  6785.03
MEAN   504.50   388.34   177.78     0.33  5886.31     1.72
HUB    426.43   356.81    63.51     0.31  5526.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.29     1.18    18.99   586.46     1.05   567.59     0.92     0.88
MEAN    20.83     1.15    18.57   582.42     1.05   563.55     0.92     0.88
HUB     20.66     1.14    18.13   580.80     1.04   559.51     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.32    35.19    31.50     3.69     0.93     0.46     2.90
MEAN    43.42    27.25    23.50     3.75     0.95     0.44     3.30     0.88
HUB     45.95    10.25     6.50     3.75     0.95     0.43     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.964

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     618.674     327.638     524.796    1151.725       0.537       -0.594

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.902      17.171     551.266      46.000      31.977      30.600      -1.377

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
    17.960     524.265     327.638     618.224    1161.099       0.452       -0.177

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      20.875      18.147     560.276     361.848       0.021       0.343

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.823     516.291       0.000     516.291    1161.816       0.444       0.433

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.680      18.193     560.969       0.000       0.060       0.037       -0.158

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.857      20.838       1.155     583.227      27.285     191.826       1.487

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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 169945.438       0.519    1106.079  992227.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.991   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.171    3210.000      20.838     583.227       1.000       1.000       0.710
W Kg/sec =   52.35062

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.154    3027.222       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 88599.312   90371.109       1.575     395.194     250.916     307.469       1.225

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   471.68    -0.16   471.68     0.40   530.18
 MEAN    17.74     0.00    -0.02   471.68    -0.16   471.68     0.40
 HUB     15.05     0.00    -0.02   471.68    -0.16   471.68     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.01    46.36     3.65   562.21   733.99    18.61   564.66     0.63
 MEAN    46.50    43.40     3.10   496.90   685.24    18.61   564.66     0.59
 HUB     41.80    38.84     2.96   421.59   632.73    18.61   564.66     0.54

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   450.66   302.48   334.07  1194.69     0.38
 MEAN    17.51   452.95   301.19   338.30  1191.25     0.38
 HUB     14.85   483.68   341.09   342.94  1187.87     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   418.73   252.45     0.35  5995.33
 MEAN   490.40   387.62   189.21     0.33  5275.69     1.90
 HUB    415.99   351.03    74.90     0.30  5067.56

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.03     1.15    21.78   610.18     1.05   593.23     0.92     0.90
 MEAN    23.63     1.13    21.38   606.95     1.04   589.82     0.92     0.90
 HUB     23.52     1.13    20.98   606.01     1.04   586.48     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.16    37.08    31.50     5.58     0.93     0.50     2.90
 MEAN    41.68    29.22    23.50     5.72     0.91     0.50     3.28     0.90
 HUB     44.84    12.32     6.50     5.82     0.91     0.51     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     457.230     303.167     342.270    1191.693       0.384       0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.702      21.411     590.261      46.000      41.533      31.500     -10.033

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     348.692     303.167     462.056    1199.041       0.291       0.396

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.660      22.309     597.563     471.992       0.028       0.480

    VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	339.499	0.000	339.499	1199.571	0.283	0.374

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.288	598.091	0.000	0.060	0.069	0.387

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.855	23.565	1.131	607.713	24.485	202.094	1.567

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
152581.547	0.495	993.068	1397732.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =13.991 EfDer = 0.979

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
115.171	3210.000	23.565	607.713	1.000	1.000	0.980

W Kg/sec = 52.35062

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
77.766	2965.610	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
88599.312	90371.109	2.266	513.330	226.498	401.059	1.771

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	319.75	-0.11	319.75	0.27	498.43
MEAN	16.97	0.00	-0.02	319.75	-0.11	319.75	0.27	
HUB	14.32	0.00	-0.02	319.75	-0.11	319.75	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.35	46.36	12.99	539.52	627.25	22.43	599.18	0.52
MEAN	56.08	43.80	12.28	475.39	573.01	22.43	599.18	0.48
HUB	51.45	37.84	13.61	401.14	513.07	22.43	599.18	0.43

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	441.64	298.10	325.86	1218.04	0.36
MEAN	16.57	441.56	293.66	329.76	1214.66	0.36
HUB	13.89	468.28	328.09	334.13	1211.27	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	528.88	399.30	230.78	0.33	5630.23	
MEAN	464.28	371.29	170.62	0.31	4868.94	1.69
HUB	389.09	339.65	61.01	0.28	4558.70	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.78	1.14	24.45	633.01	1.04	616.74	0.92	0.90
MEAN	26.32	1.12	24.03	629.59	1.04	613.32	0.92	0.90
HUB	26.14	1.11	23.58	628.20	1.03	609.90	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.45	35.31	31.50	3.81	0.93	0.44	2.90	
MEAN	41.69	27.36	23.50	3.86	0.94	0.43	3.29	0.90
HUB	44.48	10.35	6.50	3.85	0.94	0.42	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.979

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	438.022	295.311	323.504	1215.590	0.360	0.041

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
26.390	24.123	614.257	46.000	42.391	32.400	-9.991

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	334.037	295.311	445.857	1222.201	0.273	0.417

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	26.351	25.017	620.956	456.573	0.026	0.499

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	318.696	0.000	318.696	1223.023	0.261	0.382

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	25.038	621.792	0.000	0.060	0.068	0.426

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.846	26.250	1.114	630.267	22.555	201.612	1.563

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
140620.984	0.503	915.223	981520.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =13.991 EfDer = 0.984

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
115.171	3210.000	26.250	630.267	1.000	1.000	0.980

W Kg/sec = 52.35062

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
71.094	2912.063	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
88599.312	90371.109	2.461	509.668	207.076	390.276	1.885

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	298.12	-0.10	298.12	0.24	465.54
MEAN	15.91	0.00	-0.02	298.12	-0.10	298.12	0.24	
HUB	13.07	0.00	-0.02	298.12	-0.10	298.12	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.85	47.36	12.49	513.19	593.58	25.19	622.85	0.48
MEAN	56.23	44.80	11.43	445.76	536.35	25.19	622.85	0.44
HUB	50.85	38.84	12.01	366.12	472.22	25.19	622.85	0.39

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	417.55	285.18	304.98	1239.45	0.34
MEAN	15.50	412.50	273.66	308.66	1235.97	0.33
HUB	12.59	430.28	295.61	312.66	1232.48	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	502.54	374.51	217.36	0.30	5118.06	
MEAN	434.13	347.88	160.47	0.28	4242.71	1.71
HUB	352.68	317.82	57.07	0.26	3723.03	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	29.38	1.12	27.16	653.25	1.04	638.71	0.92	0.90
MEAN	28.83	1.10	26.69	649.32	1.03	635.13	0.92	0.90
HUB	28.51	1.09	26.20	646.99	1.03	631.54	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.08	35.48	31.50	3.98	0.93	0.45	2.90	

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 MEAN    41.56    27.47    23.50     3.97     0.94     0.43     3.34     0.90
 HUB     43.39    10.34     6.50     3.84     0.94     0.40     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     417.786     278.678     311.262    1236.134       0.338       -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.863      26.667     635.295      46.000      41.839      33.000      -8.839

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     325.330     278.678     428.370    1241.697       0.262       0.351

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      28.807      27.464     641.026     440.827       0.045       0.494

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     305.386       0.000     305.386    1242.713       0.246       0.413

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      27.585     642.075       0.000       0.060       0.062       0.405

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.856       28.769       1.096     649.855      19.587     215.537       1.671

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 122185.836       0.484     795.239 1016624.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    791611.88   5152.1582     112.5109      1.9044      0.8348     13.9913      1.2430


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 85%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3210.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    149.697    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.907     831.557     435.951     619.754       1.422

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   358.22    -0.12   358.22     0.32   575.61
 MEAN    17.06     0.00    -0.02   358.22    -0.12   358.22     0.32
 HUB     12.51     0.00    -0.02   358.22    -0.12   358.22     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.21    50.47     7.74   577.90   680.02    14.05   512.09     0.61
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MEAN    53.15    47.20     5.95   477.90   597.35    14.05   512.09     0.54
HUB     44.38    38.62     5.76   350.44   501.21    14.05   512.09     0.45

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   575.83   318.33   479.84  1123.72     0.51
MEAN    18.04   604.23   357.10   487.42  1120.12     0.54
HUB     15.00   688.82   470.47   503.13  1113.31     0.62

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    577.90   545.55   259.57     0.49  6569.64
MEAN   505.23   509.43   148.14     0.45  6442.69     1.31
HUB    420.19   505.63    50.28     0.45  7058.54

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.01     1.19    15.05   552.37     1.06   524.68     0.92     0.91
MEAN    17.95     1.19    14.72   551.80     1.06   521.31     0.92     0.91
HUB     18.24     1.21    14.09   554.57     1.06   514.95     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.56    28.41    24.20     4.21     0.93     0.28     2.90
MEAN    36.23    16.91    12.70     4.21     0.92     0.23     3.51     0.91
HUB     43.08    -5.71    -9.30     3.59     0.92     0.10     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     614.075     356.402     500.066    1120.172       0.548      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.033      14.697     521.420      24.000      35.478      35.400      -0.078

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     528.924     356.402     637.795    1128.870       0.469       0.249

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.994      15.478     529.549     528.796       0.021       0.401

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     486.649       0.000     486.649    1132.685       0.430       0.320

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.801     533.135       0.000       0.060       0.037       0.342

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.878      17.942       1.188     552.916      30.106     218.943       1.697

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 187435.969       0.561    1623.114 1506272.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3210.000      17.942     552.916       1.000       1.000       0.980
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    129.626    3109.092       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 117882.562  120239.961       1.564     590.487     377.504     474.134       1.256

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   463.08    -0.16   463.08     0.41   557.55
MEAN    18.08     0.00    -0.02   463.08    -0.16   463.08     0.41
HUB     15.21     0.00    -0.02   463.08    -0.16   463.08     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.19    46.36     4.83   575.66   738.93    15.99   535.01     0.65
MEAN    47.57    42.30     5.27   506.42   686.34    15.99   535.01     0.60
HUB     42.63    37.84     4.79   426.07   629.38    15.99   535.01     0.55

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   531.02   235.48   475.96  1151.50     0.46
MEAN    18.01   544.29   256.23   480.20  1149.35     0.47
HUB     15.22   591.21   337.61   485.34  1147.17     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    572.02   582.92   336.54     0.51  4811.71
MEAN   504.50   540.58   248.27     0.47  4617.65     1.37
HUB    426.43   493.40    88.82     0.43  5141.87

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.28     1.13    17.53   574.56     1.04   551.01     0.92     0.91
MEAN    20.18     1.12    17.31   573.69     1.04   548.95     0.92     0.91
HUB     20.45     1.14    17.06   576.04     1.04   546.86     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     26.32    35.26    31.50     3.76     0.93     0.27     2.90
MEAN    28.08    27.34    23.50     3.84     0.92     0.27     3.30     0.91
HUB     34.82    10.37     6.50     3.87     0.92     0.28     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     954.991     256.953     919.773    1095.501       0.872      -1.648

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.273      12.349     498.623      46.000      15.609      30.600      14.991

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960    1007.519     256.953    1039.769    1086.625       0.927      -1.933

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.650      20.020      11.483     490.099     345.258       0.094      -0.007

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823    1047.624       0.000    1047.624    1081.641       0.969      -0.570

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.650      10.634     483.604       0.000       0.060       0.292      -2.215

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.583      19.424       1.083     574.764      21.848     266.717       2.068

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 136076.438       0.416    1178.363 1379340.500
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.785

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    153.237    3210.000      19.424     574.764       1.000       1.000       0.680
W Kg/sec =   69.65320

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    122.076    3049.429       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 117882.562  120239.961       1.065     378.495     355.537     293.880       0.827

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   832.10    -0.29   832.10     0.75   534.07
 MEAN    17.74     0.00    -0.02   832.10    -0.29   832.10     0.75
 HUB     15.05     0.00    -0.02   832.10    -0.29   832.10     0.75

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     34.06    46.36   -12.30   562.21  1004.39    13.42   516.96     0.90
 MEAN    30.86    43.40   -12.54   496.90   969.32    13.42   516.96     0.87
 HUB     26.89    38.84   -11.95   421.59   932.94    13.42   516.96     0.84

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   537.87   143.33   518.42  1164.32     0.46
 MEAN    17.51   549.64   182.04   518.62  1164.83     0.47
 HUB     14.85   594.92   286.09   521.61  1165.30     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   661.95   411.60     0.57  2845.10
 MEAN   490.40   603.37   308.36     0.52  3192.00     1.67
 HUB    415.99   537.54   129.90     0.46  4252.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.53     1.06    17.73   587.56     1.02   563.41     0.92     0.72
 MEAN    20.67     1.06    17.74   589.12     1.02   563.90     0.92     0.72
 HUB     21.09     1.09    17.65   593.89     1.03   564.35     0.92     0.72

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.45    38.45    31.50     6.95     0.93     0.37     2.90
 MEAN    19.34    30.73    23.50     7.23     0.83     0.41     3.28     0.72
 HUB     28.74    13.98     6.50     7.48     0.83     0.46     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.785

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     556.807     183.236     525.793    1165.199       0.478      -0.004

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.732      17.729     564.307      46.000      19.213      31.500      12.287

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
    17.392     553.109     183.236     582.671    1165.553       0.475      -0.009

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.633      17.682     564.649     471.992       0.042       0.145

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     537.376       0.000     537.376    1167.031       0.460       0.001
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.732	566.081	0.000	0.060	0.083	0.008

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.586	20.510	1.056	590.188	15.424	371.577	2.880

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
96093.812	0.312	832.131	2357810.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 5.953 EfDer = 0.945

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
153.237	3210.000	20.510	590.188	1.000	1.000	0.980

W Kg/sec = 69.65320

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
117.152	3009.319	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
117882.562	120239.961	1.504	513.330	341.209	401.059	1.175

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	501.52	-0.17	501.52	0.43	505.78
MEAN	16.97	0.00	-0.02	501.52	-0.17	501.52	0.43	
HUB	14.32	0.00	-0.02	501.52	-0.17	501.52	0.43	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.10	46.36	0.74	539.52	736.75	18.07	569.20	0.63
MEAN	43.48	43.80	-0.32	475.39	691.15	18.07	569.20	0.59
HUB	38.67	37.84	0.83	401.14	642.32	18.07	569.20	0.55

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	547.69	153.44	525.76	1179.43	0.46
MEAN	16.57	559.04	188.85	526.18	1179.43	0.47
HUB	13.89	602.40	289.66	528.19	1179.25	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	528.88	646.05	375.44	0.55	2900.24	
MEAN	464.28	593.91	275.42	0.50	3132.94	1.24
HUB	389.09	537.47	99.44	0.46	4025.79	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.91	1.07	18.90	603.23	1.02	578.19	0.92	0.86
MEAN	22.03	1.07	18.88	604.27	1.02	578.19	0.92	0.86
HUB	22.47	1.10	18.80	608.29	1.03	578.01	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	16.27	35.53	31.50	4.03	0.93	0.16	2.90	
MEAN	19.74	27.63	23.50	4.13	0.90	0.18	3.29	0.86
HUB	28.74	10.66	6.50	4.16	0.90	0.22	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.945

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	548.298	189.914	514.357	1181.399	0.464	0.056

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.103	19.067	580.173	46.000	20.265	32.400	12.135

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	547.047	189.914	579.075	1181.515	0.463	0.040

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.003	18.993	580.287	456.573	0.041	0.169

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	519.373	0.000	519.373	1184.020	0.439	0.028

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.159	582.750	0.000	0.060	0.082	0.091

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.726	21.868	1.066	605.261	15.074	341.716	2.649

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
93937.758	0.336	813.460	1410097.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 5.953 EfDer = 0.915

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
153.237	3210.000	21.868	605.261	1.000	1.000	0.980

W Kg/sec = 69.65320

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
111.269	2971.609	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
117882.562	120239.961	1.573	509.668	324.087	390.276	1.204

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	481.34	-0.17	481.34	0.41	475.06
MEAN	15.91	0.00	-0.02	481.34	-0.17	481.34	0.41	
HUB	13.07	0.00	-0.02	481.34	-0.17	481.34	0.41	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.84	47.36	-0.52	513.19	703.72	19.53	585.93	0.59
MEAN	42.81	44.80	-1.99	445.76	656.16	19.53	585.93	0.55
HUB	37.27	38.84	-1.57	366.12	604.86	19.53	585.93	0.51

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	525.31	137.36	507.04	1194.69	0.44
MEAN	15.50	534.45	166.33	507.90	1194.39	0.45
HUB	12.59	570.91	256.21	510.19	1193.94	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	502.54	624.86	365.19	0.52	2467.19	
MEAN	434.13	574.18	267.79	0.48	2580.40	1.23
HUB	352.68	519.23	96.47	0.43	3227.86	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.06	1.05	20.19	616.35	1.02	593.33	0.92	0.84
MEAN	23.12	1.06	20.15	616.86	1.02	593.03	0.92	0.84
HUB	23.44	1.07	20.04	619.77	1.02	592.58	0.92	0.84

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	15.16	35.76	31.50	4.26	0.93	0.15	2.90	
MEAN	18.13	27.80	23.50	4.30	0.89	0.16	3.34	0.84
HUB	26.66	10.71	6.50	4.21	0.89	0.19	4.06	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.915

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     540.026     169.383     512.774    1194.655       0.452      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.145      20.114     593.328      46.000      18.280      33.000      14.720

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     555.995     169.383     581.223    1193.184       0.466      -0.125

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.912      19.741     591.868     440.827       0.096       0.151

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     515.715       0.000     515.715    1196.809       0.431       0.013

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.156     595.469       0.000       0.060       0.099       0.010

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.650      22.902       1.047     617.659      12.398     386.155       2.993

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   77282.258       0.306     669.231 1467608.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    590826.25   5116.2979    149.6973      1.5160      0.6984      5.9530      1.1814


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 85%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.746    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   68.52104

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    147.264    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 115966.477  118285.555       1.939     831.557     428.865     619.754       1.445

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   351.74    -0.12   351.74     0.32   575.61
  MEAN    17.06     0.00    -0.02   351.74    -0.12   351.74     0.32
  HUB     12.51     0.00    -0.02   351.74    -0.12   351.74     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.68    50.47     8.21   577.90   676.63    14.09   512.48     0.61
  MEAN    53.65    47.20     6.45   477.90   593.48    14.09   512.48     0.53
  HUB     44.90    38.62     6.28   350.44   496.60    14.09   512.48     0.45
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      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   570.63   323.74   469.91  1124.78     0.51
MEAN    18.04   598.14   360.13   477.58  1121.03     0.53
HUB     15.00   680.68   469.48   492.87  1114.23     0.61

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    577.90   534.24   254.16     0.47  6681.23
MEAN   505.23   499.14   145.11     0.45  6497.30     1.33
HUB    420.19   495.33    49.29     0.44  7043.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.06     1.20    15.15   552.88     1.06   525.68     0.92     0.91
MEAN    17.98     1.19    14.81   552.05     1.06   522.17     0.92     0.91
HUB     18.24     1.21    14.17   554.51     1.06   515.81     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.56    28.41    24.20     4.21     0.93     0.29     2.90
MEAN    37.02    16.90    12.70     4.20     0.93     0.25     3.51     0.91
HUB     43.61    -5.71    -9.30     3.59     0.93     0.11     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     607.572     359.426     489.853    1121.128       0.542      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.059      14.785     522.311      24.000      36.269      35.400      -0.869

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     517.261     359.426     629.878    1130.197       0.458       0.265

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.021      15.607     530.796     528.796       0.021       0.413

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     476.367       0.000     476.367    1133.805       0.420       0.333

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.911     534.189       0.000       0.060       0.037       0.355

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      17.968       1.189     553.143      30.333     215.735       1.672

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 188849.547       0.565    1608.773 1479027.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    150.746    3210.000      17.968     553.143       1.000       1.000       0.980
W Kg/sec =   68.52104

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    127.356    3108.454       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 115966.477  118285.555       1.592     590.487     370.893     474.134       1.278

     ROTOR LEADING EDGE CONDITIONS, STAGE            2
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```
       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   453.51    -0.16   453.51     0.40   557.43
MEAN    18.08     0.00    -0.02   453.51    -0.16   453.51     0.40
HUB     15.21     0.00    -0.02   453.51    -0.16   453.51     0.40

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.78    46.36     5.42   575.66   732.96    16.10   535.97     0.65
MEAN    48.16    42.30     5.86   506.42   679.91    16.10   535.97     0.60
HUB     43.22    37.84     5.38   426.07   622.36    16.10   535.97     0.55

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   524.95   243.24   465.19  1153.04     0.46
MEAN    18.01   537.75   261.83   469.71  1150.67     0.47
HUB     15.22   583.98   339.64   475.06  1148.29     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    572.02   569.65   328.77     0.49  4970.19
MEAN   504.50   528.69   242.67     0.46  4718.42     1.39
HUB    426.43   482.93    86.80     0.42  5172.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.39     1.13    17.69   575.50     1.04   552.49     0.92     0.91
MEAN    20.26     1.13    17.44   574.37     1.04   550.22     0.92     0.91
HUB     20.50     1.14    17.18   576.41     1.04   547.93     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     27.60    35.25    31.50     3.75     0.93     0.28     2.90
MEAN    29.14    27.32    23.50     3.82     0.92     0.28     3.30     0.91
HUB     35.56    10.35     6.50     3.85     0.92     0.29     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     910.518     262.568     871.838    1103.699       0.825      -1.502

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.355      13.016     506.200      46.000      16.760      30.600      13.840

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     924.713     262.568     961.268    1101.421       0.840      -1.610

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.650      20.143      12.689     504.035     345.258       0.082       0.069

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.823     935.521       0.000     935.521    1100.349       0.850      -0.246

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.650      12.291     502.445       0.000       0.060       0.223      -1.745

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.673      19.727       1.098     575.426      22.283     260.071       2.016

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 138785.188       0.424    1182.285 1351848.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.766
```

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
150.746	3210.000	19.727	575.426	1.000	1.000	0.680

W Kg/sec = 68.52104

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
118.317	3047.674	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
115966.477	118285.555	1.098	378.495	344.587	293.880	0.853

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	780.21	-0.27	780.21	0.69	533.77
MEAN	17.74	0.00	-0.02	780.21	-0.27	780.21	0.69	
HUB	15.05	0.00	-0.02	780.21	-0.27	780.21	0.69	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	35.79	46.36	-10.57	562.21	961.83	14.29	524.61	0.86
MEAN	32.51	43.40	-10.89	496.90	925.15	14.29	524.61	0.82
HUB	28.40	38.84	-10.44	421.59	886.95	14.29	524.61	0.79

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	524.07	161.58	498.54	1167.93	0.45
MEAN	17.51	536.56	195.64	499.62	1167.83	0.46
HUB	14.85	582.37	292.68	503.48	1167.70	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	635.03	393.35	0.54	3206.26	
MEAN	490.40	580.09	294.76	0.50	3429.75	1.66
HUB	415.99	518.36	123.31	0.44	4350.30	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.96	1.06	18.25	589.84	1.03	566.92	0.92	0.70
MEAN	21.05	1.07	18.21	590.85	1.03	566.82	0.92	0.70
HUB	21.42	1.09	18.07	594.99	1.03	566.68	0.92	0.70

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	17.96	38.27	31.50	6.77	0.93	0.37	2.90	
MEAN	21.38	30.54	23.50	7.04	0.84	0.41	3.28	0.70
HUB	30.17	13.76	6.50	7.26	0.84	0.46	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.766

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	543.405	196.924	506.468	1168.234	0.465	-0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.113	18.200	567.242	46.000	21.247	31.500	10.253

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	530.138	196.924	565.530	1169.458	0.453	0.031

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.039	18.270	568.431	471.992	0.035	0.174

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	514.754	0.000	514.754	1170.838	0.440	0.044

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.330	569.773	0.000	0.060	0.070	0.052

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.600	20.935	1.061	591.893	16.467	342.558	2.655

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
102597.828	0.333	874.011	2240720.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.453 EfDer = 0.963

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
150.746	3210.000	20.935	591.893	1.000	1.000	0.980

W Kg/sec = 68.52104

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
113.072	3004.980	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
115966.477	118285.555	1.559	513.330	329.325	401.059	1.218

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	481.10	-0.17	481.10	0.41	505.05
MEAN	16.97	0.00	-0.02	481.10	-0.17	481.10	0.41	
HUB	14.32	0.00	-0.02	481.10	-0.17	481.10	0.41	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.28	46.36	1.92	539.52	723.00	18.65	572.58	0.62
MEAN	44.67	43.80	0.87	475.39	676.47	18.65	572.58	0.58
HUB	39.83	37.84	1.99	401.14	626.50	18.65	572.58	0.53

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	529.70	171.22	501.27	1184.33	0.45
MEAN	16.57	541.55	201.52	502.67	1183.75	0.46
HUB	13.89	584.74	294.31	505.28	1183.05	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	528.88	615.78	357.66	0.52	3235.85	
MEAN	464.28	567.20	262.76	0.48	3342.70	1.28
HUB	389.09	514.09	94.79	0.43	4090.27	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.56	1.08	19.66	606.44	1.02	583.02	0.92	0.88
MEAN	22.61	1.08	19.59	606.92	1.03	582.45	0.92	0.88
HUB	23.00	1.10	19.46	610.28	1.03	581.75	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	18.86	35.51	31.50	4.01	0.93	0.19	2.90	
MEAN	21.85	27.60	23.50	4.10	0.91	0.21	3.29	0.88
HUB	30.22	10.63	6.50	4.13	0.91	0.24	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.963

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	531.697	202.649	491.565	1185.585	0.448	0.056

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.694	19.766	584.287	46.000	22.404	32.400	9.996

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	520.093	202.649	558.178	1186.618	0.438	0.080

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.622	19.823	585.305	456.573	0.033	0.200

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	493.745	0.000	493.745	1188.875	0.415	0.071

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.988	587.535	0.000	0.060	0.068	0.132

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.778	22.510	1.075	607.880	15.987	320.234	2.482

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
99633.000	0.356	848.755	1373778.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 6.453 EfDer = 0.940

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
150.746	3210.000	22.510	607.880	1.000	1.000	0.980

W Kg/sec = 68.52104

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
106.571	2965.202	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
115966.477	118285.555	1.642	509.668	310.401	390.276	1.257

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	458.34	-0.16	458.34	0.38	474.04
MEAN	15.91	0.00	-0.02	458.34	-0.16	458.34	0.38	
HUB	13.07	0.00	-0.02	458.34	-0.16	458.34	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.24	47.36	0.88	513.19	688.19	20.32	590.35	0.58
MEAN	44.21	44.80	-0.59	445.76	639.47	20.32	590.35	0.54
HUB	38.63	38.84	-0.21	366.12	586.72	20.32	590.35	0.49

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	504.84	157.43	479.67	1200.70	0.42
MEAN	15.50	514.23	180.70	481.44	1199.79	0.43
HUB	12.59	550.35	261.49	484.26	1198.79	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	502.54	590.92	345.12	0.49	2827.11	
MEAN	434.13	544.06	253.43	0.45	2802.96	1.27
HUB	352.68	492.77	91.19	0.41	3294.21	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.96	1.06	21.21	620.58	1.02	599.32	0.92	0.86
MEAN	23.94	1.06	21.10	620.48	1.02	598.41	0.92	0.86
HUB	24.20	1.08	20.94	622.68	1.02	597.41	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	18.17	35.73	31.50	4.23	0.93	0.18	2.90	
MEAN	20.57	27.76	23.50	4.26	0.90	0.19	3.34	0.86
HUB	28.37	10.66	6.50	4.16	0.90	0.21	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.940

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     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     519.526     184.016     485.845    1200.084       0.433      -0.009

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      23.974      21.074     598.729      46.000      20.744      33.000      12.256

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     522.483     184.016     553.941    1199.826       0.435      -0.063

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      23.808      20.897     598.472     440.827       0.076       0.184

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     485.925       0.000     485.925    1202.906       0.404       0.062

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      21.258     601.548       0.000       0.060       0.082       0.059

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.726      23.790       1.057     621.248      13.368     356.078       2.760

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   83341.188       0.330     709.968 1427680.000

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     613206.75   5223.7915    147.2640      1.5748      0.7386      6.4535      1.1883


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 85%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.014   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     147.976    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   67.26170

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     144.557    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  113835.133  116111.594       1.975     831.557     420.983     619.754       1.472

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   344.58    -0.12   344.58     0.31   575.61
  MEAN    17.06     0.00    -0.02   344.58    -0.12   344.58     0.31
  HUB     12.51     0.00    -0.02   344.58    -0.12   344.58     0.31

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.20    50.47     8.73   577.90   672.93    14.13   512.89     0.61
  MEAN    54.21    47.20     7.01   477.90   589.26    14.13   512.89     0.53
  HUB     45.49    38.62     6.87   350.44   491.55    14.13   512.89     0.44

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	565.18	329.62	459.10	1125.91	0.50
MEAN	18.04	591.64	363.44	466.85	1122.00	0.53
HUB	15.00	671.88	468.41	481.68	1115.21	0.60

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	577.90	521.93	248.28	0.46	6802.58	
MEAN	505.23	487.91	141.80	0.43	6557.03	1.35
HUB	420.19	484.09	48.22	0.43	7027.58	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.12	1.20	15.25	553.42	1.06	526.74	0.92	0.91
MEAN	18.01	1.19	14.90	552.32	1.06	523.08	0.92	0.91
HUB	18.23	1.21	14.26	554.43	1.06	516.73	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.68	28.40	24.20	4.20	0.93	0.31	2.90	
MEAN	37.90	16.90	12.70	4.20	0.93	0.26	3.51	0.91
HUB	44.20	-5.72	-9.30	3.58	0.93	0.12	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	600.633	362.733	478.732	1122.145	0.535	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.086	14.878	523.259	24.000	37.151	35.400	-1.751

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	504.663	362.733	621.498	1131.605	0.446	0.283

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.047	15.741	532.118	528.796	0.022	0.427

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	465.238	0.000	465.238	1134.995	0.410	0.346

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.026	535.312	0.000	0.060	0.038	0.369

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	17.994	1.191	553.391	30.581	212.230	1.645

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
190390.438	0.570	1592.091	1448913.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.014 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
147.976	3210.000	17.994	553.391	1.000	1.000	0.980

W Kg/sec = 67.26170

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
124.864	3107.759	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
113835.133	116111.594	1.624	590.487	363.639	474.134	1.304

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	443.12	-0.15	443.12	0.39	557.31

```
 MEAN    18.08     0.00    -0.02   443.12    -0.15   443.12     0.39
 HUB     15.21     0.00    -0.02   443.12    -0.15   443.12     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.42    46.36     6.06   575.66   726.57    16.20   536.99     0.64
 MEAN    48.82    42.30     6.52   506.42   673.03    16.20   536.99     0.59
 HUB     43.89    37.84     6.05   426.07   614.83    16.20   536.99     0.54

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   518.74   251.53   453.67  1154.65     0.45
 MEAN    18.01   530.93   267.82   458.43  1152.07     0.46
 HUB     15.22   576.31   341.82   463.99  1149.48     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   555.46   320.49     0.48  5139.35
 MEAN   504.50   515.93   236.68     0.45  4826.20     1.41
 HUB    426.43   471.65    84.62     0.41  5205.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.51     1.14    17.85   576.51     1.04   554.04     0.92     0.91
 MEAN    20.35     1.13    17.59   575.10     1.04   551.56     0.92     0.91
 HUB     20.54     1.14    17.30   576.81     1.04   549.07     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.01    35.24    31.50     3.74     0.93     0.30     2.90
 MEAN    30.29    27.31    23.50     3.81     0.93     0.29     3.30     0.91
 HUB     36.38    10.34     6.50     3.84     0.93     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     872.010     268.573     829.621    1110.669       0.785      -1.382

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.438      13.600     512.641      46.000      17.938      30.600      12.662

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     865.152     268.573     905.880    1111.763       0.778      -1.388

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      20.260      13.573     513.637     345.258       0.072       0.111

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     864.958       0.000     864.958    1112.065       0.778      -0.078

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      13.373     513.692       0.000       0.060       0.178      -1.457

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.732      19.954       1.109     576.138      22.747     253.125       1.962

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 141680.609       0.433    1184.768 1321738.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.014   EfDer =  0.770

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3210.000      19.954     576.138       1.000       1.000       0.680
W Kg/sec =   67.26170
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
114.888	3045.790	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
113835.133	116111.594	1.131	378.495	334.599	293.880	0.878

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	739.68	-0.25	739.68	0.65	533.44
MEAN	17.74	0.00	-0.02	739.68	-0.25	739.68	0.65	
HUB	15.05	0.00	-0.02	739.68	-0.25	739.68	0.65	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	37.25	46.36	-9.11	562.21	929.25	14.96	530.46	0.82
MEAN	33.91	43.40	-9.49	496.90	891.23	14.96	530.46	0.79
HUB	29.70	38.84	-9.14	421.59	851.52	14.96	530.46	0.75

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	511.99	177.78	480.13	1171.22	0.44
MEAN	17.51	524.66	207.76	481.77	1170.62	0.45
HUB	14.85	570.24	298.38	485.95	1170.02	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	610.55	377.15	0.52	3526.88	
MEAN	490.40	558.56	282.64	0.48	3641.65	1.67
HUB	415.99	499.97	117.61	0.43	4434.77	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.34	1.07	18.71	592.00	1.03	570.11	0.92	0.70
MEAN	21.38	1.07	18.63	592.51	1.03	569.53	0.92	0.70
HUB	21.71	1.09	18.45	596.08	1.03	568.93	0.92	0.70

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.32	38.15	31.50	6.65	0.93	0.38	2.90	
MEAN	23.33	30.40	23.50	6.90	0.85	0.41	3.28	0.70
HUB	31.55	13.60	6.50	7.10	0.85	0.46	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.770

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	531.156	209.121	488.257	1171.052	0.454	-0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.447	18.621	569.977	46.000	23.186	31.500	8.314

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	508.951	209.121	550.238	1173.031	0.434	0.069

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.393	18.795	571.905	471.992	0.029	0.202

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	493.967	0.000	493.967	1174.317	0.421	0.083

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.861	573.159	0.000	0.060	0.059	0.092

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.628	21.306	1.068	593.529	17.391	320.151	2.482

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 108359.648       0.352     906.130 2144222.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.014   EfDer =  0.976

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.976    3210.000      21.306     593.529       1.000       1.000       0.980
W Kg/sec =   67.26170

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    109.214    3000.835       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113835.133  116111.594       1.614     513.330     318.087     401.059       1.261

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   462.24    -0.16   462.24     0.39   504.35
 MEAN    16.97     0.00    -0.02   462.24    -0.16   462.24     0.39
 HUB     14.32     0.00    -0.02   462.24    -0.16   462.24     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.42    46.36     3.06   539.52   710.58    19.15   575.70     0.60
 MEAN    45.81    43.80     2.01   475.39   663.18    19.15   575.70     0.56
 HUB     40.96    37.84     3.12   401.14   612.13    19.15   575.70     0.52

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   514.47   187.29   479.16  1188.71     0.43
 MEAN    16.57   526.34   213.01   481.31  1187.64     0.44
 HUB     13.89   569.01   298.54   484.41  1186.50     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   588.45   341.58     0.50  3539.18
 MEAN   464.28   542.94   251.26     0.46  3533.18     1.31
 HUB    389.09   492.80    90.56     0.42  4148.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.14     1.09    20.34   609.44     1.03   587.35     0.92     0.89
 MEAN    23.14     1.09    20.22   609.41     1.03   586.29     0.92     0.89
 HUB     23.47     1.10    20.05   612.18     1.03   585.16     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.35    35.48    31.50     3.98     0.93     0.22     2.90
 MEAN    23.87    27.57    23.50     4.07     0.91     0.23     3.29     0.89
 HUB     31.65    10.59     6.50     4.09     0.91     0.26     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.976

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     517.289     214.212     470.852    1189.361       0.435       0.056

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.217      20.385     588.011      46.000      24.463      32.400       7.937

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     496.069     214.212     540.343    1191.174       0.416       0.117

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      23.167      20.558     589.806     456.573       0.027       0.229
```

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	470.928	0.000	470.928	1193.221	0.395	0.111

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.722	591.835	0.000	0.060	0.057	0.171

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.815	23.073	1.083	610.343	16.814	302.228	2.343

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
104792.734	0.375	876.302	1336819.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 7.014 EfDer = 0.961

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
147.976	3210.000	23.073	610.343	1.000	1.000	0.980

W Kg/sec = 67.26170

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
102.265	2959.212	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
113835.133	116111.594	1.711	509.668	297.858	390.276	1.310

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	437.74	-0.15	437.74	0.37	473.08
MEAN	15.91	0.00	-0.02	437.74	-0.15	437.74	0.37	
HUB	13.07	0.00	-0.02	437.74	-0.15	437.74	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.54	47.36	2.18	513.19	674.64	21.03	594.36	0.56
MEAN	45.53	44.80	0.73	445.76	624.86	21.03	594.36	0.52
HUB	39.92	38.84	1.08	366.12	570.76	21.03	594.36	0.48

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	488.14	175.09	455.66	1205.96	0.40
MEAN	15.50	497.24	193.37	458.10	1204.56	0.41
HUB	12.59	532.60	266.16	461.33	1203.12	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	502.54	561.12	327.46	0.47	3143.82	
MEAN	434.13	517.51	240.76	0.43	2999.10	1.31
HUB	352.68	469.37	86.51	0.39	3352.97	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.75	1.07	22.11	624.47	1.02	604.59	0.92	0.88
MEAN	24.68	1.07	21.94	623.82	1.02	603.19	0.92	0.88
HUB	24.87	1.08	21.74	625.41	1.02	601.74	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	21.02	35.70	31.50	4.20	0.93	0.21	2.90	
MEAN	22.88	27.73	23.50	4.23	0.91	0.22	3.34	0.88
HUB	29.98	10.62	6.50	4.12	0.91	0.23	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.961

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

```
     15.219     502.355     196.911     462.154    1204.870       0.417      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.709      21.921     603.512      46.000      23.077      33.000       9.923

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     493.914     196.911     531.719    1205.570       0.410      -0.008

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.594      21.907     604.213     440.827       0.061       0.216

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     460.194       0.000     460.194    1208.245       0.381       0.109

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.230     606.898       0.000       0.060       0.068       0.106

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.781      24.573       1.065     624.567      14.224     332.152       2.575

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  88679.344       0.351     741.558 1387801.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    633902.75   5300.8491    144.5575      1.6266      0.7691      7.0142      1.1946


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 85%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 7.464   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    145.767    3210.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    142.400    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 112136.125  114378.609       2.005     831.557     414.700     619.754       1.494

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   338.90    -0.12   338.90     0.30   575.61
 MEAN    17.06     0.00    -0.02   338.90    -0.12   338.90     0.30
 HUB     12.51     0.00    -0.02   338.90    -0.12   338.90     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.62    50.47     9.15   577.90   670.04    14.16   513.22     0.60
 MEAN    54.66    47.20     7.46   477.90   585.96    14.16   513.22     0.53
 HUB     45.97    38.62     7.35   350.44   487.59    14.16   513.22     0.44

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   561.06   334.22   450.66  1126.77     0.50
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MEAN	18.04	586.65	366.04	458.44	1122.75	0.52
HUB	15.00	665.04	467.56	472.93	1115.96	0.60

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	577.90	512.32	243.68	0.45	6897.29	
MEAN	505.23	479.11	139.20	0.43	6603.83	1.37
HUB	420.19	475.30	47.37	0.43	7014.87	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.17	1.20	15.33	553.85	1.06	527.56	0.92	0.91
MEAN	18.03	1.19	14.96	552.53	1.06	523.78	0.92	0.91
HUB	18.22	1.21	14.33	554.38	1.06	517.44	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.56	28.40	24.20	4.20	0.93	0.32	2.90	
MEAN	38.60	16.89	12.70	4.19	0.93	0.27	3.51	0.91
HUB	44.67	-5.72	-9.30	3.58	0.93	0.13	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	595.310	365.325	470.033	1122.922	0.530	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.105	14.947	523.984	24.000	37.856	35.400	-2.456

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	494.877	365.325	615.115	1132.678	0.437	0.297

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.066	15.843	533.128	528.796	0.022	0.438

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	456.579	0.000	456.579	1135.907	0.402	0.357

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.112	536.172	0.000	0.060	0.039	0.379

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	18.012	1.192	553.584	30.774	209.484	1.624

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
191592.750	0.574	1578.233	1425047.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.464 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
145.767	3210.000	18.012	553.584	1.000	1.000	0.980

W Kg/sec = 66.25780

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
122.903	3107.216	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
112136.125	114378.609	1.650	590.487	357.925	474.134	1.325

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	435.02	-0.15	435.02	0.38	557.21
MEAN	18.08	0.00	-0.02	435.02	-0.15	435.02	0.38	
HUB	15.21	0.00	-0.02	435.02	-0.15	435.02	0.38	

```
      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     52.93    46.36     6.57   575.66   721.66    16.28   537.78     0.63
MEAN    49.35    42.30     7.05   506.42   667.72    16.28   537.78     0.59
HUB     44.41    37.84     6.57   426.07   609.02    16.28   537.78     0.54

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   514.17   257.92   444.80  1155.87     0.44
MEAN    18.01   525.81   272.43   449.72  1153.13     0.46
HUB     15.22   570.44   343.51   455.42  1150.38     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    572.02   544.52   314.10     0.47  5269.78
MEAN   504.50   506.07   232.07     0.44  4909.18     1.43
HUB    426.43   462.91    82.93     0.40  5231.49

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.59     1.14    17.98   577.29     1.04   555.21     0.92     0.91
MEAN    20.41     1.13    17.69   575.67     1.04   552.58     0.92     0.91
HUB     20.58     1.14    17.39   577.12     1.04   549.94     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.11    35.23    31.50     3.73     0.93     0.31     2.90
MEAN    31.21    27.30    23.50     3.80     0.93     0.30     3.30     0.91
HUB     37.03    10.32     6.50     3.82     0.93     0.31     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     846.327     273.196     801.020    1115.241       0.759      -1.304

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.498      13.990     516.877      46.000      18.832      30.600      11.768

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     828.415     273.196     872.300    1117.944       0.741      -1.255

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.650      20.344      14.121     519.382     345.258       0.064       0.135

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     823.935       0.000     823.935    1118.743       0.736       0.006

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.650      14.009     520.012       0.000       0.060       0.151      -1.295

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.764      20.096       1.116     576.689      23.106     247.877       1.922

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 143913.656       0.440    1185.479 1298067.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.464   EfDer =  0.782

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3210.000      20.096     576.689       1.000       1.000       0.680
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.427    3044.333       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
112136.125	114378.609	1.156	378.495	327.431	293.880	0.898

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	713.28	-0.25	713.28	0.63	533.18
MEAN	17.74	0.00	-0.02	713.28	-0.25	713.28	0.63	
HUB	15.05	0.00	-0.02	713.28	-0.25	713.28	0.63	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	38.26	46.36	-8.10	562.21	908.36	15.39	534.22	0.80
MEAN	34.88	43.40	-8.52	496.90	869.44	15.39	534.22	0.77
HUB	30.60	38.84	-8.24	421.59	828.68	15.39	534.22	0.73

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	503.78	189.20	466.90	1173.54	0.43
MEAN	17.51	516.34	216.28	468.86	1172.62	0.44
HUB	14.85	561.47	302.34	473.12	1171.70	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	593.09	365.72	0.51	3753.06	
MEAN	490.40	543.11	274.12	0.46	3790.70	1.68
HUB	415.99	486.58	113.65	0.42	4493.38	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.60	1.07	19.03	593.56	1.03	572.38	0.92	0.72
MEAN	21.62	1.08	18.92	593.73	1.03	571.48	0.92	0.72
HUB	21.91	1.09	18.72	596.89	1.04	570.58	0.92	0.72

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	22.06	38.07	31.50	6.57	0.93	0.38	2.90	
MEAN	24.76	30.31	23.50	6.81	0.86	0.41	3.28	0.72
HUB	32.58	13.51	6.50	7.01	0.86	0.46	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.782

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	522.582	217.701	475.077	1173.061	0.445	-0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.681	18.917	571.932	46.000	24.619	31.500	6.881

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	493.850	217.701	539.705	1175.559	0.420	0.097

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.639	19.162	574.370	471.992	0.025	0.223

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	479.200	0.000	479.200	1176.776	0.407	0.112

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.233	575.560	0.000	0.060	0.052	0.122

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.651	21.562	1.073	594.731	18.041	305.848	2.371

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
112411.312	0.365	925.981	2078932.125

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.464   EfDer =  0.984

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3210.000      21.562     594.731       1.000       1.000       0.980
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.412    2997.802       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 112136.125  114378.609       1.656     513.330     309.927     401.059       1.294

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   448.78    -0.15   448.78     0.38   503.84
MEAN    16.97     0.00    -0.02   448.78    -0.15   448.78     0.38
HUB     14.32     0.00    -0.02   448.78    -0.15   448.78     0.38

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.25    46.36     3.89   539.52   701.89    19.51   577.92     0.60
MEAN    46.66    43.80     2.86   475.39   653.87    19.51   577.92     0.55
HUB     41.80    37.84     3.96   401.14   602.03    19.51   577.92     0.51

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   504.42   198.56   463.69  1191.75     0.42
MEAN    16.57   516.06   221.12   466.28  1190.37     0.43
HUB     13.89   558.16   301.55   469.70  1188.94     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    528.88   569.31   330.31     0.48  3751.86
MEAN   464.28   525.87   243.15     0.44  3667.48     1.34
HUB    389.09   477.79    87.54     0.40  4190.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.55     1.09    20.81   611.60     1.03   590.36     0.92     0.90
MEAN    23.50     1.09    20.65   611.22     1.03   588.99     0.92     0.90
HUB     23.79     1.10    20.45   613.57     1.03   587.57     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     23.18    35.46    31.50     3.96     0.93     0.24     2.90
MEAN    25.37    27.54    23.50     4.04     0.91     0.25     3.29     0.90
HUB     32.70    10.56     6.50     4.06     0.91     0.27     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.984

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     507.579     222.366     456.278    1192.002       0.426       0.055

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.581      20.814     590.625      46.000      25.982      32.400       6.418

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     479.403     222.366     528.464    1194.342       0.401       0.144

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      23.542      21.067     592.946     456.573       0.023       0.251

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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    16.096     455.128       0.000     455.128    1196.247       0.380       0.139

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950     21.229     594.839       0.000       0.060       0.050       0.199

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.837     23.461       1.088     612.127      17.396     290.286       2.250

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 108423.273       0.388     893.130 1308893.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.464   EfDer =  0.973

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.767    3210.000      23.461     612.127       1.000       1.000       0.980
W Kg/sec =   66.25780

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     99.218    2954.898       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 112136.125  114378.609       1.764     509.668     288.985     390.276       1.351

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   423.41    -0.15   423.41     0.35   472.39
 MEAN    15.91     0.00    -0.02   423.41    -0.15   423.41     0.35
 HUB     13.07     0.00    -0.02   423.41    -0.15   423.41     0.35

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.48    47.36     3.12   513.19   665.43    21.52   597.17     0.56
 MEAN    46.48    44.80     1.68   445.76   614.91    21.52   597.17     0.51
 HUB     40.86    38.84     2.02   366.12   559.85    21.52   597.17     0.47

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   477.47   187.15   439.26  1209.55     0.39
 MEAN    15.50   486.07   202.07   442.08  1207.86     0.40
 HUB     12.59   520.66   269.38   445.56  1206.13     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   540.76   315.40     0.45  3360.12
 MEAN   434.13   499.28   232.06     0.41  3133.90     1.34
 HUB    352.68   453.28    83.30     0.38  3393.39

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.31     1.08    22.73   627.23     1.02   608.20     0.92     0.89
 MEAN    25.18     1.07    22.52   626.21     1.02   606.50     0.92     0.89
 HUB     25.33     1.08    22.28   627.37     1.02   604.76     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.08    35.68    31.50     4.18     0.93     0.24     2.90
 MEAN    24.56    27.70    23.50     4.20     0.91     0.24     3.34     0.89
 HUB     31.16    10.59     6.50     4.09     0.91     0.25     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.973

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     491.110     205.774     445.921    1208.161       0.406      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     25.217      22.503     606.813      46.000      24.771      33.000       8.229

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     474.771     205.774     517.446    1209.470       0.393       0.031

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.131      22.596     608.129     440.827       0.051       0.240

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     442.818       0.000     442.818    1211.901       0.365       0.142

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.896     610.576       0.000       0.060       0.059       0.140

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.812      25.110       1.070     626.936      14.809     316.921       2.457

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  92335.648       0.366     760.609 1358000.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    648676.62   5343.4321    142.3999      1.6622      0.7875      7.4643      1.1992


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 85%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    143.384    3210.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   65.17433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    140.071    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 110302.430  112508.234       2.039     831.557     407.918     619.754       1.519

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   332.81    -0.11   332.81     0.30   575.61
 MEAN    17.06     0.00    -0.02   332.81    -0.11   332.81     0.30
 HUB     12.51     0.00    -0.02   332.81    -0.11   332.81     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.07    50.47     9.60   577.90   666.98    14.19   513.56     0.60
 MEAN    55.15    47.20     7.95   477.90   582.46    14.19   513.56     0.52
 HUB     46.49    38.62     7.87   350.44   483.37    14.19   513.56     0.43

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   556.85   339.08   441.70  1127.67     0.49
 MEAN    18.04   581.43   368.78   449.51  1123.53     0.52
 HUB     15.00   657.81   466.65   463.63  1116.75     0.59
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    577.90   502.13   238.81     0.45  6997.68
 MEAN   505.23   469.76   136.45     0.42  6653.37     1.39
 HUB    420.19   465.95    46.46     0.42  7001.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.21     1.21    15.41   554.30     1.06   528.40     0.92     0.91
 MEAN    18.05     1.19    15.03   552.75     1.06   524.52     0.92     0.91
 HUB     18.21     1.21    14.40   554.32     1.06   518.18     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.51    28.40    24.20     4.20     0.93     0.33     2.90
 MEAN    39.37    16.89    12.70     4.19     0.93     0.29     3.51     0.91
 HUB     45.19    -5.72    -9.30     3.58     0.93     0.15     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     589.753     368.069     460.798    1123.730       0.525      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.124      15.019     524.738      24.000      38.617      35.400      -3.217

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     484.552     368.069     608.494    1133.792       0.427       0.312

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.084      15.947     534.178     528.796       0.023       0.450

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     447.429       0.000     447.429    1136.855       0.394       0.368

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.199     537.067       0.000       0.060       0.040       0.390

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      18.028       1.193     553.788      30.978     206.564       1.601

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 192865.359       0.577    1562.737 1399425.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    143.384    3210.000      18.028     553.788       1.000       1.000       0.980
W Kg/sec =   65.17433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.807    3106.643       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 110302.430  112508.234       1.678     590.487     351.823     474.134       1.348

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   426.46    -0.15   426.46     0.37   557.11
 MEAN    18.08     0.00    -0.02   426.46    -0.15   426.46     0.37
 HUB     15.21     0.00    -0.02   426.46    -0.15   426.46     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.48    46.36     7.12   575.66   716.53    16.36   538.60     0.63
 MEAN    49.91    42.30     7.61   506.42   662.17    16.36   538.60     0.58
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HUB     44.98    37.84     7.14   426.07   602.93    16.36   538.60     0.53

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   509.59   264.60   435.51  1157.12     0.44
MEAN    18.01   520.57   277.29   440.57  1154.23     0.45
HUB     15.22   564.34   345.28   446.39  1151.32     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    572.02   533.08   307.42     0.46  5406.14
MEAN   504.50   495.71   227.21     0.43  4996.63     1.45
HUB    426.43   453.71    81.16     0.39  5258.37

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.68     1.15    18.10   578.11     1.04   556.42     0.92     0.91
MEAN    20.47     1.14    17.80   576.26     1.04   553.63     0.92     0.91
HUB     20.60     1.14    17.48   577.44     1.04   550.85     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.28    35.22    31.50     3.72     0.93     0.32     2.90
MEAN    32.19    27.28    23.50     3.78     0.93     0.31     3.30     0.91
HUB     37.72    10.30     6.50     3.80     0.93     0.32     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      822.039     278.068     773.581    1119.505       0.734       -1.233

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.557      14.359      520.840      46.000      19.771      30.600      10.829

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960      794.861     278.068     842.096    1123.443       0.708       -1.136

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.650      20.424      14.620     524.510     345.258       0.058       0.155

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.823     787.696       0.000     787.696    1124.523       0.700       0.075

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.650      14.569     525.463       0.000       0.060       0.129       -1.155

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.790      20.224       1.122     577.270      23.482     242.472       1.880

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 146255.062       0.447    1185.066 1272825.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.797

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    143.384    3210.000      20.224     577.270       1.000       1.000       0.680
W Kg/sec =   65.17433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    109.944    3042.803       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 110302.430  112508.234       1.182     378.495     320.198     293.880       0.918
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ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	688.35	-0.24	688.35	0.61	532.91
MEAN	17.74	0.00	-0.02	688.35	-0.24	688.35	0.61	
HUB	15.05	0.00	-0.02	688.35	-0.24	688.35	0.61	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	39.25	46.36	-7.11	562.21	888.92	15.79	537.71	0.78
MEAN	35.84	43.40	-7.56	496.90	849.10	15.79	537.71	0.75
HUB	31.50	38.84	-7.34	421.59	807.32	15.79	537.71	0.71

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	495.94	200.52	453.59	1175.83	0.42
MEAN	17.51	508.24	224.75	455.84	1174.60	0.43
HUB	14.85	552.69	306.17	460.14	1173.39	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	575.63	354.41	0.49	3977.08	
MEAN	490.40	527.60	265.65	0.45	3938.84	1.69
HUB	415.99	473.06	109.81	0.40	4550.23	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.86	1.08	19.34	595.15	1.03	574.62	0.92	0.73
MEAN	21.85	1.08	19.21	594.98	1.03	573.42	0.92	0.73
HUB	22.11	1.09	18.99	597.73	1.04	572.23	0.92	0.73

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	23.85	38.00	31.50	6.50	0.93	0.39	2.90	
MEAN	26.25	30.23	23.50	6.73	0.86	0.42	3.28	0.73
HUB	33.64	13.42	6.50	6.92	0.86	0.46	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.797

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	514.227	226.227	461.791	1175.057	0.438	0.000

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.912	19.208	573.878	46.000	26.100	31.500	5.400

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	478.799	226.227	529.554	1178.060	0.406	0.125

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.880	19.524	576.815	471.992	0.022	0.244

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	464.526	0.000	464.526	1179.207	0.394	0.141

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.596	577.939	0.000	0.060	0.046	0.151

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.676	21.812	1.078	595.954	18.684	292.667	2.269

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
116417.750	0.378	943.302	2015523.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

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 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    143.384    3210.000      21.812     595.954       1.000       1.000       0.980
W Kg/sec =   65.17433

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    103.580    2994.724       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
110302.430  112508.234       1.702     513.330     301.679     401.059       1.329

    ROTOR LEADING EDGE CONDITIONS, STAGE             4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   435.36    -0.15   435.36     0.37   503.32
MEAN    16.97     0.00    -0.02   435.36    -0.15   435.36     0.37
HUB     14.32     0.00    -0.02   435.36    -0.15   435.36     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.11    46.36     4.75   539.52   693.39    19.86   580.14     0.59
MEAN    47.53    43.80     3.73   475.39   644.74    19.86   580.14     0.55
HUB     42.67    37.84     4.83   401.14   592.09    19.86   580.14     0.50

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
TIP     18.88   495.09   209.63   448.52  1194.71     0.41
MEAN    16.57   506.28   229.10   451.48  1193.04     0.42
HUB     13.89   547.62   304.48   455.17  1191.34     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    528.88   550.53   319.25     0.46  3960.71
MEAN   464.28   509.07   235.18     0.43  3799.54     1.37
HUB    389.09   462.97    84.61     0.39  4231.37

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.94     1.10    21.27   613.76     1.03   593.30     0.92     0.91
MEAN    23.85     1.09    21.07   613.03     1.03   591.64     0.92     0.91
HUB     24.09     1.10    20.84   614.97     1.03   589.95     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.05    35.44    31.50     3.94     0.93     0.26     2.90
MEAN    26.90    27.52    23.50     4.02     0.92     0.26     3.29     0.91
HUB     33.78    10.53     6.50     4.03     0.92     0.28     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.991

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     498.363     230.384     441.916    1194.591       0.417       0.055

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.935      21.231     593.193      46.000      27.534      32.400       4.866

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     463.154     230.384     517.289    1197.433       0.387       0.172

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      23.906      21.560     596.018     456.573       0.020       0.273

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     439.754       0.000     439.754    1199.203       0.367       0.168

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      21.718     597.782       0.000       0.060       0.045       0.226

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854      23.835       1.093     613.921      17.967     279.064       2.163

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 111986.297       0.400     907.395 1279876.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    143.384    3210.000      23.835     613.921       1.000       1.000       0.980
W Kg/sec =   65.17433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.206    2950.577       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 110302.430  112508.234       1.819     509.668     280.213     390.276       1.393

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   409.43    -0.14   409.43     0.34   471.70
 MEAN    15.91     0.00    -0.02   409.43    -0.14   409.43     0.34
 HUB     13.07     0.00    -0.02   409.43    -0.14   409.43     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.42    47.36     4.06   513.19   656.61    21.99   599.93     0.55
 MEAN    47.44    44.80     2.64   445.76   605.36    21.99   599.93     0.50
 HUB     41.82    38.84     2.98   366.12   549.35    21.99   599.93     0.46

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   467.81   198.78   423.48  1213.02     0.39
 MEAN    15.50   475.71   210.48   426.61  1211.04     0.39
 HUB     12.59   509.33   272.51   430.30  1209.05     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   521.16   303.77     0.43  3568.63
 MEAN   434.13   481.67   223.64     0.40  3264.24     1.37
 HUB    352.68   437.70    80.17     0.36  3432.69

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.85     1.08    23.32   629.96     1.03   611.70     0.92     0.90
 MEAN    25.67     1.08    23.08   628.59     1.02   609.71     0.92     0.90
 HUB     25.77     1.08    22.80   629.34     1.03   607.70     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.14    35.65    31.50     4.15     0.93     0.26     2.90
 MEAN    26.26    27.67    23.50     4.17     0.91     0.26     3.34     0.90
 HUB     32.35    10.55     6.50     4.05     0.91     0.26     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.982

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     480.698     214.343     430.264    1211.345       0.397      -0.006

    Pt3        Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.708     23.061     610.017      46.000      26.481      33.000       6.519

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     456.605     214.343     504.411    1213.214       0.376       0.069

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.645      23.254     611.901     440.827       0.043       0.264

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     426.249       0.000     426.249    1215.429       0.351       0.175

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.533     614.137       0.000       0.060       0.051       0.173

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.837      25.625       1.075     629.296      15.375     302.993       2.349

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  95867.047       0.380     776.785 1327267.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    663391.56   5375.2847    140.0713      1.6962      0.8031      7.9532      1.2037


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 85%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    138.557    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   62.98067

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    135.357    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  106589.836  108721.398       2.110     831.557     394.188     619.754       1.572

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   320.57    -0.11   320.57     0.29   575.61
  MEAN    17.06     0.00    -0.02   320.57    -0.11   320.57     0.29
  HUB     12.51     0.00    -0.02   320.57    -0.11   320.57     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.99    50.47    10.52   577.90   660.95    14.26   514.23     0.59
  MEAN    56.15    47.20     8.95   477.90   575.55    14.26   514.23     0.52
  HUB     47.56    38.62     8.94   350.44   475.02    14.26   514.23     0.43

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   548.98   348.69   424.03  1129.39     0.49
  MEAN    18.04   571.41   374.21   431.83  1125.02     0.51
  HUB     15.00   643.66   464.84   445.22  1118.25     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   482.01   229.21     0.43  7195.72
  MEAN   505.23   451.27   131.02     0.40  6751.20     1.44
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 HUB    420.19   447.46    44.65     0.40  6973.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.29     1.21    15.56   555.19     1.06   530.02     0.92     0.91
 MEAN    18.08     1.20    15.16   553.19     1.06   525.92     0.92     0.91
 HUB     18.19     1.20    14.53   554.19     1.06   519.59     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.43    28.39    24.20     4.19     0.93     0.36     2.90
 MEAN    40.91    16.88    12.70     4.18     0.93     0.31     3.51     0.91
 HUB     46.23    -5.73    -9.30     3.57     0.93     0.17     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     579.080     373.486     442.540    1125.276       0.515      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.159      15.154     526.183      24.000      40.163      35.400      -4.763

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     464.308     373.486     595.881    1135.920       0.409       0.341

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.114      16.143     536.185     528.796       0.024       0.474

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     429.451       0.000     429.451    1138.673       0.377       0.389

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.362     538.787       0.000       0.060       0.044       0.412

    STAGE EXIT CONDITIONS, STAGE             1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      18.052       1.195     554.191      31.381     200.774       1.556

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 195373.719       0.585    1529.778 1347956.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    138.557    3210.000      18.052     554.191       1.000       1.000       0.980
W Kg/sec =   62.98067

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    116.625    3105.514       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106589.836  108721.398       1.739     590.487     339.644     474.134       1.396

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   409.59    -0.14   409.59     0.36   556.90
 MEAN    18.08     0.00    -0.02   409.59    -0.14   409.59     0.36
 HUB     15.21     0.00    -0.02   409.59    -0.14   409.59     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.57    46.36     8.21   575.66   706.62    16.51   540.18     0.62
 MEAN    51.04    42.30     8.74   506.42   651.44    16.51   540.18     0.57
 HUB     46.14    37.84     8.30   426.07   591.12    16.51   540.18     0.52

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   501.31   277.55   417.47  1159.50     0.43
MEAN    18.01   510.79   286.70   422.74  1156.31     0.44
HUB     15.22   552.63   348.69   428.73  1153.12     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    572.02   510.88   294.47     0.44  5670.38
MEAN   504.50   475.55   217.81     0.41  5165.94     1.49
HUB    426.43   435.72    77.74     0.38  5310.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.84     1.15    18.32   579.70     1.05   558.71     0.92     0.91
MEAN    20.58     1.14    17.99   577.43     1.04   555.64     0.92     0.91
HUB     20.65     1.14    17.64   578.08     1.04   552.58     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.62    35.20    31.50     3.70     0.93     0.34     2.90
MEAN    34.14    27.26    23.50     3.76     0.93     0.34     3.30     0.91
HUB     39.12    10.28     6.50     3.78     0.93     0.34     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     780.343     287.501     725.450    1126.690       0.693      -1.112

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.660      14.987     527.551      46.000      21.619      30.600       8.981

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     738.706     287.501     792.681    1132.316       0.652      -0.941

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.650      20.561      15.443     532.832     345.258       0.047       0.189

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.823     729.024       0.000     729.024    1133.595       0.643       0.176

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.650      15.462     534.020       0.000       0.060       0.096      -0.934

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.826      20.428       1.132     578.400      24.209     232.251       1.800

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 150788.750       0.461    1180.677 1222602.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.833

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    138.557    3210.000      20.428     578.400       1.000       1.000       0.680
W Kg/sec =   62.98067

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    105.289    3039.827       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106589.836  108721.398       1.234     378.495     306.641     293.880       0.958

    ROTOR LEADING EDGE CONDITIONS, STAGE            3
```

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	645.20	-0.22	645.20	0.56	532.39
MEAN	17.74	0.00	-0.02	645.20	-0.22	645.20	0.56	
HUB	15.05	0.00	-0.02	645.20	-0.22	645.20	0.56	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	41.08	46.36	-5.28	562.21	855.93	16.46	543.65	0.75
MEAN	37.61	43.40	-5.79	496.90	814.50	16.46	543.65	0.71
HUB	33.18	38.84	-5.66	421.59	770.85	16.46	543.65	0.67

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	482.62	221.25	428.92	1179.97	0.41
MEAN	17.51	494.00	240.23	431.65	1178.21	0.42
HUB	14.85	536.79	313.16	435.98	1176.50	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	543.43	333.68	0.46	4387.48	
MEAN	490.40	498.91	250.17	0.42	4209.54	1.72
HUB	415.99	447.94	102.83	0.38	4653.77	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.34	1.09	19.91	598.13	1.03	578.68	0.92	0.76
MEAN	22.26	1.09	19.72	597.33	1.03	576.95	0.92	0.76
HUB	22.46	1.10	19.47	599.32	1.04	575.27	0.92	0.76

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.29	37.88	31.50	6.38	0.93	0.41	2.90	
MEAN	29.10	30.10	23.50	6.60	0.87	0.43	3.28	0.76
HUB	35.69	13.27	6.50	6.77	0.87	0.47	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.833

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	499.550	241.806	437.127	1178.684	0.424	0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.328	19.730	577.427	46.000	28.950	31.500	2.550

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	451.266	241.806	511.968	1182.589	0.382	0.178

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.307	20.173	581.259	471.992	0.018	0.286

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	437.805	0.000	437.805	1183.605	0.370	0.193

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.243	582.258	0.000	0.060	0.039	0.205

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.722	22.251	1.089	598.260	19.860	270.667	2.098

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
123745.055	0.402	968.925	1901676.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl

```
    138.557    3210.000      22.251     598.260       1.000       1.000       0.980
W Kg/sec =   62.98067

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     98.307    2988.947       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106589.836  108721.398       1.793     513.330     286.319     401.059       1.401

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   410.84    -0.14   410.84     0.35   502.35
 MEAN    16.97     0.00    -0.02   410.84    -0.14   410.84     0.35
 HUB     14.32     0.00    -0.02   410.84    -0.14   410.84     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.72    46.36     6.36   539.52   678.25    20.48   584.17     0.57
 MEAN    49.17    43.80     5.37   475.39   628.43    20.48   584.17     0.53
 HUB     44.33    37.84     6.49   401.14   574.30    20.48   584.17     0.48

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   479.76   229.41   421.36  1199.96     0.40
 MEAN    16.57   489.64   243.41   424.86  1197.82     0.41
 HUB     13.89   529.11   309.80   428.93  1195.66     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   516.94   299.47     0.43  4333.91
 MEAN   464.28   478.84   220.87     0.40  4036.58     1.42
 HUB    389.09   436.20    79.30     0.36  4305.13

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.65     1.11    22.07   617.74     1.03   598.53     0.92     0.91
 MEAN    24.48     1.10    21.81   616.40     1.03   596.39     0.92     0.91
 HUB     24.63     1.11    21.53   617.61     1.03   594.25     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.57    35.40    31.50     3.90     0.93     0.30     2.90
 MEAN    29.81    27.47    23.50     3.97     0.92     0.30     3.29     0.91
 HUB     35.84    10.47     6.50     3.97     0.92     0.31     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     482.719     244.775     416.056    1199.224       0.403       0.053

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.557      21.961     597.804      46.000      30.469      32.400       1.931

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     434.290     244.775     498.520    1202.936       0.361       0.222

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.540      22.424     601.510     456.573       0.016       0.316

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     412.530       0.000     412.530    1204.473       0.342       0.219

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.570     603.048       0.000       0.060       0.038       0.275

    STAGE EXIT CONDITIONS, STAGE            4
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Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.873	24.480	1.100	617.251	18.991	260.043	2.016

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
118373.922	0.423	926.869	1223842.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.995

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
138.557	3210.000	24.480	617.251	1.000	1.000	0.980

W Kg/sec = 62.98067

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
90.763	2942.608	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
106589.836	108721.398	1.928	509.668	264.360	390.276	1.476

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	384.57	-0.13	384.57	0.32	470.43
MEAN	15.91	0.00	-0.02	384.57	-0.13	384.57	0.32	
HUB	13.07	0.00	-0.02	384.57	-0.13	384.57	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.16	47.36	5.80	513.19	641.40	22.81	604.91	0.53
MEAN	49.22	44.80	4.42	445.76	588.83	22.81	604.91	0.49
HUB	43.60	38.84	4.76	366.12	531.07	22.81	604.91	0.44

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	452.51	219.03	395.97	1219.08	0.37
MEAN	15.50	458.61	225.19	399.51	1216.67	0.38
HUB	12.59	489.96	277.94	403.49	1214.26	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	502.54	487.01	283.52	0.40	3931.79	
MEAN	434.13	450.85	208.94	0.37	3492.04	1.43
HUB	352.68	410.35	74.73	0.34	3501.03	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.78	1.09	24.35	634.91	1.03	617.83	0.92	0.91
MEAN	26.51	1.08	24.04	632.94	1.03	615.39	0.92	0.91
HUB	26.52	1.08	23.70	632.98	1.03	612.95	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.95	35.60	31.50	4.10	0.93	0.30	2.90	
MEAN	29.41	27.61	23.50	4.11	0.92	0.29	3.34	0.91
HUB	34.56	10.49	6.50	3.99	0.92	0.29	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	463.573	229.321	402.879	1216.953	0.381	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
26.553	24.021	615.682	46.000	29.649	33.000	3.351

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	425.453	229.321	483.320	1219.744	0.349	0.135

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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.519      24.377     618.509     440.827       0.033       0.309

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     397.703       0.000     397.703    1221.622       0.326       0.234

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.623     620.415       0.000       0.060       0.040       0.231

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      26.500       1.083     633.611      16.361     280.256       2.173

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102024.414       0.404     798.852 1268384.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    690305.88   5405.1006    135.3568      1.7542      0.8250      8.9530      1.2119


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

   Fan-Core + 4 Stage LPC 85%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    133.793    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   60.81521

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    130.703    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 102924.961  104983.242       2.185     831.557     380.635     619.754       1.628

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   308.61    -0.11   308.61     0.28   575.61
 MEAN    17.06     0.00    -0.02   308.61    -0.11   308.61     0.28
 HUB     12.51     0.00    -0.02   308.61    -0.11   308.61     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.90    50.47    11.43   577.90   655.23    14.32   514.86     0.59
 MEAN    57.15    47.20     9.95   477.90   568.97    14.32   514.86     0.51
 HUB     48.64    38.62    10.02   350.44   467.03    14.32   514.86     0.42

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   542.01   357.81   407.12  1130.96     0.48
 MEAN    18.04   562.16   379.38   414.84  1126.40     0.50
 HUB     15.00   630.27   463.08   427.55  1119.64     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    577.90   462.80   220.08     0.41  7383.91
 MEAN   505.23   433.51   125.85     0.38  6844.35     1.48
 HUB    420.19   429.70    42.90     0.38  6947.60

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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```
 TIP     18.37     1.22    15.69   556.04     1.06   531.50     0.92     0.91
 MEAN    18.12     1.20    15.28   553.61     1.06   527.21     0.92     0.91
 HUB     18.16     1.20    14.64   554.07     1.06   520.90     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.31    28.40    24.20     4.20     0.93     0.39     2.90
 MEAN    42.44    16.88    12.70     4.18     0.94     0.34     3.51     0.91
 HUB     47.28    -5.73    -9.30     3.57     0.94     0.19     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     569.231     378.645     425.031    1126.694       0.505       -0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.186      15.274     527.510      24.000      41.697      35.400      -6.297

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     445.082     378.645     584.354    1137.871       0.391       0.369

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.135      16.317     538.028     528.796       0.027       0.498

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     412.333       0.000     412.333    1140.348       0.362       0.408

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.504     540.373       0.000       0.060       0.050       0.431

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      18.066       1.196     554.573      31.763     195.211       1.513

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 197755.156       0.592    1495.185 1297660.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.992

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    133.793    3210.000      18.066     554.573       1.000       1.000       0.980
W Kg/sec =   60.81521

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.566    3104.443       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 102924.961  104983.242       1.801     590.487     327.823     474.134       1.446

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   393.50    -0.14   393.50     0.34   556.71
 MEAN    18.08     0.00    -0.02   393.50    -0.14   393.50     0.34
 HUB     15.21     0.00    -0.02   393.50    -0.14   393.50     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.65    46.36     9.29   575.66   697.41    16.64   541.64     0.61
 MEAN    52.16    42.30     9.86   506.42   641.43    16.64   541.64     0.56
 HUB     47.29    37.84     9.45   426.07   580.08    16.64   541.64     0.51

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
```

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	494.29	289.64	400.54	1161.65	0.43
MEAN	18.01	502.10	295.54	405.92	1158.21	0.43
HUB	15.22	541.83	351.90	412.00	1154.77	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	572.02	490.08	282.38	0.42	5917.15	
MEAN	504.50	456.55	208.97	0.39	5325.02	1.53
HUB	426.43	418.69	74.54	0.36	5359.03	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.96	1.16	18.51	581.19	1.05	560.79	0.92	0.91
MEAN	20.66	1.14	18.15	578.53	1.04	557.47	0.92	0.91
HUB	20.68	1.14	17.78	578.68	1.04	554.16	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.87	35.18	31.50	3.68	0.93	0.37	2.90	
MEAN	36.06	27.24	23.50	3.74	0.94	0.36	3.30	0.91
HUB	40.50	10.25	6.50	3.75	0.94	0.36	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	745.938	296.364	684.538	1132.492	0.659	-1.015

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.741	15.495	533.000	46.000	23.410	30.600	7.190

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	692.818	296.364	753.544	1139.252	0.608	-0.783

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	20.668	16.095	539.382	345.258	0.038	0.218

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	682.391	0.000	682.391	1140.522	0.598	0.249

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	16.148	540.580	0.000	0.060	0.073	-0.763

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.846	20.575	1.139	579.464	24.891	222.951	1.728

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
155033.750	0.474	1172.178	1174067.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 9.953 EfDer = 0.869

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
133.793	3210.000	20.575	579.464	1.000	1.000	0.680

W Kg/sec = 60.81521

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
101.032	3037.035	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
102924.961	104983.242	1.286	378.495	294.244	293.880	0.999

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	608.86	-0.21	608.86	0.53	531.90
MEAN	17.74	0.00	-0.02	608.86	-0.21	608.86	0.53	

```
 HUB     15.05     0.00    -0.02   608.86    -0.21   608.86     0.53

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.73    46.36    -3.63   562.21   828.88    16.99   548.52     0.72
 MEAN    39.23    43.40    -4.17   496.90   786.02    16.99   548.52     0.68
 HUB     34.71    38.84    -4.13   421.59   740.70    16.99   548.52     0.64

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   472.15   239.60   406.84  1183.56     0.40
 MEAN    17.51   482.23   253.90   409.98  1181.37     0.41
 HUB     14.85   523.04   319.23   414.32  1179.23     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   514.73   315.33     0.43  4750.71
 MEAN   490.40   473.30   236.51     0.40  4448.58     1.76
 HUB    415.99   425.47    96.75     0.36  4743.79

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.76     1.11    20.39   600.82     1.04   582.21     0.92     0.79
 MEAN    22.61     1.10    20.16   599.47     1.03   580.05     0.92     0.79
 HUB     22.75     1.11    19.88   600.79     1.04   577.95     0.92     0.79

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.50    37.78    31.50     6.28     0.93     0.43     2.90
 MEAN    31.77    29.98    23.50     6.48     0.88     0.45     3.28     0.79
 HUB     37.61    13.14     6.50     6.64     0.88     0.48     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.869

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     487.422     255.563     415.052    1181.843       0.412       0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.682      20.173     580.527      46.000      31.622      31.500      -0.122

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     427.004     255.563     497.640    1186.528       0.360       0.227

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.666      20.723     585.139     471.992       0.016       0.326

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     414.391       0.000     414.391    1187.426       0.349       0.238

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.785     586.025       0.000       0.060       0.037       0.251

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.761      22.614       1.099     600.361      20.897     253.081       1.962

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 130210.266       0.423     984.493 1801764.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    133.793    3210.000      22.614     600.361       1.000       1.000       0.980
W Kg/sec =   60.81521
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
93.569	2983.712	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
102924.961	104983.242	1.884	513.330	272.521	401.059	1.472

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	389.26	-0.13	389.26	0.33	501.47
MEAN	16.97	0.00	-0.02	389.26	-0.13	389.26	0.33	
HUB	14.32	0.00	-0.02	389.26	-0.13	389.26	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.20	46.36	7.84	539.52	665.39	20.99	587.72	0.56
MEAN	50.70	43.80	6.90	475.39	614.53	20.99	587.72	0.52
HUB	45.87	37.84	8.03	401.14	559.05	20.99	587.72	0.47

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	468.10	246.32	398.05	1204.41	0.39
MEAN	16.57	476.32	255.73	401.85	1201.91	0.40
HUB	13.89	513.59	314.34	406.16	1199.41	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	528.88	488.14	282.55	0.41	4653.16	
MEAN	464.28	452.74	208.55	0.38	4240.70	1.47
HUB	389.09	412.98	74.75	0.34	4368.13	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.23	1.12	22.73	621.27	1.03	602.99	0.92	0.91
MEAN	24.99	1.11	22.42	619.42	1.03	600.49	0.92	0.91
HUB	25.06	1.11	22.09	619.99	1.03	597.98	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.75	35.37	31.50	3.87	0.93	0.33	2.90	
MEAN	32.47	27.43	23.50	3.93	0.93	0.33	3.29	0.91
HUB	37.74	10.43	6.50	3.93	0.93	0.33	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	470.244	257.167	393.694	1203.198	0.391	0.051

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.068	22.559	601.774	46.000	33.153	32.400	-0.753

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	409.682	257.167	483.709	1207.636	0.339	0.268

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	25.053	23.133	606.222	456.573	0.015	0.356

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	389.410	0.000	389.410	1208.982	0.322	0.262

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.261	607.574	0.000	0.060	0.037	0.315

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.880	24.996	1.105	620.229	19.868	244.679	1.897

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
123850.039	0.443	936.404	1171254.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 9.953 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
133.793	3210.000	24.996	620.229	1.000	1.000	0.980

W Kg/sec = 60.81521

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
86.039	2935.534	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
102924.961	104983.242	2.034	509.668	250.602	390.276	1.557

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	363.37	-0.13	363.37	0.30	469.30
MEAN	15.91	0.00	-0.02	363.37	-0.13	363.37	0.30	
HUB	13.07	0.00	-0.02	363.37	-0.13	363.37	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.71	47.36	7.35	513.19	628.91	23.48	609.21	0.52
MEAN	50.82	44.80	6.02	445.76	575.20	23.48	609.21	0.48
HUB	45.23	38.84	6.39	366.12	515.92	23.48	609.21	0.43

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	441.35	235.84	373.05	1224.16	0.36
MEAN	15.50	445.38	237.45	376.80	1221.43	0.36
HUB	12.59	474.23	282.46	380.93	1218.70	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	502.54	458.58	266.70	0.37	4233.27	
MEAN	434.13	425.04	196.67	0.35	3681.95	1.48
HUB	352.68	387.34	70.21	0.32	3557.85	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.53	1.10	25.16	639.25	1.03	623.00	0.92	0.91
MEAN	27.19	1.09	24.80	636.77	1.03	620.22	0.92	0.91
HUB	27.11	1.08	24.42	636.21	1.03	617.45	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.30	35.56	31.50	4.06	0.93	0.33	2.90	
MEAN	32.22	27.56	23.50	4.06	0.93	0.32	3.34	0.91
HUB	36.56	10.44	6.50	3.94	0.93	0.32	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	450.370	241.807	379.950	1221.686	0.369	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
27.228	24.787	620.487	46.000	32.473	33.000	0.527

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	399.891	241.807	467.315	1225.206	0.326	0.191

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	27.206	25.269	624.068	440.827	0.029	0.350

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     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     374.194       0.000     374.194    1226.834       0.305       0.282

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      25.486     625.727       0.000       0.060       0.037       0.278

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.879      27.187       1.088     637.409      17.180     262.600       2.036

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  107143.789       0.424     810.092 1213495.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     713993.06   5398.3516    130.7028      1.7996      0.8371      9.9532      1.2192


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 85%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.987

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     129.093    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   58.67873

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     126.111    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   99309.141  101295.109       2.264     831.557     367.263     619.754       1.687

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   296.92    -0.10   296.92     0.27   575.61
  MEAN    17.06     0.00    -0.02   296.92    -0.10   296.92     0.27
  HUB     12.51     0.00    -0.02   296.92    -0.10   296.92     0.27

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.81    50.47    12.34   577.90   649.80    14.38   515.45     0.58
  MEAN    58.15    47.20    10.95   477.90   562.71    14.38   515.45     0.51
  HUB     49.73    38.62    11.11   350.44   459.39    14.38   515.45     0.41

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   535.87   366.54   390.89  1132.41     0.47
  MEAN    18.04   553.62   384.33   398.48  1127.67     0.49
  HUB     15.00   617.54   461.33   410.53  1120.93     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   444.37   211.36     0.39  7563.90
  MEAN   505.23   416.42   120.90     0.37  6933.53     1.53
  HUB    420.19   412.58    41.14     0.37  6921.21

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.44     1.22    15.81   556.85     1.07   532.86     0.92     0.90
  MEAN    18.14     1.20    15.38   554.01     1.06   528.41     0.92     0.90
  HUB     18.13     1.20    14.75   553.96     1.06   522.10     0.92     0.90
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.16    28.40    24.20     4.20     0.93     0.41     2.90
 MEAN    43.96    16.88    12.70     4.18     0.94     0.36     3.51     0.90
 HUB     48.33    -5.72    -9.30     3.58     0.94     0.22     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     560.139     383.584     408.190    1127.998       0.497       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.208      15.381     528.732      24.000      43.220      35.400      -7.820

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     426.733     383.584     573.793    1139.667       0.374       0.396

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.149      16.473     539.728     528.796       0.030       0.522

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     395.956       0.000     395.956    1141.898       0.347       0.426

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.627     541.843       0.000       0.060       0.057       0.449

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      18.072       1.196     554.938      32.128     189.848       1.472

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 200022.594       0.599    1459.200 1248503.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    129.093    3210.000      18.072     554.938       1.000       1.000       0.980
W Kg/sec =   58.67873

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.615    3103.424       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  99309.141  101295.109       1.867     590.487     316.316     474.134       1.499

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   378.07    -0.13   378.07     0.33   556.53
 MEAN    18.08     0.00    -0.02   378.07    -0.13   378.07     0.33
 HUB     15.21     0.00    -0.02   378.07    -0.13   378.07     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.71    46.36    10.35   575.66   688.81    16.75   543.00     0.60
 MEAN    53.26    42.30    10.96   506.42   632.08    16.75   543.00     0.55
 HUB     48.42    37.84    10.58   426.07   569.72    16.75   543.00     0.50

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   488.34   301.01   384.54  1163.60     0.42
 MEAN    18.01   494.35   303.85   389.94  1159.95     0.43
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 HUB     15.22   531.78   354.87   396.05  1156.29     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   470.44   271.01     0.40  6149.25
 MEAN   504.50   438.54   200.65     0.38  5474.71     1.58
 HUB    426.43   402.46    71.56     0.35  5404.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.07     1.17    18.66   582.60     1.05   562.68     0.92     0.90
 MEAN    20.73     1.15    18.29   579.56     1.04   559.16     0.92     0.90
 HUB     20.69     1.14    17.89   579.25     1.04   555.63     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.05    35.17    31.50     3.67     0.93     0.39     2.90
 MEAN    37.93    27.23    23.50     3.73     0.94     0.38     3.30     0.90
 HUB     41.86    10.24     6.50     3.74     0.94     0.37     3.92


   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     716.527     304.704     648.510    1137.363       0.630      -0.931

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.803      15.918     537.597      46.000      25.167      30.600       5.433

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     653.419     304.704     720.972    1144.974       0.571      -0.648

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      20.748      16.632     544.816     345.258       0.031       0.245

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     642.987       0.000     642.987    1146.162       0.561       0.307

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      16.700     545.945       0.000       0.060       0.057      -0.621

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      20.683       1.144     580.469      25.531     214.413       1.662

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 159021.297       0.486    1160.088 1127074.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.901

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    129.093    3210.000      20.683     580.469       1.000       1.000       0.680
W Kg/sec =   58.67873

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.061    3034.406       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  99309.141  101295.109       1.339     378.495     282.680     293.880       1.040

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   577.03    -0.20   577.03     0.50   531.44
 MEAN    17.74     0.00    -0.02   577.03    -0.20   577.03     0.50
 HUB     15.05     0.00    -0.02   577.03    -0.20   577.03     0.50

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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 TIP     44.27    46.36    -2.09   562.21   805.77    17.43   552.67     0.70
 MEAN    40.74    43.40    -2.66   496.90   761.62    17.43   552.67     0.66
 HUB     36.17    38.84    -2.67   421.59   714.75    17.43   552.67     0.62

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   463.92   256.15   386.79  1186.73     0.39
 MEAN    17.51   472.43   266.24   390.26  1184.17     0.40
 HUB     14.85   511.04   324.67   394.65  1181.67     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   488.75   298.78     0.41  5078.36
 MEAN   490.40   450.06   224.16     0.38  4664.54     1.80
 HUB    415.99   405.08    91.32     0.34  4824.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.12     1.12    20.80   603.30     1.04   585.33     0.92     0.82
 MEAN    22.91     1.11    20.53   601.44     1.04   582.81     0.92     0.82
 HUB     22.99     1.11    20.22   602.16     1.04   580.36     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.51    37.68    31.50     6.18     0.93     0.45     2.90
 MEAN    34.30    29.87    23.50     6.37     0.89     0.46     3.28     0.82
 HUB     39.44    13.03     6.50     6.53     0.89     0.49     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.901

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     477.333     267.991     395.003    1184.638       0.403       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.984      20.549     583.279      46.000      34.155      31.500      -2.655

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     405.232     267.991     485.831    1190.020       0.341       0.272

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.967      21.194     588.592     471.992       0.017       0.364

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     393.476       0.000     393.476    1190.812       0.330       0.278

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.241     589.375       0.000       0.060       0.039       0.291

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.791      22.912       1.108     602.300      21.832     238.415       1.848

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 136038.531       0.442     992.425 1711274.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    129.093    3210.000      22.912     602.300       1.000       1.000       0.980
W Kg/sec =   58.67873

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.251    2978.905       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
99309.141	101295.109	1.975	513.330	259.947	401.059	1.543

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	369.91	-0.13	369.91	0.31	500.67
MEAN	16.97	0.00	-0.02	369.91	-0.13	369.91	0.31	
HUB	14.32	0.00	-0.02	369.91	-0.13	369.91	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.57	46.36	9.21	539.52	654.26	21.43	590.88	0.55
MEAN	52.12	43.80	8.32	475.39	602.46	21.43	590.88	0.51
HUB	47.33	37.84	9.49	401.14	545.76	21.43	590.88	0.46

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	459.09	261.15	377.57	1208.29	0.38
MEAN	16.57	465.41	266.55	381.52	1205.51	0.39
HUB	13.89	500.28	318.31	385.95	1202.72	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	528.88	462.85	267.72	0.38	4933.02	
MEAN	464.28	429.71	197.72	0.36	4420.00	1.53
HUB	389.09	392.39	70.79	0.33	4423.12	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.71	1.12	23.27	624.47	1.04	606.88	0.92	0.91
MEAN	25.41	1.11	22.93	622.16	1.03	604.09	0.92	0.91
HUB	25.41	1.11	22.56	622.18	1.03	601.29	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.67	35.34	31.50	3.84	0.93	0.36	2.90	
MEAN	34.94	27.40	23.50	3.90	0.93	0.35	3.29	0.91
HUB	39.51	10.39	6.50	3.89	0.93	0.35	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	460.073	268.053	373.918	1206.687	0.381	0.048

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.486	23.051	605.273	46.000	35.636	32.400	-3.236

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	388.152	268.053	471.714	1211.751	0.320	0.309

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	25.469	23.720	610.364	456.573	0.016	0.393

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	369.245	0.000	369.245	1212.937	0.304	0.298

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.824	611.559	0.000	0.060	0.040	0.349

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	25.408	1.109	622.938	20.637	231.814	1.797

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
128651.258	0.460	938.533	1121391.625

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    129.093    3210.000      25.408     622.938       1.000       1.000       0.980
W Kg/sec =   58.67873

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     81.850    2929.145       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 99309.141  101295.109       2.138     509.668     238.400     390.276       1.637

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   344.82    -0.12   344.82     0.28   468.27
MEAN    15.91     0.00    -0.02   344.82    -0.12   344.82     0.28
HUB     13.07     0.00    -0.02   344.82    -0.12   344.82     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.11    47.36     8.75   513.19   618.37    24.02   613.02     0.51
MEAN    52.28    44.80     7.48   445.76   563.66    24.02   613.02     0.46
HUB     46.73    38.84     7.89   366.12   503.03    24.02   613.02     0.41

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   432.99   250.23   353.36  1228.54     0.35
MEAN    15.50   434.84   248.00   357.19  1225.56     0.35
HUB     12.59   461.06   286.35   361.37  1222.58     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    502.54   434.19   252.31     0.35  4491.36
MEAN   434.13   402.77   186.12     0.33  3845.36     1.54
HUB    352.68   367.40    66.33     0.30  3606.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     28.13     1.11    25.82   643.11     1.03   627.47     0.92     0.91
MEAN    27.73     1.09    25.42   640.21     1.03   624.44     0.92     0.91
HUB     27.58     1.09    25.00   639.14     1.03   621.40     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.30    35.53    31.50     4.03     0.93     0.37     2.90
MEAN    34.77    27.52    23.50     4.02     0.93     0.35     3.34     0.91
HUB     38.39    10.40     6.50     3.90     0.93     0.34     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     439.892     252.551     360.170    1225.796       0.359      -0.007

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    27.766      25.400     624.677      46.000      35.038      33.000      -2.038

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     378.153     252.551     454.732    1229.923       0.307       0.238

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      27.744      25.982     628.891     440.827       0.029       0.389

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    14.701     354.161       0.000     354.161    1231.355       0.288       0.322
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   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.174     630.357       0.000       0.060       0.038       0.318

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      27.723       1.091     640.821      17.883     248.217       1.924

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 111535.680       0.442     813.672 1161645.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    735269.38   5363.9185    126.1111      1.8351      0.8424     10.9531      1.2257


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 85%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc =12.015   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    124.165    3210.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   56.43852

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    121.297    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95517.758   97427.906       2.354     831.557     353.242     619.754       1.754

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   284.77    -0.10   284.77     0.26   575.61
 MEAN    17.06     0.00    -0.02   284.77    -0.10   284.77     0.26
 HUB     12.51     0.00    -0.02   284.77    -0.10   284.77     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.77    50.47    13.30   577.90   644.34    14.44   516.04     0.58
 MEAN    59.22    47.20    12.02   477.90   556.39    14.44   516.04     0.50
 HUB     50.91    38.62    12.29   350.44   451.63    14.44   516.04     0.41

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   530.12   375.40   374.30  1133.82     0.47
 MEAN    18.04   545.22   389.34   381.69  1128.92     0.48
 HUB     15.00   604.68   459.50   393.06  1122.20     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    577.90   425.56   202.50     0.38  7746.57
 MEAN   505.23   398.90   115.90     0.35  7023.73     1.59
 HUB    420.19   395.02    39.32     0.35  6893.78

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.50     1.22    15.92   557.67     1.07   534.20     0.92     0.90
 MEAN    18.16     1.20    15.48   554.42     1.06   529.59     0.92     0.90
 HUB     18.10     1.20    14.85   553.83     1.06   523.29     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.08    28.41    24.20     4.21     0.93     0.44     2.90
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 MEAN    45.57    16.89    12.70     4.19     0.94     0.39     3.51     0.90
 HUB     49.46    -5.71    -9.30     3.59     0.94     0.24     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     551.196     388.579     390.927    1129.275       0.488        0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.226      15.482     529.930      24.000      44.827      35.400      -9.427

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     408.055     388.579     563.473    1141.430       0.357        0.424

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.157      16.620     541.398     528.796       0.034        0.547

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083     379.239       0.000     379.239    1143.425       0.332        0.444

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      16.742     543.293       0.000       0.060       0.065        0.467

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.848       18.069       1.196     555.306      32.496     184.342        1.429

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 202314.734       0.606    1419.574 1197425.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =12.015   EfDer =  0.980

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    124.165     3210.000       18.069     555.306       1.000        1.000        0.980
W Kg/sec =   56.43852

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    104.516     3102.395        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  95517.758   97427.906        1.940     590.487     304.380     474.134        1.558

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1       Stator    Alfa     C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   362.29     -0.12   362.29      0.32   556.34
 MEAN    18.08      0.00    -0.02   362.29     -0.12   362.29      0.32
 HUB     15.21      0.00    -0.02   362.29     -0.12   362.29      0.32

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     57.82     46.36    11.46   575.66    680.28     16.86   544.35      0.59
 MEAN    54.43     42.30    12.13   506.42    622.77     16.86   544.35      0.54
 HUB     49.63     37.84    11.79   426.07    559.37     16.86   544.35      0.49

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     20.42   483.03    312.44    368.37   1165.51      0.41
 MEAN    18.01   487.00    312.24    373.73   1161.66      0.42
 HUB     15.22   521.83    357.86    379.80   1157.79      0.45

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
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 TIP    572.02   450.64   259.57     0.39  6382.63
 MEAN   504.50   420.29   192.27     0.36  5625.61     1.62
 HUB    426.43   385.94    68.57     0.33  5449.61

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.16     1.17    18.80   584.01     1.05   564.53     0.92     0.90
 MEAN    20.78     1.15    18.41   580.61     1.05   560.81     0.92     0.90
 HUB     20.69     1.14    17.99   579.82     1.04   557.08     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.30    35.17    31.50     3.67     0.93     0.42     2.90
 MEAN    39.88    27.22    23.50     3.72     0.94     0.40     3.30     0.90
 HUB     43.30    10.23     6.50     3.73     0.94     0.39     3.92


   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     689.280     313.112     614.058    1141.807       0.604      -0.853

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.851      16.296     541.808      46.000      27.017      30.600       3.583

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     616.429     313.112     691.393    1150.146       0.536      -0.521

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      20.810      17.111     549.751     345.258       0.027       0.272

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     606.353       0.000     606.353    1151.222       0.527       0.359

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      17.184     550.780       0.000       0.060       0.046      -0.492

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      20.763       1.149     581.481      26.175     206.004       1.597

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 163033.812       0.498    1143.953 1078647.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =12.015   EfDer =  0.931

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    124.165    3210.000      20.763     581.481       1.000       1.000       0.680
W Kg/sec =   56.43852

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.075    3031.764       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 95517.758   97427.906       1.396     378.495     271.071     293.880       1.084

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   546.66    -0.19   546.66     0.47   530.98
 MEAN    17.74     0.00    -0.02   546.66    -0.19   546.66     0.47
 HUB     15.05     0.00    -0.02   546.66    -0.19   546.66     0.47

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.81    46.36    -0.55   562.21   784.30    17.82   556.53     0.68
 MEAN    42.28    43.40    -1.12   496.90   738.87    17.82   556.53     0.64
 HUB     37.65    38.84    -1.19   421.59   690.46    17.82   556.53     0.60
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      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   457.14   272.20   367.27  1189.72     0.38
 MEAN    17.51   463.75   278.21   371.03  1186.83     0.39
 HUB     14.85   499.83   329.91   375.48  1184.01     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   463.49   282.73     0.39  5396.00
 MEAN   490.40   427.42   212.19     0.36  4873.88     1.84
 HUB    415.99   385.22    86.07     0.33  4902.07

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.45     1.13    21.18   605.74     1.04   588.30     0.92     0.85
 MEAN    23.18     1.12    20.86   603.39     1.04   585.44     0.92     0.85
 HUB     23.20     1.12    20.52   603.52     1.04   582.66     0.92     0.85

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.54    37.59    31.50     6.09     0.93     0.47     2.90
 MEAN    36.86    29.77    23.50     6.27     0.90     0.48     3.28     0.85
 HUB     41.30    12.91     6.50     6.41     0.90     0.50     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.931

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     468.402     280.038     375.471    1187.295       0.395       0.009

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.255      20.886     585.903      46.000      36.717      31.500      -5.217

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     384.222     280.038     475.445    1193.351       0.322       0.316

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.232      21.620     591.895     471.992       0.019       0.404

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     17.121     373.368       0.000     373.368    1194.043       0.313       0.314

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.648     592.581       0.000       0.060       0.046       0.327

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.816      23.168       1.116     604.219      22.738     225.085       1.745

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 141686.453       0.460     994.166 1622599.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =12.015   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    124.165    3210.000      23.168     604.219       1.000       1.000       0.980
W Kg/sec =   56.43852

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     85.030    2974.172       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95517.758   97427.906       2.073     513.330     247.651     401.059       1.619
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ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	351.26	-0.12	351.26	0.29	499.87
MEAN	16.97	0.00	-0.02	351.26	-0.12	351.26	0.29	
HUB	14.32	0.00	-0.02	351.26	-0.12	351.26	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.94	46.36	10.58	539.52	643.89	21.82	593.92	0.54
MEAN	53.55	43.80	9.75	475.39	591.18	21.82	593.92	0.49
HUB	48.80	37.84	10.96	401.14	533.29	21.82	593.92	0.45

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	451.62	275.14	358.14	1211.93	0.37
MEAN	16.57	455.81	276.81	362.13	1208.91	0.38
HUB	13.89	487.96	322.04	366.61	1205.87	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	528.88	438.91	253.74	0.36	5196.90	
MEAN	464.28	407.78	187.47	0.34	4589.84	1.58
HUB	389.09	372.69	67.06	0.31	4474.82	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.13	1.13	23.74	627.57	1.04	610.55	0.92	0.91
MEAN	25.77	1.11	23.36	624.85	1.03	607.51	0.92	0.91
HUB	25.71	1.11	22.96	624.33	1.03	604.46	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.53	35.32	31.50	3.82	0.93	0.39	2.90	
MEAN	37.39	27.37	23.50	3.87	0.94	0.38	3.29	0.91
HUB	41.30	10.37	6.50	3.87	0.94	0.38	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.993

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	451.165	278.365	355.053	1209.989	0.373	0.046

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.845	23.478	608.595	46.000	38.097	32.400	-5.697

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	367.784	278.365	461.251	1215.640	0.303	0.349

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	25.823	24.233	614.294	456.573	0.019	0.431

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	350.208	0.000	350.208	1216.682	0.288	0.331

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	24.310	615.347	0.000	0.060	0.048	0.380

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.870	25.751	1.112	625.582	21.364	220.103	1.706

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
133184.641	0.476	934.512	1070811.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
RESET = 0.000BLEED = 0.000 DPInc =12.015 EfDer = 0.996

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
124.165	3210.000	25.751	625.582	1.000	1.000	0.980

W Kg/sec = 56.43852

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
77.840	2922.947	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
95517.758	97427.906	2.248	509.668	226.723	390.276	1.721

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	327.26	-0.11	327.26	0.27	467.28
MEAN	15.91	0.00	-0.02	327.26	-0.11	327.26	0.27	
HUB	13.07	0.00	-0.02	327.26	-0.11	327.26	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.48	47.36	10.12	513.19	608.75	24.49	616.65	0.50
MEAN	53.72	44.80	8.92	445.76	553.09	24.49	616.65	0.45
HUB	48.22	38.84	9.38	366.12	491.15	24.49	616.65	0.40

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	426.27	263.59	335.00	1232.63	0.35
MEAN	15.50	425.74	257.80	338.82	1229.45	0.35
HUB	12.59	449.08	289.89	342.98	1226.26	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	502.54	411.48	238.95	0.33	4730.94	
MEAN	434.13	381.96	176.33	0.31	3997.02	1.60
HUB	352.68	348.68	62.79	0.28	3651.19	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	28.64	1.11	26.37	646.83	1.03	631.67	0.92	0.91
MEAN	28.18	1.09	25.93	643.54	1.03	628.41	0.92	0.91
HUB	27.96	1.09	25.49	641.98	1.03	625.16	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.20	35.50	31.50	4.00	0.93	0.40	2.90	
MEAN	37.27	27.49	23.50	3.99	0.93	0.38	3.34	0.91
HUB	40.20	10.37	6.50	3.87	0.93	0.36	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	430.867	262.523	341.655	1229.656	0.350	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
28.216	25.917	628.629	46.000	37.538	33.000	-4.538

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	358.022	262.523	443.957	1234.336	0.290	0.281

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	28.186	26.585	633.423	440.827	0.033	0.427

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	335.589	0.000	335.589	1235.600	0.272	0.358

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	26.752	634.721	0.000	0.060	0.044	0.353

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    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      28.161       1.094     644.117      18.534     235.403       1.825

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  115605.141       0.458     811.162 1109157.500

    OVERALL EXIT CONDITIONS; ALL          5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     755824.75   5303.3672    121.2965      1.8641      0.8426     12.0155      1.2320


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 85%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =12.453   EfDer =  0.977

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     122.152    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   55.52385

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     119.331    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   93969.758   95848.945       2.393     831.557     347.517     619.754       1.783

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   279.84    -0.10   279.84     0.25   575.61
  MEAN    17.06     0.00    -0.02   279.84    -0.10   279.84     0.25
  HUB     12.51     0.00    -0.02   279.84    -0.10   279.84     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.17    50.47    13.70   577.90   642.17    14.46   516.27     0.58
  MEAN    59.65    47.20    12.45   477.90   553.88    14.46   516.27     0.50
  HUB     51.40    38.62    12.78   350.44   448.53    14.46   516.27     0.40

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   527.97   378.94   367.63  1134.37     0.47
  MEAN    18.04   541.95   391.32   374.93  1129.41     0.48
  HUB     15.00   599.55   458.75   386.02  1122.70     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   418.02   198.96     0.37  7819.52
  MEAN   505.23   391.85   113.91     0.35  7059.59     1.61
  HUB    420.19   387.94    38.56     0.35  6882.41

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.52     1.23    15.96   558.00     1.07   534.72     0.92     0.89
  MEAN    18.17     1.20    15.52   554.58     1.06   530.05     0.92     0.89
  HUB     18.09     1.20    14.89   553.78     1.06   523.76     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     45.87    28.42    24.20     4.22     0.93     0.45     2.90
  MEAN    46.23    16.90    12.70     4.20     0.94     0.40     3.51     0.89
  HUB     49.92    -5.70    -9.30     3.60     0.94     0.25     4.78
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     547.707     390.565     383.982    1129.772       0.485       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.231      15.521     530.396      24.000      45.487      35.400     -10.087

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     400.572     390.565     559.463    1142.116       0.351       0.435

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.159      16.676     542.050     528.796       0.036       0.558

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     372.528       0.000     372.528    1144.022       0.326       0.451

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.785     543.861       0.000       0.060       0.069       0.474

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.843      18.066       1.196     555.452      32.642     182.126       1.412

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 203224.438       0.609    1402.848 1176700.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =12.453   EfDer =  0.976

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    122.152    3210.000      18.066     555.452       1.000       1.000       0.980
W Kg/sec =   55.52385

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    102.852    3101.987       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  93969.758   95848.945       1.971     590.487     299.536     474.134       1.583

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   355.94    -0.12   355.94     0.31   556.27
 MEAN    18.08     0.00    -0.02   355.94    -0.12   355.94     0.31
 HUB     15.21     0.00    -0.02   355.94    -0.12   355.94     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.28    46.36    11.92   575.66   676.92    16.89   544.87     0.59
 MEAN    54.90    42.30    12.60   506.42   619.10    16.89   544.87     0.54
 HUB     50.13    37.84    12.29   426.07   555.28    16.89   544.87     0.48

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   481.10   316.97   361.92  1166.25     0.41
 MEAN    18.01   484.20   315.56   367.25  1162.32     0.42
 HUB     15.22   517.93   359.04   373.28  1158.38     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   442.76   255.05     0.38  6475.03
 MEAN   504.50   413.00   188.94     0.36  5685.44     1.64
 HUB    426.43   379.32    67.39     0.33  5467.54
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.19     1.17    18.85   584.58     1.05   565.25     0.92     0.89
 MEAN    20.79     1.15    18.45   581.03     1.05   561.45     0.92     0.89
 HUB     20.68     1.14    18.03   580.04     1.04   557.65     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.21    35.17    31.50     3.67     0.93     0.43     2.90
 MEAN    40.67    27.23    23.50     3.73     0.94     0.41     3.30     0.89
 HUB     43.89    10.23     6.50     3.73     0.94     0.40     3.92


   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       0.976

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     679.010     316.446     600.763    1143.464       0.594      -0.824

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.867      16.434     543.383      46.000      27.778      30.600       2.822

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     602.309     316.446     680.378    1152.066       0.523      -0.473

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      20.830      17.286     551.589     345.258       0.025       0.284

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     592.435       0.000     592.435    1153.095       0.514       0.378

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      17.359     552.574       0.000       0.060       0.042      -0.443

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.863      20.788       1.151     581.882      26.430     202.712       1.571

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 164622.984       0.503    1136.384 1059104.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =12.453   EfDer =  0.942

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    122.152    3210.000      20.788     581.882       1.000       1.000       0.680
W Kg/sec =   55.52385

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.489    3030.719       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93969.758   95848.945       1.421     378.495     266.452     293.880       1.103

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   534.96    -0.18   534.96     0.46   530.80
 MEAN    17.74     0.00    -0.02   534.96    -0.18   534.96     0.46
 HUB     15.05     0.00    -0.02   534.96    -0.18   534.96     0.46

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.43    46.36     0.07   562.21   776.19    17.96   557.99     0.67
 MEAN    42.90    43.40    -0.50   496.90   730.26    17.96   557.99     0.63
 HUB     38.25    38.84    -0.59   421.59   681.23    17.96   557.99     0.59

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
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     0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   454.86   278.42   359.69  1190.86     0.38
 MEAN    17.51   460.61   282.85   363.54  1187.85     0.39
 HUB     14.85   495.61   331.96   368.02  1184.91     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   453.69   276.50     0.38  5519.30
 MEAN   490.40   418.62   207.55     0.35  4955.00     1.86
 HUB    415.99   377.49    84.03     0.32  4932.33

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.58     1.13    21.32   606.70     1.04   589.43     0.92     0.86
 MEAN    23.28     1.12    20.99   604.16     1.04   586.45     0.92     0.86
 HUB     23.27     1.12    20.63   604.06     1.04   583.55     0.92     0.86

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.74    37.55    31.50     6.05     0.93     0.48     2.90
 MEAN    37.88    29.72    23.50     6.22     0.90     0.49     3.28     0.86
 HUB     42.05    12.86     6.50     6.36     0.90     0.51     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.942

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     465.175     284.706     367.872    1188.311       0.391       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.352      21.008     586.907      46.000      37.737      31.500      -6.237

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     376.096     284.706     471.705    1194.627       0.315       0.333

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.326      21.776     593.163     471.992       0.021       0.420

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     365.605       0.000     365.605    1195.281       0.306       0.328

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.794     593.813       0.000       0.060       0.050       0.341

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.824      23.257       1.119     604.971      23.089     220.114       1.706

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 143878.016       0.467     993.182 1587855.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =12.453   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    122.152    3210.000      23.257     604.971       1.000       1.000       0.980
W Kg/sec =   55.52385

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.382    2972.321       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93969.758   95848.945       2.114     513.330     242.854     401.059       1.651

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP	19.26	0.00	-0.02	344.05	-0.12	344.05	0.29	499.56	
MEAN	16.97	0.00	-0.02	344.05	-0.12	344.05	0.29		
HUB	14.32	0.00	-0.02	344.05	-0.12	344.05	0.29		

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.48	46.36	11.12	539.52	639.99	21.96	595.09	0.53
MEAN	54.11	43.80	10.31	475.39	586.93	21.96	595.09	0.49
HUB	49.39	37.84	11.55	401.14	528.56	21.96	595.09	0.44

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	449.05	280.47	350.69	1213.32	0.37
MEAN	16.57	452.33	280.71	354.69	1210.20	0.37
HUB	13.89	483.33	323.45	359.15	1207.08	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	528.88	429.76	248.41	0.35	5297.48	
MEAN	464.28	399.37	183.56	0.33	4654.50	1.61
HUB	389.09	365.10	65.65	0.30	4494.39	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.28	1.13	23.91	628.78	1.04	611.95	0.92	0.91
MEAN	25.90	1.11	23.52	625.89	1.03	608.81	0.92	0.91
HUB	25.81	1.11	23.10	625.17	1.03	605.67	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.65	35.31	31.50	3.81	0.93	0.40	2.90	
MEAN	38.36	27.36	23.50	3.86	0.94	0.39	3.29	0.91
HUB	42.01	10.36	6.50	3.86	0.94	0.39	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.990

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	447.943	282.291	347.800	1211.249	0.370	0.045

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
25.971	23.628	609.867	46.000	39.064	32.400	-6.664

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	359.994	282.291	457.476	1217.123	0.296	0.364

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	25.945	24.415	615.797	456.573	0.020	0.447

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	342.933	0.000	342.933	1218.112	0.282	0.343

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	24.481	616.797	0.000	0.060	0.051	0.391

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.865	25.868	1.112	626.612	21.640	215.738	1.672

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
134910.609	0.482	931.281	1050583.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =12.453 EfDer = 0.994

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
122.152	3210.000	25.868	626.612	1.000	1.000	0.980

W Kg/sec = 55.52385

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
76.295	2920.545	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
93969.758	95848.945	2.293	509.668	222.224	390.276	1.756

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	320.54	-0.11	320.54	0.26	466.90
MEAN	15.91	0.00	-0.02	320.54	-0.11	320.54	0.26	
HUB	13.07	0.00	-0.02	320.54	-0.11	320.54	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.02	47.36	10.66	513.19	605.16	24.65	618.04	0.50
MEAN	54.29	44.80	9.49	445.76	549.14	24.65	618.04	0.45
HUB	48.81	38.84	9.97	366.12	486.70	24.65	618.04	0.40

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	423.99	268.64	328.03	1234.18	0.34
MEAN	15.50	422.48	261.49	331.83	1230.93	0.34
HUB	12.59	444.64	291.26	335.97	1227.66	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	502.54	402.88	233.90	0.33	4821.42	
MEAN	434.13	374.05	172.64	0.30	4054.23	1.62
HUB	352.68	341.54	61.42	0.28	3668.36	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	28.82	1.11	26.56	648.27	1.03	633.27	0.92	0.91
MEAN	28.33	1.10	26.11	644.82	1.03	629.93	0.92	0.91
HUB	28.09	1.09	25.66	643.09	1.03	626.60	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.32	35.49	31.50	3.99	0.93	0.41	2.90	
MEAN	38.24	27.49	23.50	3.99	0.94	0.39	3.34	0.91
HUB	40.92	10.36	6.50	3.86	0.94	0.37	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.994

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	427.636	266.285	334.612	1231.125	0.347	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
28.369	26.096	630.137	46.000	38.513	33.000	-5.513

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	350.412	266.285	440.109	1236.011	0.284	0.297

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	28.335	26.795	635.149	440.827	0.035	0.442

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	328.562	0.000	328.562	1237.215	0.266	0.371

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	26.952	636.387	0.000	0.060	0.047	0.365

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

```
      0.872      28.307       1.094     645.392      18.781     230.673       1.788

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  117144.930       0.464     808.645 1088185.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     763781.00   5272.3403    119.3307      1.8738      0.8414     12.4534      1.2345


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 85%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.213   EfDer =  0.972

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     118.688    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   53.94899

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     115.946    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   91304.422   93130.320       2.463     831.557     337.660     619.754       1.835

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   271.39    -0.09   271.39     0.24   575.61
  MEAN    17.06     0.00    -0.02   271.39    -0.09   271.39     0.24
  HUB     12.51     0.00    -0.02   271.39    -0.09   271.39     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.85    50.47    14.38   577.90   638.54    14.50   516.66     0.57
  MEAN    60.41    47.20    13.21   477.90   549.66    14.50   516.66     0.49
  HUB     52.25    38.62    13.63   350.44   443.31    14.50   516.66     0.40

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   524.51   384.93   356.29  1135.28     0.46
  MEAN    18.04   536.52   394.70   363.42  1130.22     0.47
  HUB     15.00   590.89   457.44   374.04  1123.52     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   405.19   192.97     0.36  7943.00
  MEAN   505.23   379.85   110.54     0.34  7120.34     1.65
  HUB    420.19   375.89    37.25     0.33  6862.76

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.56     1.23    16.03   558.55     1.07   535.58     0.92     0.89
  MEAN    18.18     1.20    15.58   554.85     1.06   530.81     0.92     0.89
  HUB     18.06     1.20    14.96   553.69     1.06   524.53     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     47.21    28.44    24.20     4.24     0.93     0.47     2.90
  MEAN    47.36    16.92    12.70     4.22     0.94     0.41     3.51     0.89
  HUB     50.73    -5.69    -9.30     3.61     0.94     0.27     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.972
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ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	541.922	393.930	372.154	1130.596	0.479	0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.240	15.582	531.170	24.000	46.628	35.400	-11.228

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	387.864	393.930	552.828	1143.257	0.339	0.454

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.160	16.768	543.134	528.796	0.039	0.576

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	361.111	0.000	361.111	1145.017	0.315	0.463

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.854	544.807	0.000	0.060	0.076	0.485

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.835	18.059	1.195	555.699	32.889	178.345	1.383

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
204761.906	0.613	1373.370	1141185.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =13.213 EfDer = 0.971

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
118.688	3210.000	18.059	555.699	1.000	1.000	0.980

W Kg/sec = 53.94899

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
100.000	3101.297	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
91304.422	93130.320	2.028	590.487	291.228	474.134	1.628

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	345.14	-0.12	345.14	0.30	556.15
MEAN	18.08	0.00	-0.02	345.14	-0.12	345.14	0.30	
HUB	15.21	0.00	-0.02	345.14	-0.12	345.14	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.06	46.36	12.70	575.66	671.30	16.96	545.75	0.59
MEAN	55.73	42.30	13.43	506.42	612.95	16.96	545.75	0.53
HUB	51.00	37.84	13.16	426.07	548.42	16.96	545.75	0.48

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	478.08	324.60	350.99	1167.47	0.41
MEAN	18.01	479.65	321.18	356.24	1163.42	0.41
HUB	15.22	511.39	361.01	362.20	1159.36	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	572.02	429.43	247.42	0.37	6630.78	
MEAN	504.50	400.65	183.33	0.34	5786.49	1.68
HUB	426.43	368.06	65.42	0.32	5497.49	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.24	1.18	18.92	585.52	1.05	566.44	0.92	0.89

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 MEAN    20.82     1.15    18.52   581.73     1.05   562.52     0.92     0.89
 HUB     20.67     1.14    18.08   580.43     1.04   558.59     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.76    35.18    31.50     3.68     0.93     0.44     2.90
 MEAN    42.04    27.23    23.50     3.73     0.94     0.43     3.30     0.89
 HUB     44.91    10.24     6.50     3.74     0.94     0.41     3.92


   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     662.321     322.076     578.737    1146.138       0.578      -0.775

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.887      16.653     545.929      46.000      29.097      30.600       1.503

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     579.082     322.076     662.623    1155.160       0.501      -0.393

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      20.856      17.563     554.558     345.258       0.023       0.303

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     569.596       0.000     569.596    1156.107       0.493       0.408

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      17.634     555.468       0.000       0.060       0.038      -0.364

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      20.821       1.153     582.559      26.860     197.212       1.529

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 167300.953       0.511    1122.113 1025740.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.213   EfDer =  0.958

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    118.688    3210.000      20.821     582.559       1.000       1.000       0.680
W Kg/sec =   53.94899

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.803    3028.958       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  91304.422   93130.320       1.463     378.495     258.630     293.880       1.136

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   515.58    -0.18   515.58     0.44   530.49
 MEAN    17.74     0.00    -0.02   515.58    -0.18   515.58     0.44
 HUB     15.05     0.00    -0.02   515.58    -0.18   515.58     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.49    46.36     1.13   562.21   762.96    18.18   560.37     0.66
 MEAN    43.95    43.40     0.55   496.90   716.18    18.18   560.37     0.62
 HUB     39.28    38.84     0.44   421.59   666.11    18.18   560.37     0.57

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     19.81   451.49   288.74   347.09  1192.72     0.38
 MEAN    17.51   455.72   290.56   351.08  1189.52     0.38
 HUB     14.85   488.76   335.32   355.59  1186.39     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   437.41   266.19     0.37  5723.51
 MEAN   490.40   403.97   199.85     0.34  5089.81     1.90
 HUB    415.99   364.63    80.67     0.31  4982.10

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.77     1.14    21.53   608.29     1.04   591.28     0.92     0.88
 MEAN    23.43     1.13    21.17   605.44     1.04   588.11     0.92     0.88
 HUB     23.38     1.12    20.79   604.96     1.04   585.02     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.76    37.49    31.50     5.99     0.93     0.49     2.90
 MEAN    39.61    29.65    23.50     6.15     0.90     0.50     3.28     0.88
 HUB     43.32    12.78     6.50     6.28     0.90     0.52     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.958

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     460.140     292.464     355.237    1189.975       0.387       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.503      21.198     588.556      46.000      39.464      31.500      -7.964

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     362.634     292.464     465.874    1196.726       0.303       0.362

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.471      22.021     595.253     471.992       0.024       0.447

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     352.759       0.000     352.759    1197.318       0.295       0.349

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.022     595.843       0.000       0.060       0.057       0.362

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.835      23.391       1.123     606.231      23.672     212.088       1.644

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 147508.906       0.479     989.365 1529687.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =13.213   EfDer =  0.985

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    118.688    3210.000      23.391     606.231       1.000       1.000       0.980
W Kg/sec =   53.94899

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     80.636    2969.232       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  91304.422   93130.320       2.186     513.330     234.855     401.059       1.708

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   332.10    -0.11   332.10     0.28   499.04
 MEAN    16.97     0.00    -0.02   332.10    -0.11   332.10     0.28
 HUB     14.32     0.00    -0.02   332.10    -0.11   332.10     0.28
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.39    46.36    12.03   539.52   633.64    22.18   597.03     0.53
MEAN    55.07    43.80    11.27   475.39   580.00    22.18   597.03     0.48
HUB     50.39    37.84    12.55   401.14   520.86    22.18   597.03     0.43

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   445.16   289.20   338.43  1215.58     0.37
MEAN    16.57   446.85   287.12   342.40  1212.33     0.37
HUB     13.89   475.83   325.77   346.83  1209.07     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    528.88   414.71   239.68     0.34  5462.21
MEAN   464.28   385.52   177.16     0.32  4760.62     1.65
HUB    389.09   352.56    63.32     0.29  4526.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.51     1.13    24.16   630.78     1.04   614.24     0.92     0.90
MEAN    26.09     1.12    23.75   627.62     1.04   610.96     0.92     0.90
HUB     25.95     1.11    23.32   626.57     1.03   607.68     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.51    35.31    31.50     3.81     0.93     0.42     2.90
MEAN    39.98    27.36    23.50     3.86     0.94     0.41     3.29     0.90
HUB     43.21    10.35     6.50     3.85     0.94     0.40     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.985

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     442.884     288.734     335.826    1213.317       0.365       0.043

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.161      23.858     611.956      46.000      40.688      32.400      -8.288

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     347.176     288.734     451.551    1219.556       0.285       0.390

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.129      24.697     618.266     456.573       0.023       0.472

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     330.965       0.000     330.965    1220.460       0.271       0.363

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      24.742     619.183       0.000       0.060       0.059       0.409

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.857      26.041       1.113     628.324      22.093     208.684       1.618

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 137740.734       0.492     923.848 1016256.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =13.213   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    118.688    3210.000      26.041     628.324       1.000       1.000       0.980
W Kg/sec =   53.94899

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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    73.740    2916.562       1.401       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
91304.422   93130.320       2.373     509.668     214.781     390.276       1.817

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   309.48    -0.11   309.48     0.25   466.26
MEAN    15.91     0.00    -0.02   309.48    -0.11   309.48     0.25
HUB     13.07     0.00    -0.02   309.48    -0.11   309.48     0.25

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.91    47.36    11.55   513.19   599.37    24.90   620.33     0.49
MEAN    55.24    44.80    10.44   445.76   542.75    24.90   620.33     0.44
HUB     49.80    38.84    10.96   366.12   479.48    24.90   620.33     0.39

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   420.59   276.85   316.62  1236.72     0.34
MEAN    15.50   417.39   267.55   320.37  1233.35     0.34
HUB     12.59   437.45   293.41   324.45  1229.97     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    502.54   388.82   225.69     0.31  4968.68
MEAN   434.13   361.09   166.58     0.29  4148.01     1.67
HUB    352.68   329.82    59.27     0.27  3695.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     29.08     1.12    26.84   650.64     1.04   635.88     0.92     0.91
MEAN    28.56     1.10    26.39   646.95     1.03   632.42     0.92     0.91
HUB     28.28     1.09    25.91   644.92     1.03   628.96     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.17    35.48    31.50     3.98     0.93     0.43     2.90
MEAN    39.87    27.47    23.50     3.97     0.94     0.41     3.34     0.91
HUB     42.12    10.35     6.50     3.85     0.94     0.39     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     422.610     272.451     323.063    1233.526       0.343      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     28.598      26.365     632.607      46.000      40.142      33.000      -7.142

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     337.978     272.451     434.118    1238.750       0.273       0.324

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      28.554      27.113     637.977     440.827       0.039       0.467

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     317.077       0.000     317.077    1239.859       0.256       0.392

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      27.253     639.119       0.000       0.060       0.054       0.385

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      28.522       1.095     647.506      19.181     223.089       1.729

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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 119648.680       0.474     802.502 1052607.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    776961.19   5211.1982    115.9461      1.8880      0.8380     13.2130      1.2385

*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

   Fan-Core + 4 Stage LPC 85%  Stat 2 35% Ice Block 8-31-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 7.762   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    144.313    3210.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   65.59689

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    140.979    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111017.570  113237.688       2.025     831.557     410.563     619.754       1.510

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   335.18    -0.12   335.18     0.30   575.61
 MEAN    17.06     0.00    -0.02   335.18    -0.12   335.18     0.30
 HUB     12.51     0.00    -0.02   335.18    -0.12   335.18     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.89    50.47     9.42   577.90   668.17    14.18   513.43     0.60
 MEAN    54.96    47.20     7.76   477.90   583.82    14.18   513.43     0.53
 HUB     46.28    38.62     7.66   350.44   485.01    14.18   513.43     0.44

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   558.46   337.19   445.17  1127.33     0.50
 MEAN    18.04   583.44   367.72   452.98  1123.22     0.52
 HUB     15.00   660.61   467.01   467.24  1116.44     0.59

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    577.90   506.08   240.71     0.45  6958.68
 MEAN   505.23   473.39   137.51     0.42  6634.19     1.38
 HUB    420.19   469.58    46.82     0.42  7006.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.19     1.20    15.38   554.12     1.06   528.08     0.92     0.91
 MEAN    18.04     1.19    15.01   552.66     1.06   524.23     0.92     0.91
 HUB     18.22     1.21    14.37   554.34     1.06   517.89     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.14    28.40    24.20     4.20     0.93     0.33     2.90
 MEAN    39.07    16.89    12.70     4.19     0.93     0.28     3.51     0.91
 HUB     44.99    -5.72    -9.30     3.58     0.93     0.14     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     591.898     367.006     464.381    1123.418       0.527      -0.004
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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.117      14.992     524.447      24.000      38.320      35.400      -2.920

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     488.551     367.006     611.045    1133.363       0.431       0.306

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.077      15.907     533.773     528.796       0.022       0.445

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     450.974       0.000     450.974    1136.489       0.397       0.363

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.166     536.722       0.000       0.060       0.040       0.386

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      18.022       1.193     553.709      30.899     207.697       1.610

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 192372.500       0.576    1568.849 1409401.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.762   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    144.313    3210.000      18.022     553.709       1.000       1.000       0.980
W Kg/sec =   65.59689

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    121.622    3106.865       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111017.570  113237.688       1.667     590.487     354.195     474.134       1.339

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   429.78    -0.15   429.78     0.38   557.15
 MEAN    18.08     0.00    -0.02   429.78    -0.15   429.78     0.38
 HUB     15.21     0.00    -0.02   429.78    -0.15   429.78     0.38

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.26    46.36     6.90   575.66   718.51    16.33   538.28     0.63
 MEAN    49.69    42.30     7.39   506.42   664.32    16.33   538.28     0.58
 HUB     44.76    37.84     6.92   426.07   605.28    16.33   538.28     0.53

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   511.33   262.01   439.10  1156.64     0.44
 MEAN    18.01   522.57   275.40   444.11  1153.80     0.45
 HUB     15.22   566.69   344.59   449.88  1150.96     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   537.51   310.01     0.46  5353.28
 MEAN   504.50   499.72   229.10     0.43  4962.66     1.44
 HUB    426.43   457.27    81.84     0.40  5247.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.65     1.15    18.05   577.79     1.04   555.96     0.92     0.91
 MEAN    20.45     1.13    17.76   576.03     1.04   553.23     0.92     0.91
 HUB     20.59     1.14    17.45   577.31     1.04   550.50     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     30.82    35.22    31.50     3.72     0.93     0.31     2.90
 MEAN    31.80    27.29    23.50     3.79     0.93     0.31     3.30     0.91
 HUB     37.45    10.31     6.50     3.81     0.93     0.32     3.92


   blockage3   Cor/U1    Cor/Incid
      0.600       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960    1018.410     276.175     980.248    1086.868       0.937      -2.174

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.535      11.650      490.507      46.000      15.735      30.600      14.865

    STATOR / VANED DIFFUSER THROAT IS CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960    1089.484     276.175    1123.944    1074.920       1.014      -2.566

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.600      20.282      10.539     478.311     317.610       0.100      -0.033

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823    1144.295       0.000    1144.295    1068.748       1.071      -0.763

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600       9.506     469.008       0.000       0.060       0.346      -2.934

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.575      19.591       1.087     577.045      23.336     244.554       1.896

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 145346.719       0.444    1185.341 1282632.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.762   EfDer =  0.801

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    144.313    3210.000      19.591     577.045       1.000       1.000       0.630
W Kg/sec =   65.59689

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    114.210    3043.396       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111017.570  113237.688       1.054     350.665     332.627     271.233       0.815

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   852.94    -0.29   852.94     0.77   533.02
 MEAN    17.74     0.00    -0.02   852.94    -0.29   852.94     0.77
 HUB     15.05     0.00    -0.02   852.94    -0.29   852.94     0.77

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     33.40    46.36   -12.96   562.21  1021.73    13.29   516.32     0.92
 MEAN    30.24    43.40   -13.16   496.90   987.28    13.29   516.32     0.89
 HUB     26.32    38.84   -12.52   421.59   951.58    13.29   516.32     0.85

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   504.78   166.75   476.44  1171.75     0.43
 MEAN    17.51   516.99   197.82   477.64  1171.42     0.44
 HUB     14.85   561.03   289.00   480.87  1171.18     0.48
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   614.55   388.18     0.52  3309.25
 MEAN   490.40   560.13   292.58     0.48  3468.36     1.83
 HUB    415.99   497.35   126.98     0.42  4296.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.91     1.07    18.41   591.93     1.03   570.66     0.92     0.73
 MEAN    20.98     1.07    18.35   592.64     1.03   570.33     0.92     0.73
 HUB     21.32     1.09    18.22   596.36     1.03   570.09     0.92     0.73

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.29    39.17    31.50     7.67     0.93     0.43     2.90
 MEAN    22.50    31.49    23.50     7.99     0.83     0.46     3.28     0.73
 HUB     31.01    14.79     6.50     8.29     0.83     0.52     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.801

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     523.299     199.118     483.936    1171.859       0.447       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.043      18.349     570.784      46.000      22.365      31.500       9.135

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     505.378     199.118     543.190    1173.437       0.431       0.054

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.987      18.473     572.323     471.992       0.030       0.190

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     490.689       0.000     490.689    1174.689       0.418       0.066

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.530     573.544       0.000       0.060       0.064       0.075

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.648      20.896       1.067     593.643      16.598     342.708       2.657

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 103414.117       0.336     843.370 2420976.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.762   EfDer =  0.978

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    144.313    3210.000      20.896     593.643       1.000       1.000       0.980
W Kg/sec =   65.59689

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.607    3000.548       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111017.570  113237.688       1.623     513.330     316.323     401.059       1.268

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   459.25    -0.16   459.25     0.39   504.30
 MEAN    16.97     0.00    -0.02   459.25    -0.16   459.25     0.39
 HUB     14.32     0.00    -0.02   459.25    -0.16   459.25     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.60    46.36     3.24   539.52   708.64    18.81   576.04     0.60
 MEAN    46.00    43.80     2.20   475.39   661.11    18.81   576.04     0.56
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HUB     41.15    37.84     3.31   401.14   609.88    18.81   576.04     0.52

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   512.17   189.82   475.70  1189.23     0.43
MEAN    16.57   524.01   214.83   477.95  1188.09     0.44
HUB     13.89   566.58   299.23   481.12  1186.88     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    528.88   584.17   339.06     0.49  3586.77
MEAN   464.28   539.13   249.45     0.45  3563.26     1.32
HUB    389.09   489.44    89.87     0.41  4158.54

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.72     1.09    20.00   609.77     1.03   587.88     0.92     0.90
MEAN    22.71     1.09    19.87   609.66     1.03   586.75     0.92     0.90
HUB     23.03     1.10    19.70   612.34     1.03   585.55     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     21.75    35.48    31.50     3.98     0.93     0.22     2.90
MEAN    24.20    27.56    23.50     4.06     0.91     0.23     3.29     0.90
HUB     31.88    10.58     6.50     4.08     0.91     0.26     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.978

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     515.088     216.038     467.593    1189.784       0.433       0.056

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.791      20.034     588.448      46.000      24.798      32.400       7.602

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     492.325     216.038     537.640    1191.717       0.413       0.123

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.744      20.220     590.361     456.573       0.026       0.234

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     467.375       0.000     467.375    1193.732       0.392       0.117

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      20.381     592.359       0.000       0.060       0.056       0.177

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.821      22.655       1.084     610.588      16.945     299.506       2.322

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 105607.469       0.378     861.257 1302252.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.762   EfDer =  0.964

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    144.313    3210.000      22.655     610.588       1.000       1.000       0.980
W Kg/sec =   65.59689

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.594    2958.618       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111017.570  113237.688       1.722     509.668     295.909     390.276       1.319
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ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	434.52	-0.15	434.52	0.36	472.99
MEAN	15.91	0.00	-0.02	434.52	-0.15	434.52	0.36	
HUB	13.07	0.00	-0.02	434.52	-0.15	434.52	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.75	47.36	2.39	513.19	672.55	20.68	594.84	0.56
MEAN	45.74	44.80	0.94	445.76	622.61	20.68	594.84	0.52
HUB	40.13	38.84	1.29	366.12	568.30	20.68	594.84	0.48

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	485.67	177.81	451.95	1206.60	0.40
MEAN	15.50	494.68	195.35	454.47	1205.14	0.41
HUB	12.59	529.88	266.88	457.77	1203.63	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	502.54	556.52	324.74	0.46	3192.57	
MEAN	434.13	513.38	238.78	0.43	3029.81	1.31
HUB	352.68	465.74	85.80	0.39	3362.01	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.34	1.07	21.76	624.93	1.02	605.26	0.92	0.88
MEAN	24.25	1.07	21.59	624.20	1.02	603.79	0.92	0.88
HUB	24.43	1.08	21.38	625.70	1.02	602.27	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	21.48	35.70	31.50	4.20	0.93	0.22	2.90	
MEAN	23.26	27.72	23.50	4.22	0.91	0.22	3.34	0.88
HUB	30.24	10.62	6.50	4.12	0.91	0.24	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.964

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	499.780	198.931	458.483	1205.445	0.415	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.283	21.571	604.106	46.000	23.455	33.000	9.545

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	489.555	198.931	528.429	1206.286	0.406	0.001

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.177	21.582	604.950	440.827	0.058	0.221

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	456.244	0.000	456.244	1208.904	0.377	0.117

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.893	607.579	0.000	0.060	0.066	0.114

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.789	24.156	1.066	624.945	14.357	328.634	2.548

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
89505.883	0.354	729.944	1351706.625

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
636246.69	5188.7617	140.9795	1.5990	0.7374	7.7622	1.1954

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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Fan-Core + 4 Stage LPC 85% Stat 2 35% Ice Block 8-31-2011

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1

RESET = 0.000 BLEED = 0.000 DPInc = 8.058 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
142.874	3210.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 64.94257

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
139.573	3197.358	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
109910.180	112108.148	2.046	831.557	406.468	619.754	1.525

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	331.51	-0.11	331.51	0.30	575.61
MEAN	17.06	0.00	-0.02	331.51	-0.11	331.51	0.30	
HUB	12.51	0.00	-0.02	331.51	-0.11	331.51	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.16	50.47	9.69	577.90	666.33	14.20	513.63	0.60
MEAN	55.26	47.20	8.06	477.90	581.72	14.20	513.63	0.52
HUB	46.60	38.62	7.98	350.44	482.48	14.20	513.63	0.43

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	555.98	340.12	439.80	1127.86	0.49
MEAN	18.04	580.34	369.37	447.62	1123.69	0.52
HUB	15.00	656.28	466.46	461.66	1116.91	0.59

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	577.90	499.97	237.78	0.44	7019.05	
MEAN	505.23	467.78	135.87	0.42	6663.86	1.40
HUB	420.19	463.97	46.27	0.42	6998.29	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.22	1.21	15.43	554.40	1.06	528.58	0.92	0.91
MEAN	18.05	1.19	15.05	552.80	1.06	524.67	0.92	0.91
HUB	18.21	1.21	14.41	554.30	1.06	518.33	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.72	28.40	24.20	4.20	0.93	0.34	2.90	
MEAN	39.53	16.88	12.70	4.18	0.93	0.29	3.51	0.91
HUB	45.30	-5.72	-9.30	3.58	0.93	0.15	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	588.589	368.650	458.841	1123.899	0.524	-0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.128	15.034	524.896	24.000	38.780	35.400	-3.380

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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     482.372     368.650     607.112    1134.025       0.425       0.315

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.088      15.969     534.397     528.796       0.023       0.452

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     445.495       0.000     445.495    1137.053       0.392       0.370

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.218     537.255       0.000       0.060       0.041       0.393

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      18.031       1.194     553.832      31.022     205.943       1.596

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 193135.922       0.578    1559.364 1393961.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 8.058   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    142.874    3210.000      18.031     553.832       1.000       1.000       0.980
W Kg/sec =   64.94257

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    120.361    3106.521       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109910.180  112108.148       1.685     590.487     350.524     474.134       1.353

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   424.64    -0.15   424.64     0.37   557.08
 MEAN    18.08      0.00    -0.02   424.64    -0.15   424.64     0.37
 HUB     15.21      0.00    -0.02   424.64    -0.15   424.64     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.59    46.36     7.23   575.66   715.45    16.38   538.77     0.63
 MEAN    50.03    42.30     7.73   506.42   661.01    16.38   538.77     0.58
 HUB     45.11    37.84     7.27   426.07   601.65    16.38   538.77     0.53

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   508.65   265.99   433.55  1157.39     0.44
 MEAN    18.01   519.49   278.31   438.65  1154.45     0.45
 HUB     15.22   563.06   345.65   444.49  1151.52     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   530.68   306.02     0.46  5434.61
 MEAN   504.50   493.53   226.20     0.43  5014.95     1.45
 HUB    426.43   451.77    80.79     0.39  5264.01

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.70     1.15    18.12   578.28     1.04   556.67     0.92     0.91
 MEAN    20.48     1.14    17.82   576.39     1.04   553.85     0.92     0.91
 HUB     20.61     1.14    17.50   577.51     1.04   551.04     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.53    35.22    31.50     3.72     0.93     0.32     2.90
 MEAN    32.39    27.28    23.50     3.78     0.93     0.32     3.30     0.91
 HUB     37.87    10.30     6.50     3.80     0.93     0.32     3.92
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   blockage3   Cor/U1    Cor/Incid
      0.600       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      980.861     279.089     940.318     1093.877       0.897      -2.021

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     20.569      12.199      497.081      46.000      16.531       30.600      14.069

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     1008.089     279.089    1046.009     1089.405       0.925      -2.200

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.600       20.345      11.693      492.629     317.610       0.091       0.049

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     1025.935       0.000    1025.935    1087.991       0.943      -0.366

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600       11.180      489.867       0.000       0.060       0.273      -2.385

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4           PR4        Texit        Del T        Ns         Ns nondim
      0.652       19.837        1.100      577.392      23.560      241.351       1.871

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 146744.406       0.448    1184.802 1267464.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.058   EfDer =  0.774

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    142.874     3210.000       19.837      577.392       1.000        1.000        0.630
W Kg/sec =   64.94257

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
    111.705     3042.481        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 109910.180  112108.148        1.078      350.665      325.332      271.233       0.834

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00     -0.02   811.78     -0.28   811.78      0.72    532.86
 MEAN    17.74      0.00     -0.02   811.78     -0.28   811.78      0.72
 HUB     15.05      0.00     -0.02   811.78     -0.28   811.78      0.72

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     34.72     46.36    -11.64   562.21    987.62     13.99    522.38      0.88
 MEAN    31.49     43.40    -11.91   496.90    951.93     13.99    522.38      0.85
 HUB     27.46     38.84    -11.38   421.59    914.86     13.99    522.38      0.82

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050        0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP      19.81   497.82    178.69    464.64   1173.80      0.42
 MEAN     17.51   510.11    206.89    466.28   1173.11      0.43
 HUB      14.85   554.33    293.75    470.10   1172.50      0.47

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP     554.93    597.86    376.23      0.51   3545.53
 MEAN    490.40    545.71    283.52      0.47   3626.82      1.82
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 HUB    415.99   485.73   122.24     0.41  4366.33

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.22     1.07    18.75   593.33     1.03   572.65     0.92     0.71
 MEAN    21.26     1.07    18.66   593.70     1.03   571.98     0.92     0.71
 HUB     21.55     1.09    18.49   597.03     1.03   571.38     0.92     0.71

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.04    39.00    31.50     7.50     0.93     0.43     2.90
 MEAN    23.93    31.30    23.50     7.80     0.84     0.46     3.28     0.71
 HUB     32.00    14.58     6.50     8.08     0.84     0.51     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.774

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     516.311     208.244     472.452    1173.558       0.440      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.317      18.661     572.433      46.000      23.787      31.500       7.713

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     492.038     208.244     534.291    1175.651       0.419       0.081

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.273      18.855     574.476     471.992       0.026       0.210

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     477.588       0.000     477.588    1176.847       0.406       0.095

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.917     575.646       0.000       0.060       0.056       0.104

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.638      21.192       1.068     594.686      17.295     324.181       2.513

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 107756.188       0.350     870.015 2330551.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.058   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    142.874    3210.000      21.192     594.686       1.000       1.000       0.980
W Kg/sec =   64.94257

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.116    2997.914       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109910.180  112108.148       1.661     513.330     309.068     401.059       1.298

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   447.31    -0.15   447.31     0.38   503.86
 MEAN    16.97     0.00    -0.02   447.31    -0.15   447.31     0.38
 HUB     14.32     0.00    -0.02   447.31    -0.15   447.31     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.35    46.36     3.99   539.52   700.95    19.19   577.99     0.59
 MEAN    46.75    43.80     2.95   475.39   652.86    19.19   577.99     0.55
 HUB     41.90    37.84     4.06   401.14   600.93    19.19   577.99     0.51

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   503.35   199.79   462.00  1191.89     0.42
MEAN    16.57   514.95   222.01   464.64  1190.47     0.43
HUB     13.89   556.97   301.85   468.08  1189.01     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    528.88   567.22   329.08     0.48  3775.09
MEAN   464.28   524.01   242.27     0.44  3682.15     1.34
HUB    389.09   476.15    87.24     0.40  4194.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.16     1.09    20.48   611.66     1.03   590.51     0.92     0.90
MEAN    23.11     1.09    20.32   611.24     1.03   589.11     0.92     0.90
HUB     23.38     1.10    20.12   613.54     1.03   587.66     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     23.39    35.46    31.50     3.96     0.93     0.24     2.90
MEAN    25.54    27.54    23.50     4.04     0.91     0.25     3.29     0.90
HUB     32.82    10.56     6.50     4.06     0.91     0.27     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.985

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     506.537     223.257     454.683    1192.097       0.425       0.055

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.186      20.476     590.734      46.000      26.152      32.400       6.248

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     477.588     223.257     527.194    1194.493       0.400       0.147

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      23.149      20.733     593.111     456.573       0.023       0.253

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     453.408       0.000     453.408    1196.384       0.379       0.143

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      20.891     594.990       0.000       0.060       0.050       0.202

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.839      23.071       1.089     612.146      17.460     289.024       2.240

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 108816.219       0.389     878.573 1282396.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.058   EfDer =  0.974

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    142.874    3210.000      23.071     612.146       1.000       1.000       0.980
W Kg/sec =   64.94257

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     98.896    2954.852       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109910.180  112108.148       1.769     509.668     288.049     390.276       1.355

    ROTOR LEADING EDGE CONDITIONS, STAGE            5
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	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	421.85	-0.15	421.85	0.35	472.38
MEAN	15.91	0.00	-0.02	421.85	-0.15	421.85	0.35	
HUB	13.07	0.00	-0.02	421.85	-0.15	421.85	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.59	47.36	3.23	513.19	664.43	21.18	597.30	0.55
MEAN	46.59	44.80	1.79	445.76	613.83	21.18	597.30	0.51
HUB	40.97	38.84	2.13	366.12	558.67	21.18	597.30	0.47

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	476.34	188.46	437.47	1209.75	0.39
MEAN	15.50	484.88	203.02	440.33	1208.02	0.40
HUB	12.59	519.37	269.73	443.84	1206.26	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	502.54	538.55	314.09	0.45	3383.63	
MEAN	434.13	497.29	231.11	0.41	3148.61	1.34
HUB	352.68	451.52	82.95	0.37	3397.75	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.90	1.08	22.38	627.35	1.02	608.42	0.92	0.89
MEAN	24.77	1.07	22.17	626.29	1.02	606.68	0.92	0.89
HUB	24.91	1.08	21.93	627.41	1.02	604.91	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	23.31	35.68	31.50	4.18	0.93	0.24	2.90	
MEAN	24.75	27.69	23.50	4.19	0.91	0.24	3.34	0.89
HUB	31.29	10.59	6.50	4.09	0.91	0.25	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.974

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	489.913	206.741	444.154	1208.327	0.405	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.808	22.150	606.995	46.000	24.961	33.000	8.039

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	472.706	206.741	515.939	1209.701	0.391	0.035

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.727	22.253	608.377	440.827	0.050	0.242

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	440.936	0.000	440.936	1212.107	0.364	0.146

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.545	610.799	0.000	0.060	0.058	0.143

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.815	24.706	1.071	627.019	14.874	315.316	2.444

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
92733.562	0.367	748.723	1330416.625

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
649186.31	5241.4775	139.5732	1.6354	0.7599	8.0582	1.1993

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 85%  Stat 2 35% Ice Block 8-31-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.499   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     140.741    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   63.97328

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     137.490    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  108269.750  110434.914       2.077     831.557     400.401     619.754       1.548

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   326.09    -0.11   326.09     0.29   575.61
  MEAN    17.06     0.00    -0.02   326.09    -0.11   326.09     0.29
  HUB     12.51     0.00    -0.02   326.09    -0.11   326.09     0.29

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.57    50.47    10.10   577.90   663.65    14.23   513.93     0.60
  MEAN    55.70    47.20     8.50   477.90   578.64    14.23   513.93     0.52
  HUB     47.07    38.62     8.45   350.44   478.77    14.23   513.93     0.43

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   552.43   344.38   431.95  1128.63     0.49
  MEAN    18.04   575.86   371.78   439.76  1124.36     0.51
  HUB     15.00   649.99   465.66   453.48  1117.58     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   491.03   233.52     0.44  7106.86
  MEAN   505.23   459.57   133.45     0.41  6707.40     1.42
  HUB    420.19   455.76    45.47     0.41  6986.31

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.26     1.21    15.50   554.79     1.06   529.30     0.92     0.91
  MEAN    18.07     1.20    15.10   552.99     1.06   525.30     0.92     0.91
  HUB     18.20     1.20    14.47   554.25     1.06   518.96     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     38.56    28.40    24.20     4.20     0.93     0.35     2.90
  MEAN    40.21    16.88    12.70     4.18     0.93     0.30     3.51     0.91
  HUB     45.76    -5.73    -9.30     3.57     0.93     0.16     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.997

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     583.820     371.061     450.732    1124.590       0.519      -0.003

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      18.144      15.095     525.542      24.000      39.463      35.400      -4.063

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     473.364     371.061     601.465    1134.977       0.417       0.328

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.101      16.057     535.295     528.796       0.023       0.463

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     437.500       0.000     437.500    1137.866       0.384       0.379

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.291     538.024       0.000       0.060       0.042       0.402

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      18.042       1.194     554.011      31.201     203.374       1.577

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 194250.453       0.582    1544.954 1371179.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.499   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.741    3210.000      18.042     554.011       1.000       1.000       0.980
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    118.508    3106.019       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 108269.750  110434.914       1.711     590.487     345.127     474.134       1.374

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   417.15    -0.14   417.15     0.37   556.99
 MEAN    18.08     0.00    -0.02   417.15    -0.14   417.15     0.37
 HUB     15.21     0.00    -0.02   417.15    -0.14   417.15     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.08    46.36     7.72   575.66   711.03    16.44   539.48     0.62
 MEAN    50.53    42.30     8.23   506.42   656.21    16.44   539.48     0.58
 HUB     45.62    37.84     7.78   426.07   596.38    16.44   539.48     0.52

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   504.90   271.77   425.51  1158.45     0.44
 MEAN    18.01   515.08   282.50   430.70  1155.39     0.45
 HUB     15.22   557.82   347.17   436.63  1152.32     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   520.78   300.24     0.45  5552.52
 MEAN   504.50   484.55   222.00     0.42  5090.41     1.47
 HUB    426.43   443.76    79.27     0.39  5287.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.77     1.15    18.22   578.99     1.05   557.70     0.92     0.91
 MEAN    20.53     1.14    17.91   576.91     1.04   554.75     0.92     0.91
 HUB     20.63     1.14    17.57   577.79     1.04   551.81     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.57    35.21    31.50     3.71     0.93     0.33     2.90
 MEAN    33.26    27.27    23.50     3.77     0.93     0.33     3.30     0.91
 HUB     38.49    10.29     6.50     3.79     0.93     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.600       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     938.241     283.293     894.451    1101.758       0.852      -1.854

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.616      12.827     504.395      46.000      17.574      30.600      13.026

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     935.974     283.293     977.907    1102.240       0.849      -1.883

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.600      20.425      12.740     504.760     317.610       0.080       0.101

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     938.414       0.000     938.414    1102.566       0.851      -0.125

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600      12.484     504.465       0.000       0.060       0.215      -1.976

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.714      20.055       1.112     577.895      23.885     236.769       1.835

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 148766.016       0.455    1183.198 1245187.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.499   EfDer =  0.765

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    140.741    3210.000      20.055     577.895       1.000       1.000       0.630
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    108.888    3041.155       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 108269.750  110434.914       1.106     350.665     317.125     271.233       0.855

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   771.99    -0.27   771.99     0.68   532.62
 MEAN    17.74     0.00    -0.02   771.99    -0.27   771.99     0.68
 HUB     15.05     0.00    -0.02   771.99    -0.27   771.99     0.68

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     36.08    46.36   -10.28   562.21   955.17    14.65   528.14     0.85
 MEAN    32.78    43.40   -10.62   496.90   918.23    14.65   528.14     0.81
 HUB     28.65    38.84   -10.19   421.59   879.73    14.65   528.14     0.78

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   489.92   191.90   450.77  1176.18     0.42
 MEAN    17.51   502.04   216.93   452.75  1175.14     0.43
 HUB     14.85   545.92   298.80   456.89  1174.15     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   578.78   363.03     0.49  3806.85
 MEAN   490.40   528.94   273.48     0.45  3802.34     1.81
 HUB    415.99   471.68   117.19     0.40  4441.16

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     21.54     1.07    19.12   595.01     1.03   574.98     0.92     0.70
 MEAN    21.54     1.07    19.00   594.99     1.03   573.95     0.92     0.70
 HUB     21.80     1.09    18.80   597.86     1.03   572.99     0.92     0.70

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.06    38.85    31.50     7.35     0.93     0.43     2.90
 MEAN    25.60    31.13    23.50     7.63     0.84     0.46     3.28     0.70
 HUB     33.18    14.39     6.50     7.89     0.84     0.51     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.765

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     508.040     218.350     458.725    1175.589       0.432      -0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.603      18.998     574.410      46.000      25.454      31.500       6.046

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     476.341     218.350     524.001    1178.251       0.404       0.113

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.569      19.270     577.015     471.992       0.023       0.234

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     462.236       0.000     462.236    1179.379       0.392       0.127

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.337     578.120       0.000       0.060       0.049       0.138

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.644      21.499       1.072     595.956      18.061     306.013       2.372

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 112534.547       0.365     895.034 2237279.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.499   EfDer =  0.992

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    140.741    3210.000      21.499     595.956       1.000       1.000       0.980
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.148    2994.718       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 108269.750  110434.914       1.709     513.330     300.422     401.059       1.335

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   433.27    -0.15   433.27     0.37   503.32
 MEAN    16.97     0.00    -0.02   433.27    -0.15   433.27     0.37
 HUB     14.32     0.00    -0.02   433.27    -0.15   433.27     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.24    46.36     4.88   539.52   692.07    19.59   580.29     0.59
 MEAN    47.66    43.80     3.86   475.39   643.32    19.59   580.29     0.54
 HUB     42.81    37.84     4.97   401.14   590.55    19.59   580.29     0.50

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   493.68   211.35   446.15  1194.97      0.41
MEAN    16.57   504.79   230.33   449.17  1193.25      0.42
HUB     13.89   546.00   304.95   452.90  1191.51      0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    528.88   547.61   317.53     0.46  3993.08
MEAN   464.28   506.45   233.95     0.42  3819.97     1.37
HUB    389.09   460.65    84.14     0.39  4237.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.62     1.10    21.00   613.91     1.03   593.57     0.92     0.91
MEAN    23.53     1.09    20.80   613.13     1.03   591.86     0.92     0.91
HUB     23.76     1.10    20.57   615.01     1.03   590.13     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.35    35.44    31.50     3.94     0.93     0.26     2.90
MEAN    27.15    27.51    23.50     4.01     0.92     0.27     3.29     0.91
HUB     33.95    10.52     6.50     4.02     0.92     0.29     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     496.951     231.624     439.671    1194.790       0.416       0.054

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.606      20.954     593.403      46.000      27.781      32.400       4.619

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     460.629     231.624     515.586    1197.709       0.385       0.176

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      23.579      21.289     596.306     456.573       0.020       0.277

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    16.096     437.366       0.000     437.366    1199.458       0.365       0.172

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      21.444     598.049       0.000       0.060       0.044       0.230

   STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.856      23.509       1.093     614.013      18.057     277.361       2.150

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 112541.086       0.402     895.086 1255479.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.499   EfDer =  0.984

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.741    3210.000      23.509     614.013       1.000       1.000       0.980
W Kg/sec =   63.97328

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.747    2950.356       1.401       0.249      53.349      56.000       0.050

  CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 108269.750  110434.914       1.828     509.668     278.878     390.276       1.399

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   407.25    -0.14   407.25     0.34   471.67
 MEAN    15.91     0.00    -0.02   407.25    -0.14   407.25     0.34
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 HUB     13.07     0.00    -0.02   407.25    -0.14   407.25     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.57    47.36     4.21   513.19   655.26    21.71   600.18     0.55
 MEAN    47.59    44.80     2.79   445.76   603.89    21.71   600.18     0.50
 HUB     41.97    38.84     3.13   366.12   547.73    21.71   600.18     0.46

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   466.37   200.58   421.03  1213.35     0.38
 MEAN    15.50   474.13   211.78   424.21  1211.34     0.39
 HUB     12.59   507.58   272.97   427.93  1209.31     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   518.12   301.96     0.43  3600.98
 MEAN   434.13   478.94   222.34     0.40  3284.38     1.37
 HUB    352.68   435.29    79.71     0.36  3438.56

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.51     1.09    23.04   630.19     1.03   612.05     0.92     0.90
 MEAN    25.33     1.08    22.79   628.77     1.02   610.02     0.92     0.90
 HUB     25.42     1.08    22.52   629.46     1.03   607.97     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.47    35.65    31.50     4.15     0.93     0.26     2.90
 MEAN    26.53    27.66    23.50     4.16     0.91     0.26     3.34     0.90
 HUB     32.53    10.55     6.50     4.05     0.91     0.27     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.984

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     479.120     215.668     427.836    1211.636       0.395      -0.006

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      25.371      22.776     610.324      46.000      26.752      33.000       6.248

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     453.812     215.668     502.452    1213.590       0.374       0.075

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      25.312      22.981     612.294     440.827       0.042       0.268

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     423.694       0.000     423.694    1215.773       0.348       0.181

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      23.253     614.499       0.000       0.060       0.050       0.178

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.840      25.292       1.076     629.476      15.463     300.904       2.333

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   96412.391       0.382     766.808 1301864.250

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

    Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
      664504.44   5285.0791    137.4901      1.6742      0.7805      8.4989      1.2040


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
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*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 85%  Stat 2 35% Ice Block 8-31-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     138.557    3210.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   62.98067

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     135.357    3197.358       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  106589.836  108721.398       2.110     831.557     394.188     619.754       1.572

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   320.57    -0.11   320.57     0.29   575.61
  MEAN    17.06     0.00    -0.02   320.57    -0.11   320.57     0.29
  HUB     12.51     0.00    -0.02   320.57    -0.11   320.57     0.29

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.99    50.47    10.52   577.90   660.95    14.26   514.23     0.59
  MEAN    56.15    47.20     8.95   477.90   575.55    14.26   514.23     0.52
  HUB     47.56    38.62     8.94   350.44   475.02    14.26   514.23     0.43

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   548.98   348.69   424.03  1129.39     0.49
  MEAN    18.04   571.41   374.21   431.83  1125.02     0.51
  HUB     15.00   643.66   464.84   445.22  1118.25     0.58

        U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    577.90   482.01   229.21     0.43  7195.72
  MEAN   505.23   451.27   131.02     0.40  6751.20     1.44
  HUB    420.19   447.46    44.65     0.40  6973.93

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.29      1.21    15.56   555.19     1.06   530.02     0.92     0.91
  MEAN    18.08      1.20    15.16   553.19     1.06   525.92     0.92     0.91
  HUB     18.19      1.20    14.53   554.19     1.06   519.59     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     39.43    28.39    24.20     4.19     0.93     0.36     2.90
  MEAN    40.91    16.88    12.70     4.18     0.93     0.31     3.51     0.91
  HUB     46.23    -5.73    -9.30     3.57     0.93     0.17     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.996

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     579.080     373.486     442.540    1125.276       0.515      -0.002

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      18.159      15.154     526.183      24.000      40.163      35.400      -4.763

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      18.071     464.308     373.486     595.881    1135.920       0.409       0.341

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      18.114      16.143     536.185     528.796       0.024       0.474

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     429.451       0.000     429.451    1138.673       0.377       0.389

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.362     538.787       0.000       0.060       0.044       0.412

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      18.052       1.195     554.191      31.381     200.774       1.556

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 195373.719       0.585    1529.778 1347956.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    138.557    3210.000      18.052     554.191       1.000       1.000       0.980
W Kg/sec =   62.98067

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    116.625    3105.514       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106589.836  108721.398       1.739     590.487     339.644     474.134       1.396

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   409.59    -0.14   409.59     0.36   556.90
 MEAN    18.08     0.00    -0.02   409.59    -0.14   409.59     0.36
 HUB     15.21     0.00    -0.02   409.59    -0.14   409.59     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.57    46.36     8.21   575.66   706.62    16.51   540.18     0.62
 MEAN    51.04    42.30     8.74   506.42   651.44    16.51   540.18     0.57
 HUB     46.14    37.84     8.30   426.07   591.12    16.51   540.18     0.52

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   501.31   277.55   417.47  1159.50     0.43
 MEAN    18.01   510.79   286.70   422.74  1156.31     0.44
 HUB     15.22   552.63   348.69   428.73  1153.12     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    572.02   510.88   294.47     0.44  5670.38
 MEAN   504.50   475.55   217.81     0.41  5165.94     1.49
 HUB    426.43   435.72    77.74     0.38  5310.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.84     1.15    18.32   579.70     1.05   558.71     0.92     0.91
 MEAN    20.58     1.14    17.99   577.43     1.04   555.64     0.92     0.91
 HUB     20.65     1.14    17.64   578.08     1.04   552.58     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.62    35.20    31.50     3.70     0.93     0.34     2.90
 MEAN    34.14    27.26    23.50     3.76     0.93     0.34     3.30     0.91
 HUB     39.12    10.28     6.50     3.78     0.93     0.34     3.92


  blockage3   Cor/U1    Cor/Incid
     0.600       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     903.806     287.501     856.859    1108.024       0.816      -1.724

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.660      13.336     510.191      46.000      18.548      30.600      12.052

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     885.384     287.501     930.893    1111.029       0.797      -1.667

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.600      20.496      13.481     512.945     317.610       0.071       0.131

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     881.454       0.000     881.454    1111.993       0.793       0.004

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600      13.348     513.560       0.000       0.060       0.177      -1.716

    STAGE EXIT CONDITIONS, STAGE            2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.753      20.209       1.120     578.400      24.209     232.251       1.800

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 150788.750       0.461    1180.677 1222602.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.770

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    138.557    3210.000      20.209     578.400       1.000       1.000       0.630
W Kg/sec =   62.98067

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.427    3039.827       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106589.836  108721.398       1.131     350.665     309.958     271.233       0.875

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   740.97    -0.26   740.97     0.65   532.39
 MEAN    17.74     0.00    -0.02   740.97    -0.26   740.97     0.65
 HUB     15.05     0.00    -0.02   740.97    -0.26   740.97     0.65

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     37.20    46.36    -9.16   562.21   930.27    15.15   532.57     0.82
 MEAN    33.86    43.40    -9.54   496.90   892.30    15.15   532.57     0.79
 HUB     29.65    38.84    -9.19   421.59   852.64    15.15   532.57     0.75

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
       0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   483.21   203.27   438.37  1178.29     0.41
 MEAN    17.51   494.98   225.54   440.60  1176.95     0.42
 HUB     14.85   538.24   303.00   444.85  1175.67     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    554.93   561.99   351.66     0.48  4031.95
 MEAN   490.40   514.08   264.86     0.44  3953.01     1.82
 HUB    415.99   458.98   112.99     0.39  4503.34

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.81     1.08    19.42   596.53     1.03   577.04     0.92     0.70
 MEAN    21.78     1.08    19.28   596.17     1.03   575.72     0.92     0.70
 HUB     22.00     1.09    19.05   598.65     1.04   574.47     0.92     0.70
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.88    38.74    31.50     7.24     0.93     0.43     2.90
 MEAN    27.11    31.01    23.50     7.51     0.85     0.46     3.28     0.70
 HUB     34.26    14.25     6.50     7.75     0.85     0.51     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.770

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     500.779     227.023     446.364    1177.404       0.425       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.837      19.280     576.182      46.000      26.958      31.500       4.542

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     462.389     227.023     515.114    1180.554       0.392       0.141

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.812      19.620     579.269     471.992       0.020       0.256

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     448.644       0.000     448.644    1181.619       0.380       0.156

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.688     580.315       0.000       0.060       0.044       0.167

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.657      21.750       1.076     597.118      18.717     291.881       2.263

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 116624.875       0.379     913.174 2160603.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

   W act       RPM act        Pt          Tt           POTS        POTH       AeroBl
    138.557    3210.000      21.750     597.118       1.000       1.000       0.980
W Kg/sec =   62.98067

   W cor       RPM cor        GAMMA       Cp          R           Blades       THK
    100.477    2991.804       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 106589.836  108721.398       1.754     513.330     292.643     401.059       1.370

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   420.80    -0.14   420.80     0.36   502.83
 MEAN    16.97     0.00    -0.02   420.80    -0.14   420.80     0.36
 HUB     14.32     0.00    -0.02   420.80    -0.14   420.80     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.05    46.36     5.69   539.52   684.33    19.93   582.34     0.58
 MEAN    48.49    43.80     4.69   475.39   634.99    19.93   582.34     0.54
 HUB     43.64    37.84     5.80   401.14   581.47    19.93   582.34     0.49

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   485.71   221.44   432.29  1197.65     0.41
 MEAN    16.57   496.20   237.64   435.60  1195.69     0.41
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 HUB     13.89   536.50   307.64   439.53  1193.71     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   530.46   307.43     0.44  4183.64
 MEAN   464.28   491.03   226.63     0.41  3941.11     1.40
 HUB    389.09   447.01    81.45     0.37  4275.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.01     1.10    21.43   615.92     1.03   596.24     0.92     0.91
 MEAN    23.87     1.10    21.20   614.83     1.03   594.29     0.92     0.91
 HUB     24.06     1.11    20.94   616.33     1.03   592.31     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.12    35.42    31.50     3.92     0.93     0.28     2.90
 MEAN    28.61    27.49    23.50     3.99     0.92     0.28     3.29     0.91
 HUB     34.99    10.50     6.50     4.00     0.92     0.30     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     488.880     238.978     426.489    1197.152       0.408       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.951      21.350     595.751      46.000      29.264      32.400       3.136

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     445.876     238.978     505.881    1200.518       0.371       0.202

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.930      21.754     599.105     456.573       0.017       0.298

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     423.442       0.000     423.442    1202.147       0.352       0.198

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.903     600.733       0.000       0.060       0.040       0.255

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      23.868       1.097     615.696      18.579     267.553       2.074

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 115799.133       0.414     906.708 1229364.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    138.557    3210.000      23.868     615.696       1.000       1.000       0.980
W Kg/sec =   62.98067

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.974    2946.320       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106589.836  108721.398       1.882     509.668     270.801     390.276       1.441

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   394.55    -0.14   394.55     0.33   471.02
 MEAN    15.91     0.00    -0.02   394.55    -0.14   394.55     0.33
 HUB     13.07     0.00    -0.02   394.55    -0.14   394.55     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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 TIP     52.45    47.36     5.09   513.19   647.43    22.16   602.71     0.54
 MEAN    48.50    44.80     3.70   445.76   595.39    22.16   602.71     0.49
 HUB     42.87    38.84     4.03   366.12   538.34    22.16   602.71     0.45

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   458.36   210.97   406.92  1216.46     0.38
 MEAN    15.50   465.26   219.32   410.32  1214.21     0.38
 HUB     12.59   497.60   275.77   414.20  1211.96     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   500.60   291.58     0.41  3787.21
 MEAN   434.13   463.14   214.80     0.38  3401.16     1.40
 HUB    352.68   421.28    76.91     0.35  3473.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.02     1.09    23.59   632.71     1.03   615.18     0.92     0.91
 MEAN    25.80     1.08    23.31   630.98     1.02   612.92     0.92     0.91
 HUB     25.84     1.08    23.00   631.30     1.03   610.65     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.40    35.62    31.50     4.12     0.93     0.28     2.90
 MEAN    28.13    27.63    23.50     4.13     0.92     0.28     3.34     0.91
 HUB     33.66    10.52     6.50     4.02     0.92     0.28     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     470.224     223.346     413.796    1214.505       0.387      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.833      23.293     613.217      46.000      28.358      33.000       4.642

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     437.783     223.346     491.464    1216.936       0.360       0.109

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.791      23.582     615.675     440.827       0.036       0.291

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     409.017       0.000     409.017    1218.943       0.336       0.210

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.837     617.707       0.000       0.060       0.044       0.208

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      25.771       1.080     631.664      15.968     289.100       2.241

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   99570.156       0.394     779.635 1274359.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     678156.62   5309.9722    135.3568      1.7059      0.7948      8.9530      1.2082


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 85%  Stat 2 35% Ice Block 8-31-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    133.793    3210.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   60.81521

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    130.703    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 102924.961  104983.242       2.185     831.557     380.635     619.754       1.628

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   308.61    -0.11   308.61     0.28   575.61
 MEAN    17.06     0.00    -0.02   308.61    -0.11   308.61     0.28
 HUB     12.51     0.00    -0.02   308.61    -0.11   308.61     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.90    50.47    11.43   577.90   655.23    14.32   514.86     0.59
 MEAN    57.15    47.20     9.95   477.90   568.97    14.32   514.86     0.51
 HUB     48.64    38.62    10.02   350.44   467.03    14.32   514.86     0.42

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   542.01   357.81   407.12  1130.96     0.48
 MEAN    18.04   562.16   379.38   414.84  1126.40     0.50
 HUB     15.00   630.27   463.08   427.55  1119.64     0.56

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    577.90   462.80   220.08     0.41  7383.91
 MEAN   505.23   433.51   125.85     0.38  6844.35     1.48
 HUB    420.19   429.70    42.90     0.38  6947.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.37     1.22    15.69   556.04     1.06   531.50     0.92     0.91
 MEAN    18.12     1.20    15.28   553.61     1.06   527.21     0.92     0.91
 HUB     18.16     1.20    14.64   554.07     1.06   520.90     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.31    28.40    24.20     4.20     0.93     0.39     2.90
 MEAN    42.44    16.88    12.70     4.18     0.94     0.34     3.51     0.91
 HUB     47.28    -5.73    -9.30     3.57     0.94     0.19     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     569.231     378.645     425.031    1126.694       0.505      -0.001

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.186      15.274     527.510      24.000      41.697      35.400      -6.297

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     445.082     378.645     584.354    1137.871       0.391       0.369

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.135      16.317     538.028     528.796       0.027       0.498

   VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	412.333	0.000	412.333	1140.348	0.362	0.408

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.504	540.373	0.000	0.060	0.050	0.431

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.866	18.066	1.196	554.573	31.763	195.211	1.513

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
197755.156	0.592	1495.185	1297660.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 9.953 EfDer = 0.992

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
133.793	3210.000	18.066	554.573	1.000	1.000	0.980

W Kg/sec = 60.81521

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
112.566	3104.443	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
102924.961	104983.242	1.801	590.487	327.823	474.134	1.446

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	393.50	-0.14	393.50	0.34	556.71
MEAN	18.08	0.00	-0.02	393.50	-0.14	393.50	0.34	
HUB	15.21	0.00	-0.02	393.50	-0.14	393.50	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.65	46.36	9.29	575.66	697.41	16.64	541.64	0.61
MEAN	52.16	42.30	9.86	506.42	641.43	16.64	541.64	0.56
HUB	47.29	37.84	9.45	426.07	580.08	16.64	541.64	0.51

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	494.29	289.64	400.54	1161.65	0.43
MEAN	18.01	502.10	295.54	405.92	1158.21	0.43
HUB	15.22	541.83	351.90	412.00	1154.77	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	572.02	490.08	282.38	0.42	5917.15	
MEAN	504.50	456.55	208.97	0.39	5325.02	1.53
HUB	426.43	418.69	74.54	0.36	5359.03	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.96	1.16	18.51	581.19	1.05	560.79	0.92	0.91
MEAN	20.66	1.14	18.15	578.53	1.04	557.47	0.92	0.91
HUB	20.68	1.14	17.78	578.68	1.04	554.16	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.87	35.18	31.50	3.68	0.93	0.37	2.90	
MEAN	36.06	27.24	23.50	3.74	0.94	0.36	3.30	0.91
HUB	40.50	10.25	6.50	3.75	0.94	0.36	3.92	

blockage3	Cor/U1	Cor/Incid
0.600	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	845.849	296.364	792.230	1118.299	0.756	-1.513

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.741	14.190	519.720	46.000	20.510	30.600	10.090

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	807.058	296.364	859.753	1124.045	0.718	-1.346

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.600	20.621	14.621	525.074	317.610	0.056	0.174

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	797.632	0.000	797.632	1125.474	0.709	0.163

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.600	14.616	526.344	0.000	0.060	0.125	-1.347

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.803	20.441	1.131	579.464	24.891	222.951	1.728

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
155033.750	0.474	1172.178	1174067.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 9.953 EfDer = 0.797

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
133.793	3210.000	20.441	579.464	1.000	1.000	0.630

W Kg/sec = 60.81521

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
101.699	3037.035	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
102924.961	104983.242	1.184	350.665	296.187	271.233	0.916

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	687.95	-0.24	687.94	0.60	531.90
MEAN	17.74	0.00	-0.02	687.95	-0.24	687.94	0.60	
HUB	15.05	0.00	-0.02	687.95	-0.24	687.94	0.60	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	39.27	46.36	-7.09	562.21	888.60	15.98	539.96	0.78
MEAN	35.85	43.40	-7.55	496.90	848.77	15.98	539.96	0.74
HUB	31.52	38.84	-7.32	421.59	806.97	15.98	539.96	0.71

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	471.28	224.72	414.26	1182.28	0.40
MEAN	17.51	481.92	241.75	416.90	1180.42	0.41
HUB	14.85	523.40	310.72	421.18	1178.62	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	529.77	330.21	0.45	4456.39	
MEAN	490.40	485.42	248.65	0.41	4236.40	1.84
HUB	415.99	434.14	105.27	0.37	4617.77	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.30	1.09	19.98	599.50	1.03	580.96	0.92	0.73
MEAN	22.20	1.09	19.79	598.51	1.03	579.12	0.92	0.73
HUB	22.37	1.09	19.53	600.23	1.04	577.36	0.92	0.73

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.48	38.56	31.50	7.06	0.93	0.45	2.90	

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 MEAN    30.11    30.81    23.50     7.31     0.86     0.47     3.28     0.73
 HUB     36.42    14.03     6.50     7.53     0.86     0.51     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.797

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     487.329     243.335     422.229    1180.880       0.413        0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.263      19.798     579.587      46.000      29.955      31.500       1.545

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     435.548     243.335     498.913    1184.937       0.368        0.196

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.247      20.262     583.577     471.992       0.017        0.300

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     422.628       0.000     422.628    1185.876       0.356        0.210

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      20.327     584.502       0.000       0.060       0.037        0.222

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.693      22.194       1.086     599.413      19.949     268.110        2.078

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 124303.555       0.404     939.833 2022438.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  1.000

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    133.793     3210.000       22.194     599.413       1.000        1.000        0.980
W Kg/sec =   60.81521

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     95.261     2986.070        1.402       0.249      53.349      56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 102924.961  104983.242        1.850     513.330     277.452     401.059        1.446

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa     C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   396.86     -0.14   396.86      0.33   501.87
 MEAN    16.97      0.00    -0.02   396.86     -0.14   396.86      0.33
 HUB     14.32      0.00    -0.02   396.86     -0.14   396.86      0.33

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     53.67     46.36      7.31   539.52    669.87     20.54    586.27      0.56
 MEAN    50.15     43.80      6.35   475.39    619.37     20.54    586.27      0.52
 HUB     45.32     37.84      7.48   401.14    564.38     20.54    586.27      0.48

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88    472.01    240.42    406.19   1202.65      0.39
 MEAN    16.57    480.86    251.42    409.90   1200.27      0.40
 HUB     13.89    518.97    312.75    414.14   1197.88      0.43

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
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 TIP    528.88   498.20   288.46     0.41  4541.69
 MEAN   464.28   461.87   212.86     0.38  4169.31     1.45
 HUB    389.09   421.12    76.34     0.35  4346.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.70     1.11    22.21   619.83     1.03   601.23     0.92     0.91
 MEAN    24.49     1.10    21.92   618.15     1.03   598.86     0.92     0.91
 HUB     24.59     1.11    21.61   618.95     1.03   596.47     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.62    35.38    31.50     3.88     0.93     0.32     2.90
 MEAN    31.52    27.44    23.50     3.94     0.93     0.32     3.29     0.91
 HUB     37.06    10.44     6.50     3.94     0.93     0.32     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     474.493     252.833     401.521    1201.600       0.395       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.567      22.061     600.186      46.000      32.198      32.400       0.202

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     418.259     252.833     488.738    1205.787       0.347       0.252

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.553      22.590     604.376     456.573       0.015       0.342

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     397.459       0.000     397.459    1207.198       0.329       0.247

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.723     605.792       0.000       0.060       0.037       0.301

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      24.496       1.104     618.975      19.562     249.960       1.938

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 121936.016       0.436     921.933 1175227.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 9.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    133.793    3210.000      24.496     618.975       1.000       1.000       0.980
W Kg/sec =   60.81521

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.707    2938.505       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 102924.961  104983.242       1.995     509.668     255.459     390.276       1.528

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   370.76    -0.13   370.76     0.31   469.77
 MEAN    15.91     0.00    -0.02   370.76    -0.13   370.76     0.31
 HUB     13.07     0.00    -0.02   370.76    -0.13   370.76     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.16    47.36     6.80   513.19   633.21    22.95   607.51     0.52
 MEAN    50.26    44.80     5.46   445.76   579.90    22.95   607.51     0.48
 HUB     44.65    38.84     5.81   366.12   521.15    22.95   607.51     0.43
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      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   445.03   230.03   380.98  1222.19     0.36
 MEAN    15.50   449.84   233.20   384.67  1219.56     0.37
 HUB     12.59   479.62   280.90   388.76  1216.94     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   468.41   272.52     0.38  4129.00
 MEAN   434.13   433.98   200.92     0.36  3616.12     1.46
 HUB    352.68   395.33    71.78     0.32  3538.18

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.92     1.10    24.56   637.53     1.03   621.00     0.92     0.91
 MEAN    26.61     1.09    24.22   635.22     1.03   618.34     0.92     0.91
 HUB     26.56     1.08    23.86   634.87     1.03   615.68     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.12    35.58    31.50     4.08     0.93     0.32     2.90
 MEAN    31.23    27.58    23.50     4.08     0.92     0.31     3.34     0.91
 HUB     35.85    10.46     6.50     3.96     0.92     0.31     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     454.815     237.479     387.892    1219.834       0.373      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.647      24.206     618.615      46.000      31.476      33.000       1.524

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     408.696     237.479     472.682    1223.105       0.334       0.172

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.622      24.640     621.937     440.827       0.030       0.336

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     382.297       0.000     382.297    1224.817       0.312       0.265

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.865     623.679       0.000       0.060       0.037       0.262

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      26.604       1.086     635.872      16.897     268.595       2.082

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 105371.648       0.417     796.693 1217708.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    704400.12   5325.8218    130.7028      1.7610      0.8146      9.9532      1.2163


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 85%  Stat 2 35% Ice Block 8-31-2011
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    129.093    3210.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   58.67873

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    126.111    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 99309.141  101295.109        2.264     831.557     367.263     619.754       1.687

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   296.92    -0.10   296.92     0.27   575.61
MEAN    17.06     0.00    -0.02   296.92    -0.10   296.92     0.27
HUB     12.51     0.00    -0.02   296.92    -0.10   296.92     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     62.81    50.47    12.34   577.90   649.80    14.38   515.45     0.58
MEAN    58.15    47.20    10.95   477.90   562.71    14.38   515.45     0.51
HUB     49.73    38.62    11.11   350.44   459.39    14.38   515.45     0.41

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   535.87   366.54   390.89  1132.41     0.47
MEAN    18.04   553.62   384.33   398.48  1127.67     0.49
HUB     15.00   617.54   461.33   410.53  1120.93     0.55

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    577.90   444.37   211.36     0.39  7563.90
MEAN   505.23   416.42   120.90     0.37  6933.53     1.53
HUB    420.19   412.58    41.14     0.37  6921.21

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.44     1.22    15.81   556.85     1.07   532.86     0.92     0.90
MEAN    18.14     1.20    15.38   554.01     1.06   528.41     0.92     0.90
HUB     18.13     1.20    14.75   553.96     1.06   522.10     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.16    28.40    24.20     4.20     0.93     0.41     2.90
MEAN    43.96    16.88    12.70     4.18     0.94     0.36     3.51     0.90
HUB     48.33    -5.72    -9.30     3.58     0.94     0.22     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.987

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     560.139     383.584     408.190    1127.998       0.497       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.208      15.381     528.732      24.000      43.220      35.400      -7.820

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     426.733     383.584     573.793    1139.667       0.374       0.396

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.149      16.473     539.728     528.796       0.030       0.522

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     395.956       0.000     395.956    1141.898       0.347       0.426
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.627	541.843	0.000	0.060	0.057	0.449

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.858	18.072	1.196	554.938	32.128	189.848	1.472

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
200022.594	0.599	1459.200	1248503.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =10.953 EfDer = 0.987

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
129.093	3210.000	18.072	554.938	1.000	1.000	0.980

W Kg/sec = 58.67873

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
108.615	3103.424	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
99309.141	101295.109	1.867	590.487	316.316	474.134	1.499

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	378.07	-0.13	378.07	0.33	556.53
MEAN	18.08	0.00	-0.02	378.07	-0.13	378.07	0.33	
HUB	15.21	0.00	-0.02	378.07	-0.13	378.07	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.71	46.36	10.35	575.66	688.81	16.75	543.00	0.60
MEAN	53.26	42.30	10.96	506.42	632.08	16.75	543.00	0.55
HUB	48.42	37.84	10.58	426.07	569.72	16.75	543.00	0.50

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	488.34	301.01	384.54	1163.60	0.42
MEAN	18.01	494.35	303.85	389.94	1159.95	0.43
HUB	15.22	531.78	354.87	396.05	1156.29	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	572.02	470.44	271.01	0.40	6149.25	
MEAN	504.50	438.54	200.65	0.38	5474.71	1.58
HUB	426.43	402.46	71.56	0.35	5404.23	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.07	1.17	18.66	582.60	1.05	562.68	0.92	0.90
MEAN	20.73	1.15	18.29	579.56	1.04	559.16	0.92	0.90
HUB	20.69	1.14	17.89	579.25	1.04	555.63	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.05	35.17	31.50	3.67	0.93	0.39	2.90	
MEAN	37.93	27.23	23.50	3.73	0.94	0.38	3.30	0.90
HUB	41.86	10.24	6.50	3.74	0.94	0.37	3.92	

blockage3	Cor/U1	Cor/Incid
0.600	1.000	0.987

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	801.435	304.704	741.251	1125.921	0.712	-1.357

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.803	14.833	526.834	46.000	22.346	30.600	8.254

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	749.344	304.704	808.926	1133.106	0.661	-1.116

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.600	20.714	15.440	533.580	317.610	0.045	0.206

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	738.298	0.000	738.298	1134.584	0.651	0.257

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.600	15.489	534.953	0.000	0.060	0.092	-1.097

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.829	20.593	1.140	580.469	25.531	214.413	1.662

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
159021.297	0.486	1160.088	1127074.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =10.953 EfDer = 0.832

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
129.093	3210.000	20.593	580.469	1.000	1.000	0.630

W Kg/sec = 58.67873

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
97.482	3034.406	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
99309.141	101295.109	1.235	350.665	283.907	271.233	0.955

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	645.73	-0.22	645.73	0.56	531.44
MEAN	17.74	0.00	-0.02	645.73	-0.22	645.73	0.56	
HUB	15.05	0.00	-0.02	645.73	-0.22	645.73	0.56	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	41.06	46.36	-5.30	562.21	856.33	16.60	545.66	0.75
MEAN	37.59	43.40	-5.81	496.90	814.92	16.60	545.66	0.71
HUB	33.15	38.84	-5.69	421.59	771.29	16.60	545.66	0.67

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	462.08	243.35	392.81	1185.71	0.39
MEAN	17.51	471.25	255.79	395.79	1183.42	0.40
HUB	14.85	510.56	317.22	400.06	1181.21	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	501.37	311.58	0.42	4825.29	
MEAN	490.40	460.10	234.61	0.39	4481.92	1.87
HUB	415.99	412.07	98.77	0.35	4714.05	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.71	1.10	20.45	602.16	1.04	584.34	0.92	0.76
MEAN	22.56	1.10	20.22	600.62	1.03	582.08	0.92	0.76
HUB	22.66	1.10	19.93	601.66	1.04	579.90	0.92	0.76

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.78	38.42	31.50	6.92	0.93	0.46	2.90	
MEAN	32.87	30.66	23.50	7.16	0.87	0.48	3.28	0.76
HUB	38.41	13.87	6.50	7.37	0.87	0.52	3.87	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.832

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      476.319     257.467     400.738     1183.886       0.402       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     22.619      20.229      582.542      46.000      32.720      31.500      -1.220

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392      412.011     257.467     485.842     1188.722       0.347       0.246

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.604      20.800      587.311      471.992       0.016       0.342

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121      399.950       0.000     399.950     1189.549       0.336       0.255

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.853     588.129       0.000       0.060       0.037       0.268

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.729      22.553       1.095     601.482      21.014     249.815       1.937

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 130940.367       0.425     955.233 1906757.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    129.093    3210.000      22.553     601.482       1.000       1.000       0.980
W Kg/sec =   58.67873

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     90.610    2980.930       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  99309.141  101295.109       1.945     513.330     263.905     401.059       1.520

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   375.91    -0.13   375.91     0.32   501.01
 MEAN    16.97     0.00    -0.02   375.91    -0.13   375.91     0.32
 HUB     14.32     0.00    -0.02   375.91    -0.13   375.91     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.14    46.36     8.78   539.52   657.67    21.05   589.69     0.55
 MEAN    51.67    43.80     7.87   475.39   606.16    21.05   589.69     0.51
 HUB     46.87    37.84     9.03   401.14   549.84    21.05   589.69     0.46

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   461.73   256.59   383.87  1206.88     0.38
 MEAN    16.57   468.68   263.24   387.78  1204.18     0.39
 HUB     13.89   504.33   317.08   392.19  1201.48     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    528.88   470.63   272.28     0.39  4847.00
 MEAN   464.28   436.79   201.04     0.36  4365.05     1.51
 HUB    389.09   398.74    72.02     0.33  4406.05
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.27     1.12    22.84   623.27     1.04   605.47     0.92     0.91
 MEAN    24.99     1.11    22.51   621.10     1.03   602.77     0.92     0.91
 HUB     25.01     1.11    22.15   621.28     1.03   600.06     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.76    35.35    31.50     3.85     0.93     0.35     2.90
 MEAN    34.17    27.40    23.50     3.90     0.93     0.34     3.29     0.91
 HUB     38.96    10.41     6.50     3.91     0.93     0.35     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     463.124     264.717     380.012    1205.394       0.384       0.049

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.062      22.633     603.985      46.000      34.861      32.400      -2.461

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     394.761     264.717     475.302    1210.268       0.326       0.296

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.047      23.266     608.879     456.573       0.016       0.382

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     375.429       0.000     375.429    1211.502       0.310       0.287

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.377     610.121       0.000       0.060       0.039       0.339

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      24.988       1.108     621.884      20.401     235.715       1.827

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 127175.703       0.455     927.769 1124377.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    129.093    3210.000      24.988     621.884       1.000       1.000       0.980
W Kg/sec =   58.67873

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.154    2931.626       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  99309.141  101295.109       2.104     509.668     242.200     390.276       1.611

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   350.51    -0.12   350.51     0.29   468.67
 MEAN    15.91     0.00    -0.02   350.51    -0.12   350.51     0.29
 HUB     13.07     0.00    -0.02   350.51    -0.12   350.51     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.67    47.36     8.31   513.19   621.57    23.58   611.63     0.51
 MEAN    51.83    44.80     7.03   445.76   567.16    23.58   611.63     0.47
 HUB     46.26    38.84     7.42   366.12   506.95    23.58   611.63     0.42

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
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      0.500       0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
  TIP     17.94   435.41   245.85   359.36  1226.98     0.35
  MEAN    15.50   437.97   244.80   363.17  1224.08     0.36
  HUB     12.59   465.04   285.16   367.35  1221.17     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    502.54   441.62   256.69     0.36  4412.83
  MEAN   434.13   409.56   189.33     0.33  3795.69     1.52
  HUB    352.68   373.50    67.52     0.31  3591.76

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     27.63     1.11    25.32   641.71     1.03   625.89     0.92     0.91
  MEAN    27.25     1.09    24.94   638.93     1.03   622.93     0.92     0.91
  HUB     27.12     1.09    24.54   638.02     1.03   619.98     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     34.38    35.54    31.50     4.04     0.93     0.36     2.90
  MEAN    33.98    27.53    23.50     4.03     0.93     0.34     3.34     0.91
  HUB     37.82    10.41     6.50     3.91     0.93     0.33     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       1.000

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     443.004     249.286     366.209    1224.321       0.362      -0.006

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      27.283      24.921     623.181      46.000      34.244      33.000      -1.244

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     384.759     249.286     458.457    1228.265       0.313       0.223

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      27.262      25.467     627.203     440.827       0.029       0.377

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     360.251       0.000     360.251    1229.756       0.293       0.310

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      25.665     628.727       0.000       0.060       0.037       0.306

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.881      27.242       1.090     639.554      17.670     252.530       1.958

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  110199.641       0.436     803.926 1164769.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     727359.56   5306.2153    126.1111      1.8032      0.8248     10.9531      1.2233

*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 85%  Stat 2 35% Ice Block 8-31-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =11.744   EfDer =  0.982

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
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    125.416    3210.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   57.00716

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    122.519    3197.358       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 96480.141   98409.539       2.331     831.557     356.801     619.754       1.737

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   287.84    -0.10   287.84     0.26   575.61
MEAN    17.06     0.00    -0.02   287.84    -0.10   287.84     0.26
HUB     12.51     0.00    -0.02   287.84    -0.10   287.84     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     63.53    50.47    13.06   577.90   645.70    14.42   515.89     0.58
MEAN    58.94    47.20    11.74   477.90   557.97    14.42   515.89     0.50
HUB     50.61    38.62    11.99   350.44   453.57    14.42   515.89     0.41

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   531.51   373.18   378.47  1133.47     0.47
MEAN    18.04   547.30   388.08   385.92  1128.61     0.48
HUB     15.00   607.90   459.97   397.46  1121.89     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    577.90   430.29   204.72     0.38  7700.71
MEAN   505.23   403.31   117.15     0.36  7001.17     1.57
HUB    420.19   399.44    39.78     0.36  6900.78

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.48     1.22    15.90   557.46     1.07   533.87     0.92     0.90
MEAN    18.16     1.20    15.46   554.32     1.06   529.30     0.92     0.90
HUB     18.11     1.20    14.83   553.86     1.06   523.00     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.60    28.41    24.20     4.21     0.93     0.43     2.90
MEAN    45.16    16.89    12.70     4.19     0.94     0.38     3.51     0.90
HUB     49.17    -5.72    -9.30     3.58     0.94     0.23     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.982

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     553.413     387.330     395.274    1128.959       0.490       0.001

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.222      15.458     529.633      24.000      44.418      35.400      -9.018

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     412.747     387.330     566.025    1140.993       0.362       0.417

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.156      16.584     540.985     528.796       0.033       0.541

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     383.443       0.000     383.443    1143.046       0.335       0.440

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.715     542.933       0.000       0.060       0.063       0.462

   STAGE EXIT CONDITIONS, STAGE            1
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Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.850	18.071	1.196	555.214	32.404	185.729	1.440

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
201740.938	0.604	1429.810	1210347.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =11.744 EfDer = 0.981

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
125.416	3210.000	18.071	555.214	1.000	1.000	0.980

W Kg/sec = 57.00716

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
105.553	3102.652	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96480.141	98409.539	1.921	590.487	307.399	474.134	1.542

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	366.26	-0.13	366.26	0.32	556.39
MEAN	18.08	0.00	-0.02	366.26	-0.13	366.26	0.32	
HUB	15.21	0.00	-0.02	366.26	-0.13	366.26	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.54	46.36	11.18	575.66	682.40	16.83	544.01	0.60
MEAN	54.13	42.30	11.83	506.42	625.08	16.83	544.01	0.55
HUB	49.33	37.84	11.49	426.07	561.95	16.83	544.01	0.49

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	484.29	309.58	372.42	1165.04	0.42
MEAN	18.01	488.79	310.14	377.80	1161.24	0.42
HUB	15.22	524.31	357.12	383.88	1157.42	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	572.02	455.60	262.43	0.39	6324.24	
MEAN	504.50	424.86	194.37	0.37	5587.87	1.61
HUB	426.43	390.09	69.32	0.34	5438.31	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.14	1.17	18.77	583.66	1.05	564.08	0.92	0.90
MEAN	20.77	1.15	18.38	580.35	1.05	560.40	0.92	0.90
HUB	20.69	1.14	17.97	579.68	1.04	556.72	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.74	35.17	31.50	3.67	0.93	0.41	2.90	
MEAN	39.38	27.22	23.50	3.72	0.94	0.40	3.30	0.90
HUB	42.93	10.24	6.50	3.74	0.94	0.39	3.92	

blockage3	Cor/U1	Cor/Incid
0.600	1.000	0.981

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	771.997	311.009	706.578	1130.852	0.683	-1.255

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.840	15.251	531.461	46.000	23.757	30.600	6.843

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	711.296	311.009	776.318	1138.823	0.625	-0.967

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.600	20.770	15.963	538.980	317.610	0.038	0.228

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	699.968	0.000	699.968	1140.241	0.614	0.313

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.600	16.032	540.315	0.000	0.060	0.074	-0.939

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.841	20.680	1.144	581.228	26.014	208.091	1.613

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
162030.500	0.495	1148.368	1090863.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =11.744 EfDer = 0.861

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
125.416	3210.000	20.680	581.228	1.000	1.000	0.630

W Kg/sec = 57.00716

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
94.369	3032.424	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96480.141	98409.539	1.276	350.665	274.840	271.233	0.987

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	616.77	-0.21	616.77	0.54	531.09
MEAN	17.74	0.00	-0.02	616.77	-0.21	616.77	0.54	
HUB	15.05	0.00	-0.02	616.77	-0.21	616.77	0.54	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	42.36	46.36	-4.00	562.21	834.70	17.00	549.47	0.73
MEAN	38.87	43.40	-4.53	496.90	792.17	17.00	549.47	0.69
HUB	34.37	38.84	-4.47	421.59	747.21	17.00	549.47	0.65

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	456.28	256.78	377.17	1188.14	0.38
MEAN	17.51	464.09	265.87	380.39	1185.56	0.39
HUB	14.85	501.56	321.86	384.66	1183.07	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	554.93	480.78	298.15	0.40	5090.99	
MEAN	490.40	441.71	224.54	0.37	4658.17	1.90
HUB	415.99	396.01	94.12	0.33	4782.87	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.01	1.11	20.78	604.12	1.04	586.74	0.92	0.79
MEAN	22.80	1.10	20.51	602.17	1.04	584.19	0.92	0.79
HUB	22.86	1.11	20.20	602.73	1.04	581.73	0.92	0.79

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.25	38.33	31.50	6.83	0.93	0.48	2.90	
MEAN	34.95	30.55	23.50	7.05	0.88	0.49	3.28	0.79
HUB	39.92	13.75	6.50	7.25	0.88	0.53	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.861

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	468.933	267.611	385.075	1186.023	0.395	0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.865	20.527	584.649	46.000	34.798	31.500	-3.298

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	395.037	267.611	477.148	1191.417	0.332	0.282

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.848	21.171	589.979	471.992	0.017	0.373

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	383.663	0.000	383.663	1192.163	0.322	0.287

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.212	590.719	0.000	0.060	0.040	0.299

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.754	22.792	1.102	603.007	21.779	237.685	1.843

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
135710.484	0.441	961.829	1824785.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =11.744 EfDer = 0.996

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
125.416	3210.000	22.792	603.007	1.000	1.000	0.980

W Kg/sec = 57.00716

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
87.214	2977.160	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96480.141	98409.539	2.021	513.330	254.014	401.059	1.579

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	360.82	-0.12	360.82	0.30	500.37
MEAN	16.97	0.00	-0.02	360.82	-0.12	360.82	0.30	
HUB	14.32	0.00	-0.02	360.82	-0.12	360.82	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.23	46.36	9.87	539.52	649.16	21.39	592.14	0.54
MEAN	52.81	43.80	9.01	475.39	596.91	21.39	592.14	0.50
HUB	48.04	37.84	10.20	401.14	539.63	21.39	592.14	0.45

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	455.29	268.02	368.04	1209.85	0.38
MEAN	16.57	460.62	271.59	372.03	1206.95	0.38
HUB	13.89	494.20	320.14	376.49	1204.03	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	528.88	451.11	260.86	0.37	5062.62	
MEAN	464.28	418.97	192.69	0.35	4503.41	1.55
HUB	389.09	382.76	68.96	0.32	4448.50	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.65	1.13	23.25	625.76	1.04	608.46	0.92	0.91
MEAN	25.32	1.11	22.90	623.25	1.03	605.54	0.92	0.91

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 HUB     25.29     1.11    22.51   623.00     1.03   602.62     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.06    35.33    31.50     3.83     0.93     0.38     2.90
 MEAN    36.13    27.38    23.50     3.88     0.93     0.37     3.29     0.91
 HUB     40.38    10.38     6.50     3.88     0.93     0.37     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     455.619     273.117     364.686    1208.075       0.377       0.047

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.392      23.015     606.677      46.000      36.830      32.400      -4.430

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     378.161     273.117     466.475    1213.430       0.312       0.328

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.373      23.719     612.067     456.573       0.017       0.412

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     359.903       0.000     359.903    1214.544       0.296       0.314

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.810     613.192       0.000       0.060       0.043       0.364

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      25.308       1.110     624.001      20.994     226.020       1.752

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 130877.383       0.468     927.575 1085906.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =11.744   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    125.416    3210.000      25.308     624.001       1.000       1.000       0.980
W Kg/sec =   57.00716

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     79.901    2926.648       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96480.141   98409.539       2.190     509.668     232.727     390.276       1.677

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   336.21    -0.12   336.21     0.28   467.88
 MEAN    15.91     0.00    -0.02   336.21    -0.12   336.21     0.28
 HUB     13.07     0.00    -0.02   336.21    -0.12   336.21     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.78    47.36     9.42   513.19   613.61    24.00   614.57     0.50
 MEAN    52.98    44.80     8.18   445.76   558.43    24.00   614.57     0.46
 HUB     47.45    38.84     8.61   366.12   497.16    24.00   614.57     0.41

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   429.55   256.83   344.31  1230.33     0.35
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 MEAN    15.50   430.26   252.82   348.15  1227.24     0.35
 HUB     12.59   455.12   288.09   352.33  1224.16     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    502.54   423.00   245.71     0.34  4609.71
 MEAN   434.13   392.53   181.31     0.32  3919.89     1.57
 HUB    352.68   358.20    64.59     0.29  3628.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     28.09     1.11    25.82   644.71     1.03   629.31     0.92     0.91
 MEAN    27.66     1.09    25.40   641.61     1.03   626.17     0.92     0.91
 HUB     27.48     1.09    24.98   640.30     1.03   623.02     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.72    35.51    31.50     4.01     0.93     0.38     2.90
 MEAN    35.99    27.51    23.50     4.01     0.93     0.36     3.34     0.91
 HUB     39.27    10.39     6.50     3.89     0.93     0.35     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     435.343     257.452     351.059    1227.467       0.355      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.695      25.386     626.395      46.000      36.255      33.000      -3.255

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     368.221     257.452     449.298    1231.867       0.299       0.259

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.670      26.005     630.895     440.827       0.031       0.407

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     345.000       0.000     345.000    1233.215       0.280       0.340

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.183     632.276       0.000       0.060       0.040       0.335

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      27.647       1.092     642.206      18.205     241.844       1.875

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 113541.336       0.450     804.708 1124817.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    743900.62   5272.2900    122.5186      1.8301      0.8285     11.7444      1.2284


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 80% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 5.504   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.236    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   66.92538
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
143.835	3009.102	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
113265.953	115531.023	1.985	831.557	418.878	619.754	1.480

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	342.67	-0.12	342.67	0.31	541.71
MEAN	17.06	0.00	-0.02	342.67	-0.12	342.67	0.31	
HUB	12.51	0.00	-0.02	342.67	-0.12	342.67	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.79	50.47	7.32	543.87	642.92	14.14	513.00	0.58
MEAN	52.70	47.20	5.50	449.76	565.52	14.14	513.00	0.51
HUB	43.91	38.62	5.29	329.80	475.68	14.14	513.00	0.43

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	548.32	293.59	463.10	1122.29	0.49
MEAN	18.04	575.30	333.00	469.13	1119.35	0.51
HUB	15.00	655.23	443.59	482.24	1113.48	0.59

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	543.87	526.40	250.29	0.47	6059.10	
MEAN	475.49	490.29	142.49	0.44	6007.94	1.28
HUB	395.45	484.63	48.14	0.44	6655.35	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.60	1.17	14.95	548.47	1.05	523.36	0.92	0.91
MEAN	17.58	1.16	14.68	548.25	1.05	520.61	0.92	0.91
HUB	17.86	1.18	14.13	551.00	1.05	515.14	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.37	28.39	24.20	4.19	0.93	0.26	2.90	
MEAN	35.37	16.90	12.70	4.20	0.92	0.22	3.51	0.91
HUB	42.61	-5.70	-9.30	3.60	0.92	0.09	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	584.885	332.349	481.285	1119.362	0.523	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.653	14.652	520.667	24.000	34.627	35.400	0.773

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	512.442	332.349	610.781	1126.477	0.455	0.226

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.620	15.285	527.307	528.796	0.021	0.383

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	472.008	0.000	472.008	1130.022	0.418	0.299

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.580	530.632	0.000	0.060	0.037	0.321

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.875	17.570	1.163	549.240	26.430	222.210	1.723

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 164548.391       0.556    1369.114 1440904.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 5.504   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.236    3021.000      17.570     549.240       1.000       1.000       0.980
W Kg/sec =   66.92538

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    126.763    2935.809       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113265.953  115531.023       1.600     590.487     369.167     474.134       1.284

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   449.41    -0.15   449.41     0.40   526.47
 MEAN    18.08     0.00    -0.02   449.41    -0.15   449.41     0.40
 HUB     15.21     0.00    -0.02   449.41    -0.15   449.41     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.33    46.36     3.97   541.76   704.02    15.76   532.37     0.62
 MEAN    46.69    42.30     4.39   476.60   655.18    15.76   532.37     0.58
 HUB     41.75    37.84     3.91   400.98   602.39    15.76   532.37     0.53

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   511.60   208.01   467.40  1145.60     0.45
 MEAN    18.01   524.32   231.68   470.36  1144.12     0.46
 HUB     15.22   569.00   314.50   474.19  1142.57     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   572.35   330.33     0.50  4250.67
 MEAN   474.80   529.47   243.12     0.46  4175.30     1.33
 HUB    401.33   482.07    86.83     0.42  4789.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.47     1.11    16.97   567.24     1.03   545.38     0.92     0.91
 MEAN    19.43     1.11    16.82   566.92     1.03   543.96     0.92     0.91
 HUB     19.72     1.12    16.64   569.52     1.04   542.48     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.99    35.25    31.50     3.75     0.93     0.24     2.90
 MEAN    26.22    27.33    23.50     3.83     0.92     0.25     3.30     0.91
 HUB     33.55    10.38     6.50     3.88     0.92     0.27     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     599.733     232.328     552.904    1137.648       0.527      -0.250

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.510      16.141     537.853      46.000      22.792      30.600       7.808

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     567.712     232.328     613.411    1140.944       0.498      -0.144

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      19.450      16.420     540.975     455.853       0.032       0.196
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	559.994	0.000	559.994	1141.711	0.490	0.110

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	16.440	541.702	0.000	0.060	0.057	-0.136

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.841	19.383	1.103	567.890	18.650	278.452	2.159

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
116152.578	0.401	966.440	1326164.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 5.504 EfDer = 0.926

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
147.236	3021.000	19.383	567.890	1.000	1.000	0.880

W Kg/sec = 66.92538

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
116.838	2887.200	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
113265.953	115531.023	1.439	489.817	340.272	384.470	1.130

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	519.70	-0.18	519.70	0.45	505.66
MEAN	17.74	0.00	-0.02	519.70	-0.18	519.70	0.45	
HUB	15.05	0.00	-0.02	519.70	-0.18	519.70	0.45	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.52	46.36	-0.84	529.11	741.78	16.83	545.34	0.65
MEAN	41.99	43.40	-1.41	467.64	699.24	16.83	545.34	0.61
HUB	37.37	38.84	-1.47	396.77	653.95	16.83	545.34	0.57

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	510.76	172.55	480.73	1161.43	0.44
MEAN	17.51	523.12	203.34	481.99	1160.95	0.45
HUB	14.85	567.31	294.87	484.66	1160.38	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	594.47	349.71	0.51	3421.74	
MEAN	461.53	546.78	258.19	0.47	3562.98	1.36
HUB	391.49	494.20	96.63	0.43	4381.48	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.88	1.08	18.28	582.37	1.03	560.59	0.92	0.85
MEAN	20.95	1.08	18.22	582.97	1.03	560.12	0.92	0.85
HUB	21.32	1.10	18.10	586.43	1.03	559.56	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	19.74	36.03	31.50	4.53	0.93	0.24	2.90	
MEAN	22.87	28.18	23.50	4.68	0.90	0.26	3.28	0.85
HUB	31.32	11.28	6.50	4.78	0.90	0.30	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.926

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

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     17.392     529.277     204.675     488.101    1161.346       0.456       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.021      18.227     560.535      46.000      22.750      31.500       8.750

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     509.245     204.675     548.837    1163.144       0.438       0.061

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.964      18.375     562.272     471.992       0.030       0.196

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     494.299       0.000     494.299    1164.438       0.424       0.074

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.439     563.524       0.000       0.060       0.061       0.083

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.761      20.875       1.077     583.925      16.035     305.373       2.367

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  99895.875       0.366     831.177 1500593.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.504   EfDer =  0.954

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.236    3021.000      20.875     583.925       1.000       1.000       0.980
W Kg/sec =   66.92538

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    110.009    2847.282       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113265.953  115531.023       1.602     513.330     320.393     401.059       1.252

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   462.44    -0.16   462.44     0.40   478.54
 MEAN    16.97     0.00    -0.02   462.44    -0.16   462.44     0.40
 HUB     14.32     0.00    -0.02   462.44    -0.16   462.44     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.68    46.36     1.32   507.76   686.89    18.73   566.07     0.59
 MEAN    44.06    43.80     0.26   447.40   643.55    18.73   566.07     0.55
 HUB     39.24    37.84     1.40   377.52   597.07    18.73   566.07     0.51

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   508.53   151.44   485.45  1175.64     0.43
 MEAN    16.57   519.39   182.81   486.15  1175.43     0.44
 HUB     13.89   559.97   274.59   488.03  1175.09     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   596.31   346.29     0.51  2862.31
 MEAN   436.94   548.57   254.13     0.47  3032.60     1.26
 HUB    366.18   496.55    91.60     0.42  3816.28

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.22     1.06    19.54   596.04     1.02   574.45     0.92     0.87
 MEAN    22.31     1.07    19.50   596.76     1.02   574.24     0.92     0.87
 HUB     22.69     1.09    19.42   600.07     1.03   573.90     0.92     0.87
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.33    35.50    31.50     4.00     0.93     0.17     2.90
 MEAN    20.61    27.60    23.50     4.10     0.90     0.19     3.29     0.87
 HUB     29.36    10.63     6.50     4.13     0.90     0.23     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.954

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     509.930     183.839     475.638    1177.118       0.433       0.055

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.376      19.666     575.915      46.000      21.132      32.400      11.268

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     504.486     183.839     536.939    1177.589       0.428       0.058

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.302      19.656     576.376     456.573       0.035       0.181

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     479.390       0.000     479.390    1179.693       0.406       0.045

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.796     578.437       0.000       0.060       0.076       0.106

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.749      22.183       1.063     597.621      13.696     331.833       2.572

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  85350.219       0.345     710.151 1348109.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.504   EfDer =  0.924

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    147.236    3021.000      22.183     597.621       1.000       1.000       0.980
W Kg/sec =   66.92538

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    104.728    2814.465       1.402       0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 113265.953  115531.023       1.671     509.668     305.021     390.276       1.280

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   445.27    -0.15   445.27     0.38   449.94
 MEAN    15.91      0.00    -0.02   445.27    -0.15   445.27     0.38
 HUB     13.07      0.00    -0.02   445.27    -0.15   445.27     0.38

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     47.33     47.36    -0.03   482.97   657.02     20.11   581.07      0.56
 MEAN    43.30     44.80    -1.50   419.52   611.88     20.11   581.07      0.52
 HUB     37.75     38.84    -1.09   344.57   563.12     20.11   581.07      0.48

     ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   488.47    135.14    469.41   1189.34      0.41
 MEAN    15.50   497.10    160.82    470.37   1188.92      0.42
 HUB     12.59   531.15    242.79    472.41   1188.38      0.45
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   578.33   337.81     0.49  2427.25
 MEAN   408.57   531.62   247.75     0.45  2494.73     1.24
 HUB    331.91   480.74    89.12     0.40  3058.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.33     1.05    20.77   607.89     1.02   587.98     0.92     0.85
 MEAN    23.36     1.05    20.71   608.17     1.02   587.55     0.92     0.85
 HUB     23.63     1.07    20.60   610.56     1.02   587.02     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.06    35.74    31.50     4.24     0.93     0.15     2.90
 MEAN    18.88    27.78    23.50     4.28     0.90     0.17     3.34     0.85
 HUB     27.20    10.68     6.50     4.18     0.90     0.20     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.924

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     502.137     163.767     474.681    1189.181       0.422      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.386      20.684     587.831      46.000      19.035      33.000      13.965

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     512.102     163.767     537.650    1188.328       0.431      -0.098

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.208      20.424     586.987     440.827       0.085       0.161

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     476.599       0.000     476.599    1191.290       0.400       0.028

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.760     589.917       0.000       0.060       0.094       0.024

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.675      23.184       1.045     608.874      11.253     375.903       2.914

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   70141.234       0.314     583.605 1407969.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    536088.31   4460.4858    143.8347      1.5346      0.7937      5.5035      1.1646


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 80% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.961   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.038    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   65.92652

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    141.688    3009.102       1.402       0.249      53.349      32.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
111575.445	113806.719	2.015	831.557	412.626	619.754	1.502

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	337.03	-0.12	337.03	0.30	541.71
MEAN	17.06	0.00	-0.02	337.03	-0.12	337.03	0.30	
HUB	12.51	0.00	-0.02	337.03	-0.12	337.03	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.22	50.47	7.75	543.87	639.93	14.17	513.32	0.58
MEAN	53.16	47.20	5.96	449.76	562.12	14.17	513.32	0.51
HUB	44.39	38.62	5.77	329.80	471.63	14.17	513.32	0.42

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	543.58	298.32	454.40	1123.19	0.48
MEAN	18.04	569.88	335.66	460.54	1120.12	0.51
HUB	15.00	648.13	442.75	473.34	1114.25	0.58

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	543.87	516.51	245.56	0.46	6156.67	
MEAN	475.49	481.30	139.83	0.43	6055.97	1.30
HUB	395.45	475.69	47.31	0.43	6642.74	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.65	1.17	15.03	548.88	1.05	524.21	0.92	0.91
MEAN	17.61	1.17	14.75	548.46	1.05	521.33	0.92	0.91
HUB	17.86	1.18	14.20	550.94	1.05	515.86	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.28	28.39	24.20	4.19	0.93	0.27	2.90	
MEAN	36.09	16.89	12.70	4.19	0.92	0.23	3.51	0.91
HUB	43.09	-5.71	-9.30	3.59	0.92	0.10	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	579.115	335.009	472.380	1120.167	0.517	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.675	14.726	521.416	24.000	35.344	35.400	0.056

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	502.214	335.009	603.697	1127.603	0.445	0.241

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.643	15.395	528.361	528.796	0.020	0.394

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	462.928	0.000	462.928	1130.977	0.409	0.311

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.674	531.528	0.000	0.060	0.037	0.333

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	17.594	1.165	549.428	26.618	219.207	1.699

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
165717.266	0.560	1358.260	1417198.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 5.961 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
145.038	3021.000	17.594	549.428	1.000	1.000	0.980

W Kg/sec = 65.92652

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
124.721	2935.308	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
111575.445	113806.719	1.626	590.487	363.218	474.134	1.305

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	440.93	-0.15	440.93	0.39	526.38
MEAN	18.08	0.00	-0.02	440.93	-0.15	440.93	0.39	
HUB	15.21	0.00	-0.02	440.93	-0.15	440.93	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.87	46.36	4.51	541.76	698.63	15.85	533.19	0.62
MEAN	47.24	42.30	4.94	476.60	649.39	15.85	533.19	0.57
HUB	42.29	37.84	4.45	400.98	596.09	15.85	533.19	0.53

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	505.67	215.02	457.67	1146.96	0.44
MEAN	18.01	518.13	236.69	460.90	1145.28	0.45
HUB	15.22	562.36	316.34	464.95	1143.55	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	560.36	323.32	0.49	4393.75	
MEAN	474.80	518.77	238.10	0.45	4265.61	1.35
HUB	401.33	472.65	84.99	0.41	4817.91	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.56	1.11	17.12	568.03	1.03	546.68	0.92	0.91
MEAN	19.50	1.11	16.95	567.49	1.03	545.07	0.92	0.91
HUB	19.76	1.12	16.75	569.82	1.04	543.42	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.16	35.24	31.50	3.74	0.93	0.25	2.90	
MEAN	27.18	27.32	23.50	3.82	0.92	0.26	3.30	0.91
HUB	34.23	10.36	6.50	3.86	0.92	0.27	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	590.640	237.359	540.847	1139.191	0.518	-0.242

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.582	16.299	539.314	46.000	23.695	30.600	6.905

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	554.168	237.359	602.862	1142.868	0.485	-0.116

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	19.531	16.626	542.800	455.853	0.029	0.209

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4

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     17.823     546.566       0.000     546.566    1143.603       0.478       0.130

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850     16.647     543.499       0.000       0.060       0.052      -0.108

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.851     19.469       1.107     568.446      19.019     271.791       2.107

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 118450.117       0.409     970.847 1302166.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 5.961   EfDer =  0.938

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.038    3021.000      19.469     568.446       1.000       1.000       0.880
W Kg/sec =   65.92652

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    114.645    2885.786       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111575.445  113806.719       1.467     489.817     333.883     384.470       1.152

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   507.76    -0.17   507.76     0.44   505.41
 MEAN    17.74     0.00    -0.02   507.76    -0.17   507.76     0.44
 HUB     15.05     0.00    -0.02   507.76    -0.17   507.76     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.19    46.36    -0.17   529.11   733.46    17.02   546.92     0.64
 MEAN    42.66    43.40    -0.74   467.64   690.42    17.02   546.92     0.60
 HUB     38.02    38.84    -0.82   396.77   644.51    17.02   546.92     0.56

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   502.69   181.46   468.79  1163.48     0.43
 MEAN    17.51   515.08   209.79   470.42  1162.73     0.44
 HUB     14.85   558.96   297.39   473.28  1161.92     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   579.58   340.80     0.50  3598.22
 MEAN   461.53   533.54   251.73     0.46  3675.88     1.38
 HUB    391.49   482.55    94.11     0.42  4418.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.07     1.08    18.53   583.67     1.03   562.58     0.92     0.86
 MEAN    21.11     1.08    18.45   584.00     1.03   561.85     0.92     0.86
 HUB     21.45     1.10    18.31   587.15     1.03   561.06     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.16    36.02    31.50     4.52     0.93     0.25     2.90
 MEAN    24.04    28.15    23.50     4.65     0.90     0.27     3.28     0.86
 HUB     32.14    11.25     6.50     4.75     0.90     0.31     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.938

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     521.020     211.171     476.307    1163.148       0.448       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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    21.185      18.457     562.276      46.000      23.910      31.500       7.590

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     495.810     211.171     538.907    1165.360       0.425       0.083

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.139      18.662     564.417     471.992       0.027       0.213

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.121     481.166       0.000     481.166    1166.592       0.412       0.098

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.729     565.611       0.000       0.060       0.056       0.107

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.784      21.059       1.082     584.942      16.496     295.499       2.291

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102767.188       0.377     842.305 1470101.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.961   EfDer =  0.964

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.038    3021.000      21.059     584.942       1.000       1.000       0.980
W Kg/sec =   65.92652

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    107.515    2844.805       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111575.445  113806.719       1.639     513.330     313.130     401.059       1.281

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   450.48    -0.16   450.48     0.39   478.13
 MEAN    16.97     0.00    -0.02   450.48    -0.16   450.48     0.39
 HUB     14.32     0.00    -0.02   450.48    -0.16   450.48     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.43    46.36     2.07   507.76   678.90    19.01   568.00     0.58
 MEAN    44.81    43.80     1.01   447.40   635.01    19.01   568.00     0.54
 HUB     39.98    37.84     2.14   377.52   587.85    19.01   568.00     0.50

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   498.31   161.70   471.34  1178.39     0.42
 MEAN    16.57   509.34   190.16   472.51  1177.87     0.43
 HUB     13.89   549.75   277.29   474.69  1177.25     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   578.87   336.04     0.49  3055.86
 MEAN   436.94   533.07   246.78     0.45  3154.33     1.28
 HUB    366.18   482.94    88.89     0.41  3853.78

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.53     1.07    19.92   597.87     1.02   577.14     0.92     0.88
 MEAN    22.58     1.07    19.85   598.29     1.02   576.63     0.92     0.88
 HUB     22.92     1.09    19.74   601.25     1.03   576.02     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.94    35.49    31.50     3.99     0.93     0.19     2.90
 MEAN    21.92    27.58    23.50     4.08     0.91     0.21     3.29     0.88
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HUB     30.29    10.61     6.50     4.11     0.91     0.24     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.964

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     500.380     191.230     462.397    1179.487       0.424       0.055

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.647      20.007     578.235      46.000      22.468      32.400       9.932

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     489.126     191.230     525.179    1180.434       0.414       0.082

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.587      20.067     579.164     456.573       0.031       0.200

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096     464.739       0.000     464.739    1182.412       0.393       0.071

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      20.208     581.106       0.000       0.060       0.068       0.131

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.780      22.482       1.068     599.136      14.194     318.866       2.472

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  88450.828       0.357     724.965 1320801.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.961   EfDer =  0.940

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.038    3021.000      22.482     599.136       1.000       1.000       0.980
W Kg/sec =   65.92652

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.924    2810.906       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111575.445  113806.719       1.717     509.668     296.853     390.276       1.315

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   432.03    -0.15   432.03     0.36   449.37
 MEAN    15.91     0.00    -0.02   432.03    -0.15   432.03     0.36
 HUB     13.07     0.00    -0.02   432.03    -0.15   432.03     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.20    47.36     0.84   482.97   648.12    20.51   583.56     0.55
 MEAN    44.17    44.80    -0.63   419.52   602.30    20.51   583.56     0.51
 HUB     38.59    38.84    -0.25   344.57   552.70    20.51   583.56     0.47

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   476.93   146.58   453.85  1192.68     0.40
 MEAN    15.50   485.62   169.03   455.25  1191.94     0.41
 HUB     12.59   519.41   245.83   457.55  1191.11     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   559.01   326.37     0.47  2632.40
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 MEAN   408.57   514.42   239.54     0.43  2621.95     1.26
 HUB    331.91   465.58    86.08     0.39  3096.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.76     1.06    21.28   610.27     1.02   591.29     0.92     0.86
 MEAN    23.76     1.06    21.19   610.23     1.02   590.55     0.92     0.86
 HUB     23.99     1.07    21.05   612.24     1.02   589.72     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.90    35.72    31.50     4.22     0.93     0.18     2.90
 MEAN    20.37    27.75    23.50     4.25     0.90     0.19     3.34     0.86
 HUB     28.25    10.65     6.50     4.15     0.90     0.21     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.940

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     490.521     172.131     459.328    1192.211       0.411      -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.783      21.164     590.830      46.000      20.543      33.000      12.457

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     493.490     172.131     522.648    1191.965       0.414      -0.062

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.640      21.006     590.586     440.827       0.074       0.181

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     459.824       0.000     459.824    1194.665       0.385       0.057

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.317     593.264       0.000       0.060       0.084       0.054

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.721      23.613       1.050     610.910      11.775     357.877       2.774

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   73398.289       0.328     601.591 1378375.250

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     548783.69   4497.9678    141.6879      1.5630      0.8108      5.9606      1.1685


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 80% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     142.688    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   64.85819

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     139.392    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  109767.383  111962.492       2.048     831.557     405.939     619.754       1.527
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ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	331.03	-0.11	331.03	0.30	541.71
MEAN	17.06	0.00	-0.02	331.03	-0.11	331.03	0.30	
HUB	12.51	0.00	-0.02	331.03	-0.11	331.03	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.68	50.47	8.21	543.87	636.79	14.20	513.66	0.57
MEAN	53.65	47.20	6.45	449.76	558.54	14.20	513.66	0.50
HUB	44.90	38.62	6.28	329.80	467.36	14.20	513.66	0.42

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	538.76	303.30	445.28	1124.12	0.48
MEAN	18.04	564.28	338.47	451.50	1120.91	0.50
HUB	15.00	640.71	441.86	463.98	1115.04	0.57

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	543.87	506.11	240.57	0.45	6259.48	
MEAN	475.49	471.83	137.02	0.42	6106.63	1.32
HUB	395.45	466.29	46.41	0.42	6629.34	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.70	1.17	15.12	549.32	1.05	525.08	0.92	0.91
MEAN	17.63	1.17	14.82	548.67	1.05	522.08	0.92	0.91
HUB	17.86	1.18	14.27	550.89	1.05	516.60	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.26	28.38	24.20	4.18	0.93	0.29	2.90	
MEAN	36.86	16.88	12.70	4.18	0.93	0.24	3.51	0.91
HUB	43.60	-5.71	-9.30	3.59	0.93	0.11	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	573.154	337.814	463.019	1120.995	0.511	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.697	14.802	522.187	24.000	36.114	35.400	-0.714

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	491.536	337.814	596.428	1128.759	0.435	0.257

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.667	15.506	529.445	528.796	0.020	0.406

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	453.435	0.000	453.435	1131.960	0.401	0.324

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.771	532.453	0.000	0.060	0.037	0.346

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	17.617	1.166	549.625	26.815	216.045	1.675

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
166948.453	0.564	1346.177	1391974.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

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 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    142.688    3021.000      17.617     549.625       1.000       1.000       0.980
W Kg/sec =   64.85819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    122.560    2934.780       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
109767.383  111962.492       1.654     590.487     356.928     474.134       1.328

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   432.05    -0.15   432.05     0.38   526.29
MEAN    18.08     0.00    -0.02   432.05    -0.15   432.05     0.38
HUB     15.21     0.00    -0.02   432.05    -0.15   432.05     0.38

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.44    46.36     5.08   541.76   693.06    15.93   534.04     0.61
MEAN    47.82    42.30     5.52   476.60   643.40    15.93   534.04     0.57
HUB     42.87    37.84     5.03   400.98   589.56    15.93   534.04     0.52

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   499.76   222.28   447.60  1148.34     0.44
MEAN    18.01   511.86   241.91   451.09  1146.46     0.45
HUB     15.22   555.52   318.23   455.34  1144.55     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    538.34   547.95   316.06     0.48  4541.94
MEAN   474.80   507.66   232.89     0.44  4359.46     1.37
HUB    401.33   462.86    83.09     0.40  4846.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.66     1.12    17.26   568.85     1.03   548.00     0.92     0.91
MEAN    19.58     1.11    17.07   568.08     1.03   546.20     0.92     0.91
HUB     19.80     1.12    16.85   570.14     1.04   544.37     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     26.41    35.23    31.50     3.73     0.93     0.26     2.90
MEAN    28.20    27.31    23.50     3.81     0.92     0.27     3.30     0.91
HUB     34.95    10.34     6.50     3.84     0.92     0.28     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     581.451     242.588     528.428    1140.752       0.510      -0.234

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.653      16.457     540.793      46.000      24.659      30.600       5.941

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     540.338     242.588     592.296    1144.807       0.472      -0.087

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      19.610      16.832     544.644     455.853       0.026       0.223

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     532.867       0.000     532.867    1145.511       0.465       0.152

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.850      16.855     545.314       0.000       0.060       0.048      -0.078

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      19.553       1.110     569.026      19.401     265.057       2.055

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 120830.141       0.417     974.305 1276830.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.949

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    142.688    3021.000      19.553     569.026       1.000       1.000       0.880
W Kg/sec =   64.85819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.359    2884.315       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109767.383  111962.492       1.497     489.817     327.227     384.470       1.175

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   495.54    -0.17   495.54     0.43   505.16
 MEAN    17.74     0.00    -0.02   495.54    -0.17   495.54     0.43
 HUB     15.05     0.00    -0.02   495.54    -0.17   495.54     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.89    46.36     0.53   529.11   725.05    17.20   548.52     0.63
 MEAN    43.35    43.40    -0.05   467.64   681.47    17.20   548.52     0.59
 HUB     38.70    38.84    -0.14   396.77   634.91    17.20   548.52     0.55

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   494.80   190.56   456.63  1165.54     0.42
 MEAN    17.51   507.10   216.38   458.62  1164.54     0.44
 HUB     14.85   550.54   299.93   461.66  1163.49     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   564.38   331.69     0.48  3778.51
 MEAN   461.53   520.03   245.15     0.45  3791.07     1.40
 HUB    391.49   470.65    91.56     0.40  4456.53

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.27     1.09    18.79   585.02     1.03   564.58     0.92     0.87
 MEAN    21.27     1.09    18.67   585.07     1.03   563.60     0.92     0.87
 HUB     21.59     1.10    18.52   587.89     1.03   562.58     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.65    35.99    31.50     4.49     0.93     0.27     2.90
 MEAN    25.26    28.13    23.50     4.63     0.90     0.29     3.28     0.87
 HUB     33.01    11.22     6.50     4.72     0.90     0.32     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.949

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     512.826     217.799     464.278    1164.964       0.440       0.005

    Pt3        Ps3        Ts3        Vane No.     Alpha3     Vane A3      Incid3
    21.350     18.686     564.034      46.000      25.132      31.500       6.368

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	482.232	217.799	529.135	1167.586	0.413	0.107

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.313	18.949	566.575	471.992	0.024	0.230

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	467.919	0.000	467.919	1168.755	0.400	0.122

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.017	567.711	0.000	0.060	0.050	0.132

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.806	21.241	1.086	585.992	16.966	285.831	2.216

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
105695.625	0.388	852.269	1438332.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.453 EfDer = 0.974

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
142.688	3021.000	21.241	585.992	1.000	1.000	0.980

W Kg/sec = 64.85819

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
104.960	2842.256	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
109767.383	111962.492	1.679	513.330	305.688	401.059	1.312

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	438.39	-0.15	438.39	0.37	477.70
MEAN	16.97	0.00	-0.02	438.39	-0.15	438.39	0.37	
HUB	14.32	0.00	-0.02	438.39	-0.15	438.39	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.20	46.36	2.84	507.76	670.93	19.28	569.95	0.57
MEAN	45.59	43.80	1.79	447.40	626.49	19.28	569.95	0.53
HUB	40.75	37.84	2.91	377.52	578.63	19.28	569.95	0.49

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	488.52	171.96	457.25	1181.12	0.41
MEAN	16.57	499.56	197.51	458.85	1180.30	0.42
HUB	13.89	539.65	280.03	461.31	1179.42	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	561.44	325.78	0.48	3249.43	
MEAN	436.94	517.56	239.43	0.44	3276.11	1.30
HUB	366.18	469.29	86.16	0.40	3891.75	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.83	1.07	20.29	599.74	1.02	579.82	0.92	0.89
MEAN	22.84	1.08	20.19	599.85	1.02	579.02	0.92	0.89
HUB	23.16	1.09	20.06	602.46	1.03	578.15	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.61	35.47	31.50	3.97	0.93	0.21	2.90	
MEAN	23.29	27.56	23.50	4.06	0.91	0.22	3.29	0.89
HUB	31.26	10.58	6.50	4.08	0.91	0.25	3.90	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     491.089     198.623     449.129    1181.847       0.416       0.055

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.916      20.346     580.551      46.000      23.857      32.400       8.543

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     473.893     198.623     513.835    1183.256       0.400       0.106

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.869      20.474     581.937     456.573       0.027       0.219

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     450.226       0.000     450.226    1185.111       0.380       0.097

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.615     583.762       0.000       0.060       0.060       0.157

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.806      22.777       1.072     600.683      14.692     306.520       2.376

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91556.164       0.370     738.257 1292415.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.954

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    142.688    3021.000      22.777     600.683       1.000       1.000       0.980
W Kg/sec =   64.85819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     99.101    2807.282       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109767.383  111962.492       1.766     509.668     288.632     390.276       1.352

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   418.87    -0.14   418.87     0.35   448.79
 MEAN    15.91     0.00    -0.02   418.87    -0.14   418.87     0.35
 HUB     13.07     0.00    -0.02   418.87    -0.14   418.87     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.07    47.36     1.71   482.97   639.41    20.90   586.04     0.54
 MEAN    45.05    44.80     0.25   419.52   592.93    20.90   586.04     0.50
 HUB     39.45    38.84     0.61   344.57   542.47    20.90   586.04     0.46

     ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   466.09   157.82   438.56  1195.96     0.39
 MEAN    15.50   474.64   177.12   440.36  1194.91     0.40
 HUB     12.59   508.00   248.80   442.90  1193.81     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   540.04   315.13     0.45  2833.98
 MEAN   408.57   497.48   231.45     0.42  2747.17     1.29
 HUB    331.91   450.63    83.11     0.38  3134.26
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    24.19     1.06    21.78   612.67     1.02   594.54     0.92     0.87
 MEAN   24.15     1.06    21.66   612.30     1.02   593.50     0.92     0.87
 HUB    24.35     1.07    21.49   613.94     1.02   592.40     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    19.79    35.70    31.50     4.20     0.93     0.20     2.90
 MEAN   21.91    27.73    23.50     4.23     0.90     0.21     3.34     0.87
 HUB    29.32    10.63     6.50     4.13     0.90     0.22     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.954

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     479.444     180.364     444.225    1195.190       0.401       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.176      21.637      593.787      46.000      22.098      33.000      10.902

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     475.484     180.364     508.543    1195.508       0.398       -0.026

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.064      21.576     594.102     440.827       0.063       0.202

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     443.491       0.000     443.491    1197.974       0.370       0.088

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      21.864     596.556       0.000       0.060       0.074       0.085

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.760      24.037       1.055     612.971      12.288     341.282       2.646

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  76598.578       0.342     617.647 1347836.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    561628.94   4528.6553    139.3919      1.5911      0.8260      6.4529      1.1725


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 80% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.038    3021.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   63.65342

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    136.803    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107728.406  109882.742       2.087     831.557     398.399     619.754       1.556

     ROTOR LEADING EDGE CONDITIONS, STAGE            1
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   324.31    -0.11   324.31     0.29   541.71
MEAN    17.06     0.00    -0.02   324.31    -0.11   324.31     0.29
HUB     12.51     0.00    -0.02   324.31    -0.11   324.31     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.20    50.47     8.73   543.87   633.32    14.24   514.03     0.57
MEAN    54.21    47.20     7.01   449.76   554.58    14.24   514.03     0.50
HUB     45.49    38.62     6.87   329.80   462.62    14.24   514.03     0.42

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   533.61   308.81   435.18  1125.12     0.47
MEAN    18.04   558.19   341.58   441.48  1121.77     0.50
HUB     15.00   632.55   440.86   453.60  1115.90     0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    543.87   494.61   235.06     0.44  6373.05
MEAN   475.49   461.34   133.91     0.41  6162.62     1.35
HUB    395.45   455.87    45.42     0.41  6614.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.74     1.17    15.21   549.80     1.05   526.02     0.92     0.91
MEAN    17.65     1.17    14.90   548.91     1.05   522.89     0.92     0.91
HUB     17.85     1.18    14.35   550.82     1.05   517.41     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.36    28.38    24.20     4.18     0.93     0.30     2.90
MEAN    37.73    16.87    12.70     4.17     0.93     0.26     3.51     0.91
HUB     44.18    -5.72    -9.30     3.58     0.93     0.12     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     566.673     340.915     452.653    1121.891       0.505      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.720      14.884     523.023      24.000      36.985      35.400      -1.585

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     479.794     340.915     588.579    1130.006       0.425       0.275

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.690      15.625     530.616     528.796       0.020       0.419

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     442.983       0.000     442.983    1133.023       0.391       0.338

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.873     533.453       0.000       0.060       0.037       0.359

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.879      17.640       1.168     549.844      27.034     212.543       1.648

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 168306.938       0.569    1331.922 1363684.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
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    140.038    3021.000      17.640     549.844       1.000       1.000       0.980
W Kg/sec =   63.65342

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.153    2934.197       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107728.406  109882.742       1.688     590.487     349.918     474.134       1.355

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   422.26    -0.15   422.26     0.37   526.18
 MEAN    18.08     0.00    -0.02   422.26    -0.15   422.26     0.37
 HUB     15.21     0.00    -0.02   422.26    -0.15   422.26     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.07    46.36     5.71   541.76   687.00    16.03   534.95     0.61
 MEAN    48.47    42.30     6.17   476.60   636.86    16.03   534.95     0.56
 HUB     43.53    37.84     5.69   400.98   582.42    16.03   534.95     0.51

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   493.58   230.16   436.64  1149.82     0.43
 MEAN    18.01   505.21   247.62   440.36  1147.74     0.44
 HUB     15.22   548.13   320.31   444.80  1145.63     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   534.43   308.17     0.46  4702.95
 MEAN   474.80   495.51   227.18     0.43  4462.24     1.39
 HUB    401.33   452.12    81.02     0.39  4878.25

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.76     1.12    17.41   569.75     1.04   549.41     0.92     0.91
 MEAN    19.65     1.11    17.20   568.73     1.03   547.42     0.92     0.91
 HUB     19.85     1.13    16.96   570.50     1.04   545.41     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.80    35.21    31.50     3.71     0.93     0.28     2.90
 MEAN    29.35    27.29    23.50     3.79     0.93     0.28     3.30     0.91
 HUB     35.76    10.32     6.50     3.82     0.93     0.29     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     571.700     248.314     514.957    1142.411       0.500      -0.225

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.727      16.622     542.367      46.000      25.744      30.600       4.856

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     525.464     248.314     581.182    1146.864       0.458      -0.055

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      19.691      17.048     546.603     455.853       0.024       0.239

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     518.153       0.000     518.153    1147.532       0.452       0.176

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.850      17.072     547.240       0.000       0.060       0.045      -0.046

   STAGE EXIT CONDITIONS, STAGE            2
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Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.867	19.638	1.113	569.661	19.818	257.893	1.999

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
123426.102	0.426	976.751	1248642.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 7.013 EfDer = 0.961

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
140.038	3021.000	19.638	569.661	1.000	1.000	0.880

W Kg/sec = 63.65342

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
109.853	2882.708	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
107728.406	109882.742	1.531	489.817	319.928	384.470	1.202

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	482.34	-0.17	482.34	0.42	504.87
MEAN	17.74	0.00	-0.02	482.34	-0.17	482.34	0.42	
HUB	15.05	0.00	-0.02	482.34	-0.17	482.34	0.42	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.66	46.36	1.30	529.11	716.09	17.40	550.24	0.62
MEAN	44.12	43.40	0.72	467.64	671.94	17.40	550.24	0.58
HUB	39.45	38.84	0.61	396.77	624.67	17.40	550.24	0.54

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	486.73	200.31	443.61	1167.71	0.42
MEAN	17.51	498.79	223.46	445.94	1166.45	0.43
HUB	14.85	541.65	302.69	449.18	1165.16	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	548.12	321.95	0.47	3971.41	
MEAN	461.53	505.51	238.07	0.43	3914.87	1.42
HUB	391.49	457.87	88.80	0.39	4497.52	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.47	1.09	19.05	586.47	1.03	566.69	0.92	0.88
MEAN	21.45	1.09	18.91	586.23	1.03	565.46	0.92	0.88
HUB	21.72	1.11	18.73	588.70	1.03	564.20	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	24.30	35.97	31.50	4.47	0.93	0.28	2.90	
MEAN	26.62	28.10	23.50	4.60	0.91	0.30	3.28	0.88
HUB	33.98	11.18	6.50	4.68	0.91	0.33	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.961

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	504.312	224.921	451.376	1166.885	0.432	0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.521	18.926	565.896	46.000	26.487	31.500	5.013

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	467.797	224.921	519.061	1169.936	0.400	0.132

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.493	19.248	568.860	471.992	0.021	0.250

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	453.869	0.000	453.869	1171.038	0.388	0.148

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.317	569.932	0.000	0.060	0.045	0.158

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.826	21.428	1.091	587.131	17.470	275.869	2.139

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
108839.797	0.399	861.320	1403439.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 7.013 EfDer = 0.982

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
140.038	3021.000	21.428	587.131	1.000	1.000	0.980

W Kg/sec = 63.65342

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
102.207	2839.497	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
107728.406	109882.742	1.724	513.330	297.671	401.059	1.347

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	425.52	-0.15	425.52	0.36	477.23
MEAN	16.97	0.00	-0.02	425.52	-0.15	425.52	0.36	
HUB	14.32	0.00	-0.02	425.52	-0.15	425.52	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.04	46.36	3.68	507.76	662.60	19.56	572.02	0.56
MEAN	46.45	43.80	2.65	447.40	617.55	19.56	572.02	0.53
HUB	41.59	37.84	3.75	377.52	568.95	19.56	572.02	0.48

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	478.72	182.74	442.47	1183.95	0.40
MEAN	16.57	489.58	205.28	444.47	1182.85	0.41
HUB	13.89	529.17	282.90	447.20	1181.70	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	543.15	315.00	0.46	3452.92	
MEAN	436.94	501.22	231.66	0.42	3404.69	1.33
HUB	366.18	454.89	83.29	0.38	3931.55	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.15	1.08	20.68	601.74	1.02	582.61	0.92	0.90
MEAN	23.12	1.08	20.55	601.54	1.02	581.53	0.92	0.90
HUB	23.39	1.09	20.38	603.76	1.03	580.39	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	22.44	35.45	31.50	3.95	0.93	0.23	2.90	
MEAN	24.79	27.53	23.50	4.03	0.91	0.24	3.29	0.90
HUB	32.32	10.55	6.50	4.05	0.91	0.26	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.982

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     481.638     206.430     435.157    1184.318       0.407       0.055

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.195      20.695     582.982      46.000      25.379      32.400       7.021

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     458.008     206.430     502.379    1186.199       0.386       0.133

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.160      20.894     584.836     456.573       0.023       0.241

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     435.117       0.000     435.117    1187.928       0.366       0.126

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.035     586.542       0.000       0.060       0.053       0.185

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.830      23.080       1.077     602.347      15.216     294.149       2.280

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94824.602       0.383     750.408 1261299.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  0.967

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.038    3021.000      23.080     602.347       1.000       1.000       0.980
W Kg/sec =   63.65342

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.117    2803.403       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107728.406  109882.742       1.821     509.668     279.941     390.276       1.394

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   405.12    -0.14   405.12     0.34   448.17
 MEAN    15.91     0.00    -0.02   405.12    -0.14   405.12     0.34
 HUB     13.07     0.00    -0.02   405.12    -0.14   405.12     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.02    47.36     2.66   482.97   630.49    21.30   588.65     0.53
 MEAN    46.01    44.80     1.21   419.52   583.30    21.30   588.65     0.49
 HUB     40.39    38.84     1.55   344.57   531.93    21.30   588.65     0.45

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   455.48   169.43   422.80  1199.33     0.38
 MEAN    15.50   463.67   185.50   424.95  1198.00     0.39
 HUB     12.59   496.40   251.91   427.73  1196.62     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   520.47   303.53     0.43  3042.12
 MEAN   408.57   479.94   223.06     0.40  2877.07     1.32
 HUB    331.91   435.15    80.01     0.36  3173.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.64     1.07    22.30   615.21     1.02   597.90     0.92     0.88
 MEAN    24.55     1.06    22.14   614.52     1.02   596.57     0.92     0.88
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 HUB     24.71     1.07    21.94   615.77     1.02   595.20     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.84    35.67    31.50     4.17     0.93     0.22     2.90
 MEAN    23.58    27.70    23.50     4.20     0.91     0.22     3.34     0.88
 HUB     30.50    10.59     6.50     4.09     0.91     0.24     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     468.400     188.904     428.618    1198.273       0.391      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.582      22.122     596.855      46.000      23.784      33.000       9.216

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     457.166     188.904     494.657    1199.144       0.381       0.012

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.498      22.158     597.723     440.827       0.054       0.225

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     426.786       0.000     426.786    1201.390       0.355       0.121

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.426     599.964       0.000       0.060       0.064       0.119

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.795      24.472       1.060     615.166      12.819     325.140       2.520

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79913.062       0.357     632.404 1314581.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    575310.50   4552.8042    136.8026      1.6199      0.8397      7.0126      1.1767


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 80% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.209    3021.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    132.086    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       2.162     831.557     384.662     619.754       1.611

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   312.15    -0.11   312.15     0.28   541.71
 MEAN    17.06     0.00    -0.02   312.15    -0.11   312.15     0.28
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 HUB     12.51     0.00    -0.02   312.15    -0.11   312.15     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.15    50.47     9.68   543.87   627.18    14.30   514.67     0.56
 MEAN    55.24    47.20     8.04   449.76   547.56    14.30   514.67     0.49
 HUB     46.58    38.62     7.96   329.80   454.18    14.30   514.67     0.41

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   524.98   318.57   417.27  1126.84     0.47
 MEAN    18.04   547.66   347.08   423.65  1123.26     0.49
 HUB     15.00   618.19   439.09   435.16  1117.38     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    543.87   474.21   225.31     0.42  6574.24
 MEAN   475.49   442.68   128.41     0.39  6261.69     1.39
 HUB    395.45   437.34    43.64     0.39  6587.68

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.83     1.18    15.36   550.65     1.05   527.63     0.92     0.91
 MEAN    17.69     1.17    15.03   549.33     1.05   524.28     0.92     0.91
 HUB     17.83     1.18    14.48   550.71     1.05   518.79     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.36    28.37    24.20     4.17     0.93     0.33     2.90
 MEAN    39.33    16.86    12.70     4.16     0.93     0.28     3.51     0.91
 HUB     45.26    -5.73    -9.30     3.57     0.93     0.15     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     555.477     346.401     434.237    1123.430       0.494      -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.757      15.021     524.458      24.000      38.580      35.400      -3.180

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     459.132     346.401     575.148    1132.141       0.406       0.306

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.725      15.824     532.623     528.796       0.021       0.444

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     424.556       0.000     424.556    1134.850       0.374       0.361

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.042     535.175       0.000       0.060       0.040       0.383

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      17.672       1.170     550.230      27.420     206.314       1.599

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 170711.172       0.577    1304.368 1312555.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.209    3021.000      17.672     550.230       1.000       1.000       0.980
W Kg/sec =   61.45868
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
115.839	2933.167	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
104013.984	106094.039	1.750	590.487	337.352	474.134	1.405

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	404.97	-0.14	404.97	0.36	526.00
MEAN	18.08	0.00	-0.02	404.97	-0.14	404.97	0.36	
HUB	15.21	0.00	-0.02	404.97	-0.14	404.97	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.23	46.36	6.87	541.76	676.51	16.18	536.53	0.60
MEAN	49.65	42.30	7.35	476.60	625.53	16.18	536.53	0.55
HUB	44.73	37.84	6.89	400.98	570.00	16.18	536.53	0.50

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	483.57	243.88	417.57	1152.31	0.42
MEAN	18.01	494.06	257.54	421.63	1149.90	0.43
HUB	15.22	535.44	323.92	426.35	1147.48	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	510.95	294.45	0.44	4982.95	
MEAN	474.80	474.31	217.26	0.41	4640.83	1.43
HUB	401.33	433.32	77.41	0.38	4933.12	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.93	1.13	17.65	571.32	1.04	551.80	0.92	0.91
MEAN	19.77	1.12	17.41	569.88	1.04	549.49	0.92	0.91
HUB	19.91	1.13	17.14	571.11	1.04	547.17	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.29	35.19	31.50	3.69	0.93	0.31	2.90	
MEAN	31.42	27.26	23.50	3.76	0.93	0.30	3.30	0.91
HUB	37.23	10.29	6.50	3.79	0.93	0.31	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	555.375	258.264	491.671	1145.194	0.485	-0.210

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.843	16.891	545.014	46.000	27.712	30.600	2.888

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	500.047	258.264	562.803	1150.306	0.435	0.000

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	19.817	17.401	549.891	455.853	0.021	0.268

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	493.063	0.000	493.063	1150.912	0.428	0.216

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	17.424	550.470	0.000	0.060	0.039	0.009

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.876	19.770	1.119	570.772	20.542	245.847	1.906

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
127938.578	0.441	977.552	1198238.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 8.045 EfDer = 0.977

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
135.209	3021.000	19.770	570.772	1.000	1.000	0.880

W Kg/sec = 61.45868

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
105.459	2879.902	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
104013.984	106094.039	1.595	489.817	307.133	384.470	1.252

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	459.72	-0.16	459.72	0.40	504.38
MEAN	17.74	0.00	-0.02	459.72	-0.16	459.72	0.40	
HUB	15.05	0.00	-0.02	459.72	-0.16	459.72	0.40	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.02	46.36	2.66	529.11	701.05	17.72	553.13	0.61
MEAN	45.50	43.40	2.10	467.64	655.88	17.72	553.13	0.57
HUB	40.81	38.84	1.97	396.77	607.37	17.72	553.13	0.53

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	474.03	216.85	421.52	1171.32	0.40
MEAN	17.51	485.31	235.48	424.36	1169.64	0.41
HUB	14.85	526.86	307.37	427.90	1167.96	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	520.53	305.40	0.44	4298.99	
MEAN	461.53	480.81	226.05	0.41	4125.17	1.46
HUB	391.49	436.10	84.12	0.37	4566.85	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.81	1.10	19.48	588.97	1.03	570.20	0.92	0.89
MEAN	21.72	1.10	19.29	588.23	1.03	568.56	0.92	0.89
HUB	21.94	1.11	19.08	590.10	1.03	566.92	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.22	35.92	31.50	4.42	0.93	0.31	2.90	
MEAN	29.03	28.04	23.50	4.54	0.91	0.32	3.28	0.89
HUB	35.69	11.12	6.50	4.62	0.91	0.35	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.977

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	490.519	237.021	429.453	1170.087	0.419	0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.797	19.312	569.009	46.000	28.895	31.500	2.605

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	443.548	237.021	502.905	1173.848	0.378	0.177

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.778	19.732	572.672	471.992	0.017	0.285

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	430.348	0.000	430.348	1174.834	0.366	0.191

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.798	573.635	0.000	0.060	0.039	0.203

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.853	21.723	1.099	589.098	18.326	259.826	2.014

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
114176.391	0.419	872.398	1342056.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 8.045 EfDer = 0.993

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
135.209	3021.000	21.723	589.098	1.000	1.000	0.980

W Kg/sec = 61.45868

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
97.506	2834.752	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
104013.984	106094.039	1.808	513.330	283.979	401.059	1.412

ROTOR LEADING EDGE CONDITIONS, STAGE 4

R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP 19.26	0.00	-0.02	403.91	-0.14	403.91	0.34	476.44
MEAN 16.97	0.00	-0.02	403.91	-0.14	403.91	0.34	
HUB 14.32	0.00	-0.02	403.91	-0.14	403.91	0.34	

BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP 51.51	46.36	5.15	507.76	648.92	20.02	575.48	0.55
MEAN 47.93	43.80	4.13	447.40	602.86	20.02	575.48	0.51
HUB 43.08	37.84	5.24	377.52	552.97	20.02	575.48	0.47

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

R2	C2	Cu2	Cm2	Ao2	Mach2
TIP 18.88	463.70	200.49	418.11	1188.57	0.39
MEAN 16.57	473.83	218.11	420.65	1187.04	0.40
HUB 13.89	512.18	287.65	423.78	1185.47	0.43

U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP 497.74	513.00	297.25	0.43	3787.95	
MEAN 436.94	474.17	218.83	0.40	3617.26	1.37
HUB 366.18	430.99	78.54	0.36	3997.38	

Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP 23.66	1.09	21.30	605.12	1.03	587.18	0.92	0.91
MEAN 23.57	1.08	21.11	604.40	1.03	585.66	0.92	0.91
HUB 23.77	1.09	20.90	606.01	1.03	584.11	0.92	0.91

Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP 25.62	35.41	31.50	3.91	0.93	0.26	2.90	
MEAN 27.41	27.48	23.50	3.98	0.92	0.27	3.29	0.91
HUB 34.17	10.50	6.50	4.00	0.92	0.29	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.993

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	466.751	219.335	412.005	1188.381	0.393	0.053

```
     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.637      21.250     586.992      46.000      28.029      32.400       4.371

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     432.013     219.335     484.503    1191.016       0.363       0.179

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.616      21.562     589.598     456.573       0.018       0.279

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     410.463       0.000     410.463    1192.546       0.344       0.175

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.697     591.114       0.000       0.060       0.043       0.232

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      23.552       1.084     605.178      16.080     274.941       2.131

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 100215.680       0.405     765.727 1206675.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.984

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.209    3021.000      23.552     605.178       1.000       1.000       0.980
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.153    2796.838       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       1.920     509.668     265.485     390.276       1.470

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   382.61    -0.13   382.61     0.32   447.12
 MEAN    15.91     0.00    -0.02   382.61    -0.13   382.61     0.32
 HUB     13.07     0.00    -0.02   382.61    -0.13   382.61     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.62    47.36     4.26   482.97   616.26    21.93   592.96     0.52
 MEAN    47.64    44.80     2.84   419.52   567.89    21.93   592.96     0.48
 HUB     42.02    38.84     3.18   344.57   514.98    21.93   592.96     0.43

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   439.70   188.13   397.42  1204.75     0.36
 MEAN    15.50   446.83   199.06   400.04  1203.00     0.37
 HUB     12.59   478.05   256.91   403.14  1201.22     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   488.95   284.83     0.41  3377.45
 MEAN   408.57   451.59   209.51     0.38  3086.98     1.37
 HUB    331.91   410.06    75.00     0.34  3236.28

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.35     1.08    23.12   619.46     1.02   603.33     0.92     0.90
 MEAN    25.19     1.07    22.90   618.23     1.02   601.57     0.92     0.90
 HUB     25.27     1.07    22.65   618.86     1.02   599.79     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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  TIP     25.33    35.63    31.50     4.13     0.93     0.26     2.90
  MEAN    26.45    27.64    23.50     4.14     0.91     0.26     3.34     0.90
  HUB     32.51    10.54     6.50     4.04     0.91     0.26     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.984

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
       R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
       15.219     451.487     202.705     403.424    1203.263       0.375      -0.006

       Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
       25.221      22.882     601.842      46.000      26.678      33.000       6.322

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
       RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
       15.219     428.155     202.705     473.715    1204.974       0.355       0.075

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      25.173      23.067     603.554     440.827       0.040       0.265

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     400.191       0.000     400.191    1206.902       0.332       0.177

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      23.304     605.487       0.000       0.060       0.050       0.174

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.840      25.149       1.068     618.853      13.675     301.000       2.333

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   85258.414       0.381     651.442 1256646.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     598300.25   4571.4858     132.0858      1.6647      0.8566      8.0445      1.1837


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 80% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     131.020     3021.000       15.107     522.810       1.000        1.000        0.980
 W Kg/sec =   59.55438

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     127.993     3009.102        1.402        0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  100791.102  102806.711        2.231     831.557     372.744     619.754       1.663

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa     C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   301.69    -0.10   301.69      0.27   541.71
  MEAN    17.06      0.00    -0.02   301.69    -0.10   301.69      0.27
  HUB     12.51      0.00    -0.02   301.69    -0.10   301.69      0.27

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
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 TIP     60.99    50.47    10.52   543.87   622.04    14.35   515.21     0.56
 MEAN    56.15    47.20     8.95   449.76   541.66    14.35   515.21     0.49
 HUB     47.56    38.62     8.94   329.80   447.05    14.35   515.21     0.40

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   518.19   326.74   402.19  1128.23     0.46
 MEAN    18.04   539.10   351.70   408.57  1124.46     0.48
 HUB     15.00   606.22   437.56   419.58  1118.58     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    543.87   457.06   217.13     0.41  6742.85
 MEAN   475.49   426.92   123.79     0.38  6344.99     1.43
 HUB    395.45   421.69    42.11     0.38  6564.67

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.90     1.18    15.48   551.37     1.05   528.94     0.92     0.91
 MEAN    17.72     1.17    15.14   549.68     1.05   525.41     0.92     0.91
 HUB     17.82     1.18    14.59   550.61     1.05   519.92     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.09    28.36    24.20     4.16     0.93     0.36     2.90
 MEAN    40.72    16.86    12.70     4.16     0.93     0.31     3.51     0.91
 HUB     46.20    -5.73    -9.30     3.57     0.93     0.17     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     546.368     351.014     418.697    1124.673       0.486      -0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.784      15.130     525.620      24.000      39.975      35.400      -4.575

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     441.869     351.014     564.322    1133.864       0.390       0.333

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.749      15.982     534.245     528.796       0.023       0.466

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     409.131       0.000     409.131    1136.330       0.360       0.381

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.173     536.572       0.000       0.060       0.044       0.403

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      17.691       1.171     550.553      27.743     201.055       1.559

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 172722.875       0.584    1278.847 1268596.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.020    3021.000      17.691     550.553       1.000       1.000       0.980
W Kg/sec =   59.55438

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.159    2932.307       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
100791.102	102806.711	1.808	590.487	326.637	474.134	1.452

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	390.46	-0.13	390.46	0.34	525.84
MEAN	18.08	0.00	-0.02	390.46	-0.13	390.46	0.34	
HUB	15.21	0.00	-0.02	390.46	-0.13	390.46	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.23	46.36	7.87	541.76	667.92	16.30	537.82	0.59
MEAN	50.68	42.30	8.38	476.60	616.23	16.30	537.82	0.54
HUB	45.77	37.84	7.93	400.98	559.78	16.30	537.82	0.49

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	476.01	255.14	401.86	1154.29	0.41
MEAN	18.01	485.33	265.73	406.12	1151.63	0.42
HUB	15.22	525.16	326.90	411.00	1148.97	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	491.62	283.20	0.43	5212.74	
MEAN	474.80	456.77	209.07	0.40	4788.16	1.47
HUB	401.33	417.69	74.42	0.36	4978.48	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.05	1.13	17.84	572.62	1.04	553.70	0.92	0.91
MEAN	19.85	1.12	17.57	570.82	1.04	551.15	0.92	0.91
HUB	19.94	1.13	17.28	571.63	1.04	548.60	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.41	35.17	31.50	3.67	0.93	0.33	2.90	
MEAN	33.20	27.24	23.50	3.74	0.93	0.32	3.30	0.91
HUB	38.50	10.26	6.50	3.76	0.93	0.33	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	542.535	266.473	472.585	1147.394	0.473	-0.198

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.926	17.094	547.111	46.000	29.417	30.600	1.183

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	479.459	266.473	548.533	1153.025	0.416	0.046

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	19.905	17.669	552.494	455.853	0.019	0.293

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	472.796	0.000	472.796	1153.578	0.410	0.249

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	17.689	553.024	0.000	0.060	0.037	0.054

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	19.861	1.123	571.691	21.138	236.278	1.832

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
131651.844	0.454	974.755	1155394.125

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.020    3021.000      19.861     571.691       1.000       1.000       0.880
W Kg/sec =   59.55438

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    101.805    2877.585       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100791.102  102806.711       1.652     489.817     296.492     384.470       1.297

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   441.35    -0.15   441.35     0.38   503.98
 MEAN    17.74     0.00    -0.02   441.35    -0.15   441.35     0.38
 HUB     15.05     0.00    -0.02   441.35    -0.15   441.35     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.18    46.36     3.82   529.11   689.14    17.96   555.43     0.60
 MEAN    46.67    43.40     3.27   467.64   643.13    17.96   555.43     0.56
 HUB     41.97    38.84     3.13   396.77   593.58    17.96   555.43     0.51

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   464.78   230.09   403.84  1174.14     0.40
 MEAN    17.51   475.14   245.16   407.00  1172.16     0.41
 HUB     14.85   515.29   311.12   410.76  1170.17     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   498.44   292.17     0.42  4561.13
 MEAN   461.53   460.94   216.37     0.39  4294.60     1.50
 HUB    391.49   418.55    80.37     0.36  4622.41

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.06     1.11    19.80   590.99     1.03   572.96     0.92     0.90
 MEAN    21.92     1.10    19.58   589.87     1.03   571.02     0.92     0.90
 HUB     22.09     1.11    19.33   591.25     1.03   569.08     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.67    35.88    31.50     4.38     0.93     0.33     2.90
 MEAN    31.06    28.00    23.50     4.50     0.92     0.34     3.28     0.90
 HUB     37.14    11.07     6.50     4.57     0.92     0.36     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.988

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     480.117     246.769     411.846    1172.601       0.409       0.009

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.998      19.597     571.458      46.000      30.929      31.500       0.571

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     424.297     246.769     490.838    1176.917       0.361       0.214

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.983      20.093     575.673     471.992       0.016       0.315

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     411.751       0.000     411.751    1177.812       0.350       0.226
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.153	576.549	0.000	0.060	0.037	0.238

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.867	21.933	1.104	590.704	19.013	247.649	1.920

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
118457.344	0.434	877.063	1290725.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
131.020	3021.000	21.933	590.704	1.000	1.000	0.980

W Kg/sec = 59.55438

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
93.711	2830.896	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
100791.102	102806.711	1.881	513.330	272.925	401.059	1.469

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	386.77	-0.13	386.77	0.33	475.79
MEAN	16.97	0.00	-0.02	386.77	-0.13	386.77	0.33	
HUB	14.32	0.00	-0.02	386.77	-0.13	386.77	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.71	46.36	6.35	507.76	638.39	20.36	578.22	0.54
MEAN	49.17	43.80	5.37	447.40	591.50	20.36	578.22	0.50
HUB	44.32	37.84	6.48	377.52	540.57	20.36	578.22	0.46

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	453.05	214.26	399.18	1192.12	0.38
MEAN	16.57	462.25	228.11	402.04	1190.28	0.39
HUB	13.89	499.24	291.34	405.41	1188.42	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	489.59	283.48	0.41	4047.82	
MEAN	436.94	453.04	208.83	0.38	3782.93	1.41
HUB	366.18	412.26	74.84	0.35	4048.64	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.03	1.10	21.75	607.83	1.03	590.70	0.92	0.91
MEAN	23.89	1.09	21.52	606.71	1.03	588.87	0.92	0.91
HUB	24.03	1.10	21.28	607.83	1.03	587.03	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.22	35.38	31.50	3.88	0.93	0.29	2.90	
MEAN	29.57	27.45	23.50	3.95	0.92	0.29	3.29	0.91
HUB	35.70	10.46	6.50	3.96	0.92	0.31	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	455.833	229.393	393.907	1191.530	0.383	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.955	21.652	590.111	46.000	30.215	32.400	2.185

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	411.944	229.393	471.507	1194.736	0.345	0.216

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.941	22.049	593.290	456.573	0.016	0.310

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	391.497	0.000	391.497	1196.115	0.327	0.212

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.176	594.662	0.000	0.060	0.038	0.268

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.872	23.886	1.089	607.456	16.752	260.901	2.022

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
104406.289	0.421	773.028	1161061.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.993

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
131.020	3021.000	23.886	607.456	1.000	1.000	0.980

W Kg/sec = 59.55438

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
87.261	2791.589	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
100791.102	102806.711	2.005	509.668	254.149	390.276	1.536

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	365.23	-0.13	365.23	0.30	446.28
MEAN	15.91	0.00	-0.02	365.23	-0.13	365.23	0.30	
HUB	13.07	0.00	-0.02	365.23	-0.13	365.23	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.91	47.36	5.55	482.97	605.62	22.39	596.32	0.51
MEAN	48.97	44.80	4.17	419.52	556.32	22.39	596.32	0.46
HUB	43.34	38.84	4.50	344.57	502.20	22.39	596.32	0.42

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	428.90	202.29	378.20	1208.86	0.35
MEAN	15.50	434.79	209.32	381.09	1206.82	0.36
HUB	12.59	464.46	260.73	384.38	1204.76	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	472.96	465.07	270.67	0.38	3631.37	
MEAN	408.57	430.04	199.25	0.36	3245.91	1.41
HUB	331.91	390.91	71.18	0.32	3284.26	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.86	1.08	23.70	622.81	1.03	607.46	0.92	0.91
MEAN	25.64	1.07	23.44	621.18	1.02	605.41	0.92	0.91
HUB	25.66	1.07	23.16	621.34	1.02	603.34	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.14	35.59	31.50	4.09	0.93	0.29	2.90	
MEAN	28.78	27.60	23.50	4.10	0.92	0.28	3.34	0.91
HUB	34.15	10.49	6.50	3.99	0.92	0.28	4.06	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      439.434     213.155     384.274     1207.073       0.364       -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     25.675      23.426      605.665      46.000      29.017       33.000       3.983

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      406.518     213.155     459.012     1209.386       0.336       0.123

   BlockageThr  PtTh        PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.950       25.646      23.714      607.989      440.827       0.033       0.298

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4        cp 3-4
     14.701      380.276       0.000     380.276     1211.099       0.314       0.220

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       23.930      609.712       0.000       0.060       0.042       0.217

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.863       25.625        1.073      621.780       14.324      284.024       2.202

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  89308.336       0.399     661.242 1208583.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    616546.69    4564.9351     127.9930       1.6962       0.8641       8.9529       1.1893


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 80% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  0.991

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    126.046     3021.000       15.107      522.810        1.000        1.000        0.980
W Kg/sec =   57.29363

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
    123.134     3009.102        1.402        0.249       53.349       32.000       0.050

   CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
  96964.961    98904.055        2.319      831.557      358.594      619.754       1.728

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.63      0.00     -0.02    289.39     -0.10    289.39      0.26    541.71
 MEAN    17.06      0.00     -0.02    289.39     -0.10    289.39      0.26
 HUB     12.51      0.00     -0.02    289.39     -0.10    289.39      0.26

       BetaFlo    BetaBlade Incid    U1        W1        Ps1       Ts1      Rel Mach
 TIP     61.99     50.47     11.52    543.87    616.16     14.41    515.82      0.55
 MEAN    57.25     47.20     10.05    449.76    534.90     14.41    515.82      0.48
 HUB     48.74     38.62     10.12    329.80    438.84     14.41    515.82      0.39
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      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   510.93   336.16   384.78  1129.77     0.45
 MEAN    18.04   529.54   357.00   391.11  1125.80     0.47
 HUB     15.00   592.54   435.76   401.52  1119.93     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    543.87   437.26   207.72     0.39  6936.94
 MEAN   475.49   408.66   118.49     0.36  6440.60     1.48
 HUB    395.45   403.53    40.32     0.36  6537.71

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.97     1.19    15.61   552.19     1.06   530.38     0.92     0.91
 MEAN    17.75     1.17    15.25   550.09     1.05   526.67     0.92     0.91
 HUB     17.79     1.18    14.70   550.50     1.05   521.17     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.14    28.36    24.20     4.16     0.93     0.38     2.90
 MEAN    42.39    16.85    12.70     4.15     0.94     0.33     3.51     0.91
 HUB     47.34    -5.73    -9.30     3.57     0.94     0.19     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     536.210     356.309     400.705    1126.052       0.476       -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.810      15.246     526.909      24.000      41.644      35.400      -6.244

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     422.054     356.309     552.345    1135.773       0.372       0.364

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.769      16.151     536.046     528.796       0.025       0.492

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083     391.390       0.000     391.390    1137.978       0.344       0.402

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.312     538.129       0.000       0.060       0.050       0.424

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      17.705       1.172     550.924      28.114     194.961       1.511

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 175032.500       0.592    1246.752 1216867.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3021.000      17.705     550.924       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    107.855    2931.319       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       1.880     590.487     314.102     474.134       1.509
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ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	373.74	-0.13	373.74	0.33	525.67
MEAN	18.08	0.00	-0.02	373.74	-0.13	373.74	0.33	
HUB	15.21	0.00	-0.02	373.74	-0.13	373.74	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.41	46.36	9.05	541.76	658.28	16.43	539.26	0.58
MEAN	51.90	42.30	9.60	476.60	605.77	16.43	539.26	0.53
HUB	47.02	37.84	9.18	400.98	548.25	16.43	539.26	0.48

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	468.24	267.88	384.04	1156.46	0.40
MEAN	18.01	475.94	275.01	388.44	1153.54	0.41
HUB	15.22	513.67	330.24	393.45	1150.62	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	469.72	270.46	0.41	5472.74	
MEAN	474.80	436.81	199.79	0.38	4955.27	1.51
HUB	401.33	399.82	71.08	0.35	5029.25	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.18	1.14	18.02	574.09	1.04	555.78	0.92	0.91
MEAN	19.94	1.13	17.73	571.90	1.04	552.99	0.92	0.91
HUB	19.97	1.13	17.41	572.21	1.04	550.18	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.90	35.15	31.50	3.65	0.93	0.36	2.90	
MEAN	35.30	27.22	23.50	3.72	0.94	0.35	3.30	0.91
HUB	40.01	10.24	6.50	3.74	0.94	0.35	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.993

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	528.661	275.784	451.028	1149.787	0.460	-0.185

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.005	17.303	549.397	46.000	31.444	30.600	-0.844

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	456.439	275.784	533.285	1155.987	0.395	0.098

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	19.987	17.948	555.338	455.853	0.018	0.323

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	450.200	0.000	450.200	1156.479	0.389	0.286

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	17.962	555.811	0.000	0.060	0.037	0.104

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	19.944	1.126	572.736	21.812	225.783	1.750

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
135851.672	0.469	967.668	1105473.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =10.047 EfDer = 0.996

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
126.046	3021.000	19.944	572.736	1.000	1.000	0.880

W Kg/sec = 57.29363

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
97.626	2874.958	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96964.961	98904.055	1.723	489.817	284.319	384.470	1.352

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	420.77	-0.14	420.77	0.36	503.52
MEAN	17.74	0.00	-0.02	420.77	-0.14	420.77	0.36	
HUB	15.05	0.00	-0.02	420.77	-0.14	420.77	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.51	46.36	5.15	529.11	676.13	18.20	557.95	0.58
MEAN	48.03	43.40	4.63	467.64	629.18	18.20	557.95	0.54
HUB	43.33	38.84	4.49	396.77	578.43	18.20	557.95	0.50

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	455.59	244.69	384.30	1177.18	0.39
MEAN	17.51	464.55	255.84	387.76	1174.88	0.40
HUB	14.85	502.82	315.27	391.71	1172.59	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	474.06	277.56	0.40	4850.26	
MEAN	461.53	438.93	205.69	0.37	4481.50	1.55
HUB	391.49	399.05	76.23	0.34	4683.91	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.31	1.12	20.12	593.26	1.04	575.93	0.92	0.91
MEAN	22.12	1.11	19.86	591.70	1.03	573.68	0.92	0.91
HUB	22.22	1.11	19.58	592.56	1.03	571.45	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.49	35.84	31.50	4.34	0.93	0.36	2.90	
MEAN	33.42	27.94	23.50	4.44	0.92	0.36	3.28	0.91
HUB	38.83	11.01	6.50	4.51	0.92	0.38	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	469.304	257.522	392.337	1175.323	0.399	0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.195	19.883	574.119	46.000	33.280	31.500	-1.780

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	403.175	257.522	478.401	1180.244	0.342	0.256

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.181	20.458	578.936	471.992	0.016	0.350

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	391.423	0.000	391.423	1181.038	0.331	0.264

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.507	579.715	0.000	0.060	0.038	0.276

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    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      22.130       1.110     592.507      19.771     234.815       1.820

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 123181.891       0.452     877.421 1231704.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3021.000      22.130     592.507       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.488    2826.585       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 96964.961   98904.055       1.970     513.330     260.628     401.059       1.539

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   367.97    -0.13   367.97     0.31   475.06
 MEAN    16.97     0.00    -0.02   367.97    -0.13   367.97     0.31
 HUB     14.32     0.00    -0.02   367.97    -0.13   367.97     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.08    46.36     7.72   507.76   627.17    20.69   581.21     0.53
 MEAN    50.57    43.80     6.77   447.40   579.38    20.69   581.21     0.49
 HUB     45.74    37.84     7.90   377.52   527.27    20.69   581.21     0.45

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   442.67   229.07   378.80  1195.91     0.37
 MEAN    16.57   450.47   238.88   381.91  1193.76     0.38
 HUB     13.89   485.61   295.32   385.48  1191.60     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   464.40   268.67     0.39  4327.19
 MEAN   436.94   430.22   198.06     0.36  3961.35     1.46
 HUB    366.18   391.94    70.86     0.33  4103.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.39     1.10    22.19   610.81     1.03   594.46     0.92     0.91
 MEAN    24.19     1.09    21.93   609.26     1.03   592.33     0.92     0.91
 HUB     24.27     1.10    21.64   609.87     1.03   590.18     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.16    35.35    31.50     3.85     0.93     0.32     2.90
 MEAN    32.03    27.41    23.50     3.91     0.93     0.32     3.29     0.91
 HUB     37.46    10.42     6.50     3.92     0.93     0.33     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     444.771     240.225     374.317    1194.910       0.372       0.050

    Pt3        Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.260     22.045     593.469      46.000      32.691      32.400      -0.291

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     16.481     390.442     240.225     458.425    1198.717       0.326       0.258

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.250      22.530     597.257     456.573       0.015       0.347

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     371.243       0.000     371.243    1199.941       0.309       0.252

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.642     598.477       0.000       0.060       0.037       0.306

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      24.198       1.093     609.982      17.474     246.539       1.911

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 108914.969       0.440     775.798 1108634.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3021.000      24.198     609.982       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     83.038    2785.804       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       2.107     509.668     241.851     390.276       1.614

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   346.61    -0.12   346.61     0.29   445.36
 MEAN    15.91     0.00    -0.02   346.61    -0.12   346.61     0.29
 HUB     13.07     0.00    -0.02   346.61    -0.12   346.61     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.34    47.36     6.98   482.97   594.57    22.84   599.96     0.49
 MEAN    50.44    44.80     5.64   419.52   544.28    22.84   599.96     0.45
 HUB     44.84    38.84     6.00   344.57   488.82    22.84   599.96     0.41

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   418.68   217.16   357.96  1213.20     0.35
 MEAN    15.50   422.88   220.16   361.05  1210.88     0.35
 HUB     12.59   450.46   264.72   364.48  1208.54     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   439.96   255.80     0.36  3897.99
 MEAN   408.57   407.25   188.41     0.34  3413.82     1.46
 HUB    331.91   370.62    67.20     0.31  3334.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.35     1.09    24.26   626.47     1.03   611.84     0.92     0.91
 MEAN    26.07     1.08    23.96   624.42     1.02   609.49     0.92     0.91
 HUB     26.03     1.08    23.65   624.08     1.02   607.15     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.24    35.55    31.50     4.05     0.93     0.32     2.90
 MEAN    31.37    27.56    23.50     4.06     0.92     0.31     3.34     0.91
 HUB     35.99    10.45     6.50     3.95     0.92     0.31     4.06


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.999

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     427.541     224.195     364.044    1211.112       0.353      -0.006

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      26.107      23.949     609.734      46.000      31.627      33.000       1.373

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     383.989     224.195     444.647    1214.038       0.316       0.174

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      26.089      24.339     612.684     440.827       0.028       0.336

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     359.495       0.000     359.495    1215.543       0.296       0.266

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      24.532     614.203       0.000       0.060       0.037       0.262

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.877      26.069       1.077     624.988      15.006     267.190       2.071

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   93567.461       0.418     666.479 1153584.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     636548.44   4534.1177    123.1343      1.7256      0.8664     10.0471      1.1954


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 80% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  0.986

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     121.700    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   55.31819

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     118.889    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   93621.680   95493.914       2.402     831.557     346.230     619.754       1.790

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   278.73    -0.10   278.73     0.25   541.71
  MEAN    17.06     0.00    -0.02   278.73    -0.10   278.73     0.25
  HUB     12.51     0.00    -0.02   278.73    -0.10   278.73     0.25

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.87    50.47    12.40   543.87   611.22    14.46   516.32     0.55
  MEAN    58.22    47.20    11.02   449.76   529.21    14.46   516.32     0.47
  HUB     49.81    38.62    11.19   329.80   431.89    14.46   516.32     0.39

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
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     0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   505.24   344.12   369.93  1131.02     0.45
 MEAN    18.04   521.71   361.50   376.17  1126.90     0.46
 HUB     15.00   581.00   434.18   386.07  1121.03     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    543.87   420.42   199.75     0.37  7101.16
 MEAN   475.49   393.06   113.99     0.35  6521.64     1.53
 HUB    395.45   388.01    38.73     0.35  6513.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.02     1.19    15.71   552.88     1.06   531.56     0.92     0.90
 MEAN    17.77     1.18    15.34   550.43     1.05   527.70     0.92     0.90
 HUB     17.77     1.18    14.79   550.40     1.05   522.20     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.93    28.37    24.20     4.17     0.93     0.41     2.90
 MEAN    43.86    16.86    12.70     4.16     0.94     0.36     3.51     0.90
 HUB     48.36    -5.73    -9.30     3.57     0.94     0.22     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     527.884     360.797     385.341    1127.176       0.468      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.828      15.338     527.962      24.000      43.116      35.400      -7.716

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     405.255     360.797     542.592    1137.333       0.356       0.390

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.781      16.285     537.519     528.796       0.028       0.515

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     376.320       0.000     376.320    1139.329       0.330       0.420

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.419     539.408       0.000       0.060       0.056       0.442

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      17.709       1.172     551.236      28.426     189.757       1.471

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 176978.844       0.598    1217.150 1172050.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    3021.000      17.709     551.236       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.140    2930.488       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       1.947     590.487     303.283     474.134       1.563

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     20.55     0.00    -0.02   359.51    -0.12   359.51     0.32   525.52
MEAN    18.08     0.00    -0.02   359.51    -0.12   359.51     0.32
HUB     15.21     0.00    -0.02   359.51    -0.12   359.51     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.44    46.36    10.08   541.76   650.30    16.53   540.44     0.57
MEAN    52.98    42.30    10.68   476.60   597.09    16.53   540.44     0.52
HUB     48.13    37.84    10.29   400.98   538.64    16.53   540.44     0.47

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   462.38   278.51   369.09  1158.21     0.40
MEAN    18.01   468.51   282.80   373.53  1155.09     0.41
HUB     15.22   504.23   333.05   378.59  1151.97     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    538.34   451.37   259.83     0.39  5689.68
MEAN   474.80   419.99   192.00     0.36  5095.42     1.55
HUB    401.33   384.70    68.28     0.33  5071.92

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.27     1.14    18.16   575.32     1.04   557.47     0.92     0.90
MEAN    19.99     1.13    17.85   572.81     1.04   554.48     0.92     0.90
HUB     19.98     1.13    17.51   572.71     1.04   551.48     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.04    35.14    31.50     3.64     0.93     0.38     2.90
MEAN    37.13    27.20    23.50     3.70     0.94     0.37     3.30     0.90
HUB     41.34    10.22     6.50     3.72     0.94     0.36     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.988

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     517.602     283.592     432.998    1151.713       0.449      -0.173

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.060      17.460     551.240      46.000      33.223      30.600      -2.623

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     437.353     283.592     521.251    1158.378       0.378       0.142

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      20.040      18.160     557.640     455.853       0.019       0.350

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     431.516       0.000     431.516    1158.818       0.372       0.315

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.850      18.167     558.063       0.000       0.060       0.039       0.145

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.872      19.995       1.129     573.613      22.376     217.243       1.684

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 139365.188       0.481     958.467 1062600.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    3021.000      19.995     573.613       1.000       1.000       0.880
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W Kg/sec = 55.31819

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
94.089	2872.760	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
93621.680	95493.914	1.788	489.817	274.021	384.470	1.403

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	403.68	-0.14	403.68	0.35	503.13
MEAN	17.74	0.00	-0.02	403.68	-0.14	403.68	0.35	
HUB	15.05	0.00	-0.02	403.68	-0.14	403.68	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.67	46.36	6.31	529.11	665.63	18.39	560.01	0.57
MEAN	49.21	43.40	5.81	467.64	617.88	18.39	560.01	0.53
HUB	44.52	38.84	5.68	396.77	566.12	18.39	560.01	0.49

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	448.90	256.62	368.31	1179.61	0.38
MEAN	17.51	456.45	264.61	371.93	1177.08	0.39
HUB	14.85	492.86	318.65	376.00	1174.55	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	454.11	265.63	0.38	5086.50	
MEAN	461.53	420.84	196.92	0.36	4634.85	1.59
HUB	391.49	382.99	72.84	0.33	4734.11	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.49	1.12	20.35	595.14	1.04	578.31	0.92	0.91
MEAN	22.26	1.11	20.07	593.23	1.03	575.83	0.92	0.91
HUB	22.31	1.12	19.76	593.65	1.03	573.37	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.87	35.80	31.50	4.30	0.93	0.38	2.90	
MEAN	35.43	27.90	23.50	4.40	0.92	0.38	3.28	0.91
HUB	40.28	10.96	6.50	4.46	0.92	0.40	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	461.031	266.345	376.311	1177.507	0.392	0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.332	20.090	576.258	46.000	35.290	31.500	-3.790

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	385.964	266.345	468.944	1182.918	0.326	0.291

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.315	20.727	581.567	471.992	0.017	0.381

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	374.911	0.000	374.911	1183.632	0.317	0.293

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.763	582.269	0.000	0.060	0.042	0.306

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

```
      0.879      22.260       1.113     594.004      20.391     224.729       1.742

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 127046.984       0.466     873.750 1181568.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    3021.000      22.260     594.004       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     86.004    2823.021       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       2.049     513.330     250.483     401.059       1.601

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   352.66    -0.12   352.66     0.30   474.47
 MEAN    16.97     0.00    -0.02   352.66    -0.12   352.66     0.30
 HUB     14.32     0.00    -0.02   352.66    -0.12   352.66     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.22    46.36     8.86   507.76   618.31    20.93   583.62     0.52
 MEAN    51.76    43.80     7.96   447.40   569.78    20.93   583.62     0.48
 HUB     46.96    37.84     9.12   377.52   516.70    20.93   583.62     0.44

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   435.20   240.88   362.46  1198.90     0.36
 MEAN    16.57   441.60   247.52   365.71  1196.54     0.37
 HUB     13.89   474.91   298.49   369.39  1194.16     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   444.25   256.86     0.37  4550.14
 MEAN   436.94   411.85   189.42     0.34  4104.42     1.51
 HUB    366.18   375.54    67.70     0.31  4147.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.65     1.11    22.50   613.25     1.03   597.44     0.92     0.91
 MEAN    24.40     1.10    22.21   611.37     1.03   595.09     0.92     0.91
 HUB     24.43     1.10    21.90   611.55     1.03   592.72     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.61    35.32    31.50     3.82     0.93     0.35     2.90
 MEAN    34.09    27.38    23.50     3.88     0.93     0.34     3.29     0.91
 HUB     38.94    10.39     6.50     3.89     0.93     0.35     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     436.471     248.911     358.539    1197.603       0.364       0.048

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.470      22.322     596.155      46.000      34.770      32.400      -2.370

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     373.269     248.911     448.649    1201.886       0.311       0.293

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      24.458      22.874     600.426     456.573       0.015       0.378

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     355.113       0.000     355.113    1202.991       0.295       0.284

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.971     601.530       0.000       0.060       0.039       0.335

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      24.404       1.096     612.056      18.052     235.536       1.826

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 112517.578       0.454     773.826 1064085.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    3021.000      24.404     612.056       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     79.630    2781.079       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       2.198     509.668     231.927     390.276       1.683

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   331.75    -0.11   331.75     0.28   444.60
 MEAN    15.91     0.00    -0.02   331.75    -0.11   331.75     0.28
 HUB     13.07     0.00    -0.02   331.75    -0.11   331.75     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.52    47.36     8.16   482.97   586.03    23.15   602.87     0.49
 MEAN    51.67    44.80     6.87   419.52   534.93    23.15   602.87     0.44
 HUB     46.10    38.84     7.26   344.57   478.40    23.15   602.87     0.40

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   411.51   228.80   342.05  1216.61     0.34
 MEAN    15.50   414.09   228.67   345.22  1214.09     0.34
 HUB     12.59   439.73   267.88   348.71  1211.55     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   420.25   244.16     0.35  4106.72
 MEAN   408.57   389.28   179.90     0.32  3545.65     1.51
 HUB    331.91   354.55    64.04     0.29  3374.04

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.69     1.09    24.65   629.42     1.03   615.29     0.92     0.91
 MEAN    26.37     1.08    24.33   627.05     1.02   612.74     0.92     0.91
 HUB     26.27     1.08    23.98   626.32     1.02   610.19     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.78    35.52    31.50     4.02     0.93     0.35     2.90
 MEAN    33.52    27.52    23.50     4.02     0.93     0.34     3.34     0.91
 HUB     37.53    10.41     6.50     3.91     0.93     0.33     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     418.790     232.863     348.081    1214.304       0.345      -0.007

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      26.399      24.312     612.962      46.000      33.782      33.000      -0.782

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     366.419     232.863     434.152    1217.699       0.301       0.215

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      26.384      24.776     616.394     440.827       0.027       0.368

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     343.268       0.000     343.268    1219.052       0.282       0.301

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      24.950     617.765       0.000       0.060       0.037       0.297

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.881      26.364       1.080     627.598      15.542     254.608       1.974

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   96909.688       0.433     666.485 1106987.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     652818.25   4489.6782    118.8887      1.7451      0.8637     11.0174      1.2004


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 80% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  0.981

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     117.504    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   53.41085

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     114.790    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   90393.664   92201.352       2.488     831.557     334.292     619.754       1.854

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   268.52    -0.09   268.52     0.24   541.71
  MEAN    17.06     0.00    -0.02   268.52    -0.09   268.52     0.24
  HUB     12.51     0.00    -0.02   268.52    -0.09   268.52     0.24

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.73    50.47    13.26   543.87   606.63    14.51   516.79     0.54
  MEAN    59.17    47.20    11.97   449.76   523.90    14.51   516.79     0.47
  HUB     50.86    38.62    12.24   329.80   425.36    14.51   516.79     0.38

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

           R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     20.63   500.29   351.61   355.90  1132.16     0.44
 MEAN    18.04   514.58   365.72   362.00  1127.90     0.46
 HUB     15.00   570.20   432.64   371.42  1122.03     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    543.87   404.51   192.26     0.36  7255.70
 MEAN   475.49   378.28   109.77     0.34  6597.71     1.57
 HUB    395.45   373.27    37.19     0.33  6490.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.07     1.20    15.80   553.54     1.06   532.63     0.92     0.90
 MEAN    17.79     1.18    15.42   550.75     1.05   528.63     0.92     0.90
 HUB     17.74     1.17    14.87   550.30     1.05   523.14     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.65    28.38    24.20     4.18     0.93     0.43     2.90
 MEAN    45.29    16.87    12.70     4.17     0.94     0.38     3.51     0.90
 HUB     49.35    -5.72    -9.30     3.58     0.94     0.24     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     520.297     365.009     370.780    1128.197       0.461       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.842      15.419     528.919      24.000      44.551      35.400      -9.151

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     389.426     365.009     533.746    1138.753       0.342       0.415

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.788      16.404     538.863     528.796       0.031       0.538

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     362.091       0.000     362.091    1140.565       0.317       0.437

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.512     540.578       0.000       0.060       0.064       0.459

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.848      17.708       1.172     551.529      28.719     184.822       1.433

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 178801.688       0.604    1187.288 1129097.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  0.982

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     117.504    3021.000      17.708     551.529       1.000       1.000       0.980
W Kg/sec =   53.41085

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     100.584    2929.710       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  90393.664   92201.352       2.016     590.487     292.928     474.134       1.619

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   346.06    -0.12   346.06     0.30   525.38
 MEAN    18.08     0.00    -0.02   346.06    -0.12   346.06     0.30
 HUB     15.21     0.00    -0.02   346.06    -0.12   346.06     0.30
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.44    46.36    11.08   541.76   642.96    16.61   541.53     0.56
MEAN    54.02    42.30    11.72   476.60   589.08    16.61   541.53     0.52
HUB     49.21    37.84    11.37   400.98   529.75    16.61   541.53     0.46

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   457.46   288.40   355.10  1159.79     0.39
MEAN    18.01   461.93   290.02   359.54  1156.50     0.40
HUB     15.22   495.55   335.62   364.59  1153.20     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    538.34   434.23   249.93     0.37  5891.65
MEAN   474.80   404.25   184.78     0.35  5225.37     1.60
HUB    401.33   370.47    65.71     0.32  5110.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.35     1.15    18.28   576.47     1.05   559.00     0.92     0.90
MEAN    20.04     1.13    17.95   573.65     1.04   555.83     0.92     0.90
HUB     19.98     1.13    17.60   573.17     1.04   552.66     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.08    35.14    31.50     3.64     0.93     0.40     2.90
MEAN    38.89    27.20    23.50     3.70     0.94     0.39     3.30     0.90
HUB     42.63    10.22     6.50     3.72     0.94     0.38     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.982

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     507.725     290.832     416.175    1153.445       0.440      -0.163

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.100      17.593     552.902      46.000      34.947      30.600      -4.347

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     419.671     290.832     510.595    1160.537       0.362       0.184

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      20.078      18.341     559.721     455.853       0.020       0.376

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     414.245       0.000     414.245    1160.928       0.357       0.342

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.850      18.339     560.099       0.000       0.060       0.043       0.183

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.865      20.028       1.131     574.429      22.900     209.474       1.624

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 142625.078       0.492     947.066 1021800.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    117.504    3021.000      20.028     574.429       1.000       1.000       0.880
W Kg/sec =   53.41085

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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    90.759    2870.719       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
90393.664   92201.352       1.853     489.817     264.323     384.470       1.455

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   387.83    -0.13   387.83     0.33   502.77
MEAN    17.74     0.00    -0.02   387.83    -0.13   387.83     0.33
HUB     15.05     0.00    -0.02   387.83    -0.13   387.83     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.77    46.36     7.41   529.11   656.13    18.54   561.87     0.56
MEAN    50.34    43.40     6.94   467.64   607.64    18.54   561.87     0.52
HUB     45.66    38.84     6.82   396.77   554.92    18.54   561.87     0.48

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   443.44   267.52   353.65  1181.78     0.38
MEAN    17.51   449.49   272.63   357.36  1179.05     0.38
HUB     14.85   483.95   321.74   361.50  1176.33     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    522.26   435.84   254.73     0.37  5302.29
MEAN   461.53   404.22   188.90     0.34  4775.19     1.63
HUB    391.49   368.17    69.75     0.31  4779.92

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.64     1.13    20.54   596.87     1.04   580.45     0.92     0.91
MEAN    22.37     1.12    20.23   594.64     1.04   577.77     0.92     0.91
HUB     22.37     1.12    19.91   594.66     1.04   575.10     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.11    35.77    31.50     4.27     0.93     0.41     2.90
MEAN    37.34    27.86    23.50     4.36     0.93     0.40     3.28     0.91
HUB     41.67    10.92     6.50     4.42     0.93     0.41     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      453.918     274.419     361.574    1179.469       0.385        0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.437      20.255      578.185      46.000      37.197      31.500      -5.697

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392      370.239     274.419     460.850    1185.328       0.312        0.323

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.415      20.948     583.943     471.992       0.020        0.410

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     359.856       0.000     359.856    1185.970       0.303        0.319

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950      20.968     584.576       0.000       0.060        0.048        0.332

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.876      22.353       1.116     595.387      20.958     215.789        1.673

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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 130579.547       0.479     867.081 1134251.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    117.504    3021.000      22.353     595.387       1.000       1.000       0.980
W Kg/sec =   53.41085

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     82.790    2819.741       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 90393.664   92201.352       2.129     513.330     241.122     401.059       1.663

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   338.67    -0.12   338.67     0.29   473.91
 MEAN    16.97     0.00    -0.02   338.67    -0.12   338.67     0.29
 HUB     14.32     0.00    -0.02   338.67    -0.12   338.67     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.30    46.36     9.94   507.76   610.44    21.12   585.81     0.51
 MEAN    52.88    43.80     9.08   447.40   561.22    21.12   585.81     0.47
 HUB     48.11    37.84    10.27   377.52   507.26    21.12   585.81     0.43

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   429.15   251.52   347.72  1201.57     0.36
 MEAN    16.57   434.05   255.29   351.04  1199.02     0.36
 HUB     13.89   465.46   301.32   354.76  1196.45     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   426.07   246.22     0.35  4750.88
 MEAN   436.94   395.25   181.65     0.33  4233.07     1.55
 HUB    366.18   360.65    64.86     0.30  4187.03

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.84     1.11    22.75   615.48     1.03   600.11     0.92     0.91
 MEAN    24.56     1.10    22.43   613.29     1.03   597.57     0.92     0.91
 HUB     24.54     1.10    22.10   613.10     1.03   595.02     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.88    35.30    31.50     3.80     0.93     0.37     2.90
 MEAN    36.03    27.36    23.50     3.86     0.93     0.36     3.29     0.91
 HUB     40.34    10.36     6.50     3.86     0.93     0.36     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     429.428     256.723     344.242    1200.016       0.358       0.047

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.626      22.538     598.566      46.000      36.714      32.400      -4.314

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     357.807     256.723     440.377    1204.724       0.297       0.325

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.612      23.149     603.273     456.573       0.016       0.408

    VANED DIFFUSER EXIT:
```

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	340.619	0.000	340.619	1205.724	0.283	0.311

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.228	604.274	0.000	0.060	0.043	0.360

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.874	24.553	1.098	613.958	18.571	225.955	1.752

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
115758.109	0.467	768.663	1022006.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =11.967 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
117.504	3021.000	24.553	613.958	1.000	1.000	0.980

W Kg/sec = 53.41085

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
76.537	2776.767	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
90393.664	92201.352	2.286	509.668	222.919	390.276	1.751

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	318.37	-0.11	318.37	0.26	443.91
MEAN	15.91	0.00	-0.02	318.37	-0.11	318.37	0.26	
HUB	13.07	0.00	-0.02	318.37	-0.11	318.37	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.61	47.36	9.25	482.97	578.56	23.39	605.50	0.48
MEAN	52.81	44.80	8.01	419.52	526.73	23.39	605.50	0.44
HUB	47.27	38.84	8.43	344.57	469.21	23.39	605.50	0.39

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	405.82	239.13	327.89	1219.63	0.33
MEAN	15.50	406.74	236.25	331.10	1216.95	0.33
HUB	12.59	430.34	270.61	334.61	1214.25	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	472.96	402.72	233.83	0.33	4291.95	
MEAN	408.57	373.25	172.32	0.31	3663.02	1.56
HUB	331.91	340.18	61.31	0.28	3408.38	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	26.95	1.10	24.96	632.11	1.03	618.36	0.92	0.91
MEAN	26.59	1.08	24.61	629.45	1.03	615.64	0.92	0.91
HUB	26.44	1.08	24.24	628.37	1.02	612.92	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.10	35.49	31.50	3.99	0.93	0.37	2.90	
MEAN	35.51	27.49	23.50	3.99	0.93	0.36	3.34	0.91
HUB	38.96	10.38	6.50	3.88	0.93	0.34	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	411.493	240.580	333.838	1217.146	0.338	-0.007

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.617      24.590     615.845      46.000      35.778      33.000      -2.778

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     350.874     240.580     425.431    1220.951       0.287       0.250

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.599      25.116     619.701     440.827       0.028       0.398

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     328.900       0.000     328.900    1222.178       0.269       0.331

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.271     620.948       0.000       0.060       0.039       0.326

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      26.577       1.082     629.974      16.016     243.853       1.890

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  99870.953       0.446     663.168 1063050.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    667635.38   4433.2666    114.7895      1.7592      0.8578     11.9669      1.2050


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 80% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc =13.026   EfDer =  0.973

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    112.885    3021.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   51.31144

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    110.278    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  86840.570   88577.203       2.589     831.557     321.152     619.754       1.930

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   257.36    -0.09   257.36     0.23   541.71
 MEAN    17.06     0.00    -0.02   257.36    -0.09   257.36     0.23
 HUB     12.51     0.00    -0.02   257.36    -0.09   257.36     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     64.68    50.47    14.21   543.87   601.77    14.56   517.28     0.54
 MEAN    60.23    47.20    13.03   449.76   518.26    14.56   517.28     0.46
 HUB     52.04    38.62    13.42   329.80   418.40    14.56   517.28     0.38

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   495.40   359.62   340.73  1133.33     0.44
 MEAN    18.04   507.19   370.23   346.66  1128.94     0.45
 HUB     15.00   558.68   430.94   355.55  1123.08     0.50
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    543.87   387.36   184.25     0.34  7420.78
 MEAN   475.49   362.29   105.26     0.32  6678.98     1.63
 HUB    395.45   357.31    35.49     0.32  6465.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.12     1.20    15.89   554.24     1.06   533.74     0.92     0.89
 MEAN    17.80     1.18    15.50   551.10     1.05   529.61     0.92     0.89
 HUB     17.71     1.17    14.95   550.19     1.05   524.12     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.54    28.40    24.20     4.20     0.93     0.46     2.90
 MEAN    46.88    16.89    12.70     4.19     0.94     0.41     3.51     0.89
 HUB     50.48    -5.70    -9.30     3.60     0.94     0.26     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     512.427     369.510     355.026    1129.253       0.454       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.853      15.499     529.909      24.000      46.145      35.400     -10.745

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     372.387     369.510     524.604    1140.227       0.327       0.443

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.792      16.523     540.258     528.796       0.035       0.564

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     346.738       0.000     346.738    1141.852       0.304       0.454

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.602     541.799       0.000       0.060       0.073       0.476

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.837      17.701       1.172     551.841      29.031     179.480       1.391

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 180741.953       0.611    1152.997 1082160.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.026   EfDer =  0.974

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    112.885    3021.000      17.701     551.841       1.000       1.000       0.980
W Kg/sec =   51.31144

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.698    2928.882       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  86840.570   88577.203       2.097     590.487     281.611     474.134       1.684

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   331.52    -0.11   331.52     0.29   525.23
 MEAN    18.08     0.00    -0.02   331.52    -0.11   331.52     0.29
 HUB     15.21     0.00    -0.02   331.52    -0.11   331.52     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.54    46.36    12.18   541.76   635.25    16.69   542.66     0.56
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MEAN    55.18    42.30    12.88   476.60   580.66    16.69   542.66     0.51
HUB     50.43    37.84    12.59   400.98   520.37    16.69   542.66     0.46

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   452.80   298.91   340.12  1161.42     0.39
MEAN    18.01   455.35   297.74   344.52  1157.96     0.39
HUB     15.22   486.45   338.33   349.52  1154.48     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    538.34   415.94   239.43     0.36  6106.06
MEAN   474.80   387.36   177.06     0.33  5364.33     1.65
HUB    401.33   355.15    63.00     0.31  5152.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.42     1.15    18.38   577.69     1.05   560.57     0.92     0.89
MEAN    20.07     1.13    18.04   574.55     1.04   557.24     0.92     0.89
HUB     19.97     1.13    17.67   573.65     1.04   553.89     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.31    35.14    31.50     3.64     0.93     0.43     2.90
MEAN    40.83    27.20    23.50     3.70     0.94     0.41     3.30     0.89
HUB     44.07    10.22     6.50     3.72     0.94     0.40     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.974

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     497.715     298.575     398.213    1155.224       0.431      -0.151

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.133      17.718     554.611      46.000      36.862      30.600      -6.262

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     400.903     298.575     499.870    1162.766       0.345       0.228

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      20.105      18.516     561.876     455.853       0.023       0.405

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    17.823     395.947       0.000     395.947    1163.107       0.340       0.369

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.850      18.501     562.206       0.000       0.060       0.050       0.221

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.855      20.048       1.133     575.297      23.457     201.366       1.561

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 146092.844       0.504     931.962  977503.188


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =13.026   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    112.885    3021.000      20.048     575.297       1.000       1.000       0.880
W Kg/sec =   51.31144

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.170    2868.551       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 86840.570   88577.203       1.929     489.817     253.871     384.470       1.514

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   370.99    -0.13   370.99     0.32   502.39
MEAN    17.74     0.00    -0.02   370.99    -0.13   370.99     0.32
HUB     15.05     0.00    -0.02   370.99    -0.13   370.99     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.97    46.36     8.61   529.11   646.32    18.69   563.81     0.55
MEAN    51.58    43.40     8.18   467.64   597.03    18.69   563.81     0.51
HUB     46.93    38.84     8.09   396.77   543.28    18.69   563.81     0.47

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   438.41   278.92   338.24  1184.01     0.37
MEAN    17.51   442.66   281.04   342.00  1181.08     0.37
HUB     14.85   474.80   324.96   346.17  1178.16     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    522.26   416.67   243.33     0.35  5528.06
MEAN   461.53   386.71   180.49     0.33  4922.26     1.68
HUB    391.49   352.51    66.53     0.30  4827.62

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.77     1.14    20.71   598.69     1.04   582.64     0.92     0.91
MEAN    22.46     1.12    20.38   596.13     1.04   579.77     0.92     0.91
HUB     22.41     1.12    20.03   595.73     1.04   576.91     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.51    35.73    31.50     4.23     0.93     0.43     2.90
MEAN    39.41    27.82    23.50     4.32     0.93     0.42     3.28     0.91
HUB     43.19    10.88     6.50     4.38     0.93     0.43     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     446.946     282.882     346.033    1181.488       0.378       0.011

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.523      20.403     580.171      46.000      39.266      31.500      -7.766

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     353.747     282.882     452.944    1187.815       0.298       0.358

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.495      21.151     586.401     471.992       0.023       0.443

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     344.091       0.000     344.091    1188.385       0.290       0.346

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      21.153     586.964       0.000       0.060       0.056       0.359

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.870      22.423       1.118     596.848      21.551     206.679       1.602

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 134275.625       0.492     856.577 1083238.125
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =13.026   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    112.885    3021.000      22.423     596.848       1.000       1.000       0.980
W Kg/sec =   51.31144

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     79.386    2816.287       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 86840.570   88577.203       2.220     513.330     231.210     401.059       1.735

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   324.00    -0.11   324.00     0.27   473.33
MEAN    16.97     0.00    -0.02   324.00    -0.11   324.00     0.27
HUB     14.32     0.00    -0.02   324.00    -0.11   324.00     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.46    46.36    11.10   507.76   602.41    21.29   588.09     0.51
MEAN    54.10    43.80    10.30   447.40   552.49    21.29   588.09     0.46
HUB     49.37    37.84    11.53   377.52   497.58    21.29   588.09     0.42

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   423.54   262.46   332.42  1204.29     0.35
MEAN    16.57   426.69   263.31   335.76  1201.57     0.36
HUB     13.89   455.86   304.23   339.49  1198.82     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    497.74   407.26   235.28     0.34  4957.33
MEAN   436.94   377.99   173.63     0.31  4365.99     1.60
HUB    366.18   345.10    61.96     0.29  4227.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.01     1.12    22.96   617.82     1.04   602.85     0.92     0.91
MEAN    24.69     1.10    22.63   615.32     1.03   600.12     0.92     0.91
HUB     24.62     1.10    22.28   614.73     1.03   597.39     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.29    35.29    31.50     3.79     0.93     0.40     2.90
MEAN    38.10    27.34    23.50     3.84     0.94     0.39     3.29     0.91
HUB     41.86    10.34     6.50     3.84     0.94     0.38     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.990

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     422.591     264.792     329.345    1202.494       0.351       0.044

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.754      22.726     601.050      46.000      38.799      32.400      -6.399

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     341.786     264.792     432.357    1207.640       0.283       0.359

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.735      23.395     606.205     456.573       0.019       0.440

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    16.096     325.620       0.000     325.620    1208.536       0.269       0.338
```

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.452	607.105	0.000	0.060	0.050	0.385

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.866	24.667	1.100	615.955	19.106	216.345	1.677

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
119094.961	0.481	759.736	976590.062

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =13.026 EfDer = 0.995

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
112.885	3021.000	24.667	615.955	1.000	1.000	0.980

W Kg/sec = 51.31144

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
73.308	2772.263	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
86840.570	88577.203	2.387	509.668	213.516	390.276	1.828

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	304.50	-0.10	304.50	0.25	443.19
MEAN	15.91	0.00	-0.02	304.50	-0.10	304.50	0.25	
HUB	13.07	0.00	-0.02	304.50	-0.10	304.50	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.78	47.36	10.42	482.97	571.04	23.60	608.22	0.47
MEAN	54.03	44.80	9.23	419.52	518.46	23.60	608.22	0.43
HUB	48.54	38.84	9.70	344.57	459.91	23.60	608.22	0.38

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	400.64	249.64	313.35	1222.71	0.33
MEAN	15.50	399.66	243.96	316.56	1219.87	0.33
HUB	12.59	420.94	273.42	320.05	1217.02	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	472.96	384.79	223.31	0.31	4480.50	
MEAN	408.57	356.80	164.60	0.29	3782.51	1.61
HUB	331.91	325.35	58.49	0.27	3443.77	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.16	1.10	25.21	634.90	1.03	621.51	0.92	0.91
MEAN	26.76	1.08	24.84	631.95	1.03	618.62	0.92	0.91
HUB	26.57	1.08	24.46	630.52	1.02	615.73	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.54	35.48	31.50	3.98	0.93	0.40	2.90	
MEAN	37.62	27.47	23.50	3.97	0.93	0.38	3.34	0.91
HUB	40.51	10.36	6.50	3.86	0.93	0.36	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	404.473	248.437	319.183	1220.053	0.332	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
26.792	24.827	618.804	46.000	37.895	33.000	-4.895

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     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     334.994     248.437     417.063    1224.272       0.274       0.287

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      26.769      25.410     623.091     440.827       0.032       0.431

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     314.214       0.000     314.214    1225.377       0.256       0.361

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      25.546     624.216       0.000       0.060       0.045       0.355

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.874      26.743       1.084     632.454      16.499     233.215       1.808

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  102889.094       0.460     656.355 1015683.438

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     683094.50   4357.6255    110.2775      1.7702      0.8484     13.0264      1.2097


*********************************************************************
**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 80% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.967

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     108.898    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   49.49893

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     106.382    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   83773.047   85448.320       2.684     831.557     309.808     619.754       2.000

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   247.78    -0.09   247.78     0.22   541.71
  MEAN    17.06     0.00    -0.02   247.78    -0.09   247.78     0.22
  HUB     12.51     0.00    -0.02   247.78    -0.09   247.78     0.22

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     65.51    50.47    15.04   543.87   597.73    14.60   517.68     0.54
  MEAN    61.15    47.20    13.95   449.76   513.57    14.60   517.68     0.46
  HUB     53.09    38.62    14.47   329.80   412.58    14.60   517.68     0.37

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   491.65   366.37   327.86  1134.28     0.43
  MEAN    18.04   501.18   374.01   333.61  1129.78     0.44
  HUB     15.00   548.99   429.42   342.04  1123.93     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   372.83   177.50     0.33  7559.97
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 MEAN   475.49   348.70   101.48     0.31  6747.13     1.68
 HUB    395.45   343.72    33.97     0.31  6442.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.16     1.20    15.96   554.83     1.06   534.64     0.92     0.88
 MEAN    17.81     1.18    15.56   551.38     1.05   530.40     0.92     0.88
 HUB     17.68     1.17    15.02   550.09     1.05   524.92     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.17    28.43    24.20     4.23     0.93     0.48     2.90
 MEAN    48.27    16.92    12.70     4.22     0.95     0.43     3.51     0.88
 HUB     51.46    -5.67    -9.30     3.63     0.95     0.29     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     506.016     373.285     341.630    1130.111       0.448       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.860      15.561     530.715      24.000      47.535      35.400     -12.135

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     357.958     373.285     517.180    1141.430       0.314       0.466

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.791      16.617     541.399     528.796       0.039       0.587

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     333.704       0.000     333.704    1142.906       0.292       0.468

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.672     542.800       0.000       0.060       0.082       0.490

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.826      17.690       1.171     552.101      29.291     174.934       1.356

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 182364.531       0.617    1122.254 1041909.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.967

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.898    3021.000      17.690     552.101       1.000       1.000       0.980
W Kg/sec =   49.49893

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.360    2928.191       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83773.047   85448.320       2.172     590.487     271.889     474.134       1.744

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   319.16    -0.11   319.16     0.28   525.10
 MEAN    18.08     0.00    -0.02   319.16    -0.11   319.16     0.28
 HUB     15.21     0.00    -0.02   319.16    -0.11   319.16     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.50    46.36    13.14   541.76   628.88    16.76   543.60     0.55
 MEAN    56.20    42.30    13.90   476.60   573.69    16.76   543.60     0.50
 HUB     51.49    37.84    13.65   400.98   512.58    16.76   543.60     0.45
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      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   449.36   307.69   327.49  1162.74     0.39
MEAN    18.01   450.14   304.18   331.81  1159.14     0.39
HUB     15.22   478.94   340.58   336.73  1155.53     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    538.34   400.56   230.64     0.34  6285.38
MEAN   474.80   373.11   170.62     0.32  5480.19     1.69
HUB    401.33   342.17    60.75     0.30  5186.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.46     1.16    18.46   578.71     1.05   561.85     0.92     0.88
MEAN    20.09     1.14    18.11   575.30     1.04   558.38     0.92     0.88
HUB     19.96     1.13    17.73   574.06     1.04   554.90     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.22    35.16    31.50     3.66     0.93     0.45     2.90
MEAN    42.51    27.21    23.50     3.71     0.95     0.43     3.30     0.88
HUB     45.33    10.23     6.50     3.73     0.95     0.42     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     489.699     305.030     383.095    1156.665       0.423      -0.142

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.151      17.811     555.998      46.000      38.528      30.600      -7.928

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     385.191     305.030     491.340    1164.580       0.331       0.265

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      20.118      18.649     563.633     455.853       0.026       0.431

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     380.649       0.000     380.649    1164.880       0.327       0.391

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      18.622     563.923       0.000       0.060       0.057       0.253

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.845      20.053       1.134     576.023      23.921     194.691       1.509

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 148987.281       0.514     916.854  939730.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.898    3021.000      20.053     576.023       1.000       1.000       0.880
W Kg/sec =   49.49893

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     84.123    2866.745       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83773.047   85448.320       1.999     489.817     244.998     384.470       1.569

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   356.87    -0.12   356.87     0.31   502.08
MEAN    17.74     0.00    -0.02   356.87    -0.12   356.87     0.31
HUB     15.05     0.00    -0.02   356.87    -0.12   356.87     0.31

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.01    46.36     9.65   529.11   638.31    18.79   565.39     0.55
MEAN    52.66    43.40     9.26   467.64   588.36    18.79   565.39     0.50
HUB     48.04    38.84     9.20   396.77   533.74    18.79   565.39     0.46

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   434.80   288.35   325.43  1185.81     0.37
MEAN    17.51   437.39   288.00   329.19  1182.73     0.37
HUB     14.85   467.38   327.60   333.36  1179.66     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    522.26   400.77   233.91     0.34  5714.68
MEAN   461.53   372.13   173.53     0.31  5044.04     1.72
HUB    391.49   339.42    63.89     0.29  4866.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.86     1.14    20.83   600.21     1.04   584.42     0.92     0.91
MEAN    22.51     1.12    20.48   597.37     1.04   581.40     0.92     0.91
HUB     22.42     1.12    20.12   596.62     1.04   578.38     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.54    35.71    31.50     4.21     0.93     0.45     2.90
MEAN    41.18    27.80    23.50     4.30     0.93     0.44     3.28     0.91
HUB     44.50    10.85     6.50     4.35     0.93     0.44     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     441.566     289.888     333.085    1183.126       0.373       0.010

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.576      20.504     581.786      46.000      41.034      31.500      -9.534

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     340.067     289.888     446.857    1189.842       0.286       0.387

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.542      21.298     588.409     471.992       0.026       0.471

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.121     331.022       0.000     331.022    1190.354       0.278       0.367

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      21.282     588.916       0.000       0.060       0.066       0.380

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.862      22.458       1.120     598.064      22.041     199.318       1.545

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 137329.844       0.504     845.115 1039996.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.984
```

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
108.898	3021.000	22.458	598.064	1.000	1.000	0.980

W Kg/sec = 49.49893

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
76.538	2813.424	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
83773.047	85448.320	2.303	513.330	222.916	401.059	1.799

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	311.82	-0.11	311.82	0.26	472.85
MEAN	16.97	0.00	-0.02	311.82	-0.11	311.82	0.26	
HUB	14.32	0.00	-0.02	311.82	-0.11	311.82	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.45	46.36	12.09	507.76	595.95	21.41	589.95	0.50
MEAN	55.13	43.80	11.33	447.40	545.43	21.41	589.95	0.46
HUB	50.45	37.84	12.61	377.52	489.73	21.41	589.95	0.41

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	419.48	271.43	319.83	1206.49	0.35
MEAN	16.57	421.03	269.89	323.15	1203.63	0.35
HUB	13.89	448.14	306.59	326.86	1200.76	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	391.79	226.30	0.32	5126.73	
MEAN	436.94	363.77	167.05	0.30	4474.96	1.64
HUB	366.18	332.25	59.60	0.28	4260.04	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.12	1.12	23.11	619.75	1.04	605.06	0.92	0.90
MEAN	24.77	1.10	22.76	616.99	1.03	602.20	0.92	0.90
HUB	24.66	1.10	22.40	616.08	1.03	599.32	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.32	35.28	31.50	3.78	0.93	0.42	2.90	
MEAN	39.87	27.34	23.50	3.84	0.94	0.41	3.29	0.90
HUB	43.17	10.33	6.50	3.83	0.94	0.40	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.984

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	417.347	271.409	317.042	1204.506	0.346	0.042

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.831	22.850	603.071	46.000	40.566	32.400	-8.166

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	328.614	271.409	426.204	1210.010	0.272	0.387

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.806	23.566	608.596	456.573	0.022	0.468

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	313.297	0.000	313.297	1210.826	0.259	0.359

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.603	609.416	0.000	0.060	0.058	0.405

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.856	24.729	1.101	617.608	19.545	208.657	1.617

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
121828.664	0.492	749.722	938038.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =13.953 EfDer = 0.990

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
108.898	3021.000	24.729	617.608	1.000	1.000	0.980

W Kg/sec = 49.49893

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
70.635	2768.550	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
83773.047	85448.320	2.477	509.668	205.733	390.276	1.897

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	293.08	-0.10	293.08	0.24	442.60
MEAN	15.91	0.00	-0.02	293.08	-0.10	293.08	0.24	
HUB	13.07	0.00	-0.02	293.08	-0.10	293.08	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.75	47.36	11.39	482.97	565.03	23.74	610.44	0.47
MEAN	55.07	44.80	10.27	419.52	511.84	23.74	610.44	0.42
HUB	49.62	38.84	10.78	344.57	452.43	23.74	610.44	0.37

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	396.94	258.19	301.50	1225.21	0.32
MEAN	15.50	394.26	250.24	304.66	1222.25	0.32
HUB	12.59	413.44	275.69	308.11	1219.28	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	472.96	370.17	214.77	0.30	4633.72	
MEAN	408.57	343.35	158.33	0.28	3879.68	1.65
HUB	331.91	313.20	56.22	0.26	3472.25	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.30	1.10	25.38	637.20	1.03	624.05	0.92	0.91
MEAN	26.87	1.09	25.00	634.01	1.03	621.04	0.92	0.91
HUB	26.64	1.08	24.60	632.29	1.02	618.03	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.58	35.46	31.50	3.96	0.93	0.42	2.90	
MEAN	39.40	27.46	23.50	3.96	0.94	0.40	3.34	0.91
HUB	41.82	10.34	6.50	3.84	0.94	0.38	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.990

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	399.131	254.826	307.196	1222.409	0.327	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
26.898	24.981	621.209	46.000	39.676	33.000	-6.676

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	322.075	254.826	410.693	1226.963	0.262	0.316

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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.867      25.609     625.846     440.827       0.036       0.458

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     302.261       0.000     302.261    1227.974       0.246       0.384

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.728     626.878       0.000       0.060       0.051       0.378

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      26.837       1.085     634.500      16.892     224.797       1.743

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 105340.539       0.471     648.256  975503.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    695850.88   4282.1997    106.3821      1.7764      0.8384     13.9532      1.2136


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 80% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  0.959

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    104.649    3021.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   47.56755

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.231    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  80504.336   82114.242       2.793     831.557     297.720     619.754       2.082

     ROTOR LEADING EDGE CONDITIONS, STAGE           1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   237.65    -0.08   237.65     0.21   541.71
 MEAN    17.06     0.00    -0.02   237.65    -0.08   237.65     0.21
 HUB     12.51     0.00    -0.02   237.65    -0.08   237.65     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     66.40    50.47    15.93   543.87   593.60    14.64   518.09     0.53
 MEAN    62.15    47.20    14.95   449.76   508.76    14.64   518.09     0.46
 HUB     54.23    38.62    15.61   329.80   406.57    14.64   518.09     0.36

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   488.08   373.37   314.35  1135.24     0.43
 MEAN    18.04   495.12   377.91   319.88  1130.64     0.44
 HUB     15.00   538.95   427.78   327.83  1124.79     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    543.87   357.61   170.50     0.32  7704.38
 MEAN   475.49   334.44    97.57     0.30  6817.45     1.74
 HUB    395.45   329.42    32.34     0.29  6417.79
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	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.19	1.20	16.02	555.44	1.06	535.54	0.92	0.88
MEAN	17.82	1.18	15.62	551.68	1.06	531.21	0.92	0.88
HUB	17.65	1.17	15.08	549.99	1.05	525.73	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	49.91	28.47	24.20	4.27	0.93	0.51	2.90	
MEAN	49.75	16.96	12.70	4.26	0.95	0.45	3.51	0.88
HUB	52.54	-5.63	-9.30	3.67	0.95	0.31	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.959

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	499.549	377.179	327.545	1130.975	0.442	0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.863	15.621	531.527	24.000	49.029	35.400	-13.629

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	342.838	377.179	509.708	1142.646	0.300	0.491

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.786	16.708	542.553	528.796	0.043	0.611

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	320.008	0.000	320.008	1143.976	0.280	0.483

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.739	543.817	0.000	0.060	0.091	0.504

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.814	17.675	1.170	552.370	29.560	170.151	1.319

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
184035.375	0.622	1088.346	999280.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =14.953 EfDer = 0.958

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
104.649	3021.000	17.675	552.370	1.000	1.000	0.980

W Kg/sec = 47.56755

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
89.815	2927.479	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
80504.336	82114.242	2.258	590.487	261.566	474.134	1.813

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	306.16	-0.11	306.16	0.27	524.98
MEAN	18.08	0.00	-0.02	306.16	-0.11	306.16	0.27	
HUB	15.21	0.00	-0.02	306.16	-0.11	306.16	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.53	46.36	14.17	541.76	622.38	16.82	544.54	0.54
MEAN	57.29	42.30	14.99	476.60	566.55	16.82	544.54	0.49
HUB	52.64	37.84	14.80	400.98	504.58	16.82	544.54	0.44

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	446.25	316.79	314.29	1164.07	0.38
MEAN	18.01	445.06	310.85	318.51	1160.34	0.38
HUB	15.22	471.25	342.86	323.30	1156.59	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	384.53	221.54	0.33	6471.08	
MEAN	474.80	358.23	163.95	0.31	5600.34	1.74
HUB	401.33	328.55	58.47	0.28	5220.94	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.51	1.16	18.53	579.76	1.05	563.14	0.92	0.88
MEAN	20.11	1.14	18.16	576.08	1.04	559.54	0.92	0.88
HUB	19.93	1.13	17.78	574.47	1.04	555.93	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.23	35.18	31.50	3.68	0.93	0.47	2.90	
MEAN	44.30	27.24	23.50	3.74	0.95	0.45	3.30	0.88
HUB	46.68	10.25	6.50	3.75	0.95	0.44	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.958

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	481.769	311.724	367.327	1158.110	0.416	-0.132

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.162	17.896	557.390	46.000	40.319	30.600	-9.719

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	368.871	311.724	482.947	1166.411	0.316	0.304

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	20.122	18.773	565.410	455.853	0.030	0.459

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	364.771	0.000	364.771	1166.671	0.313	0.413

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	18.732	565.661	0.000	0.060	0.067	0.284

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.832	20.047	1.134	576.772	24.402	187.861	1.456

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
151980.125	0.524	898.778	899923.938

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =14.953 EfDer = 0.989

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
104.649	3021.000	20.047	576.772	1.000	1.000	0.880

W Kg/sec = 47.56755

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
80.918	2864.883	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
80504.336	82114.242	2.078	489.817	235.666	384.470	1.631

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	342.19	-0.12	342.19	0.29	501.75

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MEAN    17.74     0.00    -0.02   342.19    -0.12   342.19     0.29
HUB     15.05     0.00    -0.02   342.19    -0.12   342.19     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.11    46.36    10.75   529.11   630.22    18.89   567.00     0.54
MEAN    53.81    43.40    10.41   467.64   579.56    18.89   567.00     0.50
HUB     49.23    38.84    10.39   396.77   524.03    18.89   567.00     0.45

     ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   431.60   298.01   312.21  1187.61     0.36
MEAN    17.51   432.34   295.14   315.93  1184.40     0.37
HUB     14.85   459.92   330.30   320.05  1181.18     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    522.26   384.40   224.25     0.32  5905.87
MEAN   461.53   357.07   166.39     0.30  5169.02     1.77
HUB    391.49   325.85    61.19     0.28  4906.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.93     1.14    20.93   601.76     1.04   586.21     0.92     0.91
MEAN    22.55     1.13    20.57   598.65     1.04   583.04     0.92     0.91
HUB     22.42     1.12    20.19   597.54     1.04   579.88     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.67    35.69    31.50     4.19     0.93     0.47     2.90
MEAN    43.05    27.77    23.50     4.27     0.94     0.46     3.28     0.91
HUB     45.90    10.82     6.50     4.32     0.94     0.46     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     436.405     297.079     319.676    1184.776       0.368       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.613      20.588     583.416      46.000      42.902      31.500     -11.402

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     325.953     297.079     441.023    1191.893       0.273       0.417

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.571      21.427     590.445     471.992       0.030       0.501

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     317.538       0.000     317.538    1192.349       0.266       0.388

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.392     590.897       0.000       0.060       0.077       0.401

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.852      22.474       1.121     599.315      22.543     191.904       1.488

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 140460.094       0.515     830.651  994643.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  0.978

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    104.649    3021.000      22.474     599.315       1.000       1.000       0.980
W Kg/sec =   47.56755
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
73.575	2810.486	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
80504.336	82114.242	2.396	513.330	214.289	401.059	1.872

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	299.23	-0.10	299.23	0.25	472.36
MEAN	16.97	0.00	-0.02	299.23	-0.10	299.23	0.25	
HUB	14.32	0.00	-0.02	299.23	-0.10	299.23	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.49	46.36	13.13	507.76	589.46	21.51	591.84	0.49
MEAN	56.23	43.80	12.43	447.40	538.33	21.51	591.84	0.45
HUB	51.61	37.84	13.77	377.52	481.81	21.51	591.84	0.40

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	415.81	280.55	306.90	1208.71	0.34
MEAN	16.57	415.57	276.58	310.17	1205.72	0.34
HUB	13.89	440.39	308.96	313.83	1202.71	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	375.98	217.19	0.31	5298.81	
MEAN	436.94	349.18	160.37	0.29	4585.67	1.69
HUB	366.18	319.00	57.22	0.27	4292.95	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.21	1.12	23.23	621.73	1.04	607.30	0.92	0.89
MEAN	24.83	1.10	22.87	618.71	1.03	604.30	0.92	0.89
HUB	24.67	1.10	22.49	617.47	1.03	601.29	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.43	35.29	31.50	3.79	0.93	0.44	2.90	
MEAN	41.72	27.34	23.50	3.84	0.94	0.43	3.29	0.89
HUB	44.55	10.33	6.50	3.83	0.94	0.42	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.978

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	412.316	278.130	304.381	1206.537	0.342	0.040

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.883	22.950	605.116	46.000	42.420	32.400	-10.020

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	315.109	278.130	420.298	1212.406	0.260	0.416

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.852	23.711	611.018	456.573	0.025	0.498

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	300.661	0.000	300.661	1213.143	0.248	0.380

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.726	611.760	0.000	0.060	0.069	0.424

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.845	24.763	1.102	619.304	19.989	200.979	1.558

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
124603.430	0.503	736.878	897549.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =14.953 EfDer = 0.984

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
104.649	3021.000	24.763	619.304	1.000	1.000	0.980

W Kg/sec = 47.56755

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
67.879	2764.756	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
80504.336	82114.242	2.578	509.668	197.706	390.276	1.974

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	281.37	-0.10	281.37	0.23	441.99
MEAN	15.91	0.00	-0.02	281.37	-0.10	281.37	0.23	
HUB	13.07	0.00	-0.02	281.37	-0.10	281.37	0.23	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.78	47.36	12.42	482.97	559.04	23.85	612.70	0.46
MEAN	56.16	44.80	11.36	419.52	505.22	23.85	612.70	0.42
HUB	50.77	38.84	11.93	344.57	444.93	23.85	612.70	0.37

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	393.64	266.84	289.40	1227.71	0.32
MEAN	15.50	389.10	256.59	292.50	1224.64	0.32
HUB	12.59	405.97	277.96	295.88	1221.56	0.33

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	472.96	355.30	206.12	0.29	4788.82	
MEAN	408.57	329.63	151.97	0.27	3978.15	1.70
HUB	331.91	300.76	53.95	0.25	3500.77	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.40	1.11	25.52	639.55	1.03	626.62	0.92	0.90
MEAN	26.94	1.09	25.12	636.12	1.03	623.49	0.92	0.90
HUB	26.67	1.08	24.71	634.11	1.02	620.36	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.68	35.46	31.50	3.96	0.93	0.45	2.90	
MEAN	41.26	27.45	23.50	3.95	0.94	0.42	3.34	0.90
HUB	43.21	10.33	6.50	3.83	0.94	0.40	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.984

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	394.044	261.300	294.946	1224.785	0.322	-0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
26.970	25.102	623.639	46.000	41.539	33.000	-8.539

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	308.930	261.300	404.617	1229.677	0.251	0.346

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	26.929	25.771	628.631	440.827	0.042	0.488

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     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     290.092       0.000     290.092    1230.597       0.236       0.407

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      25.872     629.573       0.000       0.060       0.060       0.400

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.857      26.893       1.086     636.593      17.289     216.448       1.678

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  107819.484       0.482     637.622  933323.438

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     708898.50   4192.2749    102.2312      1.7802      0.8262     14.9531      1.2176


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 80% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =16.040   EfDer =  0.949

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     100.090    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   45.49547

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      97.778    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   76997.508   78537.289       2.920     831.557     284.751     619.754       2.176

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   226.84    -0.08   226.84     0.20   541.71
  MEAN    17.06     0.00    -0.02   226.84    -0.08   226.84     0.20
  HUB     12.51     0.00    -0.02   226.84    -0.08   226.84     0.20

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     67.36    50.47    16.89   543.87   589.35    14.68   518.51     0.53
  MEAN    63.24    47.20    16.04   449.76   503.79    14.68   518.51     0.45
  HUB     55.49    38.62    16.87   329.80   400.35    14.68   518.51     0.36

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
  TIP     20.63   484.75   380.70   300.07  1136.21     0.43
  MEAN    18.04   489.04   381.99   305.35  1131.50     0.43
  HUB     15.00   528.47   425.97   312.77  1125.67     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   341.56   163.17     0.30  7855.53
  MEAN   475.49   319.34    93.49     0.28  6890.99     1.81
  HUB    395.45   314.26    30.53     0.28  6390.59

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.23     1.21    16.08   556.08     1.06   536.45     0.92     0.87
  MEAN    17.82     1.18    15.67   551.99     1.06   532.02     0.92     0.87
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 HUB     17.61     1.17    15.14   549.87     1.05   526.55     0.92     0.87

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     51.75    28.54    24.20     4.34     0.93     0.53     2.90
 MEAN    51.36    17.02    12.70     4.32     0.95     0.48     3.51     0.87
 HUB     53.71    -5.57    -9.30     3.73     0.95     0.34     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.949

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     493.048     381.252     312.639    1131.845       0.436       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.863      15.677     532.344      24.000      50.647      35.400     -15.247

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     326.881     381.252     502.200    1143.878       0.286       0.517

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.778      16.797     543.724     528.796       0.048       0.638

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     305.505       0.000     305.505    1145.065       0.267       0.499

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.802     544.853       0.000       0.060       0.102       0.519

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.801      17.655       1.169     552.649      29.839     165.070       1.280

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 185771.203       0.628    1050.755  953829.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =16.040   EfDer =  0.948

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    100.090    3021.000      17.655     552.649       1.000       1.000       0.980
W Kg/sec =   45.49547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.022    2926.741       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76997.508   78537.289       2.357     590.487     250.520     474.134       1.893

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   292.38    -0.10   292.38     0.26   524.84
 MEAN    18.08     0.00    -0.02   292.38    -0.10   292.38     0.26
 HUB     15.21     0.00    -0.02   292.38    -0.10   292.38     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.65    46.36    15.29   541.76   615.71    16.87   545.51     0.54
 MEAN    58.48    42.30    16.18   476.60   559.22    16.87   545.51     0.49
 HUB     53.91    37.84    16.07   400.98   496.34    16.87   545.51     0.43

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   443.51   326.28   300.40  1165.41     0.38
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 MEAN    18.01   440.12   317.81   304.46  1161.55     0.38
 HUB     15.22   463.37   345.21   309.10  1157.68     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   367.71   212.05     0.32  6664.79
 MEAN   474.80   342.55   156.99     0.29  5725.62     1.80
 HUB    401.33   314.15    56.12     0.27  5256.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.54     1.16    18.58   580.86     1.05   564.44     0.92     0.87
 MEAN    20.11     1.14    18.21   576.89     1.04   560.71     0.92     0.87
 HUB     19.90     1.13    17.82   574.90     1.04   556.97     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.36    35.22    31.50     3.72     0.93     0.49     2.90
 MEAN    46.23    27.28    23.50     3.78     0.95     0.47     3.30     0.87
 HUB     48.16    10.29     6.50     3.79     0.95     0.46     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.948

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     473.923     318.705     350.756    1159.567       0.409       -0.122

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.163      17.970     558.796      46.000      42.259      30.600     -11.659

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     351.783     318.705     474.683    1168.272       0.301       0.345

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      20.115      18.887     567.217     455.853       0.034       0.491

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     348.148       0.000     348.148    1168.491       0.298       0.434

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      18.830     567.430       0.000       0.060       0.079       0.316

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.817      20.028       1.134     577.551      24.902     180.809       1.402

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 155097.922       0.535     877.262  857684.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =16.040   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    100.090    3021.000      20.028     577.551       1.000       1.000       0.880
W Kg/sec =   45.49547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.520    2862.949       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76997.508   78537.289       2.170     489.817     225.769     384.470       1.703

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   326.79    -0.11   326.79     0.28   501.41
 MEAN    17.74     0.00    -0.02   326.79    -0.11   326.79     0.28
 HUB     15.05     0.00    -0.02   326.79    -0.11   326.79     0.28
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.31    46.36    11.95   529.11   621.98    18.97   568.64     0.53
MEAN    55.06    43.40    11.66   467.64   570.60    18.97   568.64     0.49
HUB     50.53    38.84    11.69   396.77   514.10    18.97   568.64     0.44

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   428.86   308.00   298.42  1189.44     0.36
MEAN    17.51   427.50   302.52   302.06  1186.09     0.36
HUB     14.85   452.35   333.05   306.10  1182.73     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    522.26   367.37   214.26     0.31  6103.73
MEAN   461.53   341.36   159.01     0.29  5298.02     1.83
HUB    391.49   311.63    58.45     0.26  4947.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.98     1.15    21.00   603.38     1.04   588.03     0.92     0.90
MEAN    22.57     1.13    20.63   599.97     1.04   584.71     0.92     0.90
HUB     22.40     1.12    20.25   598.49     1.04   581.41     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     45.91    35.68    31.50     4.18     0.93     0.49     2.90
MEAN    45.04    27.76    23.50     4.26     0.94     0.48     3.28     0.90
HUB     47.41    10.81     6.50     4.31     0.94     0.48     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.982

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     431.449     304.502     305.658    1186.452       0.364       0.009

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.631      20.653     585.073      46.000      44.891      31.500     -13.391

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     311.247     304.502     435.426    1193.984       0.261       0.449

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.580      21.537     592.526     471.992       0.035       0.534

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     303.476       0.000     303.476    1194.386       0.254       0.410

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      21.482     592.924       0.000       0.060       0.090       0.422

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.839      22.469       1.122     600.613      23.062     184.364       1.429

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 143690.625       0.527     812.740  946737.312


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =16.040   EfDer =  0.969

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    100.090    3021.000      22.469     600.613       1.000       1.000       0.980
W Kg/sec =   45.49547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     70.462    2807.447       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
76997.508	78537.289	2.501	513.330	205.222	401.059	1.954

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	286.09	-0.10	286.09	0.24	471.85
MEAN	16.97	0.00	-0.02	286.09	-0.10	286.09	0.24	
HUB	14.32	0.00	-0.02	286.09	-0.10	286.09	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.61	46.36	14.25	507.76	582.89	21.59	593.78	0.49
MEAN	57.41	43.80	13.61	447.40	531.13	21.59	593.78	0.44
HUB	52.85	37.84	15.01	377.52	473.75	21.59	593.78	0.40

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	412.55	289.94	293.49	1210.96	0.34
MEAN	16.57	410.34	283.48	296.68	1207.85	0.34
HUB	13.89	432.55	311.37	300.25	1204.71	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	359.61	207.80	0.30	5475.92	
MEAN	436.94	334.02	153.46	0.28	4700.08	1.75
HUB	366.18	305.21	54.81	0.25	4326.35	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.27	1.12	23.32	623.77	1.04	609.57	0.92	0.89
MEAN	24.86	1.11	22.95	620.49	1.03	606.44	0.92	0.89
HUB	24.66	1.10	22.56	618.91	1.03	603.30	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.65	35.30	31.50	3.80	0.93	0.47	2.90	
MEAN	43.70	27.35	23.50	3.85	0.94	0.45	3.29	0.89
HUB	46.04	10.35	6.50	3.85	0.94	0.44	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.969

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	407.515	285.077	291.204	1208.603	0.337	0.038

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.909	23.022	607.201	46.000	44.391	32.400	-11.991

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	301.100	285.077	414.645	1214.850	0.248	0.447

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.871	23.829	613.494	456.573	0.029	0.530

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	287.546	0.000	287.546	1215.509	0.237	0.402

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.821	614.160	0.000	0.060	0.081	0.443

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.831	24.768	1.102	621.060	20.447	193.204	1.498

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
127459.195	0.514	720.932	854713.125

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =16.040   EfDer =  0.977

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    100.090    3021.000      24.768     621.060       1.000       1.000       0.980
W Kg/sec =   45.49547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     65.001    2760.846       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 76997.508   78537.289       2.692     509.668     189.326     390.276       2.061

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   269.19    -0.09   269.19     0.22   441.37
MEAN    15.91     0.00    -0.02   269.19    -0.09   269.19     0.22
HUB     13.07     0.00    -0.02   269.19    -0.09   269.19     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.87    47.36    13.51   482.97   553.01    23.94   615.01     0.45
MEAN    57.32    44.80    12.52   419.52   498.53    23.94   615.01     0.41
HUB     52.01    38.84    13.17   344.57   437.32    23.94   615.01     0.36

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   390.77   275.72   276.90  1230.26     0.32
MEAN    15.50   384.16   263.11   279.91  1227.08     0.31
HUB     12.59   398.43   280.26   283.20  1223.89     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    472.96   339.96   197.23     0.28  4948.18
MEAN   408.57   315.45   145.46     0.26  4079.05     1.76
HUB    331.91   287.87    51.65     0.24  3529.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     27.47     1.11    25.61   641.98     1.03   629.24     0.92     0.89
MEAN    26.98     1.09    25.21   638.31     1.03   625.99     0.92     0.89
HUB     26.68     1.08    24.79   635.98     1.02   622.74     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.88    35.46    31.50     3.96     0.93     0.47     2.90
MEAN    43.23    27.46    23.50     3.96     0.94     0.45     3.34     0.89
HUB     44.70    10.34     6.50     3.84     0.94     0.42     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.977

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     389.180     267.935     282.263    1227.203       0.317      -0.012

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    27.007      25.187     626.121      46.000      43.508      33.000     -10.508

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     295.369     267.935     398.788    1232.443       0.240       0.377

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.954      25.897     631.478     440.827       0.049       0.519

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     14.701     277.528       0.000     277.528    1233.274       0.225       0.430

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.978     632.331       0.000       0.060       0.071       0.421

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.844      26.912       1.087     638.756      17.696     208.044       1.613

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 110361.633       0.493     624.225  888708.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     722380.56   4085.9141     97.7779      1.7814      0.8119     16.0399      1.2218


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 80% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =16.989   EfDer =  0.940

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     96.156    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   43.70718

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.935    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73970.969   75450.234       3.040     831.557     273.558     619.754       2.266

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   217.56    -0.07   217.56     0.19   541.71
  MEAN    17.06     0.00    -0.02   217.56    -0.07   217.56     0.19
  HUB     12.51     0.00    -0.02   217.56    -0.07   217.56     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.20    50.47    17.73   543.87   585.84    14.71   518.86     0.52
  MEAN    64.19    47.20    16.99   449.76   499.68    14.71   518.86     0.45
  HUB     56.59    38.62    17.97   329.80   395.16    14.71   518.86     0.35

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   482.24   386.86   287.92  1136.99     0.42
  MEAN    18.04   484.08   385.38   292.96  1132.20     0.43
  HUB     15.00   519.66   424.37   299.94  1126.38     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   327.95   157.02     0.29  7982.40
  MEAN   475.49   306.50    90.11     0.27  6951.93     1.88
  HUB    395.45   301.33    28.92     0.27  6366.47

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.25     1.21    16.12   556.62     1.06   537.19     0.92     0.86
  MEAN    17.82     1.18    15.71   552.25     1.06   532.68     0.92     0.86
  HUB     17.58     1.16    15.19   549.77     1.05   527.22     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     53.34    28.61    24.20     4.41     0.93     0.55     2.90
 MEAN    52.76    17.10    12.70     4.40     0.95     0.50     3.51     0.86
 HUB     54.75    -5.51    -9.30     3.79     0.95     0.36     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.940

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     487.750     384.627     299.936    1132.552       0.431       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.858      15.718     533.009      24.000      52.053      35.400     -16.653

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     313.317     384.627     496.090    1144.884       0.274       0.540

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.767      16.865     544.680     528.796       0.051       0.662

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     293.134       0.000     293.134    1145.958       0.256       0.512

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.849     545.703       0.000       0.060       0.112       0.533

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.788      17.634       1.167     552.880      30.070     160.727       1.246

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 187209.484       0.633    1017.269  914825.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =16.989   EfDer =  0.938

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     96.156     3021.000       17.634     552.880       1.000        1.000        0.980
W Kg/sec =   43.70718

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     82.756     2926.130        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  73970.969   75450.234        2.450     590.487     241.008     474.134        1.967

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   280.61    -0.10   280.61      0.24   524.73
 MEAN    18.08      0.00    -0.02   280.61    -0.10   280.61      0.24
 HUB     15.21      0.00    -0.02   280.61    -0.10   280.61      0.24

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     62.62     46.36     16.26   541.76   610.21     16.91   546.30      0.53
 MEAN    59.52     42.30     17.22   476.60   553.16     16.91   546.30      0.48
 HUB     55.02     37.84     17.18   400.98   489.50     16.91   546.30      0.43

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     20.42   441.60    334.22    288.63   1166.50      0.38
 MEAN    18.01   436.25    323.63    292.53   1162.54      0.38
 HUB     15.22   456.85    347.13    297.00   1158.56      0.39
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       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   353.51   204.11      0.30  6826.85
 MEAN   474.80   329.28   151.17      0.28  5830.34      1.86
 HUB    401.33   301.91    54.19      0.26  5285.90

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.55     1.17    18.61   581.78     1.05   565.50     0.92     0.86
 MEAN    20.11     1.14    18.24   577.56     1.04   561.67     0.92     0.86
 HUB     19.87     1.13    17.84   575.26     1.04   557.83     0.92     0.86

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.19    35.27    31.50     3.77     0.93     0.51     2.90
 MEAN    47.89    27.33    23.50     3.83     0.95     0.49     3.30     0.86
 HUB     49.45    10.34     6.50     3.84     0.95     0.47     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.938

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     467.663     324.540     336.723    1160.748       0.403      -0.114

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.155      18.020     559.937      46.000      43.945      30.600     -13.345

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     337.359     324.540     468.121    1169.791       0.288       0.380

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      20.099      18.970     568.696     455.853       0.039       0.518

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     334.109       0.000     334.109    1169.979       0.286       0.452

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      18.898     568.879       0.000       0.060       0.090       0.343

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.803      20.000       1.134     578.200      25.320     174.937       1.356

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 157699.125       0.544     856.914  821594.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =16.989   EfDer =  0.975

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     96.156    3021.000      20.000     578.200       1.000       1.000       0.880
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     74.617    2861.343       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73970.969   75450.234       2.254     489.817     217.315     384.470       1.769

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   313.75    -0.11   313.75     0.27   501.13
 MEAN    17.74     0.00    -0.02   313.75    -0.11   313.75     0.27
 HUB     15.05     0.00    -0.02   313.75    -0.11   313.75     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.34    46.36    12.98   529.11   615.23    19.03   569.98     0.53
 MEAN    56.15    43.40    12.75   467.64   563.23    19.03   569.98     0.48
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HUB     51.67    38.84    12.83   396.77   505.92    19.03   569.98     0.43

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   426.99   316.34   286.80  1190.93     0.36
MEAN    17.51   423.78   308.68   290.35  1187.47     0.36
HUB     14.85   446.14   335.31   294.30  1184.00     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    522.26   353.07   205.92     0.30  6268.82
MEAN   461.53   328.13   152.85     0.28  5405.90     1.88
HUB    391.49   299.61    56.18     0.25  4980.97

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.01     1.15    21.05   604.73     1.05   589.51     0.92     0.89
MEAN    22.57     1.13    20.67   601.08     1.04   586.08     0.92     0.89
HUB     22.36     1.12    20.27   599.28     1.04   582.66     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     47.80    35.68    31.50     4.18     0.93     0.51     2.90
MEAN    46.75    27.76    23.50     4.26     0.94     0.50     3.28     0.89
HUB     48.73    10.81     6.50     4.31     0.94     0.49     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.975

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      427.635     310.709     293.823    1187.818       0.360        0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.629      20.688      586.428      46.000      46.600      31.500     -15.100

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     17.392      298.864     310.709     431.114    1195.702       0.250        0.477

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.571      21.610     594.237     471.992       0.039       0.562

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121      291.617       0.000     291.617    1196.061       0.244        0.428

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950      21.537      594.595       0.000       0.060       0.101        0.440

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.828      22.448       1.122     601.694      23.494     178.151       1.381

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 146384.750       0.537     795.433  905966.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =16.989   EfDer =  0.961

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     96.156    3021.000      22.448     601.694       1.000       1.000       0.980
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     67.819    2804.924       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73970.969   75450.234       2.599     513.330     197.525     401.059       2.030
```

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	274.99	-0.09	274.99	0.23	471.42
MEAN	16.97	0.00	-0.02	274.99	-0.09	274.99	0.23	
HUB	14.32	0.00	-0.02	274.99	-0.09	274.99	0.23	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.57	46.36	15.21	507.76	577.52	21.64	595.38	0.48
MEAN	58.43	43.80	14.63	447.40	525.24	21.64	595.38	0.44
HUB	53.94	37.84	16.10	377.52	467.13	21.64	595.38	0.39

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	410.25	297.75	282.22	1212.80	0.34
MEAN	16.57	406.26	289.20	285.32	1209.59	0.34
HUB	13.89	426.13	313.35	288.80	1206.36	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	345.90	199.99	0.29	5623.29	
MEAN	436.94	321.31	147.74	0.27	4794.71	1.80
HUB	366.18	293.59	52.84	0.24	4353.73	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.29	1.13	23.37	625.48	1.04	611.43	0.92	0.88
MEAN	24.86	1.11	22.99	621.97	1.03	608.20	0.92	0.88
HUB	24.63	1.10	22.59	620.11	1.03	604.96	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	46.53	35.32	31.50	3.82	0.93	0.49	2.90	
MEAN	45.39	27.38	23.50	3.88	0.95	0.47	3.29	0.88
HUB	47.33	10.37	6.50	3.87	0.95	0.46	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.961

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	403.780	290.823	280.108	1210.298	0.334	0.036

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.907	23.058	608.915	46.000	46.075	32.400	-13.675

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	289.337	290.823	410.236	1216.859	0.238	0.473

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.863	23.903	615.534	456.573	0.033	0.558

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	276.518	0.000	276.518	1217.457	0.227	0.420

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.874	616.140	0.000	0.060	0.092	0.459

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.819	24.748	1.102	622.521	20.827	186.823	1.448

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
129826.836	0.524	705.460	818201.312

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

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 RESET =  0.000BLEED =  0.000 DPInc =16.989   EfDer =  0.970

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     96.156    3021.000      24.748     622.521       1.000       1.000       0.980
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     62.570    2757.605       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 73970.969   75450.234       2.797     509.668     182.247     390.276       2.141

    ROTOR LEADING EDGE CONDITIONS, STAGE             5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   258.94    -0.09   258.94     0.21   440.85
MEAN    15.91     0.00    -0.02   258.94    -0.09   258.94     0.21
HUB     13.07     0.00    -0.02   258.94    -0.09   258.94     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.81    47.36    14.45   482.97   548.09    23.98   616.93     0.45
MEAN    58.32    44.80    13.52   419.52   493.07    23.98   616.93     0.40
HUB     53.08    38.84    14.24   344.57   431.09    23.98   616.93     0.35

     ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
TIP     17.94   388.73   283.07   266.43  1232.34     0.32
MEAN    15.50   380.33   268.52   269.35  1229.08     0.31
HUB     12.59   392.27   282.13   272.54  1225.80     0.32

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    472.96   327.17   189.88     0.27  5079.94
MEAN   408.57   303.58   140.04     0.25  4162.90     1.81
HUB    331.91   277.05    49.78     0.23  3553.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     27.50     1.11    25.66   644.00     1.03   631.39     0.92     0.89
MEAN    26.99     1.09    25.25   640.12     1.03   628.05     0.92     0.89
HUB     26.65     1.08    24.82   637.54     1.02   624.71     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.73    35.48    31.50     3.98     0.93     0.49     2.90
MEAN    44.91    27.47    23.50     3.97     0.94     0.46     3.34     0.89
HUB     45.99    10.35     6.50     3.85     0.94     0.44     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.970

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     385.423     273.448     271.620    1229.188       0.314      -0.013

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    27.008      25.227     628.161      46.000      45.192      33.000     -12.192

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     284.021     273.448     394.261    1234.716       0.230       0.403

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.945      25.969     633.824     440.827       0.055       0.547

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     267.005       0.000     267.005    1235.477       0.216       0.449

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      26.034     634.606       0.000       0.060       0.082       0.439

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.833      26.896       1.087     640.553      18.033     201.179       1.560

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  112462.453       0.503     611.104  850685.188

   OVERALL EXIT CONDITIONS; ALL          5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     733582.62   3986.1794     93.9346      1.7804      0.7986     16.9895      1.2252


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 80% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =17.223   EfDer =  0.938

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      95.197    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   43.27120

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      92.998    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73233.102   74697.609       3.070     831.557     270.829     619.754       2.288

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   215.31    -0.07   215.31     0.19   541.71
  MEAN    17.06     0.00    -0.02   215.31    -0.07   215.31     0.19
  HUB     12.51     0.00    -0.02   215.31    -0.07   215.31     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.41    50.47    17.94   543.87   585.01    14.72   518.94     0.52
  MEAN    64.42    47.20    17.22   449.76   498.71    14.72   518.94     0.45
  HUB     56.87    38.62    18.25   329.80   393.92    14.72   518.94     0.35

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   481.68   388.33   284.98  1137.17     0.42
  MEAN    18.04   482.93   386.19   289.96  1132.37     0.43
  HUB     15.00   517.56   423.99   296.83  1126.55     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   324.67   155.54     0.29  8012.77
  MEAN   475.49   303.40    89.30     0.27  6966.63     1.89
  HUB    395.45   298.20    28.54     0.26  6360.74

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.25     1.21    16.13   556.74     1.06   537.37     0.92     0.86
  MEAN    17.82     1.18    15.72   552.31     1.06   532.83     0.92     0.86
  HUB     17.57     1.16    15.20   549.75     1.05   527.37     0.92     0.86

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     53.73    28.63    24.20     4.43     0.93     0.56     2.90
  MEAN    53.10    17.12    12.70     4.42     0.95     0.51     3.51     0.86
  HUB     55.00    -5.49    -9.30     3.81     0.95     0.37     4.78
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.938

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     486.510     385.442     296.862    1132.718       0.430       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.856      15.727     533.166      24.000      52.397      35.400     -16.997

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     310.038     385.442     494.660    1145.122       0.271       0.545

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.763      16.880     544.907     528.796       0.052       0.668

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     290.137       0.000     290.137    1146.169       0.253       0.515

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.859     545.904       0.000       0.060       0.114       0.536

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.785      17.629       1.167     552.935      30.125     159.671       1.238

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 187555.672       0.634    1008.984  905346.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =17.223   EfDer =  0.935

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     95.197    3021.000      17.629     552.935       1.000       1.000       0.980
W Kg/sec =   43.27120

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.960    2925.983       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73233.102   74697.609       2.474     590.487     238.692     474.134       1.986

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   277.76    -0.10   277.76     0.24   524.71
 MEAN    18.08     0.00    -0.02   277.76    -0.10   277.76     0.24
 HUB     15.21     0.00    -0.02   277.76    -0.10   277.76     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.86    46.36    16.50   541.76   608.90    16.92   546.49     0.53
 MEAN    59.77    42.30    17.47   476.60   551.71    16.92   546.49     0.48
 HUB     55.30    37.84    17.46   400.98   487.87    16.92   546.49     0.43

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   441.19   336.12   285.78  1166.75     0.38
 MEAN    18.01   435.37   325.04   289.65  1162.78     0.37
 HUB     15.22   455.29   347.58   294.07  1158.77     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   350.09   202.22     0.30  6865.55
 MEAN   474.80   326.07   149.76     0.28  5855.63     1.87
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 HUB    401.33   298.95    53.74     0.26  5292.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.55     1.17    18.62   582.00     1.05   565.75     0.92     0.86
 MEAN    20.10     1.14    18.25   577.72     1.04   561.90     0.92     0.86
 HUB     19.85     1.13    17.85   575.34     1.04   558.03     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.63    35.28    31.50     3.78     0.93     0.52     2.90
 MEAN    48.30    27.34    23.50     3.84     0.95     0.50     3.30     0.86
 HUB     49.77    10.36     6.50     3.86     0.95     0.48     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.935

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     466.217     325.949     333.340    1161.025       0.402      -0.112

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.151      18.030     560.205      46.000      44.358      30.600     -13.758

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     333.886     325.949     466.608    1170.151       0.285       0.388

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      20.094      18.988     569.047     455.853       0.040       0.525

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     330.727       0.000     330.727    1170.331       0.283       0.457

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      18.912     569.222       0.000       0.060       0.092       0.349

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.799      19.992       1.134     578.355      25.420     173.533       1.345

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 158321.375       0.546     851.713  812843.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =17.223   EfDer =  0.974

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     95.197    3021.000      19.992     578.355       1.000       1.000       0.880
W Kg/sec =   43.27120

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     73.913    2860.958       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73233.102   74697.609       2.275     489.817     215.265     384.470       1.786

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   310.61    -0.11   310.61     0.27   501.06
 MEAN    17.74     0.00    -0.02   310.61    -0.11   310.61     0.27
 HUB     15.05     0.00    -0.02   310.61    -0.11   310.61     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.59    46.36    13.23   529.11   613.64    19.04   570.30     0.52
 MEAN    56.41    43.40    13.01   467.64   561.49    19.04   570.30     0.48
 HUB     51.95    38.84    13.11   396.77   503.97    19.04   570.30     0.43

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   426.60   318.33   284.00  1191.29     0.36
MEAN    17.51   422.93   310.16   287.53  1187.80     0.36
HUB     14.85   444.67   335.84   291.45  1184.30     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    522.26   349.63   203.93     0.29  6308.24
MEAN   461.53   324.94   151.37     0.27  5431.70     1.90
HUB    391.49   296.71    55.65     0.25  4988.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.01     1.15    21.06   605.05     1.05   589.86     0.92     0.89
MEAN    22.57     1.13    20.68   601.34     1.04   586.41     0.92     0.89
HUB     22.35     1.12    20.28   599.47     1.04   582.96     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     48.26    35.68    31.50     4.18     0.93     0.52     2.90
MEAN    47.17    27.76    23.50     4.26     0.94     0.50     3.28     0.89
HUB     49.05    10.81     6.50     4.31     0.94     0.50     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     426.767     312.194     290.972    1188.142       0.359       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.626      20.694     586.749      46.000      47.015      31.500     -15.515

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     295.884     312.194     430.131    1196.109       0.247       0.483

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.566      21.625     594.644     471.992       0.040       0.569

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     288.760       0.000     288.760    1196.459       0.241       0.432

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.548     594.992       0.000       0.060       0.104       0.444

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.825      22.440       1.122     601.952      23.597     176.675       1.370

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 147027.531       0.539     790.956  896101.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =17.223   EfDer =  0.959

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     95.197    3021.000      22.440     601.952       1.000       1.000       0.980
W Kg/sec =   43.27120

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     67.180    2804.322       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73233.102   74697.609       2.624     513.330     195.664     401.059       2.050

     ROTOR LEADING EDGE CONDITIONS, STAGE            4
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   272.31    -0.09   272.31     0.23   471.32
MEAN    16.97     0.00    -0.02   272.31    -0.09   272.31     0.23
HUB     14.32     0.00    -0.02   272.31    -0.09   272.31     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.80    46.36    15.44   507.76   576.25    21.65   595.76     0.48
MEAN    58.68    43.80    14.88   447.40   523.84    21.65   595.76     0.44
HUB     54.20    37.84    16.36   377.52   465.56    21.65   595.76     0.39

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   409.77   299.63   279.52  1213.23     0.34
MEAN    16.57   405.33   290.58   282.59  1210.00     0.33
HUB     13.89   424.60   313.79   286.04  1206.75     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    497.74   342.60   198.11     0.28  5658.84
MEAN   436.94   318.24   146.36     0.26  4817.61     1.82
HUB    366.18   290.80    52.39     0.24  4359.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.30     1.13    23.37   625.89     1.04   611.88     0.92     0.88
MEAN    24.86     1.11    23.00   622.33     1.03   608.62     0.92     0.88
HUB     24.62     1.10    22.60   620.39     1.03   605.35     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.99    35.33    31.50     3.83     0.93     0.49     2.90
MEAN    45.80    27.38    23.50     3.88     0.95     0.48     3.29     0.88
HUB     47.65    10.38     6.50     3.88     0.95     0.46     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.959

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     402.939     292.213     277.437    1210.699       0.333       0.035

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.904      23.063     609.322      46.000      46.486      32.400     -14.086

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     286.509     292.213     409.238    1217.336       0.235       0.480

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.858      23.916     616.020     456.573       0.034       0.564

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     273.865       0.000     273.865    1217.920       0.225       0.424

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.883     616.611       0.000       0.060       0.094       0.463

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.816      24.740       1.102     622.870      20.918     185.304       1.436

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 130395.211       0.526     701.480  809359.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =17.223   EfDer =  0.968

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
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     95.197    3021.000      24.740     622.870       1.000       1.000       0.980
W Kg/sec =   43.27120

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     61.984    2756.831       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 73233.102   74697.609       2.823     509.668     180.539     390.276       2.162

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   256.47    -0.09   256.47     0.21   440.73
 MEAN    15.91     0.00    -0.02   256.47    -0.09   256.47     0.21
 HUB     13.07     0.00    -0.02   256.47    -0.09   256.47     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.04    47.36    14.68   482.97   546.92    23.99   617.38     0.45
 MEAN    58.57    44.80    13.77   419.52   491.78    23.99   617.38     0.40
 HUB     53.35    38.84    14.51   344.57   429.61    23.99   617.38     0.35

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   388.31   284.84   263.91  1232.84     0.31
 MEAN    15.50   379.45   269.81   266.81  1229.56     0.31
 HUB     12.59   390.80   282.56   269.97  1226.26     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   324.09   188.11     0.26  5111.71
 MEAN   408.57   300.73   138.75     0.24  4182.84     1.82
 HUB    331.91   274.44    49.35     0.22  3558.65

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.50     1.11    25.67   644.48     1.03   631.90     0.92     0.89
 MEAN    26.98     1.09    25.26   640.55     1.03   628.54     0.92     0.89
 HUB     26.64     1.08    24.83   637.92     1.02   625.17     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.18    35.48    31.50     3.98     0.93     0.50     2.90
 MEAN    45.32    27.48    23.50     3.98     0.94     0.47     3.34     0.89
 HUB     46.31    10.36     6.50     3.86     0.94     0.44     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.968

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     384.560     274.759     269.061    1229.660       0.313      -0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.004      25.232     628.647      46.000      45.600      33.000     -12.600

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     281.297     274.759     393.218    1235.257       0.228       0.409

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.938      25.982     634.383     440.827       0.057       0.553

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     264.477       0.000     264.477    1236.002       0.214       0.453

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.043     635.149       0.000       0.060       0.085       0.443

    STAGE EXIT CONDITIONS, STAGE            5
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      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.830      26.888       1.087     640.984      18.113     199.550       1.547

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  112965.086       0.505     607.712  841477.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     736264.88   3960.8464     92.9976      1.7798      0.7953     17.2226      1.2260


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 80% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.043   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     149.467    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   67.93939

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     146.014    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  114982.070  117281.461       1.956     831.557     425.224     619.754       1.457

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   348.42    -0.12   348.42     0.31   541.71
  MEAN    17.06     0.00    -0.02   348.42    -0.12   348.42     0.31
  HUB     12.51     0.00    -0.02   348.42    -0.12   348.42     0.31

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.36    50.47     6.89   543.87   646.01    14.11   512.67     0.58
  MEAN    52.24    47.20     5.04   449.76   569.03    14.11   512.67     0.51
  HUB     43.44    38.62     4.82   329.80   479.84    14.11   512.67     0.43

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   553.35   288.68   472.08  1121.34     0.49
  MEAN    18.04   580.98   330.24   477.99  1118.54     0.52
  HUB     15.00   662.61   444.47   491.43  1112.68     0.60

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   536.64   255.19     0.48  5957.91
  MEAN   475.49   499.57   145.25     0.45  5958.26     1.27
  HUB    395.45   493.87    49.02     0.44  6668.57

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.56     1.16    14.86   548.04     1.05   522.47     0.92     0.91
  MEAN    17.56     1.16    14.60   548.04     1.05   519.85     0.92     0.91
  HUB     17.87     1.18    14.05   551.05     1.05   514.39     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     31.45    28.39    24.20     4.19     0.93     0.25     2.90
  MEAN    34.64    16.90    12.70     4.20     0.92     0.21     3.51     0.91
  HUB     42.13    -5.70    -9.30     3.60     0.92     0.08     4.78


    blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     590.941     329.598     490.486    1118.514       0.528      -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.629      14.573     519.878      24.000      33.900      35.400       1.500

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     523.091     329.598     618.271    1125.285       0.465       0.210

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.593      15.169     526.191     528.796       0.021       0.371

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     481.445       0.000     481.445    1129.015       0.426       0.287

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.478     529.686       0.000       0.060       0.037       0.308

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      17.542       1.161     549.045      26.235     225.311       1.747

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 163338.484       0.552    1379.638 1465094.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 5.043   EfDer =  0.991

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    149.467    3021.000      17.542     549.045       1.000       1.000       0.980
W Kg/sec =   67.93939

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    128.861    2936.329       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 114982.070  117281.461       1.573     590.487     375.277     474.134       1.263

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   458.20    -0.16   458.20     0.41   526.56
 MEAN    18.08     0.00    -0.02   458.20    -0.16   458.20     0.41
 HUB     15.21     0.00    -0.02   458.20    -0.16   458.20     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.78    46.36     3.42   541.76   709.67    15.66   531.51     0.63
 MEAN    46.14    42.30     3.84   476.60   661.25    15.66   531.51     0.58
 HUB     41.20    37.84     3.36   400.98   608.99    15.66   531.51     0.54

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   518.05   200.65   477.62  1144.15     0.45
 MEAN    18.01   530.94   226.39   480.25  1142.88     0.46
 HUB     15.22   576.03   312.58   483.84  1141.54     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   584.94   337.69     0.51  4100.47
 MEAN   474.80   540.69   248.41     0.47  4080.20     1.32
 HUB    401.33   491.91    88.75     0.43  4760.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     19.36     1.10    16.82   566.40     1.03   543.99     0.92     0.91
 MEAN    19.35     1.10    16.69   566.32     1.03   542.78     0.92     0.91
 HUB     19.67     1.12    16.52   569.20     1.04   541.49     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.79    35.26    31.50     3.76     0.93     0.22     2.90
 MEAN    25.24    27.35    23.50     3.85     0.92     0.23     3.30     0.91
 HUB     32.86    10.39     6.50     3.89     0.92     0.26     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     717.744     227.030     680.892    1123.210       0.639      -0.693

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.432      14.758     524.288      46.000      18.440      30.600      12.160

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     707.963     227.030     743.475    1124.457       0.630      -0.683

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      19.304      14.775     525.452     400.556       0.056       0.128

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     702.132       0.000     702.132    1125.202       0.624      -0.017

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      14.710     526.140       0.000       0.060       0.118      -0.707

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.757      19.132       1.091     567.308      18.263     285.623       2.214

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 113741.383       0.392     960.716 1350857.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 5.043   EfDer =  0.808

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    149.467    3021.000      19.132     567.308       1.000       1.000       0.780
W Kg/sec =   67.93939

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.106    2888.679       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 114982.070  117281.461       1.241     434.156     349.789     339.175       0.970

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   633.83    -0.22   633.83     0.56   505.92
 MEAN    17.74     0.00    -0.02   633.83    -0.22   633.83     0.56
 HUB     15.05     0.00    -0.02   633.83    -0.22   633.83     0.56

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     39.87    46.36    -6.49   529.11   825.79    15.47   533.77     0.73
 MEAN    36.43    43.40    -6.97   467.64   787.81    15.47   533.77     0.70
 HUB     32.06    38.84    -6.78   396.77   747.89    15.47   533.77     0.66

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
```

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	524.70	142.59	504.95	1156.98	0.45
MEAN	17.51	536.31	179.89	505.24	1157.34	0.46
HUB	14.85	580.58	280.88	508.12	1157.55	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	631.76	379.67	0.55	2829.01	
MEAN	461.53	578.43	281.64	0.50	3153.17	1.43
HUB	391.49	520.02	110.62	0.45	4174.28	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.19	1.06	17.53	579.28	1.02	556.30	0.92	0.74
MEAN	20.32	1.06	17.53	580.65	1.02	556.64	0.92	0.74
HUB	20.71	1.08	17.44	584.98	1.03	556.84	0.92	0.74

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	15.77	36.94	31.50	5.44	0.93	0.26	2.90	
MEAN	19.60	29.14	23.50	5.64	0.87	0.30	3.28	0.74
HUB	28.93	12.28	6.50	5.78	0.87	0.35	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.808

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	543.229	181.073	512.163	1157.669	0.469	-0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.379	17.523	556.999	46.000	19.471	31.500	12.029

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	538.310	181.073	567.948	1158.131	0.465	-0.003

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.290	17.495	557.443	471.992	0.041	0.149

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	523.031	0.000	523.031	1159.536	0.451	0.007

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.542	558.797	0.000	0.060	0.081	0.013

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.606	20.173	1.054	581.637	14.329	345.464	2.678

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
89263.734	0.327	753.966	1809652.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 5.043 EfDer = 0.928

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
149.467	3021.000	20.173	581.637	1.000	1.000	0.980

W Kg/sec = 67.93939

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
115.333	2852.876	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
114982.070	117281.461	1.528	513.330	335.902	401.059	1.194

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	488.46	-0.17	488.46	0.42	479.48
MEAN	16.97	0.00	-0.02	488.46	-0.17	488.46	0.42	

```
HUB     14.32     0.00    -0.02   488.46    -0.17   488.46     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     46.12    46.36    -0.24   507.76   704.68    17.86   561.72     0.61
MEAN    42.50    43.80    -1.30   447.40   662.50    17.86   561.72     0.57
HUB     37.71    37.84    -0.13   377.52   617.45    17.86   561.72     0.53

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   532.59   128.67   516.81  1169.29     0.46
MEAN    16.57   542.50   166.61   516.28  1169.83     0.46
HUB     13.89   582.99   268.61   517.42  1170.14     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    497.74   635.07   369.07     0.54  2432.44
MEAN   436.94   582.77   270.33     0.50  2764.21     1.21
HUB    366.18   526.54    97.57     0.45  3733.45

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.25     1.05    18.43   591.93     1.02   568.25     0.92     0.85
MEAN    21.40     1.06    18.47   593.33     1.02   568.77     0.92     0.85
HUB     21.84     1.08    18.43   597.43     1.03   569.07     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     13.98    35.53    31.50     4.03     0.93     0.13     2.90
MEAN    17.89    27.64    23.50     4.14     0.90     0.16     3.29     0.85
HUB     27.44    10.68     6.50     4.18     0.90     0.20     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.928

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     531.956     167.546     504.882    1171.674       0.454       0.055

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.468      18.634     570.612      46.000      18.359      32.400      14.041

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     539.024     167.546     564.463    1171.025       0.460       0.008

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.358      18.468     569.980     456.573       0.046       0.143

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     512.352       0.000     512.352    1173.427       0.437      -0.010

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.604     572.321       0.000       0.060       0.094       0.053

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.668      21.211       1.051     594.233      12.596     363.177       2.815

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  78485.625       0.317     662.929 1385575.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.043   EfDer =  0.887

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    149.467    3021.000      21.211     594.233       1.000       1.000       0.980
W Kg/sec =   67.93939
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
110.874	2822.478	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
114982.070	117281.461	1.578	509.668	322.922	390.276	1.209

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	474.90	-0.16	474.90	0.40	451.22
MEAN	15.91	0.00	-0.02	474.90	-0.16	474.90	0.40	
HUB	13.07	0.00	-0.02	474.90	-0.16	474.90	0.40	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.49	47.36	-1.87	482.97	677.46	18.96	575.41	0.58
MEAN	41.47	44.80	-3.33	419.52	633.77	18.96	575.41	0.54
HUB	35.98	38.84	-2.86	344.57	586.83	18.96	575.41	0.50

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	516.52	109.17	504.85	1181.53	0.44
MEAN	15.50	524.29	142.26	504.62	1181.90	0.44
HUB	12.59	558.32	235.97	506.00	1182.07	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	472.96	622.26	363.79	0.53	1961.52	
MEAN	408.57	570.58	266.30	0.48	2207.33	1.19
HUB	331.91	515.02	95.95	0.44	2972.94	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.06	1.04	19.34	602.53	1.01	580.27	0.92	0.81
MEAN	22.17	1.05	19.37	603.57	1.02	580.63	0.92	0.81
HUB	22.51	1.06	19.32	606.81	1.02	580.80	0.92	0.81

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	12.20	35.78	31.50	4.28	0.93	0.11	2.90	
MEAN	15.74	27.82	23.50	4.32	0.89	0.13	3.34	0.81
HUB	25.00	10.74	6.50	4.24	0.89	0.17	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.887

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	529.749	144.871	509.555	1182.121	0.448	-0.012

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.189	19.329	580.884	46.000	15.871	33.000	17.129

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	555.653	144.871	574.228	1179.731	0.471	-0.175

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.927	18.834	578.538	440.827	0.110	0.120

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	515.309	0.000	515.309	1183.402	0.435	-0.033

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.235	582.144	0.000	0.060	0.115	-0.037

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.554	21.914	1.033	604.304	10.071	421.928	3.271

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 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   62768.293       0.281     530.172 1450139.250

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     507597.53   4287.4204    146.0140      1.4506      0.7220      5.0429      1.1559


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 80% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.504   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     147.236    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   66.92538

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     143.835    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  113265.953  115531.023       1.985     831.557     418.878     619.754       1.480

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   342.67    -0.12   342.67     0.31   541.71
  MEAN    17.06     0.00    -0.02   342.67    -0.12   342.67     0.31
  HUB     12.51     0.00    -0.02   342.67    -0.12   342.67     0.31

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     57.79    50.47     7.32   543.87   642.92    14.14   513.00     0.58
  MEAN    52.70    47.20     5.50   449.76   565.52    14.14   513.00     0.51
  HUB     43.91    38.62     5.29   329.80   475.68    14.14   513.00     0.43

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   548.32   293.59   463.10  1122.29     0.49
  MEAN    18.04   575.30   333.00   469.13  1119.35     0.51
  HUB     15.00   655.23   443.59   482.24  1113.48     0.59

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   526.40   250.29     0.47  6059.10
  MEAN   475.49   490.29   142.49     0.44  6007.94     1.28
  HUB    395.45   484.63    48.14     0.44  6655.35

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.60     1.17    14.95   548.47     1.05   523.36     0.92     0.91
  MEAN    17.58     1.16    14.68   548.25     1.05   520.61     0.92     0.91
  HUB     17.86     1.18    14.13   551.00     1.05   515.14     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     32.37    28.39    24.20     4.19     0.93     0.26     2.90
  MEAN    35.37    16.90    12.70     4.20     0.92     0.22     3.51     0.91
  HUB     42.61    -5.70    -9.30     3.60     0.92     0.09     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.998

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	584.885	332.349	481.285	1119.362	0.523	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.653	14.652	520.667	24.000	34.627	35.400	0.773

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	512.442	332.349	610.781	1126.477	0.455	0.226

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.620	15.285	527.307	528.796	0.021	0.383

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	472.008	0.000	472.008	1130.022	0.418	0.299

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.580	530.632	0.000	0.060	0.037	0.321

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.875	17.570	1.163	549.240	26.430	222.210	1.723

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
164548.391	0.556	1369.114	1440904.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 5.504 EfDer = 0.994

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
147.236	3021.000	17.570	549.240	1.000	1.000	0.980

W Kg/sec = 66.92538

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
126.763	2935.809	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
113265.953	115531.023	1.600	590.487	369.167	474.134	1.284

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	449.41	-0.15	449.41	0.40	526.47
MEAN	18.08	0.00	-0.02	449.41	-0.15	449.41	0.40	
HUB	15.21	0.00	-0.02	449.41	-0.15	449.41	0.40	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.33	46.36	3.97	541.76	704.02	15.76	532.37	0.62
MEAN	46.69	42.30	4.39	476.60	655.18	15.76	532.37	0.58
HUB	41.75	37.84	3.91	400.98	602.39	15.76	532.37	0.53

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	511.60	208.01	467.40	1145.60	0.45
MEAN	18.01	524.32	231.68	470.36	1144.12	0.46
HUB	15.22	569.00	314.50	474.19	1142.57	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	572.35	330.33	0.50	4250.67	
MEAN	474.80	529.47	243.12	0.46	4175.30	1.33
HUB	401.33	482.07	86.83	0.42	4789.94	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.47	1.11	16.97	567.24	1.03	545.38	0.92	0.91
MEAN	19.43	1.11	16.82	566.92	1.03	543.96	0.92	0.91
HUB	19.72	1.12	16.64	569.52	1.04	542.48	0.92	0.91

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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.99    35.25    31.50     3.75     0.93     0.24     2.90
 MEAN    26.22    27.33    23.50     3.83     0.92     0.25     3.30     0.91
 HUB     33.55    10.38     6.50     3.88     0.92     0.27     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     702.369     232.328     662.832    1125.783       0.624      -0.667

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.510      15.003     526.693      46.000      19.316      30.600      11.284

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     686.364     232.328     724.618    1127.765       0.609      -0.627

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      19.399      15.101     528.549     400.556       0.051       0.143

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     679.360       0.000     679.360    1128.623       0.602       0.024

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      15.068     529.348       0.000       0.060       0.104      -0.639

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.783      19.254       1.096     567.890      18.650     278.452       2.159

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 116152.578       0.401     966.440 1326164.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.504   EfDer =  0.825

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    147.236    3021.000      19.254     567.890       1.000       1.000       0.780
W Kg/sec =   66.92538

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    117.619    2887.200       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
 113265.953  115531.023       1.267     434.156     342.545     339.175       0.990

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   615.40    -0.21   615.40     0.54   505.66
 MEAN    17.74     0.00    -0.02   615.40    -0.21   615.40     0.54
 HUB     15.05     0.00    -0.02   615.40    -0.21   615.40     0.54

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     40.70    46.36    -5.66   529.11   811.73    15.77   536.27     0.71
 MEAN    37.24    43.40    -6.16   467.64   773.05    15.77   536.27     0.68
 HUB     32.82    38.84    -6.02   396.77   732.33    15.77   536.27     0.64

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   514.32   153.64   490.84  1159.47     0.44
 MEAN    17.51   526.27   187.97   491.56  1159.48     0.45
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 HUB     14.85   570.42   284.23   494.56  1159.38     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   613.84   368.62     0.53  3047.85
 MEAN   461.53   562.55   273.56     0.49  3294.44     1.45
 HUB    391.49   506.06   107.26     0.44  4223.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.43     1.06    17.85   580.79     1.02   558.70     0.92     0.75
 MEAN    20.53     1.07    17.82   581.83     1.02   558.71     0.92     0.75
 HUB     20.90     1.09    17.71   585.77     1.03   558.60     0.92     0.75

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.38    36.91    31.50     5.41     0.93     0.28     2.90
 MEAN    20.93    29.10    23.50     5.60     0.87     0.31     3.28     0.75
 HUB     29.89    12.24     6.50     5.74     0.87     0.36     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.825

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     532.875     189.202     498.155    1159.840       0.459      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.591      17.813     559.088      46.000      20.797      31.500      10.703

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     521.945     189.202     555.180    1160.838       0.450       0.023

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.518      17.857     560.051     471.992       0.036       0.168

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     506.946       0.000     506.946    1162.173       0.436       0.034

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.909     561.339       0.000       0.060       0.073       0.042

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.644      20.414       1.060     582.796      14.907     330.453       2.562

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  92865.617       0.340     772.682 1765149.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.504   EfDer =  0.943

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.236    3021.000      20.414     582.796       1.000       1.000       0.980
W Kg/sec =   66.92538

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.386    2850.037       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 113265.953  115531.023       1.568     513.330     327.317     401.059       1.225

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   473.91    -0.16   473.91     0.41   479.01
 MEAN    16.97     0.00    -0.02   473.91    -0.16   473.91     0.41
 HUB     14.32     0.00    -0.02   473.91    -0.16   473.91     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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 TIP     46.98    46.36     0.62   507.76   694.68    18.21   564.05     0.60
 MEAN    43.36    43.80    -0.44   447.40   651.85    18.21   564.05     0.56
 HUB     38.55    37.84     0.71   377.52   606.00    18.21   564.05     0.52

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   518.83   141.47   499.17  1172.77     0.44
 MEAN    16.57   529.37   175.71   499.36  1172.87     0.45
 HUB     13.89   570.00   271.98   500.92  1172.81     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   613.27   356.27     0.52  2674.06
 MEAN   436.94   563.56   261.23     0.48  2914.91     1.24
 HUB    366.18   509.70    94.21     0.43  3780.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.63     1.06    18.91   594.11     1.02   571.64     0.92     0.86
 MEAN    21.74     1.07    18.90   595.13     1.02   571.74     0.92     0.86
 HUB     22.15     1.09    18.84   598.79     1.03   571.67     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.82    35.52    31.50     4.02     0.93     0.15     2.90
 MEAN    19.39    27.62    23.50     4.12     0.90     0.18     3.29     0.86
 HUB     28.50    10.65     6.50     4.15     0.90     0.22     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.943

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     519.434     176.695     488.458    1174.626       0.442       0.056

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.813      19.069     573.489      46.000      19.887      32.400      12.513

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     519.518     176.695     548.744    1174.618       0.442       0.036

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.725      18.991     573.482     456.573       0.040       0.164

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     493.736       0.000     493.736    1176.849       0.420       0.020

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.129     575.663       0.000       0.060       0.084       0.082

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.716      21.594       1.058     596.011      13.215     345.082       2.675

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  82343.922       0.332     685.137 1355619.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.504   EfDer =  0.908

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    147.236    3021.000      21.594     596.011       1.000       1.000       0.980
W Kg/sec =   66.92538

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    107.441    2818.264       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
113265.953	115531.023	1.629	509.668	312.925	390.276	1.247

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	458.20	-0.16	458.20	0.39	450.55
MEAN	15.91	0.00	-0.02	458.20	-0.16	458.20	0.39	
HUB	13.07	0.00	-0.02	458.20	-0.16	458.20	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.52	47.36	-0.84	482.97	665.85	19.46	578.49	0.56
MEAN	42.49	44.80	-2.31	419.52	621.35	19.46	578.49	0.53
HUB	36.96	38.84	-1.88	344.57	573.39	19.46	578.49	0.49

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	500.34	123.87	484.76	1185.85	0.42
MEAN	15.50	508.71	152.76	485.23	1185.76	0.43
HUB	12.59	542.85	239.82	487.00	1185.52	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	472.96	597.37	349.09	0.50	2225.13	
MEAN	408.57	548.53	255.80	0.46	2369.98	1.22
HUB	331.91	495.63	92.09	0.42	3021.39	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.60	1.05	19.99	605.42	1.02	584.53	0.92	0.83
MEAN	22.67	1.05	19.97	606.04	1.02	584.44	0.92	0.83
HUB	22.97	1.06	19.89	608.79	1.02	584.20	0.92	0.83

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	14.33	35.76	31.50	4.26	0.93	0.13	2.90	
MEAN	17.48	27.80	23.50	4.30	0.89	0.15	3.34	0.83
HUB	26.22	10.71	6.50	4.21	0.89	0.19	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.908

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	513.912	155.564	489.801	1186.010	0.433	-0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.688	19.939	584.711	46.000	17.620	33.000	15.380

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	530.758	155.564	553.086	1184.519	0.448	-0.132

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.477	19.581	583.242	440.827	0.096	0.142

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	493.281	0.000	493.281	1187.767	0.415	0.000

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.940	586.445	0.000	0.060	0.103	-0.004

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.626	22.456	1.040	606.751	10.740	394.913	3.061

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
66940.594	0.299	556.975	1417010.125

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    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     522851.09   4350.3472    143.8347      1.4865      0.7497      5.5035      1.1606


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 80% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 5.961   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     145.038    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   65.92652

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     141.688    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  111575.445  113806.719       2.015     831.557     412.626     619.754       1.502

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   337.03    -0.12   337.03     0.30   541.71
  MEAN    17.06     0.00    -0.02   337.03    -0.12   337.03     0.30
  HUB     12.51     0.00    -0.02   337.03    -0.12   337.03     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.22    50.47     7.75   543.87   639.93    14.17   513.32     0.58
  MEAN    53.16    47.20     5.96   449.76   562.12    14.17   513.32     0.51
  HUB     44.39    38.62     5.77   329.80   471.63    14.17   513.32     0.42

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   543.58   298.32   454.40  1123.19     0.48
  MEAN    18.04   569.88   335.66   460.54  1120.12     0.51
  HUB     15.00   648.13   442.75   473.34  1114.25     0.58

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   516.51   245.56     0.46  6156.67
  MEAN   475.49   481.30   139.83     0.43  6055.97     1.30
  HUB    395.45   475.69    47.31     0.43  6642.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.65     1.17    15.03   548.88     1.05   524.21     0.92     0.91
  MEAN    17.61     1.17    14.75   548.46     1.05   521.33     0.92     0.91
  HUB     17.86     1.18    14.20   550.94     1.05   515.86     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     33.28    28.39    24.20     4.19     0.93     0.27     2.90
  MEAN    36.09    16.89    12.70     4.19     0.92     0.23     3.51     0.91
  HUB     43.09    -5.71    -9.30     3.59     0.92     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     579.115     335.009     472.380    1120.167       0.517      -0.008
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Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.675	14.726	521.416	24.000	35.344	35.400	0.056

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	502.214	335.009	603.697	1127.603	0.445	0.241

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.643	15.395	528.361	528.796	0.020	0.394

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	462.928	0.000	462.928	1130.977	0.409	0.311

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.674	531.528	0.000	0.060	0.037	0.333

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	17.594	1.165	549.428	26.618	219.207	1.699

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
165717.266	0.560	1358.260	1417198.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 5.961 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
145.038	3021.000	17.594	549.428	1.000	1.000	0.980

W Kg/sec = 65.92652

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
124.721	2935.308	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
111575.445	113806.719	1.626	590.487	363.218	474.134	1.305

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	440.93	-0.15	440.93	0.39	526.38
MEAN	18.08	0.00	-0.02	440.93	-0.15	440.93	0.39	
HUB	15.21	0.00	-0.02	440.93	-0.15	440.93	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.87	46.36	4.51	541.76	698.63	15.85	533.19	0.62
MEAN	47.24	42.30	4.94	476.60	649.39	15.85	533.19	0.57
HUB	42.29	37.84	4.45	400.98	596.09	15.85	533.19	0.53

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	505.67	215.02	457.67	1146.96	0.44
MEAN	18.01	518.13	236.69	460.90	1145.28	0.45
HUB	15.22	562.36	316.34	464.95	1143.55	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	560.36	323.32	0.49	4393.75	
MEAN	474.80	518.77	238.10	0.45	4265.61	1.35
HUB	401.33	472.65	84.99	0.41	4817.91	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.56	1.11	17.12	568.03	1.03	546.68	0.92	0.91
MEAN	19.50	1.11	16.95	567.49	1.03	545.07	0.92	0.91
HUB	19.76	1.12	16.75	569.82	1.04	543.42	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.16	35.24	31.50	3.74	0.93	0.25	2.90	

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 MEAN    27.18    27.32    23.50     3.82     0.92     0.26     3.30     0.91
 HUB     34.23    10.36     6.50     3.86     0.92     0.27     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     688.276     237.359     646.053    1128.124       0.610       -0.643

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.582      15.226     528.886      46.000      20.173      30.600      10.427

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     666.664     237.359     707.659    1130.729       0.590       -0.576

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      19.485      15.396     531.331     400.556       0.046       0.158

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     658.895       0.000     658.895    1131.648       0.582       0.060

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      15.387     532.192       0.000       0.060       0.092       -0.579

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.805      19.363       1.101     568.446      19.019     271.791       2.107

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 118450.117       0.409     970.847 1302166.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.961   EfDer =  0.841

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    145.038     3021.000      19.363     568.446       1.000        1.000        0.780
W Kg/sec =   65.92652

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
    115.267     2885.786       1.402       0.249      53.349      56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 111575.445  113806.719       1.293     434.156     335.697     339.175       1.010

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa     C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   598.56    -0.21   598.56      0.53   505.41
 MEAN    17.74      0.00    -0.02   598.56    -0.21   598.56      0.53
 HUB     15.05      0.00    -0.02   598.56    -0.21   598.56      0.53

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     41.49     46.36    -4.87   529.11   799.03     16.04   538.53      0.70
 MEAN    38.01     43.40    -5.39   467.64   759.71     16.04   538.53      0.67
 HUB     33.55     38.84    -5.29   396.77   718.23     16.04   538.53      0.63

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   505.06    163.90    477.72   1161.75      0.43
 MEAN    17.51   517.18    195.45    478.82   1161.45      0.45
 HUB     14.85   561.07    287.33    481.91   1161.07      0.48

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
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 TIP    522.26   597.19   358.35     0.51  3251.05
 MEAN   461.53   547.78   266.07     0.47  3425.38     1.46
 HUB    391.49   493.04   104.16     0.42  4269.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.65     1.07    18.13   582.21     1.02   560.91     0.92     0.77
 MEAN    20.72     1.07    18.08   582.94     1.03   560.61     0.92     0.77
 HUB     21.07     1.09    17.95   586.52     1.03   560.24     0.92     0.77

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.94    36.87    31.50     5.37     0.93     0.29     2.90
 MEAN    22.21    29.06    23.50     5.56     0.88     0.32     3.28     0.77
 HUB     30.80    12.20     6.50     5.70     0.88     0.36     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.841

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     523.498     196.736     485.124    1161.830       0.451      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.787      18.081     561.008      46.000      22.074      31.500       9.426

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     506.904     196.736     543.743    1163.308       0.436       0.048

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.727      18.190     562.435     471.992       0.031       0.186

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     492.184       0.000     492.184    1164.577       0.423       0.060

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.246     563.663       0.000       0.060       0.065       0.069

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.677      20.635       1.066     583.889      15.443     317.375       2.460

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96205.852       0.353     788.527 1723613.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.961   EfDer =  0.956

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.038    3021.000      20.635     583.889       1.000       1.000       0.980
W Kg/sec =   65.92652

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    109.626    2847.369       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111575.445  113806.719       1.608     513.330     319.278     401.059       1.256

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   460.51    -0.16   460.51     0.39   478.56
 MEAN    16.97     0.00    -0.02   460.51    -0.16   460.51     0.39
 HUB     14.32     0.00    -0.02   460.51    -0.16   460.51     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.80    46.36     1.44   507.76   685.60    18.53   566.19     0.59
 MEAN    44.18    43.80     0.38   447.40   642.17    18.53   566.19     0.55
 HUB     39.36    37.84     1.52   377.52   595.58    18.53   566.19     0.51
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      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   506.84   153.09   483.16  1175.88     0.43
 MEAN    16.57   517.74   184.02   483.94  1175.62     0.44
 HUB     13.89   558.30   275.03   485.86  1175.23     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   593.49   344.64     0.50  2893.46
 MEAN   436.94   546.05   252.92     0.46  3052.54     1.26
 HUB    366.18   494.34    91.16     0.42  3822.40

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.99     1.07    19.35   596.13     1.02   574.69     0.92     0.87
 MEAN    22.06     1.07    19.31   596.80     1.02   574.43     0.92     0.87
 HUB     22.43     1.09    19.22   600.06     1.03   574.05     0.92     0.87

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.58    35.50    31.50     4.00     0.93     0.17     2.90
 MEAN    20.82    27.59    23.50     4.09     0.90     0.19     3.29     0.87
 HUB     29.51    10.63     6.50     4.13     0.90     0.23     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.956

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     508.366     185.050     473.490    1177.291       0.432       0.055

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.131      19.466     576.094      46.000      21.347      32.400      11.053

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     501.982     185.050     535.004    1177.841       0.426       0.062

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.060      19.468     576.632     456.573       0.035       0.184

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096     477.000       0.000     477.000    1179.925       0.404       0.049

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.606     578.674       0.000       0.060       0.075       0.110

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.754      21.945       1.064     597.666      13.777     329.685       2.556

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  85853.102       0.347     703.673 1327200.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.961   EfDer =  0.927

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.038    3021.000      21.945     597.666       1.000       1.000       0.980
W Kg/sec =   65.92652

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.288    2814.359       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111575.445  113806.719       1.678     509.668     303.741     390.276       1.285
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ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	443.11	-0.15	443.11	0.37	449.92
MEAN	15.91	0.00	-0.02	443.11	-0.15	443.11	0.37	
HUB	13.07	0.00	-0.02	443.11	-0.15	443.11	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.47	47.36	0.11	482.97	655.56	19.92	581.28	0.55
MEAN	43.44	44.80	-1.36	419.52	610.31	19.92	581.28	0.52
HUB	37.88	38.84	-0.96	344.57	561.41	19.92	581.28	0.47

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	486.55	137.03	466.85	1189.68	0.41
MEAN	15.50	495.19	162.15	467.89	1189.20	0.42
HUB	12.59	529.20	243.27	469.97	1188.61	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	472.96	575.15	335.93	0.48	2461.05	
MEAN	408.57	528.81	246.41	0.44	2515.42	1.24
HUB	331.91	478.26	88.64	0.40	3064.82	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.10	1.05	20.58	608.08	1.02	588.32	0.92	0.85
MEAN	23.12	1.05	20.52	608.31	1.02	587.84	0.92	0.85
HUB	23.39	1.07	20.41	610.63	1.02	587.26	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	16.36	35.74	31.50	4.24	0.93	0.16	2.90	
MEAN	19.11	27.77	23.50	4.27	0.90	0.17	3.34	0.85
HUB	27.37	10.68	6.50	4.18	0.90	0.20	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.927

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	500.203	165.127	472.161	1189.468	0.421	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.149	20.495	588.124	46.000	19.276	33.000	13.724

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	509.029	165.127	535.142	1188.716	0.428	-0.092

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.979	20.255	587.381	440.827	0.083	0.164

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	473.835	0.000	473.835	1191.634	0.398	0.032

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.582	590.268	0.000	0.060	0.092	0.029

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.683	22.954	1.046	609.005	11.339	372.868	2.890

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
70674.023	0.316	579.262	1385929.500

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR

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    536900.31   4400.5688    141.6879      1.5194      0.7730      5.9606      1.1649

*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 80% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    142.688    3021.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   64.85819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    139.392    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
109767.383  111962.492       2.048     831.557     405.939     619.754       1.527

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   331.03    -0.11   331.03     0.30   541.71
MEAN    17.06     0.00    -0.02   331.03    -0.11   331.03     0.30
HUB     12.51     0.00    -0.02   331.03    -0.11   331.03     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.68    50.47     8.21   543.87   636.79    14.20   513.66     0.57
MEAN    53.65    47.20     6.45   449.76   558.54    14.20   513.66     0.50
HUB     44.90    38.62     6.28   329.80   467.36    14.20   513.66     0.42

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   538.76   303.30   445.28  1124.12     0.48
MEAN    18.04   564.28   338.47   451.50  1120.91     0.50
HUB     15.00   640.71   441.86   463.98  1115.04     0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    543.87   506.11   240.57     0.45  6259.48
MEAN   475.49   471.83   137.02     0.42  6106.63     1.32
HUB    395.45   466.29    46.41     0.42  6629.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.70     1.17    15.12   549.32     1.05   525.08     0.92     0.91
MEAN    17.63     1.17    14.82   548.67     1.05   522.08     0.92     0.91
HUB     17.86     1.18    14.27   550.89     1.05   516.60     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.26    28.38    24.20     4.18     0.93     0.29     2.90
MEAN    36.86    16.88    12.70     4.18     0.93     0.24     3.51     0.91
HUB     43.60    -5.71    -9.30     3.59     0.93     0.11     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     573.154     337.814     463.019    1120.995       0.511      -0.007

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.697      14.802     522.187      24.000      36.114      35.400      -0.714

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	491.536	337.814	596.428	1128.759	0.435	0.257

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.667	15.506	529.445	528.796	0.020	0.406

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	453.435	0.000	453.435	1131.960	0.401	0.324

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.771	532.453	0.000	0.060	0.037	0.346

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	17.617	1.166	549.625	26.815	216.045	1.675

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
166948.453	0.564	1346.177	1391974.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 6.453 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
142.688	3021.000	17.617	549.625	1.000	1.000	0.980

W Kg/sec = 64.85819

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
122.560	2934.780	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
109767.383	111962.492	1.654	590.487	356.928	474.134	1.328

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	432.05	-0.15	432.05	0.38	526.29
MEAN	18.08	0.00	-0.02	432.05	-0.15	432.05	0.38	
HUB	15.21	0.00	-0.02	432.05	-0.15	432.05	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.44	46.36	5.08	541.76	693.06	15.93	534.04	0.61
MEAN	47.82	42.30	5.52	476.60	643.40	15.93	534.04	0.57
HUB	42.87	37.84	5.03	400.98	589.56	15.93	534.04	0.52

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	499.76	222.28	447.60	1148.34	0.44
MEAN	18.01	511.86	241.91	451.09	1146.46	0.45
HUB	15.22	555.52	318.23	455.34	1144.55	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	547.95	316.06	0.48	4541.94	
MEAN	474.80	507.66	232.89	0.44	4359.46	1.37
HUB	401.33	462.86	83.09	0.40	4846.72	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.66	1.12	17.26	568.85	1.03	548.00	0.92	0.91
MEAN	19.58	1.11	17.07	568.08	1.03	546.20	0.92	0.91
HUB	19.80	1.12	16.85	570.14	1.04	544.37	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	26.41	35.23	31.50	3.73	0.93	0.26	2.90	
MEAN	28.20	27.31	23.50	3.81	0.92	0.27	3.30	0.91
HUB	34.95	10.34	6.50	3.84	0.92	0.28	3.92	

```
   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     674.219     242.588     629.065    1130.446       0.596      -0.619

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.653      15.447     531.065      46.000      21.088      30.600       9.512

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     647.027     242.588     691.008    1133.635       0.571      -0.524

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      19.570      15.687     534.065     400.556       0.042       0.173

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     638.733       0.000     638.733    1134.581       0.563       0.095

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      15.696     534.956       0.000       0.060       0.081      -0.521

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.823      19.468       1.105     569.026      19.401     265.057       2.055

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 120830.141       0.417     974.305 1276830.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.859

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    142.688    3021.000      19.468     569.026       1.000       1.000       0.780
W Kg/sec =   64.85819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.845    2884.315       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109767.383  111962.492       1.321     434.156     328.642     339.175       1.032

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   581.73    -0.20   581.73     0.51   505.16
 MEAN    17.74     0.00    -0.02   581.73    -0.20   581.73     0.51
 HUB     15.05     0.00    -0.02   581.73    -0.20   581.73     0.51

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.30    46.36    -4.06   529.11   786.50    16.30   540.77     0.69
 MEAN    38.81    43.40    -4.59   467.64   746.52    16.30   540.77     0.65
 HUB     34.31    38.84    -4.53   396.77   704.27    16.30   540.77     0.62

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   496.06   174.26   464.45  1164.02     0.43
 MEAN    17.51   508.23   203.05   465.91  1163.42     0.44
 HUB     14.85   551.73   290.45   469.09  1162.76     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   580.36   347.99     0.50  3456.13
 MEAN   461.53   532.80   258.47     0.46  3558.34     1.48
 HUB    391.49   479.84   101.04     0.41  4316.26
```

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.88	1.07	18.42	583.65	1.03	563.11	0.92	0.79
MEAN	20.92	1.07	18.35	584.09	1.03	562.52	0.92	0.79
HUB	21.24	1.09	18.20	587.29	1.03	561.88	0.92	0.79

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.57	36.84	31.50	5.34	0.93	0.30	2.90	
MEAN	23.55	29.02	23.50	5.52	0.88	0.33	3.28	0.79
HUB	31.77	12.16	6.50	5.66	0.88	0.37	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.859

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	514.287	204.387	471.929	1163.817	0.442	0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.984	18.347	562.928	46.000	23.417	31.500	8.083

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	491.831	204.387	532.608	1165.766	0.422	0.074

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.937	18.521	564.814	471.992	0.027	0.205

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	477.420	0.000	477.420	1166.969	0.409	0.087

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.582	565.980	0.000	0.060	0.058	0.097

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.709	20.855	1.071	585.011	15.985	304.888	2.363

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
99584.203	0.365	802.990	1681260.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.453 EfDer = 0.967

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
142.688	3021.000	20.855	585.011	1.000	1.000	0.980

W Kg/sec = 64.85819

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
106.814	2844.637	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
109767.383	111962.492	1.650	513.330	311.089	401.059	1.289

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	447.06	-0.15	447.06	0.38	478.10
MEAN	16.97	0.00	-0.02	447.06	-0.15	447.06	0.38	
HUB	14.32	0.00	-0.02	447.06	-0.15	447.06	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.65	46.36	2.29	507.76	676.64	18.85	568.33	0.58
MEAN	45.03	43.80	1.23	447.40	632.59	18.85	568.33	0.54
HUB	40.19	37.84	2.35	377.52	585.24	18.85	568.33	0.50

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   495.48   164.61   467.33  1178.93     0.42
MEAN    16.57   506.53   192.25   468.63  1178.33     0.43
HUB     13.89   546.87   278.09   470.89  1177.63     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    497.74   573.91   333.13     0.49  3110.84
MEAN   436.94   528.67   244.69     0.45  3188.91     1.28
HUB    366.18   479.06    88.10     0.41  3864.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.34     1.07    19.78   598.17     1.02   577.68     0.92     0.89
MEAN    22.38     1.07    19.71   598.50     1.02   577.09     0.92     0.89
HUB     22.71     1.09    19.59   601.36     1.03   576.40     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     19.40    35.48    31.50     3.98     0.93     0.19     2.90
MEAN    22.31    27.57    23.50     4.07     0.91     0.21     3.29     0.89
HUB     30.56    10.60     6.50     4.10     0.91     0.24     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.967

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     497.707     193.329     458.624    1179.921       0.422       0.055

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.449      19.860     578.669      46.000      22.857      32.400       9.543

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     484.779     193.329     521.907    1181.001       0.410       0.089

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.394      19.938     579.729     456.573       0.030       0.205

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    16.096     460.594       0.000     460.594    1182.943       0.389       0.078

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      20.078     581.638       0.000       0.060       0.066       0.139

   STAGE EXIT CONDITIONS, STAGE             4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.788      22.293       1.069     599.346      14.336     315.294       2.444

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  89334.758       0.361     720.345 1297825.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.944

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    142.688    3021.000      22.293     599.346       1.000       1.000       0.980
W Kg/sec =   64.85819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.138    2810.411       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109767.383  111962.492       1.730     509.668     294.566     390.276       1.325

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   428.27    -0.15   428.27     0.36   449.29
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 MEAN    15.91     0.00    -0.02   428.27    -0.15   428.27     0.36
 HUB     13.07     0.00    -0.02   428.27    -0.15   428.27     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.44    47.36     1.08   482.97   645.62    20.37   584.04     0.54
 MEAN    44.42    44.80    -0.38   419.52   599.61    20.37   584.04     0.51
 HUB     38.83    38.84    -0.01   344.57   549.77    20.37   584.04     0.46

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   473.77   149.81   449.46  1193.39     0.40
 MEAN    15.50   482.43   171.34   450.98  1192.55     0.40
 HUB     12.59   516.12   246.67   453.35  1191.64     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   553.57   323.15     0.46  2690.28
 MEAN   408.57   509.57   237.23     0.43  2657.71     1.27
 HUB    331.91   461.30    85.24     0.39  3107.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.60     1.06    21.16   610.73     1.02   591.99     0.92     0.86
 MEAN    23.58     1.06    21.06   610.59     1.02   591.17     0.92     0.86
 HUB     23.80     1.07    20.92   612.49     1.02   590.26     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.43    35.72    31.50     4.22     0.93     0.18     2.90
 MEAN    20.80    27.75    23.50     4.25     0.90     0.19     3.34     0.86
 HUB     28.55    10.65     6.50     4.15     0.90     0.22     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.944

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     487.303     174.482     454.995    1192.828       0.409      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.607      21.041     591.451      46.000      20.981      33.000      12.019

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     488.298     174.482     518.535    1192.747       0.409      -0.052

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.474      20.913     591.370     440.827       0.071       0.187

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     455.121       0.000     455.121    1195.378       0.381       0.066

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.214     593.982       0.000       0.060       0.081       0.063

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.733      23.448       1.052     611.268      11.922     353.018       2.737

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   74314.234       0.332     599.228 1354103.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     551011.81   4443.0449    139.3919      1.5521      0.7940      6.4529      1.1692

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**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 80% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.038    3021.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   63.65342

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    136.803    3009.102       1.402       0.249      53.349      32.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
107728.406  109882.742       2.087     831.557     398.399     619.754       1.556

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   324.31    -0.11   324.31     0.29   541.71
MEAN    17.06     0.00    -0.02   324.31    -0.11   324.31     0.29
HUB     12.51     0.00    -0.02   324.31    -0.11   324.31     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.20    50.47     8.73   543.87   633.32    14.24   514.03     0.57
MEAN    54.21    47.20     7.01   449.76   554.58    14.24   514.03     0.50
HUB     45.49    38.62     6.87   329.80   462.62    14.24   514.03     0.42

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   533.61   308.81   435.18  1125.12     0.47
MEAN    18.04   558.19   341.58   441.48  1121.77     0.50
HUB     15.00   632.55   440.86   453.60  1115.90     0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    543.87   494.61   235.06     0.44  6373.05
MEAN   475.49   461.34   133.91     0.41  6162.62     1.35
HUB    395.45   455.87    45.42     0.41  6614.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.74     1.17    15.21   549.80     1.05   526.02     0.92     0.91
MEAN    17.65     1.17    14.90   548.91     1.05   522.89     0.92     0.91
HUB     17.85     1.18    14.35   550.82     1.05   517.41     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.36    28.38    24.20     4.18     0.93     0.30     2.90
MEAN    37.73    16.87    12.70     4.17     0.93     0.26     3.51     0.91
HUB     44.18    -5.72    -9.30     3.58     0.93     0.12     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     566.673     340.915     452.653    1121.891       0.505      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.720      14.884     523.023      24.000      36.985      35.400      -1.585

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     479.794     340.915     588.579    1130.006       0.425       0.275
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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.690      15.625     530.616     528.796       0.020       0.419

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     442.983       0.000     442.983    1133.023       0.391       0.338

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.873     533.453       0.000       0.060       0.037       0.359

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      17.640       1.168     549.844      27.034     212.543       1.648

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 168306.938       0.569    1331.922 1363684.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.038    3021.000      17.640     549.844       1.000       1.000       0.980
W Kg/sec =   63.65342

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    120.153    2934.197       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107728.406  109882.742       1.688     590.487     349.918     474.134       1.355

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   422.26    -0.15   422.26     0.37   526.18
 MEAN    18.08     0.00    -0.02   422.26    -0.15   422.26     0.37
 HUB     15.21     0.00    -0.02   422.26    -0.15   422.26     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.07    46.36     5.71   541.76   687.00    16.03   534.95     0.61
 MEAN    48.47    42.30     6.17   476.60   636.86    16.03   534.95     0.56
 HUB     43.53    37.84     5.69   400.98   582.42    16.03   534.95     0.51

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   493.58   230.16   436.64  1149.82     0.43
 MEAN    18.01   505.21   247.62   440.36  1147.74     0.44
 HUB     15.22   548.13   320.31   444.80  1145.63     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   534.43   308.17     0.46  4702.95
 MEAN   474.80   495.51   227.18     0.43  4462.24     1.39
 HUB    401.33   452.12    81.02     0.39  4878.25

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.76     1.12    17.41   569.75     1.04   549.41     0.92     0.91
 MEAN    19.65     1.11    17.20   568.73     1.03   547.42     0.92     0.91
 HUB     19.85     1.13    16.96   570.50     1.04   545.41     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.80    35.21    31.50     3.71     0.93     0.28     2.90
 MEAN    29.35    27.29    23.50     3.79     0.93     0.28     3.30     0.91
 HUB     35.76    10.32     6.50     3.82     0.93     0.29     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       1.000
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     659.474     248.314     610.939    1132.867       0.582      -0.594

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.727      15.677     533.342      46.000      22.119      30.600       8.481

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     626.372     248.314     673.797    1136.635       0.551      -0.470

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      19.656      15.987     536.897     400.556       0.037       0.189

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     617.743       0.000     617.743    1137.585       0.543       0.131

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      16.013     537.793       0.000       0.060       0.070      -0.460

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.840      19.574       1.110     569.661      19.818     257.893       1.999

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 123426.102       0.426     976.751 1248642.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  0.878

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.038    3021.000      19.574     569.661       1.000       1.000       0.780
W Kg/sec =   63.65342

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    110.214    2882.708       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107728.406  109882.742       1.353     434.156     320.981     339.175       1.057

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   564.00    -0.19   564.00     0.49   504.87
 MEAN    17.74     0.00    -0.02   564.00    -0.19   564.00     0.49
 HUB     15.05     0.00    -0.02   564.00    -0.19   564.00     0.49

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.18    46.36    -3.18   529.11   773.47    16.57   543.10     0.68
 MEAN    39.68    43.40    -3.72   467.64   732.78    16.57   543.10     0.64
 HUB     35.14    38.84    -3.70   396.77   689.69    16.57   543.10     0.60

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   486.94   185.29   450.31  1166.40     0.42
 MEAN    17.51   498.99   211.13   452.12  1165.49     0.43
 HUB     14.85   541.95   293.81   455.39  1164.55     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   562.42   336.96     0.48  3674.50
 MEAN   461.53   516.83   250.40     0.44  3699.56     1.50
 HUB    391.49   465.75    97.69     0.40  4365.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.11     1.08    18.72   585.21     1.03   565.42     0.92     0.80
 MEAN    21.12     1.08    18.62   585.32     1.03   564.53     0.92     0.80
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 HUB     21.41     1.09    18.46   588.14     1.03   563.62     0.92     0.80

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.37    36.81    31.50     5.31     0.93     0.31     2.90
 MEAN    25.03    28.98    23.50     5.48     0.88     0.34     3.28     0.80
 HUB     32.83    12.11     6.50     5.61     0.88     0.38     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.878

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     504.775     212.513     457.860    1165.905       0.433       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.191      18.627     564.949      46.000      24.898      31.500       6.602

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     475.928     212.513     521.219    1168.340       0.407       0.102

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.155      18.868     567.311     471.992       0.024       0.226

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     461.882       0.000     461.882    1169.472       0.395       0.116

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.931     568.411       0.000       0.060       0.051       0.126

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.740      21.083       1.077     586.223      16.562     292.320       2.266

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 103181.336       0.378     816.541 1635637.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  0.978

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.038    3021.000      21.083     586.223       1.000       1.000       0.980
W Kg/sec =   63.65342

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.802    2841.695       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107728.406  109882.742       1.698     513.330     302.315     401.059       1.327

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   432.86    -0.15   432.86     0.37   477.60
 MEAN    16.97     0.00    -0.02   432.86    -0.15   432.86     0.37
 HUB     14.32     0.00    -0.02   432.86    -0.15   432.86     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.56    46.36     3.20   507.76   667.33    19.18   570.58     0.57
 MEAN    45.96    43.80     2.16   447.40   622.63    19.18   570.58     0.53
 HUB     41.10    37.84     3.26   377.52   574.46    19.18   570.58     0.49

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   484.22   176.61   450.87  1182.07     0.41
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MEAN    16.57   495.22   200.87   452.65  1181.14     0.42
HUB     13.89   535.11   281.27   455.23  1180.13     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    497.74   553.54   321.13     0.47  3337.19
MEAN   436.94   510.51   236.07     0.43  3331.71     1.31
HUB    366.18   463.08    84.91     0.39  3909.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.71     1.08    20.23   600.34     1.02   580.77     0.92     0.89
MEAN    22.71     1.08    20.12   600.32     1.02   579.85     0.92     0.89
HUB     23.00     1.09    19.97   602.76     1.03   578.86     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     21.39    35.46    31.50     3.96     0.93     0.22     2.90
MEAN    23.93    27.54    23.50     4.04     0.91     0.23     3.29     0.89
HUB     31.71    10.57     6.50     4.07     0.91     0.26     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.978

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     486.972     201.999     443.100    1182.647       0.412       0.055

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.779      20.267     581.346      46.000      24.507      32.400       7.893

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     467.018     201.999     508.832    1184.262       0.394       0.118

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.738      20.424     582.935     456.573       0.025       0.228

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     443.682       0.000     443.682    1186.063       0.374       0.110

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      20.564     584.709       0.000       0.060       0.057       0.169

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.817      22.652       1.074     601.141      14.918     301.108       2.334

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  92967.766       0.375     735.714 1265787.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  0.960

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.038    3021.000      22.652     601.141       1.000       1.000       0.980
W Kg/sec =   63.65342

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.832    2806.213       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107728.406  109882.742       1.789     509.668     284.937     390.276       1.370

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   412.91    -0.14   412.91     0.35   448.62
 MEAN    15.91     0.00    -0.02   412.91    -0.14   412.91     0.35
 HUB     13.07     0.00    -0.02   412.91    -0.14   412.91     0.35
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     49.48    47.36     2.12   482.97   635.53    20.84   586.91     0.53
MEAN    45.46    44.80     0.66   419.52   588.74    20.84   586.91     0.50
HUB     39.86    38.84     1.02   344.57   537.89    20.84   586.91     0.45

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   461.41   162.88   431.70  1197.16     0.39
MEAN    15.50   469.83   180.78   433.66  1195.99     0.39
HUB     12.59   502.94   250.15   436.31  1194.76     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    472.96   531.52   310.07     0.44  2924.74
MEAN   408.57   489.85   227.79     0.41  2803.85     1.30
HUB    331.91   443.91    81.76     0.37  3151.26

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.11     1.06    21.76   613.51     1.02   595.74     0.92     0.88
MEAN    24.05     1.06    21.62   613.00     1.02   594.58     0.92     0.88
HUB     24.23     1.07    21.45   614.47     1.02   593.36     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     20.67    35.69    31.50     4.19     0.93     0.21     2.90
MEAN    22.63    27.71    23.50     4.21     0.90     0.21     3.34     0.88
HUB     29.83    10.61     6.50     4.11     0.90     0.23     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.960

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     474.599     184.091     437.441    1196.264       0.397      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.081      21.603     594.863      46.000      22.823      33.000      10.177

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     467.486     184.091     502.426    1196.826       0.391      -0.010

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.983      21.586     595.422     440.827       0.059       0.212

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     436.204       0.000     436.204    1199.195       0.364       0.102

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.862     597.781       0.000       0.060       0.069       0.100

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.776      23.957       1.058     613.661      12.520     334.133       2.590

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   78043.641       0.349     617.610 1319680.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     565925.75   4478.5371    136.8026      1.5858      0.8134      7.0126      1.1738


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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 80% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.998

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    135.209    3021.000      15.107     522.810      1.000       1.000       0.980
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    132.086    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       2.162     831.557     384.662     619.754       1.611

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   312.15    -0.11   312.15     0.28   541.71
 MEAN    17.06     0.00    -0.02   312.15    -0.11   312.15     0.28
 HUB     12.51     0.00    -0.02   312.15    -0.11   312.15     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.15    50.47     9.68   543.87   627.18    14.30   514.67     0.56
 MEAN    55.24    47.20     8.04   449.76   547.56    14.30   514.67     0.49
 HUB     46.58    38.62     7.96   329.80   454.18    14.30   514.67     0.41

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   524.98   318.57   417.27  1126.84     0.47
 MEAN    18.04   547.66   347.08   423.65  1123.26     0.49
 HUB     15.00   618.19   439.09   435.16  1117.38     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    543.87   474.21   225.31     0.42  6574.24
 MEAN   475.49   442.68   128.41     0.39  6261.69     1.39
 HUB    395.45   437.34    43.64     0.39  6587.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.83     1.18    15.36   550.65     1.05   527.63     0.92     0.91
 MEAN    17.69     1.17    15.03   549.33     1.05   524.28     0.92     0.91
 HUB     17.83     1.18    14.48   550.71     1.05   518.79     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.36    28.37    24.20     4.17     0.93     0.33     2.90
 MEAN    39.33    16.86    12.70     4.16     0.93     0.28     3.51     0.91
 HUB     45.26    -5.73    -9.30     3.57     0.93     0.15     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     555.477     346.401     434.237    1123.430       0.494      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.757      15.021     524.458      24.000      38.580      35.400      -3.180

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     459.132     346.401     575.148    1132.141       0.406       0.306

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.725      15.824     532.623     528.796       0.021       0.444
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    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     424.556       0.000     424.556    1134.850       0.374       0.361

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.042     535.175       0.000       0.060       0.040       0.383

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      17.672       1.170     550.230      27.420     206.314       1.599

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 170711.172       0.577    1304.368 1312555.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.209    3021.000      17.672     550.230       1.000       1.000       0.980
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    115.839    2933.167       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       1.750     590.487     337.352     474.134       1.405

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   404.97    -0.14   404.97     0.36   526.00
 MEAN    18.08     0.00    -0.02   404.97    -0.14   404.97     0.36
 HUB     15.21     0.00    -0.02   404.97    -0.14   404.97     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.23    46.36     6.87   541.76   676.51    16.18   536.53     0.60
 MEAN    49.65    42.30     7.35   476.60   625.53    16.18   536.53     0.55
 HUB     44.73    37.84     6.89   400.98   570.00    16.18   536.53     0.50

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   483.57   243.88   417.57  1152.31     0.42
 MEAN    18.01   494.06   257.54   421.63  1149.90     0.43
 HUB     15.22   535.44   323.92   426.35  1147.48     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   510.95   294.45     0.44  4982.95
 MEAN   474.80   474.31   217.26     0.41  4640.83     1.43
 HUB    401.33   433.32    77.41     0.38  4933.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.93     1.13    17.65   571.32     1.04   551.80     0.92     0.91
 MEAN    19.77     1.12    17.41   569.88     1.04   549.49     0.92     0.91
 HUB     19.91     1.13    17.14   571.11     1.04   547.17     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.29    35.19    31.50     3.69     0.93     0.31     2.90
 MEAN    31.42    27.26    23.50     3.76     0.93     0.30     3.30     0.91
 HUB     37.23    10.29     6.50     3.79     0.93     0.31     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3       cp 2-3
     17.960     635.116     258.264     580.235    1136.835       0.559      -0.552
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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.843      16.049     537.086      46.000      23.994      30.600       6.606

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     592.009     258.264     645.891    1141.501       0.519      -0.377

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      19.792      16.472     541.504     400.556       0.031       0.218

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     583.211       0.000     583.211    1142.411       0.511       0.189

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      16.515     542.367       0.000       0.060       0.054      -0.359

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.861      19.734       1.117     570.772      20.542     245.847       1.906

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 127938.578       0.441     977.552 1198238.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.911

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.209    3021.000      19.734     570.772       1.000       1.000       0.780
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    105.652    2879.902       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       1.411     434.156     307.694     339.175       1.102

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   534.39    -0.18   534.39     0.47   504.38
 MEAN    17.74     0.00    -0.02   534.39    -0.18   534.39     0.47
 HUB     15.05     0.00    -0.02   534.39    -0.18   534.39     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.73    46.36    -1.63   529.11   752.15    17.00   546.93     0.66
 MEAN    41.20    43.40    -2.20   467.64   710.23    17.00   546.93     0.62
 HUB     36.61    38.84    -2.23   396.77   665.69    17.00   546.93     0.58

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   472.70   203.90   426.46  1170.32     0.40
 MEAN    17.51   484.16   224.78   428.82  1168.92     0.41
 HUB     14.85   525.85   299.43   432.27  1167.53     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   532.18   318.36     0.45  4042.94
 MEAN   461.53   489.83   236.75     0.42  3938.42     1.54
 HUB    391.49   441.96    92.06     0.38  4449.37

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.51     1.09    19.22   587.88     1.03   569.23     0.92     0.83
 MEAN    21.46     1.09    19.07   587.44     1.03   567.87     0.92     0.83
 HUB     21.69     1.10    18.87   589.60     1.03   566.52     0.92     0.83

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     25.55    36.74    31.50     5.24     0.93     0.34     2.90
 MEAN    27.66    28.90    23.50     5.40     0.89     0.36     3.28     0.83
 HUB     34.71    12.02     6.50     5.52     0.89     0.39     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.911

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     489.547     226.257     434.124    1169.355       0.419       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.528      19.080     568.298      46.000      27.528      31.500       3.972

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     449.448     226.257     503.185    1172.585       0.383       0.151

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.506      19.431     571.442     471.992       0.019       0.264

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     436.108       0.000     436.108    1173.596       0.372       0.166

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.496     572.428       0.000       0.060       0.042       0.177

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.787       21.448       1.087     588.307      17.536     272.601       2.113

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 109252.000       0.401     834.771 1557177.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.991

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    135.209     3021.000       21.448     588.307       1.000        1.000        0.980
W Kg/sec =   61.45868

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     98.689     2836.656        1.402       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 104013.984  106094.039        1.786     513.330     287.427     401.059       1.395

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   409.21    -0.14   409.21      0.35   476.76
 MEAN    16.97      0.00    -0.02   409.21    -0.14   409.21      0.35
 HUB     14.32      0.00    -0.02   409.21    -0.14   409.21      0.35

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     51.14     46.36     4.78   507.76   652.24     19.72   574.33      0.55
 MEAN    47.56     43.80     3.76   447.40   606.42     19.72   574.33      0.52
 HUB     42.70     37.84     4.86   377.52   556.85     19.72   574.33      0.47

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   467.20    196.17    424.02   1187.14      0.39
 MEAN    16.57   477.57    214.99    426.44   1185.71      0.40
 HUB     13.89   516.26    286.47    429.48   1184.24      0.44
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    497.74   520.32   301.57     0.44  3706.39
MEAN   436.94   480.74   221.95     0.41  3565.68     1.36
HUB    366.18   436.82    79.71     0.37  3981.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.31     1.09    20.95   603.99     1.03   585.77     0.92     0.91
MEAN    23.24     1.08    20.78   603.39     1.03   584.36     0.92     0.91
HUB     23.46     1.09    20.58   605.15     1.03   582.90     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     24.83    35.42    31.50     3.92     0.93     0.25     2.90
MEAN    26.76    27.50    23.50     4.00     0.92     0.26     3.29     0.91
HUB     33.70    10.51     6.50     4.01     0.92     0.28     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.991

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     470.280     216.204     417.635    1187.083       0.396       0.054

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.310      20.918     585.716      46.000      27.370      32.400       5.030

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     438.297     216.204     488.721    1189.539       0.368       0.168

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      23.287      21.200     588.142     456.573       0.019       0.269

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     416.412       0.000     416.412    1191.117       0.350       0.163

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      21.336     589.703       0.000       0.060       0.045       0.221

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.853      23.220       1.083     604.177      15.870     279.488       2.167

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98902.828       0.399     755.696 1209865.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.209    3021.000      23.220     604.177       1.000       1.000       0.980
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.382    2799.153       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       1.894     509.668     269.064     390.276       1.450

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   388.05    -0.13   388.05     0.33   447.49
MEAN    15.91     0.00    -0.02   388.05    -0.13   388.05     0.33
HUB     13.07     0.00    -0.02   388.05    -0.13   388.05     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.23    47.36     3.87   482.97   619.66    21.58   591.61     0.52
MEAN    47.24    44.80     2.44   419.52   571.57    21.58   591.61     0.48
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 HUB     41.61    38.84     2.77   344.57   519.04    21.58   591.61     0.44

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   443.32   183.66   403.49  1203.14     0.37
 MEAN    15.50   450.76   195.79   406.02  1201.48     0.38
 HUB     12.59   482.41   255.73   409.05  1199.80     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   496.48   289.29     0.41  3297.40
 MEAN   408.57   458.39   212.77     0.38  3036.46     1.36
 HUB    331.91   416.08    76.18     0.35  3221.40

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.94     1.07    22.71   618.12     1.02   601.72     0.92     0.90
 MEAN    24.80     1.07    22.50   617.02     1.02   600.06     0.92     0.90
 HUB     24.90     1.07    22.27   617.80     1.02   598.38     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.47    35.64    31.50     4.14     0.93     0.25     2.90
 MEAN    25.74    27.66    23.50     4.16     0.91     0.25     3.34     0.90
 HUB     32.01    10.55     6.50     4.05     0.91     0.26     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      455.425     199.384      409.461    1201.755       0.379       -0.006

     Pt3          Ps3         Ts3          Vane No.     Alpha3     Vane A3      Incid3
     24.834       22.489      600.339       46.000      25.963      33.000       7.037

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth         Cmth          Aoth         Machth       cp 2-Th
     15.219      435.048     199.384      478.561    1203.270       0.362        0.059

   BlockageThr  PtTh         PsTh        TsTh         AreaTh         w 2-Th  DiffFact4
      0.950       24.779       22.637      601.853      440.827       0.043        0.255

    VANED DIFFUSER EXIT:
   R4           C4           Cu4         Cm4          Ao4           Mach4        cp 3-4
     14.701      406.521       0.000      406.521    1205.271       0.337        0.164

   Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       22.879      603.857       0.000        0.060       0.053        0.161

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.830       24.756        1.066      617.648       13.471     306.587        2.377

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   83979.602       0.375     641.670 1260162.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc   TR
     590784.19   4514.0576     132.0858      1.6387       0.8386       8.0445      1.1814


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 80% Stat 2 20% Ice Block 8-22-2011
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COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.996

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
131.020	3021.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 59.55438

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
127.993	3009.102	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
100791.102	102806.711	2.231	831.557	372.744	619.754	1.663

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	301.69	-0.10	301.69	0.27	541.71
MEAN	17.06	0.00	-0.02	301.69	-0.10	301.69	0.27	
HUB	12.51	0.00	-0.02	301.69	-0.10	301.69	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.99	50.47	10.52	543.87	622.04	14.35	515.21	0.56
MEAN	56.15	47.20	8.95	449.76	541.66	14.35	515.21	0.49
HUB	47.56	38.62	8.94	329.80	447.05	14.35	515.21	0.40

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	518.19	326.74	402.19	1128.23	0.46
MEAN	18.04	539.10	351.70	408.57	1124.46	0.48
HUB	15.00	606.22	437.56	419.58	1118.58	0.54

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	543.87	457.06	217.13	0.41	6742.85	
MEAN	475.49	426.92	123.79	0.38	6344.99	1.43
HUB	395.45	421.69	42.11	0.38	6564.67	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.90	1.18	15.48	551.37	1.05	528.94	0.92	0.91
MEAN	17.72	1.17	15.14	549.68	1.05	525.41	0.92	0.91
HUB	17.82	1.18	14.59	550.61	1.05	519.92	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.09	28.36	24.20	4.16	0.93	0.36	2.90	
MEAN	40.72	16.86	12.70	4.16	0.93	0.31	3.51	0.91
HUB	46.20	-5.73	-9.30	3.57	0.93	0.17	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	546.368	351.014	418.697	1124.673	0.486	-0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.784	15.130	525.620	24.000	39.975	35.400	-4.575

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	441.869	351.014	564.322	1133.864	0.390	0.333

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.749	15.982	534.245	528.796	0.023	0.466

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	409.131	0.000	409.131	1136.330	0.360	0.381

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.173	536.572	0.000	0.060	0.044	0.403

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.873	17.691	1.171	550.553	27.743	201.055	1.559

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
172722.875	0.584	1278.847	1268596.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
131.020	3021.000	17.691	550.553	1.000	1.000	0.980

W Kg/sec = 59.55438

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
112.159	2932.307	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
100791.102	102806.711	1.808	590.487	326.637	474.134	1.452

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	390.46	-0.13	390.46	0.34	525.84
MEAN	18.08	0.00	-0.02	390.46	-0.13	390.46	0.34	
HUB	15.21	0.00	-0.02	390.46	-0.13	390.46	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.23	46.36	7.87	541.76	667.92	16.30	537.82	0.59
MEAN	50.68	42.30	8.38	476.60	616.23	16.30	537.82	0.54
HUB	45.77	37.84	7.93	400.98	559.78	16.30	537.82	0.49

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	476.01	255.14	401.86	1154.29	0.41
MEAN	18.01	485.33	265.73	406.12	1151.63	0.42
HUB	15.22	525.16	326.90	411.00	1148.97	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	491.62	283.20	0.43	5212.74	
MEAN	474.80	456.77	209.07	0.40	4788.16	1.47
HUB	401.33	417.69	74.42	0.36	4978.48	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.05	1.13	17.84	572.62	1.04	553.70	0.92	0.91
MEAN	19.85	1.12	17.57	570.82	1.04	551.15	0.92	0.91
HUB	19.94	1.13	17.28	571.63	1.04	548.60	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.41	35.17	31.50	3.67	0.93	0.33	2.90	
MEAN	33.20	27.24	23.50	3.74	0.93	0.32	3.30	0.91
HUB	38.50	10.26	6.50	3.76	0.93	0.33	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	616.173	266.473	555.573	1139.898	0.541	-0.518

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.926	16.330	539.985	46.000	25.624	30.600	4.976

```
    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     564.891     266.473     624.588    1145.224       0.493      -0.303

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      19.888      16.837     545.043     400.556       0.026       0.242

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     556.301       0.000     556.301    1146.069       0.485       0.233

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      16.885     545.847       0.000       0.060       0.045      -0.282

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      19.842       1.122     571.691      21.138     236.278       1.832

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 131651.844       0.454     974.755 1155394.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.935

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    131.020    3021.000      19.842     571.691       1.000       1.000       0.780
W Kg/sec =   59.55438

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    101.902    2877.585       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100791.102  102806.711       1.463     434.156     296.774     339.175       1.143

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   510.99    -0.18   510.99     0.44   503.98
 MEAN    17.74     0.00    -0.02   510.99    -0.18   510.99     0.44
 HUB     15.05     0.00    -0.02   510.99    -0.18   510.99     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.01    46.36    -0.35   529.11   735.70    17.33   549.89     0.64
 MEAN    42.47    43.40    -0.93   467.64   692.80    17.33   549.89     0.60
 HUB     37.84    38.84    -1.00   396.77   647.05    17.33   549.89     0.56

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   462.48   218.66   407.52  1173.35      0.39
 MEAN    17.51   473.12   235.64   410.26  1171.60      0.40
 HUB     14.85   513.44   303.89   413.85  1169.87      0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   508.18   303.60     0.43  4335.09
 MEAN   461.53   468.34   225.89     0.40  4128.35     1.58
 HUB    391.49   423.02    87.61     0.36  4515.39

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.81     1.10    19.59   590.04     1.03   572.18     0.92     0.86
 MEAN    21.71     1.09    19.40   589.16     1.03   570.47     0.92     0.86
 HUB     21.89     1.10    19.18   590.80     1.03   568.79     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.22    36.69    31.50     5.19     0.93     0.36     2.90
 MEAN    29.87    28.84    23.50     5.34     0.90     0.38     3.28     0.86
 HUB     36.29    11.95     6.50     5.45     0.90     0.41     3.87
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.935

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      478.215     237.185     415.250     1172.033       0.408       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     21.780      19.418      570.906      46.000      29.734       31.500       1.766

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392      428.671     237.185     489.914     1175.877       0.365       0.192

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.764      19.853      574.657      471.992       0.016       0.297

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121      415.980       0.000     415.980     1176.793       0.353       0.205

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.914      575.552       0.000       0.060       0.038       0.217

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.817      21.713       1.094     590.000      18.309     258.080       2.001

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 114068.844       0.418     844.570 1492977.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.020    3021.000      21.713     590.000       1.000       1.000       0.980
W Kg/sec =   59.55438

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.603    2832.585       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100791.102  102806.711       1.863     513.330     275.525     401.059       1.456

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   390.67    -0.13   390.67     0.33   476.07
 MEAN    16.97     0.00    -0.02   390.67    -0.13   390.67     0.33
 HUB     14.32     0.00    -0.02   390.67    -0.13   390.67     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.43    46.36     6.07   507.76   640.76    20.12   577.26     0.54
 MEAN    48.88    43.80     5.08   447.40   594.06    20.12   577.26     0.50
 HUB     44.03    37.84     6.19   377.52   543.36    20.12   577.26     0.46

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   455.37   211.17   403.44  1190.98     0.38
 MEAN    16.57   464.81   225.85   406.24  1189.21     0.39
 HUB     13.89   502.14   290.51   409.57  1187.41     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   494.86   286.57     0.42  3989.50
 MEAN   436.94   457.81   211.09     0.38  3745.53     1.40
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 HUB    366.18   416.50    75.67     0.35  4037.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.76     1.09    21.47   606.88     1.03   589.57     0.92     0.91
 MEAN    23.63     1.09    21.26   605.85     1.03   587.81     0.92     0.91
 HUB     23.78     1.10    21.03   607.08     1.03   586.03     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.63    35.39    31.50     3.89     0.93     0.28     2.90
 MEAN    29.07    27.46    23.50     3.96     0.92     0.29     3.29     0.91
 HUB     35.35    10.47     6.50     3.97     0.92     0.30     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     458.238     227.123     397.992    1190.478       0.385       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.697      21.392     589.073      46.000      29.712      32.400       2.688

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     416.454     227.123     474.361    1193.557       0.349       0.208

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.682      21.767     592.124     456.573       0.016       0.303

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     395.752       0.000     395.752    1194.970       0.331       0.204

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.895     593.527       0.000       0.060       0.039       0.260

    STAGE EXIT CONDITIONS, STAGE             4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      23.625       1.088     606.601      16.601     264.002       2.047

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 103464.336       0.418     766.054 1163439.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.020    3021.000      23.625     606.601       1.000       1.000       0.980
W Kg/sec =   59.55438

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.161    2793.556       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100791.102  102806.711       1.985     509.668     256.772     390.276       1.520

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   369.13    -0.13   369.13     0.31   446.60
 MEAN    15.91     0.00    -0.02   369.13    -0.13   369.13     0.31
 HUB     13.07     0.00    -0.02   369.13    -0.13   369.13     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.62    47.36     5.26   482.97   607.98    22.11   595.23     0.51
 MEAN    48.66    44.80     3.86   419.52   558.89    22.11   595.23     0.47
 HUB     43.04    38.84     4.20   344.57   505.05    22.11   595.23     0.42

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   431.21   199.14   382.47  1207.61     0.36
MEAN    15.50   437.42   207.03   385.32  1205.62     0.36
HUB     12.59   467.46   259.88   388.57  1203.63     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    472.96   470.39   273.82     0.39  3574.89
MEAN   408.57   434.84   201.53     0.36  3210.56     1.40
HUB    331.91   395.19    72.04     0.33  3273.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     25.54     1.08    23.39   621.72     1.02   606.20     0.92     0.91
MEAN    25.34     1.07    23.14   620.18     1.02   604.21     0.92     0.91
HUB     25.38     1.07    22.87   620.44     1.02   602.21     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     27.50    35.60    31.50     4.10     0.93     0.28     2.90
MEAN    28.25    27.61    23.50     4.11     0.92     0.28     3.34     0.91
HUB     33.77    10.50     6.50     4.00     0.92     0.28     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     442.058     210.831     388.543    1205.882       0.367      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.375      23.123     604.473      46.000      28.485      33.000       4.515

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     411.311     210.831     462.198    1208.064       0.340       0.112

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.342      23.387     606.662     440.827       0.034       0.291

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     384.691       0.000     384.691    1209.823       0.318       0.211

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.606     608.431       0.000       0.060       0.044       0.208

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      25.321       1.072     620.781      14.180     287.719       2.230

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  88406.695       0.395     654.567 1211146.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    610314.62   4518.7925    127.9930      1.6761      0.8518      8.9529      1.1874


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 80% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  0.991
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
126.046	3021.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 57.29363

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
123.134	3009.102	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96964.961	98904.055	2.319	831.557	358.594	619.754	1.728

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	289.39	-0.10	289.39	0.26	541.71
MEAN	17.06	0.00	-0.02	289.39	-0.10	289.39	0.26	
HUB	12.51	0.00	-0.02	289.39	-0.10	289.39	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.99	50.47	11.52	543.87	616.16	14.41	515.82	0.55
MEAN	57.25	47.20	10.05	449.76	534.90	14.41	515.82	0.48
HUB	48.74	38.62	10.12	329.80	438.84	14.41	515.82	0.39

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	510.93	336.16	384.78	1129.77	0.45
MEAN	18.04	529.54	357.00	391.11	1125.80	0.47
HUB	15.00	592.54	435.76	401.52	1119.93	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	543.87	437.26	207.72	0.39	6936.94	
MEAN	475.49	408.66	118.49	0.36	6440.60	1.48
HUB	395.45	403.53	40.32	0.36	6537.71	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.97	1.19	15.61	552.19	1.06	530.38	0.92	0.91
MEAN	17.75	1.17	15.25	550.09	1.05	526.67	0.92	0.91
HUB	17.79	1.18	14.70	550.50	1.05	521.17	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.14	28.36	24.20	4.16	0.93	0.38	2.90	
MEAN	42.39	16.85	12.70	4.15	0.94	0.33	3.51	0.91
HUB	47.34	-5.73	-9.30	3.57	0.94	0.19	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.991

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	536.210	356.309	400.705	1126.052	0.476	-0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.810	15.246	526.909	24.000	41.644	35.400	-6.244

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	422.054	356.309	552.345	1135.773	0.372	0.364

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.769	16.151	536.046	528.796	0.025	0.492

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	391.390	0.000	391.390	1137.978	0.344	0.402

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.312	538.129	0.000	0.060	0.050	0.424

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    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      17.705       1.172     550.924      28.114     194.961       1.511

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 175032.500       0.592    1246.752 1216867.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3021.000      17.705     550.924       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    107.855    2931.319       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 96964.961   98904.055       1.880     590.487     314.102     474.134       1.509

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   373.74    -0.13   373.74     0.33   525.67
MEAN    18.08     0.00    -0.02   373.74    -0.13   373.74     0.33
HUB     15.21     0.00    -0.02   373.74    -0.13   373.74     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.41    46.36     9.05   541.76   658.28    16.43   539.26     0.58
MEAN    51.90    42.30     9.60   476.60   605.77    16.43   539.26     0.53
HUB     47.02    37.84     9.18   400.98   548.25    16.43   539.26     0.48

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   468.24   267.88   384.04  1156.46     0.40
MEAN    18.01   475.94   275.01   388.44  1153.54     0.41
HUB     15.22   513.67   330.24   393.45  1150.62     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    538.34   469.72   270.46     0.41  5472.74
MEAN   474.80   436.81   199.79     0.38  4955.27     1.51
HUB    401.33   399.82    71.08     0.35  5029.25

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.18     1.14    18.02   574.09     1.04   555.78     0.92     0.91
MEAN    19.94     1.13    17.73   571.90     1.04   552.99     0.92     0.91
HUB     19.97     1.13    17.41   572.21     1.04   550.18     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.90    35.15    31.50     3.65     0.93     0.36     2.90
MEAN    35.30    27.22    23.50     3.72     0.94     0.35     3.30     0.91
HUB     40.01    10.24     6.50     3.74     0.94     0.35     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.993

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     595.841     275.784     528.176    1143.167       0.521      -0.481

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.005      16.620     543.089      46.000      27.571      30.600       3.029

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     17.960     535.197     275.784     602.073    1149.179       0.466      -0.220

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      19.977      17.215     548.817     400.556       0.022       0.270

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     527.158       0.000     527.158    1149.926       0.458       0.277

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      17.258     549.530       0.000       0.060       0.040      -0.201

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      19.937       1.126     572.736      21.812     225.783       1.750

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 135851.672       0.469     967.668 1105473.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  0.958

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3021.000      19.937     572.736       1.000       1.000       0.780
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     97.658    2874.958       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       1.526     434.156     284.415     339.175       1.193

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   485.39    -0.17   485.39     0.42   503.52
 MEAN    17.74     0.00    -0.02   485.39    -0.17   485.39     0.42
 HUB     15.05     0.00    -0.02   485.39    -0.17   485.39     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.48    46.36     1.12   529.11   718.15    17.65   553.07     0.62
 MEAN    43.94    43.40     0.54   467.64   674.13    17.65   553.07     0.58
 HUB     39.28    38.84     0.44   396.77   627.02    17.65   553.07     0.54

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   452.48   234.79   386.80  1176.58     0.38
 MEAN    17.51   461.82   247.51   389.90  1174.47     0.39
 HUB     14.85   500.29   308.77   393.64  1172.39     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   481.92   287.47     0.41  4654.48
 MEAN   461.53   444.77   214.02     0.38  4335.99     1.62
 HUB    391.49   402.24    82.72     0.34  4587.78

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.11     1.11    19.97   592.43     1.03   575.34     0.92     0.88
 MEAN    21.96     1.10    19.74   591.09     1.03   573.28     0.92     0.88
 HUB     22.08     1.11    19.48   592.15     1.03   571.25     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.26    36.62    31.50     5.12     0.93     0.38     2.90
 MEAN    32.41    28.76    23.50     5.26     0.90     0.40     3.28     0.88
 HUB     38.11    11.87     6.50     5.37     0.90     0.42     3.87


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.958

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     466.639     249.133     394.569    1174.904       0.397       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.028      19.757     573.710      46.000      32.268      31.500      -0.768

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     406.155     249.133     476.476    1179.409       0.344       0.237

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.015      20.279     578.117     471.992       0.016       0.334

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     394.262       0.000     394.262    1180.219       0.334       0.247

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.331     578.912       0.000       0.060       0.037       0.260

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.842      21.966       1.102     591.890      19.154     243.155       1.885

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 119337.227       0.438     850.036 1420390.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    126.046    3021.000      21.966     591.890       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     90.106    2828.058       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       1.956     513.330     262.430     401.059       1.528

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   370.59    -0.13   370.59     0.31   475.31
 MEAN    16.97     0.00    -0.02   370.59    -0.13   370.59     0.31
 HUB     14.32     0.00    -0.02   370.59    -0.13   370.59     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.88    46.36     7.52   507.76   628.72    20.52   580.43     0.53
 MEAN    50.37    43.80     6.57   447.40   581.05    20.52   580.43     0.49
 HUB     45.54    37.84     7.70   377.52   529.11    20.52   580.43     0.45

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   444.03   227.02   381.61  1195.02     0.37
 MEAN    16.57   452.05   237.39   384.70  1192.91     0.38
 HUB     13.89   487.47   294.77   388.25  1190.79     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   467.88   270.72     0.39  4288.62
 MEAN   436.94   433.38   199.55     0.36  3936.57     1.46
 HUB    366.18   394.76    71.41     0.33  4096.20

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     24.19     1.10    21.99   610.03     1.03   593.58     0.92     0.91
 MEAN    24.00     1.09    21.74   608.54     1.03   591.49     0.92     0.91
 HUB     24.09     1.10    21.46   609.22     1.03   589.38     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.75    35.35    31.50     3.85     0.93     0.32     2.90
 MEAN    31.68    27.42    23.50     3.92     0.93     0.32     3.29     0.91
 HUB     37.21    10.42     6.50     3.92     0.93     0.32     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     446.248     238.721     377.027    1194.075       0.374       0.051

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.071      21.856     592.643      46.000      32.341      32.400       0.059

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     393.401     238.721     460.166    1197.801       0.328       0.252

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.060      22.326     596.347     456.573       0.015       0.342

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     374.026       0.000     374.026    1199.047       0.312       0.247

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.440     597.588       0.000       0.060       0.037       0.301

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      24.008       1.093     609.265      17.375     248.486       1.926

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 108291.164       0.437     771.355 1110323.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3021.000      24.008     609.265       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.644    2787.442       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       2.092     509.668     243.618     390.276       1.602

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   349.17    -0.12   349.17     0.29   445.62
 MEAN    15.91     0.00    -0.02   349.17    -0.12   349.17     0.29
 HUB     13.07     0.00    -0.02   349.17    -0.12   349.17     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.14    47.36     6.78   482.97   596.07    22.64   599.09     0.50
 MEAN    50.24    44.80     5.44   419.52   545.91    22.64   599.09     0.45
 HUB     44.63    38.84     5.79   344.57   490.64    22.64   599.09     0.41

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   419.99   215.12   360.71  1212.24      0.35
MEAN    15.50   424.46   218.69   363.78  1209.96      0.35
HUB     12.59   452.35   264.18   367.19  1207.66      0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    472.96   443.39   257.83     0.37  3861.48
MEAN   408.57   410.35   189.87     0.34  3391.13     1.46
HUB    331.91   373.39    67.73     0.31  3327.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.12     1.09    24.04   625.59     1.03   610.87     0.92     0.91
MEAN    25.86     1.08    23.75   623.61     1.02   608.57     0.92     0.91
HUB     25.82     1.08    23.44   623.34     1.02   606.26     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.81    35.56    31.50     4.06     0.93     0.32     2.90
MEAN    31.01    27.56    23.50     4.06     0.92     0.31     3.34     0.91
HUB     35.73    10.45     6.50     3.95     0.92     0.30     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     429.116     222.703     366.802    1210.195       0.355      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.891      23.733     608.812      46.000      31.264      33.000       1.736

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     387.038     222.703     446.537    1213.040       0.319       0.167

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.872      24.108     611.678     440.827       0.029       0.331

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     362.308       0.000     362.308    1214.572       0.298       0.260

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.303     613.224       0.000       0.060       0.038       0.256

    STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.875      25.852       1.077     624.179      14.914     269.427       2.089

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   92987.859       0.416     662.350 1155367.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     631500.44   4498.1602    123.1343      1.7113      0.8589     10.0471      1.1939


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 80% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  0.986

    W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     121.700    3021.000      15.107     522.810       1.000       1.000       0.980
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W Kg/sec = 55.31819

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
118.889	3009.102	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
93621.680	95493.914	2.402	831.557	346.230	619.754	1.790

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	278.73	-0.10	278.73	0.25	541.71
MEAN	17.06	0.00	-0.02	278.73	-0.10	278.73	0.25	
HUB	12.51	0.00	-0.02	278.73	-0.10	278.73	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.87	50.47	12.40	543.87	611.22	14.46	516.32	0.55
MEAN	58.22	47.20	11.02	449.76	529.21	14.46	516.32	0.47
HUB	49.81	38.62	11.19	329.80	431.89	14.46	516.32	0.39

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	505.24	344.12	369.93	1131.02	0.45
MEAN	18.04	521.71	361.50	376.17	1126.90	0.46
HUB	15.00	581.00	434.18	386.07	1121.03	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	543.87	420.42	199.75	0.37	7101.16	
MEAN	475.49	393.06	113.99	0.35	6521.64	1.53
HUB	395.45	388.01	38.73	0.35	6513.94	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.02	1.19	15.71	552.88	1.06	531.56	0.92	0.90
MEAN	17.77	1.18	15.34	550.43	1.05	527.70	0.92	0.90
HUB	17.77	1.18	14.79	550.40	1.05	522.20	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.93	28.37	24.20	4.17	0.93	0.41	2.90	
MEAN	43.86	16.86	12.70	4.16	0.94	0.36	3.51	0.90
HUB	48.36	-5.73	-9.30	3.57	0.94	0.22	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.986

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	527.884	360.797	385.341	1127.176	0.468	-0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.828	15.338	527.962	24.000	43.116	35.400	-7.716

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	405.255	360.797	542.592	1137.333	0.356	0.390

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.781	16.285	537.519	528.796	0.028	0.515

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	376.320	0.000	376.320	1139.329	0.330	0.420

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.419	539.408	0.000	0.060	0.056	0.442

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

```
      0.858      17.709       1.172     551.236      28.426     189.757       1.471

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 176978.844       0.598    1217.150 1172050.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    3021.000      17.709     551.236       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    104.140    2930.488       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       1.947     590.487     303.283     474.134       1.563

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   359.51    -0.12   359.51     0.32   525.52
 MEAN    18.08     0.00    -0.02   359.51    -0.12   359.51     0.32
 HUB     15.21     0.00    -0.02   359.51    -0.12   359.51     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.44    46.36    10.08   541.76   650.30    16.53   540.44     0.57
 MEAN    52.98    42.30    10.68   476.60   597.09    16.53   540.44     0.52
 HUB     48.13    37.84    10.29   400.98   538.64    16.53   540.44     0.47

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   462.38   278.51   369.09  1158.21     0.40
 MEAN    18.01   468.51   282.80   373.53  1155.09     0.41
 HUB     15.22   504.23   333.05   378.59  1151.97     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   451.37   259.83     0.39  5689.68
 MEAN   474.80   419.99   192.00     0.36  5095.42     1.55
 HUB    401.33   384.70    68.28     0.33  5071.92

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.27      1.14    18.16   575.32     1.04   557.47     0.92     0.90
 MEAN    19.99      1.13    17.85   572.81     1.04   554.48     0.92     0.90
 HUB     19.98      1.13    17.51   572.71     1.04   551.48     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.04    35.14    31.50     3.64     0.93     0.38     2.90
 MEAN    37.13    27.20    23.50     3.70     0.94     0.37     3.30     0.90
 HUB     41.34    10.22     6.50     3.72     0.94     0.36     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     579.687     283.592     505.582    1145.754       0.506      -0.450

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.060      16.840     545.551      46.000      29.289      30.600       1.311

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     511.005     283.592     584.423    1152.304       0.443      -0.151

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.750      20.037      17.503     551.807     400.556       0.020       0.295

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     503.441       0.000     503.441    1152.973       0.437       0.313

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      17.541     552.448       0.000       0.060       0.037      -0.134

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      19.999       1.129     573.613      22.376     217.243       1.684

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 139365.188       0.481     958.467 1062600.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  0.974

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    3021.000      19.999     573.613       1.000       1.000       0.780
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.071    2872.760       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       1.585     434.156     273.967     339.175       1.238

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   464.36    -0.16   464.36     0.40   503.13
 MEAN    17.74     0.00    -0.02   464.36    -0.16   464.36     0.40
 HUB     15.05     0.00    -0.02   464.36    -0.16   464.36     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.74    46.36     2.38   529.11   704.10    17.89   555.61     0.61
 MEAN    45.21    43.40     1.81   467.64   659.15    17.89   555.61     0.57
 HUB     40.52    38.84     1.68   396.77   610.89    17.89   555.61     0.53

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   445.29   247.96   369.86  1179.15     0.38
 MEAN    17.51   453.26   257.23   373.20  1176.77     0.39
 HUB     14.85   489.88   312.74   377.05  1174.43     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   460.47   274.29     0.39  4915.38
 MEAN   461.53   425.46   204.30     0.36  4505.99     1.66
 HUB    391.49   385.19    78.75     0.33  4646.67

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.35     1.12    20.25   594.41     1.04   577.86     0.92     0.89
 MEAN    22.14     1.11    19.99   592.68     1.03   575.53     0.92     0.89
 HUB     22.21     1.11    19.70   593.28     1.03   573.24     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.84    36.56    31.50     5.06     0.93     0.41     2.90
 MEAN    34.58    28.70    23.50     5.20     0.91     0.41     3.28     0.89
 HUB     39.67    11.80     6.50     5.30     0.91     0.44     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.974

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	457.868	258.914	377.632	1177.197	0.389	0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.212	20.009	575.955	46.000	34.436	31.500	-2.936

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	387.884	258.914	466.359	1182.236	0.328	0.275

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.197	20.601	580.896	471.992	0.016	0.367

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	376.705	0.000	376.705	1182.962	0.318	0.280

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.641	581.610	0.000	0.060	0.040	0.293

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.857	22.145	1.107	593.457	19.845	231.593	1.795

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
123642.016	0.453	850.333	1359471.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =11.017 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
121.700	3021.000	22.145	593.457	1.000	1.000	0.980

W Kg/sec = 55.31819

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
86.410	2824.321	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
93621.680	95493.914	2.040	513.330	251.665	401.059	1.594

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	354.32	-0.12	354.32	0.30	474.68
MEAN	16.97	0.00	-0.02	354.32	-0.12	354.32	0.30	
HUB	14.32	0.00	-0.02	354.32	-0.12	354.32	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.10	46.36	8.74	507.76	619.26	20.81	582.98	0.52
MEAN	51.63	43.80	7.83	447.40	570.81	20.81	582.98	0.48
HUB	46.82	37.84	8.98	377.52	517.84	20.81	582.98	0.44

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	435.96	239.61	364.21	1198.19	0.36
MEAN	16.57	442.53	246.60	367.45	1195.85	0.37
HUB	13.89	476.04	298.13	371.12	1193.49	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	446.41	258.12	0.37	4526.26	
MEAN	436.94	413.82	190.34	0.35	4089.20	1.50
HUB	366.18	377.31	68.05	0.32	4142.80	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.51	1.11	22.36	612.60	1.03	596.74	0.92	0.91
MEAN	24.27	1.10	22.08	610.76	1.03	594.41	0.92	0.91
HUB	24.30	1.10	21.78	610.98	1.03	592.07	0.92	0.91

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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.34    35.33    31.50     3.83     0.93     0.35     2.90
 MEAN    33.87    27.38    23.50     3.88     0.93     0.34     3.29     0.91
 HUB     38.78    10.39     6.50     3.89     0.93     0.34     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     437.341     247.988     360.235    1196.928       0.365       0.049

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.338      22.192     595.483      46.000      34.544      32.400      -2.144

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     375.104     247.988     449.668    1201.162       0.312       0.289

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.327      22.735     599.703     456.573       0.015       0.375

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     356.835       0.000     356.835    1202.279       0.297       0.280

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.833     600.820       0.000       0.060       0.038       0.332

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      24.274       1.096     611.448      17.990     236.702       1.835

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 112130.828       0.453     771.166 1065305.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    121.700    3021.000      24.274     611.448       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     80.018    2782.462       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       2.187     509.668     233.058     390.276       1.675

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   333.34    -0.11   333.34     0.28   444.83
 MEAN    15.91     0.00    -0.02   333.34    -0.11   333.34     0.28
 HUB     13.07     0.00    -0.02   333.34    -0.11   333.34     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.39    47.36     8.03   482.97   586.93    23.01   602.18     0.49
 MEAN    51.54    44.80     6.74   419.52   535.91    23.01   602.18     0.45
 HUB     45.96    38.84     7.12   344.57   479.50    23.01   602.18     0.40

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   412.23   227.57   343.73  1215.87     0.34
 MEAN    15.50   415.00   227.80   346.90  1213.36     0.34
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 HUB     12.59   440.84   267.53   350.39  1210.85     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   422.33   245.39     0.35  4084.62
 MEAN   408.57   391.17   180.77     0.32  3532.10     1.51
 HUB    331.91   356.25    64.38     0.29  3369.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.53     1.09    24.50   628.72     1.03   614.54     0.92     0.91
 MEAN    26.22     1.08    24.18   626.38     1.02   612.01     0.92     0.91
 HUB     26.13     1.08    23.84   625.70     1.02   609.48     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.51    35.52    31.50     4.02     0.93     0.35     2.90
 MEAN    33.29    27.52    23.50     4.02     0.93     0.33     3.34     0.91
 HUB     37.36    10.41     6.50     3.91     0.93     0.32     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     419.703     231.972     349.770    1213.583       0.346      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.252      24.166     612.234      46.000      33.553      33.000      -0.553

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     368.266     231.972     435.237    1216.930       0.303       0.210

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.237      24.621     615.616     440.827       0.027       0.365

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     344.973       0.000     344.973    1218.300       0.283       0.297

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.796     617.003       0.000       0.060       0.037       0.293

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      26.217       1.080     626.933      15.486     255.912       1.984

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96558.523       0.432     664.069 1108254.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    648675.38   4461.1855    118.8887      1.7354      0.8598     11.0174      1.1992


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 80% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    117.504    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   53.41085

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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   114.790    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  90393.664   92201.352       2.488     831.557     334.292     619.754       1.854

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   268.52    -0.09   268.52     0.24   541.71
MEAN    17.06     0.00    -0.02   268.52    -0.09   268.52     0.24
HUB     12.51     0.00    -0.02   268.52    -0.09   268.52     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     63.73    50.47    13.26   543.87   606.63    14.51   516.79     0.54
MEAN    59.17    47.20    11.97   449.76   523.90    14.51   516.79     0.47
HUB     50.86    38.62    12.24   329.80   425.36    14.51   516.79     0.38

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   500.29   351.61   355.90  1132.16     0.44
MEAN    18.04   514.58   365.72   362.00  1127.90     0.46
HUB     15.00   570.20   432.64   371.42  1122.03     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    543.87   404.51   192.26     0.36  7255.70
MEAN   475.49   378.28   109.77     0.34  6597.71     1.57
HUB    395.45   373.27    37.19     0.33  6490.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.07     1.20    15.80   553.54     1.06   532.63     0.92     0.90
MEAN    17.79     1.18    15.42   550.75     1.05   528.63     0.92     0.90
HUB     17.74     1.17    14.87   550.30     1.05   523.14     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.65    28.38    24.20     4.18     0.93     0.43     2.90
MEAN    45.29    16.87    12.70     4.17     0.94     0.38     3.51     0.90
HUB     49.35    -5.72    -9.30     3.58     0.94     0.24     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     520.297     365.009     370.780    1128.197       0.461       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.842      15.419     528.919      24.000      44.551      35.400      -9.151

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     389.426     365.009     533.746    1138.753       0.342       0.415

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.788      16.404     538.863     528.796       0.031       0.538

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     362.091       0.000     362.091    1140.565       0.317       0.437

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.512     540.578       0.000       0.060       0.064       0.459

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.848      17.708       1.172     551.529      28.719     184.822       1.433

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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 178801.688       0.604    1187.288 1129097.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    117.504    3021.000      17.708     551.529       1.000       1.000       0.980
W Kg/sec =   53.41085

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.584    2929.710       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 90393.664   92201.352       2.016     590.487     292.928     474.134       1.619

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   346.06    -0.12   346.06     0.30   525.38
MEAN    18.08     0.00    -0.02   346.06    -0.12   346.06     0.30
HUB     15.21     0.00    -0.02   346.06    -0.12   346.06     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.44    46.36    11.08   541.76   642.96    16.61   541.53     0.56
MEAN    54.02    42.30    11.72   476.60   589.08    16.61   541.53     0.52
HUB     49.21    37.84    11.37   400.98   529.75    16.61   541.53     0.46

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   457.46   288.40   355.10  1159.79     0.39
MEAN    18.01   461.93   290.02   359.54  1156.50     0.40
HUB     15.22   495.55   335.62   364.59  1153.20     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    538.34   434.23   249.93     0.37  5891.65
MEAN   474.80   404.25   184.78     0.35  5225.37     1.60
HUB    401.33   370.47    65.71     0.32  5110.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.35     1.15    18.28   576.47     1.05   559.00     0.92     0.90
MEAN    20.04     1.13    17.95   573.65     1.04   555.83     0.92     0.90
HUB     19.98     1.13    17.60   573.17     1.04   552.66     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.08    35.14    31.50     3.64     0.93     0.40     2.90
MEAN    38.89    27.20    23.50     3.70     0.94     0.39     3.30     0.90
HUB     42.63    10.22     6.50     3.72     0.94     0.38     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.982

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     565.283     290.832     484.728    1148.053       0.492      -0.422

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.100      17.027     547.745      46.000      30.963      30.600      -0.363

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     488.893     290.832     568.858    1155.079       0.423      -0.088

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      20.080      17.749     554.470     400.556       0.019       0.320

   VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	481.792	0.000	481.792	1155.679	0.417	0.345

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	17.780	555.045	0.000	0.060	0.037	-0.073

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.870	20.042	1.132	574.429	22.900	209.474	1.624

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
142625.078	0.492	947.066	1021800.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =11.967 EfDer = 0.986

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
117.504	3021.000	20.042	574.429	1.000	1.000	0.780

W Kg/sec = 53.41085

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
90.696	2870.719	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
90393.664	92201.352	1.644	434.156	264.140	339.175	1.284

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	445.05	-0.15	445.05	0.38	502.77
MEAN	17.74	0.00	-0.02	445.05	-0.15	445.05	0.38	
HUB	15.05	0.00	-0.02	445.05	-0.15	445.05	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.94	46.36	3.58	529.11	691.51	18.10	557.89	0.60
MEAN	46.43	43.40	3.03	467.64	645.68	18.10	557.89	0.56
HUB	41.73	38.84	2.89	396.77	596.33	18.10	557.89	0.51

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	439.52	259.96	354.40	1181.43	0.37
MEAN	17.51	446.00	266.12	357.90	1178.82	0.38
HUB	14.85	480.67	316.40	361.85	1176.25	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	440.91	262.29	0.37	5152.89	
MEAN	461.53	407.77	195.41	0.35	4661.62	1.70
HUB	391.49	369.56	75.09	0.31	4700.85	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.54	1.12	20.48	596.24	1.04	580.11	0.92	0.90
MEAN	22.29	1.11	20.19	594.16	1.03	577.55	0.92	0.90
HUB	22.31	1.11	19.89	594.32	1.03	575.03	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.26	36.51	31.50	5.01	0.93	0.43	2.90	
MEAN	36.63	28.63	23.50	5.13	0.91	0.43	3.28	0.90
HUB	41.17	11.72	6.50	5.22	0.91	0.45	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.986

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	450.440	267.869	362.135	1179.246	0.382	0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.360	20.216	577.965	46.000	36.490	31.500	-4.990

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	371.281	267.869	457.825	1184.773	0.313	0.311

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.341	20.869	583.396	471.992	0.018	0.399

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	360.794	0.000	360.794	1185.424	0.304	0.309

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.895	584.037	0.000	0.060	0.045	0.322

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.865	22.283	1.112	594.904	20.475	221.465	1.717

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
127573.188	0.468	847.118	1302504.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =11.967 EfDer = 0.996

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
117.504	3021.000	22.283	594.904	1.000	1.000	0.980

W Kg/sec = 53.41085

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
83.016	2820.884	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
90393.664	92201.352	2.123	513.330	241.781	401.059	1.659

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	339.54	-0.12	339.54	0.29	474.11
MEAN	16.97	0.00	-0.02	339.54	-0.12	339.54	0.29	
HUB	14.32	0.00	-0.02	339.54	-0.12	339.54	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.23	46.36	9.87	507.76	610.92	21.05	585.28	0.51
MEAN	52.81	43.80	9.01	447.40	561.75	21.05	585.28	0.47
HUB	48.04	37.84	10.20	377.52	507.84	21.05	585.28	0.43

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	429.49	250.85	348.62	1201.01	0.36
MEAN	16.57	434.50	254.81	351.94	1198.47	0.36
HUB	13.89	466.03	301.15	355.66	1195.91	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	427.19	246.88	0.36	4738.39	
MEAN	436.94	396.27	182.13	0.33	4225.23	1.55
HUB	366.18	361.56	65.04	0.30	4184.63	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.76	1.11	22.67	614.95	1.03	599.55	0.92	0.91
MEAN	24.48	1.10	22.36	612.78	1.03	597.02	0.92	0.91
HUB	24.46	1.10	22.03	612.61	1.03	594.48	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.74	35.30	31.50	3.80	0.93	0.37	2.90	

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 MEAN    35.91    27.36    23.50     3.86     0.93     0.36     3.29     0.91
 HUB     40.26    10.36     6.50     3.86     0.93     0.36     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     429.847     256.247     345.118    1199.471       0.358        0.047

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.548      22.461     598.022      46.000      36.594      32.400      -4.194

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     358.747     256.247     440.865    1204.156       0.298        0.323

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.534      23.067     602.702     456.573       0.016        0.406

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096     341.499       0.000     341.499    1205.162       0.283        0.309

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      23.147     603.710       0.000       0.060       0.043        0.359

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.875      24.475       1.098     613.444      18.540     226.539        1.756

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 115558.227       0.466     767.336 1022871.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  0.999

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    117.504     3021.000       24.475     613.444       1.000        1.000        0.980
W Kg/sec =   53.41085

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     76.748     2777.931        1.401       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  90393.664   92201.352        2.280     509.668     223.535     390.276        1.746

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   319.18    -0.11   319.18      0.26   444.10
 MEAN    15.91      0.00    -0.02   319.18    -0.11   319.18      0.26
 HUB     13.07      0.00    -0.02   319.18    -0.11   319.18      0.26

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     56.55     47.36     9.19   482.97   579.00     23.31   604.94      0.48
 MEAN    52.74     44.80     7.94   419.52   527.22     23.31   604.94      0.44
 HUB     47.20     38.84     8.36   344.57   469.76     23.31   604.94      0.39

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     17.94   406.14    238.51    328.73  1219.06      0.33
 MEAN    15.50   407.17    235.79    331.94  1216.38      0.33
 HUB     12.59   430.91    270.48    335.45  1213.69      0.36

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
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 TIP    472.96   403.77   234.45     0.33  4280.88
 MEAN   408.57   374.22   172.77     0.31  3655.96     1.55
 HUB    331.91   341.03    61.44     0.28  3406.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.86     1.10    24.87   631.55     1.03   617.78     0.92     0.91
 MEAN    26.50     1.08    24.52   628.90     1.03   615.07     0.92     0.91
 HUB     26.36     1.08    24.16   627.85     1.02   612.35     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.96    35.50    31.50     4.00     0.93     0.37     2.90
 MEAN    35.39    27.50    23.50     4.00     0.93     0.36     3.34     0.91
 HUB     38.88    10.38     6.50     3.88     0.93     0.34     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     411.914     240.116     334.690    1216.583       0.339      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.531      24.505     615.274      46.000      35.657      33.000      -2.657

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     351.798     240.116     425.931    1220.365       0.288       0.248

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.513      25.026     619.105     440.827       0.028       0.396

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     329.753       0.000     329.753    1221.599       0.270       0.329

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.182     620.359       0.000       0.060       0.039       0.324

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      26.491       1.082     629.432      15.988     244.483       1.895

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   99696.836       0.446     662.012 1063933.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     664255.00   4410.8203    114.7895      1.7536      0.8568     11.9669      1.2039


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 80% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =13.026   EfDer =  0.973

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     112.885    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   51.31144

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     110.278    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 86840.570   88577.203       2.589     831.557     321.152     619.754       1.930

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   257.36    -0.09   257.36     0.23   541.71
MEAN    17.06     0.00    -0.02   257.36    -0.09   257.36     0.23
HUB     12.51     0.00    -0.02   257.36    -0.09   257.36     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     64.68    50.47    14.21   543.87   601.77    14.56   517.28     0.54
MEAN    60.23    47.20    13.03   449.76   518.26    14.56   517.28     0.46
HUB     52.04    38.62    13.42   329.80   418.40    14.56   517.28     0.38

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   495.40   359.62   340.73  1133.33     0.44
MEAN    18.04   507.19   370.23   346.66  1128.94     0.45
HUB     15.00   558.68   430.94   355.55  1123.08     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    543.87   387.36   184.25     0.34  7420.78
MEAN   475.49   362.29   105.26     0.32  6678.98     1.63
HUB    395.45   357.31    35.49     0.32  6465.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.12     1.20    15.89   554.24     1.06   533.74     0.92     0.89
MEAN    17.80     1.18    15.50   551.10     1.05   529.61     0.92     0.89
HUB     17.71     1.17    14.95   550.19     1.05   524.12     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.54    28.40    24.20     4.20     0.93     0.46     2.90
MEAN    46.88    16.89    12.70     4.19     0.94     0.41     3.51     0.89
HUB     50.48    -5.70    -9.30     3.60     0.94     0.26     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.973

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     512.427     369.510     355.026    1129.253       0.454       0.001

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.853      15.499     529.909      24.000      46.145      35.400     -10.745

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     372.387     369.510     524.604    1140.227       0.327       0.443

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.792      16.523     540.258     528.796       0.035       0.564

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     346.738       0.000     346.738    1141.852       0.304       0.454

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.602     541.799       0.000       0.060       0.073       0.476

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.837      17.701       1.172     551.841      29.031     179.480       1.391

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 180741.953       0.611    1152.997 1082160.000
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =13.026   EfDer =  0.974

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    112.885    3021.000      17.701     551.841       1.000       1.000       0.980
W Kg/sec =   51.31144

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.698    2928.882       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 86840.570   88577.203       2.097     590.487     281.611     474.134       1.684

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   331.52    -0.11   331.52     0.29   525.23
MEAN    18.08     0.00    -0.02   331.52    -0.11   331.52     0.29
HUB     15.21     0.00    -0.02   331.52    -0.11   331.52     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.54    46.36    12.18   541.76   635.25    16.69   542.66     0.56
MEAN    55.18    42.30    12.88   476.60   580.66    16.69   542.66     0.51
HUB     50.43    37.84    12.59   400.98   520.37    16.69   542.66     0.46

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   452.80   298.91   340.12  1161.42     0.39
MEAN    18.01   455.35   297.74   344.52  1157.96     0.39
HUB     15.22   486.45   338.33   349.52  1154.48     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    538.34   415.94   239.43     0.36  6106.06
MEAN   474.80   387.36   177.06     0.33  5364.33     1.65
HUB    401.33   355.15    63.00     0.31  5152.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.42     1.15    18.38   577.69     1.05   560.57     0.92     0.89
MEAN    20.07     1.13    18.04   574.55     1.04   557.24     0.92     0.89
HUB     19.97     1.13    17.67   573.65     1.04   553.89     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.31    35.14    31.50     3.64     0.93     0.43     2.90
MEAN    40.83    27.20    23.50     3.70     0.94     0.41     3.30     0.89
HUB     44.07    10.22     6.50     3.72     0.94     0.40     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.974

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     550.652     298.575     462.678    1150.388       0.479       -0.392

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.133      17.207     549.977      46.000      32.835      30.600      -2.235

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     465.701     298.575     553.195    1157.904       0.402       -0.020

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      20.112      17.989     557.187     400.556       0.020       0.348

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     459.121       0.000     459.121    1158.431       0.396       0.379
```

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	18.010	557.695	0.000	0.060	0.038	-0.010

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.864	20.072	1.134	575.297	23.457	201.366	1.561

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
146092.844	0.504	931.962	977503.188

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =13.026 EfDer = 0.994

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
112.885	3021.000	20.072	575.297	1.000	1.000	0.780

W Kg/sec = 51.31144

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
87.065	2868.551	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
86840.570	88577.203	1.712	434.156	253.565	339.175	1.338

ROTOR LEADING EDGE CONDITIONS, STAGE 3

R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP 20.07	0.00	-0.02	424.70	-0.15	424.70	0.37	502.39
MEAN 17.74	0.00	-0.02	424.70	-0.15	424.70	0.37	
HUB 15.05	0.00	-0.02	424.70	-0.15	424.70	0.37	

BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP 51.25	46.36	4.89	529.11	678.59	18.30	560.24	0.58
MEAN 47.76	43.40	4.36	467.64	631.82	18.30	560.24	0.54
HUB 43.06	38.84	4.22	396.77	581.30	18.30	560.24	0.50

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

R2	C2	Cu2	Cm2	Ao2	Mach2
TIP 19.81	434.35	272.49	338.24	1183.76	0.37
MEAN 17.51	439.00	275.40	341.87	1180.93	0.37
HUB 14.85	471.31	320.16	345.87	1178.14	0.40

U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP 522.26	420.47	249.77	0.36	5400.88	
MEAN 461.53	389.25	186.13	0.33	4823.89	1.75
HUB 391.49	353.16	71.34	0.30	4756.51	

Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP 22.72	1.13	20.70	598.15	1.04	582.40	0.92	0.91
MEAN 22.43	1.12	20.38	595.71	1.04	579.62	0.92	0.91
HUB 22.39	1.12	20.05	595.43	1.03	576.88	0.92	0.91

Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP 38.85	36.44	31.50	4.94	0.93	0.45	2.90	
MEAN 38.85	28.57	23.50	5.07	0.92	0.45	3.28	0.91
HUB 42.79	11.65	6.50	5.15	0.92	0.46	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.994

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	443.271	277.207	345.899	1181.341	0.375	0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.491	20.406	580.026	46.000	38.709	31.500	-7.209

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	353.991	277.207	449.614	1187.377	0.298	0.348

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.466	21.121	585.968	471.992	0.022	0.433

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	344.258	0.000	344.258	1187.952	0.290	0.338

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.128	586.536	0.000	0.060	0.054	0.351

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.869	22.398	1.116	596.430	21.132	211.277	1.638

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
131668.641	0.483	839.946	1241581.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =13.026 EfDer = 0.990

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
112.885	3021.000	22.398	596.430	1.000	1.000	0.980

W Kg/sec = 51.31144

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
79.447	2817.275	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
86840.570	88577.203	2.218	513.330	231.387	401.059	1.733

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	324.15	-0.11	324.15	0.27	473.50
MEAN	16.97	0.00	-0.02	324.15	-0.11	324.15	0.27	
HUB	14.32	0.00	-0.02	324.15	-0.11	324.15	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.45	46.36	11.09	507.76	602.50	21.27	587.66	0.51
MEAN	54.08	43.80	10.28	447.40	552.58	21.27	587.66	0.46
HUB	49.36	37.84	11.52	377.52	497.68	21.27	587.66	0.42

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	423.60	262.37	332.57	1203.86	0.35
MEAN	16.57	426.76	263.24	335.91	1201.14	0.36
HUB	13.89	455.96	304.21	339.65	1198.40	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	407.43	235.37	0.34	4955.60	
MEAN	436.94	378.16	173.70	0.31	4364.75	1.60
HUB	366.18	345.26	61.98	0.29	4227.04	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.99	1.12	22.93	617.39	1.04	602.42	0.92	0.91
MEAN	24.67	1.10	22.60	614.89	1.03	599.69	0.92	0.91
HUB	24.59	1.10	22.25	614.31	1.03	596.96	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.27	35.29	31.50	3.79	0.93	0.40	2.90	
MEAN	38.08	27.34	23.50	3.84	0.94	0.39	3.29	0.91
HUB	41.85	10.34	6.50	3.84	0.94	0.38	3.90	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481      422.657     264.717     329.490     1202.068       0.352       0.044

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     24.728      22.699      600.622      46.000      38.779      32.400      -6.379

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481      341.936     264.717     432.430     1207.212       0.283       0.358

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       24.708      23.368      605.773     456.573       0.019       0.440

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096      325.761       0.000     325.761     1208.110       0.270       0.337

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       23.426      606.675       0.000       0.060       0.050       0.385

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4        Pt4           PR4       Texit        Del T       Ns        Ns nondim
      0.866       24.641        1.100     615.532      19.102     216.437       1.678

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 119065.992       0.481     759.551  977158.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =13.026   EfDer =  0.995

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    112.885     3021.000       24.641      615.532       1.000        1.000        0.980
W Kg/sec =   51.31144

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     73.361     2773.216        1.401        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  86840.570   88577.203        2.385      509.668     213.669      390.276       1.827

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00     -0.02   304.63     -0.10   304.63      0.25    443.35
 MEAN    15.91      0.00     -0.02   304.63     -0.10   304.63      0.25
 HUB     13.07      0.00     -0.02   304.63     -0.10   304.63      0.25

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     57.76     47.36    10.40   482.97   571.11     23.58   607.79      0.47
 MEAN    54.02     44.80     9.22   419.52   518.54     23.58   607.79      0.43
 HUB     48.53     38.84     9.69   344.57   460.00     23.58   607.79      0.38

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   400.68    249.55    313.48   1222.29      0.33
 MEAN    15.50   399.72    243.90    316.68   1219.45      0.33
 HUB     12.59   421.02    273.40    320.18   1216.60      0.35

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    472.96    384.94    223.40      0.31   4478.94
 MEAN   408.57    356.94    164.67      0.29   3781.49      1.61
 HUB    331.91    325.48     58.52      0.27   3443.44
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    27.14     1.10    25.19   634.47     1.03   621.07     0.92     0.91
 MEAN   26.74     1.08    24.82   631.52     1.03   618.19     0.92     0.91
 HUB    26.54     1.08    24.43   630.09     1.02   615.30     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    38.52    35.48    31.50     3.98     0.93     0.40     2.90
 MEAN   37.60    27.47    23.50     3.97     0.93     0.38     3.34     0.91
 HUB    40.49    10.36     6.50     3.86     0.93     0.36     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     404.533     248.369     319.311    1219.631       0.332      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.765      24.800     618.373      46.000      37.877      33.000      -4.877

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     335.129     248.369     417.131    1223.848       0.274       0.287

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.741      25.383     622.656     440.827       0.032       0.430

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     314.338       0.000     314.338    1224.954       0.257       0.361

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.519     623.783       0.000       0.060       0.045       0.355

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      26.716       1.084     632.027      16.496     233.307       1.809

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102863.898       0.460     656.194 1016251.812

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    680433.31   4340.6494    110.2775      1.7684      0.8500     13.0264      1.2089


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 80% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.967

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    108.898    3021.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   49.49893

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.382    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83773.047   85448.320       2.684     831.557     309.808     619.754       2.000

     ROTOR LEADING EDGE CONDITIONS, STAGE            1
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   247.78    -0.09   247.78     0.22   541.71
MEAN    17.06     0.00    -0.02   247.78    -0.09   247.78     0.22
HUB     12.51     0.00    -0.02   247.78    -0.09   247.78     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     65.51    50.47    15.04   543.87   597.73    14.60   517.68     0.54
MEAN    61.15    47.20    13.95   449.76   513.57    14.60   517.68     0.46
HUB     53.09    38.62    14.47   329.80   412.58    14.60   517.68     0.37

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   491.65   366.37   327.86  1134.28     0.43
MEAN    18.04   501.18   374.01   333.61  1129.78     0.44
HUB     15.00   548.99   429.42   342.04  1123.93     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    543.87   372.83   177.50     0.33  7559.97
MEAN   475.49   348.70   101.48     0.31  6747.13     1.68
HUB    395.45   343.72    33.97     0.31  6442.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.16     1.20    15.96   554.83     1.06   534.64     0.92     0.88
MEAN    17.81     1.18    15.56   551.38     1.05   530.40     0.92     0.88
HUB     17.68     1.17    15.02   550.09     1.05   524.92     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     48.17    28.43    24.20     4.23     0.93     0.48     2.90
MEAN    48.27    16.92    12.70     4.22     0.95     0.43     3.51     0.88
HUB     51.46    -5.67    -9.30     3.63     0.95     0.29     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.967

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     506.016     373.285     341.630    1130.111       0.448       0.002

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.860      15.561     530.715      24.000      47.535      35.400     -12.135

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     357.958     373.285     517.180    1141.430       0.314       0.466

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.791      16.617     541.399     528.796       0.039       0.587

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     333.704       0.000     333.704    1142.906       0.292       0.468

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.672     542.800       0.000       0.060       0.082       0.490

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.826      17.690       1.171     552.101      29.291     174.934       1.356

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 182364.531       0.617    1122.254 1041909.562


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.967
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
108.898	3021.000	17.690	552.101	1.000	1.000	0.980

W Kg/sec = 49.49893

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
93.360	2928.191	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
83773.047	85448.320	2.172	590.487	271.889	474.134	1.744

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	319.16	-0.11	319.16	0.28	525.10
MEAN	18.08	0.00	-0.02	319.16	-0.11	319.16	0.28	
HUB	15.21	0.00	-0.02	319.16	-0.11	319.16	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.50	46.36	13.14	541.76	628.88	16.76	543.60	0.55
MEAN	56.20	42.30	13.90	476.60	573.69	16.76	543.60	0.50
HUB	51.49	37.84	13.65	400.98	512.58	16.76	543.60	0.45

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	449.36	307.69	327.49	1162.74	0.39
MEAN	18.01	450.14	304.18	331.81	1159.14	0.39
HUB	15.22	478.94	340.58	336.73	1155.53	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	400.56	230.64	0.34	6285.38	
MEAN	474.80	373.11	170.62	0.32	5480.19	1.69
HUB	401.33	342.17	60.75	0.30	5186.29	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.46	1.16	18.46	578.71	1.05	561.85	0.92	0.88
MEAN	20.09	1.14	18.11	575.30	1.04	558.38	0.92	0.88
HUB	19.96	1.13	17.73	574.06	1.04	554.90	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.22	35.16	31.50	3.66	0.93	0.45	2.90	
MEAN	42.51	27.21	23.50	3.71	0.95	0.43	3.30	0.88
HUB	45.33	10.23	6.50	3.73	0.95	0.42	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.967

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	538.907	305.030	444.271	1152.260	0.468	-0.368

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.151	17.343	551.771	46.000	34.473	30.600	-3.873

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	446.482	305.030	540.730	1160.174	0.385	0.035

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	20.129	18.171	559.376	400.556	0.021	0.372

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	440.362	0.000	440.362	1160.644	0.379	0.405

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	18.184	559.830	0.000	0.060	0.042	0.041

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.856	20.085	1.135	576.023	23.921	194.691	1.509

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
148987.281	0.514	916.854	939730.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =13.953 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
108.898	3021.000	20.085	576.023	1.000	1.000	0.780

W Kg/sec = 49.49893

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
83.988	2866.745	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
83773.047	85448.320	1.775	434.156	244.605	339.175	1.387

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	407.79	-0.14	407.79	0.35	502.08
MEAN	17.74	0.00	-0.02	407.79	-0.14	407.79	0.35	
HUB	15.05	0.00	-0.02	407.79	-0.14	407.79	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.39	46.36	6.03	529.11	668.13	18.45	562.14	0.57
MEAN	48.92	43.40	5.52	467.64	620.58	18.45	562.14	0.53
HUB	44.23	38.84	5.39	396.77	569.06	18.45	562.14	0.49

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	430.73	282.77	324.92	1185.63	0.36
MEAN	17.51	433.69	283.04	328.60	1182.63	0.37
HUB	14.85	463.83	323.26	332.63	1179.67	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	403.64	239.49	0.34	5604.48	
MEAN	461.53	373.95	178.49	0.32	4957.56	1.79
HUB	391.49	339.56	68.24	0.29	4802.48	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.85	1.14	20.85	599.74	1.04	584.25	0.92	0.91
MEAN	22.52	1.12	20.52	597.00	1.04	581.30	0.92	0.91
HUB	22.44	1.12	20.17	596.35	1.04	578.39	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.03	36.39	31.50	4.89	0.93	0.47	2.90	
MEAN	40.74	28.51	23.50	5.01	0.92	0.47	3.28	0.91
HUB	44.18	11.59	6.50	5.09	0.92	0.48	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	437.839	284.898	332.470	1183.031	0.370	0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.579	20.539	581.691	46.000	40.594	31.500	-9.094

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	339.760	284.898	443.400	1189.488	0.286	0.379

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.547	21.304	588.058	471.992	0.025	0.463

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	330.662	0.000	330.662	1190.003	0.278	0.361

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.293	588.568	0.000	0.060	0.063	0.374

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.868	22.468	1.119	597.696	21.673	203.142	1.575

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
135036.719	0.495	831.003	1190288.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =13.953 EfDer = 0.984

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
108.898	3021.000	22.468	597.696	1.000	1.000	0.980

W Kg/sec = 49.49893

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
76.483	2814.290	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
83773.047	85448.320	2.304	513.330	222.755	401.059	1.800

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	311.48	-0.11	311.48	0.26	473.00
MEAN	16.97	0.00	-0.02	311.48	-0.11	311.48	0.26	
HUB	14.32	0.00	-0.02	311.48	-0.11	311.48	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.48	46.36	12.12	507.76	595.77	21.42	589.60	0.50
MEAN	55.16	43.80	11.36	447.40	545.24	21.42	589.60	0.46
HUB	50.48	37.84	12.64	377.52	489.51	21.42	589.60	0.41

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	419.38	271.69	319.47	1206.16	0.35
MEAN	16.57	420.87	270.08	322.79	1203.29	0.35
HUB	13.89	447.92	306.64	326.50	1200.41	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	391.35	226.05	0.32	5131.58	
MEAN	436.94	363.37	166.86	0.30	4478.08	1.64
HUB	366.18	331.89	59.55	0.28	4260.73	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.14	1.12	23.12	619.40	1.04	604.72	0.92	0.90
MEAN	24.79	1.10	22.77	616.64	1.03	601.85	0.92	0.90
HUB	24.67	1.10	22.41	615.72	1.03	598.97	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.38	35.28	31.50	3.78	0.93	0.42	2.90	
MEAN	39.92	27.34	23.50	3.84	0.94	0.41	3.29	0.90
HUB	43.20	10.34	6.50	3.84	0.94	0.40	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.984

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     417.205     271.598     316.693    1204.164       0.346       0.042

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.844      22.862     602.725      46.000      40.617      32.400      -8.217

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     328.235     271.598     426.033    1209.681       0.271       0.388

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.819      23.580     608.260     456.573       0.022       0.469

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     312.942       0.000     312.942    1210.494       0.259       0.360

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.617     609.079       0.000       0.060       0.059       0.405

    STAGE EXIT CONDITIONS, STAGE             4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.856      24.742       1.101     617.253      19.557     208.447       1.616

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 121904.711       0.492     750.190  938415.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.898    3021.000      24.742     617.253       1.000       1.000       0.980
W Kg/sec =   49.49893

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     70.580    2769.347       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83773.047   85448.320       2.479     509.668     205.571     390.276       1.898

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   292.75    -0.10   292.75     0.24   442.73
 MEAN    15.91     0.00    -0.02   292.75    -0.10   292.75     0.24
 HUB     13.07     0.00    -0.02   292.75    -0.10   292.75     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.78    47.36    11.42   482.97   564.86    23.76   610.10     0.47
 MEAN    55.10    44.80    10.30   419.52   511.65    23.76   610.10     0.42
 HUB     49.66    38.84    10.82   344.57   452.22    23.76   610.10     0.37

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     17.94   396.84   258.44   301.15  1224.89      0.32
 MEAN    15.50   394.10   250.42   304.31  1221.92      0.32
 HUB     12.59   413.22   275.75   307.76  1218.95      0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   369.74   214.52     0.30  4638.26
 MEAN   408.57   342.95   158.15     0.28  3882.44     1.65
 HUB    331.91   312.84    56.16     0.26  3473.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.32     1.10    25.40   636.86     1.03   623.72     0.92     0.91
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  MEAN    26.89     1.09    25.01   633.67     1.03   620.71     0.92     0.91
  HUB     26.65     1.08    24.61   631.94     1.02   617.69     0.92     0.91

          Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     40.64    35.46    31.50     3.96     0.93     0.42     2.90
  MEAN    39.45    27.46    23.50     3.96     0.94     0.40     3.34     0.91
  HUB     41.86    10.34     6.50     3.84     0.94     0.38     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.990

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     398.976     255.007     306.844    1222.084       0.326      -0.009

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      26.914      24.997     620.875      46.000      39.729      33.000      -6.729

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     321.694     255.007     410.506    1226.649       0.262       0.317

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      26.882      25.626     625.521     440.827       0.036       0.459

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     301.907       0.000     301.907    1227.658       0.246       0.385

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      25.745     626.551       0.000       0.060       0.052       0.378

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.866      26.852       1.085     634.156      16.904     224.558       1.741

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  105411.289       0.471     648.691  975873.062

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     693704.56   4268.9917    106.3821      1.7775      0.8419     13.9532      1.2130


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 80% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  0.959

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     104.649    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   47.56755

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     102.231    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   80504.336   82114.242       2.793     831.557     297.720     619.754       2.082

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   237.65    -0.08   237.65     0.21   541.71
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 MEAN    17.06     0.00    -0.02   237.65    -0.08   237.65     0.21
 HUB     12.51     0.00    -0.02   237.65    -0.08   237.65     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     66.40    50.47    15.93   543.87   593.60    14.64   518.09     0.53
 MEAN    62.15    47.20    14.95   449.76   508.76    14.64   518.09     0.46
 HUB     54.23    38.62    15.61   329.80   406.57    14.64   518.09     0.36

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   488.08   373.37   314.35  1135.24     0.43
 MEAN    18.04   495.12   377.91   319.88  1130.64     0.44
 HUB     15.00   538.95   427.78   327.83  1124.79     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    543.87   357.61   170.50     0.32  7704.38
 MEAN   475.49   334.44    97.57     0.30  6817.45     1.74
 HUB    395.45   329.42    32.34     0.29  6417.79

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.19     1.20    16.02   555.44     1.06   535.54     0.92     0.88
 MEAN    17.82     1.18    15.62   551.68     1.06   531.21     0.92     0.88
 HUB     17.65     1.17    15.08   549.99     1.05   525.73     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.91    28.47    24.20     4.27     0.93     0.51     2.90
 MEAN    49.75    16.96    12.70     4.26     0.95     0.45     3.51     0.88
 HUB     52.54    -5.63    -9.30     3.67     0.95     0.31     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.959

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     499.549     377.179     327.545    1130.975       0.442       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.863      15.621     531.527      24.000      49.029      35.400     -13.629

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     342.838     377.179     509.708    1142.646       0.300       0.491

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.786      16.708     542.553     528.796       0.043       0.611

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     320.008       0.000     320.008    1143.976       0.280       0.483

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.739     543.817       0.000       0.060       0.091       0.504

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.814      17.675       1.170     552.370      29.560     170.151       1.319

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 184035.375       0.622    1088.346  999280.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  0.958

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    104.649    3021.000      17.675     552.370       1.000       1.000       0.980
W Kg/sec =   47.56755
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
89.815	2927.479	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
80504.336	82114.242	2.258	590.487	261.566	474.134	1.813

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	306.16	-0.11	306.16	0.27	524.98
MEAN	18.08	0.00	-0.02	306.16	-0.11	306.16	0.27	
HUB	15.21	0.00	-0.02	306.16	-0.11	306.16	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.53	46.36	14.17	541.76	622.38	16.82	544.54	0.54
MEAN	57.29	42.30	14.99	476.60	566.55	16.82	544.54	0.49
HUB	52.64	37.84	14.80	400.98	504.58	16.82	544.54	0.44

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	446.25	316.79	314.29	1164.07	0.38
MEAN	18.01	445.06	310.85	318.51	1160.34	0.38
HUB	15.22	471.25	342.86	323.30	1156.59	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	384.53	221.54	0.33	6471.08	
MEAN	474.80	358.23	163.95	0.31	5600.34	1.74
HUB	401.33	328.55	58.47	0.28	5220.94	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.51	1.16	18.53	579.76	1.05	563.14	0.92	0.88
MEAN	20.11	1.14	18.16	576.08	1.04	559.54	0.92	0.88
HUB	19.93	1.13	17.78	574.47	1.04	555.93	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.23	35.18	31.50	3.68	0.93	0.47	2.90	
MEAN	44.30	27.24	23.50	3.74	0.95	0.45	3.30	0.88
HUB	46.68	10.25	6.50	3.75	0.95	0.44	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.958

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	527.232	311.724	425.207	1154.124	0.457	-0.342

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.162	17.470	553.560	46.000	36.246	30.600	-5.646

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	426.692	311.724	528.430	1162.443	0.367	0.093

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	20.135	18.344	561.568	400.556	0.023	0.399

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	421.071	0.000	421.071	1162.854	0.362	0.431

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	18.344	561.966	0.000	0.060	0.047	0.093

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.845	20.086	1.136	576.772	24.402	187.861	1.456

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 151980.125       0.524     898.778  899923.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    104.649    3021.000      20.086     576.772       1.000       1.000       0.780
W Kg/sec =   47.56755

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     80.759    2864.883       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  80504.336   82114.242       1.846     434.156     235.203     339.175       1.442

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   390.33    -0.13   390.33     0.34   501.75
 MEAN    17.74     0.00    -0.02   390.33    -0.13   390.33     0.34
 HUB     15.05     0.00    -0.02   390.33    -0.13   390.33     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.59    46.36     7.23   529.11   657.61    18.58   564.05     0.56
 MEAN    50.16    43.40     6.76   467.64   609.24    18.58   564.05     0.52
 HUB     45.48    38.84     6.64   396.77   556.67    18.58   564.05     0.48

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   427.64   293.25   311.26  1187.50     0.36
 MEAN    17.51   428.70   290.83   314.95  1184.34     0.36
 HUB     14.85   456.39   326.41   318.98  1181.21     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   386.42   229.00     0.33  5812.06
 MEAN   461.53   358.24   170.70     0.30  5093.86     1.84
 HUB    391.49   325.55    65.09     0.28  4849.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.96     1.14    20.99   601.37     1.04   586.10     0.92     0.91
 MEAN    22.59     1.12    20.63   598.33     1.04   582.98     0.92     0.91
 HUB     22.46     1.12    20.26   597.29     1.04   579.90     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.29    36.34    31.50     4.84     0.93     0.49     2.90
 MEAN    42.72    28.46    23.50     4.96     0.93     0.48     3.28     0.91
 HUB     45.66    11.53     6.50     5.03     0.93     0.49     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     432.720     292.741     318.668    1184.725       0.365       0.011

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.647      20.651     583.363      46.000      42.572      31.500     -11.072

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     325.194     292.741     437.548    1191.614       0.273       0.412

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.608      21.467     590.167     471.992       0.029       0.495
```

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	316.747	0.000	316.747	1192.070	0.266	0.384

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.435	590.620	0.000	0.060	0.075	0.397

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.863	22.515	1.121	598.995	22.224	195.038	1.512

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
138469.375	0.508	818.878	1136795.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =14.953 EfDer = 0.977

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
104.649	3021.000	22.515	598.995	1.000	1.000	0.980

W Kg/sec = 47.56755

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
73.423	2811.235	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
80504.336	82114.242	2.400	513.330	213.845	401.059	1.875

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	298.49	-0.10	298.49	0.25	472.48
MEAN	16.97	0.00	-0.02	298.49	-0.10	298.49	0.25	
HUB	14.32	0.00	-0.02	298.49	-0.10	298.49	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.56	46.36	13.20	507.76	589.08	21.55	591.56	0.49
MEAN	56.30	43.80	12.50	447.40	537.92	21.55	591.56	0.45
HUB	51.68	37.84	13.84	377.52	481.35	21.55	591.56	0.40

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	415.61	281.09	306.14	1208.45	0.34
MEAN	16.57	415.28	276.99	309.40	1205.46	0.34
HUB	13.89	439.94	309.09	313.06	1202.44	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	375.04	216.65	0.31	5308.92	
MEAN	436.94	348.30	159.95	0.29	4592.56	1.70
HUB	366.18	318.22	57.09	0.26	4294.79	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.26	1.12	23.27	621.45	1.04	607.04	0.92	0.89
MEAN	24.88	1.10	22.91	618.42	1.03	604.03	0.92	0.89
HUB	24.72	1.10	22.53	617.16	1.03	601.01	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.56	35.29	31.50	3.79	0.93	0.44	2.90	
MEAN	41.84	27.34	23.50	3.84	0.94	0.43	3.29	0.89
HUB	44.63	10.34	6.50	3.84	0.94	0.42	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.977

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

```
    16.481     412.045     278.549     303.631    1206.268       0.342       0.040

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.932      22.996     604.842      46.000      42.533      32.400     -10.133

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     314.304     278.549     419.972    1212.161       0.259       0.418

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.900      23.762     610.767     456.573       0.025       0.500

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     299.908       0.000     299.908    1212.894       0.247       0.382

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.776     611.505       0.000       0.060       0.069       0.425

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.844      24.810       1.102     619.011      20.016     200.531       1.555

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 124768.867       0.504     737.857  897778.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  0.984

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    104.649    3021.000      24.810     619.011       1.000       1.000       0.980
W Kg/sec =   47.56755

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     67.734    2765.410       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  80504.336   82114.242       2.583     509.668     197.284     390.276       1.978

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   280.67    -0.10   280.67     0.23   442.10
 MEAN    15.91     0.00    -0.02   280.67    -0.10   280.67     0.23
 HUB     13.07     0.00    -0.02   280.67    -0.10   280.67     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.84    47.36    12.48   482.97   558.69    23.90   612.44     0.46
 MEAN    56.22    44.80    11.42   419.52   504.83    23.90   612.44     0.42
 HUB     50.84    38.84    12.00   344.57   444.48    23.90   612.44     0.37

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   393.46   267.35   288.67  1227.48     0.32
 MEAN    15.50   388.80   256.98   291.77  1224.40     0.32
 HUB     12.59   405.52   278.08   295.15  1221.31     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   354.41   205.60     0.29  4798.08
 MEAN   408.57   328.80   151.59     0.27  3984.05     1.70
 HUB    331.91   300.02    53.83     0.25  3502.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.46     1.11    25.57   639.30     1.03   626.38     0.92     0.90
 MEAN    27.00     1.09    25.17   635.86     1.03   623.24     0.92     0.90
 HUB     26.73     1.08    24.76   633.82     1.02   620.10     0.92     0.90
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         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     42.80    35.46    31.50     3.96     0.93     0.45     2.90
  MEAN    41.37    27.45    23.50     3.95     0.94     0.42     3.34     0.90
  HUB     43.29    10.34     6.50     3.84     0.94     0.40     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.984

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     393.751     261.688     294.210    1224.543       0.322      -0.011

      Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      27.024       25.154     623.389       46.000      41.652      33.000      -8.652

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     308.138     261.688     404.264    1229.458       0.251       0.348

    BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
       0.950       26.983       25.828     628.402     440.827       0.042       0.490

     VANED DIFFUSER EXIT:
    R4           C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
      14.701     289.358       0.000     289.358    1230.373       0.235       0.409

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       25.928     629.339       0.000       0.060       0.061       0.401

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
       0.856       26.947       1.086     636.324      17.313     215.958       1.674

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  107966.703       0.483     638.492  933537.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     707220.44   4182.3516     102.2312      1.7837      0.8313     14.9531      1.2171


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 80% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =16.040   EfDer =  0.949

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     100.090     3021.000       15.107     522.810        1.000        1.000        0.980
 W Kg/sec =   45.49547

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
      97.778     3009.102        1.402        0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
   76997.508   78537.289        2.920     831.557     284.751     619.754       2.176

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa     C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   226.84    -0.08   226.84      0.20   541.71
  MEAN    17.06      0.00    -0.02   226.84    -0.08   226.84      0.20
  HUB     12.51      0.00    -0.02   226.84    -0.08   226.84      0.20
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	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	67.36	50.47	16.89	543.87	589.35	14.68	518.51	0.53
MEAN	63.24	47.20	16.04	449.76	503.79	14.68	518.51	0.45
HUB	55.49	38.62	16.87	329.80	400.35	14.68	518.51	0.36

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	484.75	380.70	300.07	1136.21	0.43
MEAN	18.04	489.04	381.99	305.35	1131.50	0.43
HUB	15.00	528.47	425.97	312.77	1125.67	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	543.87	341.56	163.17	0.30	7855.53	
MEAN	475.49	319.34	93.49	0.28	6890.99	1.81
HUB	395.45	314.26	30.53	0.28	6390.59	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.23	1.21	16.08	556.08	1.06	536.45	0.92	0.87
MEAN	17.82	1.18	15.67	551.99	1.06	532.02	0.92	0.87
HUB	17.61	1.17	15.14	549.87	1.05	526.55	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	51.75	28.54	24.20	4.34	0.93	0.53	2.90	
MEAN	51.36	17.02	12.70	4.32	0.95	0.48	3.51	0.87
HUB	53.71	-5.57	-9.30	3.73	0.95	0.34	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.949

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	493.048	381.252	312.639	1131.845	0.436	0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.863	15.677	532.344	24.000	50.647	35.400	-15.247

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	326.881	381.252	502.200	1143.878	0.286	0.517

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.778	16.797	543.724	528.796	0.048	0.638

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	305.505	0.000	305.505	1145.065	0.267	0.499

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.802	544.853	0.000	0.060	0.102	0.519

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.801	17.655	1.169	552.649	29.839	165.070	1.280

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
185771.203	0.628	1050.755	953829.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =16.040 EfDer = 0.948

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
100.090	3021.000	17.655	552.649	1.000	1.000	0.980

W Kg/sec = 45.49547

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
86.022	2926.741	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
76997.508	78537.289	2.357	590.487	250.520	474.134	1.893

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	292.38	-0.10	292.38	0.26	524.84
MEAN	18.08	0.00	-0.02	292.38	-0.10	292.38	0.26	
HUB	15.21	0.00	-0.02	292.38	-0.10	292.38	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.65	46.36	15.29	541.76	615.71	16.87	545.51	0.54
MEAN	58.48	42.30	16.18	476.60	559.22	16.87	545.51	0.49
HUB	53.91	37.84	16.07	400.98	496.34	16.87	545.51	0.43

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	443.51	326.28	300.40	1165.41	0.38
MEAN	18.01	440.12	317.81	304.46	1161.55	0.38
HUB	15.22	463.37	345.21	309.10	1157.68	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	367.71	212.05	0.32	6664.79	
MEAN	474.80	342.55	156.99	0.29	5725.62	1.80
HUB	401.33	314.15	56.12	0.27	5256.68	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.54	1.16	18.58	580.86	1.05	564.44	0.92	0.87
MEAN	20.11	1.14	18.21	576.89	1.04	560.71	0.92	0.87
HUB	19.90	1.13	17.82	574.90	1.04	556.97	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	47.36	35.22	31.50	3.72	0.93	0.49	2.90	
MEAN	46.23	27.28	23.50	3.78	0.95	0.47	3.30	0.87
HUB	48.16	10.29	6.50	3.79	0.95	0.46	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.948

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	515.601	318.705	405.304	1155.988	0.446	-0.316

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.163	17.587	555.352	46.000	38.179	30.600	-7.579

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	406.141	318.705	516.259	1164.724	0.349	0.152

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	20.131	18.505	563.777	400.556	0.027	0.429

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	401.061	0.000	401.061	1165.077	0.344	0.457

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	18.491	564.120	0.000	0.060	0.056	0.145

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.832	20.073	1.137	577.551	24.902	180.809	1.402

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
155097.922	0.535	877.262	857684.812

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =16.040   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    100.090    3021.000      20.073     577.551       1.000       1.000       0.780
W Kg/sec =   45.49547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.344    2862.949       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 76997.508   78537.289       1.927     434.156     225.257     339.175       1.506

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   372.14    -0.13   372.14     0.32   501.41
MEAN    17.74     0.00    -0.02   372.14    -0.13   372.14     0.32
HUB     15.05     0.00    -0.02   372.14    -0.13   372.14     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.89    46.36     8.53   529.11   646.98    18.71   565.99     0.55
MEAN    51.50    43.40     8.10   467.64   597.75    18.71   565.99     0.51
HUB     46.84    38.84     8.00   396.77   544.07    18.71   565.99     0.47

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   425.12   304.03   297.13  1189.38     0.36
MEAN    17.51   424.02   298.86   300.80  1186.07     0.36
HUB     14.85   448.93   329.62   304.78  1182.77     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    522.26   368.66   218.22     0.31  6025.48
MEAN   461.53   341.97   162.67     0.29  5234.26     1.90
HUB    391.49   311.00    61.87     0.26  4896.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.04     1.15    21.09   603.05     1.04   587.96     0.92     0.91
MEAN    22.64     1.13    20.72   599.70     1.04   584.69     0.92     0.91
HUB     22.46     1.12    20.34   598.27     1.04   581.45     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     45.66    36.29    31.50     4.79     0.93     0.51     2.90
MEAN    44.81    28.40    23.50     4.90     0.93     0.50     3.28     0.91
HUB     47.24    11.48     6.50     4.98     0.93     0.51     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     427.931     300.820     304.356    1186.434       0.361       0.010

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.694      20.740     585.053      46.000      44.665      31.500     -13.165

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     310.141     300.820     432.065    1193.770       0.260       0.446

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.646      21.606     592.311     471.992       0.034       0.529

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     17.121     302.359       0.000     302.359    1194.171       0.253       0.407

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950     21.553     592.709       0.000       0.060       0.088       0.419

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.855     22.537       1.123     600.341      22.790     186.881       1.449

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 141997.766       0.521     803.165 1080588.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =16.040   EfDer =  0.969

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    100.090    3021.000      22.537     600.341       1.000       1.000       0.980
W Kg/sec =   45.49547

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     70.234    2808.083       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76997.508   78537.289       2.509     513.330     204.558     401.059       1.961

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   285.04    -0.10   285.04     0.24   471.96
 MEAN    16.97     0.00    -0.02   285.04    -0.10   285.04     0.24
 HUB     14.32     0.00    -0.02   285.04    -0.10   285.04     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.70    46.36    14.34   507.76   582.38    21.66   593.56     0.49
 MEAN    57.50    43.80    13.70   447.40   530.57    21.66   593.56     0.44
 HUB     52.95    37.84    15.11   377.52   473.12    21.66   593.56     0.40

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   412.33   290.70   292.42  1210.77     0.34
 MEAN    16.57   409.94   284.03   295.60  1207.65     0.34
 HUB     13.89   431.93   311.56   299.16  1204.50     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   358.29   207.04     0.30  5490.23
 MEAN   436.94   332.81   152.91     0.28  4709.17     1.76
 HUB    366.18   304.11    54.63     0.25  4328.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.35     1.12    23.39   623.56     1.04   609.37     0.92     0.89
 MEAN    24.94     1.11    23.02   620.26     1.03   606.23     0.92     0.89
 HUB     24.74     1.10    22.63   618.65     1.03   603.08     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.83    35.30    31.50     3.80     0.93     0.47     2.90
 MEAN    43.86    27.35    23.50     3.85     0.94     0.45     3.29     0.89
 HUB     46.16    10.35     6.50     3.85     0.94     0.44     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.969

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     407.149     285.629     290.150    1208.398       0.337       0.037

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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    24.988      23.098     606.990      46.000      44.550      32.400     -12.150

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     299.977     285.629     414.210    1214.677       0.247       0.450

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.949      23.911     613.315     456.573       0.029       0.532

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     286.493       0.000     286.493    1215.331       0.236       0.403

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.901     613.975       0.000       0.060       0.082       0.445

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.830      24.845       1.102     620.825      20.484     192.592       1.493

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 127687.406       0.515     722.223  854830.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =16.040   EfDer =  0.976

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    100.090    3021.000      24.845     620.825       1.000       1.000       0.980
W Kg/sec =   45.49547

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     64.788    2761.369       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76997.508   78537.289       2.701     509.668     188.705     390.276       2.068

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   268.21    -0.09   268.21     0.22   441.45
 MEAN    15.91      0.00    -0.02   268.21    -0.09   268.21     0.22
 HUB     13.07      0.00    -0.02   268.21    -0.09   268.21     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.96     47.36    13.60   482.97   552.53    24.02   614.82     0.45
 MEAN    57.41     44.80    12.61   419.52   498.00    24.02   614.82     0.41
 HUB     52.11     38.84    13.27   344.57   436.72    24.02   614.82     0.36

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   390.54   276.42   275.89  1230.10     0.32
 MEAN    15.50   383.77   263.62   278.90  1226.91     0.31
 HUB     12.59   397.82   280.42   282.18  1223.71     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   338.74   196.54     0.28  4960.60
 MEAN   408.57   314.32   144.95     0.26  4086.91     1.76
 HUB    331.91   286.84    51.49     0.23  3531.68

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.56     1.11    25.70   641.80     1.03   629.07     0.92     0.89
 MEAN    27.07     1.09    25.29   638.10     1.03   625.82     0.92     0.89
 HUB     26.76     1.08    24.87   635.76     1.02   622.55     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.05    35.47    31.50     3.97     0.93     0.47     2.90
 MEAN    43.39    27.46    23.50     3.96     0.94     0.45     3.34     0.89
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 HUB     44.82    10.34     6.50     3.84     0.94     0.42     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.976

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     388.796     268.451     281.240    1227.033       0.317      -0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     27.094      25.271     625.941      46.000      43.667      33.000     -10.667

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     294.275     268.451     398.327    1232.301       0.239       0.379

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      27.040      25.987     631.328     440.827       0.049       0.522

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     276.513       0.000     276.513    1233.126       0.224       0.432

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      26.067     632.173       0.000       0.060       0.072       0.423

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.843      26.997       1.087     638.552      17.728     207.391       1.608

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 110556.750       0.494     625.329  888806.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    721111.00   4078.7334     97.7779      1.7871      0.8181     16.0399      1.2214



*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 80% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 5.961   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.038    3021.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   65.92652

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    141.688    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111575.445  113806.719       2.015     831.557     412.626     619.754       1.502

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   337.03    -0.12   337.03     0.30   541.71
 MEAN    17.06     0.00    -0.02   337.03    -0.12   337.03     0.30
 HUB     12.51     0.00    -0.02   337.03    -0.12   337.03     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.22    50.47     7.75   543.87   639.93    14.17   513.32     0.58
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MEAN    53.16    47.20     5.96   449.76   562.12    14.17   513.32     0.51
HUB     44.39    38.62     5.77   329.80   471.63    14.17   513.32     0.42

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   543.58   298.32   454.40  1123.19     0.48
MEAN    18.04   569.88   335.66   460.54  1120.12     0.51
HUB     15.00   648.13   442.75   473.34  1114.25     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    543.87   516.51   245.56     0.46  6156.67
MEAN   475.49   481.30   139.83     0.43  6055.97     1.30
HUB    395.45   475.69    47.31     0.43  6642.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.65     1.17    15.03   548.88     1.05   524.21     0.92     0.91
MEAN    17.61     1.17    14.75   548.46     1.05   521.33     0.92     0.91
HUB     17.86     1.18    14.20   550.94     1.05   515.86     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.28    28.39    24.20     4.19     0.93     0.27     2.90
MEAN    36.09    16.89    12.70     4.19     0.92     0.23     3.51     0.91
HUB     43.09    -5.71    -9.30     3.59     0.92     0.10     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     579.115     335.009     472.380    1120.167       0.517      -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.675      14.726     521.416      24.000      35.344      35.400       0.056

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     502.214     335.009     603.697    1127.603       0.445       0.241

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.643      15.395     528.361     528.796       0.020       0.394

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     462.928       0.000     462.928    1130.977       0.409       0.311

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.674     531.528       0.000       0.060       0.037       0.333

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.877      17.594       1.165     549.428      26.618     219.207       1.699

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 165717.266       0.560    1358.260 1417198.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.961   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.038    3021.000      17.594     549.428       1.000       1.000       0.980
W Kg/sec =   65.92652

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    124.721    2935.308       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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111575.445  113806.719       1.626     590.487     363.218     474.134       1.305

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   440.93    -0.15   440.93     0.39   526.38
MEAN    18.08     0.00    -0.02   440.93    -0.15   440.93     0.39
HUB     15.21     0.00    -0.02   440.93    -0.15   440.93     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.87    46.36     4.51   541.76   698.63    15.85   533.19     0.62
MEAN    47.24    42.30     4.94   476.60   649.39    15.85   533.19     0.57
HUB     42.29    37.84     4.45   400.98   596.09    15.85   533.19     0.53

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   505.67   215.02   457.67  1146.96     0.44
MEAN    18.01   518.13   236.69   460.90  1145.28     0.45
HUB     15.22   562.36   316.34   464.95  1143.55     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    538.34   560.36   323.32     0.49  4393.75
MEAN   474.80   518.77   238.10     0.45  4265.61     1.35
HUB    401.33   472.65    84.99     0.41  4817.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.56     1.11    17.12   568.03     1.03   546.68     0.92     0.91
MEAN    19.50     1.11    16.95   567.49     1.03   545.07     0.92     0.91
HUB     19.76     1.12    16.75   569.82     1.04   543.42     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.16    35.24    31.50     3.74     0.93     0.25     2.90
MEAN    27.18    27.32    23.50     3.82     0.92     0.26     3.30     0.91
HUB     34.23    10.36     6.50     3.86     0.92     0.27     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     800.039     237.359     764.018    1113.213       0.719      -1.148

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.582      13.876     514.995      46.000      17.259      30.600      13.341

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     800.092     237.359     834.557    1113.208       0.719      -1.186

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      19.425      13.764     514.988     361.848       0.069       0.102

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     797.541       0.000     797.541    1113.666       0.716      -0.096

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.680      13.619     515.336       0.000       0.060       0.162      -1.240

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.722      19.176       1.090     568.446      19.019     271.791       2.107

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 118450.117       0.409     970.847 1302166.625
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.961   EfDer =  0.770

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.038    3021.000      19.176     568.446       1.000       1.000       0.710
W Kg/sec =   65.92652

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    116.395    2885.786       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
111575.445  113806.719        1.166     395.194     338.985     307.469       0.907

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   698.38    -0.24   698.38     0.62   505.41
MEAN    17.74     0.00    -0.02   698.38    -0.24   698.38     0.62
HUB     15.05     0.00    -0.02   698.38    -0.24   698.38     0.62

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     37.16    46.36    -9.20   529.11   876.32    14.80   527.73     0.78
MEAN    33.82    43.40    -9.58   467.64   840.62    14.80   527.73     0.75
HUB     29.62    38.84    -9.22   396.77   803.33    14.80   527.73     0.71

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   508.89   144.97   487.80  1159.77     0.44
MEAN    17.51   520.54   180.04   488.41  1159.96     0.45
HUB     14.85   564.12   276.68   491.61  1160.08     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    522.26   616.68   377.28     0.53  2876.69
MEAN   461.53   563.72   281.49     0.49  3156.19     1.56
HUB    391.49   504.84   114.81     0.44  4112.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.20     1.05    17.70   580.62     1.02   559.00     0.92     0.70
MEAN    20.31     1.06    17.68   581.80     1.02   559.18     0.92     0.70
HUB     20.66     1.08    17.57   585.85     1.03   559.28     0.92     0.70

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     16.55    37.72    31.50     6.22     0.93     0.32     2.90
MEAN    20.24    29.96    23.50     6.46     0.85     0.36     3.28     0.70
HUB     29.37    13.15     6.50     6.65     0.85     0.42     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.770

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     527.231     181.224     495.107    1160.313       0.454      -0.004

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.362      17.670     559.551      46.000      20.104      31.500      11.396

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     519.495     181.224     550.197    1161.014       0.447       0.011

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.287      17.679     560.227     471.992       0.037       0.158

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.121     504.753       0.000     504.753    1162.319       0.434       0.019
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.723	561.488	0.000	0.060	0.077	0.027

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.585	20.179	1.052	582.759	14.313	346.260	2.684

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
89164.852	0.327	730.817	1991565.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 5.961 EfDer = 0.945

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
145.038	3021.000	20.179	582.759	1.000	1.000	0.980

W Kg/sec = 65.92652

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
111.994	2850.128	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
111575.445	113806.719	1.574	513.330	326.179	401.059	1.230

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	471.92	-0.16	471.92	0.41	479.02
MEAN	16.97	0.00	-0.02	471.92	-0.16	471.92	0.41	
HUB	14.32	0.00	-0.02	471.92	-0.16	471.92	0.41	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.10	46.36	0.74	507.76	693.32	18.02	564.17	0.60
MEAN	43.48	43.80	-0.32	447.40	650.40	18.02	564.17	0.56
HUB	38.67	37.84	0.83	377.52	604.45	18.02	564.17	0.52

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	517.00	143.22	496.77	1173.02	0.44
MEAN	16.57	527.61	176.95	497.05	1173.07	0.45
HUB	13.89	568.24	272.43	498.67	1172.96	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	610.30	354.52	0.52	2707.15	
MEAN	436.94	560.94	259.99	0.48	2935.53	1.24
HUB	366.18	507.41	93.75	0.43	3786.42	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.40	1.06	18.73	594.21	1.02	571.90	0.92	0.86
MEAN	21.51	1.07	18.72	595.18	1.02	571.95	0.92	0.86
HUB	21.90	1.09	18.65	598.78	1.03	571.83	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	16.08	35.51	31.50	4.01	0.93	0.16	2.90	
MEAN	19.60	27.61	23.50	4.11	0.90	0.18	3.29	0.86
HUB	28.65	10.65	6.50	4.15	0.90	0.22	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.945

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	517.756	177.947	486.217	1174.814	0.441	0.056

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.574	18.877	573.683	46.000	20.102	32.400	12.298

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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     516.880     177.947     546.653    1174.892       0.440       0.040

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.490      18.812     573.759     456.573       0.039       0.167

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     491.216       0.000     491.216    1177.101       0.417       0.024

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.948     575.918       0.000       0.060       0.083       0.086

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.722      21.363       1.059     596.059      13.300     342.712       2.657

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  82871.195       0.335     679.233 1334541.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.961   EfDer =  0.911

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.038    3021.000      21.363     596.058       1.000       1.000       0.980
W Kg/sec =   65.92652

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.985    2818.152       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111575.445  113806.719       1.636     509.668     311.598     390.276       1.253

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   455.93    -0.16   455.93     0.39   450.53
 MEAN    15.91     0.00    -0.02   455.93    -0.16   455.93     0.39
 HUB     13.07     0.00    -0.02   455.93    -0.16   455.93     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.66    47.36    -0.70   482.97   664.29    19.27   578.71     0.56
 MEAN    42.63    44.80    -2.17   419.52   619.68    19.27   578.71     0.53
 HUB     37.09    38.84    -1.75   344.57   571.58    19.27   578.71     0.48

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   498.21   125.87   482.04  1186.22     0.42
 MEAN    15.50   506.63   154.16   482.61  1186.07     0.43
 HUB     12.59   540.78   240.36   484.42  1185.78     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   594.00   347.09     0.50  2260.90
 MEAN   408.57   545.56   254.40     0.46  2391.65     1.22
 HUB    331.91   493.00    91.55     0.42  3028.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.38     1.05    19.82   605.62     1.02   584.91     0.92     0.83
 MEAN    22.44     1.05    19.79   606.18     1.02   584.76     0.92     0.83
 HUB     22.73     1.06    19.70   608.87     1.02   584.47     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     14.63    35.76    31.50     4.26     0.93     0.14     2.90
 MEAN    17.72    27.80    23.50     4.30     0.89     0.16     3.34     0.83
 HUB     26.39    10.70     6.50     4.20     0.89     0.19     4.06
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.911

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     511.801     156.989     487.129    1186.324       0.431      -0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.460      19.760     585.030      46.000      17.863      33.000      15.137

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     527.444     156.989     550.311    1184.948       0.445      -0.126

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.257      19.424     583.674     440.827       0.094       0.146

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     490.323       0.000     490.323    1188.144       0.413       0.005

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.774     586.827       0.000       0.060       0.102       0.001

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.635      22.236       1.041     606.889      10.831     391.459       3.035

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   67505.391       0.302     553.291 1394740.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    523708.81   4292.4478    141.6879      1.4719      0.7288      5.9606      1.1608


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 80% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    142.688    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   64.85819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    139.392    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  109767.383  111962.492       2.048     831.557     405.939     619.754       1.527

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   331.03    -0.11   331.03     0.30   541.71
  MEAN    17.06     0.00    -0.02   331.03    -0.11   331.03     0.30
  HUB     12.51     0.00    -0.02   331.03    -0.11   331.03     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.68    50.47     8.21   543.87   636.79    14.20   513.66     0.57
  MEAN    53.65    47.20     6.45   449.76   558.54    14.20   513.66     0.50
  HUB     44.90    38.62     6.28   329.80   467.36    14.20   513.66     0.42
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      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   538.76   303.30   445.28  1124.12     0.48
MEAN    18.04   564.28   338.47   451.50  1120.91     0.50
HUB     15.00   640.71   441.86   463.98  1115.04     0.57

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    543.87   506.11   240.57     0.45  6259.48
MEAN   475.49   471.83   137.02     0.42  6106.63     1.32
HUB    395.45   466.29    46.41     0.42  6629.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.70     1.17    15.12   549.32     1.05   525.08     0.92     0.91
MEAN    17.63     1.17    14.82   548.67     1.05   522.08     0.92     0.91
HUB     17.86     1.18    14.27   550.89     1.05   516.60     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.26    28.38    24.20     4.18     0.93     0.29     2.90
MEAN    36.86    16.88    12.70     4.18     0.93     0.24     3.51     0.91
HUB     43.60    -5.71    -9.30     3.59     0.93     0.11     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     573.154     337.814     463.019    1120.995       0.511      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.697      14.802     522.187      24.000      36.114      35.400      -0.714

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     491.536     337.814     596.428    1128.759       0.435       0.257

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.667      15.506     529.445     528.796       0.020       0.406

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     453.435       0.000     453.435    1131.960       0.401       0.324

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.771     532.453       0.000       0.060       0.037       0.346

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      17.617       1.166     549.625      26.815     216.045       1.675

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 166948.453       0.564    1346.177 1391974.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    142.688    3021.000      17.617     549.625       1.000       1.000       0.980
W Kg/sec =   64.85819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    122.560    2934.780       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109767.383  111962.492       1.654     590.487     356.928     474.134       1.328

     ROTOR LEADING EDGE CONDITIONS, STAGE            2
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   432.05    -0.15   432.05     0.38   526.29
MEAN    18.08     0.00    -0.02   432.05    -0.15   432.05     0.38
HUB     15.21     0.00    -0.02   432.05    -0.15   432.05     0.38

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.44    46.36     5.08   541.76   693.06    15.93   534.04     0.61
MEAN    47.82    42.30     5.52   476.60   643.40    15.93   534.04     0.57
HUB     42.87    37.84     5.03   400.98   589.56    15.93   534.04     0.52

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   499.76   222.28   447.60  1148.34     0.44
MEAN    18.01   511.86   241.91   451.09  1146.46     0.45
HUB     15.22   555.52   318.23   455.34  1144.55     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    538.34   547.95   316.06     0.48  4541.94
MEAN   474.80   507.66   232.89     0.44  4359.46     1.37
HUB    401.33   462.86    83.09     0.40  4846.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.66     1.12    17.26   568.85     1.03   548.00     0.92     0.91
MEAN    19.58     1.11    17.07   568.08     1.03   546.20     0.92     0.91
HUB     19.80     1.12    16.85   570.14     1.04   544.37     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     26.41    35.23    31.50     3.73     0.93     0.26     2.90
MEAN    28.20    27.31    23.50     3.81     0.92     0.27     3.30     0.91
HUB     34.95    10.34     6.50     3.84     0.92     0.28     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     777.773     242.588     738.973    1117.003       0.696      -1.091

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.653      14.210     518.509      46.000      18.174      30.600      12.426

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     768.660     242.588     806.032    1118.271       0.687      -1.083

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      19.516      14.223     519.686     361.848       0.062       0.123

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     763.202       0.000     763.202    1119.066       0.682      -0.026

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.680      14.142     520.388       0.000       0.060       0.140      -1.114

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.757      19.313       1.096     569.026      19.401     265.057       2.055

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 120830.141       0.417     974.305 1276830.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.780
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
142.688	3021.000	19.313	569.026	1.000	1.000	0.710

W Kg/sec = 64.85819

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
113.750	2884.315	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
109767.383	111962.492	1.193	395.194	331.280	307.469	0.928

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	673.72	-0.23	673.72	0.60	505.16
MEAN	17.74	0.00	-0.02	673.72	-0.23	673.72	0.60	
HUB	15.05	0.00	-0.02	673.72	-0.23	673.72	0.60	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	38.16	46.36	-8.20	529.11	856.79	15.19	531.13	0.76
MEAN	34.78	43.40	-8.62	467.64	820.24	15.19	531.13	0.73
HUB	30.51	38.84	-8.33	396.77	781.99	15.19	531.13	0.69

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	498.81	156.80	473.52	1162.27	0.43
MEAN	17.51	510.71	188.78	474.54	1162.10	0.44
HUB	14.85	554.15	280.54	477.89	1161.89	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	598.15	365.45	0.51	3110.93	
MEAN	461.53	547.34	272.75	0.47	3308.92	1.57
HUB	391.49	490.60	110.95	0.42	4169.56	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.45	1.06	18.01	582.19	1.02	561.42	0.92	0.71
MEAN	20.52	1.06	17.97	583.03	1.02	561.26	0.92	0.71
HUB	20.85	1.08	17.84	586.67	1.03	561.04	0.92	0.71

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	18.32	37.66	31.50	6.16	0.93	0.33	2.90	
MEAN	21.69	29.89	23.50	6.39	0.86	0.37	3.28	0.71
HUB	30.42	13.07	6.50	6.57	0.86	0.42	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.780

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	517.104	190.014	480.927	1162.479	0.445	-0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.580	17.963	561.640	46.000	21.559	31.500	9.941

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	503.069	190.014	537.759	1163.715	0.432	0.039

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.520	18.044	562.836	471.992	0.032	0.178

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	488.599	0.000	488.599	1164.953	0.419	0.049

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.094	564.034	0.000	0.060	0.068	0.057

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.616	20.425	1.058	583.965	14.939	329.335	2.553

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
93069.211	0.341	750.457	1931613.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.453 EfDer = 0.959

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
142.688	3021.000	20.425	583.965	1.000	1.000	0.980

W Kg/sec = 64.85819

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
108.962	2847.183	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
109767.383	111962.492	1.618	513.330	317.347	401.059	1.264

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	457.25	-0.16	457.25	0.39	478.53
MEAN	16.97	0.00	-0.02	457.25	-0.16	457.25	0.39	
HUB	14.32	0.00	-0.02	457.25	-0.16	457.25	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.00	46.36	1.64	507.76	683.41	18.37	566.51	0.59
MEAN	44.39	43.80	0.59	447.40	639.83	18.37	566.51	0.55
HUB	39.56	37.84	1.72	377.52	593.06	18.37	566.51	0.51

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	504.02	155.93	479.29	1176.42	0.43
MEAN	16.57	514.97	186.01	480.20	1176.07	0.44
HUB	13.89	555.50	275.77	482.21	1175.61	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	588.69	341.81	0.50	2946.94	
MEAN	436.94	541.81	250.93	0.46	3085.58	1.26
HUB	366.18	490.61	90.41	0.42	3832.70	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.79	1.07	19.21	596.43	1.02	575.23	0.92	0.88
MEAN	21.86	1.07	19.16	597.02	1.02	574.89	0.92	0.88
HUB	22.21	1.09	19.06	600.18	1.03	574.43	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	18.02	35.49	31.50	3.99	0.93	0.18	2.90	
MEAN	21.17	27.59	23.50	4.09	0.90	0.20	3.29	0.88
HUB	29.76	10.62	6.50	4.12	0.90	0.23	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.959

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	505.724	187.056	469.858	1177.729	0.429	0.055

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.926	19.314	576.532	46.000	21.708	32.400	10.692

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	497.763	187.056	531.750	1178.410	0.422	0.068

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.861	19.333	577.198	456.573	0.033	0.189

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	472.973	0.000	472.973	1180.458	0.401	0.056

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.471	579.207	0.000	0.060	0.073	0.117

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.763	21.751	1.065	597.879	13.914	326.094	2.528

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
86703.914	0.350	699.131	1304128.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 6.453 EfDer = 0.931

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
142.688	3021.000	21.751	597.879	1.000	1.000	0.980

W Kg/sec = 64.85819

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
103.534	2813.857	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
109767.383	111962.492	1.690	509.668	301.547	390.276	1.294

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	439.47	-0.15	439.47	0.37	449.84
MEAN	15.91	0.00	-0.02	439.47	-0.15	439.47	0.37	
HUB	13.07	0.00	-0.02	439.47	-0.15	439.47	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.71	47.36	0.35	482.97	653.11	19.77	581.76	0.55
MEAN	43.68	44.80	-1.12	419.52	607.67	19.77	581.76	0.51
HUB	38.11	38.84	-0.73	344.57	558.54	19.77	581.76	0.47

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	483.33	140.17	462.56	1190.39	0.41
MEAN	15.50	492.01	164.44	463.72	1189.82	0.41
HUB	12.59	525.97	244.14	465.88	1189.15	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	472.96	569.83	332.79	0.48	2517.36	
MEAN	408.57	524.06	244.13	0.44	2550.82	1.25
HUB	331.91	474.08	87.78	0.40	3075.67	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.92	1.05	20.46	608.53	1.02	589.03	0.92	0.85
MEAN	22.94	1.05	20.39	608.67	1.02	588.47	0.92	0.85
HUB	23.19	1.07	20.27	610.89	1.02	587.80	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	16.86	35.73	31.50	4.23	0.93	0.16	2.90	
MEAN	19.52	27.76	23.50	4.26	0.90	0.18	3.34	0.85
HUB	27.66	10.67	6.50	4.17	0.90	0.20	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.931

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     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     496.989     167.454     467.929    1190.092       0.418      -0.009

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      22.966      20.366     588.750      46.000      19.690      33.000      13.310

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     503.881     167.454     530.978    1189.510       0.424      -0.083

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      22.807      20.157     588.175     440.827       0.080       0.170

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     469.198       0.000     469.198    1192.354       0.394       0.041

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      20.474     590.991       0.000       0.060       0.089       0.037

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.696      22.783       1.047     609.363      11.483     367.822       2.851

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   71575.078       0.320     577.141 1361522.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     539126.81   4347.2109    139.3919      1.5081      0.7551      6.4529      1.1656


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 80% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     140.038    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   63.65342

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     136.803    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  107728.406  109882.742       2.087     831.557     398.399     619.754       1.556

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   324.31    -0.11   324.31     0.29   541.71
  MEAN    17.06     0.00    -0.02   324.31    -0.11   324.31     0.29
  HUB     12.51     0.00    -0.02   324.31    -0.11   324.31     0.29

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.20    50.47     8.73   543.87   633.32    14.24   514.03     0.57
  MEAN    54.21    47.20     7.01   449.76   554.58    14.24   514.03     0.50
  HUB     45.49    38.62     6.87   329.80   462.62    14.24   514.03     0.42

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000
```

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	533.61	308.81	435.18	1125.12	0.47
MEAN	18.04	558.19	341.58	441.48	1121.77	0.50
HUB	15.00	632.55	440.86	453.60	1115.90	0.57

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	543.87	494.61	235.06	0.44	6373.05	
MEAN	475.49	461.34	133.91	0.41	6162.62	1.35
HUB	395.45	455.87	45.42	0.41	6614.35	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.74	1.17	15.21	549.80	1.05	526.02	0.92	0.91
MEAN	17.65	1.17	14.90	548.91	1.05	522.89	0.92	0.91
HUB	17.85	1.18	14.35	550.82	1.05	517.41	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.36	28.38	24.20	4.18	0.93	0.30	2.90	
MEAN	37.73	16.87	12.70	4.17	0.93	0.26	3.51	0.91
HUB	44.18	-5.72	-9.30	3.58	0.93	0.12	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	566.673	340.915	452.653	1121.891	0.505	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.720	14.884	523.023	24.000	36.985	35.400	-1.585

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	479.794	340.915	588.579	1130.006	0.425	0.275

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.690	15.625	530.616	528.796	0.020	0.419

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	442.983	0.000	442.983	1133.023	0.391	0.338

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.873	533.453	0.000	0.060	0.037	0.359

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	17.640	1.168	549.844	27.034	212.543	1.648

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
168306.938	0.569	1331.922	1363684.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.013 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
140.038	3021.000	17.640	549.844	1.000	1.000	0.980

W Kg/sec = 63.65342

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
120.153	2934.197	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
107728.406	109882.742	1.688	590.487	349.918	474.134	1.355

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	422.26	-0.15	422.26	0.37	526.18

```
MEAN    18.08     0.00    -0.02   422.26    -0.15   422.26     0.37
HUB     15.21     0.00    -0.02   422.26    -0.15   422.26     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     52.07    46.36     5.71   541.76   687.00    16.03   534.95     0.61
MEAN    48.47    42.30     6.17   476.60   636.86    16.03   534.95     0.56
HUB     43.53    37.84     5.69   400.98   582.42    16.03   534.95     0.51

     ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   493.58   230.16   436.64  1149.82     0.43
MEAN    18.01   505.21   247.62   440.36  1147.74     0.44
HUB     15.22   548.13   320.31   444.80  1145.63     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    538.34   534.43   308.17     0.46  4702.95
MEAN   474.80   495.51   227.18     0.43  4462.24     1.39
HUB    401.33   452.12    81.02     0.39  4878.25

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.76     1.12    17.41   569.75     1.04   549.41     0.92     0.91
MEAN    19.65     1.11    17.20   568.73     1.03   547.42     0.92     0.91
HUB     19.85     1.13    16.96   570.50     1.04   545.41     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     27.80    35.21    31.50     3.71     0.93     0.28     2.90
MEAN    29.35    27.29    23.50     3.79     0.93     0.28     3.30     0.91
HUB     35.76    10.32     6.50     3.82     0.93     0.29     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     755.246     248.314     713.258    1120.786       0.674      -1.035

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.727      14.547     522.028      46.000      19.195      30.600      11.405

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     737.537     248.314     778.216    1123.153       0.657      -0.982

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      19.610      14.675     524.235     361.848       0.056       0.143

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     730.116       0.000     730.116    1124.148       0.649       0.037

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      14.642     525.146       0.000       0.060       0.119      -0.995

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.787      19.447       1.102     569.661      19.818     257.893       1.999

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 123426.102       0.426     976.751 1248642.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  0.796

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.038    3021.000      19.447     569.661       1.000       1.000       0.710
W Kg/sec =   63.65342
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
110.931	2882.708	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
107728.406	109882.742	1.223	395.194	323.069	307.469	0.952

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	648.90	-0.22	648.90	0.57	504.87
MEAN	17.74	0.00	-0.02	648.90	-0.22	648.90	0.57	
HUB	15.05	0.00	-0.02	648.90	-0.22	648.90	0.57	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	39.21	46.36	-7.15	529.11	837.41	15.57	534.51	0.74
MEAN	35.79	43.40	-7.61	467.64	799.98	15.57	534.51	0.71
HUB	31.46	38.84	-7.38	396.77	760.70	15.57	534.51	0.67

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	488.67	169.22	458.44	1164.86	0.42
MEAN	17.51	500.62	197.97	459.82	1164.34	0.43
HUB	14.85	543.68	284.58	463.25	1163.79	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	578.62	353.04	0.50	3356.72	
MEAN	461.53	530.00	263.56	0.46	3469.71	1.59
HUB	391.49	475.43	106.91	0.41	4229.37	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.71	1.06	18.34	583.87	1.02	563.93	0.92	0.73
MEAN	20.75	1.07	18.27	584.35	1.03	563.42	0.92	0.73
HUB	21.05	1.08	18.12	587.56	1.03	562.88	0.92	0.73

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.26	37.60	31.50	6.10	0.93	0.34	2.90	
MEAN	23.29	29.82	23.50	6.32	0.86	0.37	3.28	0.73
HUB	31.56	13.00	6.50	6.50	0.86	0.42	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.796

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	506.723	199.268	465.897	1164.734	0.435	-0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.809	18.269	563.820	46.000	23.157	31.500	8.343

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	485.869	199.268	525.144	1166.518	0.417	0.069

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.763	18.424	565.548	471.992	0.028	0.201

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	471.723	0.000	471.723	1167.683	0.404	0.082

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.480	566.679	0.000	0.060	0.059	0.091

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.650	20.681	1.063	585.258	15.597	312.931	2.426

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  97168.016       0.356     768.953 1869708.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  0.971

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.038    3021.000      20.681     585.258       1.000       1.000       0.980
W Kg/sec =   63.65342

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    105.730    2844.037       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107728.406  109882.742       1.667     513.330     307.934     401.059       1.302

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   441.86    -0.15   441.86     0.38   478.00
 MEAN    16.97     0.00    -0.02   441.86    -0.15   441.86     0.38
 HUB     14.32     0.00    -0.02   441.86    -0.15   441.86     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.98    46.36     2.62   507.76   673.21    18.74   568.96     0.58
 MEAN    45.37    43.80     1.57   447.40   628.92    18.74   568.96     0.54
 HUB     40.52    37.84     2.68   377.52   581.27    18.74   568.96     0.50

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   491.26   169.05   461.26  1179.89     0.42
 MEAN    16.57   502.32   195.43   462.74  1179.16     0.43
 HUB     13.89   542.51   279.23   465.13  1178.35     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   566.39   328.69     0.48  3194.55
 MEAN   436.94   521.97   241.51     0.44  3241.66     1.29
 HUB    366.18   473.18    86.95     0.40  3880.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.20     1.07    19.70   598.77     1.02   578.63     0.92     0.89
 MEAN    22.22     1.07    19.61   598.97     1.02   577.91     0.92     0.89
 HUB     22.54     1.09    19.49   601.68     1.03   577.11     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.13    35.47    31.50     3.97     0.93     0.20     2.90
 MEAN    22.90    27.56    23.50     4.06     0.91     0.22     3.29     0.89
 HUB     30.98    10.59     6.50     4.09     0.91     0.25     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     493.711     196.532     452.908    1180.720       0.418       0.055

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.294      19.764     579.463      46.000      23.458      32.400       8.942

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     478.214     196.532     517.023    1182.000       0.405       0.099

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.245      19.871     580.720     456.573       0.028       0.214
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	454.338	0.000	454.338	1183.890	0.384	0.090

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.009	582.579	0.000	0.060	0.062	0.150

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.799	22.151	1.071	599.809	14.551	309.974	2.403

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
90674.336	0.366	717.565	1271137.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 7.013 EfDer = 0.950

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
140.038	3021.000	22.151	599.809	1.000	1.000	0.980

W Kg/sec = 63.65342

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
99.935	2809.328	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
107728.406	109882.742	1.751	509.668	291.065	390.276	1.341

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	422.59	-0.15	422.59	0.36	449.12
MEAN	15.91	0.00	-0.02	422.59	-0.15	422.59	0.36	
HUB	13.07	0.00	-0.02	422.59	-0.15	422.59	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.82	47.36	1.46	482.97	641.87	20.29	584.91	0.54
MEAN	44.80	44.80	0.00	419.52	595.57	20.29	584.91	0.50
HUB	39.20	38.84	0.36	344.57	545.36	20.29	584.91	0.46

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	469.09	154.66	442.86	1194.58	0.39
MEAN	15.50	477.70	174.86	444.55	1193.62	0.40
HUB	12.59	511.20	247.96	447.03	1192.59	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	472.96	545.38	318.29	0.46	2777.30	
MEAN	408.57	502.24	233.71	0.42	2712.21	1.28
HUB	331.91	454.85	83.95	0.38	3123.72	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.50	1.06	21.12	611.56	1.02	593.19	0.92	0.87
MEAN	23.46	1.06	21.01	611.28	1.02	592.24	0.92	0.87
HUB	23.67	1.07	20.86	613.02	1.02	591.21	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	19.25	35.71	31.50	4.21	0.93	0.19	2.90	
MEAN	21.47	27.73	23.50	4.23	0.90	0.20	3.34	0.87
HUB	29.02	10.64	6.50	4.14	0.90	0.22	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.950

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

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     15.219     482.534     178.065     448.477    1193.899       0.404      -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.491      20.989     592.522      46.000      21.655      33.000      11.345

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     480.526     178.065     512.457    1194.061       0.402      -0.037

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.373      20.903     592.684     440.827       0.066       0.196

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     448.068       0.000     448.068    1196.592       0.374       0.079

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.191     595.199       0.000       0.060       0.077       0.076

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.750      23.347       1.054     611.953      12.144     345.844       2.681

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  75700.539       0.338     599.067 1325853.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    555275.94   4394.2578     136.8026      1.5454      0.7797      7.0126      1.1705


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 80% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 7.457   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.947    3021.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   62.70338

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    134.761    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106120.539  108242.727       2.119     831.557     392.453     619.754       1.579

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   319.03    -0.11   319.03     0.29   541.71
 MEAN    17.06     0.00    -0.02   319.03    -0.11   319.03     0.29
 HUB     12.51     0.00    -0.02   319.03    -0.11   319.03     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.61    50.47     9.14   543.87   630.63    14.27   514.31     0.57
 MEAN    54.66    47.20     7.46   449.76   551.51    14.27   514.31     0.50
 HUB     45.96    38.62     7.34   329.80   458.94    14.27   514.31     0.41

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   529.76   313.07   427.35  1125.88     0.47
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 MEAN    18.04   553.54   343.97   433.69  1122.43     0.49
 HUB     15.00   626.27   440.11   445.55  1116.55     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    543.87   485.69   230.80     0.43  6460.95
 MEAN   475.49   453.20   131.52     0.40  6205.71     1.36
 HUB    395.45   447.78    44.66     0.40  6602.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.78     1.18    15.28   550.17     1.05   526.73     0.92     0.91
 MEAN    17.67     1.17    14.96   549.09     1.05   523.50     0.92     0.91
 HUB     17.84     1.18    14.41   550.77     1.05   518.02     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.23    28.37    24.20     4.17     0.93     0.32     2.90
 MEAN    38.42    16.87    12.70     4.17     0.93     0.27     3.51     0.91
 HUB     44.65    -5.72    -9.30     3.58     0.93     0.13     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     561.723     343.301     444.609    1122.572       0.500       -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.737      14.945     523.658      24.000      37.673      35.400      -2.273

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     470.742     343.301     582.626    1130.951       0.416       0.288

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.706      15.714     531.504     528.796       0.021       0.430

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     434.915       0.000     434.915    1133.830       0.384       0.348

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.949     534.214       0.000       0.060       0.038       0.370

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.878      17.655       1.169     550.012      27.202     209.824       1.627

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 169357.625       0.573    1320.233 1341488.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.457   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.947    3021.000      17.655     550.012       1.000       1.000       0.980
W Kg/sec =   62.70338

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.275    2933.747       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106120.539  108242.727       1.714     590.487     344.448     474.134       1.377

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   414.70    -0.14   414.70     0.37   526.10
 MEAN    18.08     0.00    -0.02   414.70    -0.14   414.70     0.37
 HUB     15.21     0.00    -0.02   414.70    -0.14   414.70     0.37
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     52.57    46.36     6.21   541.76   682.38    16.10   535.65     0.60
MEAN    48.98    42.30     6.68   476.60   631.87    16.10   535.65     0.56
HUB     44.05    37.84     6.21   400.98   576.95    16.10   535.65     0.51

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   489.07   236.21   428.25  1150.93     0.42
MEAN    18.01   500.23   251.99   432.13  1148.70     0.44
HUB     15.22   542.52   321.90   436.70  1146.45     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    538.34   524.09   302.13     0.46  4826.31
MEAN   474.80   486.19   222.81     0.42  4540.87     1.41
HUB    401.33   443.87    79.43     0.39  4902.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.84     1.12    17.52   570.44     1.04   550.47     0.92     0.91
MEAN    19.70     1.12    17.29   569.24     1.03   548.34     0.92     0.91
HUB     19.87     1.13    17.04   570.77     1.04   546.19     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     28.88    35.20    31.50     3.70     0.93     0.29     2.90
MEAN    30.25    27.28    23.50     3.78     0.93     0.29     3.30     0.91
HUB     36.39    10.31     6.50     3.81     0.93     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     739.026     252.695     694.482    1123.479       0.658      -0.995

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.780      14.788     524.540      46.000      19.995      30.600      10.605

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     715.393     252.695     758.711    1126.548       0.635      -0.910

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      19.677      14.994     527.410     361.848       0.051       0.158

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     707.022       0.000     707.022    1127.622       0.627       0.079

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      14.988     528.405       0.000       0.060       0.105      -0.912

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.806      19.540       1.107     570.149      20.137     252.528       1.958

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 125413.750       0.433     977.667 1226681.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.457   EfDer =  0.811

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.947    3021.000      19.540     570.149       1.000       1.000       0.710
W Kg/sec =   62.70338

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.805    2881.474       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
106120.539	108242.727	1.247	395.194	316.878	307.469	0.970

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	631.03	-0.22	631.03	0.56	504.66
MEAN	17.74	0.00	-0.02	631.03	-0.22	631.03	0.56	
HUB	15.05	0.00	-0.02	631.03	-0.22	631.03	0.56	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	39.99	46.36	-6.37	529.11	823.64	15.84	536.90	0.72
MEAN	36.55	43.40	-6.85	467.64	785.55	15.84	536.90	0.69
HUB	32.17	38.84	-6.67	396.77	745.51	15.84	536.90	0.66

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	481.46	178.42	447.18	1166.76	0.41
MEAN	17.51	493.32	204.79	448.80	1165.99	0.42
HUB	14.85	535.95	287.56	452.28	1165.20	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	564.09	343.84	0.48	3538.80	
MEAN	461.53	517.05	256.74	0.44	3588.98	1.60
HUB	391.49	464.07	103.94	0.40	4273.51	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.90	1.07	18.59	585.13	1.03	565.77	0.92	0.74
MEAN	20.92	1.07	18.49	585.34	1.03	565.02	0.92	0.74
HUB	21.19	1.08	18.33	588.24	1.03	564.25	0.92	0.74

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	21.75	37.56	31.50	6.06	0.93	0.35	2.90	
MEAN	24.53	29.77	23.50	6.27	0.87	0.38	3.28	0.74
HUB	32.45	12.94	6.50	6.44	0.87	0.43	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.811

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	499.203	206.131	454.657	1166.393	0.428	0.000

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.979	18.494	565.427	46.000	24.388	31.500	7.112

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	473.139	206.131	516.092	1168.573	0.405	0.092

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.942	18.703	567.543	471.992	0.024	0.219

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	459.265	0.000	459.265	1169.685	0.393	0.106

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.762	568.623	0.000	0.060	0.053	0.116

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.675	20.869	1.068	586.233	16.084	301.552	2.338

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
100204.391	0.367	781.147	1824122.750

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.457   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.947    3021.000      20.869     586.233       1.000       1.000       0.980
W Kg/sec =   62.70338

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.304    2841.671       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
106120.539  108242.727       1.706     513.330     300.866     401.059       1.333

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   430.46    -0.15   430.46     0.37   477.60
MEAN    16.97     0.00    -0.02   430.46    -0.15   430.46     0.37
HUB     14.32     0.00    -0.02   430.46    -0.15   430.46     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     49.72    46.36     3.36   507.76   665.78    19.01   570.77     0.57
MEAN    46.11    43.80     2.31   447.40   620.97    19.01   570.77     0.53
HUB     41.26    37.84     3.42   377.52   572.65    19.01   570.77     0.49

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   482.40   178.63   448.11  1182.39     0.41
MEAN    16.57   493.35   202.31   449.96  1181.40     0.42
HUB     13.89   533.15   281.79   452.59  1180.35     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    497.74   550.12   319.11     0.47  3375.37
MEAN   436.94   507.46   234.63     0.43  3355.61     1.32
HUB    366.18   460.39    84.39     0.39  3916.25

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.50     1.08    20.06   600.51     1.02   581.09     0.92     0.90
MEAN    22.49     1.08    19.95   600.43     1.02   580.12     0.92     0.90
HUB     22.77     1.09    19.79   602.80     1.03   579.08     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     21.73    35.46    31.50     3.96     0.93     0.22     2.90
MEAN    24.21    27.54    23.50     4.04     0.91     0.23     3.29     0.90
HUB     31.91    10.56     6.50     4.06     0.91     0.26     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.979

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     485.203     203.450     440.488    1182.895       0.410       0.055

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.562      20.092     581.599      46.000      24.791      32.400       7.609

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     464.049     203.450     506.689    1184.598       0.392       0.123

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.524      20.260     583.275     456.573       0.024       0.233

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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    16.096     440.857       0.000     440.857    1186.375       0.372       0.115

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950     20.398      585.026       0.000       0.060       0.056       0.175

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.821     22.441       1.075     601.249      15.016     298.805       2.316

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93577.289       0.378     729.485 1245947.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.457   EfDer =  0.962

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.947    3021.000      22.441     601.249       1.000       1.000       0.980
W Kg/sec =   62.70338

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     97.288    2805.961       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106120.539  108242.727       1.799     509.668     283.354     390.276       1.377

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   410.34    -0.14   410.34     0.35   448.58
 MEAN    15.91     0.00    -0.02   410.34    -0.14   410.34     0.35
 HUB     13.07     0.00    -0.02   410.34    -0.14   410.34     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.66    47.36     2.30   482.97   633.86    20.66   587.20     0.53
 MEAN    45.64    44.80     0.84   419.52   586.94    20.66   587.20     0.49
 HUB     40.03    38.84     1.19   344.57   535.92    20.66   587.20     0.45

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   459.42   165.06   428.75  1197.58     0.38
 MEAN    15.50   467.78   182.34   430.77  1196.35     0.39
 HUB     12.59   500.76   250.74   433.47  1195.08     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   527.85   307.90     0.44  2963.69
 MEAN   408.57   486.56   226.23     0.41  2828.09     1.31
 HUB    331.91   441.00    81.18     0.37  3158.61

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.91     1.07    21.60   613.78     1.02   596.17     0.92     0.88
 MEAN    23.84     1.06    21.46   613.21     1.02   594.95     0.92     0.88
 HUB     24.01     1.07    21.28   614.61     1.02   593.68     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.06    35.68    31.50     4.18     0.93     0.21     2.90
 MEAN    22.94    27.71    23.50     4.21     0.91     0.22     3.34     0.88
 HUB     30.05    10.61     6.50     4.11     0.91     0.23     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.962

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     472.528     185.684     434.516    1196.629       0.395      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     23.873      21.437     595.235      46.000      23.139      33.000       9.861

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     464.056     185.684     499.826    1197.294       0.388      -0.003

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.780      21.438     595.898     440.827       0.057       0.216

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     433.073       0.000     433.073    1199.622       0.361       0.109

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.707     598.217       0.000       0.060       0.068       0.106

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.783      23.755       1.059     613.869      12.619     331.118       2.567

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  78664.086       0.352     613.229 1298832.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    567217.12   4421.7612    134.7608      1.5724      0.7956      7.4574      1.1742


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 80% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.209    3021.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    132.086    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       2.162     831.557     384.662     619.754       1.611

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   312.15    -0.11   312.15     0.28   541.71
 MEAN    17.06     0.00    -0.02   312.15    -0.11   312.15     0.28
 HUB     12.51     0.00    -0.02   312.15    -0.11   312.15     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.15    50.47     9.68   543.87   627.18    14.30   514.67     0.56
 MEAN    55.24    47.20     8.04   449.76   547.56    14.30   514.67     0.49
 HUB     46.58    38.62     7.96   329.80   454.18    14.30   514.67     0.41

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   524.98   318.57   417.27  1126.84     0.47
 MEAN    18.04   547.66   347.08   423.65  1123.26     0.49
 HUB     15.00   618.19   439.09   435.16  1117.38     0.55
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	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	543.87	474.21	225.31	0.42	6574.24	
MEAN	475.49	442.68	128.41	0.39	6261.69	1.39
HUB	395.45	437.34	43.64	0.39	6587.68	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.83	1.18	15.36	550.65	1.05	527.63	0.92	0.91
MEAN	17.69	1.17	15.03	549.33	1.05	524.28	0.92	0.91
HUB	17.83	1.18	14.48	550.71	1.05	518.79	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.36	28.37	24.20	4.17	0.93	0.33	2.90	
MEAN	39.33	16.86	12.70	4.16	0.93	0.28	3.51	0.91
HUB	45.26	-5.73	-9.30	3.57	0.93	0.15	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	555.477	346.401	434.237	1123.430	0.494	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.757	15.021	524.458	24.000	38.580	35.400	-3.180

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	459.132	346.401	575.148	1132.141	0.406	0.306

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.725	15.824	532.623	528.796	0.021	0.444

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	424.556	0.000	424.556	1134.850	0.374	0.361

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.042	535.175	0.000	0.060	0.040	0.383

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	17.672	1.170	550.230	27.420	206.314	1.599

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
170711.172	0.577	1304.368	1312555.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 8.045 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
135.209	3021.000	17.672	550.230	1.000	1.000	0.980

W Kg/sec = 61.45868

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
115.839	2933.167	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
104013.984	106094.039	1.750	590.487	337.352	474.134	1.405

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	404.97	-0.14	404.97	0.36	526.00
MEAN	18.08	0.00	-0.02	404.97	-0.14	404.97	0.36	
HUB	15.21	0.00	-0.02	404.97	-0.14	404.97	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.23	46.36	6.87	541.76	676.51	16.18	536.53	0.60
MEAN	49.65	42.30	7.35	476.60	625.53	16.18	536.53	0.55

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HUB     44.73    37.84     6.89   400.98   570.00    16.18   536.53     0.50

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   483.57   243.88   417.57  1152.31     0.42
MEAN    18.01   494.06   257.54   421.63  1149.90     0.43
HUB     15.22   535.44   323.92   426.35  1147.48     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    538.34   510.95   294.45     0.44  4982.95
MEAN   474.80   474.31   217.26     0.41  4640.83     1.43
HUB    401.33   433.32    77.41     0.38  4933.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.93     1.13    17.65   571.32     1.04   551.80     0.92     0.91
MEAN    19.77     1.12    17.41   569.88     1.04   549.49     0.92     0.91
HUB     19.91     1.13    17.14   571.11     1.04   547.17     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.29    35.19    31.50     3.69     0.93     0.31     2.90
MEAN    31.42    27.26    23.50     3.76     0.93     0.30     3.30     0.91
HUB     37.23    10.29     6.50     3.79     0.93     0.31     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     719.460     258.264     671.507    1126.693       0.639      -0.946

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.843      15.076     527.546      46.000      21.037      30.600       9.563

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     688.841     258.264     735.665    1130.531       0.609      -0.824

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      19.756      15.371     531.146     361.848       0.045       0.175

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.823     679.723       0.000     679.723    1131.646       0.601       0.127

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.680      15.390     532.189       0.000       0.060       0.090      -0.816

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.825      19.646       1.112     570.772      20.542     245.847       1.906

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 127938.578       0.441     977.552 1198238.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.831

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.209    3021.000      19.646     570.772       1.000       1.000       0.710
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.128    2879.902       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       1.279     395.194     309.082     307.469       0.995
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ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	609.39	-0.21	609.39	0.53	504.38
MEAN	17.74	0.00	-0.02	609.39	-0.21	609.39	0.53	
HUB	15.05	0.00	-0.02	609.39	-0.21	609.39	0.53	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	40.98	46.36	-5.38	529.11	807.18	16.17	539.77	0.71
MEAN	37.51	43.40	-5.89	467.64	768.27	16.17	539.77	0.67
HUB	33.08	38.84	-5.76	396.77	727.29	16.17	539.77	0.64

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	472.92	189.84	433.14	1169.09	0.40
MEAN	17.51	484.52	213.27	435.06	1168.01	0.41
HUB	14.85	526.47	291.25	438.57	1166.95	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	546.00	332.42	0.47	3764.89	
MEAN	461.53	500.91	248.26	0.43	3737.33	1.62
HUB	391.49	449.88	100.24	0.39	4328.26	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.14	1.08	18.88	586.71	1.03	568.03	0.92	0.76
MEAN	21.13	1.08	18.77	586.59	1.03	566.99	0.92	0.76
HUB	21.37	1.09	18.58	589.09	1.03	565.95	0.92	0.76

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	23.67	37.50	31.50	6.00	0.93	0.36	2.90	
MEAN	26.11	29.71	23.50	6.21	0.87	0.39	3.28	0.76
HUB	33.59	12.87	6.50	6.37	0.87	0.43	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.831

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	490.150	214.669	440.640	1168.429	0.419	0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.187	18.768	567.402	46.000	25.974	31.500	5.526

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	457.408	214.669	505.277	1171.093	0.391	0.122

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.160	19.044	569.993	471.992	0.021	0.241

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	443.913	0.000	443.913	1172.136	0.379	0.136

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.105	571.008	0.000	0.060	0.047	0.147

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.705	21.096	1.074	587.461	16.689	288.237	2.234

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
103976.508	0.381	794.463	1767767.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

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 RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.209    3021.000      21.096     587.461       1.000       1.000       0.980
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.267    2838.699       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       1.758     513.330     292.023     401.059       1.373

    ROTOR LEADING EDGE CONDITIONS, STAGE             4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   416.38    -0.14   416.38     0.35   477.10
MEAN    16.97     0.00    -0.02   416.38    -0.14   416.38     0.35
HUB     14.32     0.00    -0.02   416.38    -0.14   416.38     0.35

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.65    46.36     4.29   507.76   656.76    19.34   572.99     0.56
MEAN    47.07    43.80     3.27   447.40   611.29    19.34   572.99     0.52
HUB     42.21    37.84     4.37   377.52   562.14    19.34   572.99     0.48

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   472.13   190.29   432.08  1185.41     0.40
MEAN    16.57   482.75   210.73   434.33  1184.12     0.41
HUB     13.89   521.87   284.91   437.24  1182.79     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    497.74   530.30   307.45     0.45  3595.45
MEAN   436.94   489.71   226.21     0.41  3495.07     1.35
HUB    366.18   444.73    81.28     0.38  3959.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.87     1.08    20.50   602.67     1.03   584.07     0.92     0.90
MEAN    22.82     1.08    20.35   602.25     1.03   582.80     0.92     0.90
HUB     23.05     1.09    20.17   604.21     1.03   581.48     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     23.77    35.43    31.50     3.93     0.93     0.24     2.90
MEAN    25.88    27.51    23.50     4.01     0.92     0.25     3.29     0.90
HUB     33.09    10.53     6.50     4.03     0.92     0.27     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.988

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     475.171     211.917     425.299    1185.536       0.401       0.054

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.888      20.488     584.198      46.000      26.486      32.400       5.914

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     446.890     211.917     494.590    1187.742       0.376       0.152

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.861      20.730     586.375     456.573       0.021       0.257

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     424.558       0.000     424.558    1189.386       0.357       0.147

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      20.866     587.999       0.000       0.060       0.048       0.205

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.843      22.789       1.080     603.045      15.584     285.807       2.216

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  97116.562       0.392     742.047 1213878.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.975

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.209    3021.000      22.789     603.045       1.000       1.000       0.980
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.039    2801.781       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       1.861     509.668     273.891     390.276       1.425

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   395.49    -0.14   395.49     0.33   447.91
 MEAN    15.91     0.00    -0.02   395.49    -0.14   395.49     0.33
 HUB     13.07     0.00    -0.02   395.49    -0.14   395.49     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.70    47.36     3.34   482.97   624.34    21.11   589.99     0.52
 MEAN    46.70    44.80     1.90   419.52   576.65    21.11   589.99     0.48
 HUB     41.08    38.84     2.24   344.57   524.62    21.11   589.99     0.44

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   448.47   177.49   411.85  1201.15     0.37
 MEAN    15.50   456.28   191.32   414.23  1199.63     0.38
 HUB     12.59   488.44   254.08   417.16  1198.08     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   506.88   295.47     0.42  3186.65
 MEAN   408.57   467.74   217.25     0.39  2967.19     1.34
 HUB    331.91   424.36    77.84     0.35  3200.61

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.42     1.07    22.17   616.52     1.02   599.74     0.92     0.89
 MEAN    24.30     1.07    21.99   615.59     1.02   598.22     0.92     0.89
 HUB     24.42     1.07    21.78   616.58     1.02   596.67     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.31    35.66    31.50     4.16     0.93     0.24     2.90
 MEAN    24.79    27.68    23.50     4.18     0.91     0.24     3.34     0.89
 HUB     31.34    10.57     6.50     4.07     0.91     0.25     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.975

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     460.965     194.830     417.768    1199.906       0.384      -0.007

    Pt3        Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.332      21.974     598.501      46.000      25.002      33.000       7.998

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     444.593     194.830     485.409    1201.146       0.370       0.039

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.266      22.073     599.738     440.827       0.047       0.242

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     415.274       0.000     415.274    1203.250       0.345       0.145

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.322     601.842       0.000       0.060       0.058       0.142

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.816      24.242       1.064     616.233      13.188     314.482       2.438

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  82214.977       0.368     628.187 1264652.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    581957.81   4446.6172    132.0858      1.6046      0.8127      8.0445      1.1787



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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 80% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.020    3021.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   59.55438

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    127.993    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100791.102  102806.711       2.231     831.557     372.744     619.754       1.663

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   301.69    -0.10   301.69     0.27   541.71
 MEAN    17.06     0.00    -0.02   301.69    -0.10   301.69     0.27
 HUB     12.51     0.00    -0.02   301.69    -0.10   301.69     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.99    50.47    10.52   543.87   622.04    14.35   515.21     0.56
 MEAN    56.15    47.20     8.95   449.76   541.66    14.35   515.21     0.49
 HUB     47.56    38.62     8.94   329.80   447.05    14.35   515.21     0.40

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   518.19   326.74   402.19  1128.23     0.46
 MEAN    18.04   539.10   351.70   408.57  1124.46     0.48
 HUB     15.00   606.22   437.56   419.58  1118.58     0.54

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    543.87   457.06   217.13     0.41  6742.85
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 MEAN   475.49   426.92   123.79     0.38  6344.99     1.43
 HUB    395.45   421.69    42.11     0.38  6564.67

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.90     1.18    15.48   551.37     1.05   528.94     0.92     0.91
 MEAN    17.72     1.17    15.14   549.68     1.05   525.41     0.92     0.91
 HUB     17.82     1.18    14.59   550.61     1.05   519.92     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.09    28.36    24.20     4.16     0.93     0.36     2.90
 MEAN    40.72    16.86    12.70     4.16     0.93     0.31     3.51     0.91
 HUB     46.20    -5.73    -9.30     3.57     0.93     0.17     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     546.368     351.014     418.697    1124.673       0.486      -0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.784      15.130     525.620      24.000      39.975      35.400      -4.575

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     441.869     351.014     564.322    1133.864       0.390       0.333

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.749      15.982     534.245     528.796       0.023       0.466

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     409.131       0.000     409.131    1136.330       0.360       0.381

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.173     536.572       0.000       0.060       0.044       0.403

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      17.691       1.171     550.553      27.743     201.055       1.559

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 172722.875       0.584    1278.847 1268596.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.997

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    131.020    3021.000      17.691     550.553       1.000       1.000       0.980
W Kg/sec =   59.55438

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    112.159    2932.307       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100791.102  102806.711       1.808     590.487     326.637     474.134       1.452

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   390.46    -0.13   390.46     0.34   525.84
 MEAN    18.08     0.00    -0.02   390.46    -0.13   390.46     0.34
 HUB     15.21     0.00    -0.02   390.46    -0.13   390.46     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.23    46.36     7.87   541.76   667.92    16.30   537.82     0.59
 MEAN    50.68    42.30     8.38   476.60   616.23    16.30   537.82     0.54
 HUB     45.77    37.84     7.93   400.98   559.78    16.30   537.82     0.49
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      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   476.01   255.14   401.86  1154.29     0.41
MEAN    18.01   485.33   265.73   406.12  1151.63     0.42
HUB     15.22   525.16   326.90   411.00  1148.97     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    538.34   491.62   283.20     0.43  5212.74
MEAN   474.80   456.77   209.07     0.40  4788.16     1.47
HUB    401.33   417.69    74.42     0.36  4978.48

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.05     1.13    17.84   572.62     1.04   553.70     0.92     0.91
MEAN    19.85     1.12    17.57   570.82     1.04   551.15     0.92     0.91
HUB     19.94     1.13    17.28   571.63     1.04   548.60     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.41    35.17    31.50     3.67     0.93     0.33     2.90
MEAN    33.20    27.24    23.50     3.74     0.93     0.32     3.30     0.91
HUB     38.50    10.26     6.50     3.76     0.93     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     692.542     266.473     639.223    1131.054       0.612      -0.879

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.926      15.466     531.639      46.000      22.630      30.600       7.970

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     652.352     266.473     704.677    1135.845       0.574      -0.705

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      19.860      15.876     536.153     361.848       0.038       0.201

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     642.758       0.000     642.758    1136.946       0.565       0.190

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      15.919     537.191       0.000       0.060       0.071      -0.687

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.847      19.780       1.118     571.691      21.138     236.278       1.832

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 131651.844       0.454     974.755 1155394.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.862

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.020    3021.000      19.780     571.691       1.000       1.000       0.710
W Kg/sec =   59.55438

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.226    2877.585       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100791.102  102806.711       1.327     395.194     297.716     307.469       1.033

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   579.33    -0.20   579.33     0.51   503.98
MEAN    17.74     0.00    -0.02   579.33    -0.20   579.33     0.51
HUB     15.05     0.00    -0.02   579.33    -0.20   579.33     0.51

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     42.42    46.36    -3.94   529.11   784.72    16.60   543.67     0.69
MEAN    38.92    43.40    -4.48   467.64   744.65    16.60   543.67     0.65
HUB     34.42    38.84    -4.42   396.77   702.29    16.60   543.67     0.61

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   461.62   206.16   413.03  1172.34     0.39
MEAN    17.51   472.53   225.36   415.33  1170.86     0.40
HUB     14.85   513.20   296.49   418.89  1169.41     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    522.26   520.11   316.10     0.44  4088.01
MEAN   461.53   477.78   236.17     0.41  3948.75     1.65
HUB    391.49   429.53    95.01     0.37  4405.85

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.48     1.09    19.30   588.99     1.03   571.20     0.92     0.79
MEAN    21.42     1.08    19.14   588.40     1.03   569.76     0.92     0.79
HUB     21.61     1.09    18.93   590.34     1.03   568.35     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     26.53    37.43    31.50     5.93     0.93     0.38     2.90
MEAN    28.48    29.62    23.50     6.12     0.88     0.40     3.28     0.79
HUB     35.29    12.78     6.50     6.28     0.88     0.44     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.862

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     477.817     226.835     420.541    1171.287       0.408       0.004

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.477      19.149     570.182      46.000      28.342      31.500       3.158

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     435.108     226.835     490.686    1174.625       0.370       0.166

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.460      19.517     573.437     471.992       0.017       0.276

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.121     422.236       0.000     422.236    1175.569       0.359       0.180

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      19.578     574.358       0.000       0.060       0.040       0.191

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.746      21.406       1.082     589.243      17.552     270.603       2.098

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 109356.680       0.401     809.681 1687284.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
131.020	3021.000	21.406	589.243	1.000	1.000	0.980

W Kg/sec = 59.55438

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
95.897	2834.402	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
100791.102	102806.711	1.838	513.330	279.296	401.059	1.436

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	396.44	-0.14	396.44	0.34	476.38
MEAN	16.97	0.00	-0.02	396.44	-0.14	396.44	0.34	
HUB	14.32	0.00	-0.02	396.44	-0.14	396.44	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.03	46.36	5.67	507.76	644.29	19.79	576.13	0.55
MEAN	48.46	43.80	4.66	447.40	597.87	19.79	576.13	0.51
HUB	43.61	37.84	5.77	377.52	547.53	19.79	576.13	0.47

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	458.90	206.54	409.79	1189.57	0.39
MEAN	16.57	468.67	222.51	412.49	1187.90	0.39
HUB	13.89	506.47	289.27	415.73	1186.20	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	502.71	291.19	0.42	3902.20	
MEAN	436.94	464.90	214.43	0.39	3690.09	1.39
HUB	366.18	422.79	76.92	0.36	4019.90	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.37	1.09	21.09	605.75	1.03	588.17	0.92	0.91
MEAN	23.26	1.09	20.89	604.86	1.03	586.52	0.92	0.91
HUB	23.44	1.09	20.67	606.25	1.03	584.84	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	26.75	35.40	31.50	3.90	0.93	0.27	2.90	
MEAN	28.34	27.47	23.50	3.97	0.92	0.28	3.29	0.91
HUB	34.83	10.48	6.50	3.98	0.92	0.29	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	461.882	223.757	404.064	1189.197	0.388	0.053

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.333	21.025	587.812	46.000	28.976	32.400	3.424

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	423.177	223.757	478.691	1192.085	0.355	0.195

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.316	21.369	590.672	456.573	0.017	0.292

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	402.102	0.000	402.102	1193.549	0.337	0.191

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.498	592.123	0.000	0.060	0.041	0.248

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.866	23.258	1.086	605.619	16.376	268.688	2.083

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
102057.961	0.412	755.641	1166546.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.989

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
131.020	3021.000	23.258	605.619	1.000	1.000	0.980

W Kg/sec = 59.55438

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
89.481	2795.819	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
100791.102	102806.711	1.956	509.668	260.617	390.276	1.498

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	374.95	-0.13	374.95	0.31	446.96
MEAN	15.91	0.00	-0.02	374.95	-0.13	374.95	0.31	
HUB	13.07	0.00	-0.02	374.95	-0.13	374.95	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.18	47.36	4.82	482.97	611.54	21.72	593.89	0.51
MEAN	48.22	44.80	3.42	419.52	562.75	21.72	593.89	0.47
HUB	42.59	38.84	3.75	344.57	509.32	21.72	593.89	0.43

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	434.78	194.40	388.89	1206.01	0.36
MEAN	15.50	441.41	203.61	391.65	1204.12	0.37
HUB	12.59	472.00	258.62	394.84	1202.22	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	472.96	478.36	278.55	0.40	3489.99	
MEAN	408.57	442.03	204.95	0.37	3157.57	1.39
HUB	331.91	401.58	73.29	0.33	3257.76	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.10	1.08	22.94	620.38	1.02	604.60	0.92	0.90
MEAN	24.92	1.07	22.71	618.97	1.02	602.71	0.92	0.90
HUB	24.97	1.07	22.45	619.40	1.02	600.81	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	26.56	35.61	31.50	4.11	0.93	0.27	2.90	
MEAN	27.47	27.62	23.50	4.12	0.92	0.27	3.34	0.90
HUB	33.23	10.52	6.50	4.02	0.92	0.27	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.989

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	446.060	207.346	394.940	1204.385	0.370	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.950	22.693	602.979	46.000	27.700	33.000	5.300

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	418.525	207.346	467.072	1206.367	0.347	0.096

```
   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.912      22.920     604.966     440.827       0.037       0.280

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     391.331       0.000     391.331    1208.198       0.324       0.196

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.143     606.804       0.000       0.060       0.046       0.193

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.851      24.890       1.070     619.583      13.964     293.345       2.274

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  87056.328       0.389     644.568 1214547.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    602845.69   4463.4927    127.9930      1.6476      0.8315      8.9529      1.1851


********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
********************************************************************

   Fan-Core + 4 Stage LPC 80% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  0.991

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    126.046    3021.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    123.134    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       2.319     831.557     358.594     619.754       1.728

     ROTOR LEADING EDGE CONDITIONS, STAGE           1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   289.39    -0.10   289.39     0.26   541.71
 MEAN    17.06     0.00    -0.02   289.39    -0.10   289.39     0.26
 HUB     12.51     0.00    -0.02   289.39    -0.10   289.39     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.99    50.47    11.52   543.87   616.16    14.41   515.82     0.55
 MEAN    57.25    47.20    10.05   449.76   534.90    14.41   515.82     0.48
 HUB     48.74    38.62    10.12   329.80   438.84    14.41   515.82     0.39

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   510.93   336.16   384.78  1129.77     0.45
 MEAN    18.04   529.54   357.00   391.11  1125.80     0.47
 HUB     15.00   592.54   435.76   401.52  1119.93     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    543.87   437.26   207.72     0.39  6936.94
 MEAN   475.49   408.66   118.49     0.36  6440.60     1.48
 HUB    395.45   403.53    40.32     0.36  6537.71
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	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.97	1.19	15.61	552.19	1.06	530.38	0.92	0.91
MEAN	17.75	1.17	15.25	550.09	1.05	526.67	0.92	0.91
HUB	17.79	1.18	14.70	550.50	1.05	521.17	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.14	28.36	24.20	4.16	0.93	0.38	2.90	
MEAN	42.39	16.85	12.70	4.15	0.94	0.33	3.51	0.91
HUB	47.34	-5.73	-9.30	3.57	0.94	0.19	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.991

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	536.210	356.309	400.705	1126.052	0.476	-0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.810	15.246	526.909	24.000	41.644	35.400	-6.244

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	422.054	356.309	552.345	1135.773	0.372	0.364

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.769	16.151	536.046	528.796	0.025	0.492

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	391.390	0.000	391.390	1137.978	0.344	0.402

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.312	538.129	0.000	0.060	0.050	0.424

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.866	17.705	1.172	550.924	28.114	194.961	1.511

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
175032.500	0.592	1246.752	1216867.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =10.047 EfDer = 0.993

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
126.046	3021.000	17.705	550.924	1.000	1.000	0.980

W Kg/sec = 57.29363

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
107.855	2931.319	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96964.961	98904.055	1.880	590.487	314.102	474.134	1.509

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	373.74	-0.13	373.74	0.33	525.67
MEAN	18.08	0.00	-0.02	373.74	-0.13	373.74	0.33	
HUB	15.21	0.00	-0.02	373.74	-0.13	373.74	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.41	46.36	9.05	541.76	658.28	16.43	539.26	0.58
MEAN	51.90	42.30	9.60	476.60	605.77	16.43	539.26	0.53
HUB	47.02	37.84	9.18	400.98	548.25	16.43	539.26	0.48

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   468.24   267.88   384.04  1156.46     0.40
MEAN    18.01   475.94   275.01   388.44  1153.54     0.41
HUB     15.22   513.67   330.24   393.45  1150.62     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    538.34   469.72   270.46     0.41  5472.74
MEAN   474.80   436.81   199.79     0.38  4955.27     1.51
HUB    401.33   399.82    71.08     0.35  5029.25

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.18     1.14    18.02   574.09     1.04   555.78     0.92     0.91
MEAN    19.94     1.13    17.73   571.90     1.04   552.99     0.92     0.91
HUB     19.97     1.13    17.41   572.21     1.04   550.18     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.90    35.15    31.50     3.65     0.93     0.36     2.90
MEAN    35.30    27.22    23.50     3.72     0.94     0.35     3.30     0.91
HUB     40.01    10.24     6.50     3.74     0.94     0.35     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     664.299     275.784     604.349    1135.560       0.585      -0.809

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.005      15.863     535.885      46.000      24.529      30.600       6.071

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     613.808     275.784     672.916    1141.255       0.538      -0.578

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      19.958      16.388     541.274     361.848       0.031       0.229

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     604.223       0.000     604.223    1142.283       0.529       0.252

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      16.445     542.249       0.000       0.060       0.055      -0.553

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.861      19.902       1.124     572.736      21.812     225.783       1.750

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 135851.672       0.469     967.668 1105473.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  0.897

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3021.000      19.902     572.736       1.000       1.000       0.710
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.828    2874.958       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       1.387     395.194     284.909     307.469       1.079

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   547.20    -0.19   547.20     0.48   503.52
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 MEAN    17.74     0.00    -0.02   547.20    -0.19   547.20     0.48
 HUB     15.05     0.00    -0.02   547.20    -0.19   547.20     0.48

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.05    46.36    -2.31   529.11   761.30    17.03   547.74     0.66
 MEAN    40.53    43.40    -2.87   467.64   719.92    17.03   547.74     0.63
 HUB     35.96    38.84    -2.88   396.77   676.02    17.03   547.74     0.59

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   450.56   224.00   390.93  1175.80     0.38
 MEAN    17.51   460.29   238.59   393.62  1173.91     0.39
 HUB     14.85   499.11   302.17   397.25  1172.07     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   491.71   298.25     0.42  4441.32
 MEAN   461.53   452.37   222.94     0.39  4180.27     1.69
 HUB    391.49   407.17    89.33     0.35  4490.04

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.84     1.10    19.73   591.53     1.03   574.58     0.92     0.82
 MEAN    21.72     1.09    19.53   590.43     1.03   572.74     0.92     0.82
 HUB     21.86     1.10    19.29   591.74     1.03   570.94     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.81    37.34    31.50     5.84     0.93     0.40     2.90
 MEAN    31.22    29.53    23.50     6.03     0.89     0.42     3.28     0.82
 HUB     37.26    12.67     6.50     6.17     0.89     0.46     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.897

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     465.234     240.158     398.456    1174.341       0.396       0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.781      19.545     573.161      46.000      31.078      31.500       0.422

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     410.910     240.158     475.944    1178.405       0.349       0.216

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.768      20.010     577.135     471.992       0.016       0.316

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     398.832       0.000     398.832    1179.238       0.338       0.227

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.065     577.951       0.000       0.060       0.037       0.239

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.785      21.720       1.091     591.232      18.496     252.862       1.960

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 115236.352       0.422     820.825 1598490.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3021.000      21.720     591.232       1.000       1.000       0.980
W Kg/sec =   57.29363
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
91.077	2829.632	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96964.961	98904.055	1.935	513.330	265.258	401.059	1.512

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	374.82	-0.13	374.82	0.32	475.58
MEAN	16.97	0.00	-0.02	374.82	-0.13	374.82	0.32	
HUB	14.32	0.00	-0.02	374.82	-0.13	374.82	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.57	46.36	7.21	507.76	631.22	20.25	579.51	0.53
MEAN	50.05	43.80	6.25	447.40	583.76	20.25	579.51	0.49
HUB	45.22	37.84	7.38	377.52	532.08	20.25	579.51	0.45

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	446.28	223.72	386.16	1193.92	0.37
MEAN	16.57	454.64	234.99	389.20	1191.88	0.38
HUB	13.89	490.50	293.89	392.71	1189.82	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	473.51	274.02	0.40	4226.25	
MEAN	436.94	438.48	201.95	0.37	3896.89	1.44
HUB	366.18	399.31	72.30	0.34	4083.97	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.89	1.10	21.69	609.11	1.03	592.49	0.92	0.91
MEAN	23.72	1.09	21.45	607.72	1.03	590.46	0.92	0.91
HUB	23.81	1.10	21.18	608.51	1.03	588.43	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.09	35.36	31.50	3.86	0.93	0.31	2.90	
MEAN	31.12	27.42	23.50	3.92	0.93	0.31	3.29	0.91
HUB	36.81	10.43	6.50	3.93	0.93	0.32	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	448.683	236.311	381.410	1193.062	0.376	0.051

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.783	21.568	591.642	46.000	31.781	32.400	0.619

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	398.196	236.311	463.037	1196.655	0.333	0.243

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.771	22.015	595.211	456.573	0.015	0.334

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	378.538	0.000	378.538	1197.935	0.316	0.238

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.132	596.486	0.000	0.060	0.037	0.292

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	23.719	1.092	608.446	17.214	251.651	1.951

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 107286.891       0.433     764.202 1112564.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3021.000      23.719     608.446       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     84.605    2789.317       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 96964.961   98904.055       2.068     509.668     246.415     390.276       1.584

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   353.32    -0.12   353.32     0.29   445.92
 MEAN    15.91     0.00    -0.02   353.32    -0.12   353.32     0.29
 HUB     13.07     0.00    -0.02   353.32    -0.12   353.32     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.82    47.36     6.46   482.97   598.51    22.33   598.03     0.50
 MEAN    49.90    44.80     5.10   419.52   548.57    22.33   598.03     0.46
 HUB     44.29    38.84     5.45   344.57   493.60    22.33   598.03     0.41

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   422.19   211.84   365.19  1211.03     0.35
 MEAN    15.50   427.05   216.30   368.23  1208.80     0.35
 HUB     12.59   455.44   263.31   371.61  1206.56     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   448.94   261.11     0.37  3802.65
 MEAN   408.57   415.40   192.27     0.34  3354.00     1.45
 HUB    331.91   377.89    68.60     0.31  3316.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.78     1.09    23.70   624.53     1.03   609.65     0.92     0.91
 MEAN    25.53     1.08    23.42   622.63     1.02   607.41     0.92     0.91
 HUB     25.51     1.08    23.12   622.47     1.02   605.16     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.12    35.56    31.50     4.06     0.93     0.31     2.90
 MEAN    30.43    27.57    23.50     4.07     0.92     0.30     3.34     0.91
 HUB     35.32    10.46     6.50     3.96     0.92     0.30     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     431.705     220.262     371.287    1209.042       0.357      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.560      23.402     607.657      46.000      30.678      33.000       2.322

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     392.014     220.262     449.655    1211.754       0.324       0.156

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.540      23.752     610.386     440.827       0.029       0.322
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     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     366.899       0.000     366.899    1213.331       0.302       0.250

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      23.950     611.976       0.000       0.060       0.038       0.246

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.873      25.520       1.076     623.210      14.764     273.095       2.117

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   92048.617       0.412     655.660 1157769.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     625456.06   4455.1064    123.1343      1.6893      0.8447     10.0471      1.1920


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 80% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  0.986

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     121.700    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   55.31819

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     118.889    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   93621.680   95493.914       2.402     831.557     346.230     619.754       1.790

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   278.73    -0.10   278.73     0.25   541.71
  MEAN    17.06     0.00    -0.02   278.73    -0.10   278.73     0.25
  HUB     12.51     0.00    -0.02   278.73    -0.10   278.73     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.87    50.47    12.40   543.87   611.22    14.46   516.32     0.55
  MEAN    58.22    47.20    11.02   449.76   529.21    14.46   516.32     0.47
  HUB     49.81    38.62    11.19   329.80   431.89    14.46   516.32     0.39

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   505.24   344.12   369.93  1131.02     0.45
  MEAN    18.04   521.71   361.50   376.17  1126.90     0.46
  HUB     15.00   581.00   434.18   386.07  1121.03     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   420.42   199.75     0.37  7101.16
  MEAN   475.49   393.06   113.99     0.35  6521.64     1.53
  HUB    395.45   388.01    38.73     0.35  6513.94

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.02     1.19    15.71   552.88     1.06   531.56     0.92     0.90
  MEAN    17.77     1.18    15.34   550.43     1.05   527.70     0.92     0.90
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 HUB     17.77     1.18    14.79   550.40     1.05   522.20     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.93    28.37    24.20     4.17     0.93     0.41     2.90
 MEAN    43.86    16.86    12.70     4.16     0.94     0.36     3.51     0.90
 HUB     48.36    -5.73    -9.30     3.57     0.94     0.22     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     527.884     360.797     385.341    1127.176       0.468      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.828      15.338     527.962      24.000      43.116      35.400      -7.716

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     405.255     360.797     542.592    1137.333       0.356       0.390

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.781      16.285     537.519     528.796       0.028       0.515

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     376.320       0.000     376.320    1139.329       0.330       0.420

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.419     539.408       0.000       0.060       0.056       0.442

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      17.709       1.172     551.236      28.426     189.757       1.471

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 176978.844       0.598    1217.150 1172050.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    3021.000      17.709     551.236       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.140    2930.488       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       1.947     590.487     303.283     474.134       1.563

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   359.51    -0.12   359.51     0.32   525.52
 MEAN    18.08     0.00    -0.02   359.51    -0.12   359.51     0.32
 HUB     15.21     0.00    -0.02   359.51    -0.12   359.51     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.44    46.36    10.08   541.76   650.30    16.53   540.44     0.57
 MEAN    52.98    42.30    10.68   476.60   597.09    16.53   540.44     0.52
 HUB     48.13    37.84    10.29   400.98   538.64    16.53   540.44     0.47

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   462.38   278.51   369.09  1158.21     0.40
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MEAN	18.01	468.51	282.80	373.53	1155.09	0.41
HUB	15.22	504.23	333.05	378.59	1151.97	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	451.37	259.83	0.39	5689.68	
MEAN	474.80	419.99	192.00	0.36	5095.42	1.55
HUB	401.33	384.70	68.28	0.33	5071.92	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.27	1.14	18.16	575.32	1.04	557.47	0.92	0.90
MEAN	19.99	1.13	17.85	572.81	1.04	554.48	0.92	0.90
HUB	19.98	1.13	17.51	572.71	1.04	551.48	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.04	35.14	31.50	3.64	0.93	0.38	2.90	
MEAN	37.13	27.20	23.50	3.70	0.94	0.37	3.30	0.90
HUB	41.34	10.22	6.50	3.72	0.94	0.36	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.988

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	642.220	283.592	576.213	1139.034	0.564	-0.752

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.060	16.163	539.171	46.000	26.205	30.600	4.395

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	583.253	283.592	648.544	1145.390	0.509	-0.477

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	20.024	16.772	545.205	361.848	0.026	0.254

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	573.940	0.000	573.940	1146.335	0.501	0.300

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	16.835	546.105	0.000	0.060	0.044	-0.449

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.868	19.983	1.128	573.613	22.376	217.243	1.684

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
139365.188	0.481	958.467	1062600.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =11.017 EfDer = 0.924

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
121.700	3021.000	19.983	573.613	1.000	1.000	0.710

W Kg/sec = 55.31819

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
94.146	2872.760	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
93621.680	95493.914	1.441	395.194	274.188	307.469	1.121

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	521.47	-0.18	521.47	0.45	503.13
MEAN	17.74	0.00	-0.02	521.47	-0.18	521.47	0.45	
HUB	15.05	0.00	-0.02	521.47	-0.18	521.47	0.45	

```
      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     45.43    46.36    -0.93   529.11   743.02    17.36   550.91     0.65
MEAN    41.90    43.40    -1.50   467.64   700.56    17.36   550.91     0.61
HUB     37.28    38.84    -1.56   396.77   655.36    17.36   550.91     0.57

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   442.68   238.48   372.95  1178.53     0.38
MEAN    17.51   451.10   249.34   375.92  1176.34     0.38
HUB     14.85   488.07   306.77   379.62  1174.19     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    522.26   468.63   283.78     0.40  4727.89
MEAN   461.53   431.67   212.19     0.37  4368.26     1.73
HUB    391.49   388.96    84.73     0.33  4558.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.12     1.11    20.06   593.62     1.03   577.26     0.92     0.85
MEAN    21.95     1.10    19.83   592.10     1.03   575.11     0.92     0.85
HUB     22.04     1.10    19.56   592.90     1.03   573.01     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.60    37.27    31.50     5.77     0.93     0.42     2.90
MEAN    33.56    29.44    23.50     5.94     0.90     0.44     3.28     0.85
HUB     38.94    12.58     6.50     6.08     0.90     0.47     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.924

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     455.793     250.975     380.472    1176.762       0.387       0.008

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.011      19.845     575.529      46.000      33.411      31.500      -1.911

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     391.412     250.975     464.965    1181.408       0.331       0.257

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.998      20.386     580.083     471.992       0.016       0.351

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     380.059       0.000     380.059    1182.152       0.321       0.264

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      20.431     580.814       0.000       0.060       0.038       0.277

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.812      21.949       1.098     592.874      19.261     239.450       1.856

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 120005.977       0.440     825.326 1525421.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    3021.000      21.949     592.874       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.139    2825.711       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
93621.680	95493.914	2.023	513.330	253.788	401.059	1.580

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	357.43	-0.12	357.43	0.30	474.92
MEAN	16.97	0.00	-0.02	357.43	-0.12	357.43	0.30	
HUB	14.32	0.00	-0.02	357.43	-0.12	357.43	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.86	46.36	8.50	507.76	621.05	20.60	582.21	0.52
MEAN	51.39	43.80	7.59	447.40	572.74	20.60	582.21	0.48
HUB	46.58	37.84	8.74	377.52	519.97	20.60	582.21	0.44

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	437.42	237.23	367.51	1197.31	0.37
MEAN	16.57	444.29	244.85	370.73	1195.01	0.37
HUB	13.89	478.19	297.50	374.38	1192.69	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	450.47	260.51	0.38	4481.30	
MEAN	436.94	417.53	192.09	0.35	4060.27	1.49
HUB	366.18	380.63	68.69	0.32	4134.00	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.27	1.11	22.13	611.83	1.03	595.86	0.92	0.91
MEAN	24.05	1.10	21.85	610.05	1.03	593.57	0.92	0.91
HUB	24.09	1.10	21.56	610.36	1.03	591.28	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.84	35.33	31.50	3.83	0.93	0.34	2.90	
MEAN	33.44	27.39	23.50	3.89	0.93	0.34	3.29	0.91
HUB	38.47	10.40	6.50	3.90	0.93	0.34	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	438.982	246.231	363.422	1196.100	0.367	0.049

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.111	21.967	594.663	46.000	34.119	32.400	-1.719

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	378.563	246.231	451.597	1200.240	0.315	0.282

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.100	22.493	598.786	456.573	0.015	0.368

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	360.081	0.000	360.081	1201.381	0.300	0.274

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.594	599.926	0.000	0.060	0.038	0.326

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	24.048	1.096	610.748	17.874	238.901	1.852

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
111403.570	0.450	766.164	1066977.250

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    3021.000      24.048     610.748       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     80.723    2784.055       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 93621.680   95493.914       2.168     509.668     235.112     390.276       1.660

    ROTOR LEADING EDGE CONDITIONS, STAGE           5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   336.33    -0.12   336.33     0.28   445.08
MEAN    15.91     0.00    -0.02   336.33    -0.12   336.33     0.28
HUB     13.07     0.00    -0.02   336.33    -0.12   336.33     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.15    47.36     7.79   482.97   588.64    22.78   601.31     0.49
MEAN    51.29    44.80     6.49   419.52   537.78    22.78   601.31     0.45
HUB     45.70    38.84     6.86   344.57   481.58    22.78   601.31     0.40

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   413.62   225.24   346.91  1214.90     0.34
MEAN    15.50   416.72   226.07   350.07  1212.44     0.34
HUB     12.59   442.99   266.92   353.55  1209.96     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    472.96   426.27   247.71     0.35  4042.97
MEAN   408.57   394.78   182.50     0.33  3505.36     1.50
HUB    331.91   359.47    65.00     0.30  3361.98

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.27     1.09    24.24   627.84     1.03   613.57     0.92     0.91
MEAN    25.96     1.08    23.92   625.57     1.02   611.08     0.92     0.91
HUB     25.88     1.08    23.59   624.96     1.02   608.59     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.00    35.53    31.50     4.03     0.93     0.34     2.90
MEAN    32.85    27.53    23.50     4.03     0.93     0.33     3.34     0.91
HUB     37.05    10.42     6.50     3.92     0.93     0.32     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     421.406     230.214     352.966    1212.662       0.348      -0.006

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.996      23.911     611.308      46.000      33.113      33.000      -0.113

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     371.773     230.214     437.280    1215.916       0.306       0.202

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.981      24.348     614.593     440.827       0.027       0.358

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     14.701     348.211       0.000     348.211    1217.315       0.286       0.290

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.526     616.009       0.000       0.060       0.037       0.286

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      25.961       1.080     626.127      15.379     258.402       2.003

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  95889.156       0.429     659.466 1110021.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    643642.75   4426.5742    118.8887      1.7184      0.8498     11.0174      1.1976


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 80% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    117.504    3021.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   53.41085

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    114.790    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  90393.664   92201.352       2.488     831.557     334.292     619.754       1.854

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   268.52    -0.09   268.52     0.24   541.71
 MEAN    17.06     0.00    -0.02   268.52    -0.09   268.52     0.24
 HUB     12.51     0.00    -0.02   268.52    -0.09   268.52     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.73    50.47    13.26   543.87   606.63    14.51   516.79     0.54
 MEAN    59.17    47.20    11.97   449.76   523.90    14.51   516.79     0.47
 HUB     50.86    38.62    12.24   329.80   425.36    14.51   516.79     0.38

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   500.29   351.61   355.90  1132.16     0.44
 MEAN    18.04   514.58   365.72   362.00  1127.90     0.46
 HUB     15.00   570.20   432.64   371.42  1122.03     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    543.87   404.51   192.26     0.36  7255.70
 MEAN   475.49   378.28   109.77     0.34  6597.71     1.57
 HUB    395.45   373.27    37.19     0.33  6490.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.07     1.20    15.80   553.54     1.06   532.63     0.92     0.90
 MEAN    17.79     1.18    15.42   550.75     1.05   528.63     0.92     0.90
 HUB     17.74     1.17    14.87   550.30     1.05   523.14     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     44.65    28.38    24.20     4.18     0.93     0.43     2.90
 MEAN    45.29    16.87    12.70     4.17     0.94     0.38     3.51     0.90
 HUB     49.35    -5.72    -9.30     3.58     0.94     0.24     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     520.297     365.009     370.780    1128.197       0.461       0.000

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.842      15.419     528.919      24.000      44.551      35.400      -9.151

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     389.426     365.009     533.746    1138.753       0.342       0.415

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.788      16.404     538.863     528.796       0.031       0.538

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     362.091       0.000     362.091    1140.565       0.317       0.437

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.512     540.578       0.000       0.060       0.064       0.459

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.848      17.708       1.172     551.529      28.719     184.822       1.433

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 178801.688       0.604    1187.288 1129097.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  0.982

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    117.504    3021.000      17.708     551.529       1.000       1.000       0.980
W Kg/sec =   53.41085

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    100.584    2929.710       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  90393.664   92201.352       2.016     590.487     292.928     474.134       1.619

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   346.06    -0.12   346.06     0.30   525.38
 MEAN    18.08     0.00    -0.02   346.06    -0.12   346.06     0.30
 HUB     15.21     0.00    -0.02   346.06    -0.12   346.06     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.44    46.36    11.08   541.76   642.96    16.61   541.53     0.56
 MEAN    54.02    42.30    11.72   476.60   589.08    16.61   541.53     0.52
 HUB     49.21    37.84    11.37   400.98   529.75    16.61   541.53     0.46

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   457.46   288.40   355.10  1159.79     0.39
 MEAN    18.01   461.93   290.02   359.54  1156.50     0.40
 HUB     15.22   495.55   335.62   364.59  1153.20     0.43
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   434.23   249.93     0.37  5891.65
 MEAN   474.80   404.25   184.78     0.35  5225.37     1.60
 HUB    401.33   370.47    65.71     0.32  5110.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.35     1.15    18.28   576.47     1.05   559.00     0.92     0.90
 MEAN    20.04     1.13    17.95   573.65     1.04   555.83     0.92     0.90
 HUB     19.98     1.13    17.60   573.17     1.04   552.66     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.08    35.14    31.50     3.64     0.93     0.40     2.90
 MEAN    38.89    27.20    23.50     3.70     0.94     0.39     3.30     0.90
 HUB     42.63    10.22     6.50     3.72     0.94     0.38     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     622.742     290.832     550.658    1142.064       0.545      -0.702

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.100      16.417     542.045      46.000      27.841      30.600       2.759

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     555.863     290.832     627.349    1148.977       0.484      -0.386

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      20.072      17.099     548.627     361.848       0.023       0.278

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     547.075       0.000     547.075    1149.824       0.476       0.339

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      17.157     549.436       0.000       0.060       0.039      -0.359

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.868      20.036       1.131     574.429      22.900     209.474       1.624

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 142625.078       0.492     947.066 1021800.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  0.947

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    117.504    3021.000      20.036     574.429       1.000       1.000       0.710
W Kg/sec =   53.41085

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     90.721    2870.719       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  90393.664   92201.352       1.496     395.194     264.214     307.469       1.164

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   498.34    -0.17   498.34     0.43   502.77
 MEAN    17.74     0.00    -0.02   498.34    -0.17   498.34     0.43
 HUB     15.05     0.00    -0.02   498.34    -0.17   498.34     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.72    46.36     0.36   529.11   726.97    17.62   553.70     0.63
 MEAN    43.19    43.40    -0.21   467.64   683.52    17.62   553.70     0.59
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HUB     38.54    38.84    -0.30   396.77   637.11    17.62   553.70     0.55

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   436.45   251.55   356.67  1180.94     0.37
MEAN    17.51   443.41   259.06   359.87  1178.49     0.38
HUB     14.85   478.44   310.93   363.63  1176.09     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    522.26   447.77   270.70     0.38  4986.68
MEAN   461.53   412.91   202.47     0.35  4538.31     1.77
HUB    391.49   372.45    80.56     0.32  4619.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.35     1.12    20.34   595.53     1.04   579.63     0.92     0.87
MEAN    22.13     1.10    20.07   593.63     1.03   577.22     0.92     0.87
HUB     22.17     1.11    19.78   593.98     1.03   574.87     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.19    37.20    31.50     5.70     0.93     0.44     2.90
MEAN    35.75    29.36    23.50     5.86     0.90     0.45     3.28     0.87
HUB     40.53    12.49     6.50     5.99     0.90     0.48     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.947

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      447.908     260.761     364.177    1178.906       0.380        0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.198      20.091      577.632      46.000      35.604      31.500      -4.104

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     17.392      373.884     260.761     455.835    1184.078       0.316        0.295

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.183      20.700     582.711     471.992       0.017       0.384

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     363.238       0.000     363.238    1184.743       0.307       0.296

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
     0.950      20.730     583.366       0.000       0.060       0.042       0.309

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.831      22.128       1.104     594.382      19.953     227.965       1.767

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 124317.898       0.456     825.502 1458075.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    117.504    3021.000      22.128     594.382       1.000       1.000       0.980
W Kg/sec =   53.41085

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.559    2822.124       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  90393.664   92201.352       2.109     513.330     243.362     401.059       1.648
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ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	341.81	-0.12	341.81	0.29	474.32
MEAN	16.97	0.00	-0.02	341.81	-0.12	341.81	0.29	
HUB	14.32	0.00	-0.02	341.81	-0.12	341.81	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.06	46.36	9.70	507.76	612.19	20.89	584.63	0.52
MEAN	52.63	43.80	8.83	447.40	563.13	20.89	584.63	0.47
HUB	47.85	37.84	10.01	377.52	509.36	20.89	584.63	0.43

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	430.43	249.14	350.99	1200.28	0.36
MEAN	16.57	435.68	253.55	354.30	1197.77	0.36
HUB	13.89	467.54	300.68	358.03	1195.24	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	430.11	248.59	0.36	4706.10	
MEAN	436.94	398.95	183.39	0.33	4204.26	1.54
HUB	366.18	363.97	65.50	0.30	4178.19	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.58	1.11	22.48	614.29	1.03	598.83	0.92	0.91
MEAN	24.31	1.10	22.18	612.17	1.03	596.32	0.92	0.91
HUB	24.29	1.10	21.86	612.06	1.03	593.81	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.37	35.31	31.50	3.81	0.93	0.37	2.90	
MEAN	35.59	27.37	23.50	3.87	0.93	0.36	3.29	0.91
HUB	40.02	10.37	6.50	3.87	0.93	0.36	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	430.946	254.973	347.423	1198.782	0.359	0.047

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.370	22.286	597.337	46.000	36.275	32.400	-3.875

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	361.233	254.973	442.155	1203.398	0.300	0.318

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.357	22.879	601.946	456.573	0.016	0.401

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	343.827	0.000	343.827	1204.422	0.285	0.305

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.962	602.971	0.000	0.060	0.042	0.355

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.876	24.300	1.098	612.838	18.456	228.072	1.768

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
115033.727	0.464	763.853	1024141.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

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 RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    117.504    3021.000      24.300     612.838       1.000       1.000       0.980
W Kg/sec =   53.41085

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.264    2779.304       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 90393.664   92201.352       2.265     509.668     225.038     390.276       1.734

    ROTOR LEADING EDGE CONDITIONS, STAGE             5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   321.33    -0.11   321.33     0.27   444.32
MEAN    15.91     0.00    -0.02   321.33    -0.11   321.33     0.27
HUB     13.07     0.00    -0.02   321.33    -0.11   321.33     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.37    47.36     9.01   482.97   580.19    23.13   604.22     0.48
MEAN    52.56    44.80     7.76   419.52   528.53    23.13   604.22     0.44
HUB     47.01    38.84     8.17   344.57   471.23    23.13   604.22     0.39

     ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
TIP     17.94   407.00   236.85   330.99  1218.28     0.33
MEAN    15.50   408.31   234.58   334.20  1215.62     0.34
HUB     12.59   432.40   270.04   337.71  1212.96     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    472.96   406.57   236.10     0.33  4251.15
MEAN   408.57   376.78   173.99     0.31  3637.19     1.54
HUB    331.91   343.33    61.88     0.28  3401.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.65     1.10    24.67   630.81     1.03   616.99     0.92     0.91
MEAN    26.30     1.08    24.32   628.22     1.03   614.31     0.92     0.91
HUB     26.17     1.08    23.97   627.22     1.02   611.62     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.59    35.50    31.50     4.00     0.93     0.37     2.90
MEAN    35.07    27.50    23.50     4.00     0.93     0.35     3.34     0.91
HUB     38.65    10.38     6.50     3.88     0.93     0.34     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     413.050     238.881     336.966    1215.829       0.340      -0.007

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.333      24.309     614.514      46.000      35.334      33.000      -2.334

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     354.273     238.881     427.286    1219.547       0.290       0.243

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.316      24.818     618.277     440.827       0.028       0.391

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    14.701     332.040       0.000     332.040    1220.802       0.272       0.324

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      24.976     619.551       0.000       0.060       0.038       0.320

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.880      26.295       1.082     628.750      15.913     246.185       1.908

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   99221.969       0.444     658.859 1065262.500

    OVERALL EXIT CONDITIONS; ALL          5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     660000.38   4382.5679    114.7895      1.7406      0.8499     11.9669      1.2026


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 80% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.026   EfDer =  0.973

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     112.885    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   51.31144

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     110.278    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  86840.570   88577.203       2.589     831.557     321.152     619.754       1.930

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   257.36    -0.09   257.36     0.23   541.71
  MEAN    17.06     0.00    -0.02   257.36    -0.09   257.36     0.23
  HUB     12.51     0.00    -0.02   257.36    -0.09   257.36     0.23

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.68    50.47    14.21   543.87   601.77    14.56   517.28     0.54
  MEAN    60.23    47.20    13.03   449.76   518.26    14.56   517.28     0.46
  HUB     52.04    38.62    13.42   329.80   418.40    14.56   517.28     0.38

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   495.40   359.62   340.73  1133.33     0.44
  MEAN    18.04   507.19   370.23   346.66  1128.94     0.45
  HUB     15.00   558.68   430.94   355.55  1123.08     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   387.36   184.25     0.34  7420.78
  MEAN   475.49   362.29   105.26     0.32  6678.98     1.63
  HUB    395.45   357.31    35.49     0.32  6465.15

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.12     1.20    15.89   554.24     1.06   533.74     0.92     0.89
  MEAN    17.80     1.18    15.50   551.10     1.05   529.61     0.92     0.89
  HUB     17.71     1.17    14.95   550.19     1.05   524.12     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     46.54    28.40    24.20     4.20     0.93     0.46     2.90
  MEAN    46.88    16.89    12.70     4.19     0.94     0.41     3.51     0.89
  HUB     50.48    -5.70    -9.30     3.60     0.94     0.26     4.78
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     512.427     369.510     355.026    1129.253       0.454       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.853      15.499     529.909      24.000      46.145      35.400     -10.745

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     372.387     369.510     524.604    1140.227       0.327       0.443

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.792      16.523     540.258     528.796       0.035       0.564

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     346.738       0.000     346.738    1141.852       0.304       0.454

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.602     541.799       0.000       0.060       0.073       0.476

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.837      17.701       1.172     551.841      29.031     179.480       1.391

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 180741.953       0.611    1152.997 1082160.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =13.026   EfDer =  0.974

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    112.885    3021.000      17.701     551.841       1.000       1.000       0.980
W Kg/sec =   51.31144

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.698    2928.882       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  86840.570   88577.203       2.097     590.487     281.611     474.134       1.684

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   331.52    -0.11   331.52     0.29   525.23
 MEAN    18.08     0.00    -0.02   331.52    -0.11   331.52     0.29
 HUB     15.21     0.00    -0.02   331.52    -0.11   331.52     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.54    46.36    12.18   541.76   635.25    16.69   542.66     0.56
 MEAN    55.18    42.30    12.88   476.60   580.66    16.69   542.66     0.51
 HUB     50.43    37.84    12.59   400.98   520.37    16.69   542.66     0.46

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   452.80   298.91   340.12  1161.42     0.39
 MEAN    18.01   455.35   297.74   344.52  1157.96     0.39
 HUB     15.22   486.45   338.33   349.52  1154.48     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   415.94   239.43     0.36  6106.06
 MEAN   474.80   387.36   177.06     0.33  5364.33     1.65
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 HUB    401.33   355.15    63.00     0.31  5152.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.42     1.15    18.38   577.69     1.05   560.57     0.92     0.89
 MEAN    20.07     1.13    18.04   574.55     1.04   557.24     0.92     0.89
 HUB     19.97     1.13    17.67   573.65     1.04   553.89     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.31    35.14    31.50     3.64     0.93     0.43     2.90
 MEAN    40.83    27.20    23.50     3.70     0.94     0.41     3.30     0.89
 HUB     44.07    10.22     6.50     3.72     0.94     0.40     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     603.094     298.575     523.999    1145.091       0.527      -0.649

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.133      16.662     544.925      46.000      29.675      30.600       0.925

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     527.596     298.575     606.221    1152.557       0.458      -0.291

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      20.110      17.415     552.053     361.848       0.021       0.304

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     519.456       0.000     519.456    1153.300       0.450       0.378

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      17.464     552.765       0.000       0.060       0.037      -0.268

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865       20.075       1.134     575.297      23.457     201.366       1.561

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 146092.844       0.504     931.962  977503.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.026   EfDer =  0.967

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    112.885    3021.000      20.075     575.297       1.000       1.000       0.710
W Kg/sec =   51.31144

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.052    2868.551       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  86840.570   88577.203       1.559     395.194     253.527     307.469       1.213

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   474.31    -0.16   474.31     0.41   502.39
 MEAN    17.74     0.00    -0.02   474.31    -0.16   474.31     0.41
 HUB     15.05     0.00    -0.02   474.31    -0.16   474.31     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.13    46.36     1.77   529.11   710.71    17.88   556.52     0.61
 MEAN    44.60    43.40     1.20   467.64   666.20    17.88   556.52     0.58
 HUB     39.92    38.84     1.08   396.77   618.49    17.88   556.52     0.53

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   430.95   265.15   339.73  1183.39     0.36
MEAN    17.51   436.10   269.18   343.11  1180.68     0.37
HUB     14.85   468.78   315.25   346.94  1178.03     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    522.26   426.05   257.11     0.36  5255.85
MEAN   461.53   393.35   192.35     0.33  4715.37     1.82
HUB    391.49   355.22    76.25     0.30  4683.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.58     1.12    20.60   597.54     1.04   582.03     0.92     0.88
MEAN    22.31     1.11    20.30   595.25     1.03   579.37     0.92     0.88
HUB     22.29     1.11    19.99   595.12     1.03   576.77     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.97    37.12    31.50     5.62     0.93     0.46     2.90
MEAN    38.12    29.27    23.50     5.77     0.91     0.47     3.28     0.88
HUB     42.26    12.39     6.50     5.89     0.91     0.49     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.967

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     440.401     270.950     347.188    1181.088       0.373       0.010

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.371      20.321     579.777      46.000      37.969      31.500      -6.469

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     355.730     270.950     447.166    1186.807       0.300       0.335

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.350      20.998     585.405     471.992       0.020       0.421

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.121     345.861       0.000     345.861    1187.392       0.291       0.328

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      21.010     585.983       0.000       0.060       0.051       0.341

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.846      22.286       1.110     595.970      20.672     216.569       1.679

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 128801.305       0.472     821.655 1386821.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =13.026   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    112.885    3021.000      22.286     595.970       1.000       1.000       0.980
W Kg/sec =   51.31144

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     79.814    2818.362       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  86840.570   88577.203       2.208     513.330     232.455     401.059       1.725

    ROTOR LEADING EDGE CONDITIONS, STAGE            4
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   325.64    -0.11   325.64     0.27   473.68
MEAN    16.97     0.00    -0.02   325.64    -0.11   325.64     0.27
HUB     14.32     0.00    -0.02   325.64    -0.11   325.64     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.33    46.36    10.97   507.76   603.30    21.15   587.12     0.51
MEAN    53.96    43.80    10.16   447.40   553.46    21.15   587.12     0.47
HUB     49.23    37.84    11.39   377.52   498.65    21.15   587.12     0.42

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   424.12   261.25   334.11  1203.28     0.35
MEAN    16.57   427.49   262.44   337.45  1200.57     0.36
HUB     13.89   456.91   303.90   341.19  1197.85     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    497.74   409.33   236.48     0.34  4934.62
MEAN   436.94   379.90   174.50     0.32  4351.54     1.59
HUB    366.18   346.83    62.29     0.29  4222.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.85     1.12    22.81   616.84     1.04   601.83     0.92     0.91
MEAN    24.54     1.10    22.48   614.38     1.03   599.12     0.92     0.91
HUB     24.47     1.10    22.13   613.83     1.03   596.41     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.02    35.29    31.50     3.79     0.93     0.40     2.90
MEAN    37.87    27.34    23.50     3.84     0.94     0.38     3.29     0.91
HUB     41.69    10.35     6.50     3.85     0.94     0.38     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.991

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     423.329     263.915     330.993    1201.505       0.352       0.045

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.601      22.575     600.060      46.000      38.567      32.400      -6.167

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     343.545     263.915     433.214    1206.607       0.285       0.355

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.582      23.235     605.167     456.573       0.019       0.437

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    16.096     327.266       0.000     327.266    1207.515       0.271       0.335

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      23.295     606.078       0.000       0.060       0.049       0.383

   STAGE EXIT CONDITIONS, STAGE             4
     Eff4        Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.867       24.516       1.100     615.018      19.048     217.397       1.685

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 118727.953       0.479     757.394  978084.062


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.026   EfDer =  0.995

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
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    112.885    3021.000      24.516     615.018       1.000       1.000       0.980
W Kg/sec =   51.31144

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     73.703    2774.375       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 86840.570   88577.203       2.374     509.668     214.667     390.276       1.818

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   306.02    -0.11   306.02     0.25   443.53
 MEAN    15.91     0.00    -0.02   306.02    -0.11   306.02     0.25
 HUB     13.07     0.00    -0.02   306.02    -0.11   306.02     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.65    47.36    10.29   482.97   571.85    23.45   607.20     0.47
 MEAN    53.90    44.80     9.10   419.52   519.36    23.45   607.20     0.43
 HUB     48.40    38.84     9.56   344.57   460.92    23.45   607.20     0.38

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   401.17   248.51   314.92  1221.68     0.33
 MEAN    15.50   400.40   243.13   318.13  1218.85     0.33
 HUB     12.59   421.96   273.14   321.63  1216.01     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   386.72   224.44     0.32  4460.22
 MEAN   408.57   358.58   165.44     0.29  3769.58     1.60
 HUB    331.91   326.96    58.77     0.27  3440.21

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.99     1.10    25.05   633.88     1.03   620.45     0.92     0.91
 MEAN    26.60     1.08    24.68   630.96     1.03   617.58     0.92     0.91
 HUB     26.41     1.08    24.30   629.56     1.02   614.71     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.28    35.48    31.50     3.98     0.93     0.40     2.90
 MEAN    37.39    27.48    23.50     3.98     0.93     0.38     3.34     0.91
 HUB     40.34    10.36     6.50     3.86     0.93     0.36     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     405.207     247.587     320.771    1219.031       0.332      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.626      24.663     617.765      46.000      37.663      33.000      -4.663

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     336.703     247.587     417.933    1223.208       0.275       0.283

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.603      25.237     622.006     440.827       0.031       0.427

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     315.793       0.000     315.793    1224.327       0.258       0.358

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.375     623.145       0.000       0.060       0.044       0.352

    STAGE EXIT CONDITIONS, STAGE            5
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      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      26.578       1.084     631.466      16.448     234.349       1.817

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  102566.039       0.459     654.294 1017209.312

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     676930.12   4318.3018    110.2775      1.7593      0.8460     13.0264      1.2078


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 80% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.967

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     108.898    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   49.49893

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     106.382    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   83773.047   85448.320       2.684     831.557     309.808     619.754       2.000

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   247.78    -0.09   247.78     0.22   541.71
  MEAN    17.06     0.00    -0.02   247.78    -0.09   247.78     0.22
  HUB     12.51     0.00    -0.02   247.78    -0.09   247.78     0.22

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     65.51    50.47    15.04   543.87   597.73    14.60   517.68     0.54
  MEAN    61.15    47.20    13.95   449.76   513.57    14.60   517.68     0.46
  HUB     53.09    38.62    14.47   329.80   412.58    14.60   517.68     0.37

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   491.65   366.37   327.86  1134.28     0.43
  MEAN    18.04   501.18   374.01   333.61  1129.78     0.44
  HUB     15.00   548.99   429.42   342.04  1123.93     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   372.83   177.50     0.33  7559.97
  MEAN   475.49   348.70   101.48     0.31  6747.13     1.68
  HUB    395.45   343.72    33.97     0.31  6442.40

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.16     1.20    15.96   554.83     1.06   534.64     0.92     0.88
  MEAN    17.81     1.18    15.56   551.38     1.05   530.40     0.92     0.88
  HUB     17.68     1.17    15.02   550.09     1.05   524.92     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     48.17    28.43    24.20     4.23     0.93     0.48     2.90
  MEAN    48.27    16.92    12.70     4.22     0.95     0.43     3.51     0.88
  HUB     51.46    -5.67    -9.30     3.63     0.95     0.29     4.78


    blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     506.016     373.285     341.630    1130.111       0.448       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.860      15.561     530.715      24.000      47.535      35.400     -12.135

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     357.958     373.285     517.180    1141.430       0.314       0.466

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.791      16.617     541.399     528.796       0.039       0.587

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     333.704       0.000     333.704    1142.906       0.292       0.468

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.672     542.800       0.000       0.060       0.082       0.490

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.826      17.690       1.171     552.101      29.291     174.934       1.356

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 182364.531       0.617    1122.254 1041909.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.967

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    108.898    3021.000      17.690     552.101       1.000       1.000       0.980
W Kg/sec =   49.49893

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     93.360    2928.191       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83773.047   85448.320       2.172     590.487     271.889     474.134       1.744

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   319.16    -0.11   319.16     0.28   525.10
 MEAN    18.08     0.00    -0.02   319.16    -0.11   319.16     0.28
 HUB     15.21     0.00    -0.02   319.16    -0.11   319.16     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.50    46.36    13.14   541.76   628.88    16.76   543.60     0.55
 MEAN    56.20    42.30    13.90   476.60   573.69    16.76   543.60     0.50
 HUB     51.49    37.84    13.65   400.98   512.58    16.76   543.60     0.45

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   449.36   307.69   327.49  1162.74     0.39
 MEAN    18.01   450.14   304.18   331.81  1159.14     0.39
 HUB     15.22   478.94   340.58   336.73  1155.53     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   400.56   230.64     0.34  6285.38
 MEAN   474.80   373.11   170.62     0.32  5480.19     1.69
 HUB    401.33   342.17    60.75     0.30  5186.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     20.46     1.16    18.46   578.71     1.05   561.85     0.92     0.88
 MEAN    20.09     1.14    18.11   575.30     1.04   558.38     0.92     0.88
 HUB     19.96     1.13    17.73   574.06     1.04   554.90     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.22    35.16    31.50     3.66     0.93     0.45     2.90
 MEAN    42.51    27.21    23.50     3.71     0.95     0.43     3.30     0.88
 HUB     45.33    10.23     6.50     3.73     0.95     0.42     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     587.400     305.030     501.992    1147.488       0.512      -0.606

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.151      16.848     547.210      46.000      31.285      30.600      -0.685

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     504.478     305.030     589.526    1155.388       0.437      -0.213

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      20.130      17.656     554.771     361.848       0.020       0.328

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     496.878       0.000     496.878    1156.050       0.430       0.409

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      17.696     555.406       0.000       0.060       0.037      -0.194

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      20.096       1.136     576.023      23.921     194.691       1.509

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 148987.281       0.514     916.854  939730.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.898    3021.000      20.096     576.023       1.000       1.000       0.710
W Kg/sec =   49.49893

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.945    2866.745       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83773.047   85448.320       1.616     395.194     244.480     307.469       1.258

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   454.50    -0.16   454.50     0.39   502.08
 MEAN    17.74     0.00    -0.02   454.50    -0.16   454.50     0.39
 HUB     15.05     0.00    -0.02   454.50    -0.16   454.50     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.35    46.36     2.99   529.11   697.64    18.07   558.78     0.60
 MEAN    45.83    43.40     2.43   467.64   652.23    18.07   558.78     0.56
 HUB     41.13    38.84     2.29   396.77   603.42    18.07   558.78     0.52

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	427.18	276.30	325.79	1185.34	0.36
MEAN	17.51	430.62	277.50	329.28	1182.44	0.36
HUB	14.85	461.09	318.76	333.16	1179.60	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	408.20	245.96	0.34	5476.64	
MEAN	461.53	377.22	184.02	0.32	4860.92	1.86
HUB	391.49	341.00	72.73	0.29	4736.00	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.74	1.13	20.79	599.20	1.04	583.96	0.92	0.90
MEAN	22.43	1.12	20.47	596.59	1.04	581.11	0.92	0.90
HUB	22.37	1.11	20.13	596.06	1.03	578.32	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.30	37.05	31.50	5.55	0.93	0.48	2.90	
MEAN	40.12	29.20	23.50	5.70	0.91	0.49	3.28	0.90
HUB	43.74	12.31	6.50	5.81	0.91	0.50	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.980

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	434.778	279.325	333.180	1182.841	0.368	0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.495	20.488	581.504	46.000	39.975	31.500	-8.475

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	340.842	279.325	440.676	1189.011	0.287	0.369

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.467	21.219	587.586	471.992	0.024	0.453

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	331.632	0.000	331.632	1189.534	0.279	0.353

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.214	588.104	0.000	0.060	0.060	0.366

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.853	22.392	1.114	597.285	21.262	207.568	1.609

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
132479.391	0.486	815.266	1327317.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =13.953 EfDer = 0.985

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
108.898	3021.000	22.392	597.285	1.000	1.000	0.980

W Kg/sec = 49.49893

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
76.714	2815.257	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
83773.047	85448.320	2.298	513.330	223.429	401.059	1.795

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	312.38	-0.11	312.38	0.26	473.16
MEAN	16.97	0.00	-0.02	312.38	-0.11	312.38	0.26	

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 HUB     14.32     0.00    -0.02   312.38    -0.11   312.38     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.40    46.36    12.04   507.76   596.24    21.34   589.14     0.50
 MEAN    55.08    43.80    11.28   447.40   545.75    21.34   589.14     0.46
 HUB     50.40    37.84    12.56   377.52   490.09    21.34   589.14     0.41

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   419.65   271.02   320.39  1205.68     0.35
 MEAN    16.57   421.27   269.59   323.71  1202.82     0.35
 HUB     13.89   448.48   306.46   327.43  1199.95     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   392.49   226.71     0.33  5119.00
 MEAN   436.94   364.41   167.35     0.30  4469.95     1.64
 HUB    366.18   332.84    59.72     0.28  4258.32

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.05     1.12    23.03   618.94     1.04   604.24     0.92     0.90
 MEAN    24.70     1.10    22.69   616.19     1.03   601.38     0.92     0.90
 HUB     24.59     1.10    22.33   615.30     1.03   598.51     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.23    35.28    31.50     3.78     0.93     0.42     2.90
 MEAN    39.79    27.34    23.50     3.84     0.94     0.41     3.29     0.90
 HUB     43.11    10.34     6.50     3.84     0.94     0.40     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     417.570     271.104     317.596    1203.696       0.347       0.042

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.759      22.779     602.257      46.000      40.485      32.400      -8.085

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     329.197     271.104     426.460    1209.188       0.272       0.386

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.735      23.492     607.765     456.573       0.022       0.467

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     313.842       0.000     313.842    1210.008       0.259       0.358

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.530     608.589       0.000       0.060       0.058       0.404

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      24.658       1.101     616.810      19.525     209.010       1.620

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 121702.117       0.491     748.943  939105.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.990

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     108.898    3021.000      24.658     616.810       1.000       1.000       0.980
 W Kg/sec =   49.49893
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
70.793	2770.341	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
83773.047	85448.320	2.472	509.668	206.191	390.276	1.893

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	293.59	-0.10	293.59	0.24	442.89
MEAN	15.91	0.00	-0.02	293.59	-0.10	293.59	0.24	
HUB	13.07	0.00	-0.02	293.59	-0.10	293.59	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.71	47.36	11.35	482.97	565.29	23.67	609.62	0.47
MEAN	55.02	44.80	10.22	419.52	512.13	23.67	609.62	0.42
HUB	49.58	38.84	10.74	344.57	452.76	23.67	609.62	0.37

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	397.08	257.82	302.00	1224.39	0.32
MEAN	15.50	394.48	249.97	305.17	1221.43	0.32
HUB	12.59	413.76	275.58	308.63	1218.46	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	472.96	370.79	215.14	0.30	4627.12	
MEAN	408.57	343.92	158.60	0.28	3875.52	1.65
HUB	331.91	313.73	56.33	0.26	3470.89	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.22	1.10	25.31	636.37	1.03	623.22	0.92	0.91
MEAN	26.79	1.09	24.92	633.20	1.03	620.21	0.92	0.91
HUB	26.56	1.08	24.53	631.49	1.02	617.20	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.49	35.47	31.50	3.97	0.93	0.42	2.90	
MEAN	39.32	27.46	23.50	3.96	0.94	0.40	3.34	0.91
HUB	41.76	10.34	6.50	3.84	0.94	0.38	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.990

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	399.353	254.552	307.711	1221.596	0.327	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
26.822	24.906	620.378	46.000	39.599	33.000	-6.599

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	322.623	254.552	410.953	1226.139	0.263	0.315

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	26.791	25.531	625.001	440.827	0.036	0.457

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	302.766	0.000	302.766	1227.155	0.247	0.383

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	25.650	626.037	0.000	0.060	0.051	0.377

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.867	26.761	1.085	633.685	16.875	225.161	1.745

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 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  105233.727       0.470     647.598  976578.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     690767.06   4250.9146    106.3821      1.7714      0.8401     13.9532      1.2121



*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 80% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  0.959

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     104.649    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   47.56755

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     102.231    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   80504.336   82114.242       2.793     831.557     297.720     619.754       2.082

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   237.65    -0.08   237.65     0.21   541.71
  MEAN    17.06     0.00    -0.02   237.65    -0.08   237.65     0.21
  HUB     12.51     0.00    -0.02   237.65    -0.08   237.65     0.21

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     66.40    50.47    15.93   543.87   593.60    14.64   518.09     0.53
  MEAN    62.15    47.20    14.95   449.76   508.76    14.64   518.09     0.46
  HUB     54.23    38.62    15.61   329.80   406.57    14.64   518.09     0.36

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   488.08   373.37   314.35  1135.24     0.43
  MEAN    18.04   495.12   377.91   319.88  1130.64     0.44
  HUB     15.00   538.95   427.78   327.83  1124.79     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   357.61   170.50     0.32  7704.38
  MEAN   475.49   334.44    97.57     0.30  6817.45     1.74
  HUB    395.45   329.42    32.34     0.29  6417.79

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.19     1.20    16.02   555.44     1.06   535.54     0.92     0.88
  MEAN    17.82     1.18    15.62   551.68     1.06   531.21     0.92     0.88
  HUB     17.65     1.17    15.08   549.99     1.05   525.73     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     49.91    28.47    24.20     4.27     0.93     0.51     2.90
  MEAN    49.75    16.96    12.70     4.26     0.95     0.45     3.51     0.88
  HUB     52.54    -5.63    -9.30     3.67     0.95     0.31     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.959
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     499.549     377.179     327.545    1130.975       0.442       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.863      15.621     531.527      24.000      49.029      35.400     -13.629

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     342.838     377.179     509.708    1142.646       0.300       0.491

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.786      16.708     542.553     528.796       0.043       0.611

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     320.008       0.000     320.008    1143.976       0.280       0.483

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.739     543.817       0.000       0.060       0.091       0.504

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.814      17.675       1.170     552.370      29.560     170.151       1.319

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 184035.375       0.622    1088.346  999280.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  0.958

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    104.649    3021.000      17.675     552.370       1.000       1.000       0.980
W Kg/sec =   47.56755

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.815    2927.479       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  80504.336   82114.242       2.258     590.487     261.566     474.134       1.813

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   306.16    -0.11   306.16     0.27   524.98
 MEAN    18.08      0.00    -0.02   306.16    -0.11   306.16     0.27
 HUB     15.21      0.00    -0.02   306.16    -0.11   306.16     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.53    46.36    14.17   541.76   622.38    16.82   544.54     0.54
 MEAN    57.29    42.30    14.99   476.60   566.55    16.82   544.54     0.49
 HUB     52.64    37.84    14.80   400.98   504.58    16.82   544.54     0.44

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   446.25   316.79   314.29  1164.07     0.38
 MEAN    18.01   445.06   310.85   318.51  1160.34     0.38
 HUB     15.22   471.25   342.86   323.30  1156.59     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   384.53   221.54     0.33  6471.08
 MEAN   474.80   358.23   163.95     0.31  5600.34     1.74
 HUB    401.33   328.55    58.47     0.28  5220.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.51     1.16    18.53   579.76     1.05   563.14     0.92     0.88
 MEAN    20.11     1.14    18.16   576.08     1.04   559.54     0.92     0.88
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 HUB     19.93     1.13    17.78   574.47     1.04   555.93     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.23    35.18    31.50     3.68     0.93     0.47     2.90
 MEAN    44.30    27.24    23.50     3.74     0.95     0.45     3.30     0.88
 HUB     46.68    10.25     6.50     3.75     0.95     0.44     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.958

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     571.839     311.724     479.404    1149.848       0.497      -0.563

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.162      17.024     549.466      46.000      33.033      30.600      -2.433

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     480.926     311.724     573.116    1158.181       0.415      -0.134

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      20.141      17.884     557.458     361.848       0.021       0.354

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     473.896       0.000     473.896    1158.763       0.409       0.440

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      17.915     558.019       0.000       0.060       0.039      -0.119

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.851      20.104       1.137     576.772      24.402     187.861       1.456

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 151980.125       0.524     898.778  899923.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    104.649    3021.000      20.104     576.772       1.000       1.000       0.710
W Kg/sec =   47.56755

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.689    2864.883       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  80504.336   82114.242       1.682     395.194     234.996     307.469       1.308

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   434.20    -0.15   434.20     0.37   501.75
 MEAN    17.74     0.00    -0.02   434.20    -0.15   434.20     0.37
 HUB     15.05     0.00    -0.02   434.20    -0.15   434.20     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.64    46.36     4.28   529.11   684.57    18.25   561.03     0.59
 MEAN    47.13    43.40     3.73   467.64   638.24    18.25   561.03     0.55
 HUB     42.43    38.84     3.59   396.77   588.28    18.25   561.03     0.51

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   424.04   287.65   311.55  1187.29     0.36
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 MEAN    17.51   425.55   285.99   315.12  1184.21     0.36
 HUB     14.85   453.52   322.35   319.02  1181.17     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   390.01   234.60     0.33  5701.43
 MEAN   461.53   360.72   175.53     0.30  5009.42     1.91
 HUB    391.49   326.43    69.14     0.28  4789.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.89     1.14    20.96   600.90     1.04   585.89     0.92     0.91
 MEAN    22.54     1.12    20.61   597.97     1.04   582.85     0.92     0.91
 HUB     22.43     1.12    20.26   597.04     1.04   579.87     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.72    36.98    31.50     5.48     0.93     0.50     2.90
 MEAN    42.23    29.12    23.50     5.62     0.92     0.50     3.28     0.91
 HUB     45.30    12.23     6.50     5.73     0.92     0.52     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.991

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     429.573     287.871     318.848    1184.590       0.363        0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.600      20.635     583.230      46.000      42.077      31.500     -10.577

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     325.674     287.871     434.664    1191.224       0.273        0.403

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.564      21.421     589.781     471.992       0.028        0.487

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     317.143       0.000     317.143    1191.687       0.266        0.378

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      21.395     590.239       0.000       0.060       0.072        0.391

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4        Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.857      22.476       1.118     598.635      21.864     198.677        1.540

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 136227.391       0.499     805.620 1265673.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =14.953   EfDer =  0.977

   W act       RPM act        Pt          Tt           POTS        POTH        AeroBl
    104.649     3021.000      22.476     598.635       1.000       1.000        0.980
W Kg/sec =   47.56755

   W cor       RPM cor        GAMMA       Cp          R           Blades       THK
     73.529     2812.080       1.402       0.249      53.349      56.000        0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  80504.336   82114.242       2.397     513.330     214.154     401.059        1.873

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   298.86    -0.10   298.86     0.25   472.63
 MEAN    16.97      0.00    -0.02   298.86    -0.10   298.86     0.25
 HUB     14.32      0.00    -0.02   298.86    -0.10   298.86     0.25
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	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.52	46.36	13.16	507.76	589.27	21.51	591.18	0.49
MEAN	56.26	43.80	12.46	447.40	538.12	21.51	591.18	0.45
HUB	51.64	37.84	13.80	377.52	481.58	21.51	591.18	0.40

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	415.71	280.83	306.51	1208.07	0.34
MEAN	16.57	415.42	276.79	309.78	1205.08	0.34
HUB	13.89	440.15	309.02	313.44	1202.06	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	375.49	216.90	0.31	5304.11	
MEAN	436.94	348.73	160.15	0.29	4589.17	1.70
HUB	366.18	318.61	57.16	0.27	4293.78	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	25.22	1.12	23.23	621.07	1.04	606.65	0.92	0.89
MEAN	24.83	1.10	22.87	618.05	1.03	603.64	0.92	0.89
HUB	24.68	1.10	22.49	616.80	1.03	600.63	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.50	35.29	31.50	3.79	0.93	0.44	2.90	
MEAN	41.78	27.34	23.50	3.84	0.94	0.43	3.29	0.89
HUB	44.59	10.34	6.50	3.84	0.94	0.42	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.977

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	412.173	278.343	303.993	1205.888	0.342	0.040

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.889	22.954	604.460	46.000	42.478	32.400	-10.078

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	314.687	278.343	420.122	1211.773	0.260	0.417

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	24.858	23.718	610.374	456.573	0.025	0.499

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	300.266	0.000	300.266	1212.507	0.248	0.381

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	23.733	611.114	0.000	0.060	0.069	0.424

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.844	24.768	1.102	618.639	20.003	200.753	1.556

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
124688.039	0.503	737.379	898266.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =14.953 EfDer = 0.984

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
104.649	3021.000	24.768	618.639	1.000	1.000	0.980

W Kg/sec = 47.56755

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
67.829	2766.243	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
80504.336	82114.242	2.580	509.668	197.561	390.276	1.975

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	281.00	-0.10	281.00	0.23	442.23
MEAN	15.91	0.00	-0.02	281.00	-0.10	281.00	0.23	
HUB	13.07	0.00	-0.02	281.00	-0.10	281.00	0.23	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.81	47.36	12.45	482.97	558.85	23.86	612.05	0.46
MEAN	56.19	44.80	11.39	419.52	505.01	23.86	612.05	0.42
HUB	50.81	38.84	11.97	344.57	444.69	23.86	612.05	0.37

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	393.54	267.12	289.01	1227.09	0.32
MEAN	15.50	388.94	256.80	292.11	1224.02	0.32
HUB	12.59	405.73	278.04	295.49	1220.93	0.33

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	472.96	354.82	205.84	0.29	4793.84	
MEAN	408.57	329.18	151.77	0.27	3981.33	1.70
HUB	331.91	300.36	53.87	0.25	3501.76	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	27.41	1.11	25.53	638.91	1.03	625.99	0.92	0.90
MEAN	26.95	1.09	25.13	635.47	1.03	622.85	0.92	0.90
HUB	26.68	1.08	24.72	633.44	1.02	619.71	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.75	35.46	31.50	3.96	0.93	0.45	2.90	
MEAN	41.32	27.45	23.50	3.95	0.94	0.42	3.34	0.90
HUB	43.26	10.33	6.50	3.83	0.94	0.40	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.984

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	393.887	261.509	294.550	1224.160	0.322	-0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
26.979	25.109	622.997	46.000	41.600	33.000	-8.600

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	308.499	261.509	404.424	1229.066	0.251	0.347

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	26.937	25.781	628.000	440.827	0.042	0.489

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	289.691	0.000	289.691	1229.984	0.236	0.408

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	25.882	628.939	0.000	0.060	0.061	0.400

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.856	26.902	1.086	635.941	17.302	216.185	1.676

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
107900.289	0.482	638.099	934030.188

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   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    704831.25   4168.2222    102.2312      1.7807      0.8315     14.9531      1.2164


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

   Fan-Core + 4 Stage LPC 80%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 5.961   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.038    3021.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   65.92652

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    141.688    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111575.445  113806.719       2.015     831.557     412.626     619.754       1.502

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   337.03    -0.12   337.03     0.30   541.71
 MEAN    17.06     0.00    -0.02   337.03    -0.12   337.03     0.30
 HUB     12.51     0.00    -0.02   337.03    -0.12   337.03     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.22    50.47     7.75   543.87   639.93    14.17   513.32     0.58
 MEAN    53.16    47.20     5.96   449.76   562.12    14.17   513.32     0.51
 HUB     44.39    38.62     5.77   329.80   471.63    14.17   513.32     0.42

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   543.58   298.32   454.40  1123.19     0.48
 MEAN    18.04   569.88   335.66   460.54  1120.12     0.51
 HUB     15.00   648.13   442.75   473.34  1114.25     0.58

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    543.87   516.51   245.56     0.46  6156.67
 MEAN   475.49   481.30   139.83     0.43  6055.97     1.30
 HUB    395.45   475.69    47.31     0.43  6642.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.65     1.17    15.03   548.88     1.05   524.21     0.92     0.91
 MEAN    17.61     1.17    14.75   548.46     1.05   521.33     0.92     0.91
 HUB     17.86     1.18    14.20   550.94     1.05   515.86     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.28    28.39    24.20     4.19     0.93     0.27     2.90
 MEAN    36.09    16.89    12.70     4.19     0.92     0.23     3.51     0.91
 HUB     43.09    -5.71    -9.30     3.59     0.92     0.10     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     579.115     335.009     472.380    1120.167       0.517      -0.008
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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.675      14.726     521.416      24.000      35.344      35.400       0.056

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     502.214     335.009     603.697    1127.603       0.445       0.241

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.643      15.395     528.361     528.796       0.020       0.394

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     462.928       0.000     462.928    1130.977       0.409       0.311

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.674     531.528       0.000       0.060       0.037       0.333

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      17.594       1.165     549.428      26.618     219.207       1.699

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 165717.266       0.560    1358.260 1417198.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.961   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.038    3021.000      17.594     549.428       1.000       1.000       0.980
W Kg/sec =   65.92652

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    124.721    2935.308       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111575.445  113806.719       1.626     590.487     363.218     474.134       1.305

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   440.93    -0.15   440.93     0.39   526.38
 MEAN    18.08     0.00    -0.02   440.93    -0.15   440.93     0.39
 HUB     15.21     0.00    -0.02   440.93    -0.15   440.93     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.87    46.36     4.51   541.76   698.63    15.85   533.19     0.62
 MEAN    47.24    42.30     4.94   476.60   649.39    15.85   533.19     0.57
 HUB     42.29    37.84     4.45   400.98   596.09    15.85   533.19     0.53

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   505.67   215.02   457.67  1146.96     0.44
 MEAN    18.01   518.13   236.69   460.90  1145.28     0.45
 HUB     15.22   562.36   316.34   464.95  1143.55     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   560.36   323.32     0.49  4393.75
 MEAN   474.80   518.77   238.10     0.45  4265.61     1.35
 HUB    401.33   472.65    84.99     0.41  4817.91

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.56     1.11    17.12   568.03     1.03   546.68     0.92     0.91
 MEAN    19.50     1.11    16.95   567.49     1.03   545.07     0.92     0.91
 HUB     19.76     1.12    16.75   569.82     1.04   543.42     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     25.16    35.24    31.50     3.74     0.93     0.25     2.90
 MEAN    27.18    27.32    23.50     3.82     0.92     0.26     3.30     0.91
 HUB     34.23    10.36     6.50     3.86     0.92     0.27     3.92


   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     876.043     237.359     843.274    1101.677       0.795      -1.513

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.582      12.902     504.359      46.000      15.720      30.600      14.880

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     901.586     237.359     932.307    1097.597       0.821      -1.682

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      19.381      12.439     500.575     345.258       0.085       0.050

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     911.395       0.000     911.395    1096.565       0.831      -0.311

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      12.069     499.157       0.000       0.060       0.230      -1.820

    STAGE EXIT CONDITIONS, STAGE            2
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.641       18.993       1.080     568.446      19.019     271.791       2.107

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 118450.117       0.409     970.847 1302166.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.961   EfDer =  0.774

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    145.038     3021.000       18.993     568.446       1.000        1.000        0.680
W Kg/sec =   65.92652

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    117.513     2885.786        1.402       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 111575.445  113806.719        1.106     378.495     342.242     293.880       0.859

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   765.44    -0.26   765.44      0.68    505.41
 MEAN    17.74      0.00    -0.02   765.44    -0.26   765.44      0.68
 HUB     15.05      0.00    -0.02   765.44    -0.26   765.44      0.68

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     34.67     46.36   -11.69   529.11   930.66     13.88   519.53      0.83
 MEAN    31.44     43.40   -11.96   467.64   897.13     13.88   519.53      0.80
 HUB     27.42     38.84   -11.42   396.77   862.28     13.88   519.53      0.77

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   511.81    133.04    494.22   1158.47      0.44
 MEAN    17.51   522.88    170.38    494.34   1159.01      0.45
 HUB     14.85   565.62    270.07    496.98   1159.50      0.49
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    522.26   629.08   389.21     0.54  2640.85
MEAN   461.53   573.71   291.15     0.49  2987.47     1.63
HUB    391.49   511.60   121.42     0.44  4014.52

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.93     1.05    17.43   579.62     1.02   557.76     0.92     0.71
MEAN    20.06     1.06    17.44   581.09     1.02   558.27     0.92     0.71
HUB     20.43     1.08    17.36   585.44     1.03   558.73     0.92     0.71

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     15.07    38.22    31.50     6.72     0.93     0.35     2.90
MEAN    19.02    30.50    23.50     7.00     0.84     0.39     3.28     0.71
HUB     28.52    13.73     6.50     7.23     0.84     0.45     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.774

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     529.661     171.500     501.127    1159.348       0.457      -0.004

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.114      17.429     558.629      46.000      18.892      31.500      12.608

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     527.188     171.500     554.382    1159.575       0.455      -0.012

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.029      17.378     558.847     471.992       0.041       0.141

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     512.475       0.000     512.475    1160.899       0.441      -0.005

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.414     560.124       0.000       0.060       0.085       0.001

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.569      19.911       1.048     582.050      13.604     368.537       2.857

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  84749.625       0.311     694.629 2162060.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.961   EfDer =  0.938

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.038    3021.000      19.911     582.050       1.000       1.000       0.980
W Kg/sec =   65.92652

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    113.433    2851.862       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111575.445  113806.719       1.554     513.330     330.369     401.059       1.214

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   478.91    -0.16   478.91     0.41   479.31
 MEAN    16.97     0.00    -0.02   478.91    -0.16   478.91     0.41
 HUB     14.32     0.00    -0.02   478.91    -0.16   478.91     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.68    46.36     0.32   507.76   698.10    17.72   562.91     0.60
 MEAN    43.06    43.80    -0.74   447.40   655.50    17.72   562.91     0.56
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HUB     38.26    37.84     0.42   377.52   609.92    17.72   562.91     0.52

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   523.47   137.10   505.19  1171.22     0.45
MEAN    16.57   533.81   172.59   505.14  1171.46     0.46
HUB     13.89   574.41   270.82   506.57  1171.53     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    497.74   620.71   360.64     0.53  2591.56
MEAN   436.94   570.13   264.35     0.49  2863.22     1.23
HUB    366.18   515.47    95.37     0.44  3764.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.06     1.06    18.36   593.02     1.02   570.15     0.92     0.86
MEAN    21.18     1.06    18.37   594.17     1.02   570.38     0.92     0.86
HUB     21.59     1.08    18.31   597.98     1.03   570.44     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     15.18    35.52    31.50     4.02     0.93     0.14     2.90
MEAN    18.86    27.62    23.50     4.12     0.90     0.17     3.29     0.86
HUB     28.13    10.66     6.50     4.16     0.90     0.21     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.938

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     523.668     173.557     494.071    1173.253       0.446       0.056

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.246      18.528     572.165      46.000      19.355      32.400      13.045

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     526.156     173.557     554.042    1173.029       0.449       0.026

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.153      18.422     571.947     456.573       0.042       0.157

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    16.096     500.070       0.000     500.070    1175.318       0.425       0.010

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.557     574.181       0.000       0.060       0.088       0.072

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.700      21.019       1.056     595.054      13.003     351.132       2.722

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  81022.664       0.327     664.082 1339169.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 5.961   EfDer =  0.901

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    145.038    3021.000      21.019     595.054       1.000       1.000       0.980
W Kg/sec =   65.92652

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.643    2820.530       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 111575.445  113806.719       1.611     509.668     316.430     390.276       1.233
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ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	463.89	-0.16	463.89	0.39	450.91
MEAN	15.91	0.00	-0.02	463.89	-0.16	463.89	0.39	
HUB	13.07	0.00	-0.02	463.89	-0.16	463.89	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.16	47.36	-1.20	482.97	669.78	18.89	577.10	0.57
MEAN	42.14	44.80	-2.66	419.52	625.56	18.89	577.10	0.53
HUB	36.62	38.84	-2.22	344.57	577.95	18.89	577.10	0.49

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	505.73	118.88	491.56	1184.03	0.43
MEAN	15.50	513.93	149.17	491.81	1184.09	0.43
HUB	12.59	548.07	238.53	493.45	1183.99	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	472.96	605.81	354.07	0.51	2135.68	
MEAN	408.57	556.02	259.40	0.47	2314.33	1.21
HUB	331.91	502.20	93.39	0.42	3005.14	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.95	1.04	19.36	604.09	1.02	582.75	0.92	0.82
MEAN	22.03	1.05	19.35	604.84	1.02	582.80	0.92	0.82
HUB	22.34	1.06	19.29	607.77	1.02	582.70	0.92	0.82

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	13.60	35.77	31.50	4.27	0.93	0.13	2.90	
MEAN	16.87	27.81	23.50	4.31	0.89	0.15	3.34	0.82
HUB	25.80	10.72	6.50	4.22	0.89	0.18	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.901

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	519.213	151.906	496.494	1184.330	0.438	-0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.052	19.323	583.071	46.000	17.012	33.000	15.988

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	539.137	151.906	560.129	1182.541	0.456	-0.147

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.829	18.926	581.311	440.827	0.101	0.134

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	500.720	0.000	500.720	1185.927	0.422	-0.011

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.291	584.645	0.000	0.060	0.107	-0.015

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.602	21.811	1.038	605.567	10.513	403.790	3.130

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
65522.332	0.293	537.037	1400360.875

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
515462.00	4224.8545	141.6879	1.4437	0.7015	5.9606	1.1583

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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Fan-Core + 4 Stage LPC 80% Stat 2 30% Ice Block 9-1-2011

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1

RESET = 0.000BLEED = 0.000 DPInc = 6.453 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
142.688	3021.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 64.85819

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
139.392	3009.102	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
109767.383	111962.492	2.048	831.557	405.939	619.754	1.527

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	331.03	-0.11	331.03	0.30	541.71
MEAN	17.06	0.00	-0.02	331.03	-0.11	331.03	0.30	
HUB	12.51	0.00	-0.02	331.03	-0.11	331.03	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.68	50.47	8.21	543.87	636.79	14.20	513.66	0.57
MEAN	53.65	47.20	6.45	449.76	558.54	14.20	513.66	0.50
HUB	44.90	38.62	6.28	329.80	467.36	14.20	513.66	0.42

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	538.76	303.30	445.28	1124.12	0.48
MEAN	18.04	564.28	338.47	451.50	1120.91	0.50
HUB	15.00	640.71	441.86	463.98	1115.04	0.57

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	543.87	506.11	240.57	0.45	6259.48	
MEAN	475.49	471.83	137.02	0.42	6106.63	1.32
HUB	395.45	466.29	46.41	0.42	6629.34	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.70	1.17	15.12	549.32	1.05	525.08	0.92	0.91
MEAN	17.63	1.17	14.82	548.67	1.05	522.08	0.92	0.91
HUB	17.86	1.18	14.27	550.89	1.05	516.60	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.26	28.38	24.20	4.18	0.93	0.29	2.90	
MEAN	36.86	16.88	12.70	4.18	0.93	0.24	3.51	0.91
HUB	43.60	-5.71	-9.30	3.59	0.93	0.11	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	573.154	337.814	463.019	1120.995	0.511	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.697	14.802	522.187	24.000	36.114	35.400	-0.714

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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     491.536     337.814     596.428    1128.759       0.435       0.257

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.667      15.506     529.445     528.796       0.020       0.406

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     453.435       0.000     453.435    1131.960       0.401       0.324

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.771     532.453       0.000       0.060       0.037       0.346

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      17.617       1.166     549.625      26.815     216.045       1.675

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 166948.453       0.564    1346.177 1391974.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.998

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    142.688    3021.000      17.617     549.625       1.000       1.000       0.980
W Kg/sec =   64.85819

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    122.560    2934.780       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109767.383  111962.492       1.654     590.487     356.928     474.134       1.328

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   432.05    -0.15   432.05     0.38   526.29
 MEAN    18.08     0.00    -0.02   432.05    -0.15   432.05     0.38
 HUB     15.21     0.00    -0.02   432.05    -0.15   432.05     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.44    46.36     5.08   541.76   693.06    15.93   534.04     0.61
 MEAN    47.82    42.30     5.52   476.60   643.40    15.93   534.04     0.57
 HUB     42.87    37.84     5.03   400.98   589.56    15.93   534.04     0.52

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     20.42   499.76   222.28   447.60  1148.34      0.44
 MEAN    18.01   511.86   241.91   451.09  1146.46      0.45
 HUB     15.22   555.52   318.23   455.34  1144.55      0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   547.95   316.06     0.48  4541.94
 MEAN   474.80   507.66   232.89     0.44  4359.46      1.37
 HUB    401.33   462.86    83.09     0.40  4846.72

        Pt2       PR       Ps2     Tt2       TR       Ts2      Eff2uCor   Eff2incCor
 TIP     19.66     1.12    17.26   568.85     1.03   548.00     0.92     0.91
 MEAN    19.58     1.11    17.07   568.08     1.03   546.20     0.92     0.91
 HUB     19.80     1.12    16.85   570.14     1.04   544.37     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.41    35.23    31.50     3.73     0.93     0.26     2.90
 MEAN    28.20    27.31    23.50     3.81     0.92     0.27     3.30     0.91
 HUB     34.95    10.34     6.50     3.84     0.92     0.28     3.92
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   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      844.779     242.588     809.199     1107.188       0.763       -1.416

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     19.653      13.361      509.430      46.000      16.688       30.600       13.912

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     17.960      852.769     242.588     886.603     1105.973       0.771       -1.496

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.650       19.480      13.141     508.299     345.258       0.076        0.086

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4        cp 3-4
     17.823      853.672       0.000     853.672     1106.079       0.772       -0.165

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.650       12.928      508.195       0.000       0.060       0.192       -1.578

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.698       19.178        1.089      569.026       19.401     265.057        2.055

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 120830.141       0.417     974.305 1276830.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.766

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    142.688     3021.000       19.178      569.026       1.000        1.000        0.680
W Kg/sec =   64.85819

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
    114.556     2884.315        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 109767.383  111962.492        1.134      378.495     333.628      293.880        0.881

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00     -0.02   731.39     -0.25   731.39      0.65    505.16
 MEAN    17.74      0.00     -0.02   731.39     -0.25   731.39      0.65
 HUB     15.05      0.00     -0.02   731.39     -0.25   731.39      0.65

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     35.90     46.36    -10.46   529.11    902.86     14.42    524.36      0.80
 MEAN    32.61     43.40    -10.79   467.64    868.25     14.42    524.37      0.77
 HUB     28.49     38.84    -10.35   396.77    832.20     14.42    524.36      0.74

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP      19.81   500.73    146.49    478.82   1161.21      0.43
 MEAN     17.51   512.32    180.38    479.52   1161.32      0.44
 HUB      14.85   555.35    274.69    482.66   1161.39      0.48

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP     522.26    608.66    375.77      0.52   2906.93
 MEAN    461.53    555.86    281.15      0.48   3162.28      1.63
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 HUB    391.49   496.59   116.80     0.43  4082.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.21     1.05    17.78   581.33     1.02   560.40     0.92     0.70
 MEAN    20.30     1.06    17.76   582.41     1.02   560.50     0.92     0.70
 HUB     20.64     1.08    17.65   586.31     1.03   560.56     0.92     0.70

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.01    38.12    31.50     6.62     0.93     0.35     2.90
 MEAN    20.61    30.38    23.50     6.88     0.84     0.39     3.28     0.70
 HUB     29.64    13.60     6.50     7.10     0.84     0.45     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.766

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     518.849     181.562     486.044    1161.679       0.447      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.358      17.750     560.873      46.000      20.483      31.500      11.017

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     509.535     181.562     540.916    1162.507       0.438       0.018

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.289      17.778     561.673     471.992       0.036       0.163

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     495.065       0.000     495.065    1163.762       0.425       0.027

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.822     562.886       0.000       0.060       0.075       0.035

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.588      20.186       1.053     583.349      14.322     346.605       2.687

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  89226.117       0.327     719.469 2082242.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.453   EfDer =  0.953

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    142.688    3021.000      20.186     583.349       1.000       1.000       0.980
W Kg/sec =   64.85819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    110.193    2848.687       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 109767.383  111962.492       1.599     513.330     320.934     401.059       1.250

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   463.13    -0.16   463.13     0.40   478.78
 MEAN    16.97     0.00    -0.02   463.13    -0.16   463.13     0.40
 HUB     14.32     0.00    -0.02   463.13    -0.16   463.13     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.64    46.36     1.28   507.76   687.36    18.11   565.45     0.59
 MEAN    44.02    43.80     0.22   447.40   644.05    18.11   565.45     0.55
 HUB     39.20    37.84     1.36   377.52   597.60    18.11   565.45     0.51

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
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B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	509.12	150.84	486.26	1174.93	0.43
MEAN	16.57	519.97	182.41	486.92	1174.74	0.44
HUB	13.89	560.55	274.42	488.78	1174.41	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	597.31	346.90	0.51	2850.94	
MEAN	436.94	549.44	254.53	0.47	3025.93	1.25
HUB	366.18	497.32	91.76	0.42	3813.99	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.49	1.06	18.88	595.41	1.02	573.78	0.92	0.87
MEAN	21.57	1.07	18.85	596.15	1.02	573.59	0.92	0.87
HUB	21.94	1.09	18.77	599.49	1.03	573.26	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	17.23	35.50	31.50	4.00	0.93	0.17	2.90	
MEAN	20.54	27.60	23.50	4.10	0.90	0.19	3.29	0.87
HUB	29.31	10.63	6.50	4.13	0.90	0.23	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.953

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	510.482	183.435	476.386	1176.431	0.434	0.055

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.635	19.007	575.266	46.000	21.059	32.400	11.341

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	505.359	183.435	537.621	1176.875	0.429	0.057

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.563	18.993	575.701	456.573	0.036	0.180

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	480.220	0.000	480.220	1178.986	0.407	0.043

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.129	577.769	0.000	0.060	0.077	0.105

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.747	21.447	1.062	597.017	13.669	332.602	2.578

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
85171.906	0.344	686.778	1307862.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 6.453 EfDer = 0.923

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
142.688	3021.000	21.447	597.017	1.000	1.000	0.980

W Kg/sec = 64.85819

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
104.923	2815.888	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
109767.383	111962.492	1.668	509.668	305.594	390.276	1.277

ROTOR LEADING EDGE CONDITIONS, STAGE 5

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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   446.02    -0.15   446.02     0.38   450.17
MEAN    15.91     0.00    -0.02   446.02    -0.15   446.02     0.38
HUB     13.07     0.00    -0.02   446.02    -0.15   446.02     0.38

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     47.29    47.36    -0.07   482.97   657.53    19.44   580.42     0.56
MEAN    43.26    44.80    -1.54   419.52   612.42    19.44   580.42     0.52
HUB     37.70    38.84    -1.14   344.57   563.71    19.44   580.42     0.48

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   489.13   134.52   470.27  1188.61     0.41
MEAN    15.50   497.75   160.37   471.21  1188.20     0.42
HUB     12.59   531.80   242.63   473.23  1187.68     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    472.96   579.39   338.44     0.49  2416.10
MEAN   408.57   532.58   248.20     0.45  2487.72     1.24
HUB    331.91   481.58    89.28     0.41  3056.69

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.55     1.05    20.07   607.24     1.02   587.27     0.92     0.84
MEAN    22.58     1.05    20.01   607.54     1.02   586.87     0.92     0.84
HUB     22.85     1.07    19.91   609.95     1.02   586.35     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     15.96    35.74    31.50     4.24     0.93     0.15     2.90
MEAN    18.79    27.78    23.50     4.28     0.89     0.17     3.34     0.84
HUB     27.14    10.68     6.50     4.18     0.89     0.20     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.923

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     502.792     163.306     475.533    1188.464       0.423       -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.607      19.986     587.147      46.000      18.953      33.000      14.047

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     513.152     163.306     538.511    1187.575       0.432       -0.100

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.433      19.729     586.268     440.827       0.085       0.160

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     477.533       0.000     477.533    1190.554       0.401       0.026

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.056     589.213       0.000       0.060       0.094       0.023

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.673      22.409       1.045     608.242      11.225     376.931       2.922

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  69964.133       0.313     564.151 1365957.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    532140.75   4290.8794    139.3919      1.4834      0.7325      6.4529      1.1634
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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 80%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     140.038    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   63.65342

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     136.803    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  107728.406  109882.742       2.087     831.557     398.399     619.754       1.556

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   324.31    -0.11   324.31     0.29   541.71
  MEAN    17.06     0.00    -0.02   324.31    -0.11   324.31     0.29
  HUB     12.51     0.00    -0.02   324.31    -0.11   324.31     0.29

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.20    50.47     8.73   543.87   633.32    14.24   514.03     0.57
  MEAN    54.21    47.20     7.01   449.76   554.58    14.24   514.03     0.50
  HUB     45.49    38.62     6.87   329.80   462.62    14.24   514.03     0.42

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   533.61   308.81   435.18  1125.12     0.47
  MEAN    18.04   558.19   341.58   441.48  1121.77     0.50
  HUB     15.00   632.55   440.86   453.60  1115.90     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   494.61   235.06     0.44  6373.05
  MEAN   475.49   461.34   133.91     0.41  6162.62     1.35
  HUB    395.45   455.87    45.42     0.41  6614.35

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.74     1.17    15.21   549.80     1.05   526.02     0.92     0.91
  MEAN    17.65     1.17    14.90   548.91     1.05   522.89     0.92     0.91
  HUB     17.85     1.18    14.35   550.82     1.05   517.41     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     35.36    28.38    24.20     4.18     0.93     0.30     2.90
  MEAN    37.73    16.87    12.70     4.17     0.93     0.26     3.51     0.91
  HUB     44.18    -5.72    -9.30     3.58     0.93     0.12     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       1.000

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     566.673     340.915     452.653    1121.891       0.505      -0.006

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      17.720      14.884     523.023      24.000      36.985      35.400      -1.585

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     479.794     340.915     588.579    1130.006       0.425       0.275

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.690      15.625     530.616     528.796       0.020       0.419

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     442.983       0.000     442.983    1133.023       0.391       0.338

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.873     533.453       0.000       0.060       0.037       0.359

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      17.640       1.168     549.844      27.034     212.543       1.648

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 168306.938       0.569    1331.922 1363684.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.038    3021.000      17.640     549.844       1.000       1.000       0.980
W Kg/sec =   63.65342

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    120.153    2934.197       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107728.406  109882.742       1.688     590.487     349.918     474.134       1.355

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   422.26    -0.15   422.26     0.37   526.18
 MEAN    18.08     0.00    -0.02   422.26    -0.15   422.26     0.37
 HUB     15.21     0.00    -0.02   422.26    -0.15   422.26     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.07    46.36     5.71   541.76   687.00    16.03   534.95     0.61
 MEAN    48.47    42.30     6.17   476.60   636.86    16.03   534.95     0.56
 HUB     43.53    37.84     5.69   400.98   582.42    16.03   534.95     0.51

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   493.58   230.16   436.64  1149.82     0.43
 MEAN    18.01   505.21   247.62   440.36  1147.74     0.44
 HUB     15.22   548.13   320.31   444.80  1145.63     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   534.43   308.17     0.46  4702.95
 MEAN   474.80   495.51   227.18     0.43  4462.24     1.39
 HUB    401.33   452.12    81.02     0.39  4878.25

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.76     1.12    17.41   569.75     1.04   549.41     0.92     0.91
 MEAN    19.65     1.11    17.20   568.73     1.03   547.42     0.92     0.91
 HUB     19.85     1.13    16.96   570.50     1.04   545.41     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.80    35.21    31.50     3.71     0.93     0.28     2.90
 MEAN    29.35    27.29    23.50     3.79     0.93     0.28     3.30     0.91
 HUB     35.76    10.32     6.50     3.82     0.93     0.29     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.650       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     814.783     248.314     776.022    1112.377       0.732      -1.326

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.727      13.802     514.222      46.000      17.744      30.600      12.856

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     809.356     248.314     846.591    1113.177       0.727      -1.336

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      19.579      13.767     514.958     345.258       0.068       0.114

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     805.139       0.000     805.139    1113.893       0.723      -0.057

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      13.655     515.536       0.000       0.060       0.159      -1.380

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.743      19.344       1.097     569.661      19.818     257.893       1.999

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 123426.102       0.426     976.751 1248642.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  0.769

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.038    3021.000      19.344     569.661       1.000       1.000       0.680
W Kg/sec =   63.65342

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.524    2882.708       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107728.406  109882.742       1.165     378.495     324.796     293.880       0.905

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   699.59    -0.24   699.59     0.62   504.87
 MEAN    17.74     0.00    -0.02   699.59    -0.24   699.59     0.62
 HUB     15.05     0.00    -0.02   699.59    -0.24   699.59     0.62

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     37.11    46.36    -9.25   529.11   877.29    14.92   528.80     0.78
 MEAN    33.77    43.40    -9.63   467.64   841.63    14.92   528.80     0.75
 HUB     29.57    38.84    -9.27   396.77   804.39    14.92   528.80     0.71

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   489.89   160.06   463.01  1163.97     0.42
 MEAN    17.51   501.71   190.46   464.15  1163.67     0.43
 HUB     14.85   544.64   279.33   467.55  1163.36     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   587.85   362.20     0.51  3175.55
 MEAN   461.53   537.51   271.06     0.46  3338.66     1.64
 HUB    391.49   480.81   112.16     0.41  4151.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     20.49     1.06    18.14   583.10     1.02   563.06     0.92     0.70
 MEAN    20.55     1.06    18.08   583.79     1.02   562.78     0.92     0.70
 HUB     20.85     1.08    17.94   587.23     1.03   562.47     0.92     0.70

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.07    38.04    31.50     6.54     0.93     0.36     2.90
 MEAN    22.31    30.28    23.50     6.78     0.85     0.40     3.28     0.70
 HUB     30.86    13.49     6.50     6.99     0.85     0.45     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.769

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     507.944     191.715     470.375    1164.055       0.436      -0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.603      18.074     563.167      46.000      22.175      31.500       9.325

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     491.460     191.715     527.530    1165.476       0.422       0.051

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.551      18.182     564.543     471.992       0.030       0.187

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     477.288       0.000     477.288    1166.658       0.409       0.062

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.232     565.689       0.000       0.060       0.065       0.070

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.615      20.462       1.058     584.708      15.047     326.665       2.532

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93741.438       0.344     741.837 2005072.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  0.967

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    140.038    3021.000      20.462     584.708       1.000       1.000       0.980
W Kg/sec =   63.65342

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.812    2845.374       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107728.406  109882.742       1.650     513.330     311.086     401.059       1.289

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   446.94    -0.15   446.94     0.38   478.22
 MEAN    16.97     0.00    -0.02   446.94    -0.15   446.94     0.38
 HUB     14.32     0.00    -0.02   446.94    -0.15   446.94     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.65    46.36     2.29   507.76   676.55    18.50   568.03     0.58
 MEAN    45.04    43.80     1.24   447.40   632.50    18.50   568.04     0.54
 HUB     40.20    37.84     2.36   377.52   585.14    18.50   568.03     0.50

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	495.37	164.74	467.17	1178.63	0.42
MEAN	16.57	506.42	192.34	468.48	1178.02	0.43
HUB	13.89	546.75	278.10	470.74	1177.32	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	573.70	333.00	0.49	3113.29	
MEAN	436.94	528.49	244.60	0.45	3190.43	1.28
HUB	366.18	478.91	88.09	0.41	3865.00	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.92	1.07	19.41	597.88	1.02	577.40	0.92	0.89
MEAN	21.96	1.07	19.34	598.21	1.02	576.80	0.92	0.89
HUB	22.29	1.09	19.22	601.06	1.03	576.11	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	19.42	35.48	31.50	3.98	0.93	0.19	2.90	
MEAN	22.32	27.57	23.50	4.07	0.91	0.21	3.29	0.89
HUB	30.57	10.60	6.50	4.10	0.91	0.24	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.967

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	497.605	193.422	458.475	1179.614	0.422	0.055

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.028	19.488	578.383	46.000	22.874	32.400	9.526

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	484.606	193.422	521.780	1180.700	0.410	0.089

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.974	19.565	579.448	456.573	0.030	0.206

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	460.427	0.000	460.427	1182.642	0.389	0.079

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.702	581.356	0.000	0.060	0.066	0.139

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.788	21.876	1.069	599.050	14.342	315.153	2.443

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
89371.352	0.361	707.253	1274218.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 7.013 EfDer = 0.944

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
140.038	3021.000	21.876	599.050	1.000	1.000	0.980

W Kg/sec = 63.65342

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
101.128	2811.106	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
107728.406	109882.742	1.730	509.668	294.539	390.276	1.325

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	428.12	-0.15	428.12	0.36	449.40
MEAN	15.91	0.00	-0.02	428.12	-0.15	428.12	0.36	

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 HUB     13.07     0.00    -0.02   428.12    -0.15   428.12     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.45    47.36     1.09   482.97   645.52    19.99   583.76     0.54
 MEAN    44.43    44.80    -0.37   419.52   599.50    19.99   583.76     0.51
 HUB     38.84    38.84     0.00   344.57   549.65    19.99   583.76     0.46

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   473.63   149.94   449.27  1193.10     0.40
 MEAN    15.50   482.29   171.44   450.79  1192.26     0.40
 HUB     12.59   515.99   246.73   453.18  1191.35     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   553.33   323.01     0.46  2692.70
 MEAN   408.57   509.36   237.12     0.43  2659.29     1.27
 HUB    331.91   461.11    85.18     0.39  3108.26

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.16     1.06    20.77   610.44     1.02   591.72     0.92     0.86
 MEAN    23.14     1.06    20.67   610.30     1.02   590.89     0.92     0.86
 HUB     23.36     1.07    20.53   612.20     1.02   589.98     0.92     0.86

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.46    35.72    31.50     4.22     0.93     0.18     2.90
 MEAN    20.82    27.75    23.50     4.25     0.90     0.19     3.34     0.86
 HUB     28.57    10.65     6.50     4.15     0.90     0.22     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.944

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     487.166     174.586     454.808    1192.535       0.409      -0.008

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      23.167      20.649     591.174      46.000      21.000      33.000      12.000

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     488.077     174.586     518.362    1192.460       0.409      -0.052

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      23.037      20.525     591.100     440.827       0.071       0.187

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     454.917       0.000     454.917    1195.089       0.381       0.066

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      20.819     593.709       0.000       0.060       0.081       0.063

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.733      23.011       1.052     610.979      11.929     352.806       2.735

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   74355.938       0.332     588.427 1329436.000

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

    Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
      549201.75   4346.1890    136.8026      1.5232      0.7604      7.0126      1.1686


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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
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*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 80%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 7.457   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.947    3021.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   62.70338

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    134.761    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106120.539  108242.727       2.119     831.557     392.453     619.754       1.579

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   319.03    -0.11   319.03     0.29   541.71
MEAN    17.06     0.00    -0.02   319.03    -0.11   319.03     0.29
HUB     12.51     0.00    -0.02   319.03    -0.11   319.03     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.61    50.47     9.14   543.87   630.63    14.27   514.31     0.57
MEAN    54.66    47.20     7.46   449.76   551.51    14.27   514.31     0.50
HUB     45.96    38.62     7.34   329.80   458.94    14.27   514.31     0.41

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   529.76   313.07   427.35  1125.88     0.47
MEAN    18.04   553.54   343.97   433.69  1122.43     0.49
HUB     15.00   626.27   440.11   445.55  1116.55     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    543.87   485.69   230.80     0.43  6460.95
MEAN   475.49   453.20   131.52     0.40  6205.71     1.36
HUB    395.45   447.78    44.66     0.40  6602.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.78     1.18    15.28   550.17     1.05   526.73     0.92     0.91
MEAN    17.67     1.17    14.96   549.09     1.05   523.50     0.92     0.91
HUB     17.84     1.18    14.41   550.77     1.05   518.02     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     36.23    28.37    24.20     4.17     0.93     0.32     2.90
MEAN    38.42    16.87    12.70     4.17     0.93     0.27     3.51     0.91
HUB     44.65    -5.72    -9.30     3.58     0.93     0.13     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     561.723     343.301     444.609    1122.572       0.500      -0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.737      14.945     523.658      24.000      37.673      35.400      -2.273

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     470.742     343.301     582.626    1130.951       0.416       0.288

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      17.706      15.714     531.504     528.796       0.021       0.430

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     434.915       0.000     434.915    1133.830       0.384       0.348

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.949     534.214       0.000       0.060       0.038       0.370

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      17.655       1.169     550.012      27.202     209.824       1.627

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 169357.625       0.573    1320.233 1341488.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.457   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.947    3021.000      17.655     550.012       1.000       1.000       0.980
W Kg/sec =   62.70338

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.275    2933.747       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106120.539  108242.727       1.714     590.487     344.448     474.134       1.377

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   414.70    -0.14   414.70     0.37   526.10
 MEAN    18.08     0.00    -0.02   414.70    -0.14   414.70     0.37
 HUB     15.21     0.00    -0.02   414.70    -0.14   414.70     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.57    46.36     6.21   541.76   682.38    16.10   535.65     0.60
 MEAN    48.98    42.30     6.68   476.60   631.87    16.10   535.65     0.56
 HUB     44.05    37.84     6.21   400.98   576.95    16.10   535.65     0.51

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   489.07   236.21   428.25  1150.93     0.42
 MEAN    18.01   500.23   251.99   432.13  1148.70     0.44
 HUB     15.22   542.52   321.90   436.70  1146.45     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   524.09   302.13     0.46  4826.31
 MEAN   474.80   486.19   222.81     0.42  4540.87     1.41
 HUB    401.33   443.87    79.43     0.39  4902.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.84     1.12    17.52   570.44     1.04   550.47     0.92     0.91
 MEAN    19.70     1.12    17.29   569.24     1.03   548.34     0.92     0.91
 HUB     19.87     1.13    17.04   570.77     1.04   546.19     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.88    35.20    31.50     3.70     0.93     0.29     2.90
 MEAN    30.25    27.28    23.50     3.78     0.93     0.29     3.30     0.91
 HUB     36.39    10.31     6.50     3.81     0.93     0.30     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	793.929	252.695	752.641	1115.927	0.711	-1.264

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.780	14.108	517.511	46.000	18.559	30.600	12.041

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	780.336	252.695	820.231	1117.854	0.698	-1.231

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	19.649	14.185	519.298	345.258	0.062	0.132

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	773.806	0.000	773.806	1118.820	0.692	0.006

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	14.125	520.150	0.000	0.060	0.139	-1.255

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.771	19.454	1.102	570.149	20.137	252.528	1.958

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
125413.750	0.433	977.667	1226681.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 7.457 EfDer = 0.778

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
137.947	3021.000	19.454	570.149	1.000	1.000	0.680

W Kg/sec = 62.70338

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
109.284	2881.474	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
106120.539	108242.727	1.189	378.495	318.272	293.880	0.923

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	677.65	-0.23	677.65	0.60	504.66
MEAN	17.74	0.00	-0.02	677.65	-0.23	677.65	0.60	
HUB	15.05	0.00	-0.02	677.65	-0.23	677.65	0.60	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	37.99	46.36	-8.37	529.11	859.89	15.26	531.81	0.76
MEAN	34.62	43.40	-8.78	467.64	823.48	15.26	531.81	0.73
HUB	30.36	38.84	-8.48	396.77	785.38	15.26	531.81	0.69

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	482.27	169.93	451.34	1165.96	0.41
MEAN	17.51	494.09	197.84	452.76	1165.39	0.42
HUB	14.85	536.72	282.68	456.25	1164.81	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	572.57	352.32	0.49	3371.04	
MEAN	461.53	523.95	263.69	0.45	3467.65	1.65
HUB	391.49	469.04	108.82	0.40	4201.24	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.69	1.06	18.39	584.42	1.03	565.00	0.92	0.71
MEAN	20.73	1.07	18.31	584.82	1.03	564.44	0.92	0.71
HUB	21.00	1.08	18.16	587.93	1.03	563.88	0.92	0.71

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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.63    37.98    31.50     6.48     0.93     0.37     2.90
 MEAN    23.60    30.22    23.50     6.72     0.86     0.40     3.28     0.71
 HUB     31.78    13.41     6.50     6.91     0.86     0.45     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.778

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     500.114     199.139     458.757    1165.785       0.429      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.782      18.309     564.841      46.000      23.465      31.500       8.035

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     478.210     199.139     518.017    1167.630       0.410       0.075

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.740      18.475     566.630     471.992       0.027       0.205

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     464.291       0.000     464.291    1168.758       0.397       0.087

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.530     567.726       0.000       0.060       0.058       0.097

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.637      20.661       1.062     585.723      15.574     313.299       2.429

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  97028.117       0.356     756.386 1950344.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.457   EfDer =  0.976

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    137.947    3021.000      20.661     585.723       1.000       1.000       0.980
W Kg/sec =   62.70338

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    104.295    2842.907       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106120.539  108242.727       1.690     513.330     303.755     401.059       1.320

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   435.06    -0.15   435.06     0.37   477.81
 MEAN    16.97     0.00    -0.02   435.06    -0.15   435.06     0.37
 HUB     14.32     0.00    -0.02   435.06    -0.15   435.06     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.42    46.36     3.06   507.76   668.77    18.78   569.92     0.57
 MEAN    45.81    43.80     2.01   447.40   624.17    18.78   569.92     0.53
 HUB     40.96    37.84     3.12   377.52   576.12    18.78   569.92     0.49

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   485.91   174.77   453.39  1181.27     0.41
 MEAN    16.57   496.92   199.54   455.10  1180.38     0.42
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HUB     13.89   536.90   280.78   457.64  1179.42     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    497.74   556.66   322.97     0.47  3302.48
MEAN   436.94   513.30   237.40     0.43  3309.65     1.31
HUB    366.18   465.54    85.41     0.39  3902.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.24     1.08    19.79   599.70     1.02   579.99     0.92     0.89
MEAN    22.24     1.08    19.69   599.73     1.02   579.12     0.92     0.89
HUB     22.53     1.09    19.55   602.23     1.03   578.17     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     21.08    35.46    31.50     3.96     0.93     0.21     2.90
MEAN    23.67    27.55    23.50     4.05     0.91     0.23     3.29     0.89
HUB     31.53    10.57     6.50     4.07     0.91     0.25     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.976

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     488.589     200.659     445.483    1181.901       0.413       0.055

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.312      19.833     580.627      46.000      24.248      32.400       8.152

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     469.730     200.659     510.794    1183.436       0.397       0.113

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.270      19.976     582.135     456.573       0.026       0.225

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     446.261       0.000     446.261    1185.258       0.377       0.105

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.113     583.930       0.000       0.060       0.058       0.165

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.813      22.183       1.074     600.552      14.829     303.242       2.351

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  92408.219       0.373     720.372 1248642.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.457   EfDer =  0.957

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.947    3021.000      22.183     600.552       1.000       1.000       0.980
W Kg/sec =   62.70338

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     98.361    2807.589       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106120.539  108242.727       1.779     509.668     286.482     390.276       1.362

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   415.26    -0.14   415.26     0.35   448.84
 MEAN    15.91     0.00    -0.02   415.26    -0.14   415.26     0.35
 HUB     13.07     0.00    -0.02   415.26    -0.14   415.26     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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 TIP     49.32    47.36     1.96   482.97   637.06    20.38   586.16     0.54
 MEAN    45.30    44.80     0.50   419.52   590.38    20.38   586.16     0.50
 HUB     39.70    38.84     0.86   344.57   539.69    20.38   586.16     0.45

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   463.23   160.91   434.38  1196.26     0.39
 MEAN    15.50   471.71   179.34   436.28  1195.14     0.39
 HUB     12.59   504.92   249.63   438.90  1193.96     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   534.84   312.04     0.45  2889.42
 MEAN   408.57   492.83   229.22     0.41  2781.68     1.30
 HUB    331.91   446.54    82.28     0.37  3144.75

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.59     1.06    21.27   612.77     1.02   594.87     0.92     0.88
 MEAN    23.54     1.06    21.14   612.32     1.02   593.75     0.92     0.88
 HUB     23.72     1.07    20.97   613.85     1.02   592.58     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.33    35.69    31.50     4.19     0.93     0.20     2.90
 MEAN    22.35    27.72    23.50     4.22     0.90     0.21     3.34     0.88
 HUB     29.63    10.62     6.50     4.12     0.90     0.23     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.957

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     476.486     182.633     440.096    1195.418       0.399      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.570      21.123     594.036      46.000      22.538      33.000      10.462

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     470.611     182.633     504.806    1195.885       0.394      -0.016

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.468      21.089     594.500     440.827       0.061       0.208

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     439.049       0.000     439.049    1198.292       0.366       0.097

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.364     596.896       0.000       0.060       0.071       0.094

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.770      23.442       1.057     612.982      12.430     336.902       2.612

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   77481.203       0.346     604.007 1301921.000

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     561688.94   4378.6655    134.7608      1.5517      0.7784      7.4574      1.1725


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*******************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 80%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.209    3021.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    132.086    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       2.162     831.557     384.662     619.754       1.611

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   312.15    -0.11   312.15     0.28   541.71
 MEAN    17.06     0.00    -0.02   312.15    -0.11   312.15     0.28
 HUB     12.51     0.00    -0.02   312.15    -0.11   312.15     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.15    50.47     9.68   543.87   627.18    14.30   514.67     0.56
 MEAN    55.24    47.20     8.04   449.76   547.56    14.30   514.67     0.49
 HUB     46.58    38.62     7.96   329.80   454.18    14.30   514.67     0.41

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   524.98   318.57   417.27  1126.84     0.47
 MEAN    18.04   547.66   347.08   423.65  1123.26     0.49
 HUB     15.00   618.19   439.09   435.16  1117.38     0.55

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    543.87   474.21   225.31     0.42  6574.24
 MEAN   475.49   442.68   128.41     0.39  6261.69     1.39
 HUB    395.45   437.34    43.64     0.39  6587.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.83     1.18    15.36   550.65     1.05   527.63     0.92     0.91
 MEAN    17.69     1.17    15.03   549.33     1.05   524.28     0.92     0.91
 HUB     17.83     1.18    14.48   550.71     1.05   518.79     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.36    28.37    24.20     4.17     0.93     0.33     2.90
 MEAN    39.33    16.86    12.70     4.16     0.93     0.28     3.51     0.91
 HUB     45.26    -5.73    -9.30     3.57     0.93     0.15     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     555.477     346.401     434.237    1123.430       0.494      -0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.757      15.021     524.458      24.000      38.580      35.400      -3.180

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     459.132     346.401     575.148    1132.141       0.406       0.306

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.725      15.824     532.623     528.796       0.021       0.444

   VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	424.556	0.000	424.556	1134.850	0.374	0.361

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.042	535.175	0.000	0.060	0.040	0.383

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	17.672	1.170	550.230	27.420	206.314	1.599

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
170711.172	0.577	1304.368	1312555.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 8.045 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
135.209	3021.000	17.672	550.230	1.000	1.000	0.980

W Kg/sec = 61.45868

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
115.839	2933.167	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
104013.984	106094.039	1.750	590.487	337.352	474.134	1.405

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	404.97	-0.14	404.97	0.36	526.00
MEAN	18.08	0.00	-0.02	404.97	-0.14	404.97	0.36	
HUB	15.21	0.00	-0.02	404.97	-0.14	404.97	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.23	46.36	6.87	541.76	676.51	16.18	536.53	0.60
MEAN	49.65	42.30	7.35	476.60	625.53	16.18	536.53	0.55
HUB	44.73	37.84	6.89	400.98	570.00	16.18	536.53	0.50

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	483.57	243.88	417.57	1152.31	0.42
MEAN	18.01	494.06	257.54	421.63	1149.90	0.43
HUB	15.22	535.44	323.92	426.35	1147.48	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	510.95	294.45	0.44	4982.95	
MEAN	474.80	474.31	217.26	0.41	4640.83	1.43
HUB	401.33	433.32	77.41	0.38	4933.12	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.93	1.13	17.65	571.32	1.04	551.80	0.92	0.91
MEAN	19.77	1.12	17.41	569.88	1.04	549.49	0.92	0.91
HUB	19.91	1.13	17.14	571.11	1.04	547.17	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.29	35.19	31.50	3.69	0.93	0.31	2.90	
MEAN	31.42	27.26	23.50	3.76	0.93	0.30	3.30	0.91
HUB	37.23	10.29	6.50	3.79	0.93	0.31	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	769.407	258.264	724.767	1120.042	0.687	-1.193

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.843	14.466	521.336	46.000	19.613	30.600	10.987

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	746.944	258.264	790.333	1123.093	0.665	-1.111

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	19.733	14.662	524.180	345.258	0.055	0.152

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	738.608	0.000	738.608	1124.226	0.657	0.073

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	14.647	525.216	0.000	0.060	0.118	-1.117

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.798	19.578	1.108	570.772	20.542	245.847	1.906

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
127938.578	0.441	977.552	1198238.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 8.045 EfDer = 0.794

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
135.209	3021.000	19.578	570.772	1.000	1.000	0.680

W Kg/sec = 61.45868

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
106.497	2879.902	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
104013.984	106094.039	1.220	378.495	310.157	293.880	0.948

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	651.84	-0.22	651.84	0.57	504.38
MEAN	17.74	0.00	-0.02	651.84	-0.22	651.84	0.57	
HUB	15.05	0.00	-0.02	651.84	-0.22	651.84	0.57	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	39.08	46.36	-7.28	529.11	839.70	15.65	535.30	0.74
MEAN	35.67	43.40	-7.73	467.64	802.37	15.65	535.30	0.71
HUB	31.34	38.84	-7.50	396.77	763.22	15.65	535.30	0.67

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	473.30	182.05	436.89	1168.38	0.41
MEAN	17.51	484.94	206.88	438.60	1167.49	0.42
HUB	14.85	526.97	286.73	442.14	1166.61	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	553.72	340.20	0.47	3610.99	
MEAN	461.53	507.17	254.65	0.43	3625.71	1.66
HUB	391.49	454.39	104.77	0.39	4261.26	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.94	1.07	18.70	586.05	1.03	567.35	0.92	0.73
MEAN	20.94	1.07	18.60	586.12	1.03	566.48	0.92	0.73
HUB	21.19	1.08	18.42	588.81	1.03	565.62	0.92	0.73

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	22.62	37.91	31.50	6.41	0.93	0.38	2.90	

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 MEAN    25.25    30.14    23.50     6.64     0.86     0.41     3.28     0.73
 HUB     32.96    13.33     6.50     6.83     0.86     0.45     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.794

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     490.699     208.236     444.323    1167.897       0.420        0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.000      18.596     566.889      46.000      25.111      31.500       6.389

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     461.919     208.236     506.687    1170.253       0.395        0.106

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.969      18.831     569.178     471.992       0.023        0.229

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     448.357       0.000     448.357    1171.312       0.383        0.120

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      18.889     570.208       0.000       0.060       0.050        0.130

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.666      20.901       1.068     586.992      16.220     298.047        2.310

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 101053.969       0.370     772.132 1884362.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.985

   W act       RPM act        Pt          Tt           POTS        POTH       AeroBl
    135.209    3021.000      20.901     586.992       1.000       1.000       0.980
W Kg/sec =   61.45868

   W cor       RPM cor        GAMMA       Cp          R           Blades       THK
    101.159    2839.833       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       1.742     513.330     294.622     401.059       1.361

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   420.46    -0.14   420.46     0.36   477.29
 MEAN    16.97      0.00    -0.02   420.46    -0.14   420.46     0.36
 HUB     14.32      0.00    -0.02   420.46    -0.14   420.46     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.38    46.36     4.02   507.76   659.36    19.12   572.24     0.56
 MEAN    46.79    43.80     2.99   447.40   614.07    19.12   572.24     0.52
 HUB     41.93    37.84     4.09   377.52   565.17    19.12   572.24     0.48

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     18.88   475.03    186.95    436.69  1184.43      0.40
 MEAN    16.57   485.77    208.32    438.83  1183.22      0.41
 HUB     13.89   525.10    284.01    441.67  1181.97      0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
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 TIP    497.74   535.99   310.79     0.45  3532.39
 MEAN   436.94   494.81   228.62     0.42  3455.15     1.34
 HUB    366.18   449.25    82.17     0.38  3947.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.62     1.08    20.25   601.94     1.03   583.10     0.92     0.90
 MEAN    22.59     1.08    20.11   601.61     1.02   581.91     0.92     0.90
 HUB     22.83     1.09    19.94   603.69     1.03   580.68     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.18    35.44    31.50     3.94     0.93     0.24     2.90
 MEAN    25.39    27.52    23.50     4.02     0.91     0.25     3.29     0.90
 HUB     32.74    10.54     6.50     4.04     0.91     0.27     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     478.027     209.493     429.677    1184.660       0.404       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.655      20.249     583.340      46.000      25.992      32.400       6.408

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     451.816     209.493     498.021    1186.724       0.381       0.144

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.625      20.469     585.374     456.573       0.022       0.250

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     429.233       0.000     429.233    1188.406       0.361       0.138

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.605     587.035       0.000       0.060       0.050       0.196

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.838      22.551       1.079     602.413      15.421     289.474       2.244

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96102.336       0.388     734.298 1216171.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.972

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.209    3021.000      22.551     602.413       1.000       1.000       0.980
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.983    2803.249       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       1.842     509.668     276.642     390.276       1.411

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   399.75    -0.14   399.75     0.34   448.15
 MEAN    15.91     0.00    -0.02   399.75    -0.14   399.75     0.34
 HUB     13.07     0.00    -0.02   399.75    -0.14   399.75     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.39    47.36     3.03   482.97   627.06    20.86   589.08     0.53
 MEAN    46.39    44.80     1.59   419.52   579.58    20.86   589.08     0.49
 HUB     40.77    38.84     1.93   344.57   527.85    20.86   589.08     0.44
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      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   451.52   173.95   416.67  1200.02     0.38
 MEAN    15.50   459.52   188.76   418.96  1198.58     0.38
 HUB     12.59   491.93   253.10   421.82  1197.10     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   512.86   299.01     0.43  3123.12
 MEAN   408.57   473.12   219.81     0.39  2927.47     1.33
 HUB    331.91   429.12    78.81     0.36  3188.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.12     1.07    21.88   615.62     1.02   598.61     0.92     0.89
 MEAN    24.02     1.07    21.70   614.80     1.02   597.17     0.92     0.89
 HUB     24.16     1.07    21.50   615.90     1.02   595.70     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.66    35.66    31.50     4.16     0.93     0.23     2.90
 MEAN    24.25    27.68    23.50     4.18     0.91     0.23     3.34     0.89
 HUB     30.96    10.58     6.50     4.08     0.91     0.24     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.972

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     464.218     192.218     422.552    1198.854       0.387      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.053      21.687     597.456      46.000      24.461      33.000       8.539

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     450.121     192.218     489.446    1199.932       0.375       0.027

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.980      21.758     598.531     440.827       0.050       0.234

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     420.337       0.000     420.337    1202.099       0.350       0.135

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.011     600.695       0.000       0.060       0.060       0.132

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.807      23.956       1.062     615.439      13.026     319.132       2.474

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   81199.914       0.363     620.431 1267232.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    577006.00   4408.7812    132.0858      1.5857      0.7977      8.0445      1.1772


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 80%  Stat 2 30% Ice Block 9-1-2011
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 8.481   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    133.191    3021.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   60.54141

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    130.114    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 102461.570  104510.578       2.195     831.557     378.921     619.754       1.636

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   307.10    -0.11   307.10     0.28   541.71
 MEAN    17.06     0.00    -0.02   307.10    -0.11   307.10     0.28
 HUB     12.51     0.00    -0.02   307.10    -0.11   307.10     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.55    50.47    10.08   543.87   624.68    14.33   514.93     0.56
 MEAN    55.68    47.20     8.48   449.76   544.69    14.33   514.93     0.49
 HUB     47.05    38.62     8.43   329.80   450.72    14.33   514.93     0.40

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   521.63   322.53   409.96  1127.52     0.46
 MEAN    18.04   543.47   349.31   416.34  1123.85     0.48
 HUB     15.00   612.38   438.36   427.61  1117.97     0.55

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    543.87   465.90   221.34     0.41  6656.00
 MEAN   475.49   435.04   126.18     0.39  6301.90     1.41
 HUB    395.45   429.76    42.91     0.38  6576.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.86     1.18    15.42   551.00     1.05   528.27     0.92     0.91
 MEAN    17.71     1.17    15.09   549.50     1.05   524.83     0.92     0.91
 HUB     17.83     1.18    14.53   550.66     1.05   519.34     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.19    28.37    24.20     4.17     0.93     0.34     2.90
 MEAN    40.00    16.86    12.70     4.16     0.93     0.30     3.51     0.91
 HUB     45.71    -5.73    -9.30     3.57     0.93     0.16     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     551.014     348.628     426.703    1124.039       0.490      -0.004

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.770      15.075     525.027      24.000      39.250      35.400      -3.850

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     450.746     348.628     569.837    1132.984       0.398       0.319

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.737      15.902     533.417     528.796       0.022       0.454

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     417.067       0.000     417.067    1135.574       0.367       0.371
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.107	535.858	0.000	0.060	0.042	0.393

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.875	17.682	1.170	550.386	27.576	203.767	1.580

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
171686.250	0.580	1292.239	1291335.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 8.481 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
133.191	3021.000	17.682	550.386	1.000	1.000	0.980

W Kg/sec = 60.54141

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
114.060	2932.750	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
102461.570	104510.578	1.778	590.487	332.172	474.134	1.427

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	397.93	-0.14	397.93	0.35	525.92
MEAN	18.08	0.00	-0.02	397.93	-0.14	397.93	0.35	
HUB	15.21	0.00	-0.02	397.93	-0.14	397.93	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.71	46.36	7.35	541.76	672.31	16.24	537.16	0.59
MEAN	50.15	42.30	7.85	476.60	620.99	16.24	537.16	0.55
HUB	45.23	37.84	7.39	400.98	565.02	16.24	537.16	0.50

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	479.81	249.37	409.92	1153.28	0.42
MEAN	18.01	489.76	261.53	414.08	1150.75	0.43
HUB	15.22	530.41	325.37	418.89	1148.21	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	501.53	288.97	0.43	5094.85	
MEAN	474.80	465.77	213.26	0.40	4712.70	1.45
HUB	401.33	425.72	75.96	0.37	4955.12	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.99	1.13	17.74	571.96	1.04	552.73	0.92	0.91
MEAN	19.81	1.12	17.49	570.34	1.04	550.31	0.92	0.91
HUB	19.93	1.13	17.21	571.36	1.04	547.87	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.31	35.18	31.50	3.68	0.93	0.32	2.90	
MEAN	32.28	27.25	23.50	3.75	0.93	0.31	3.30	0.91
HUB	37.84	10.28	6.50	3.78	0.93	0.32	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	752.970	262.269	705.818	1122.762	0.671	-1.146

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.885	14.704	523.872	46.000	20.384	30.600	10.216

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	724.823	262.269	770.814	1126.479	0.643	-1.033

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	19.787	14.974	527.346	345.258	0.050	0.166

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	715.698	0.000	715.698	1127.665	0.635	0.115

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	14.982	528.445	0.000	0.060	0.104	-1.029

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.814	19.656	1.112	571.219	20.832	241.148	1.869

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
129747.125	0.448	976.574	1177504.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 8.481 EfDer = 0.808

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
133.191	3021.000	19.656	571.219	1.000	1.000	0.680

W Kg/sec = 60.54141

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
104.530	2878.775	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
102461.570	104510.578	1.243	378.495	304.428	293.880	0.965

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	634.45	-0.22	634.45	0.56	504.18
MEAN	17.74	0.00	-0.02	634.45	-0.22	634.45	0.56	
HUB	15.05	0.00	-0.02	634.45	-0.22	634.45	0.56	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	39.84	46.36	-6.52	529.11	826.26	15.91	537.61	0.73
MEAN	36.41	43.40	-6.99	467.64	788.30	15.91	537.61	0.69
HUB	32.03	38.84	-6.81	396.77	748.41	15.91	537.61	0.66

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	467.35	190.53	426.74	1170.05	0.40
MEAN	17.51	478.73	213.18	428.65	1168.94	0.41
HUB	14.85	520.23	289.54	432.21	1167.85	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	540.51	331.72	0.46	3778.83	
MEAN	461.53	495.39	248.35	0.42	3735.98	1.67
HUB	391.49	444.07	101.95	0.38	4303.03	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.11	1.07	18.91	587.21	1.03	568.98	0.92	0.74
MEAN	21.09	1.07	18.79	587.03	1.03	567.90	0.92	0.74
HUB	21.32	1.08	18.60	589.43	1.03	566.83	0.92	0.74

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	24.06	37.86	31.50	6.36	0.93	0.39	2.90	
MEAN	26.44	30.09	23.50	6.59	0.87	0.41	3.28	0.74
HUB	33.82	13.27	6.50	6.77	0.87	0.46	3.87	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.808

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      484.310     214.582     434.178     1169.357       0.414       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     21.151      18.793      568.307      46.000      26.300       31.500       5.200

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392      450.569     214.582     499.057     1172.064       0.384       0.128

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       21.127      19.077      570.940     471.992       0.020       0.246

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121      437.288       0.000     437.288     1173.074       0.373       0.142

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       19.136      571.925       0.000       0.060       0.046       0.153

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.687       21.065        1.072      587.890       16.671     288.054       2.233

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 103865.195       0.381     781.767 1838920.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.481   EfDer =  0.991

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    133.191     3021.000       21.065      587.890       1.000        1.000       0.980
W Kg/sec =   60.54141

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     98.950     2837.663        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 102461.570  104510.578        1.781      513.330      288.187      401.059       1.392

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   410.29    -0.14   410.29      0.35   476.93
 MEAN    16.97      0.00    -0.02   410.29    -0.14   410.29      0.35
 HUB     14.32      0.00    -0.02   410.29    -0.14   410.29      0.35

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     51.07     46.36     4.71   507.76   652.92     19.36   573.84      0.56
 MEAN    47.49     43.80     3.69   447.40   607.15     19.36   573.84      0.52
 HUB     42.63     37.84     4.79   377.52   557.65     19.36   573.84      0.47

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   467.92    195.29    425.22   1186.58      0.39
 MEAN    16.57   478.33    214.35    427.62   1185.17      0.40
 HUB     13.89   517.11    286.26    430.64   1183.72      0.44

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    497.74    521.81    302.44      0.44   3689.88
 MEAN   436.94    482.09    222.59      0.41   3554.98       1.36
 HUB    366.18    438.00     79.92      0.37   3978.21
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.89     1.09    20.56   603.50     1.03   585.23     0.92     0.91
 MEAN    22.82     1.08    20.40   602.93     1.03   583.83     0.92     0.91
 HUB     23.04     1.09    20.20   604.72     1.03   582.40     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.67    35.42    31.50     3.92     0.93     0.25     2.90
 MEAN    26.62    27.50    23.50     4.00     0.92     0.26     3.29     0.91
 HUB     33.61    10.51     6.50     4.01     0.92     0.28     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     470.996     215.554     418.777    1186.548       0.397       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.889      20.531     585.201      46.000      27.236      32.400       5.164

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     439.573     215.554     489.579    1188.967       0.370       0.165

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.865      20.804     587.590     456.573       0.019       0.267

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     417.620       0.000     417.620    1190.555       0.351       0.161

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.937     589.160       0.000       0.060       0.046       0.218

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.851      22.799       1.082     603.718      15.828     280.422       2.174

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98637.820       0.398     742.422 1192884.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.481   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    133.191    3021.000      22.799     603.718       1.000       1.000       0.980
W Kg/sec =   60.54141

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.648    2800.218       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 102461.570  104510.578       1.889     509.668     269.840     390.276       1.446

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   389.15    -0.13   389.15     0.33   447.66
 MEAN    15.91     0.00    -0.02   389.15    -0.13   389.15     0.33
 HUB     13.07     0.00    -0.02   389.15    -0.13   389.15     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.15    47.36     3.79   482.97   620.35    21.18   591.08     0.52
 MEAN    47.16    44.80     2.36   419.52   572.32    21.18   591.08     0.48
 HUB     41.53    38.84     2.69   344.57   519.86    21.18   591.08     0.44

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
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      0.500       0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
  TIP     17.94   444.07   182.76   404.72  1202.55     0.37
  MEAN    15.50   451.56   195.13   407.22  1200.91     0.38
  HUB     12.59   483.28   255.47   410.24  1199.24     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    472.96   498.01   290.20     0.41  3281.13
  MEAN   408.57   459.76   213.43     0.38  3026.25     1.35
  HUB    331.91   417.30    76.44     0.35  3218.16

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     24.48     1.07    22.28   617.60     1.02   601.14     0.92     0.90
  MEAN    24.35     1.07    22.08   616.52     1.02   599.50     0.92     0.90
  HUB     24.45     1.07    21.86   617.33     1.02   597.84     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     24.30    35.64    31.50     4.14     0.93     0.25     2.90
  MEAN    25.60    27.66    23.50     4.16     0.91     0.25     3.34     0.90
  HUB     31.91    10.55     6.50     4.05     0.91     0.26     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.980

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     456.230     198.713     410.681    1201.180       0.380      -0.006

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      24.379      22.067     599.778      46.000      25.821      33.000       7.179

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     436.445     198.713     479.553    1202.655       0.363       0.056

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      24.323      22.206     601.251     440.827       0.044       0.253

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     407.800       0.000     407.800    1204.672       0.339       0.161

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      22.445     603.269       0.000       0.060       0.054       0.158

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.829      24.300       1.066     617.147      13.429     307.740       2.386

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   83718.688       0.374     630.130 1242496.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     587655.06   4423.1323    130.1144      1.6085      0.8092      8.4806      1.1804


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

    Fan-Core + 4 Stage LPC 80%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
131.020	3021.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 59.55438

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
127.993	3009.102	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
100791.102	102806.711	2.231	831.557	372.744	619.754	1.663

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	301.69	-0.10	301.69	0.27	541.71
MEAN	17.06	0.00	-0.02	301.69	-0.10	301.69	0.27	
HUB	12.51	0.00	-0.02	301.69	-0.10	301.69	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.99	50.47	10.52	543.87	622.04	14.35	515.21	0.56
MEAN	56.15	47.20	8.95	449.76	541.66	14.35	515.21	0.49
HUB	47.56	38.62	8.94	329.80	447.05	14.35	515.21	0.40

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	518.19	326.74	402.19	1128.23	0.46
MEAN	18.04	539.10	351.70	408.57	1124.46	0.48
HUB	15.00	606.22	437.56	419.58	1118.58	0.54

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	543.87	457.06	217.13	0.41	6742.85	
MEAN	475.49	426.92	123.79	0.38	6344.99	1.43
HUB	395.45	421.69	42.11	0.38	6564.67	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.90	1.18	15.48	551.37	1.05	528.94	0.92	0.91
MEAN	17.72	1.17	15.14	549.68	1.05	525.41	0.92	0.91
HUB	17.82	1.18	14.59	550.61	1.05	519.92	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.09	28.36	24.20	4.16	0.93	0.36	2.90	
MEAN	40.72	16.86	12.70	4.16	0.93	0.31	3.51	0.91
HUB	46.20	-5.73	-9.30	3.57	0.93	0.17	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	546.368	351.014	418.697	1124.673	0.486	-0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.784	15.130	525.620	24.000	39.975	35.400	-4.575

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	441.869	351.014	564.322	1133.864	0.390	0.333

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.749	15.982	534.245	528.796	0.023	0.466

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	409.131	0.000	409.131	1136.330	0.360	0.381

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.173	536.572	0.000	0.060	0.044	0.403

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.873	17.691	1.171	550.553	27.743	201.055	1.559

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
172722.875	0.584	1278.847	1268596.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
131.020	3021.000	17.691	550.553	1.000	1.000	0.980

W Kg/sec = 59.55438

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
112.159	2932.307	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
100791.102	102806.711	1.808	590.487	326.637	474.134	1.452

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	390.46	-0.13	390.46	0.34	525.84
MEAN	18.08	0.00	-0.02	390.46	-0.13	390.46	0.34	
HUB	15.21	0.00	-0.02	390.46	-0.13	390.46	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.23	46.36	7.87	541.76	667.92	16.30	537.82	0.59
MEAN	50.68	42.30	8.38	476.60	616.23	16.30	537.82	0.54
HUB	45.77	37.84	7.93	400.98	559.78	16.30	537.82	0.49

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	476.01	255.14	401.86	1154.29	0.41
MEAN	18.01	485.33	265.73	406.12	1151.63	0.42
HUB	15.22	525.16	326.90	411.00	1148.97	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	491.62	283.20	0.43	5212.74	
MEAN	474.80	456.77	209.07	0.40	4788.16	1.47
HUB	401.33	417.69	74.42	0.36	4978.48	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.05	1.13	17.84	572.62	1.04	553.70	0.92	0.91
MEAN	19.85	1.12	17.57	570.82	1.04	551.15	0.92	0.91
HUB	19.94	1.13	17.28	571.63	1.04	548.60	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.41	35.17	31.50	3.67	0.93	0.33	2.90	
MEAN	33.20	27.24	23.50	3.74	0.93	0.32	3.30	0.91
HUB	38.50	10.26	6.50	3.76	0.93	0.33	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	736.533	266.473	686.639	1125.456	0.654	-1.100

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.926	14.940	526.389	46.000	21.210	30.600	9.390

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	702.827	266.473	751.647	1129.779	0.622	-0.954

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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      19.841      15.280     530.441     345.258       0.046       0.180

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     693.182       0.000     693.182    1130.984       0.613       0.154

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      15.307     531.565       0.000       0.060       0.092      -0.943

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.827      19.731       1.115     571.691      21.138     236.278       1.832

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 131651.844       0.454     974.755 1155394.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.823

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.020    3021.000      19.731     571.691       1.000       1.000       0.680
W Kg/sec =   59.55438

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.480    2877.585       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100791.102  102806.711       1.268     378.495     298.457     293.880       0.985

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   616.95    -0.21   616.95     0.54   503.98
 MEAN    17.74     0.00    -0.02   616.95    -0.21   616.95     0.54
 HUB     15.05     0.00    -0.02   616.95    -0.21   616.95     0.54

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     40.63    46.36    -5.73   529.11   812.90    16.16   539.91     0.71
 MEAN    37.17    43.40    -6.23   467.64   774.28    16.16   539.91     0.68
 HUB     32.76    38.84    -6.08   396.77   733.63    16.16   539.91     0.64

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   461.47   199.24   416.24  1171.76     0.39
 MEAN    17.51   472.51   219.69   418.33  1170.43     0.40
 HUB     14.85   513.35   292.44   421.91  1169.14     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   526.87   323.02     0.45  3951.18
 MEAN   461.53   483.21   241.84     0.41  3849.71     1.69
 HUB    391.49   433.38    99.05     0.37  4345.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.29     1.08    19.13   588.41     1.03   570.63     0.92     0.75
 MEAN    21.25     1.08    18.99   587.98     1.03   569.34     0.92     0.75
 HUB     21.45     1.09    18.79   590.08     1.03   568.08     0.92     0.75

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.58    37.81    31.50     6.31     0.93     0.39     2.90
 MEAN    27.71    30.03    23.50     6.53     0.87     0.42     3.28     0.75
 HUB     34.73    13.21     6.50     6.71     0.87     0.46     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.823
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     477.906     221.127     423.670    1170.849       0.408       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.306      18.994     569.757      46.000      27.562      31.500       3.938

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     438.895     221.127     491.453    1173.913       0.374       0.151

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.286      19.326     572.744     471.992       0.018       0.264

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     425.932       0.000     425.932    1174.872       0.363       0.166

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.385     573.680       0.000       0.060       0.042       0.177

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.708      21.230       1.076     588.826      17.135     278.264       2.157

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 106756.695       0.391     790.431 1792400.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.020    3021.000      21.230     588.826       1.000       1.000       0.980
W Kg/sec =   59.55438

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.657    2835.406       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100791.102  102806.711       1.823     513.330     281.509     401.059       1.425

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   399.84    -0.14   399.84     0.34   476.55
 MEAN    16.97     0.00    -0.02   399.84    -0.14   399.84     0.34
 HUB     14.32     0.00    -0.02   399.84    -0.14   399.84     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.79    46.36     5.43   507.76   646.40    19.60   575.48     0.55
 MEAN    48.22    43.80     4.42   447.40   600.14    19.60   575.48     0.51
 HUB     43.37    37.84     5.53   377.52   550.00    19.60   575.48     0.47

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   461.05   203.80   413.56  1188.76     0.39
 MEAN    16.57   471.00   220.51   416.19  1187.14     0.40
 HUB     13.89   509.05   288.54   419.38  1185.50     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   507.38   293.94     0.43  3850.34
 MEAN   436.94   469.10   216.43     0.40  3657.03     1.38
 HUB    366.18   426.51    77.65     0.36  4009.77

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.15     1.09    20.87   605.12     1.03   587.37     0.92     0.91
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 MEAN    23.06     1.09    20.68   604.30     1.03   585.78     0.92     0.91
 HUB     23.24     1.09    20.47   605.79     1.03   584.16     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.23    35.40    31.50     3.90     0.93     0.27     2.90
 MEAN    27.92    27.48    23.50     3.98     0.92     0.27     3.29     0.91
 HUB     34.53    10.49     6.50     3.99     0.92     0.29     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     464.070     221.749     407.662    1188.464       0.390       0.053

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.124      20.814     587.093      46.000      28.544      32.400       3.856

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     427.172     221.749     481.299    1191.239       0.359       0.188

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.106      21.139     589.837     456.573       0.017       0.286

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096     405.880       0.000     405.880    1192.733       0.340       0.184

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      21.269     591.318       0.000       0.060       0.042       0.241

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.863      23.046       1.086     605.068      16.242     271.508       2.105

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 101222.562       0.409     749.456 1168354.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.987

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    131.020    3021.000      23.046     605.068       1.000       1.000       0.980
W Kg/sec =   59.55438

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     90.261    2797.092       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100791.102  102806.711       1.939     509.668     262.890     390.276       1.485

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   378.41    -0.13   378.41     0.32   447.16
 MEAN    15.91     0.00    -0.02   378.41    -0.13   378.41     0.32
 HUB     13.07     0.00    -0.02   378.41    -0.13   378.41     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.93    47.36     4.57   482.97   613.66    21.50   593.12     0.51
 MEAN    47.96    44.80     3.16   419.52   565.07    21.50   593.12     0.47
 HUB     42.33    38.84     3.49   344.57   511.87    21.50   593.12     0.43

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     17.94   436.97   191.60   392.72  1205.09     0.36
 MEAN    15.50   443.83   201.56   395.43  1203.26     0.37
 HUB     12.59   474.71   257.85   398.58  1201.41     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   483.11   281.36     0.40  3439.68
 MEAN   408.57   446.34   207.01     0.37  3125.70     1.38
 HUB    331.91   405.40    74.06     0.34  3248.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.84     1.08    22.68   619.62     1.02   603.68     0.92     0.90
 MEAN    24.67     1.07    22.46   618.29     1.02   601.85     0.92     0.90
 HUB     24.74     1.07    22.21   618.81     1.02   600.00     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.01    35.62    31.50     4.12     0.93     0.27     2.90
 MEAN    27.01    27.63    23.50     4.13     0.91     0.26     3.34     0.90
 HUB     32.90    10.53     6.50     4.03     0.91     0.27     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     448.480     205.251     398.755    1203.521       0.373      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.704      22.443     602.119      46.000      27.236      33.000       5.764

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     422.848     205.251     470.030    1205.382       0.351       0.086

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.662      22.648     603.982     440.827       0.038       0.273

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     395.307       0.000     395.307    1207.257       0.327       0.188

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.875     605.863       0.000       0.060       0.048       0.185

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.846      24.640       1.069     618.903      13.835     296.760       2.300

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  86249.477       0.386     638.594 1216540.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    598603.44   4432.0830    127.9930      1.6310      0.8193      8.9529      1.1838


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

   Fan-Core + 4 Stage LPC 80%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   57.29363
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
123.134	3009.102	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96964.961	98904.055	2.319	831.557	358.594	619.754	1.728

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	289.39	-0.10	289.39	0.26	541.71
MEAN	17.06	0.00	-0.02	289.39	-0.10	289.39	0.26	
HUB	12.51	0.00	-0.02	289.39	-0.10	289.39	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.99	50.47	11.52	543.87	616.16	14.41	515.82	0.55
MEAN	57.25	47.20	10.05	449.76	534.90	14.41	515.82	0.48
HUB	48.74	38.62	10.12	329.80	438.84	14.41	515.82	0.39

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	510.93	336.16	384.78	1129.77	0.45
MEAN	18.04	529.54	357.00	391.11	1125.80	0.47
HUB	15.00	592.54	435.76	401.52	1119.93	0.53

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	543.87	437.26	207.72	0.39	6936.94	
MEAN	475.49	408.66	118.49	0.36	6440.60	1.48
HUB	395.45	403.53	40.32	0.36	6537.71	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.97	1.19	15.61	552.19	1.06	530.38	0.92	0.91
MEAN	17.75	1.17	15.25	550.09	1.05	526.67	0.92	0.91
HUB	17.79	1.18	14.70	550.50	1.05	521.17	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.14	28.36	24.20	4.16	0.93	0.38	2.90	
MEAN	42.39	16.85	12.70	4.15	0.94	0.33	3.51	0.91
HUB	47.34	-5.73	-9.30	3.57	0.94	0.19	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.991

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	536.210	356.309	400.705	1126.052	0.476	-0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.810	15.246	526.909	24.000	41.644	35.400	-6.244

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	422.054	356.309	552.345	1135.773	0.372	0.364

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.769	16.151	536.046	528.796	0.025	0.492

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	391.390	0.000	391.390	1137.978	0.344	0.402

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.312	538.129	0.000	0.060	0.050	0.424

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.866	17.705	1.172	550.924	28.114	194.961	1.511

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 175032.500       0.592    1246.752 1216867.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3021.000      17.705     550.924       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    107.855    2931.319       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 96964.961   98904.055       1.880     590.487     314.102     474.134       1.509

    ROTOR LEADING EDGE CONDITIONS, STAGE             2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   373.74    -0.13   373.74     0.33   525.67
MEAN    18.08     0.00    -0.02   373.74    -0.13   373.74     0.33
HUB     15.21     0.00    -0.02   373.74    -0.13   373.74     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.41    46.36     9.05   541.76   658.28    16.43   539.26     0.58
MEAN    51.90    42.30     9.60   476.60   605.77    16.43   539.26     0.53
HUB     47.02    37.84     9.18   400.98   548.25    16.43   539.26     0.48

     ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   468.24   267.88   384.04  1156.46     0.40
MEAN    18.01   475.94   275.01   388.44  1153.54     0.41
HUB     15.22   513.67   330.24   393.45  1150.62     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    538.34   469.72   270.46     0.41  5472.74
MEAN   474.80   436.81   199.79     0.38  4955.27     1.51
HUB    401.33   399.82    71.08     0.35  5029.25

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.18     1.14    18.02   574.09     1.04   555.78     0.92     0.91
MEAN    19.94     1.13    17.73   571.90     1.04   552.99     0.92     0.91
HUB     19.97     1.13    17.41   572.21     1.04   550.18     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.90    35.15    31.50     3.65     0.93     0.36     2.90
MEAN    35.30    27.22    23.50     3.72     0.94     0.35     3.30     0.91
HUB     40.01    10.24     6.50     3.74     0.94     0.35     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.993

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     702.837     275.784     646.470    1130.888       0.621      -1.004

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.005      15.414     531.485      46.000      23.103      30.600       7.497

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     657.778     275.784     713.252    1136.322       0.579      -0.795

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.650      19.944      15.889     536.605     345.258       0.037       0.210
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	647.715	0.000	647.715	1137.486	0.569	0.229

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	15.942	537.702	0.000	0.060	0.069	-0.771

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.849	19.869	1.122	572.736	21.812	225.783	1.750

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
135851.672	0.469	967.668	1105473.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =10.047 EfDer = 0.860

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
126.046	3021.000	19.869	572.736	1.000	1.000	0.680

W Kg/sec = 57.29363

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
97.993	2874.958	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96964.961	98904.055	1.326	378.495	285.390	293.880	1.030

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	580.55	-0.20	580.55	0.51	503.52
MEAN	17.74	0.00	-0.02	580.55	-0.20	580.55	0.51	
HUB	15.05	0.00	-0.02	580.55	-0.20	580.55	0.51	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	42.36	46.36	-4.00	529.11	785.63	16.67	544.60	0.69
MEAN	38.86	43.40	-4.54	467.64	745.60	16.67	544.60	0.65
HUB	34.36	38.84	-4.48	396.77	703.29	16.67	544.60	0.61

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	449.89	217.94	393.58	1175.33	0.38
MEAN	17.51	459.82	233.62	396.06	1173.57	0.39
HUB	14.85	498.87	298.58	399.66	1171.86	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	497.50	304.31	0.42	4321.47	
MEAN	461.53	456.95	227.91	0.39	4093.36	1.73
HUB	391.49	410.32	92.92	0.35	4436.86	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.67	1.09	19.58	591.02	1.03	574.13	0.92	0.79
MEAN	21.57	1.09	19.40	590.06	1.03	572.41	0.92	0.79
HUB	21.72	1.09	19.17	591.51	1.03	570.73	0.92	0.79

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.98	37.71	31.50	6.21	0.93	0.41	2.90	
MEAN	30.53	29.92	23.50	6.42	0.88	0.43	3.28	0.79
HUB	36.76	13.09	6.50	6.59	0.88	0.47	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.860

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

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     17.392     464.856     235.149     400.994    1173.994       0.396       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.628      19.410     572.824      46.000      30.388      31.500       1.112

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     413.957     235.149     476.083    1177.815       0.351       0.203

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.615      19.843     576.558     471.992       0.016       0.306

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     401.773       0.000     401.773    1178.662       0.341       0.215

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.898     577.388       0.000       0.060       0.037       0.227

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.751      21.567       1.085     590.865      18.129     258.750       2.006

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 112951.695       0.414     804.552 1693072.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3021.000      21.567     590.865       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.696    2830.510       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       1.922     513.330     267.061     401.059       1.502

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   377.54    -0.13   377.54     0.32   475.72
 MEAN    16.97     0.00    -0.02   377.54    -0.13   377.54     0.32
 HUB     14.32     0.00    -0.02   377.54    -0.13   377.54     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.37    46.36     7.01   507.76   632.84    20.09   578.97     0.54
 MEAN    49.85    43.80     6.05   447.40   585.51    20.09   578.97     0.50
 HUB     45.01    37.84     7.17   377.52   534.00    20.09   578.97     0.45

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   447.77   221.58   389.10  1193.26     0.38
 MEAN    16.57   456.33   233.42   392.11  1191.27     0.38
 HUB     13.89   492.47   293.31   395.59  1189.25     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   477.14   276.16     0.40  4185.90
 MEAN   436.94   441.78   203.52     0.37  3870.89     1.44
 HUB    366.18   402.25    72.87     0.34  4076.00

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.70     1.10    21.50   608.57     1.03   591.84     0.92     0.91
 MEAN    23.54     1.09    21.27   607.24     1.03   589.86     0.92     0.91
 HUB     23.64     1.10    21.01   608.11     1.03   587.87     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.66    35.36    31.50     3.86     0.93     0.31     2.90
 MEAN    30.77    27.43    23.50     3.93     0.93     0.31     3.29     0.91
 HUB     36.56    10.44     6.50     3.94     0.93     0.32     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     450.264     234.733     384.236    1192.464       0.378       0.051

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.603      21.388     591.053      46.000      31.421      32.400       0.979

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     401.297     234.733     464.907    1195.970       0.336       0.237

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.591      21.820     594.533     456.573       0.015       0.328

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     381.457       0.000     381.457    1197.273       0.319       0.232

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.938     595.830       0.000       0.060       0.037       0.287

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.877      23.539       1.091     607.975      17.110     253.722       1.967

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 106633.461       0.430     759.547 1113932.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  0.997

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    126.046    3021.000      23.539     607.975       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     85.221    2790.397       1.401       0.249      53.349       56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       2.053     509.668     248.211     390.276       1.572

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   356.00    -0.12   356.00     0.30   446.09
 MEAN    15.91     0.00    -0.02   356.00    -0.12   356.00     0.30
 HUB     13.07     0.00    -0.02   356.00    -0.12   356.00     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.61    47.36     6.25   482.97   600.10    22.14   597.40     0.50
 MEAN    49.69    44.80     4.89   419.52   550.31    22.14   597.40     0.46
 HUB     44.07    38.84     5.23   344.57   495.53    22.14   597.40     0.41

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   423.65   209.71   368.10  1210.29     0.35
 MEAN    15.50   428.75   214.73   371.11  1208.10     0.35
 HUB     12.59   457.44   262.71   374.48  1205.90     0.38
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       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   452.55   263.25     0.37  3764.43
 MEAN   408.57   418.68   193.84     0.35  3329.72     1.44
 HUB    331.91   380.82    69.20     0.32  3309.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.56     1.09    23.48   623.89     1.03   608.92     0.92     0.91
 MEAN    25.32     1.08    23.21   622.06     1.02   606.72     0.92     0.91
 HUB     25.31     1.08    22.91   621.97     1.02   604.51     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.67    35.57    31.50     4.07     0.93     0.31     2.90
 MEAN    30.05    27.58    23.50     4.08     0.92     0.30     3.34     0.91
 HUB     35.05    10.47     6.50     3.97     0.92     0.30     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     433.403     218.666     374.198    1208.350       0.359      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.353      23.194     606.965      46.000      30.300      33.000       2.700

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     395.251     218.666     451.706    1210.974       0.326       0.149

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.330      23.527     609.604     440.827       0.030       0.317

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     369.885       0.000     369.885    1212.581       0.305       0.243

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.727     611.223       0.000       0.060       0.039       0.240

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      25.311       1.075     622.640      14.665     275.513       2.136

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   91432.930       0.409     651.274 1159248.000

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     621902.25   4429.7930    123.1343      1.6754      0.8352     10.0471      1.1909


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 80%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  0.986

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     121.700    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   55.31819

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     118.889    3009.102       1.402       0.249      53.349      32.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
93621.680	95493.914	2.402	831.557	346.230	619.754	1.790

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	278.73	-0.10	278.73	0.25	541.71
MEAN	17.06	0.00	-0.02	278.73	-0.10	278.73	0.25	
HUB	12.51	0.00	-0.02	278.73	-0.10	278.73	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.87	50.47	12.40	543.87	611.22	14.46	516.32	0.55
MEAN	58.22	47.20	11.02	449.76	529.21	14.46	516.32	0.47
HUB	49.81	38.62	11.19	329.80	431.89	14.46	516.32	0.39

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	505.24	344.12	369.93	1131.02	0.45
MEAN	18.04	521.71	361.50	376.17	1126.90	0.46
HUB	15.00	581.00	434.18	386.07	1121.03	0.52

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	543.87	420.42	199.75	0.37	7101.16	
MEAN	475.49	393.06	113.99	0.35	6521.64	1.53
HUB	395.45	388.01	38.73	0.35	6513.94	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.02	1.19	15.71	552.88	1.06	531.56	0.92	0.90
MEAN	17.77	1.18	15.34	550.43	1.05	527.70	0.92	0.90
HUB	17.77	1.18	14.79	550.40	1.05	522.20	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.93	28.37	24.20	4.17	0.93	0.41	2.90	
MEAN	43.86	16.86	12.70	4.16	0.94	0.36	3.51	0.90
HUB	48.36	-5.73	-9.30	3.57	0.94	0.22	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.986

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	527.884	360.797	385.341	1127.176	0.468	-0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.828	15.338	527.962	24.000	43.116	35.400	-7.716

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	405.255	360.797	542.592	1137.333	0.356	0.390

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.781	16.285	537.519	528.796	0.028	0.515

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	376.320	0.000	376.320	1139.329	0.330	0.420

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.419	539.408	0.000	0.060	0.056	0.442

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.858	17.709	1.172	551.236	28.426	189.757	1.471

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
176978.844	0.598	1217.150	1172050.250

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    3021.000      17.709     551.236       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.140    2930.488       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 93621.680   95493.914       1.947     590.487     303.283     474.134       1.563

    ROTOR LEADING EDGE CONDITIONS, STAGE           2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   359.51    -0.12   359.51     0.32   525.52
MEAN    18.08     0.00    -0.02   359.51    -0.12   359.51     0.32
HUB     15.21     0.00    -0.02   359.51    -0.12   359.51     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.44    46.36    10.08   541.76   650.30    16.53   540.44     0.57
MEAN    52.98    42.30    10.68   476.60   597.09    16.53   540.44     0.52
HUB     48.13    37.84    10.29   400.98   538.64    16.53   540.44     0.47

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   462.38   278.51   369.09  1158.21     0.40
MEAN    18.01   468.51   282.80   373.53  1155.09     0.41
HUB     15.22   504.23   333.05   378.59  1151.97     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    538.34   451.37   259.83     0.39  5689.68
MEAN   474.80   419.99   192.00     0.36  5095.42     1.55
HUB    401.33   384.70    68.28     0.33  5071.92

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.27     1.14    18.16   575.32     1.04   557.47     0.92     0.90
MEAN    19.99     1.13    17.85   572.81     1.04   554.48     0.92     0.90
HUB     19.98     1.13    17.51   572.71     1.04   551.48     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.04    35.14    31.50     3.64     0.93     0.38     2.90
MEAN    37.13    27.20    23.50     3.70     0.94     0.37     3.30     0.90
HUB     41.34    10.22     6.50     3.72     0.94     0.36     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.988

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     676.911     283.592     614.642    1134.990       0.596      -0.929

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.060      15.767     535.349      46.000      24.768      30.600       5.832

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     622.877     283.592     684.398    1141.190       0.546      -0.670

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.650      20.013      16.340     541.214     345.258       0.031       0.235

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     17.823     612.934       0.000     612.934    1142.273       0.537       0.284

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650     16.403     542.240       0.000       0.060       0.055      -0.642

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859     19.959       1.127     573.613      22.376     217.243       1.684

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 139365.188       0.481     958.467 1062600.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  0.892

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    3021.000      19.959     573.613       1.000       1.000       0.680
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     94.258    2872.760       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       1.379     378.495     274.513     293.880       1.071

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   551.89    -0.19   551.89     0.48   503.13
 MEAN    17.74     0.00    -0.02   551.89    -0.19   551.89     0.48
 HUB     15.05     0.00    -0.02   551.89    -0.19   551.89     0.48

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.80    46.36    -2.56   529.11   764.69    17.04   548.18     0.67
 MEAN    40.29    43.40    -3.11   467.64   723.50    17.04   548.18     0.63
 HUB     35.73    38.84    -3.11   396.77   679.82    17.04   548.18     0.59

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   441.64   233.06   375.13  1178.15     0.37
 MEAN    17.51   450.31   244.88   377.90  1176.06     0.38
 HUB     14.85   487.53   303.50   381.54  1174.03     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   473.67   289.20     0.40  4620.73
 MEAN   461.53   435.60   216.65     0.37  4290.36     1.76
 HUB    391.49   391.56    88.00     0.33  4509.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.96     1.10    19.93   593.17     1.03   576.88     0.92     0.82
 MEAN    21.82     1.09    19.71   591.77     1.03   574.84     0.92     0.82
 HUB     21.91     1.10    19.46   592.70     1.03   572.85     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.85    37.63    31.50     6.13     0.93     0.43     2.90
 MEAN    32.94    29.83    23.50     6.33     0.89     0.45     3.28     0.82
 HUB     38.50    12.99     6.50     6.49     0.89     0.48     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.892

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     455.069     246.486     382.534    1176.480       0.387       0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     21.876      19.729     575.255      46.000      32.796      31.500      -1.296

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     393.885     246.486     464.651    1180.906       0.334       0.246

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.864      20.241     579.592     471.992       0.015       0.341

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     382.422       0.000     382.422    1181.663       0.324       0.255

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.288     580.335       0.000       0.060       0.037       0.267

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.783      21.816       1.093     592.545      18.932     244.215       1.893

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 117954.109       0.432     811.215 1612511.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    3021.000      21.816     592.545       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     87.646    2826.496       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       2.011     513.330     255.265     401.059       1.571

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   359.62    -0.12   359.62     0.30   475.05
 MEAN    16.97     0.00    -0.02   359.62    -0.12   359.62     0.30
 HUB     14.32     0.00    -0.02   359.62    -0.12   359.62     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.70    46.36     8.34   507.76   622.31    20.46   581.75     0.53
 MEAN    51.22    43.80     7.42   447.40   574.12    20.46   581.75     0.49
 HUB     46.40    37.84     8.56   377.52   521.48    20.46   581.75     0.44

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   438.48   235.56   369.83  1196.76     0.37
 MEAN    16.57   445.54   243.61   373.04  1194.49     0.37
 HUB     13.89   479.71   297.05   376.68  1192.21     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   453.33   262.17     0.38  4449.83
 MEAN   436.94   420.16   193.33     0.35  4039.65     1.49
 HUB    366.18   382.97    69.14     0.32  4127.76

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.11     1.11    21.97   611.37     1.03   595.32     0.92     0.91
 MEAN    23.89     1.10    21.70   609.63     1.03   593.07     0.92     0.91
 HUB     23.94     1.10    21.41   610.01     1.03   590.80     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.49    35.33    31.50     3.83     0.93     0.34     2.90
 MEAN    33.15    27.40    23.50     3.90     0.93     0.33     3.29     0.91
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 HUB     38.26    10.40     6.50     3.90     0.93     0.34     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     440.149     244.979     365.672    1195.598       0.368       0.049

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.956      21.813     594.167      46.000      33.820      32.400      -1.420

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     381.010     244.979     452.972    1199.669       0.318       0.277

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.946      22.327     598.220     456.573       0.015       0.364

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     362.378       0.000     362.378    1200.828       0.302       0.270

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.430     599.376       0.000       0.060       0.037       0.322

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.880      23.894       1.095     610.337      17.792     240.463       1.864

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 110891.031       0.448     762.640 1068047.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  1.000

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    121.700     3021.000       23.894     610.337       1.000        1.000       0.980
W Kg/sec =   55.31819

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     81.217     2784.993        1.401       0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  93621.680   95493.914        2.155     509.668     236.549     390.276       1.650

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   338.44    -0.12   338.44     0.28   445.23
 MEAN    15.91      0.00    -0.02   338.44    -0.12   338.44     0.28
 HUB     13.07      0.00    -0.02   338.44    -0.12   338.44     0.28

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     54.99     47.36     7.63   482.97   589.85     22.61   600.78     0.49
 MEAN    51.11     44.80     6.31   419.52   539.11     22.61   600.78     0.45
 HUB     45.52     38.84     6.68   344.57   483.06     22.61   600.78     0.40

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     17.94   414.62    223.59    349.17  1214.30      0.34
 MEAN    15.50   417.97    224.88    352.32  1211.86      0.34
 HUB     12.59   444.50    266.45    355.79  1209.42      0.37

       U2        W2        Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96    429.07    249.37     0.35  4013.33
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 MEAN   408.57   397.32   183.69     0.33  3486.97     1.49
 HUB    331.91   361.76    65.46     0.30  3356.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.08     1.09    24.06   627.31     1.03   612.96     0.92     0.91
 MEAN    25.79     1.08    23.75   625.08     1.02   610.50     0.92     0.91
 HUB     25.72     1.08    23.42   624.53     1.02   608.04     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.63    35.53    31.50     4.03     0.93     0.34     2.90
 MEAN    32.55    27.54    23.50     4.04     0.93     0.32     3.34     0.91
 HUB     36.83    10.43     6.50     3.93     0.93     0.32     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     422.652     229.005     355.235    1212.089       0.349      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.820      23.736     610.734      46.000      32.808      33.000       0.192

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     374.265     229.005     438.768    1215.278       0.308       0.197

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      25.805      24.161     613.951     440.827       0.027       0.354

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     350.512       0.000     350.512    1216.699       0.288       0.285

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.340     615.388       0.000       0.060       0.037       0.281

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      25.785       1.079     625.640      15.303     260.178       2.017

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  95415.570       0.427     656.209 1111159.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    640604.69   4405.6812    118.8887      1.7068      0.8423     11.0174      1.1967



**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 80%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    117.504    3021.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   53.41085

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    114.790    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 90393.664   92201.352       2.488     831.557     334.292     619.754       1.854

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   268.52    -0.09   268.52     0.24   541.71
MEAN    17.06     0.00    -0.02   268.52    -0.09   268.52     0.24
HUB     12.51     0.00    -0.02   268.52    -0.09   268.52     0.24

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     63.73    50.47    13.26   543.87   606.63    14.51   516.79     0.54
MEAN    59.17    47.20    11.97   449.76   523.90    14.51   516.79     0.47
HUB     50.86    38.62    12.24   329.80   425.36    14.51   516.79     0.38

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   500.29   351.61   355.90  1132.16     0.44
MEAN    18.04   514.58   365.72   362.00  1127.90     0.46
HUB     15.00   570.20   432.64   371.42  1122.03     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    543.87   404.51   192.26     0.36  7255.70
MEAN   475.49   378.28   109.77     0.34  6597.71     1.57
HUB    395.45   373.27    37.19     0.33  6490.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.07     1.20    15.80   553.54     1.06   532.63     0.92     0.90
MEAN    17.79     1.18    15.42   550.75     1.05   528.63     0.92     0.90
HUB     17.74     1.17    14.87   550.30     1.05   523.14     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.65    28.38    24.20     4.18     0.93     0.43     2.90
MEAN    45.29    16.87    12.70     4.17     0.94     0.38     3.51     0.90
HUB     49.35    -5.72    -9.30     3.58     0.94     0.24     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.981

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     520.297     365.009     370.780    1128.197       0.461       0.000

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.842      15.419     528.919      24.000      44.551      35.400      -9.151

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     389.426     365.009     533.746    1138.753       0.342       0.415

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.788      16.404     538.863     528.796       0.031       0.538

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     362.091       0.000     362.091    1140.565       0.317       0.437

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.512     540.578       0.000       0.060       0.064       0.459

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.848      17.708       1.172     551.529      28.719     184.822       1.433

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 178801.688       0.604    1187.288 1129097.250
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    117.504    3021.000      17.708     551.529       1.000       1.000       0.980
W Kg/sec =   53.41085

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.584    2929.710       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 90393.664   92201.352       2.016     590.487     292.928     474.134       1.619

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   346.06    -0.12   346.06     0.30   525.38
MEAN    18.08     0.00    -0.02   346.06    -0.12   346.06     0.30
HUB     15.21     0.00    -0.02   346.06    -0.12   346.06     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.44    46.36    11.08   541.76   642.96    16.61   541.53     0.56
MEAN    54.02    42.30    11.72   476.60   589.08    16.61   541.53     0.52
HUB     49.21    37.84    11.37   400.98   529.75    16.61   541.53     0.46

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   457.46   288.40   355.10  1159.79     0.39
MEAN    18.01   461.93   290.02   359.54  1156.50     0.40
HUB     15.22   495.55   335.62   364.59  1153.20     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    538.34   434.23   249.93     0.37  5891.65
MEAN   474.80   404.25   184.78     0.35  5225.37     1.60
HUB    401.33   370.47    65.71     0.32  5110.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.35     1.15    18.28   576.47     1.05   559.00     0.92     0.90
MEAN    20.04     1.13    17.95   573.65     1.04   555.83     0.92     0.90
HUB     19.98     1.13    17.60   573.17     1.04   552.66     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.08    35.14    31.50     3.64     0.93     0.40     2.90
MEAN    38.89    27.20    23.50     3.70     0.94     0.39     3.30     0.90
HUB     42.63    10.22     6.50     3.72     0.94     0.38     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.982

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     654.276     290.832     586.084    1138.516       0.575       -0.863

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.100      16.064     538.682      46.000      26.392      30.600       4.208

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     592.055     290.832     659.631    1145.339       0.517       -0.560

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.650      20.065      16.719     545.158     345.258       0.026       0.259

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.823     582.440       0.000     582.440    1146.329       0.508       0.331
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	16.786	546.101	0.000	0.060	0.045	-0.529

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.864	20.024	1.131	574.429	22.900	209.474	1.624

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
142625.078	0.492	947.066	1021800.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =11.967 EfDer = 0.919

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
117.504	3021.000	20.024	574.429	1.000	1.000	0.680

W Kg/sec = 53.41085

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
90.777	2870.719	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
90393.664	92201.352	1.432	378.495	264.375	293.880	1.112

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	526.28	-0.18	526.28	0.46	502.77
MEAN	17.74	0.00	-0.02	526.28	-0.18	526.28	0.46	
HUB	15.05	0.00	-0.02	526.28	-0.18	526.28	0.46	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.16	46.36	-1.20	529.11	746.41	17.35	551.30	0.65
MEAN	41.63	43.40	-1.77	467.64	704.16	17.35	551.30	0.61
HUB	37.03	38.84	-1.81	396.77	659.20	17.35	551.30	0.57

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	435.11	246.81	358.34	1180.64	0.37
MEAN	17.51	442.34	255.13	361.35	1178.27	0.38
HUB	14.85	477.60	307.96	365.04	1175.96	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	451.98	275.45	0.38	4892.85	
MEAN	461.53	416.15	206.40	0.35	4469.60	1.80
HUB	391.49	374.48	83.53	0.32	4575.99	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.22	1.11	20.23	595.13	1.04	579.33	0.92	0.84
MEAN	22.03	1.10	19.98	593.34	1.03	577.01	0.92	0.84
HUB	22.08	1.10	19.70	593.79	1.03	574.75	0.92	0.84

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.56	37.55	31.50	6.05	0.93	0.45	2.90	
MEAN	35.22	29.73	23.50	6.23	0.89	0.46	3.28	0.84
HUB	40.15	12.89	6.50	6.39	0.89	0.49	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.919

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	446.878	256.800	365.724	1178.687	0.379	0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.087	19.999	577.418	46.000	35.075	31.500	-3.575

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	375.758	256.800	455.127	1183.662	0.317	0.286

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.073	20.582	582.303	471.992	0.017	0.376

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	365.012	0.000	365.012	1184.337	0.308	0.289

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.615	582.967	0.000	0.060	0.041	0.301

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.807	22.021	1.100	594.091	19.662	231.808	1.797

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
122503.039	0.449	813.451	1538884.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =11.967 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
117.504	3021.000	22.021	594.091	1.000	1.000	0.980

W Kg/sec = 53.41085

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
83.947	2822.816	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
90393.664	92201.352	2.100	513.330	244.493	401.059	1.640

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	343.46	-0.12	343.46	0.29	474.43
MEAN	16.97	0.00	-0.02	343.46	-0.12	343.46	0.29	
HUB	14.32	0.00	-0.02	343.46	-0.12	343.46	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.93	46.36	9.57	507.76	613.11	20.77	584.24	0.52
MEAN	52.49	43.80	8.69	447.40	564.13	20.77	584.24	0.48
HUB	47.71	37.84	9.87	377.52	510.47	20.77	584.24	0.43

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	431.13	247.91	352.72	1199.83	0.36
MEAN	16.57	436.57	252.66	356.03	1197.34	0.36
HUB	13.89	468.64	300.34	359.75	1194.84	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	432.23	249.83	0.36	4682.81	
MEAN	436.94	400.89	184.28	0.33	4189.55	1.53
HUB	366.18	365.72	65.84	0.31	4173.44	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.45	1.11	22.36	613.90	1.03	598.39	0.92	0.91
MEAN	24.18	1.10	22.06	611.81	1.03	595.91	0.92	0.91
HUB	24.17	1.10	21.74	611.75	1.03	593.41	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.10	35.31	31.50	3.81	0.93	0.36	2.90	
MEAN	35.36	27.37	23.50	3.87	0.93	0.36	3.29	0.91
HUB	39.86	10.37	6.50	3.87	0.93	0.36	3.90	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481      431.774     254.080     349.102     1198.367       0.360       0.047

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     24.246      22.164      596.926      46.000      36.048      32.400      -3.648

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481      363.043     254.080     443.121     1202.936       0.302       0.314

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       24.233      22.748      601.486     456.573       0.016       0.398

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096      345.523       0.000     345.523     1203.971       0.287       0.302

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       22.832      602.522       0.000       0.060       0.041       0.352

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.876       24.177        1.098      612.486       18.396     229.183        1.777

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 114657.594       0.463     761.355 1024948.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  0.999

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     117.504     3021.000       24.177      612.486       1.000        1.000        0.980
W Kg/sec =   53.41085

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
      77.634     2780.102        1.401        0.249       53.349       56.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  90393.664    92201.352        2.254      509.668      226.116      390.276       1.726

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00     -0.02   322.90     -0.11   322.90      0.27    444.45
 MEAN    15.91      0.00     -0.02   322.90     -0.11   322.90      0.27
 HUB     13.07      0.00     -0.02   322.90     -0.11   322.90      0.27

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     56.24     47.36      8.88   482.97    581.06     23.00    603.79      0.48
 MEAN    52.42     44.80      7.62   419.52    529.48     23.00    603.79      0.44
 HUB     46.87     38.84      8.03   344.57    472.30     23.00    603.79      0.39

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500       0.050        0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94    407.66    235.66    332.64   1217.80      0.33
 MEAN    15.50    409.15    233.69    335.85   1215.16      0.34
 HUB     12.59    433.48    269.71    339.36   1212.52      0.36

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    472.96    408.60    237.29      0.34   4229.80
 MEAN   408.57    378.65    174.87      0.31   3623.48       1.54
 HUB    331.91    345.01     62.20      0.28   3397.10
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         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.51     1.10    24.53   630.37     1.03   616.51     0.92     0.91
 MEAN    26.16     1.08    24.19   627.81     1.03   613.84     0.92     0.91
 HUB     26.04     1.08    23.83   626.85     1.02   611.17     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.32    35.50    31.50     4.00     0.93     0.37     2.90
 MEAN    34.83    27.51    23.50     4.01     0.93     0.35     3.34     0.91
 HUB     38.48    10.39     6.50     3.89     0.93     0.34     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     413.886     237.980     338.626    1215.369       0.341       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.194      24.172     614.050      46.000      35.099      33.000      -2.099

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     356.081     237.980     428.285    1219.039       0.292       0.238

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.178      24.671     617.764     440.827       0.028       0.388

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     333.710       0.000     333.710    1220.308       0.273       0.321

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.831     619.052       0.000       0.060       0.038       0.316

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      26.157       1.082     628.344      15.858     247.428       1.918

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98878.023       0.442     656.575 1066111.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    657465.38   4365.7354    114.7895      1.7314      0.8445     11.9669      1.2019


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 80%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.026   EfDer =  0.973

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    112.885    3021.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   51.31144

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    110.278    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  86840.570   88577.203       2.589     831.557     321.152     619.754       1.930

     ROTOR LEADING EDGE CONDITIONS, STAGE            1
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   257.36    -0.09   257.36     0.23   541.71
MEAN    17.06     0.00    -0.02   257.36    -0.09   257.36     0.23
HUB     12.51     0.00    -0.02   257.36    -0.09   257.36     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     64.68    50.47    14.21   543.87   601.77    14.56   517.28     0.54
MEAN    60.23    47.20    13.03   449.76   518.26    14.56   517.28     0.46
HUB     52.04    38.62    13.42   329.80   418.40    14.56   517.28     0.38

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   495.40   359.62   340.73  1133.33     0.44
MEAN    18.04   507.19   370.23   346.66  1128.94     0.45
HUB     15.00   558.68   430.94   355.55  1123.08     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    543.87   387.36   184.25     0.34  7420.78
MEAN   475.49   362.29   105.26     0.32  6678.98     1.63
HUB    395.45   357.31    35.49     0.32  6465.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.12     1.20    15.89   554.24     1.06   533.74     0.92     0.89
MEAN    17.80     1.18    15.50   551.10     1.05   529.61     0.92     0.89
HUB     17.71     1.17    14.95   550.19     1.05   524.12     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.54    28.40    24.20     4.20     0.93     0.46     2.90
MEAN    46.88    16.89    12.70     4.19     0.94     0.41     3.51     0.89
HUB     50.48    -5.70    -9.30     3.60     0.94     0.26     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.973

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     512.427     369.510     355.026    1129.253       0.454       0.001

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.853      15.499     529.909      24.000      46.145      35.400     -10.745

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     372.387     369.510     524.604    1140.227       0.327       0.443

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.792      16.523     540.258     528.796       0.035       0.564

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    18.083     346.738       0.000     346.738    1141.852       0.304       0.454

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.602     541.799       0.000       0.060       0.073       0.476

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.837      17.701       1.172     551.841      29.031     179.480       1.391

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 180741.953       0.611    1152.997 1082160.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.026   EfDer =  0.974
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
112.885	3021.000	17.701	551.841	1.000	1.000	0.980

W Kg/sec = 51.31144

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
96.698	2928.882	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
86840.570	88577.203	2.097	590.487	281.611	474.134	1.684

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	331.52	-0.11	331.52	0.29	525.23
MEAN	18.08	0.00	-0.02	331.52	-0.11	331.52	0.29	
HUB	15.21	0.00	-0.02	331.52	-0.11	331.52	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.54	46.36	12.18	541.76	635.25	16.69	542.66	0.56
MEAN	55.18	42.30	12.88	476.60	580.66	16.69	542.66	0.51
HUB	50.43	37.84	12.59	400.98	520.37	16.69	542.66	0.46

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	452.80	298.91	340.12	1161.42	0.39
MEAN	18.01	455.35	297.74	344.52	1157.96	0.39
HUB	15.22	486.45	338.33	349.52	1154.48	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	415.94	239.43	0.36	6106.06	
MEAN	474.80	387.36	177.06	0.33	5364.33	1.65
HUB	401.33	355.15	63.00	0.31	5152.15	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.42	1.15	18.38	577.69	1.05	560.57	0.92	0.89
MEAN	20.07	1.13	18.04	574.55	1.04	557.24	0.92	0.89
HUB	19.97	1.13	17.67	573.65	1.04	553.89	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.31	35.14	31.50	3.64	0.93	0.43	2.90	
MEAN	40.83	27.20	23.50	3.70	0.94	0.41	3.30	0.89
HUB	44.07	10.22	6.50	3.72	0.94	0.40	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.974

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	631.610	298.575	556.582	1141.998	0.553	-0.796

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.133	16.350	541.984	46.000	28.211	30.600	2.389

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	560.617	298.575	635.168	1149.420	0.488	-0.447

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	20.105	17.083	549.052	345.258	0.023	0.285

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	551.590	0.000	551.590	1150.297	0.480	0.375

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	17.146	549.891	0.000	0.060	0.039	-0.418

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.863	20.072	1.134	575.297	23.457	201.366	1.561

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
146092.844	0.504	931.962	977503.188

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =13.026 EfDer = 0.945

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
112.885	3021.000	20.072	575.297	1.000	1.000	0.680

W Kg/sec = 51.31144

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
87.067	2868.551	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
86840.570	88577.203	1.493	378.495	253.571	293.880	1.159

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	499.98	-0.17	499.98	0.43	502.39
MEAN	17.74	0.00	-0.02	499.98	-0.17	499.98	0.43	
HUB	15.05	0.00	-0.02	499.98	-0.17	499.98	0.43	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.63	46.36	0.27	529.11	728.09	17.64	554.43	0.63
MEAN	43.10	43.40	-0.30	467.64	684.71	17.64	554.43	0.59
HUB	38.45	38.84	-0.39	396.77	638.39	17.64	554.43	0.55

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	429.37	261.02	340.92	1183.15	0.36
MEAN	17.51	434.79	265.72	344.15	1180.52	0.37
HUB	14.85	467.69	312.58	347.89	1177.94	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	429.50	261.23	0.36	5174.29	
MEAN	461.53	395.95	195.81	0.34	4654.87	1.85
HUB	391.49	356.73	78.92	0.30	4644.37	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.47	1.12	20.52	597.19	1.04	581.80	0.92	0.86
MEAN	22.22	1.11	20.23	595.00	1.03	579.21	0.92	0.86
HUB	22.22	1.11	19.93	594.95	1.03	576.69	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.44	37.46	31.50	5.96	0.93	0.47	2.90	
MEAN	37.67	29.64	23.50	6.14	0.90	0.48	3.28	0.86
HUB	41.94	12.78	6.50	6.28	0.90	0.50	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.945

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	439.118	267.462	348.265	1180.923	0.372	0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.284	20.253	579.615	46.000	37.524	31.500	-6.024

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	357.067	267.462	446.131	1186.466	0.301	0.328

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.264	20.907	585.069	471.992	0.019	0.414

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	347.111	0.000	347.111	1187.060	0.292	0.322

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.923	585.655	0.000	0.060	0.049	0.335

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.827	22.203	1.106	595.714	20.416	219.647	1.703

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
127205.969	0.466	811.478	1461616.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =13.026 EfDer = 0.991

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
112.885	3021.000	22.203	595.714	1.000	1.000	0.980

W Kg/sec = 51.31144

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
80.093	2818.968	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
86840.570	88577.203	2.201	513.330	233.270	401.059	1.719

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	326.81	-0.11	326.81	0.28	473.78
MEAN	16.97	0.00	-0.02	326.81	-0.11	326.81	0.28	
HUB	14.32	0.00	-0.02	326.81	-0.11	326.81	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.24	46.36	10.88	507.76	603.93	21.07	586.80	0.51
MEAN	53.86	43.80	10.06	447.40	554.14	21.07	586.80	0.47
HUB	49.13	37.84	11.29	377.52	499.41	21.07	586.80	0.42

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	424.55	260.40	335.31	1202.92	0.35
MEAN	16.57	428.05	261.80	338.65	1200.23	0.36
HUB	13.89	457.67	303.68	342.40	1197.52	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	410.81	237.33	0.34	4918.57	
MEAN	436.94	381.26	175.14	0.32	4340.91	1.59
HUB	366.18	348.06	62.50	0.29	4219.75	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.76	1.11	22.71	616.52	1.03	601.48	0.92	0.91
MEAN	24.45	1.10	22.39	614.08	1.03	598.78	0.92	0.91
HUB	24.38	1.10	22.04	613.56	1.03	596.08	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.83	35.29	31.50	3.79	0.93	0.39	2.90	
MEAN	37.71	27.35	23.50	3.85	0.94	0.38	3.29	0.91
HUB	41.57	10.35	6.50	3.85	0.94	0.38	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.991

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     423.846     263.270     332.167    1201.169       0.353       0.045

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     24.506      22.483     599.726      46.000      38.400      32.400      -6.000

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     344.804     263.270     433.821    1206.237       0.286       0.352

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.488      23.136     604.797     456.573       0.018       0.434

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     328.443       0.000     328.443    1207.153       0.272       0.333

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.198     605.716       0.000       0.060       0.049       0.381

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.868      24.423       1.100     614.720      19.006     218.145       1.691

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 118467.328       0.478     755.732  978676.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.026   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    112.885    3021.000      24.423     614.720       1.000       1.000       0.980
W Kg/sec =   51.31144

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     73.965    2775.046       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  86840.570   88577.203       2.366     509.668     215.431     390.276       1.812

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   307.11    -0.11   307.11     0.25   443.64
 MEAN    15.91     0.00    -0.02   307.11    -0.11   307.11     0.25
 HUB     13.07     0.00    -0.02   307.11    -0.11   307.11     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.55    47.36    10.19   482.97   572.43    23.35   606.85     0.47
 MEAN    53.80    44.80     9.00   419.52   520.00    23.35   606.85     0.43
 HUB     48.30    38.84     9.46   344.57   461.64    23.35   606.85     0.38

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   401.56   247.70   316.06  1221.30     0.33
 MEAN    15.50   400.94   242.53   319.27  1218.48     0.33
 HUB     12.59   422.68   272.91   322.77  1215.65     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   388.11   225.25     0.32  4445.75
 MEAN   408.57   359.86   166.04     0.30  3760.33     1.60
 HUB    331.91   328.12    59.00     0.27  3437.31

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     26.88     1.10    24.94   633.52     1.03   620.06     0.92     0.91
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 MEAN    26.49     1.08    24.58   630.62     1.03   617.21     0.92     0.91
 HUB     26.31     1.08    24.20   629.25     1.02   614.35     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.09    35.48    31.50     3.98     0.93     0.40     2.90
 MEAN    37.22    27.48    23.50     3.98     0.93     0.38     3.34     0.91
 HUB     40.22    10.36     6.50     3.86     0.93     0.36     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     405.744     246.978     321.916    1218.664       0.333      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.521      24.560     617.394      46.000      37.496      33.000      -4.496

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     337.940     246.978     418.571    1222.809       0.276       0.280

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.500      25.129     621.602     440.827       0.031       0.424

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     316.937       0.000     316.937    1223.938       0.259       0.355

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      25.267     622.749       0.000       0.060       0.043       0.350

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      26.475       1.084     631.131      16.411     235.168       1.823

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102332.336       0.457     652.803 1017826.938

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    674840.44   4304.9712    110.2775      1.7525      0.8423     13.0264      1.2072


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 80%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.967

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.898    3021.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   49.49893

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.382    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83773.047   85448.320       2.684     831.557     309.808     619.754       2.000

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   247.78    -0.09   247.78     0.22   541.71
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 MEAN    17.06     0.00    -0.02   247.78    -0.09   247.78     0.22
 HUB     12.51     0.00    -0.02   247.78    -0.09   247.78     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     65.51    50.47    15.04   543.87   597.73    14.60   517.68     0.54
 MEAN    61.15    47.20    13.95   449.76   513.57    14.60   517.68     0.46
 HUB     53.09    38.62    14.47   329.80   412.58    14.60   517.68     0.37

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   491.65   366.37   327.86  1134.28     0.43
 MEAN    18.04   501.18   374.01   333.61  1129.78     0.44
 HUB     15.00   548.99   429.42   342.04  1123.93     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    543.87   372.83   177.50     0.33  7559.97
 MEAN   475.49   348.70   101.48     0.31  6747.13     1.68
 HUB    395.45   343.72    33.97     0.31  6442.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.16     1.20    15.96   554.83     1.06   534.64     0.92     0.88
 MEAN    17.81     1.18    15.56   551.38     1.05   530.40     0.92     0.88
 HUB     17.68     1.17    15.02   550.09     1.05   524.92     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.17    28.43    24.20     4.23     0.93     0.48     2.90
 MEAN    48.27    16.92    12.70     4.22     0.95     0.43     3.51     0.88
 HUB     51.46    -5.67    -9.30     3.63     0.95     0.29     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     506.016     373.285     341.630    1130.111       0.448       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.860      15.561     530.715      24.000      47.535      35.400     -12.135

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     357.958     373.285     517.180    1141.430       0.314       0.466

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.791      16.617     541.399     528.796       0.039       0.587

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     333.704       0.000     333.704    1142.906       0.292       0.468

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.672     542.800       0.000       0.060       0.082       0.490

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.826      17.690       1.171     552.101      29.291     174.934       1.356

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 182364.531       0.617    1122.254 1041909.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.967

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.898    3021.000      17.690     552.101       1.000       1.000       0.980
W Kg/sec =   49.49893
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
93.360	2928.191	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
83773.047	85448.320	2.172	590.487	271.889	474.134	1.744

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	319.16	-0.11	319.16	0.28	525.10
MEAN	18.08	0.00	-0.02	319.16	-0.11	319.16	0.28	
HUB	15.21	0.00	-0.02	319.16	-0.11	319.16	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.50	46.36	13.14	541.76	628.88	16.76	543.60	0.55
MEAN	56.20	42.30	13.90	476.60	573.69	16.76	543.60	0.50
HUB	51.49	37.84	13.65	400.98	512.58	16.76	543.60	0.45

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	449.36	307.69	327.49	1162.74	0.39
MEAN	18.01	450.14	304.18	331.81	1159.14	0.39
HUB	15.22	478.94	340.58	336.73	1155.53	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	400.56	230.64	0.34	6285.38	
MEAN	474.80	373.11	170.62	0.32	5480.19	1.69
HUB	401.33	342.17	60.75	0.30	5186.29	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.46	1.16	18.46	578.71	1.05	561.85	0.92	0.88
MEAN	20.09	1.14	18.11	575.30	1.04	558.38	0.92	0.88
HUB	19.96	1.13	17.73	574.06	1.04	554.90	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.22	35.16	31.50	3.66	0.93	0.45	2.90	
MEAN	42.51	27.21	23.50	3.71	0.95	0.43	3.30	0.88
HUB	45.33	10.23	6.50	3.73	0.95	0.42	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.967

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	613.605	305.030	532.416	1144.729	0.536	-0.742

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.151	16.568	544.582	46.000	29.809	30.600	0.791

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	535.137	305.030	615.966	1152.613	0.464	-0.356

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	20.128	17.361	552.109	345.258	0.021	0.308

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	526.728	0.000	526.728	1153.391	0.457	0.408

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	17.414	552.855	0.000	0.060	0.037	-0.330

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.859	20.096	1.136	576.023	23.921	194.691	1.509

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 148987.281       0.514     916.854  939730.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.964

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.898    3021.000      20.096     576.023       1.000       1.000       0.680
W Kg/sec =   49.49893

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     83.946    2866.745       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83773.047   85448.320       1.548     378.495     244.481     293.880       1.202

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   478.54    -0.16   478.54     0.41   502.08
 MEAN    17.74     0.00    -0.02   478.54    -0.16   478.54     0.41
 HUB     15.05     0.00    -0.02   478.54    -0.16   478.54     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.88    46.36     1.52   529.11   713.53    17.86   556.90     0.62
 MEAN    44.35    43.40     0.95   467.64   669.21    17.86   556.90     0.58
 HUB     39.67    38.84     0.83   396.77   621.73    17.86   556.90     0.54

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   425.47   272.61   326.66  1185.15     0.36
 MEAN    17.51   429.20   274.40   330.03  1182.31     0.36
 HUB     14.85   459.89   316.33   333.82  1179.53     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   411.13   249.65     0.35  5403.69
 MEAN   461.53   379.39   187.13     0.32  4806.76     1.89
 HUB    391.49   342.17    75.17     0.29  4699.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.66     1.13    20.73   598.89     1.04   583.78     0.92     0.88
 MEAN    22.36     1.11    20.42   596.36     1.04   580.98     0.92     0.88
 HUB     22.31     1.11    20.09   595.91     1.03   578.26     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.85    37.39    31.50     5.89     0.93     0.49     2.90
 MEAN    39.74    29.55    23.50     6.05     0.91     0.50     3.28     0.88
 HUB     43.46    12.69     6.50     6.19     0.91     0.52     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.964

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     433.374     276.202     333.953    1182.710       0.366       0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.425      20.436     581.375      46.000      39.593      31.500      -8.093

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     341.831     276.202     439.473    1188.721       0.288       0.362

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.399      21.148     587.300     471.992       0.023       0.447
```

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	332.546	0.000	332.546	1189.250	0.280	0.348

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.145	587.823	0.000	0.060	0.058	0.361

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.839	22.327	1.111	597.055	21.032	210.146	1.629

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
131045.289	0.480	806.440	1397502.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =13.953 EfDer = 0.985

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
108.898	3021.000	22.327	597.055	1.000	1.000	0.980

W Kg/sec = 49.49893

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
76.923	2815.799	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
83773.047	85448.320	2.291	513.330	224.036	401.059	1.790

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	313.23	-0.11	313.23	0.26	473.25
MEAN	16.97	0.00	-0.02	313.23	-0.11	313.23	0.26	
HUB	14.32	0.00	-0.02	313.23	-0.11	313.23	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.33	46.36	11.97	507.76	596.69	21.28	588.87	0.50
MEAN	55.01	43.80	11.21	447.40	546.24	21.28	588.87	0.46
HUB	50.33	37.84	12.49	377.52	490.63	21.28	588.87	0.41

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	419.91	270.40	321.26	1205.38	0.35
MEAN	16.57	421.66	269.14	324.59	1202.53	0.35
HUB	13.89	449.01	306.30	328.31	1199.67	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	393.56	227.33	0.33	5107.30	
MEAN	436.94	365.40	167.80	0.30	4462.47	1.64
HUB	366.18	333.73	59.88	0.28	4256.06	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.97	1.12	22.96	618.66	1.04	603.94	0.92	0.90
MEAN	24.63	1.10	22.62	615.93	1.03	601.09	0.92	0.90
HUB	24.52	1.10	22.26	615.06	1.03	598.23	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.09	35.28	31.50	3.78	0.93	0.42	2.90	
MEAN	39.66	27.34	23.50	3.84	0.94	0.41	3.29	0.90
HUB	43.01	10.34	6.50	3.84	0.94	0.40	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.985

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

```
    16.481     417.926     270.650     318.451    1203.411       0.347       0.043

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.685      22.708     601.972      46.000      40.361      32.400      -7.961

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     330.109     270.650     426.876    1208.878       0.273       0.384

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.662      23.415     607.455     456.573       0.021       0.465

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     314.695       0.000     314.695    1209.703       0.260       0.357

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      23.455     608.284       0.000       0.060       0.057       0.403

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.858      24.586       1.101     616.549      19.495     209.538       1.624

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 121513.547       0.490     747.783  939564.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =13.953   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.898    3021.000      24.586     616.549       1.000       1.000       0.980
W Kg/sec =   49.49893

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     70.986    2770.926       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83773.047   85448.320       2.465     509.668     206.755     390.276       1.888

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   294.38    -0.10   294.38     0.24   442.98
 MEAN    15.91     0.00    -0.02   294.38    -0.10   294.38     0.24
 HUB     13.07     0.00    -0.02   294.38    -0.10   294.38     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.64    47.36    11.28   482.97   565.70    23.59   609.32     0.47
 MEAN    54.95    44.80    10.15   419.52   512.58    23.59   609.32     0.42
 HUB     49.50    38.84    10.66   344.57   453.27    23.59   609.32     0.37

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   397.34   257.26   302.81  1224.08     0.32
 MEAN    15.50   394.85   249.55   305.99  1221.13     0.32
 HUB     12.59   414.28   275.44   309.45  1218.16     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   371.78   215.70     0.30  4617.03
 MEAN   408.57   344.84   159.02     0.28  3868.99     1.65
 HUB    331.91   314.56    56.48     0.26  3469.06

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.14     1.10    25.23   636.07     1.03   622.90     0.92     0.91
 MEAN    26.71     1.09    24.85   632.91     1.03   619.90     0.92     0.91
 HUB     26.49     1.08    24.45   631.22     1.02   616.90     0.92     0.91
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         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     40.35    35.46    31.50     3.96     0.93     0.42     2.90
  MEAN    39.20    27.46    23.50     3.96     0.94     0.40     3.34     0.91
  HUB     41.67    10.34     6.50     3.84     0.94     0.38     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.991

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     399.715     254.122     308.535    1221.290       0.327      -0.009

      Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      26.741       24.827     620.068       46.000      39.476      33.000      -6.476

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     323.508     254.122     411.382    1225.811       0.264       0.313

    BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
       0.950       26.711       25.447     624.667     440.827       0.035       0.455

     VANED DIFFUSER EXIT:
    R4           C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
      14.701     303.585       0.000     303.585    1226.833       0.247       0.382

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       25.568     625.709       0.000       0.060       0.051       0.375

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
       0.867       26.682       1.085     633.399      16.849     225.725       1.750

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  105071.367       0.470     646.599  977053.938

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     688982.00   4239.9297     106.3821      1.7662      0.8375     13.9532      1.2115


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 80%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =14.185   EfDer =  0.965

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     107.906     3021.000       15.107     522.810       1.000        1.000        0.980
 W Kg/sec =   49.04808

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     105.413     3009.102        1.402        0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
   83010.008   84670.031        2.709     831.557     306.986     619.754       2.019

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa     C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   245.41    -0.08   245.41      0.22   541.71
  MEAN    17.06      0.00    -0.02   245.41    -0.08   245.41      0.22
  HUB     12.51      0.00    -0.02   245.41    -0.08   245.41      0.22
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     65.72    50.47    15.25   543.87   596.76    14.61   517.78     0.53
MEAN    61.39    47.20    14.19   449.76   512.43    14.61   517.78     0.46
HUB     53.35    38.62    14.73   329.80   411.16    14.61   517.78     0.37

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   490.78   368.02   324.69  1134.51     0.43
MEAN    18.04   499.74   374.94   330.39  1129.99     0.44
HUB     15.00   546.62   429.04   338.70  1124.14     0.49

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    543.87   369.25   175.85     0.33  7593.97
MEAN   475.49   345.35   100.55     0.31  6763.85     1.70
HUB    395.45   340.37    33.59     0.30  6436.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.17     1.20    15.97   554.97     1.06   534.85     0.92     0.88
MEAN    17.81     1.18    15.57   551.45     1.05   530.60     0.92     0.88
HUB     17.67     1.17    15.03   550.07     1.05   525.11     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     48.58    28.44    24.20     4.24     0.93     0.49     2.90
MEAN    48.61    16.93    12.70     4.23     0.95     0.43     3.51     0.88
HUB     51.71    -5.66    -9.30     3.64     0.95     0.29     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.965

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     504.478     374.211     338.325    1130.317       0.446       0.002

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.861      15.576     530.908      24.000      47.883      35.400     -12.483

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     354.405     374.211     515.400    1141.720       0.310       0.472

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.790      16.639     541.674     528.796       0.040       0.592

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     330.490       0.000     330.490    1143.161       0.289       0.472

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.688     543.042       0.000       0.060       0.084       0.493

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.824      17.687       1.171     552.165      29.355     173.812       1.347

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 182760.109       0.618    1114.444 1031934.812


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =14.185   EfDer =  0.965

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.906    3021.000      17.687     552.165       1.000       1.000       0.980
W Kg/sec =   49.04808

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.531    2928.022       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
83010.008	84670.031	2.191	590.487	269.476	474.134	1.759

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	316.11	-0.11	316.11	0.28	525.07
MEAN	18.08	0.00	-0.02	316.11	-0.11	316.11	0.28	
HUB	15.21	0.00	-0.02	316.11	-0.11	316.11	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.74	46.36	13.38	541.76	627.34	16.77	543.82	0.55
MEAN	56.45	42.30	14.15	476.60	571.99	16.77	543.82	0.50
HUB	51.76	37.84	13.92	400.98	510.69	16.77	543.82	0.45

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	448.59	309.84	324.39	1163.05	0.39
MEAN	18.01	448.91	305.75	328.69	1159.43	0.39
HUB	15.22	477.12	341.12	333.58	1155.78	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	396.78	228.49	0.34	6329.27	
MEAN	474.80	369.61	169.05	0.32	5508.47	1.70
HUB	401.33	338.97	60.21	0.29	5194.54	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.47	1.16	18.48	578.96	1.05	562.16	0.92	0.88
MEAN	20.10	1.14	18.12	575.48	1.04	558.66	0.92	0.88
HUB	19.95	1.13	17.74	574.16	1.04	555.15	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.69	35.16	31.50	3.66	0.93	0.45	2.90	
MEAN	42.93	27.22	23.50	3.72	0.95	0.43	3.30	0.88
HUB	45.64	10.23	6.50	3.73	0.95	0.42	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.965

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	609.327	306.606	526.567	1145.374	0.532	-0.728

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.154	16.618	545.196	46.000	30.211	30.600	0.389

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	529.002	306.606	611.433	1153.366	0.459	-0.334

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	20.132	17.425	552.832	345.258	0.021	0.314

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	520.743	0.000	520.743	1154.121	0.451	0.416

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	17.476	553.556	0.000	0.060	0.037	-0.309

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.858	20.100	1.136	576.200	24.035	193.072	1.497

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
149694.344	0.517	912.814	930399.000

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =14.185   EfDer =  0.968

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.906    3021.000      20.100     576.200       1.000       1.000       0.680
W Kg/sec =   49.04808

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.177    2866.304       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 83010.008   84670.031       1.562     378.495     242.243     293.880       1.213

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   473.35    -0.16   473.35     0.41   502.00
MEAN    17.74     0.00    -0.02   473.35    -0.16   473.35     0.41
HUB     15.05     0.00    -0.02   473.35    -0.16   473.35     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     48.19    46.36     1.83   529.11   710.06    17.91   557.49     0.61
MEAN    44.66    43.40     1.26   467.64   665.51    17.91   557.49     0.57
HUB     39.98    38.84     1.14   396.77   617.74    17.91   557.49     0.53

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   424.64   275.42   323.21  1185.63     0.36
MEAN    17.51   427.93   276.50   326.60  1182.74     0.36
HUB     14.85   458.04   317.23   330.40  1179.92     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    522.26   406.68   246.83     0.34  5459.43
MEAN   461.53   375.37   185.03     0.32  4843.46     1.90
HUB    391.49   338.64    74.26     0.29  4713.39

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.70     1.13    20.77   599.30     1.04   584.25     0.92     0.89
MEAN    22.40     1.11    20.46   596.70     1.04   581.41     0.92     0.89
HUB     22.33     1.11    20.13   596.15     1.03   578.63     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.44    37.37    31.50     5.87     0.93     0.49     2.90
MEAN    40.25    29.53    23.50     6.03     0.91     0.50     3.28     0.89
HUB     43.84    12.67     6.50     6.17     0.91     0.52     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.968

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     432.062     278.315     330.483    1183.138       0.365       0.010

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.456      20.478     581.797      46.000      40.102      31.500      -8.602

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     338.147     278.315     437.953    1189.262       0.284       0.371

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.429      21.203     587.836     471.992       0.024       0.455

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     17.121     329.026       0.000     329.026    1189.776       0.277       0.355

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.196     588.344       0.000       0.060       0.061       0.367

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.841      22.354       1.112     597.381      21.182     207.896       1.612

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 131976.109       0.484     804.771 1381872.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =14.185   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.906    3021.000      22.354     597.381       1.000       1.000       0.980
W Kg/sec =   49.04808

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     76.152    2815.030       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83010.008   84670.031       2.314     513.330     221.792     401.059       1.808

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   309.95    -0.11   309.95     0.26   473.12
 MEAN    16.97     0.00    -0.02   309.95    -0.11   309.95     0.26
 HUB     14.32     0.00    -0.02   309.95    -0.11   309.95     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.60    46.36    12.24   507.76   594.97    21.32   589.36     0.50
 MEAN    55.29    43.80    11.49   447.40   544.37    21.32   589.36     0.46
 HUB     50.62    37.84    12.78   377.52   488.54    21.32   589.36     0.41

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   418.89   272.79   317.88  1205.97     0.35
 MEAN    16.57   420.19   270.91   321.20  1203.08     0.35
 HUB     13.89   446.96   306.93   324.91  1200.18     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   389.42   224.94     0.32  5152.38
 MEAN   436.94   361.58   166.03     0.30  4491.77     1.65
 HUB    366.18   330.27    59.26     0.28  4264.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.02     1.12    23.02   619.18     1.04   604.53     0.92     0.90
 MEAN    24.67     1.10    22.67   616.38     1.03   601.65     0.92     0.90
 HUB     24.55     1.10    22.30   615.42     1.03   598.75     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.63    35.28    31.50     3.78     0.93     0.42     2.90
 MEAN    40.14    27.34    23.50     3.84     0.94     0.41     3.29     0.90
 HUB     43.37    10.34     6.50     3.84     0.94     0.40     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.983

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     416.573     272.429     315.143    1203.946       0.346       0.042

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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    24.724      22.757     602.510      46.000      40.842      32.400      -8.442

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     326.574     272.429     425.286    1209.511       0.270       0.391

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.699      23.477     608.092     456.573       0.022       0.473

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     311.388       0.000     311.388    1210.315       0.257       0.362

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      23.512     608.900       0.000       0.060       0.060       0.408

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.855      24.621       1.101     616.993      19.611     207.503       1.609

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 122243.203       0.493     745.421  929939.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =14.185   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.906    3021.000      24.621     616.993       1.000       1.000       0.980
W Kg/sec =   49.04808

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     70.266    2769.930       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83010.008   84670.031       2.490     509.668     204.658     390.276       1.907

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   291.31    -0.10   291.31     0.24   442.82
 MEAN    15.91     0.00    -0.02   291.31    -0.10   291.31     0.24
 HUB     13.07     0.00    -0.02   291.31    -0.10   291.31     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.91    47.36    11.55   482.97   564.11    23.65   609.91     0.47
 MEAN    55.23    44.80    10.43   419.52   510.82    23.65   609.91     0.42
 HUB     49.80    38.84    10.96   344.57   451.29    23.65   609.91     0.37

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   396.41   259.53   299.64  1224.74     0.32
 MEAN    15.50   393.44   251.20   302.80  1221.76     0.32
 HUB     12.59   412.28   276.02   306.25  1218.77     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   367.88   213.42     0.30  4657.83
 MEAN   408.57   341.25   157.36     0.28  3894.65     1.66
 HUB    331.91   311.31    55.89     0.26  3476.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     27.19     1.10    25.29   636.69     1.03   623.58     0.92     0.91
 MEAN    26.76     1.09    24.90   633.46     1.03   620.54     0.92     0.91
 HUB     26.52     1.08    24.50   631.69     1.02   617.51     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.90    35.46    31.50     3.96     0.93     0.43     2.90
 MEAN    39.68    27.46    23.50     3.96     0.94     0.40     3.34     0.91
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 HUB     42.03    10.34     6.50     3.84     0.94     0.38     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     398.324     255.810     305.325    1221.918       0.326       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     26.788      24.885     620.708      46.000      39.957      33.000      -6.957

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     320.057     255.810     409.725    1226.527       0.261       0.321

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      26.756      25.517     625.399     440.827       0.037       0.463

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     300.391       0.000     300.391    1227.525       0.245       0.388

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      25.633     626.417       0.000       0.060       0.053       0.381

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      26.725       1.085     633.946      16.953     223.513       1.733

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 105720.117       0.473     644.666  967024.688

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    692393.88   4222.1162    105.4131      1.7690      0.8359     14.1854      1.2126


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 80%  Stat 2 35% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    140.038    3021.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   63.65342

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    136.803    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107728.406  109882.742       2.087     831.557     398.399     619.754       1.556

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   324.31    -0.11   324.31     0.29   541.71
 MEAN    17.06     0.00    -0.02   324.31    -0.11   324.31     0.29
 HUB     12.51     0.00    -0.02   324.31    -0.11   324.31     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.20    50.47     8.73   543.87   633.32    14.24   514.03     0.57
 MEAN    54.21    47.20     7.01   449.76   554.58    14.24   514.03     0.50
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 HUB     45.49    38.62     6.87   329.80   462.62    14.24   514.03     0.42

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   533.61   308.81   435.18  1125.12     0.47
 MEAN    18.04   558.19   341.58   441.48  1121.77     0.50
 HUB     15.00   632.55   440.86   453.60  1115.90     0.57

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    543.87   494.61   235.06     0.44  6373.05
 MEAN   475.49   461.34   133.91     0.41  6162.62     1.35
 HUB    395.45   455.87    45.42     0.41  6614.35

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.74     1.17    15.21   549.80     1.05   526.02     0.92     0.91
 MEAN    17.65     1.17    14.90   548.91     1.05   522.89     0.92     0.91
 HUB     17.85     1.18    14.35   550.82     1.05   517.41     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.36    28.38    24.20     4.18     0.93     0.30     2.90
 MEAN    37.73    16.87    12.70     4.17     0.93     0.26     3.51     0.91
 HUB     44.18    -5.72    -9.30     3.58     0.93     0.12     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     566.673     340.915     452.653    1121.891       0.505       -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.720      14.884     523.023      24.000      36.985      35.400      -1.585

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     18.071     479.794     340.915     588.579    1130.006       0.425       0.275

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.690      15.625     530.616     528.796       0.020       0.419

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083     442.983       0.000     442.983    1133.023       0.391       0.338

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      15.873     533.453       0.000       0.060       0.037       0.359

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.879      17.640       1.168     549.844      27.034     212.543       1.648

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 168306.938       0.569    1331.922 1363684.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  1.000

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    140.038     3021.000      17.640     549.844       1.000       1.000       0.980
W Kg/sec =   63.65342

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
    120.153     2934.197       1.402       0.249      53.349      56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
 107728.406  109882.742       1.688     590.487     349.918     474.134       1.355
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ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	422.26	-0.15	422.26	0.37	526.18
MEAN	18.08	0.00	-0.02	422.26	-0.15	422.26	0.37	
HUB	15.21	0.00	-0.02	422.26	-0.15	422.26	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.07	46.36	5.71	541.76	687.00	16.03	534.95	0.61
MEAN	48.47	42.30	6.17	476.60	636.86	16.03	534.95	0.56
HUB	43.53	37.84	5.69	400.98	582.42	16.03	534.95	0.51

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	493.58	230.16	436.64	1149.82	0.43
MEAN	18.01	505.21	247.62	440.36	1147.74	0.44
HUB	15.22	548.13	320.31	444.80	1145.63	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	538.34	534.43	308.17	0.46	4702.95	
MEAN	474.80	495.51	227.18	0.43	4462.24	1.39
HUB	401.33	452.12	81.02	0.39	4878.25	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.76	1.12	17.41	569.75	1.04	549.41	0.92	0.91
MEAN	19.65	1.11	17.20	568.73	1.03	547.42	0.92	0.91
HUB	19.85	1.13	16.96	570.50	1.04	545.41	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.80	35.21	31.50	3.71	0.93	0.28	2.90	
MEAN	29.35	27.29	23.50	3.79	0.93	0.28	3.30	0.91
HUB	35.76	10.32	6.50	3.82	0.93	0.29	3.92	

blockage3	Cor/U1	Cor/Incid
0.600	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	996.607	248.314	965.176	1082.652	0.921	-2.264

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.727	11.399	486.775	46.000	14.428	30.600	16.172

STATOR / VANED DIFFUSER THROAT IS CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	1118.339	248.314	1145.575	1061.884	1.053	-2.941

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.600	19.479	9.655	465.834	317.610	0.107	-0.132

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	1210.921	0.000	1210.921	1050.512	1.153	-1.250

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.600	8.196	449.613	0.000	0.060	0.406	-3.510

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.473	18.712	1.061	569.661	19.818	257.893	1.999

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
123426.102	0.426	976.751	1248642.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

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 RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  0.889

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.038    3021.000      18.712     569.661       1.000       1.000       0.630
W Kg/sec =   63.65342

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    115.291    2882.708       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107728.406  109882.742       1.044     350.665     335.772     271.233       0.808

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   867.73    -0.30   867.73     0.79   504.87
MEAN    17.74     0.00    -0.02   867.73    -0.30   867.73     0.79
HUB     15.05     0.00    -0.02   867.73    -0.30   867.73     0.79

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     31.39    46.36   -14.97   529.11  1016.47    12.44   506.81     0.92
MEAN    28.34    43.40   -15.06   467.64   985.86    12.44   506.81     0.89
HUB     24.59    38.84   -14.25   396.77   954.26    12.44   506.81     0.86

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   497.06   130.80   479.54  1160.80     0.43
MEAN    17.51   507.42   167.06   479.13  1161.36     0.44
HUB     14.85   547.54   263.60   479.91  1162.05     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    522.26   619.03   391.46     0.53  2597.10
MEAN   461.53   562.38   294.47     0.48  2929.98     1.82
HUB    391.49   496.66   127.89     0.43  3918.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.76     1.06    17.42   580.65     1.02   560.03     0.92     0.81
MEAN    19.89     1.06    17.45   582.06     1.02   560.57     0.92     0.81
HUB     20.31     1.09    17.44   586.25     1.03   561.22     0.92     0.81

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     15.26    39.23    31.50     7.73     0.93     0.41     2.90
MEAN    19.22    31.57    23.50     8.07     0.81     0.46     3.28     0.81
HUB     28.78    14.92     6.50     8.42     0.81     0.52     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.889

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     513.570     168.158     485.260    1161.754       0.442       0.002

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.960      17.451     560.970      46.000      19.113      31.500      12.387

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     510.051     168.158     537.056    1162.065       0.439      -0.006

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.885      17.418     561.270     471.992       0.039       0.144

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     495.886       0.000     495.886    1163.296       0.426      -0.001

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      17.448     562.460       0.000       0.060       0.083       0.006

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.681      19.773       1.057     582.988      13.327     383.574       2.973

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  83019.703       0.304     656.989 2405730.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.013   EfDer =  0.953

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    140.038    3021.000      19.773     582.988       1.000       1.000       0.980
W Kg/sec =   63.65342

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    110.370    2849.569       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 107728.406  109882.742       1.597     513.330     321.452     401.059       1.248

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   463.87    -0.16   463.87     0.40   478.93
 MEAN    16.97     0.00    -0.02   463.87    -0.16   463.87     0.40
 HUB     14.32     0.00    -0.02   463.87    -0.16   463.87     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.60    46.36     1.24   507.76   687.86    17.73   565.03     0.59
 MEAN    43.98    43.80     0.18   447.40   644.58    17.73   565.03     0.55
 HUB     39.15    37.84     1.31   377.52   598.18    17.73   565.03     0.51

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   509.76   150.22   487.12  1174.44     0.43
 MEAN    16.57   520.59   181.94   487.76  1174.27     0.44
 HUB     13.89   561.19   274.27   489.60  1173.96     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   598.38   347.52     0.51  2839.24
 MEAN   436.94   550.40   255.00     0.47  3018.14     1.25
 HUB    366.18   498.15    91.92     0.42  3811.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.04     1.06    18.48   595.00     1.02   573.32     0.92     0.87
 MEAN    21.12     1.07    18.45   595.76     1.02   573.14     0.92     0.87
 HUB     21.49     1.09    18.37   599.12     1.03   572.83     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.14    35.50    31.50     4.00     0.93     0.17     2.90
 MEAN    20.46    27.60    23.50     4.10     0.90     0.19     3.29     0.87
 HUB     29.26    10.63     6.50     4.13     0.90     0.23     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.953

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     511.069     182.962     477.197    1175.966       0.435       0.056

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.190      18.608     574.827      46.000      20.977      32.400      11.423

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	506.309	182.962	538.353	1176.380	0.430	0.055

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.118	18.590	575.231	456.573	0.036	0.179

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	481.125	0.000	481.125	1178.500	0.408	0.042

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.724	577.307	0.000	0.060	0.077	0.103

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.745	21.003	1.062	596.626	13.639	333.427	2.585

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
84981.398	0.343	672.513	1284560.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 7.013 EfDer = 0.922

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
140.038	3021.000	21.003	596.626	1.000	1.000	0.980

W Kg/sec = 63.65342

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
105.116	2816.811	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
107728.406	109882.742	1.665	509.668	306.159	390.276	1.275

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	446.83	-0.15	446.83	0.38	450.32
MEAN	15.91	0.00	-0.02	446.83	-0.15	446.83	0.38	
HUB	13.07	0.00	-0.02	446.83	-0.15	446.83	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.24	47.36	-0.12	482.97	658.08	19.03	579.97	0.56
MEAN	43.20	44.80	-1.60	419.52	613.01	19.03	579.97	0.52
HUB	37.65	38.84	-1.19	344.57	564.35	19.03	579.97	0.48

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	489.85	133.81	471.22	1188.09	0.41
MEAN	15.50	498.46	159.85	472.13	1187.70	0.42
HUB	12.59	532.53	242.45	474.14	1187.19	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	472.96	580.58	339.14	0.49	2403.42	
MEAN	408.57	533.64	248.72	0.45	2479.70	1.24
HUB	331.91	482.51	89.46	0.41	3054.43	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.08	1.05	19.64	606.79	1.02	586.77	0.92	0.84
MEAN	22.11	1.05	19.59	607.12	1.02	586.39	0.92	0.84
HUB	22.37	1.07	19.49	609.55	1.02	585.89	0.92	0.84

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	15.85	35.74	31.50	4.24	0.93	0.15	2.90	
MEAN	18.70	27.78	23.50	4.28	0.89	0.17	3.34	0.84
HUB	27.08	10.69	6.50	4.19	0.89	0.20	4.06	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.922

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     503.510     162.778     476.472    1187.962       0.424      -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.135      19.560     586.665      46.000      18.862      33.000      14.138

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     514.311     162.778     539.456    1187.032       0.433      -0.102

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.962      19.302     585.748     440.827       0.086       0.159

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     478.568       0.000     478.568    1190.029       0.402       0.024

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.624     588.709       0.000       0.060       0.095       0.021

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.670      21.939       1.045     607.820      11.193     378.092       2.931

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   69762.273       0.312     552.074 1341665.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    529496.44   4190.2480    136.8026      1.4522      0.6944      7.0126      1.1626


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 80%  Stat 2 35% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 7.457   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.947    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   62.70338

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    134.761    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106120.539  108242.727       2.119     831.557     392.453     619.754       1.579

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   319.03    -0.11   319.03     0.29   541.71
  MEAN    17.06     0.00    -0.02   319.03    -0.11   319.03     0.29
  HUB     12.51     0.00    -0.02   319.03    -0.11   319.03     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.61    50.47     9.14   543.87   630.63    14.27   514.31     0.57
  MEAN    54.66    47.20     7.46   449.76   551.51    14.27   514.31     0.50
  HUB     45.96    38.62     7.34   329.80   458.94    14.27   514.31     0.41

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.700      0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   529.76   313.07   427.35  1125.88     0.47
MEAN    18.04   553.54   343.97   433.69  1122.43     0.49
HUB     15.00   626.27   440.11   445.55  1116.55     0.56

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    543.87   485.69   230.80     0.43  6460.95
MEAN   475.49   453.20   131.52     0.40  6205.71     1.36
HUB    395.45   447.78    44.66     0.40  6602.95

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.78     1.18    15.28   550.17     1.05   526.73     0.92     0.91
MEAN    17.67     1.17    14.96   549.09     1.05   523.50     0.92     0.91
HUB     17.84     1.18    14.41   550.77     1.05   518.02     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     36.23    28.37    24.20     4.17     0.93     0.32     2.90
MEAN    38.42    16.87    12.70     4.17     0.93     0.27     3.51     0.91
HUB     44.65    -5.72    -9.30     3.58     0.93     0.13     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    18.071     561.723     343.301     444.609    1122.572       0.500      -0.005

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.737      14.945     523.658      24.000      37.673      35.400      -2.273

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     470.742     343.301     582.626    1130.951       0.416       0.288

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.706      15.714     531.504     528.796       0.021       0.430

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     434.915       0.000     434.915    1133.830       0.384       0.348

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.949     534.214       0.000       0.060       0.038       0.370

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.878      17.655       1.169     550.012      27.202     209.824       1.627

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 169357.625       0.573    1320.233 1341488.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.457   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    137.947    3021.000      17.655     550.012       1.000       1.000       0.980
W Kg/sec =   62.70338

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.275    2933.747       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106120.539  108242.727       1.714     590.487     344.448     474.134       1.377

    ROTOR LEADING EDGE CONDITIONS, STAGE            2
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   414.70    -0.14   414.70     0.37   526.10
MEAN    18.08     0.00    -0.02   414.70    -0.14   414.70     0.37
HUB     15.21     0.00    -0.02   414.70    -0.14   414.70     0.37

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     52.57    46.36     6.21   541.76   682.38    16.10   535.65     0.60
MEAN    48.98    42.30     6.68   476.60   631.87    16.10   535.65     0.56
HUB     44.05    37.84     6.21   400.98   576.95    16.10   535.65     0.51

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   489.07   236.21   428.25  1150.93     0.42
MEAN    18.01   500.23   251.99   432.13  1148.70     0.44
HUB     15.22   542.52   321.90   436.70  1146.45     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    538.34   524.09   302.13     0.46  4826.31
MEAN   474.80   486.19   222.81     0.42  4540.87     1.41
HUB    401.33   443.87    79.43     0.39  4902.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.84     1.12    17.52   570.44     1.04   550.47     0.92     0.91
MEAN    19.70     1.12    17.29   569.24     1.03   548.34     0.92     0.91
HUB     19.87     1.13    17.04   570.77     1.04   546.19     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     28.88    35.20    31.50     3.70     0.93     0.29     2.90
MEAN    30.25    27.28    23.50     3.78     0.93     0.29     3.30     0.91
HUB     36.39    10.31     6.50     3.81     0.93     0.30     3.92


  blockage3   Cor/U1    Cor/Incid
     0.600       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     945.032     252.695     910.621    1092.146       0.865      -2.049

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.780      12.131     495.584      46.000      15.509      30.600      15.091

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     989.879     252.695    1021.624    1084.604       0.913      -2.334

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.600      19.569      11.405     488.400     317.610       0.094       0.023

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.823    1007.964       0.000    1007.964    1083.005       0.931      -0.487

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.600      10.905     485.619       0.000       0.060       0.285      -2.533

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.617      19.086       1.081     570.149      20.137     252.528       1.958

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 125413.750       0.433     977.667 1226681.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.457   EfDer =  0.800

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
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    137.947    3021.000      19.086     570.149       1.000       1.000       0.630
W Kg/sec =   62.70338

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.390    2881.474       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 106120.539  108242.727       1.081     350.665     324.410     271.233       0.836

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   801.92    -0.28   801.92     0.72   504.66
 MEAN    17.74     0.00    -0.02   801.92    -0.28   801.92     0.72
 HUB     15.05     0.00    -0.02   801.92    -0.28   801.92     0.72

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     33.43    46.36   -12.93   529.11   960.90    13.52   516.46     0.86
 MEAN    30.26    43.40   -13.14   467.64   928.45    13.52   516.46     0.83
 HUB     26.34    38.84   -12.50   396.77   894.83    13.52   516.46     0.80

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   485.40   148.60   462.10  1163.85     0.42
 MEAN    17.51   496.74   180.47   462.80  1163.83     0.43
 HUB     14.85   538.29   270.57   465.35  1163.87     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   594.27   373.65     0.51  2949.32
 MEAN   461.53   541.46   281.06     0.47  3164.30     1.78
 HUB    391.49   480.80   120.92     0.41  4022.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.17     1.06    17.90   582.63     1.02   562.96     0.92     0.73
 MEAN    20.26     1.06    17.87   583.54     1.02   562.94     0.92     0.73
 HUB     20.58     1.08    17.77   587.17     1.03   562.98     0.92     0.73

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.83    38.96    31.50     7.46     0.93     0.41     2.90
 MEAN    21.30    31.27    23.50     7.77     0.83     0.45     3.28     0.73
 HUB     30.18    14.57     6.50     8.07     0.83     0.50     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.800

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     502.860     181.654     468.903    1164.217       0.432      -0.001

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.312      17.865     563.338      46.000      21.176      31.500      10.324

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     490.862     181.654     523.396    1165.245       0.421       0.032

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.256      17.926     564.333     471.992       0.033       0.173

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     476.906       0.000     476.906    1166.408       0.409       0.041

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.967     565.461       0.000       0.060       0.070       0.049

   STAGE EXIT CONDITIONS, STAGE            3
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Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.632	20.162	1.056	584.448	14.299	349.758	2.711

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
89082.023	0.327	694.442	2264370.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
RESET = 0.000BLEED = 0.000 DPInc = 7.457 EfDer = 0.968

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
137.947	3021.000	20.162	584.448	1.000	1.000	0.980

W Kg/sec = 62.70338

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
106.761	2846.006	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
106120.539	108242.727	1.651	513.330	310.938	401.059	1.290

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	446.59	-0.15	446.59	0.38	478.33
MEAN	16.97	0.00	-0.02	446.59	-0.15	446.59	0.38	
HUB	14.32	0.00	-0.02	446.59	-0.15	446.59	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.68	46.36	2.32	507.76	676.32	18.23	567.80	0.58
MEAN	45.06	43.80	1.26	447.40	632.26	18.23	567.80	0.54
HUB	40.22	37.84	2.38	377.52	584.87	18.23	567.80	0.50

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	495.07	165.04	466.75	1178.40	0.42
MEAN	16.57	506.12	192.54	468.07	1177.79	0.43
HUB	13.89	546.45	278.18	470.34	1177.08	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	573.19	332.70	0.49	3118.88	
MEAN	436.94	528.03	244.40	0.45	3193.82	1.28
HUB	366.18	478.51	88.01	0.41	3866.07	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.60	1.07	19.13	597.65	1.02	577.19	0.92	0.89
MEAN	21.64	1.07	19.06	597.96	1.02	576.58	0.92	0.89
HUB	21.96	1.09	18.94	600.81	1.03	575.89	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	19.47	35.48	31.50	3.98	0.93	0.19	2.90	
MEAN	22.36	27.57	23.50	4.07	0.91	0.21	3.29	0.89
HUB	30.60	10.60	6.50	4.10	0.91	0.24	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.968

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	497.318	193.627	458.077	1179.379	0.422	0.055

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.708	19.206	578.162	46.000	22.914	32.400	9.486

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	484.149	193.627	521.433	1180.478	0.410	0.090

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.655	19.285	579.241	456.573	0.030	0.206

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	459.991	0.000	459.991	1182.417	0.389	0.079

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.420	581.145	0.000	0.060	0.065	0.140

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.789	21.559	1.069	598.805	14.357	314.795	2.440

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
89460.062	0.361	697.389	1255522.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 7.457 EfDer = 0.944

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
137.947	3021.000	21.559	598.805	1.000	1.000	0.980

W Kg/sec = 62.70338

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
101.064	2811.682	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
106120.539	108242.727	1.731	509.668	294.355	390.276	1.326

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	427.72	-0.15	427.72	0.36	449.50
MEAN	15.91	0.00	-0.02	427.72	-0.15	427.72	0.36	
HUB	13.07	0.00	-0.02	427.72	-0.15	427.72	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.48	47.36	1.12	482.97	645.25	19.70	583.54	0.54
MEAN	44.46	44.80	-0.34	419.52	599.22	19.70	583.54	0.51
HUB	38.87	38.84	0.03	344.57	549.34	19.70	583.54	0.46

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	473.29	150.31	448.79	1192.89	0.40
MEAN	15.50	481.95	171.69	450.34	1192.05	0.40
HUB	12.59	515.63	246.82	452.72	1191.12	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	472.96	552.74	322.65	0.46	2699.18	
MEAN	408.57	508.84	236.88	0.43	2663.08	1.27
HUB	331.91	460.65	85.10	0.39	3109.35	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.82	1.06	20.48	610.22	1.02	591.53	0.92	0.86
MEAN	22.81	1.06	20.38	610.07	1.02	590.69	0.92	0.86
HUB	23.02	1.07	20.24	611.96	1.02	589.77	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	18.52	35.71	31.50	4.21	0.93	0.18	2.90	
MEAN	20.87	27.74	23.50	4.24	0.90	0.19	3.34	0.86
HUB	28.60	10.65	6.50	4.15	0.90	0.22	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.944

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     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219      486.821     174.835      454.342     1192.322       0.408       -0.008

      Pt3          Ps3         Ts3          Vane No.     Alpha3      Vane A3      Incid3
      22.834       20.355      590.974       46.000      21.047       33.000      11.953

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG          Cth         Cuth         Cmth         Aoth         Machth       cp 2-Th
      15.219      487.523     174.835      517.925     1192.265       0.409       -0.051

    BlockageThr  PtTh         PsTh        TsTh         AreaTh         w 2-Th  DiffFact4
       0.950       22.707       20.235      590.917      440.827       0.070       0.188

     VANED DIFFUSER EXIT:
    R4           C4           Cu4         Cm4          Ao4           Mach4       cp 3-4
      14.701      454.412       0.000      454.412     1194.887       0.380       0.067

    Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       20.525      593.520       0.000        0.060       0.080       0.064

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
       0.734       22.681        1.052      610.750       11.945      352.288       2.731

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   74455.734       0.333     580.422 1309881.000

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
     547769.19   4270.1543     134.7608      1.5014       0.7347       7.4574       1.1682


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 80%  Stat 2 35% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.998

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     135.209     3021.000       15.107      522.810       1.000        1.000        0.980
 W Kg/sec =   61.45868

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     132.086     3009.102        1.402        0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
  104013.984  106094.039        2.162      831.557      384.662      619.754       1.611

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   312.15    -0.11   312.15      0.28   541.71
  MEAN    17.06      0.00    -0.02   312.15    -0.11   312.15      0.28
  HUB     12.51      0.00    -0.02   312.15    -0.11   312.15      0.28

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
  TIP     60.15     50.47      9.68   543.87   627.18     14.30   514.67      0.56
  MEAN    55.24     47.20      8.04   449.76   547.56     14.30   514.67      0.49
  HUB     46.58     38.62      7.96   329.80   454.18     14.30   514.67      0.41

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial     THK         AeroBl      Blades2
       0.700        0.050        0.950       32.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   524.98   318.57   417.27  1126.84      0.47
MEAN    18.04   547.66   347.08   423.65  1123.26      0.49
HUB     15.00   618.19   439.09   435.16  1117.38      0.55

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    543.87   474.21   225.31     0.42  6574.24
MEAN   475.49   442.68   128.41     0.39  6261.69     1.39
HUB    395.45   437.34    43.64     0.39  6587.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.83     1.18    15.36   550.65     1.05   527.63     0.92     0.91
MEAN    17.69     1.17    15.03   549.33     1.05   524.28     0.92     0.91
HUB     17.83     1.18    14.48   550.71     1.05   518.79     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.36    28.37    24.20     4.17     0.93     0.33     2.90
MEAN    39.33    16.86    12.70     4.16     0.93     0.28     3.51     0.91
HUB     45.26    -5.73    -9.30     3.57     0.93     0.15     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    18.071     555.477     346.401     434.237    1123.430       0.494      -0.005

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.757      15.021     524.458      24.000      38.580      35.400      -3.180

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     459.132     346.401     575.148    1132.141       0.406       0.306

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.725      15.824     532.623     528.796       0.021       0.444

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    18.083     424.556       0.000     424.556    1134.850       0.374       0.361

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.042     535.175       0.000       0.060       0.040       0.383

   STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      17.672       1.170     550.230      27.420     206.314       1.599

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 170711.172       0.577    1304.368 1312555.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.209    3021.000      17.672     550.230       1.000       1.000       0.980
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    115.839    2933.167       1.402       0.249      53.349      56.000       0.050

  CFM        SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       1.750     590.487     337.352     474.134       1.405

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   404.97    -0.14   404.97     0.36   526.00
MEAN    18.08     0.00    -0.02   404.97    -0.14   404.97     0.36
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 HUB     15.21     0.00    -0.02   404.97    -0.14   404.97     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.23    46.36     6.87   541.76   676.51    16.18   536.53     0.60
 MEAN    49.65    42.30     7.35   476.60   625.53    16.18   536.53     0.55
 HUB     44.73    37.84     6.89   400.98   570.00    16.18   536.53     0.50

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   483.57   243.88   417.57  1152.31     0.42
 MEAN    18.01   494.06   257.54   421.63  1149.90     0.43
 HUB     15.22   535.44   323.92   426.35  1147.48     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   510.95   294.45     0.44  4982.95
 MEAN   474.80   474.31   217.26     0.41  4640.83     1.43
 HUB    401.33   433.32    77.41     0.38  4933.12

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.93     1.13    17.65   571.32     1.04   551.80     0.92     0.91
 MEAN    19.77     1.12    17.41   569.88     1.04   549.49     0.92     0.91
 HUB     19.91     1.13    17.14   571.11     1.04   547.17     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.29    35.19    31.50     3.69     0.93     0.31     2.90
 MEAN    31.42    27.26    23.50     3.76     0.93     0.30     3.30     0.91
 HUB     37.23    10.29     6.50     3.79     0.93     0.31     3.92


   blockage3   Cor/U1    Cor/Incid
      0.600       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     895.885     258.264     857.852    1101.020       0.814      -1.855

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.843      12.834     503.750      46.000      16.755      30.600      13.845

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     905.241     258.264     941.361    1099.544       0.823      -1.948

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.600      19.668      12.598     502.350     317.610       0.081       0.085

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     906.332       0.000     906.332    1099.890       0.824      -0.185

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600      12.377     502.243       0.000       0.060       0.215      -2.038

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.700      19.337       1.094     570.772      20.542     245.847       1.906

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 127938.578       0.441     977.552 1198238.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.770

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     135.209    3021.000      19.337     570.772       1.000       1.000       0.630
W Kg/sec =   61.45868
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
107.822	2879.902	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
104013.984	106094.039	1.117	350.665	314.018	271.233	0.864

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	753.37	-0.26	753.37	0.67	504.38
MEAN	17.74	0.00	-0.02	753.37	-0.26	753.37	0.67	
HUB	15.05	0.00	-0.02	753.37	-0.26	753.37	0.67	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	35.09	46.36	-11.27	529.11	920.76	14.29	523.39	0.82
MEAN	31.84	43.40	-11.56	467.64	886.84	14.29	523.39	0.79
HUB	27.79	38.84	-11.05	396.77	851.58	14.29	523.39	0.76

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	474.60	164.57	445.16	1166.76	0.41
MEAN	17.51	486.16	192.51	446.42	1166.29	0.42
HUB	14.85	527.88	276.55	449.64	1165.86	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	571.06	357.69	0.49	3265.29	
MEAN	461.53	521.21	269.02	0.45	3374.83	1.77
HUB	391.49	464.10	114.94	0.40	4110.69	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.51	1.06	18.30	584.59	1.02	565.79	0.92	0.70
MEAN	20.55	1.06	18.23	585.05	1.03	565.32	0.92	0.70
HUB	20.82	1.08	18.09	588.17	1.03	564.91	0.92	0.70

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.29	38.78	31.50	7.28	0.93	0.41	2.90	
MEAN	23.33	31.07	23.50	7.57	0.84	0.45	3.28	0.70
HUB	31.59	14.34	6.50	7.84	0.84	0.50	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.770

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	492.082	193.775	452.322	1166.685	0.422	-0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.605	18.229	565.722	46.000	23.190	31.500	8.310

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	471.817	193.775	510.059	1168.365	0.404	0.070

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.565	18.377	567.353	471.992	0.027	0.201

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	458.169	0.000	458.169	1169.456	0.392	0.081

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.427	568.413	0.000	0.060	0.059	0.090

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.628	20.486	1.059	585.938	15.167	324.352	2.514

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94487.484       0.346     721.959 2151103.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.045   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    135.209    3021.000      20.486     585.938       1.000       1.000       0.980
W Kg/sec =   61.45868

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.117    2842.385       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 104013.984  106094.039       1.709     513.330     300.325     401.059       1.335

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   429.46    -0.15   429.46     0.37   477.72
 MEAN    16.97     0.00    -0.02   429.46    -0.15   429.46     0.37
 HUB     14.32     0.00    -0.02   429.46    -0.15   429.46     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.78    46.36     3.42   507.76   665.13    18.67   570.54     0.57
 MEAN    46.18    43.80     2.38   447.40   620.27    18.67   570.54     0.53
 HUB     41.33    37.84     3.49   377.52   571.90    18.67   570.54     0.49

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   481.62   179.47   446.94  1182.21     0.41
 MEAN    16.57   492.56   202.92   448.82  1181.20     0.42
 HUB     13.89   532.32   282.01   451.48  1180.12     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    497.74   548.68   318.27     0.46  3391.26
 MEAN   436.94   506.17   234.02     0.43  3365.66     1.32
 HUB    366.18   459.26    84.18     0.39  3919.21

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.10     1.08    19.71   600.29     1.02   580.93     0.92     0.90
 MEAN    22.09     1.08    19.59   600.18     1.02   579.93     0.92     0.90
 HUB     22.36     1.09    19.44   602.52     1.03   578.87     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.88    35.45    31.50     3.95     0.93     0.22     2.90
 MEAN    24.33    27.54    23.50     4.04     0.91     0.23     3.29     0.90
 HUB     31.99    10.56     6.50     4.06     0.91     0.26     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     484.454     204.060     439.381    1182.686       0.410       0.055

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.156      19.736     581.407      46.000      24.911      32.400       7.489

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     462.791     204.060     505.782    1184.427       0.391       0.125

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.119      19.907     583.120     456.573       0.024       0.234
```

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	439.659	0.000	439.659	1186.195	0.371	0.118

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.042	584.862	0.000	0.060	0.055	0.177

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.823	22.039	1.076	600.996	15.058	297.849	2.309

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
93831.000	0.379	716.943	1221340.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 8.045 EfDer = 0.963

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
135.209	3021.000	22.039	600.996	1.000	1.000	0.980

W Kg/sec = 61.45868

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
97.077	2806.552	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
104013.984	106094.039	1.803	509.668	282.743	390.276	1.380

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	409.25	-0.14	409.25	0.34	448.68
MEAN	15.91	0.00	-0.02	409.25	-0.14	409.25	0.34	
HUB	13.07	0.00	-0.02	409.25	-0.14	409.25	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.73	47.36	2.37	482.97	633.16	20.30	587.02	0.53
MEAN	45.72	44.80	0.92	419.52	586.17	20.30	587.02	0.49
HUB	40.11	38.84	1.27	344.57	535.08	20.30	587.02	0.45

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	458.57	165.98	427.48	1197.44	0.38
MEAN	15.50	466.90	183.00	429.54	1196.20	0.39
HUB	12.59	499.85	251.00	432.25	1194.90	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	472.96	526.29	306.98	0.44	2980.21	
MEAN	408.57	485.17	225.57	0.41	2838.24	1.31
HUB	331.91	439.76	80.91	0.37	3161.99	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.49	1.07	21.23	613.60	1.02	596.05	0.92	0.88
MEAN	23.42	1.06	21.09	613.00	1.02	594.81	0.92	0.88
HUB	23.58	1.07	20.91	614.37	1.02	593.52	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	21.22	35.68	31.50	4.18	0.93	0.21	2.90	
MEAN	23.08	27.71	23.50	4.21	0.91	0.22	3.34	0.88
HUB	30.14	10.60	6.50	4.10	0.91	0.23	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.963

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	471.641	186.351	433.265	1196.474	0.394	-0.007

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.452      21.068     595.096      46.000      23.273      33.000       9.727

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     462.594     186.351     498.719    1197.183       0.386       0.000

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.364      21.075     595.801     440.827       0.056       0.218

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     431.736       0.000     431.736    1199.495       0.360       0.111

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.338     598.104       0.000       0.060       0.067       0.109

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.786      23.338       1.059     613.658      12.662     329.847       2.557

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  78927.961       0.353     603.072 1273092.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    565896.19   4323.8936    132.0858      1.5449      0.7643      8.0445      1.1738


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 80%  Stat 2 35% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.020    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   59.55438

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    127.993    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  100791.102  102806.711       2.231     831.557     372.744     619.754       1.663

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   301.69    -0.10   301.69     0.27   541.71
  MEAN    17.06     0.00    -0.02   301.69    -0.10   301.69     0.27
  HUB     12.51     0.00    -0.02   301.69    -0.10   301.69     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.99    50.47    10.52   543.87   622.04    14.35   515.21     0.56
  MEAN    56.15    47.20     8.95   449.76   541.66    14.35   515.21     0.49
  HUB     47.56    38.62     8.94   329.80   447.05    14.35   515.21     0.40

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   518.19   326.74   402.19  1128.23     0.46
  MEAN    18.04   539.10   351.70   408.57  1124.46     0.48
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HUB     15.00   606.22   437.56   419.58  1118.58     0.54

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    543.87   457.06   217.13     0.41  6742.85
MEAN   475.49   426.92   123.79     0.38  6344.99     1.43
HUB    395.45   421.69    42.11     0.38  6564.67

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.90     1.18    15.48   551.37     1.05   528.94     0.92     0.91
MEAN    17.72     1.17    15.14   549.68     1.05   525.41     0.92     0.91
HUB     17.82     1.18    14.59   550.61     1.05   519.92     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.09    28.36    24.20     4.16     0.93     0.36     2.90
MEAN    40.72    16.86    12.70     4.16     0.93     0.31     3.51     0.91
HUB     46.20    -5.73    -9.30     3.57     0.93     0.17     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     546.368     351.014     418.697    1124.673       0.486      -0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.784      15.130     525.620      24.000      39.975      35.400      -4.575

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     441.869     351.014     564.322    1133.864       0.390       0.333

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.749      15.982     534.245     528.796       0.023       0.466

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     409.131       0.000     409.131    1136.330       0.360       0.381

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.173     536.572       0.000       0.060       0.044       0.403

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      17.691       1.171     550.553      27.743     201.055       1.559

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 172722.875       0.584    1278.847 1268596.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.020    3021.000      17.691     550.553       1.000       1.000       0.980
W Kg/sec =   59.55438

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.159    2932.307       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 100791.102  102806.711       1.808     590.487     326.637     474.134       1.452

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   390.46    -0.13   390.46     0.34   525.84
 MEAN    18.08     0.00    -0.02   390.46    -0.13   390.46     0.34
 HUB     15.21     0.00    -0.02   390.46    -0.13   390.46     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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 TIP     54.23    46.36     7.87   541.76   667.92    16.30   537.82     0.59
 MEAN    50.68    42.30     8.38   476.60   616.23    16.30   537.82     0.54
 HUB     45.77    37.84     7.93   400.98   559.78    16.30   537.82     0.49

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   476.01   255.14   401.86  1154.29     0.41
 MEAN    18.01   485.33   265.73   406.12  1151.63     0.42
 HUB     15.22   525.16   326.90   411.00  1148.97     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   491.62   283.20     0.43  5212.74
 MEAN   474.80   456.77   209.07     0.40  4788.16     1.47
 HUB    401.33   417.69    74.42     0.36  4978.48

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.05     1.13    17.84   572.62     1.04   553.70     0.92     0.91
 MEAN    19.85     1.12    17.57   570.82     1.04   551.15     0.92     0.91
 HUB     19.94     1.13    17.28   571.63     1.04   548.60     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.41    35.17    31.50     3.67     0.93     0.33     2.90
 MEAN    33.20    27.24    23.50     3.74     0.93     0.32     3.30     0.91
 HUB     38.50    10.26     6.50     3.76     0.93     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
      0.600       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     839.991     266.473     796.603    1110.805       0.756      -1.646

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.926      13.634     512.769      46.000      18.496      30.600      12.104

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     824.685     266.473     866.668    1113.112       0.741      -1.599

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.600      19.792      13.740     514.897     317.610       0.066       0.133

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     817.693       0.000     817.693    1114.274       0.734       0.019

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600      13.681     515.868       0.000       0.060       0.156      -1.623

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.768      19.578       1.107     571.691      21.138     236.278       1.832

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 131651.844       0.454     974.755 1155394.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.769

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    131.020    3021.000      19.578     571.691       1.000       1.000       0.630
W Kg/sec =   59.55438

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.277    2877.585       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
100791.102	102806.711	1.166	350.665	300.780	271.233	0.902

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	700.33	-0.24	700.33	0.62	503.98
MEAN	17.74	0.00	-0.02	700.33	-0.24	700.33	0.62	
HUB	15.05	0.00	-0.02	700.33	-0.24	700.33	0.62	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	37.08	46.36	-9.28	529.11	877.88	15.11	530.74	0.78
MEAN	33.75	43.40	-9.65	467.64	842.25	15.11	530.74	0.75
HUB	29.55	38.84	-9.29	396.77	805.03	15.11	530.74	0.71

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	461.45	184.57	422.93	1170.49	0.39
MEAN	17.51	472.69	207.60	424.66	1169.49	0.40
HUB	14.85	513.69	283.79	428.18	1168.54	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	541.20	337.68	0.46	3661.19	
MEAN	461.53	494.79	253.93	0.42	3638.59	1.78
HUB	391.49	441.52	107.71	0.38	4217.88	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.91	1.07	18.79	587.19	1.03	569.41	0.92	0.70
MEAN	20.90	1.07	18.68	587.09	1.03	568.44	0.92	0.70
HUB	21.12	1.08	18.49	589.54	1.03	567.51	0.92	0.70

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	23.58	38.61	31.50	7.11	0.93	0.42	2.90	
MEAN	26.05	30.88	23.50	7.38	0.85	0.45	3.28	0.70
HUB	33.54	14.12	6.50	7.62	0.85	0.50	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.769

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	478.267	208.959	430.204	1169.901	0.409	-0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.956	18.675	568.842	46.000	25.907	31.500	5.593

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	446.858	208.959	493.301	1172.393	0.381	0.121

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.931	18.932	571.268	471.992	0.021	0.240

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	433.747	0.000	433.747	1173.382	0.370	0.134

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.988	572.232	0.000	0.060	0.047	0.144

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.650	20.869	1.066	587.939	16.248	296.978	2.302

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
101226.977	0.371	749.488	2018939.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.992

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
131.020	3021.000	20.869	587.939	1.000	1.000	0.980

W Kg/sec = 59.55438

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
98.255	2837.545	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
100791.102	102806.711	1.794	513.330	286.164	401.059	1.401

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	407.04	-0.14	407.04	0.35	476.91
MEAN	16.97	0.00	-0.02	407.04	-0.14	407.04	0.35	
HUB	14.32	0.00	-0.02	407.04	-0.14	407.04	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.29	46.36	4.93	507.76	650.87	19.21	574.11	0.55
MEAN	47.71	43.80	3.91	447.40	604.96	19.21	574.11	0.51
HUB	42.86	37.84	5.02	377.52	555.25	19.21	574.11	0.47

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	465.73	197.96	421.56	1187.01	0.39
MEAN	16.57	476.01	216.28	424.04	1185.54	0.40
HUB	13.89	514.56	286.96	427.11	1184.03	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	517.28	299.78	0.44	3740.22	
MEAN	436.94	478.01	220.66	0.40	3586.97	1.37
HUB	366.18	434.40	79.22	0.37	3987.93	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.70	1.09	20.41	603.76	1.03	585.66	0.92	0.91
MEAN	22.63	1.08	20.25	603.12	1.03	584.20	0.92	0.91
HUB	22.83	1.09	20.05	604.81	1.03	582.71	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.15	35.42	31.50	3.92	0.93	0.26	2.90	
MEAN	27.02	27.49	23.50	3.99	0.92	0.26	3.29	0.91
HUB	33.90	10.51	6.50	4.01	0.92	0.28	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	468.798	217.496	415.292	1186.897	0.395	0.054

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.695	20.378	585.553	46.000	27.642	32.400	4.758

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	435.674	217.496	486.946	1189.428	0.366	0.172

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.673	20.664	588.054	456.573	0.019	0.273

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	413.926	0.000	413.926	1190.987	0.348	0.168

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.795	589.596	0.000	0.060	0.044	0.225

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.855	22.609	1.083	603.897	15.958	277.600	2.152

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
99447.141	0.401	736.310	1172234.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.982

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
131.020	3021.000	22.609	603.897	1.000	1.000	0.980

W Kg/sec = 59.55438

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
91.915	2799.803	1.401	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
100791.102	102806.711	1.904	509.668	267.709	390.276	1.458

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	385.77	-0.13	385.77	0.32	447.60
MEAN	15.91	0.00	-0.02	385.77	-0.13	385.77	0.32	
HUB	13.07	0.00	-0.02	385.77	-0.13	385.77	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.39	47.36	4.03	482.97	618.23	21.03	591.48	0.52
MEAN	47.41	44.80	2.61	419.52	570.02	21.03	591.48	0.48
HUB	41.78	38.84	2.94	344.57	517.34	21.03	591.48	0.43

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	441.78	185.55	400.92	1203.10	0.37
MEAN	15.50	449.09	197.16	403.49	1201.40	0.37
HUB	12.59	480.57	256.24	406.56	1199.67	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	472.96	493.29	287.40	0.41	3331.26	
MEAN	408.57	455.52	211.41	0.38	3057.60	1.36
HUB	331.91	413.54	75.68	0.34	3227.75	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.31	1.08	22.14	617.99	1.02	601.70	0.92	0.90
MEAN	24.17	1.07	21.94	616.83	1.02	600.00	0.92	0.90
HUB	24.25	1.07	21.71	617.55	1.02	598.28	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	24.84	35.64	31.50	4.14	0.93	0.25	2.90	
MEAN	26.04	27.65	23.50	4.15	0.91	0.25	3.34	0.90
HUB	32.22	10.54	6.50	4.04	0.91	0.26	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.982

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	453.747	200.774	406.911	1201.669	0.378	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
24.196	21.926	600.274	46.000	26.262	33.000	6.738

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     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     432.131     200.774     476.495    1203.267       0.359       0.066

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      24.146      22.084     601.872     440.827       0.042       0.259

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     403.838       0.000     403.838    1205.238       0.335       0.169

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      22.317     603.846       0.000       0.060       0.052       0.167

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.834      24.123       1.067     617.455      13.558     304.222       2.358

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   84519.273       0.378     625.784 1220835.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     589568.06   4365.1851    127.9930      1.5968      0.7933      8.9529      1.1810


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 80%  Stat 2 35% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  0.991

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     126.046    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   57.29363

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     123.134    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   96964.961   98904.055       2.319     831.557     358.594     619.754       1.728

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   289.39    -0.10   289.39     0.26   541.71
  MEAN    17.06     0.00    -0.02   289.39    -0.10   289.39     0.26
  HUB     12.51     0.00    -0.02   289.39    -0.10   289.39     0.26

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.99    50.47    11.52   543.87   616.16    14.41   515.82     0.55
  MEAN    57.25    47.20    10.05   449.76   534.90    14.41   515.82     0.48
  HUB     48.74    38.62    10.12   329.80   438.84    14.41   515.82     0.39

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   510.93   336.16   384.78  1129.77     0.45
  MEAN    18.04   529.54   357.00   391.11  1125.80     0.47
  HUB     15.00   592.54   435.76   401.52  1119.93     0.53

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
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 TIP    543.87   437.26   207.72     0.39  6936.94
 MEAN   475.49   408.66   118.49     0.36  6440.60     1.48
 HUB    395.45   403.53    40.32     0.36  6537.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.97     1.19    15.61   552.19     1.06   530.38     0.92     0.91
 MEAN    17.75     1.17    15.25   550.09     1.05   526.67     0.92     0.91
 HUB     17.79     1.18    14.70   550.50     1.05   521.17     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.14    28.36    24.20     4.16     0.93     0.38     2.90
 MEAN    42.39    16.85    12.70     4.15     0.94     0.33     3.51     0.91
 HUB     47.34    -5.73    -9.30     3.57     0.94     0.19     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     536.210     356.309     400.705    1126.052       0.476      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.810      15.246     526.909      24.000      41.644      35.400      -6.244

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     422.054     356.309     552.345    1135.773       0.372       0.364

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.769      16.151     536.046     528.796       0.025       0.492

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     391.390       0.000     391.390    1137.978       0.344       0.402

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.312     538.129       0.000       0.060       0.050       0.424

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      17.705       1.172     550.924      28.114     194.961       1.511

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 175032.500       0.592    1246.752 1216867.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3021.000      17.705     550.924       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    107.855    2931.319       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       1.880     590.487     314.102     474.134       1.509

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   373.74    -0.13   373.74     0.33   525.67
 MEAN    18.08     0.00    -0.02   373.74    -0.13   373.74     0.33
 HUB     15.21     0.00    -0.02   373.74    -0.13   373.74     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.41    46.36     9.05   541.76   658.28    16.43   539.26     0.58
 MEAN    51.90    42.30     9.60   476.60   605.77    16.43   539.26     0.53
 HUB     47.02    37.84     9.18   400.98   548.25    16.43   539.26     0.48
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      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   468.24   267.88   384.04  1156.46     0.40
 MEAN    18.01   475.94   275.01   388.44  1153.54     0.41
 HUB     15.22   513.67   330.24   393.45  1150.62     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   469.72   270.46     0.41  5472.74
 MEAN   474.80   436.81   199.79     0.38  4955.27     1.51
 HUB    401.33   399.82    71.08     0.35  5029.25

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.18     1.14    18.02   574.09     1.04   555.78     0.92     0.91
 MEAN    19.94     1.13    17.73   571.90     1.04   552.99     0.92     0.91
 HUB     19.97     1.13    17.41   572.21     1.04   550.18     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.90    35.15    31.50     3.65     0.93     0.36     2.90
 MEAN    35.30    27.22    23.50     3.72     0.94     0.35     3.30     0.91
 HUB     40.01    10.24     6.50     3.74     0.94     0.35     3.92


   blockage3   Cor/U1    Cor/Incid
      0.600       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      789.026     275.784     739.260    1119.407       0.705       -1.463

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.005      14.355      520.747      46.000      20.458      30.600      10.142

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960      756.631     275.784     805.324    1123.893       0.673       -1.315

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.600       19.908      14.689     524.929     317.610       0.052       0.171

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.823     746.576       0.000     746.576    1125.272       0.663       0.154

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.600       14.710     526.193       0.000       0.060       0.112       -1.305

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4          PR4        Texit        Del T        Ns         Ns nondim
      0.812       19.770       1.117     572.736      21.812     225.783       1.750

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 135851.672       0.469     967.668 1105473.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  0.795

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    126.046     3021.000       19.770     572.736       1.000        1.000        0.630
W Kg/sec =   57.29363

   W cor       RPM cor         GAMMA        Cp          R           Blades        THK
     98.480     2874.958        1.402        0.249      53.349      56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  96964.961   98904.055        1.223     350.665     286.809     271.233       0.946
```

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	651.12	-0.22	651.12	0.57	503.52
MEAN	17.74	0.00	-0.02	651.12	-0.22	651.12	0.57	
HUB	15.05	0.00	-0.02	651.12	-0.22	651.12	0.57	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	39.11	46.36	-7.25	529.11	839.14	15.83	537.34	0.74
MEAN	35.70	43.40	-7.70	467.64	801.79	15.83	537.34	0.71
HUB	31.37	38.84	-7.47	396.77	762.60	15.83	537.34	0.67

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	448.88	205.32	399.17	1174.33	0.38
MEAN	17.51	459.18	223.22	401.28	1172.83	0.39
HUB	14.85	498.64	291.10	404.85	1171.39	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	509.69	316.93	0.43	4071.95	
MEAN	461.53	466.70	238.31	0.40	3911.82	1.81
HUB	391.49	417.11	100.40	0.36	4326.19	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.32	1.08	19.27	589.97	1.03	573.15	0.92	0.73
MEAN	21.26	1.08	19.12	589.29	1.03	571.69	0.92	0.73
HUB	21.42	1.08	18.91	591.04	1.03	570.29	0.92	0.73

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.22	38.45	31.50	6.95	0.93	0.43	2.90	
MEAN	29.09	30.70	23.50	7.20	0.86	0.46	3.28	0.73
HUB	35.72	13.93	6.50	7.43	0.86	0.50	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.795

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	464.383	224.686	406.408	1173.244	0.396	0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.311	19.127	572.097	46.000	28.936	31.500	2.564

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	420.460	224.686	476.729	1176.567	0.357	0.176

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.296	19.495	575.342	471.992	0.016	0.284

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	408.079	0.000	408.079	1177.442	0.347	0.190

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.551	576.198	0.000	0.060	0.039	0.201

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.688	21.247	1.075	590.101	17.365	272.417	2.112

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
108190.453	0.397	770.638	1889500.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =10.047 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
126.046	3021.000	21.247	590.101	1.000	1.000	0.980

W Kg/sec = 57.29363

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
93.017	2832.341	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96964.961	98904.055	1.895	513.330	270.910	401.059	1.480

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	383.37	-0.13	383.37	0.33	476.03
MEAN	16.97	0.00	-0.02	383.37	-0.13	383.37	0.33	
HUB	14.32	0.00	-0.02	383.37	-0.13	383.37	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.95	46.36	6.59	507.76	636.33	19.74	577.83	0.54
MEAN	49.42	43.80	5.62	447.40	589.29	19.74	577.83	0.50
HUB	44.57	37.84	6.73	377.52	538.14	19.74	577.83	0.46

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	451.05	216.99	395.43	1191.87	0.38
MEAN	16.57	460.03	230.09	398.35	1189.97	0.39
HUB	13.89	496.71	292.07	401.77	1188.04	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	484.96	280.75	0.41	4099.26	
MEAN	436.94	448.86	206.85	0.38	3815.73	1.42
HUB	366.18	408.55	74.12	0.34	4058.68	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.31	1.10	21.11	607.44	1.03	590.46	0.92	0.91
MEAN	23.16	1.09	20.89	606.24	1.03	588.58	0.92	0.91
HUB	23.28	1.10	20.64	607.27	1.03	586.68	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.76	35.37	31.50	3.87	0.93	0.30	2.90	
MEAN	30.01	27.44	23.50	3.94	0.92	0.30	3.29	0.91
HUB	36.02	10.45	6.50	3.95	0.92	0.31	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	453.744	231.384	390.314	1191.195	0.381	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.226	21.011	589.803	46.000	30.660	32.400	1.740

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	407.975	231.384	469.023	1194.515	0.342	0.224

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.213	21.411	593.095	456.573	0.015	0.317

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	387.750	0.000	387.750	1195.866	0.324	0.220

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.532	594.438	0.000	0.060	0.038	0.275

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    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      23.160       1.090     606.987      16.886     258.218       2.002

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 105234.805       0.425     749.585 1116865.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =10.047   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    3021.000      23.160     606.987       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.543    2792.667       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 96964.961   98904.055       2.022     509.668     252.064     390.276       1.548

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   361.78    -0.12   361.78     0.30   446.46
 MEAN    15.91     0.00    -0.02   361.78    -0.12   361.78     0.30
 HUB     13.07     0.00    -0.02   361.78    -0.12   361.78     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.17    47.36     5.81   482.97   603.55    21.74   596.07     0.50
 MEAN    49.23    44.80     4.43   419.52   554.06    21.74   596.07     0.46
 HUB     43.61    38.84     4.77   344.57   499.70    21.74   596.07     0.42

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   426.88   205.07   374.40  1208.73     0.35
 MEAN    15.50   432.50   211.36   377.34  1206.63     0.36
 HUB     12.59   461.81   261.47   380.66  1204.51     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   460.37   267.89     0.38  3681.17
 MEAN   408.57   425.76   197.20     0.35  3277.60     1.42
 HUB    331.91   387.13    70.45     0.32  3293.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.10     1.08    23.03   622.56     1.03   607.35     0.92     0.91
 MEAN    24.88     1.07    22.77   620.85     1.02   605.24     0.92     0.91
 HUB     24.89     1.07    22.49   620.92     1.02   603.12     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.71    35.58    31.50     4.08     0.93     0.30     2.90
 MEAN    29.25    27.59    23.50     4.09     0.92     0.29     3.34     0.91
 HUB     34.48    10.48     6.50     3.98     0.92     0.29     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     437.148     215.238     380.487    1206.878       0.362      -0.006

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.916      22.755     605.494      46.000      29.496      33.000       3.504

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     15.219     402.269     215.238     456.233    1209.310       0.333       0.133

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      24.891      23.053     607.937     440.827       0.032       0.305

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     376.356       0.000     376.356    1210.984       0.311       0.229

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.258     609.621       0.000       0.060       0.041       0.226

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      24.871       1.074     621.440      14.453     280.803       2.177

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  90105.922       0.403     641.822 1162424.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    614415.38   4376.4639    123.1343      1.6463      0.8145     10.0471      1.1887


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 80%  Stat 2 35% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  0.986

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    121.700    3021.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.889    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       2.402     831.557     346.230     619.754       1.790

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   278.73    -0.10   278.73     0.25   541.71
 MEAN    17.06     0.00    -0.02   278.73    -0.10   278.73     0.25
 HUB     12.51     0.00    -0.02   278.73    -0.10   278.73     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.87    50.47    12.40   543.87   611.22    14.46   516.32     0.55
 MEAN    58.22    47.20    11.02   449.76   529.21    14.46   516.32     0.47
 HUB     49.81    38.62    11.19   329.80   431.89    14.46   516.32     0.39

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   505.24   344.12   369.93  1131.02     0.45
 MEAN    18.04   521.71   361.50   376.17  1126.90     0.46
 HUB     15.00   581.00   434.18   386.07  1121.03     0.52

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    543.87   420.42   199.75     0.37  7101.16
 MEAN   475.49   393.06   113.99     0.35  6521.64     1.53
 HUB    395.45   388.01    38.73     0.35  6513.94
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	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.02	1.19	15.71	552.88	1.06	531.56	0.92	0.90
MEAN	17.77	1.18	15.34	550.43	1.05	527.70	0.92	0.90
HUB	17.77	1.18	14.79	550.40	1.05	522.20	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.93	28.37	24.20	4.17	0.93	0.41	2.90	
MEAN	43.86	16.86	12.70	4.16	0.94	0.36	3.51	0.90
HUB	48.36	-5.73	-9.30	3.57	0.94	0.22	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.986

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	527.884	360.797	385.341	1127.176	0.468	-0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.828	15.338	527.962	24.000	43.116	35.400	-7.716

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	405.255	360.797	542.592	1137.333	0.356	0.390

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.781	16.285	537.519	528.796	0.028	0.515

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	376.320	0.000	376.320	1139.329	0.330	0.420

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.419	539.408	0.000	0.060	0.056	0.442

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.858	17.709	1.172	551.236	28.426	189.757	1.471

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
176978.844	0.598	1217.150	1172050.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =11.017 EfDer = 0.988

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
121.700	3021.000	17.709	551.236	1.000	1.000	0.980

W Kg/sec = 55.31819

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
104.140	2930.488	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
93621.680	95493.914	1.947	590.487	303.283	474.134	1.563

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	359.51	-0.12	359.51	0.32	525.52
MEAN	18.08	0.00	-0.02	359.51	-0.12	359.51	0.32	
HUB	15.21	0.00	-0.02	359.51	-0.12	359.51	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.44	46.36	10.08	541.76	650.30	16.53	540.44	0.57
MEAN	52.98	42.30	10.68	476.60	597.09	16.53	540.44	0.52
HUB	48.13	37.84	10.29	400.98	538.64	16.53	540.44	0.47

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2

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     0.500       0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   462.38   278.51   369.09  1158.21     0.40
 MEAN    18.01   468.51   282.80   373.53  1155.09     0.41
 HUB     15.22   504.23   333.05   378.59  1151.97     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   451.37   259.83     0.39  5689.68
 MEAN   474.80   419.99   192.00     0.36  5095.42     1.55
 HUB    401.33   384.70    68.28     0.33  5071.92

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.27     1.14    18.16   575.32     1.04   557.47     0.92     0.90
 MEAN    19.99     1.13    17.85   572.81     1.04   554.48     0.92     0.90
 HUB     19.98     1.13    17.51   572.71     1.04   551.48     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.04    35.14    31.50     3.64     0.93     0.38     2.90
 MEAN    37.13    27.20    23.50     3.70     0.94     0.37     3.30     0.90
 HUB     41.34    10.22     6.50     3.72     0.94     0.36     3.92


   blockage3   Cor/U1    Cor/Incid
      0.600       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     752.360     283.592     696.865    1125.404       0.669      -1.333

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.060      14.861     526.344      46.000      22.144      30.600       8.456

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     708.727     283.592     763.360    1131.081       0.627      -1.119

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.600      19.986      15.335     531.668     317.610       0.043       0.199

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     697.920       0.000     697.920    1132.440       0.616       0.236

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600      15.389     532.938       0.000       0.060       0.086      -1.094

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.834      19.890       1.123     573.613      22.376     217.243       1.684

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 139365.188       0.481     958.467 1062600.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  0.825

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    3021.000      19.890     573.613       1.000       1.000       0.630
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.584    2872.760       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       1.273     350.665     275.464     271.233       0.985

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
```

TIP	20.07	0.00	-0.02	614.68	-0.21	614.68	0.54	503.13	
MEAN	17.74	0.00	-0.02	614.68	-0.21	614.68	0.54		
HUB	15.05	0.00	-0.02	614.68	-0.21	614.68	0.54		

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	40.73	46.36	-5.63	529.11	811.18	16.33	542.07	0.71
MEAN	37.28	43.40	-6.12	467.64	772.48	16.33	542.07	0.68
HUB	32.86	38.84	-5.98	396.77	731.73	16.33	542.07	0.64

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	439.93	221.83	379.91	1177.31	0.37
MEAN	17.51	449.09	235.64	382.30	1175.45	0.38
HUB	14.85	486.80	296.77	385.87	1173.65	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	522.26	484.34	300.43	0.41	4398.65	
MEAN	461.53	444.05	225.89	0.38	4129.05	1.84
HUB	391.49	397.33	94.72	0.34	4410.29	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.64	1.09	19.65	592.23	1.03	576.07	0.92	0.76
MEAN	21.53	1.08	19.47	591.09	1.03	574.25	0.92	0.76
HUB	21.65	1.09	19.23	592.28	1.03	572.49	0.92	0.76

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.28	38.34	31.50	6.84	0.93	0.45	2.90	
MEAN	31.65	30.58	23.50	7.08	0.87	0.47	3.28	0.76
HUB	37.56	13.79	6.50	7.29	0.87	0.51	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.825

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	453.992	237.189	387.105	1175.865	0.386	0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.587	19.475	574.656	46.000	31.497	31.500	0.003

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	399.331	237.189	464.461	1179.842	0.338	0.222

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.576	19.929	578.550	471.992	0.015	0.322

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	387.652	0.000	387.652	1180.624	0.328	0.233

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.979	579.318	0.000	0.060	0.037	0.245

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.722	21.530	1.082	591.864	18.251	254.989	1.977

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
113710.242	0.417	782.028	1789779.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =11.017 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
121.700	3021.000	21.530	591.864	1.000	1.000	0.980

W Kg/sec = 55.31819

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
88.762	2828.122	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
93621.680	95493.914	1.986	513.330	258.517	401.059	1.551

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	364.47	-0.13	364.47	0.31	475.32
MEAN	16.97	0.00	-0.02	364.47	-0.13	364.47	0.31	
HUB	14.32	0.00	-0.02	364.47	-0.13	364.47	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.34	46.36	7.98	507.76	625.12	20.15	580.78	0.53
MEAN	50.84	43.80	7.04	447.40	577.16	20.15	580.78	0.49
HUB	46.02	37.84	8.18	377.52	524.84	20.15	580.78	0.44

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	440.87	231.82	375.00	1195.59	0.37
MEAN	16.57	448.36	240.87	378.17	1193.40	0.38
HUB	13.89	483.11	296.05	381.77	1191.18	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	497.74	459.72	265.92	0.38	4379.15	
MEAN	436.94	425.97	196.07	0.36	3994.33	1.47
HUB	366.18	388.16	70.13	0.33	4113.96	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.76	1.10	21.63	610.39	1.03	594.17	0.92	0.91
MEAN	23.56	1.09	21.37	608.76	1.03	591.98	0.92	0.91
HUB	23.62	1.10	21.09	609.27	1.03	589.79	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.72	35.34	31.50	3.84	0.93	0.33	2.90	
MEAN	32.50	27.41	23.50	3.91	0.93	0.32	3.29	0.91
HUB	37.79	10.41	6.50	3.91	0.93	0.33	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	442.793	242.228	370.664	1194.527	0.371	0.050

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.622	21.481	593.109	46.000	33.165	32.400	-0.765

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	386.445	242.228	456.085	1198.447	0.322	0.266

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.611	21.969	597.009	456.573	0.015	0.354

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	367.483	0.000	367.483	1199.645	0.306	0.260

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.075	598.202	0.000	0.060	0.037	0.313

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.880      23.561       1.094     609.473      17.610     243.962       1.891

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 109750.492       0.443     754.796 1070366.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =11.017   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    3021.000      23.561     609.473       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     82.307    2786.965       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       2.126     509.668     239.726     390.276       1.628

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   343.15    -0.12   343.15     0.29   445.55
 MEAN    15.91     0.00    -0.02   343.15    -0.12   343.15     0.29
 HUB     13.07     0.00    -0.02   343.15    -0.12   343.15     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.61    47.36     7.25   482.97   592.56    22.26   599.65     0.49
 MEAN    50.73    44.80     5.93   419.52   542.07    22.26   599.65     0.45
 HUB     45.13    38.84     6.29   344.57   486.37    22.26   599.65     0.40

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   416.91   219.89   354.20  1213.01     0.34
 MEAN    15.50   420.77   222.18   357.32  1210.63     0.35
 HUB     12.59   447.91   265.45   360.77  1208.25     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    472.96   435.31   253.06     0.36  3947.07
 MEAN   408.57   403.01   186.38     0.33  3445.20     1.48
 HUB    331.91   366.84    66.46     0.30  3343.58

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     25.69     1.09    23.67   626.17     1.03   611.66     0.92     0.91
 MEAN    25.41     1.08    23.37   624.04     1.02   609.27     0.92     0.91
 HUB     25.35     1.08    23.05   623.61     1.02   606.87     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.83    35.54    31.50     4.04     0.93     0.33     2.90
 MEAN    31.87    27.55    23.50     4.05     0.92     0.32     3.34     0.91
 HUB     36.35    10.44     6.50     3.94     0.92     0.31     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     425.438     226.258     360.284    1210.863       0.351      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     25.439      23.356     609.504      46.000      32.129      33.000       0.871

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     379.826     226.258     442.110    1213.903       0.313       0.184

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      25.423      23.753     612.569     440.827       0.028       0.344

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     355.648       0.000     355.648    1215.373       0.293       0.274

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      23.936     614.052       0.000       0.060       0.037       0.270

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.878      25.404       1.078     624.607      15.134     264.183       2.048

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   94355.961       0.422     648.922 1113637.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     634160.69   4361.3633    118.8887      1.6816      0.8253     11.0174      1.1947


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*******************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 80%  Stat 2 35% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  0.981

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     117.504    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   53.41085

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     114.790    3009.102       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   90393.664   92201.352       2.488     831.557     334.292     619.754       1.854

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   268.52    -0.09   268.52     0.24   541.71
  MEAN    17.06     0.00    -0.02   268.52    -0.09   268.52     0.24
  HUB     12.51     0.00    -0.02   268.52    -0.09   268.52     0.24

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.73    50.47    13.26   543.87   606.63    14.51   516.79     0.54
  MEAN    59.17    47.20    11.97   449.76   523.90    14.51   516.79     0.47
  HUB     50.86    38.62    12.24   329.80   425.36    14.51   516.79     0.38

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
  TIP     20.63   500.29   351.61   355.90  1132.16      0.44
  MEAN    18.04   514.58   365.72   362.00  1127.90      0.46
  HUB     15.00   570.20   432.64   371.42  1122.03      0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    543.87   404.51   192.26     0.36  7255.70
  MEAN   475.49   378.28   109.77     0.34  6597.71     1.57
  HUB    395.45   373.27    37.19     0.33  6490.71

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     18.07     1.20    15.80   553.54     1.06   532.63     0.92     0.90
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 MEAN    17.79     1.18    15.42   550.75     1.05   528.63     0.92     0.90
 HUB     17.74     1.17    14.87   550.30     1.05   523.14     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.65    28.38    24.20     4.18     0.93     0.43     2.90
 MEAN    45.29    16.87    12.70     4.17     0.94     0.38     3.51     0.90
 HUB     49.35    -5.72    -9.30     3.58     0.94     0.24     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     520.297     365.009     370.780    1128.197       0.461       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.842      15.419     528.919      24.000      44.551      35.400      -9.151

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     389.426     365.009     533.746    1138.753       0.342       0.415

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.788      16.404     538.863     528.796       0.031       0.538

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     362.091       0.000     362.091    1140.565       0.317       0.437

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.512     540.578       0.000       0.060       0.064       0.459

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.848      17.708       1.172     551.529      28.719     184.822       1.433

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 178801.688       0.604    1187.288 1129097.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  0.982

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    117.504    3021.000      17.708     551.529       1.000       1.000       0.980
W Kg/sec =   53.41085

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    100.584    2929.710       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  90393.664   92201.352       2.016     590.487     292.928     474.134       1.619

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   346.06    -0.12   346.06     0.30   525.38
 MEAN    18.08     0.00    -0.02   346.06    -0.12   346.06     0.30
 HUB     15.21     0.00    -0.02   346.06    -0.12   346.06     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.44    46.36    11.08   541.76   642.96    16.61   541.53     0.56
 MEAN    54.02    42.30    11.72   476.60   589.08    16.61   541.53     0.52
 HUB     49.21    37.84    11.37   400.98   529.75    16.61   541.53     0.46

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     20.42   457.46   288.40   355.10  1159.79     0.39
 MEAN    18.01   461.93   290.02   359.54  1156.50     0.40
 HUB     15.22   495.55   335.62   364.59  1153.20     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   434.23   249.93     0.37  5891.65
 MEAN   474.80   404.25   184.78     0.35  5225.37     1.60
 HUB    401.33   370.47    65.71     0.32  5110.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.35     1.15    18.28   576.47     1.05   559.00     0.92     0.90
 MEAN    20.04     1.13    17.95   573.65     1.04   555.83     0.92     0.90
 HUB     19.98     1.13    17.60   573.17     1.04   552.66     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.08    35.14    31.50     3.64     0.93     0.40     2.90
 MEAN    38.89    27.20    23.50     3.70     0.94     0.39     3.30     0.90
 HUB     42.63    10.22     6.50     3.72     0.94     0.38     3.92


   blockage3   Cor/U1    Cor/Incid
      0.600       1.000       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     721.557     290.832     660.349    1130.317       0.638       -1.225

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.100      15.274     530.952      46.000      23.770      30.600       6.830

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     668.561     290.832     729.080    1136.847       0.588       -0.955

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.600      20.044      15.856     537.104     317.610       0.036       0.223

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     657.735       0.000     657.735    1138.118       0.578       0.298

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600      15.925     538.303       0.000       0.060       0.067       -0.924

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.846      19.975       1.128     574.429      22.900     209.474       1.624

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 142625.078       0.492     947.066 1021800.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  0.858

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     117.504    3021.000      19.975     574.429       1.000       1.000       0.630
W Kg/sec =   53.41085

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      90.998    2870.719       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  90393.664   92201.352       1.323     350.665     265.020     271.233       1.023

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   583.23    -0.20   583.23     0.51   502.77
 MEAN    17.74     0.00    -0.02   583.23    -0.20   583.23     0.51
 HUB     15.05     0.00    -0.02   583.23    -0.20   583.23     0.51
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     42.23    46.36    -4.13   529.11   787.61    16.74   546.03     0.69
MEAN    38.74    43.40    -4.66   467.64   747.69    16.74   546.03     0.65
HUB     34.24    38.84    -4.60   396.77   705.51    16.74   546.03     0.62

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   432.85   236.73   362.38  1179.94     0.37
MEAN    17.51   440.63   246.81   365.01  1177.77     0.37
HUB     14.85   476.42   301.87   368.58  1175.67     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    522.26   461.35   285.52     0.39  4693.71
MEAN   461.53   423.48   214.72     0.36  4324.41     1.87
HUB    391.49   379.33    89.63     0.32  4485.76

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.93     1.10    19.98   594.29     1.03   578.65     0.92     0.78
MEAN    21.77     1.09    19.76   592.73     1.03   576.52     0.92     0.78
HUB     21.84     1.09    19.50   593.41     1.03   574.46     0.92     0.78

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.16    38.24    31.50     6.74     0.93     0.47     2.90
MEAN    34.07    30.47    23.50     6.97     0.88     0.48     3.28     0.78
HUB     39.32    13.67     6.50     7.17     0.88     0.52     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.858

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     445.273     248.433     369.526    1178.181       0.378       0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.828      19.776     576.925      46.000      33.913      31.500      -2.413

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     380.278     248.433     454.236    1182.747       0.322       0.265

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.816      20.306     581.405     471.992       0.016       0.358

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     369.313       0.000     369.313    1183.444       0.312       0.271

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      20.345     582.091       0.000       0.060       0.039       0.283

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.752      21.767       1.090     593.478      19.049     240.531       1.865

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 118683.711       0.435     788.090 1701248.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    117.504    3021.000      21.767     593.478       1.000       1.000       0.980
W Kg/sec =   53.41085

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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    84.880    2824.273       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
90393.664   92201.352       2.076     513.330     247.211     401.059       1.622

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   347.46    -0.12   347.46     0.29   474.68
MEAN    16.97     0.00    -0.02   347.46    -0.12   347.46     0.29
HUB     14.32     0.00    -0.02   347.46    -0.12   347.46     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.62    46.36     9.26   507.76   615.36    20.50   583.40     0.52
MEAN    52.17    43.80     8.37   447.40   566.57    20.50   583.40     0.48
HUB     47.38    37.84     9.54   377.52   513.16    20.50   583.40     0.43

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   432.86   244.89   356.92  1198.85     0.36
MEAN    16.57   438.71   250.43   360.21  1196.41     0.37
HUB     13.89   471.35   299.56   363.91  1193.96     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    497.74   437.40   252.84     0.36  4625.89
MEAN   436.94   405.63   186.51     0.34  4152.66     1.52
HUB    366.18   369.96    66.63     0.31  4162.57

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.14     1.11    22.06   613.05     1.03   597.41     0.92     0.91
MEAN    23.89     1.10    21.77   611.05     1.03   594.98     0.92     0.91
HUB     23.90     1.10    21.46   611.09     1.03   592.54     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.46    35.31    31.50     3.81     0.93     0.36     2.90
MEAN    34.81    27.37    23.50     3.87     0.93     0.35     3.29     0.91
HUB     39.46    10.38     6.50     3.88     0.93     0.35     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     433.770     251.840     353.175    1197.454       0.362       0.048

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.953      21.875     596.022      46.000      35.492      32.400      -3.092

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     367.446     251.840     445.466    1201.901       0.306       0.305

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      23.941      22.437     600.457     456.573       0.015       0.389

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     349.650       0.000     349.650    1202.967       0.291       0.294

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      22.525     601.523       0.000       0.060       0.040       0.345

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      23.887       1.097     611.726      18.249     231.909       1.798

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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 113737.977       0.459     755.249 1026794.062


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =11.967   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    117.504    3021.000      23.887     611.726       1.000       1.000       0.980
W Kg/sec =   53.41085

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     78.528    2781.828       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 90393.664   92201.352       2.228     509.668     228.721     390.276       1.706

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   326.71    -0.11   326.71     0.27   444.72
MEAN    15.91     0.00    -0.02   326.71    -0.11   326.71     0.27
HUB     13.07     0.00    -0.02   326.71    -0.11   326.71     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.93    47.36     8.57   482.97   583.19    22.69   602.82     0.48
MEAN    52.10    44.80     7.30   419.52   531.81    22.69   602.82     0.44
HUB     46.53    38.84     7.69   344.57   474.91    22.69   602.82     0.39

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   409.27   232.72   336.66  1216.71     0.34
MEAN    15.50   411.24   231.55   339.86  1214.12     0.34
HUB     12.59   436.13   268.91   343.37  1211.53     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    472.96   413.58   240.23     0.34  4177.09
MEAN   408.57   383.20   177.02     0.32  3590.25     1.53
HUB    331.91   349.10    63.01     0.29  3387.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.16     1.10    24.19   629.39     1.03   615.41     0.92     0.91
MEAN    25.83     1.08    23.86   626.91     1.02   612.80     0.92     0.91
HUB     25.72     1.08    23.52   626.05     1.02   610.18     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.65    35.51    31.50     4.01     0.93     0.36     2.90
MEAN    34.27    27.51    23.50     4.01     0.93     0.34     3.34     0.91
HUB     38.07    10.40     6.50     3.90     0.93     0.33     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     415.963     235.795     342.675    1214.336       0.343      -0.007

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    25.865      23.846     613.012      46.000      34.532      33.000      -1.532

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     360.496     235.795     430.763    1217.890       0.296       0.228

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      25.849      24.323     616.605     440.827       0.027       0.379

   VANED DIFFUSER EXIT:
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   R4          C4           Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     337.791       0.000     337.791    1219.196       0.277       0.312

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      24.487     617.928       0.000       0.060       0.037       0.308

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.881      25.829       1.081     627.449      15.723     250.488       1.942

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98034.078       0.438     650.971 1068062.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    651882.50   4328.6636    114.7895      1.7097      0.8306     11.9669      1.2001


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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 80%  Stat 2 35% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =12.653   EfDer =  0.976

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    114.504    3021.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   52.04722

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.859    3009.102       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88085.828   89847.352       2.553     831.557     325.757     619.754       1.903

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   261.26    -0.09   261.26     0.23   541.71
 MEAN    17.06     0.00    -0.02   261.26    -0.09   261.26     0.23
 HUB     12.51     0.00    -0.02   261.26    -0.09   261.26     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     64.35    50.47    13.88   543.87   603.45    14.54   517.11     0.54
 MEAN    59.85    47.20    12.65   449.76   520.21    14.54   517.11     0.47
 HUB     51.62    38.62    13.00   329.80   420.82    14.54   517.11     0.38

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   497.05   356.84   346.01  1132.93     0.44
 MEAN    18.04   509.73   368.66   352.01  1128.58     0.45
 HUB     15.00   562.68   431.55   361.08  1122.72     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    543.87   393.33   187.03     0.35  7363.53
 MEAN   475.49   367.86   106.82     0.33  6650.77     1.61
 HUB    395.45   362.88    36.10     0.32  6474.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.10     1.20    15.86   553.99     1.06   533.36     0.92     0.89
 MEAN    17.80     1.18    15.47   550.98     1.05   529.27     0.92     0.89
 HUB     17.72     1.17    14.92   550.23     1.05   523.78     0.92     0.89
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.88    28.39    24.20     4.19     0.93     0.45     2.90
 MEAN    46.32    16.88    12.70     4.18     0.94     0.40     3.51     0.89
 HUB     50.08    -5.71    -9.30     3.59     0.94     0.25     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.976

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     515.129     367.948     360.516    1128.891       0.456       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.850      15.472     529.570      24.000      45.585      35.400     -10.185

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     378.316     367.948     527.739    1139.721       0.332       0.433

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.791      16.483     539.779     528.796       0.034       0.555

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     352.085       0.000     352.085    1141.409       0.308       0.448

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.572     541.379       0.000       0.060       0.070       0.470

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.841      17.704       1.172     551.733      28.923     181.341       1.406

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 180071.641       0.609    1165.193 1098570.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =12.653   EfDer =  0.977

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    114.504    3021.000      17.704     551.733       1.000       1.000       0.980
W Kg/sec =   52.04722

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     98.057    2929.168       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88085.828   89847.352       2.068     590.487     285.569     474.134       1.660

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   336.58    -0.12   336.58     0.29   525.28
 MEAN    18.08     0.00    -0.02   336.58    -0.12   336.58     0.29
 HUB     15.21     0.00    -0.02   336.58    -0.12   336.58     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.15    46.36    11.79   541.76   637.90    16.67   542.27     0.56
 MEAN    54.78    42.30    12.48   476.60   583.56    16.67   542.27     0.51
 HUB     50.00    37.84    12.16   400.98   523.61    16.67   542.27     0.46

     ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     20.42   454.34   295.26   345.32  1160.86      0.39
 MEAN    18.01   457.59   295.07   349.74  1157.46      0.40
 HUB     15.22   489.59   337.40   354.77  1154.04      0.42
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    538.34   422.30   243.08     0.36  6031.57
 MEAN   474.80   393.22   179.73     0.34  5316.29     1.63
 HUB    401.33   360.48    63.92     0.31  5138.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.39     1.15    18.35   577.27     1.05   560.03     0.92     0.89
 MEAN    20.06     1.13    18.01   574.24     1.04   556.75     0.92     0.89
 HUB     19.98     1.13    17.65   573.48     1.04   553.47     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.53    35.14    31.50     3.64     0.93     0.42     2.90
 MEAN    40.15    27.20    23.50     3.70     0.94     0.40     3.30     0.89
 HUB     43.56    10.21     6.50     3.71     0.94     0.39     3.92


   blockage3   Cor/U1    Cor/Incid
      0.600       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     701.655     295.898     636.211    1133.434       0.619      -1.155

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.123      15.535     533.885      46.000      24.943      30.600       5.657

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     642.431     295.898     707.300    1140.468       0.563      -0.849

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.600      20.077      16.183     540.533     317.610       0.031       0.241

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     631.807       0.000     631.807    1141.662       0.553       0.337

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600      16.257     541.663       0.000       0.060       0.057      -0.815

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.852      20.022       1.131     574.997      23.264     204.158       1.583

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 144892.703       0.500     937.560  992958.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =12.653   EfDer =  0.880

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    114.504    3021.000      20.022     574.997       1.000       1.000       0.630
W Kg/sec =   52.04722

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.513    2869.301       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88085.828   89847.352       1.360     350.665     257.782     271.233       1.052

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   562.39    -0.19   562.39     0.49   502.53
 MEAN    17.74     0.00    -0.02   562.39    -0.19   562.39     0.49
 HUB     15.05     0.00    -0.02   562.39    -0.19   562.39     0.49

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.26    46.36    -3.10   529.11   772.30    16.99   548.59     0.67
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 MEAN    39.76    43.40    -3.64   467.64   731.54    16.99   548.59     0.64
 HUB     35.22    38.84    -3.62   396.77   688.37    16.99   548.59     0.60

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   428.61   246.86   350.39  1181.69     0.36
 MEAN    17.51   435.29   254.43   353.19  1179.32     0.37
 HUB     14.85   469.58   305.32   356.77  1177.02     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    522.26   445.67   275.40     0.38  4894.10
 MEAN   461.53   409.43   207.10     0.35  4457.56     1.90
 HUB    391.49   367.03    86.17     0.31  4536.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.12     1.10    20.20   595.71     1.04   580.37     0.92     0.81
 MEAN    21.93     1.10    19.96   593.86     1.03   578.04     0.92     0.81
 HUB     21.96     1.10    19.68   594.20     1.03   575.79     0.92     0.81

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.17    38.17    31.50     6.67     0.93     0.48     2.90
 MEAN    35.77    30.39    23.50     6.89     0.88     0.49     3.28     0.81
 HUB     40.56    13.58     6.50     7.08     0.88     0.52     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.880

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     439.773     256.096     357.512    1179.727       0.373       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.985      19.971     578.442      46.000      35.615      31.500      -4.115

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     367.343     256.096     447.801    1184.694       0.310       0.294

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.970      20.552     583.323     471.992       0.017       0.384

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     356.901       0.000     356.901    1185.335       0.301       0.296

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.580     583.954       0.000       0.060       0.042       0.308

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.771      21.918       1.095     594.588      19.591     231.270       1.793

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 122064.750       0.448     789.847 1641447.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =12.653   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    114.504    3021.000      21.918     594.588       1.000       1.000       0.980
W Kg/sec =   52.04722

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     82.222    2821.634       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 88085.828   89847.352       2.144     513.330     239.469     401.059       1.675

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   335.92    -0.12   335.92     0.28   474.23
MEAN    16.97     0.00    -0.02   335.92    -0.12   335.92     0.28
HUB     14.32     0.00    -0.02   335.92    -0.12   335.92     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.52    46.36    10.16   507.76   608.91    20.73   585.17     0.51
MEAN    53.11    43.80     9.31   447.40   559.57    20.73   585.17     0.47
HUB     48.35    37.84    10.51   377.52   505.42    20.73   585.17     0.43

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   428.03   253.61   344.80  1201.00     0.36
MEAN    16.57   432.61   256.81   348.13  1198.42     0.36
HUB     13.89   463.61   301.86   351.87  1195.82     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    497.74   422.47   244.13     0.35  4790.42
MEAN   436.94   391.97   180.13     0.33  4258.33     1.56
HUB    366.18   357.70    64.32     0.30  4194.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.38     1.11    22.33   614.85     1.03   599.56     0.92     0.91
MEAN    24.10     1.10    22.02   612.60     1.03   596.98     0.92     0.91
HUB     24.07     1.10    21.69   612.33     1.03   594.39     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     36.34    35.30    31.50     3.80     0.93     0.38     2.90
MEAN    36.42    27.36    23.50     3.86     0.93     0.37     3.29     0.91
HUB     40.63    10.36     6.50     3.86     0.93     0.37     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.994

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     428.084     258.256     341.408    1199.404       0.357       0.046

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    24.162      22.123     597.967      46.000      37.105      32.400      -4.705

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     354.740     258.256     438.790    1204.200       0.295       0.331

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      24.147      22.734     602.759     456.573       0.017       0.414

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     337.745       0.000     337.745    1205.181       0.280       0.316

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      22.808     603.742       0.000       0.060       0.044       0.365

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.873      24.088       1.099     613.262      18.674     224.114       1.737

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 116393.102       0.470     753.147  996315.125
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =12.653   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    114.504    3021.000      24.088     613.262       1.000       1.000       0.980
W Kg/sec =   52.04722

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     75.982    2778.342       1.401       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 88085.828   89847.352       2.303     509.668     221.304     390.276       1.764

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   315.71    -0.11   315.71     0.26   444.17
MEAN    15.91     0.00    -0.02   315.71    -0.11   315.71     0.26
HUB     13.07     0.00    -0.02   315.71    -0.11   315.71     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.83    47.36     9.47   482.97   577.10    22.97   604.95     0.48
MEAN    53.04    44.80     8.24   419.52   525.13    22.97   604.95     0.44
HUB     47.51    38.84     8.67   344.57   467.41    22.97   604.95     0.39

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   404.76   241.17   325.06  1219.16     0.33
MEAN    15.50   405.33   237.75   328.28  1216.44     0.33
HUB     12.59   428.51   271.18   331.79  1213.71     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    472.96   399.23   231.78     0.33  4328.63
MEAN   408.57   370.06   170.81     0.30  3686.31     1.56
HUB    331.91   337.31    60.74     0.28  3415.53

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     26.46     1.10    24.51   631.57     1.03   617.90     0.92     0.91
MEAN    26.10     1.08    24.16   628.85     1.03   615.14     0.92     0.91
HUB     25.94     1.08    23.80   627.71     1.02   612.38     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     36.57    35.49    31.50     3.99     0.93     0.38     2.90
MEAN    35.91    27.49    23.50     3.99     0.93     0.36     3.34     0.91
HUB     39.26    10.37     6.50     3.87     0.93     0.35     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     410.094     242.111     330.997    1216.636       0.337      -0.008

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    26.126      24.148     615.341      46.000      36.184      33.000      -3.184

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     347.778     242.111     423.754    1220.525       0.285       0.258

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      26.108      24.676     619.282     440.827       0.029       0.404

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     326.034       0.000     326.034    1221.729       0.267       0.337
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	24.825	620.504	0.000	0.060	0.040	0.332

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	26.086	1.083	629.374	16.111	241.762	1.874

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
100460.844	0.449	650.054	1036237.250

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
663883.00	4295.8003	111.8588	1.7267	0.8318	12.6533	1.2038

****
********** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********** COMDES Version 12.0 **********
********** with Stator Vane, Gasplus Prop **********
****

Fan-Core + 4 Stage LPC 70% Stat 2 10% Ice Block 8-2-2011

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1

RESET = 0.000BLEED = 0.000 DPInc = 6.032 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
127.956	2643.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 58.16170

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
125.000	2632.591	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
98434.109	100402.578	2.284	831.557	364.027	619.754	1.702

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	294.10	-0.10	294.10	0.26	473.93
MEAN	17.06	0.00	-0.02	294.10	-0.10	294.10	0.26	
HUB	12.51	0.00	-0.02	294.10	-0.10	294.10	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.29	50.47	7.82	475.82	559.46	14.39	515.59	0.50
MEAN	53.23	47.20	6.03	393.48	491.33	14.39	515.59	0.44
HUB	44.46	38.62	5.84	288.54	412.08	14.39	515.59	0.37

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	477.50	259.69	400.71	1122.55	0.43
MEAN	18.04	499.78	293.38	404.61	1120.33	0.45
HUB	15.00	565.99	387.22	412.80	1116.06	0.51

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	475.82	455.28	216.13	0.41	5359.44	
MEAN	415.99	422.78	122.62	0.38	5293.07	1.30
HUB	345.97	414.85	41.25	0.37	5809.61	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.02	1.13	15.02	542.67	1.04	523.62	0.92	0.91
MEAN	16.99	1.12	14.82	542.42	1.04	521.56	0.92	0.91
HUB	17.19	1.14	14.42	544.34	1.04	517.58	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.95	28.34	24.20	4.14	0.93	0.27	2.90	

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 MEAN    35.95    16.86    12.70     4.16     0.93     0.23     3.51     0.91
 HUB     43.17    -5.71    -9.30     3.59     0.93     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     507.765     292.806     414.837    1120.372       0.453       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.042      14.799     521.607      24.000      35.216      35.400       0.184

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     444.762     292.806     532.493    1125.742       0.395       0.230

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.024      15.285     526.619     528.796       0.018       0.382

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     411.343       0.000     411.343    1128.293       0.365       0.298

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.489     529.009       0.000       0.060       0.037       0.318

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.877       16.980       1.124     543.141      20.331     219.263       1.700

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 126579.898       0.559     915.286 1236673.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.032   EfDer =  0.995

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    127.956     2643.000       16.980     543.141       1.000        1.000        0.980
W Kg/sec =   58.16170

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    113.351     2582.848        1.402       0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  98434.109  100402.578        1.789     590.487     330.107     474.134       1.436

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   392.51    -0.14   392.51      0.35   463.18
 MEAN    18.08      0.00    -0.02   392.51    -0.14   392.51      0.35
 HUB     15.21      0.00    -0.02   392.51    -0.14   392.51      0.35

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     50.38     46.36     4.02   473.98   615.50     15.62   530.27      0.54
 MEAN    46.74     42.30     4.44   416.97   572.74     15.62   530.28      0.51
 HUB     41.80     37.84     3.96   350.81   526.52     15.62   530.27      0.47

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     20.42   450.98    178.97    413.95   1139.62      0.40
 MEAN    18.01   461.75    200.92    415.75   1138.61      0.41
 HUB     15.22   500.40    274.83    418.18   1137.55      0.44

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
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 TIP    470.98   506.58   292.01     0.44  3657.28
 MEAN   415.39   467.81   214.47     0.41  3620.97     1.32
 HUB    351.11   425.08    76.29     0.37  4185.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.36     1.08    16.48   556.69     1.02   539.70     0.92     0.91
 MEAN    18.35     1.08    16.38   556.55     1.02   538.75     0.92     0.91
 HUB     18.57     1.09    16.26   558.65     1.03   537.73     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.38    35.20    31.50     3.70     0.93     0.23     2.90
 MEAN    25.79    27.29    23.50     3.79     0.92     0.24     3.30     0.91
 HUB     33.31    10.34     6.50     3.84     0.92     0.26     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     525.116     201.482     484.925    1133.860       0.463      -0.241

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.407      15.887     534.267      46.000      22.562      30.600       8.038

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     499.522     201.482     538.625    1136.181       0.440      -0.142

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      18.369      16.082     536.458     455.853       0.029       0.189

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     493.054       0.000     493.054    1136.749       0.434       0.097

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      16.086     536.994       0.000       0.060       0.058      -0.140

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.838      18.309       1.078     557.296      14.155     280.004       2.171

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  88148.195       0.397     637.390 1141429.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.032   EfDer =  0.920

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    127.956    2643.000      18.309     557.296       1.000       1.000       0.880
W Kg/sec =   58.16170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.489    2549.836       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  98434.109  100402.578       1.579     489.817     310.126     384.470       1.240

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   459.55    -0.16   459.55     0.40   446.57
 MEAN    17.74     0.00    -0.02   459.55    -0.16   459.55     0.40
 HUB     15.05     0.00    -0.02   459.55    -0.16   459.55     0.40

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.22    46.36    -1.14   462.91   652.39    16.37   539.66     0.57
 MEAN    41.69    43.40    -1.71   409.13   615.39    16.37   539.66     0.54
 HUB     37.08    38.84    -1.76   347.12   576.01    16.37   539.66     0.51
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      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   455.13   143.30   431.98  1150.96     0.40
 MEAN    17.51   465.70   172.61   432.53  1150.82     0.40
 HUB     14.85   504.15   256.32   434.13  1150.60     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   533.82   313.61     0.46  2841.87
 MEAN   403.78   490.43   231.17     0.43  3024.67     1.33
 HUB    342.51   442.60    86.18     0.38  3808.79

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.34     1.06    17.37   567.82     1.02   550.52     0.92     0.84
 MEAN    19.41     1.06    17.34   568.50     1.02   550.39     0.92     0.84
 HUB     19.71     1.08    17.27   571.40     1.03   550.18     0.92     0.84

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.35    35.98    31.50     4.48     0.93     0.22     2.90
 MEAN    21.76    28.12    23.50     4.62     0.89     0.25     3.28     0.84
 HUB     30.56    11.23     6.50     4.73     0.89     0.29     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.920

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      471.205     173.746     438.003    1151.135       0.409        0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.466      17.342      550.699      46.000      21.637      31.500       9.863

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392      458.168     173.746     490.006    1152.192       0.398        0.042

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.424      17.416     551.711     471.992       0.030        0.179

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     445.205       0.000     445.205    1153.213       0.386        0.049

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      17.450     552.689       0.000       0.060       0.068        0.058

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.740      19.341       1.056     569.240      11.944     313.380       2.429

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  74394.930       0.356     537.942 1295189.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.032   EfDer =  0.940

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    127.956    2643.000      19.341     569.240       1.000       1.000       0.980
W Kg/sec =   58.16170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.878    2522.945       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  98434.109  100402.578       1.730     513.330     296.704     401.059       1.352
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ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	417.43	-0.14	417.43	0.36	424.03
MEAN	16.97	0.00	-0.02	417.43	-0.14	417.43	0.36	
HUB	14.32	0.00	-0.02	417.43	-0.14	417.43	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.79	46.36	0.43	444.22	609.68	17.67	554.69	0.53
MEAN	43.17	43.80	-0.63	391.42	572.34	17.67	554.69	0.50
HUB	38.36	37.84	0.52	330.28	532.38	17.67	554.69	0.46

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	458.83	119.52	442.99	1160.82	0.40
MEAN	16.57	467.89	150.73	442.94	1161.02	0.40
HUB	13.89	503.18	237.00	443.87	1161.10	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	544.11	315.94	0.47	2259.36	
MEAN	382.27	499.81	231.53	0.43	2500.70	1.22
HUB	320.37	451.63	83.36	0.39	3294.01	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.21	1.04	18.14	577.61	1.01	560.03	0.92	0.86
MEAN	20.30	1.05	18.15	578.50	1.02	560.22	0.92	0.86
HUB	20.61	1.07	18.11	581.44	1.02	560.30	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	15.10	35.50	31.50	4.00	0.93	0.14	2.90	
MEAN	18.79	27.60	23.50	4.10	0.90	0.17	3.29	0.86
HUB	28.10	10.64	6.50	4.14	0.90	0.21	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.940

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	459.537	151.583	433.817	1162.384	0.395	0.054

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.352	18.271	561.549	46.000	19.260	32.400	13.140

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	461.165	151.583	485.439	1162.255	0.397	0.029

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.291	18.202	561.424	456.573	0.037	0.156

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	439.008	0.000	439.008	1163.977	0.377	0.008

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.288	563.089	0.000	0.060	0.088	0.068

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.698	20.177	1.043	579.180	9.941	350.846	2.720

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
61928.789	0.327	447.801	1178678.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 6.032 EfDer = 0.897

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
127.956	2643.000	20.177	579.180	1.000	1.000	0.980

W Kg/sec = 58.16170

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
98.508	2501.200	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
98434.109	100402.578	1.776	509.668	286.897	390.276	1.360

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	408.49	-0.14	408.49	0.35	399.86
MEAN	15.91	0.00	-0.02	408.49	-0.14	408.49	0.35	
HUB	13.07	0.00	-0.02	408.49	-0.14	408.49	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.98	47.36	-1.38	422.54	587.82	18.53	565.25	0.50
MEAN	41.95	44.80	-2.85	367.03	549.25	18.53	565.25	0.47
HUB	36.44	38.84	-2.40	301.45	507.76	18.53	565.25	0.44

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	446.44	100.64	434.95	1170.29	0.38
MEAN	15.50	453.47	128.13	434.99	1170.43	0.39
HUB	12.59	483.05	207.92	436.01	1170.46	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	535.95	313.14	0.46	1808.05	
MEAN	357.44	491.74	229.32	0.42	1987.87	1.20
HUB	290.38	443.74	82.47	0.38	2619.49	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.85	1.03	18.86	585.87	1.01	569.24	0.92	0.82
MEAN	20.92	1.04	18.86	586.54	1.01	569.37	0.92	0.82
HUB	21.16	1.05	18.82	588.88	1.02	569.40	0.92	0.82

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	13.03	35.75	31.50	4.25	0.93	0.12	2.90	
MEAN	16.41	27.80	23.50	4.30	0.89	0.14	3.34	0.82
HUB	25.49	10.71	6.50	4.21	0.89	0.18	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.897

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	457.900	130.475	438.918	1170.646	0.391	-0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.936	18.837	569.594	46.000	16.555	33.000	16.445

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	474.370	130.475	491.986	1169.328	0.406	-0.138

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.781	18.552	568.312	440.827	0.092	0.130

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	442.608	0.000	442.608	1171.827	0.378	-0.019

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.796	570.744	0.000	0.060	0.110	-0.023

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     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.583      20.743       1.028     587.097       7.917     410.158       3.180

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   49329.305       0.288     356.695 1240784.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     400381.12   2895.1140    125.0000      1.3731      0.7740      6.0315      1.1230


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.474   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     126.046    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   57.29363

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     123.134    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   96964.961   98904.055       2.319     831.557     358.594     619.754       1.728

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   289.39    -0.10   289.39     0.26   473.93
  MEAN    17.06     0.00    -0.02   289.39    -0.10   289.39     0.26
  HUB     12.51     0.00    -0.02   289.39    -0.10   289.39     0.26

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.70    50.47     8.23   475.82   557.00    14.41   515.82     0.50
  MEAN    53.67    47.20     6.47   393.48   488.52    14.41   515.82     0.44
  HUB     44.93    38.62     6.31   288.54   408.73    14.41   515.82     0.37

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   473.73   263.53   393.67  1123.18     0.42
  MEAN    18.04   495.44   295.55   397.63  1120.87     0.44
  HUB     15.00   560.34   386.57   405.65  1116.59     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   447.26   212.29     0.40  5438.73
  MEAN   415.99   415.47   120.45     0.37  5332.19     1.32
  HUB    345.97   407.67    40.60     0.37  5799.72

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.05     1.13    15.08   542.96     1.04   524.22     0.92     0.91
  MEAN    17.01     1.13    14.87   542.57     1.04   522.07     0.92     0.91
  HUB     17.18     1.14    14.46   544.30     1.04   518.07     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     33.80    28.34    24.20     4.14     0.93     0.28     2.90
  MEAN    36.62    16.85    12.70     4.15     0.93     0.24     3.51     0.91
  HUB     43.62    -5.72    -9.30     3.58     0.93     0.11     4.78
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     503.162     294.973     407.631    1120.933       0.449      -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.057      14.851     522.130      24.000      35.891      35.400      -0.491

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     436.592     294.973     526.898    1126.528       0.388       0.244

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.039      15.360     527.355     528.796       0.018       0.393

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     403.975       0.000     403.975    1128.971       0.358       0.309

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.554     529.645       0.000       0.060       0.037       0.329

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      16.996       1.125     543.275      20.465     216.431       1.678

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 127414.367       0.563     907.569 1216867.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.474   EfDer =  0.997

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    126.046    2643.000      16.996     543.275       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    111.572    2582.530       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       1.817     590.487     324.924     474.134       1.459

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   385.57    -0.13   385.57     0.34   463.12
 MEAN    18.08     0.00    -0.02   385.57    -0.13   385.57     0.34
 HUB     15.21     0.00    -0.02   385.57    -0.13   385.57     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.88    46.36     4.52   473.98   611.10    15.68   530.86     0.54
 MEAN    47.25    42.30     4.95   416.97   568.01    15.68   530.86     0.50
 HUB     42.31    37.84     4.47   350.81   521.37    15.68   530.86     0.46

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   446.06   184.68   406.03  1140.61     0.39
 MEAN    18.01   456.63   205.03   408.01  1139.46     0.40
 HUB     15.22   494.91   276.34   410.57  1138.26     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   496.82   286.29     0.44  3773.95
 MEAN   415.39   459.05   210.36     0.40  3695.02     1.34
 HUB    351.11   417.33    74.77     0.37  4208.71
```

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.43	1.08	16.58	557.25	1.03	540.64	0.92	0.91
MEAN	18.40	1.08	16.47	556.96	1.03	539.55	0.92	0.91
HUB	18.60	1.09	16.33	558.86	1.03	538.41	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	24.46	35.19	31.50	3.69	0.93	0.24	2.90	
MEAN	26.68	27.27	23.50	3.77	0.92	0.25	3.30	0.91
HUB	33.94	10.32	6.50	3.82	0.92	0.27	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	517.930	205.608	475.370	1134.946	0.456	-0.235

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.455	15.996	535.291	46.000	23.390	30.600	7.210

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	488.989	205.608	530.457	1137.523	0.430	-0.118

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	18.422	16.222	537.725	455.853	0.026	0.201

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	482.576	0.000	482.576	1138.073	0.424	0.115

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	16.227	538.245	0.000	0.060	0.054	-0.115

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.847	18.366	1.081	557.694	14.419	273.700	2.122

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
89791.922	0.405	639.585	1121797.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 6.474 EfDer = 0.931

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
126.046	2643.000	18.366	557.694	1.000	1.000	0.880

W Kg/sec = 57.29363

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
104.608	2548.927	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96964.961	98904.055	1.608	489.817	304.649	384.470	1.262

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	450.08	-0.15	450.08	0.39	446.42
MEAN	17.74	0.00	-0.02	450.08	-0.15	450.08	0.39	
HUB	15.05	0.00	-0.02	450.08	-0.15	450.08	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.81	46.36	-0.55	462.91	645.75	16.50	540.78	0.57
MEAN	42.28	43.40	-1.12	409.13	608.34	16.50	540.78	0.53
HUB	37.65	38.84	-1.19	347.12	568.48	16.50	540.78	0.50

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2

```
     0.500       0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   448.43   150.41   422.45  1152.45     0.39
 MEAN    17.51   459.06   177.77   423.24  1152.12     0.40
 HUB     14.85   497.32   258.33   424.96  1151.73     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   521.93   306.50     0.45  2982.69
 MEAN   403.78   479.80   226.01     0.42  3114.92     1.35
 HUB    342.51   433.22    84.18     0.38  3838.49

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.47     1.06    17.54   568.74     1.02   551.95     0.92     0.85
 MEAN    19.52     1.06    17.50   569.23     1.02   551.63     0.92     0.85
 HUB     19.80     1.08    17.41   571.91     1.03   551.26     0.92     0.85

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.60    35.96    31.50     4.46     0.93     0.23     2.90
 MEAN    22.78    28.10    23.50     4.60     0.90     0.26     3.28     0.85
 HUB     31.29    11.20     6.50     4.70     0.90     0.30     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.931

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     464.404     178.938     428.546    1152.442       0.403       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.574      17.500     551.950      46.000      22.663      31.500       8.837

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     447.567     178.938     482.011    1153.780       0.388       0.061

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.539      17.611     553.233     471.992       0.027       0.193

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     434.797       0.000     434.797    1154.760       0.377       0.070

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.648     554.173       0.000       0.060       0.062       0.079

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.763      19.465       1.060     569.959      12.266     304.007       2.357

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  76400.219       0.366     544.197 1270888.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.474   EfDer =  0.950

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    126.046    2643.000      19.465     569.959       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     99.785    2521.351       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       1.766     513.330     290.609     401.059       1.380

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     19.26     0.00    -0.02   407.88    -0.14   407.88     0.35   423.76
MEAN    16.97     0.00    -0.02   407.88    -0.14   407.88     0.35
HUB     14.32     0.00    -0.02   407.88    -0.14   407.88     0.35

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     47.45    46.36     1.09   444.22   603.18    17.86   556.07     0.52
MEAN    43.83    43.80     0.03   391.42   565.41    17.86   556.07     0.49
HUB     39.01    37.84     1.17   330.28   524.92    17.86   556.07     0.45

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   450.27   127.70   431.78  1162.83     0.39
MEAN    16.57   459.56   156.62   432.05  1162.81     0.40
HUB     13.89   494.83   239.20   433.17  1162.68     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   530.23   307.76     0.46  2413.71
MEAN   382.27   487.43   225.65     0.42  2598.15     1.24
HUB    320.37   440.71    81.17     0.38  3324.48

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.41     1.05    18.40   578.90     1.02   561.97     0.92     0.87
MEAN    20.48     1.05    18.39   579.58     1.02   561.95     0.92     0.87
HUB     20.77     1.07    18.34   582.27     1.02   561.83     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     16.48    35.48    31.50     3.98     0.93     0.16     2.90
MEAN    19.93    27.58    23.50     4.08     0.90     0.18     3.29     0.87
HUB     28.91    10.61     6.50     4.11     0.90     0.22     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.950

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     451.566     157.499     423.209    1164.116       0.388       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.530      18.504     563.224      46.000      20.413      32.400      11.987

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     449.030     157.499     475.851    1164.313       0.386       0.049

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.479      18.480     563.414     456.573       0.034       0.171

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     16.096     427.363       0.000     427.363    1165.951       0.367       0.029

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.568     565.000       0.000       0.060       0.081       0.089

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4           PR4       Texit        Del T       Ns        Ns nondim
     0.732      20.376       1.047     580.248      10.289     337.961       2.620

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  64099.555       0.338     456.579 1156486.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.474   EfDer =  0.913

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    2643.000      20.376     580.248       1.000       1.000       0.980
```

W Kg/sec = 57.29363

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
96.176	2498.897	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96964.961	98904.055	1.820	509.668	280.104	390.276	1.393

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	397.89	-0.14	397.89	0.34	399.49
MEAN	15.91	0.00	-0.02	397.89	-0.14	397.89	0.34	
HUB	13.07	0.00	-0.02	397.89	-0.14	397.89	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.73	47.36	-0.63	422.54	580.50	18.80	567.03	0.50
MEAN	42.70	44.80	-2.10	367.03	541.41	18.80	567.03	0.46
HUB	37.16	38.84	-1.68	301.45	499.28	18.80	567.03	0.43

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	436.58	109.74	422.56	1172.75	0.37
MEAN	15.50	443.85	134.70	422.92	1172.65	0.38
HUB	12.59	473.41	210.34	424.11	1172.46	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	520.57	304.04	0.44	1971.24	
MEAN	357.44	477.99	222.74	0.41	2089.77	1.22
HUB	290.38	431.60	80.04	0.37	2650.03	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.13	1.04	19.20	587.55	1.01	571.64	0.92	0.83
MEAN	21.18	1.04	19.18	587.98	1.01	571.54	0.92	0.83
HUB	21.40	1.05	19.12	590.06	1.02	571.35	0.92	0.83

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	14.56	35.74	31.50	4.24	0.93	0.14	2.90	
MEAN	17.67	27.77	23.50	4.27	0.89	0.15	3.34	0.83
HUB	26.38	10.69	6.50	4.19	0.89	0.19	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.913

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	448.171	137.174	426.662	1172.873	0.382	-0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.195	19.162	571.763	46.000	17.823	33.000	15.177

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	459.750	137.174	479.778	1171.973	0.392	-0.110

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.064	18.942	570.885	440.827	0.083	0.145

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	429.299	0.000	429.299	1174.290	0.366	0.004

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.170	573.145	0.000	0.060	0.102	0.000

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.633      21.026       1.032     588.530       8.281     391.354       3.034

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   51602.297       0.301     367.562 1216635.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     409308.38   2915.4924    123.1343      1.3918      0.7910      6.4740      1.1257


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     123.994    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   56.36100

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     121.130    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95386.555   97294.086       2.357     831.557     352.757     619.754       1.757

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   284.35    -0.10   284.35     0.26   473.93
  MEAN    17.06     0.00    -0.02   284.35    -0.10   284.35     0.26
  HUB     12.51     0.00    -0.02   284.35    -0.10   284.35     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.14    50.47     8.67   475.82   554.39    14.44   516.06     0.50
  MEAN    54.15    47.20     6.95   393.48   485.55    14.44   516.06     0.44
  HUB     45.43    38.62     6.81   288.54   405.17    14.44   516.06     0.36

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   469.86   267.63   386.19  1123.84     0.42
  MEAN    18.04   490.89   297.85   390.21  1121.44     0.44
  HUB     15.00   554.36   385.84   398.05  1117.14     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   438.73   208.19     0.39  5523.20
  MEAN   415.99   407.70   118.14     0.36  5373.71     1.33
  HUB    345.97   400.05    39.87     0.36  5788.83

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.08     1.13    15.14   543.27     1.04   524.83     0.92     0.91
  MEAN    17.02     1.13    14.92   542.72     1.04   522.59     0.92     0.91
  HUB     17.18     1.14    14.51   544.26     1.04   518.59     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     34.72    28.33    24.20     4.13     0.93     0.29     2.90
  MEAN    37.35    16.84    12.70     4.14     0.93     0.25     3.51     0.91
  HUB     44.11    -5.72    -9.30     3.58     0.93     0.12     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       1.000
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     498.350     297.272     399.978    1121.518       0.444      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.071      14.904     522.674      24.000      36.621      35.400      -1.221

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     427.953     297.272     521.071    1127.346       0.380       0.259

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.054      15.438     528.121     528.796       0.018       0.404

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     396.182       0.000     396.182    1129.678       0.351       0.321

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.622     530.308       0.000       0.060       0.037       0.341

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      17.011       1.126     543.417      20.607     213.427       1.654

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 128299.383       0.567     898.997 1195665.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    123.994    2643.000      17.011     543.417       1.000       1.000       0.980
W Kg/sec =   56.36100

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    109.675    2582.192       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95386.555   97294.086       1.849     590.487     319.400     474.134       1.484

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   378.23    -0.13   378.23     0.33   463.06
 MEAN    18.08     0.00    -0.02   378.23    -0.13   378.23     0.33
 HUB     15.21     0.00    -0.02   378.23    -0.13   378.23     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.42    46.36     5.06   473.98   606.49    15.74   531.47     0.54
 MEAN    47.80    42.30     5.50   416.97   563.05    15.74   531.47     0.50
 HUB     42.86    37.84     5.02   350.81   515.96    15.74   531.47     0.46

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   441.06   190.67   397.72  1141.62     0.39
 MEAN    18.01   451.35   209.35   399.86  1140.33     0.40
 HUB     15.22   489.17   277.90   402.56  1139.00     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   486.57   280.30     0.43  3896.23
 MEAN   415.39   449.83   206.04     0.39  3772.74     1.35
 HUB    351.11   409.17    73.21     0.36  4232.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.49     1.09    16.68   557.85     1.03   541.60     0.92     0.91
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 MEAN    18.45     1.08    16.56   557.39     1.03   540.38     0.92     0.91
 HUB     18.63     1.09    16.41   559.09     1.03   539.11     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.61    35.18    31.50     3.68     0.93     0.25     2.90
 MEAN    27.63    27.26    23.50     3.76     0.92     0.26     3.30     0.91
 HUB     34.62    10.31     6.50     3.81     0.92     0.28     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     510.526     209.938     465.363    1136.062       0.449       -0.228

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.502      16.105     536.346      46.000      24.281      30.600       6.319

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     478.019     209.938     522.088    1138.901       0.420       -0.093

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      18.475      16.363     539.029     455.853       0.024       0.214

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     471.676       0.000     471.676    1139.432       0.414       0.135

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      16.371     539.532       0.000       0.060       0.050      -0.089

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.856      18.423       1.083     558.112      14.695     267.252       2.072

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91511.305       0.413     641.222 1100887.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.942

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    123.994    2643.000      18.423     558.112       1.000       1.000       0.880
W Kg/sec =   56.36100

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    102.624    2547.972       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95386.555   97294.086       1.639     489.817     298.872     384.470       1.286

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   440.19    -0.15   440.19     0.39   446.25
 MEAN    17.74     0.00    -0.02   440.19    -0.15   440.19     0.39
 HUB     15.05     0.00    -0.02   440.19    -0.15   440.19     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.45    46.36     0.09   462.91   638.90    16.63   541.93     0.56
 MEAN    42.92    43.40    -0.48   409.13   601.07    16.63   541.93     0.53
 HUB     38.27    38.84    -0.57   347.12   560.68    16.63   541.93     0.49

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     19.81   441.71   157.82   412.55  1153.97     0.38
 MEAN    17.51   452.32   183.15   413.58  1153.45     0.39
 HUB     14.85   490.30   260.41   415.42  1152.89     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   509.56   299.09     0.44  3129.43
 MEAN   403.78   468.75   220.63     0.41  3209.08     1.37
 HUB    342.51   423.46    82.10     0.37  3869.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.60     1.06    17.71   569.70     1.02   553.41     0.92     0.86
 MEAN    19.63     1.07    17.65   570.00     1.02   552.91     0.92     0.86
 HUB     19.89     1.08    17.56   572.44     1.03   552.37     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.93    35.94    31.50     4.44     0.93     0.24     2.90
 MEAN    23.89    28.08    23.50     4.58     0.90     0.27     3.28     0.86
 HUB     32.08    11.18     6.50     4.68     0.90     0.30     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.942

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     457.505     184.356     418.717    1153.782       0.397       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.685      17.661     553.235      46.000      23.763      31.500       7.737

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     436.610     184.356     473.936    1155.408       0.378       0.081

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.656      17.809     554.795     471.992       0.024       0.208

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     424.058       0.000     424.058    1156.347       0.367       0.091

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.849     555.697       0.000       0.060       0.056       0.101

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.786      19.589       1.063     570.713      12.601     294.627       2.284

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  78489.930       0.376     549.981 1245221.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.961

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    123.994    2643.000      19.589     570.713       1.000       1.000       0.980
W Kg/sec =   56.36100

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.602    2519.686       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95386.555   97294.086       1.806     513.330     284.250     401.059       1.411

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   398.00    -0.14   398.00     0.34   423.48
 MEAN    16.97     0.00    -0.02   398.00    -0.14   398.00     0.34
 HUB     14.32     0.00    -0.02   398.00    -0.14   398.00     0.34
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     48.15    46.36     1.79   444.22   596.54    18.05   557.49     0.52
MEAN    44.53    43.80     0.73   391.42   558.32    18.05   557.49     0.48
HUB     39.70    37.84     1.86   330.28   517.28    18.05   557.49     0.45

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   441.77   136.08   420.28  1164.87     0.38
MEAN    16.57   451.20   162.67   420.86  1164.62     0.39
HUB     13.89   486.33   241.42   422.18  1164.30     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   516.01   299.37     0.44  2571.90
MEAN   382.27   474.71   219.60     0.41  2698.45     1.26
HUB    320.37   429.50    78.94     0.37  3355.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.61     1.05    18.66   580.24     1.02   563.94     0.92     0.88
MEAN    20.66     1.05    18.63   580.70     1.02   563.71     0.92     0.88
HUB     20.93     1.07    18.56   583.14     1.02   563.39     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     17.94    35.46    31.50     3.96     0.93     0.17     2.90
MEAN    21.13    27.55    23.50     4.05     0.91     0.19     3.29     0.88
HUB     29.76    10.59     6.50     4.09     0.91     0.23     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.961

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     443.582     163.588     412.316    1165.880       0.380       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.712      18.741     564.931      46.000      21.641      32.400      10.759

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     436.651     163.588     466.289    1166.405       0.374       0.069

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.670      18.762     565.440     456.573       0.030       0.187

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     415.493       0.000     415.493    1167.957       0.356       0.053

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.853     566.945       0.000       0.060       0.073       0.112

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.763      20.579       1.051     581.359      10.646     325.411       2.523

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  66324.031       0.350     464.734 1133081.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.928

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     123.994    2643.000      20.579     581.359       1.000       1.000       0.980
W Kg/sec =   56.36100

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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    93.771    2496.510       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 95386.555   97294.086       1.866     509.668     273.099     390.276       1.429

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   387.07    -0.13   387.07     0.33   399.11
MEAN    15.91     0.00    -0.02   387.07    -0.13   387.07     0.33
HUB     13.07     0.00    -0.02   387.07    -0.13   387.07     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     47.52    47.36     0.16   422.54   573.13    19.07   568.85     0.49
MEAN    43.49    44.80    -1.31   367.03   533.50    19.07   568.85     0.46
HUB     37.92    38.84    -0.92   301.45   490.69    19.07   568.85     0.42

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   426.92   119.02   409.99  1175.23     0.36
MEAN    15.50   434.30   141.39   410.64  1174.90     0.37
HUB     12.59   463.73   212.82   412.01  1174.49     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.78   504.95   294.76     0.43  2137.69
MEAN   357.44   464.01   216.05     0.39  2193.39     1.24
HUB    290.38   419.25    77.56     0.36  2681.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.42     1.04    19.55   589.27     1.01   574.06     0.92     0.85
MEAN    21.44     1.04    19.51   589.48     1.01   573.73     0.92     0.85
HUB     21.64     1.05    19.43   591.28     1.02   573.33     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     16.19    35.71    31.50     4.21     0.93     0.15     2.90
MEAN    19.00    27.75    23.50     4.25     0.90     0.17     3.34     0.85
HUB     27.32    10.66     6.50     4.16     0.90     0.20     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.928

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     438.532     143.986     414.220    1175.123       0.373      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.460      19.491     573.958      46.000      19.168      33.000      13.832

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     445.069     143.986     467.780    1174.629       0.379      -0.081

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.352      19.335     573.476     440.827       0.074       0.163

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     415.871       0.000     415.871    1176.776       0.353       0.029

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      19.549     575.574       0.000       0.060       0.093       0.026

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.680      21.314       1.036     590.012       8.653     373.494       2.895

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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   53917.664       0.315     377.802 1191292.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     418542.31   2932.7366    121.1299      1.4109      0.8070      6.9532      1.1285


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 70% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.494   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     121.700    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   55.31819

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     118.889    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   93621.680   95493.914       2.402     831.557     346.230     619.754       1.790

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   278.73    -0.10   278.73     0.25   473.93
  MEAN    17.06     0.00    -0.02   278.73    -0.10   278.73     0.25
  HUB     12.51     0.00    -0.02   278.73    -0.10   278.73     0.25

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.64    50.47     9.17   475.82   551.53    14.46   516.32     0.49
  MEAN    54.69    47.20     7.49   393.48   482.28    14.46   516.32     0.43
  HUB     46.00    38.62     7.38   288.54   401.25    14.46   516.32     0.36

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   465.72   272.13   377.94  1124.55     0.41
  MEAN    18.04   485.98   300.41   382.01  1122.05     0.43
  HUB     15.00   547.82   385.06   389.66  1117.74     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   429.34   203.70     0.38  5615.93
  MEAN   415.99   399.11   115.58     0.36  5419.83     1.36
  HUB    345.97   391.62    39.09     0.35  5777.09

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.11     1.13    15.20   543.62     1.04   525.50     0.92     0.91
  MEAN    17.04     1.13    14.98   542.89     1.04   523.17     0.92     0.91
  HUB     17.17     1.14    14.57   544.21     1.04   519.15     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     35.75    28.32    24.20     4.12     0.93     0.31     2.90
  MEAN    38.18    16.83    12.70     4.13     0.93     0.26     3.51     0.91
  HUB     44.66    -5.73    -9.30     3.57     0.93     0.13     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.999

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
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    18.071     493.141     299.826     391.526    1122.149       0.439      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.086      14.961     523.263      24.000      37.444      35.400      -2.044

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     418.454     299.826     514.781    1128.230       0.371       0.275

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.069      15.520     528.949     528.796       0.018       0.417

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    18.083     387.609       0.000     387.609    1130.442       0.343       0.334

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.693     531.026       0.000       0.060       0.038       0.354

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      17.025       1.127     543.574      20.764     210.109       1.629

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 129276.734       0.571     889.085 1172050.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.494   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    2643.000      17.025     543.574       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    107.571    2581.819       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       1.885     590.487     313.271     474.134       1.513

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   370.14    -0.13   370.14     0.33   462.99
 MEAN    18.08     0.00    -0.02   370.14    -0.13   370.14     0.33
 HUB     15.21     0.00    -0.02   370.14    -0.13   370.14     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.02    46.36     5.66   473.98   601.48    15.81   532.13     0.53
 MEAN    48.41    42.30     6.11   416.97   557.65    15.81   532.13     0.49
 HUB     43.47    37.84     5.63   350.81   510.06    15.81   532.13     0.45

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   435.81   197.22   388.64  1142.71     0.38
 MEAN    18.01   445.73   214.09   390.95  1141.27     0.39
 HUB     15.22   482.98   279.64   393.79  1139.80     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   475.38   273.76     0.42  4029.75
 MEAN   415.39   439.73   201.30     0.39  3858.02     1.37
 HUB    351.11   400.22    71.47     0.35  4258.89

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.56     1.09    16.79   558.50     1.03   542.64     0.92     0.91
 MEAN    18.50     1.09    16.65   557.86     1.03   541.27     0.92     0.91
 HUB     18.65     1.10    16.48   559.35     1.03   539.87     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.91    35.16    31.50     3.66     0.93     0.27     2.90
 MEAN    28.71    27.24    23.50     3.74     0.93     0.27     3.30     0.91
 HUB     35.38    10.29     6.50     3.79     0.93     0.29     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     502.622     214.689     454.464    1137.257       0.442      -0.221

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.552      16.220     537.474      46.000      25.286      30.600       5.314

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     466.135     214.689     513.199    1140.376       0.409      -0.066

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      18.529      16.513     540.426     455.853       0.022       0.228

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     459.885       0.000     459.885    1140.885       0.403       0.156

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      16.522     540.909       0.000       0.060       0.046      -0.061

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.863      18.482       1.086     558.572      14.997     260.366       2.018

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93397.547       0.421     642.330 1077719.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.494   EfDer =  0.953

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    121.700    2643.000      18.482     558.572       1.000       1.000       0.880
W Kg/sec =   55.31819

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    100.448    2546.923       1.402       0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  93621.680   95493.914       1.674     489.817     292.534     384.470       1.314

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   429.47    -0.15   429.47      0.38   446.06
 MEAN    17.74      0.00    -0.02   429.47    -0.15   429.47      0.38
 HUB     15.05      0.00    -0.02   429.47    -0.15   429.47      0.38

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     47.15     46.36     0.79   462.91   631.56     16.76   543.17      0.55
 MEAN    43.62     43.40     0.22   409.13   593.26     16.76   543.17      0.52
 HUB     38.96     38.84     0.12   347.12   552.31     16.76   543.17      0.48

     ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   434.73   165.80   401.87  1155.59      0.38
 MEAN    17.51   445.22   188.96   403.13  1154.88      0.39
 HUB     14.85   482.81   262.67   405.11  1154.13      0.42
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   496.23   291.11     0.43  3287.41
 MEAN   403.78   456.80   214.82     0.40  3310.62     1.39
 HUB    342.51   412.91    79.84     0.36  3902.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.74     1.07    17.90   570.75     1.02   554.97     0.92     0.87
 MEAN    19.75     1.07    17.82   570.83     1.02   554.28     0.92     0.87
 HUB     19.98     1.08    17.71   573.03     1.03   553.56     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.42    35.92    31.50     4.42     0.93     0.26     2.90
 MEAN    25.11    28.05    23.50     4.55     0.90     0.28     3.28     0.87
 HUB     32.96    11.15     6.50     4.65     0.90     0.31     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.953

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     450.244     190.197     408.099    1155.211       0.390       0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.800      17.829     554.607      46.000      24.988      31.500       6.512

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     424.846     190.197     465.477    1157.142       0.367       0.104

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.778      18.017     556.463     471.992       0.021       0.226

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     412.552       0.000     412.552    1158.036       0.356       0.115

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.060     557.322       0.000       0.060       0.051       0.125

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.807      19.718       1.067     571.534      12.962     284.907       2.209

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  80742.430       0.387     555.296 1217008.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.494   EfDer =  0.971

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    2643.000      19.718     571.534       1.000       1.000       0.980
W Kg/sec =   55.31819

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      95.236    2517.875       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       1.851     513.330     277.360     401.059       1.446

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   387.40    -0.13   387.40     0.33   423.18
 MEAN    16.97     0.00    -0.02   387.40    -0.13   387.40     0.33
 HUB     14.32     0.00    -0.02   387.40    -0.13   387.40     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.92    46.36     2.56   444.22   589.52    18.25   559.00     0.51
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MEAN    45.31    43.80     1.51   391.42   550.81    18.25   559.00     0.47
HUB     40.46    37.84     2.62   330.28   509.17    18.25   559.00     0.44

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   433.06   145.02   408.06  1167.01     0.37
MEAN    16.57   442.52   169.09   408.94  1166.55     0.38
HUB     13.89   477.41   243.83   410.45  1166.01     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   500.87   290.44     0.43  2740.54
MEAN   382.27   461.16   213.17     0.40  2804.81     1.28
HUB    320.37   417.53    76.54     0.36  3388.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.82     1.06    18.93   581.68     1.02   566.02     0.92     0.89
MEAN    20.85     1.06    18.88   581.92     1.02   565.57     0.92     0.89
HUB     21.09     1.07    18.79   584.08     1.02   565.05     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     19.56    35.44    31.50     3.94     0.93     0.19     2.90
MEAN    22.47    27.53    23.50     4.03     0.91     0.21     3.29     0.89
HUB     30.71    10.56     6.50     4.06     0.91     0.24     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.971

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     435.287     170.045     400.699    1167.746       0.373       0.054

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.902      18.988     566.741      46.000      22.995      32.400       9.405

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     423.543     170.045     456.403    1168.613       0.362       0.092

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.869      19.056     567.583     456.573       0.026       0.206

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     402.943       0.000     402.943    1170.076       0.344       0.079

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      19.150     569.005       0.000       0.060       0.065       0.137

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.792      20.789       1.054     582.560      11.026     312.700       2.424

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  68695.055       0.362     472.442 1107400.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.494   EfDer =  0.943

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    2643.000      20.789     582.560       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.198    2493.933       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 93621.680   95493.914       1.919     509.668     265.606     390.276       1.469

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   375.60    -0.13   375.60     0.32   398.70
MEAN    15.91     0.00    -0.02   375.60    -0.13   375.60     0.32
HUB     13.07     0.00    -0.02   375.60    -0.13   375.60     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     48.37    47.36     1.01   422.54   565.44    19.36   570.78     0.48
MEAN    44.35    44.80    -0.45   367.03   525.24    19.36   570.78     0.45
HUB     38.76    38.84    -0.08   301.45   481.69    19.36   570.78     0.41

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   417.14   128.75   396.78  1177.82     0.35
MEAN    15.50   424.51   148.44   397.72  1177.26     0.36
HUB     12.59   453.67   215.43   399.26  1176.63     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.78   488.54   285.03     0.41  2312.15
MEAN   357.44   449.29   209.01     0.38  2302.50     1.26
HUB    290.38   406.23    74.95     0.35  2713.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.72     1.04    19.92   591.12     1.01   576.59     0.92     0.86
MEAN    21.72     1.04    19.85   591.08     1.01   576.04     0.92     0.86
HUB     21.89     1.05    19.75   592.61     1.02   575.43     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     17.98    35.69    31.50     4.19     0.93     0.17     2.90
MEAN    20.47    27.72    23.50     4.22     0.90     0.19     3.34     0.86
HUB     28.35    10.63     6.50     4.13     0.90     0.21     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.943

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     428.663     151.161     401.126    1177.482       0.364      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.738      19.834     576.264      46.000      20.648      33.000      12.352

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     429.786     151.161     455.594    1177.399       0.365      -0.049

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.651      19.745     576.184     440.827       0.065       0.182

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     401.837       0.000     401.837    1179.380       0.341       0.058

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.946     578.124       0.000       0.060       0.083       0.055

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.724      21.616       1.040     591.603       9.043     355.937       2.759

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  56350.773       0.329     387.546 1163611.000

   OVERALL EXIT CONDITIONS; ALL          5   STAGES
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   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     428462.56   2946.6990    118.8887      1.4308      0.8222      7.4939      1.1316


********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 70% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     119.767    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   54.43945

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     117.000    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   92134.484   93976.977       2.441     831.557     340.730     619.754       1.819

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   274.02    -0.09   274.02     0.25   473.93
  MEAN    17.06     0.00    -0.02   274.02    -0.09   274.02     0.25
  HUB     12.51     0.00    -0.02   274.02    -0.09   274.02     0.25

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.07    50.47     9.60   475.82   549.16    14.48   516.54     0.49
  MEAN    55.15    47.20     7.95   393.48   479.57    14.48   516.54     0.43
  HUB     46.49    38.62     7.87   288.54   397.99    14.48   516.54     0.36

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   462.38   275.86   371.08  1125.13     0.41
  MEAN    18.04   481.94   302.52   375.17  1122.55     0.43
  HUB     15.00   542.39   384.39   382.67  1118.23     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   421.52   199.96     0.37  5692.94
  MEAN   415.99   391.95   113.47     0.35  5457.87     1.38
  HUB    345.97   384.59    38.42     0.34  5767.05

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.14     1.13    15.26   543.90     1.04   526.05     0.92     0.91
  MEAN    17.05     1.13    15.02   543.03     1.04   523.63     0.92     0.91
  HUB     17.17     1.14    14.61   544.18     1.04   519.61     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     36.63    28.32    24.20     4.12     0.93     0.32     2.90
  MEAN    38.88    16.83    12.70     4.13     0.93     0.28     3.51     0.91
  HUB     45.13    -5.73    -9.30     3.57     0.93     0.14     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.998

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     488.867     301.932     384.484    1122.664       0.435      -0.006

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     17.098      15.007     523.743      24.000      38.142      35.400      -2.742

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     410.573     301.932     509.641    1128.950       0.364       0.289

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.080      15.587     529.625     528.796       0.018       0.428

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     380.494       0.000     380.494    1131.066       0.336       0.344

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.750     531.612       0.000       0.060       0.039       0.365

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      17.035       1.128     543.704      20.894     207.354       1.607

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 130084.227       0.575     880.427 1152223.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.767    2643.000      17.035     543.704       1.000       1.000       0.980
W Kg/sec =   54.43945

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    105.811    2581.511       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 92134.484   93976.977       1.916     590.487     308.146     474.134       1.539

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   363.43    -0.13   363.43     0.32   462.94
 MEAN    18.08     0.00    -0.02   363.43    -0.13   363.43     0.32
 HUB     15.21     0.00    -0.02   363.43    -0.13   363.43     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.53    46.36     6.17   473.98   597.37    15.86   532.67     0.53
 MEAN    48.93    42.30     6.63   416.97   553.21    15.86   532.67     0.49
 HUB     44.00    37.84     6.16   350.81   505.21    15.86   532.67     0.45

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   431.65   202.58   381.16  1143.59     0.38
 MEAN    18.01   441.20   217.97   383.59  1142.04     0.39
 HUB     15.22   477.91   281.06   386.53  1140.44     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   466.17   268.39     0.41  4139.32
 MEAN   415.39   431.41   197.42     0.38  3927.97     1.39
 HUB    351.11   392.82    70.05     0.34  4280.53

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.62     1.09    16.87   559.04     1.03   543.48     0.92     0.91
 MEAN    18.53     1.09    16.72   558.25     1.03   542.00     0.92     0.91
 HUB     18.67     1.10    16.55   559.56     1.03   540.49     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.99    35.15    31.50     3.65     0.93     0.28     2.90
 MEAN    29.61    27.23    23.50     3.73     0.93     0.28     3.30     0.91
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 HUB     36.02    10.27     6.50     3.77     0.93     0.29     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     496.239     218.586     445.503    1138.219       0.436      -0.215

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.590      16.311     538.385      46.000      26.135      30.600       4.465

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     456.414     218.586     506.057    1141.564       0.400      -0.043

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      18.570      16.631     541.553     455.853       0.020       0.240

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.823     450.255       0.000     450.255    1142.055       0.394       0.174

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      16.642     542.019       0.000       0.060       0.043      -0.037

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.868      18.527       1.088     558.950      15.246     254.834       1.975

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94944.328       0.428     642.596 1058360.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  0.962

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.767    2643.000      18.527     558.950       1.000       1.000       0.880
W Kg/sec =   54.43945

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     98.648    2546.061       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92134.484   93976.977       1.705     489.817     287.292     384.470       1.338

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   420.70    -0.14   420.70     0.37   445.91
 MEAN    17.74     0.00    -0.02   420.70    -0.14   420.70     0.37
 HUB     15.05     0.00    -0.02   420.70    -0.14   420.70     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.74    46.36     1.38   462.91   625.62    16.87   544.17     0.55
 MEAN    44.21    43.40     0.81   409.13   586.94    16.87   544.17     0.51
 HUB     39.54    38.84     0.70   347.12   545.51    16.87   544.17     0.48

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   429.27   172.32   393.17  1156.89     0.37
 MEAN    17.51   439.59   193.70   394.61  1156.02     0.38
 HUB     14.85   476.80   264.52   396.70  1155.13     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   485.36   284.59     0.42  3416.55
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 MEAN   403.78   447.05   210.08     0.39  3393.56     1.40
 HUB    342.51   404.29    77.99     0.35  3930.26

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.85     1.07    18.04   571.60     1.02   556.22     0.92     0.88
 MEAN    19.84     1.07    17.95   571.52     1.02   555.38     0.92     0.88
 HUB     20.05     1.08    17.83   573.50     1.03   554.52     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.67    35.90    31.50     4.40     0.93     0.27     2.90
 MEAN    26.14    28.03    23.50     4.53     0.91     0.29     3.28     0.88
 HUB     33.70    11.12     6.50     4.62     0.91     0.32     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.962

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     444.485     194.969     399.442    1156.360       0.384       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.891      17.962     555.711      46.000      26.017      31.500       5.483

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     415.305     194.969     458.793    1158.538       0.358       0.122

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.873      18.182     557.806     471.992       0.019       0.240

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     403.240       0.000     403.240    1159.394       0.348       0.134

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.226     558.630       0.000       0.060       0.047       0.145

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.823      19.819       1.070     572.208      13.258     277.251       2.149

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  82584.609       0.396     558.943 1193610.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  0.978

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    119.767    2643.000      19.819     572.208       1.000       1.000       0.980
W Kg/sec =   54.43945

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     93.302    2516.392       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92134.484   93976.977       1.889     513.330     271.727     401.059       1.476

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   378.80    -0.13   378.80     0.33   422.93
 MEAN    16.97     0.00    -0.02   378.80    -0.13   378.80     0.33
 HUB     14.32     0.00    -0.02   378.80    -0.13   378.80     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.55    46.36     3.19   444.22   583.90    18.41   560.23     0.50
 MEAN    45.95    43.80     2.15   391.42   544.80    18.41   560.23     0.47
 HUB     41.10    37.84     3.26   330.28   502.66    18.41   560.23     0.43
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      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   426.33   152.19   398.24  1168.72     0.36
MEAN    16.57   435.71   174.27   399.33  1168.08     0.37
HUB     13.89   470.31   245.75   401.00  1167.39     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   488.71   283.27     0.42  2875.84
MEAN   382.27   450.26   208.00     0.39  2890.59     1.30
HUB    320.37   407.88    74.62     0.35  3415.30

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.99     1.06    19.15   582.86     1.02   567.68     0.92     0.89
MEAN    21.00     1.06    19.07   582.91     1.02   567.06     0.92     0.89
HUB     21.22     1.07    18.97   584.85     1.02   566.39     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     20.91    35.42    31.50     3.92     0.93     0.21     2.90
MEAN    23.58    27.51    23.50     4.01     0.91     0.22     3.29     0.89
HUB     31.50    10.54     6.50     4.04     0.91     0.25     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.978

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     428.794     175.253     391.344    1169.236       0.367       0.053

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.052      19.182     568.189      46.000      24.124      32.400       8.276

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     413.050     175.253     448.692    1170.374       0.353       0.111

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.025      19.288     569.296     456.573       0.023       0.221

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     392.913       0.000     392.913    1171.766       0.335       0.100

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.382     570.651       0.000       0.060       0.059       0.158

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.812      20.953       1.057     583.540      11.332     302.932       2.348

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  70600.078       0.372     477.831 1086126.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  0.954

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.767    2643.000      20.953     583.540       1.000       1.000       0.980
W Kg/sec =   54.43945

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.121    2491.839       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92134.484   93976.977       1.964     509.668     259.557     390.276       1.504

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
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	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	366.41	-0.13	366.41	0.31	398.36
MEAN	15.91	0.00	-0.02	366.41	-0.13	366.41	0.31	
HUB	13.07	0.00	-0.02	366.41	-0.13	366.41	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.08	47.36	1.72	422.54	559.38	19.58	572.33	0.48
MEAN	45.06	44.80	0.26	367.03	518.71	19.58	572.33	0.44
HUB	39.46	38.84	0.62	301.45	474.56	19.58	572.33	0.40

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	409.69	136.49	386.28	1179.87	0.35
MEAN	15.50	416.92	154.01	387.43	1179.13	0.35
HUB	12.59	445.77	217.51	389.10	1178.33	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	475.50	277.28	0.40	2451.00	
MEAN	357.44	437.59	203.43	0.37	2388.82	1.28
HUB	290.38	395.86	72.87	0.34	2740.13	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.96	1.05	20.20	592.61	1.02	578.60	0.92	0.87
MEAN	21.94	1.05	20.12	592.38	1.02	577.87	0.92	0.87
HUB	22.08	1.05	20.00	593.68	1.02	577.10	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	19.46	35.67	31.50	4.17	0.93	0.19	2.90	
MEAN	21.68	27.70	23.50	4.20	0.90	0.20	3.34	0.87
HUB	29.21	10.61	6.50	4.11	0.90	0.22	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.954

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	421.012	156.836	390.709	1179.351	0.357	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.956	20.103	578.096	46.000	21.871	33.000	11.129

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	417.748	156.836	446.219	1179.584	0.354	-0.023

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.886	20.066	578.325	440.827	0.058	0.198

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	390.749	0.000	390.749	1181.441	0.331	0.081

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.256	580.147	0.000	0.060	0.075	0.078

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.756	21.852	1.043	592.893	9.353	342.777	2.657

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
58283.516	0.340	394.470	1140771.625

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
436496.75	2954.2668	117.0002	1.4465	0.8329	7.9535	1.1341

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 70% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     115.614    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   52.55191

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     112.943    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   88939.984   90718.586       2.528     831.557     328.916     619.754       1.884

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   263.94    -0.09   263.94     0.24   473.93
  MEAN    17.06     0.00    -0.02   263.94    -0.09   263.94     0.24
  HUB     12.51     0.00    -0.02   263.94    -0.09   263.94     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.99    50.47    10.52   475.82   544.20    14.53   516.99     0.49
  MEAN    56.15    47.20     8.95   393.48   473.88    14.53   516.99     0.42
  HUB     47.56    38.62     8.94   288.54   391.12    14.53   516.99     0.35

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   455.69   283.74   356.57  1126.33     0.40
  MEAN    18.04   473.63   306.96   360.70  1123.58     0.42
  HUB     15.00   531.01   382.95   367.86  1119.24     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   405.02   192.08     0.36  5855.37
  MEAN   415.99   376.81   109.03     0.34  5537.91     1.42
  HUB    345.97   369.71    36.98     0.33  5745.39

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.19     1.14    15.36   544.50     1.04   527.16     0.92     0.91
  MEAN    17.08     1.13    15.11   543.33     1.04   524.59     0.92     0.91
  HUB     17.15     1.14    14.70   544.10     1.04   520.55     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     38.51    28.31    24.20     4.11     0.93     0.35     2.90
  MEAN    40.40    16.82    12.70     4.12     0.93     0.30     3.51     0.91
  HUB     46.15    -5.74    -9.30     3.56     0.93     0.17     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.996

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     480.056     306.365     369.587    1123.720       0.427      -0.005

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      17.120      15.099     524.729      24.000      39.657      35.400      -4.257

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	393.992	306.365	499.089	1130.427	0.349	0.319

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.100	15.721	531.012	528.796	0.020	0.452

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	365.514	0.000	365.514	1132.348	0.323	0.366

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.863	532.818	0.000	0.060	0.043	0.387

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.873	17.052	1.129	543.977	21.167	201.536	1.562

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
131782.047	0.582	860.993	1109851.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
115.614	2643.000	17.052	543.977	1.000	1.000	0.980

W Kg/sec = 52.55191

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
102.067	2580.864	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
88939.984	90718.586	1.987	590.487	297.243	474.134	1.595

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	349.27	-0.12	349.27	0.31	462.82
MEAN	18.08	0.00	-0.02	349.27	-0.12	349.27	0.31	
HUB	15.21	0.00	-0.02	349.27	-0.12	349.27	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.62	46.36	7.26	473.98	588.86	15.96	533.79	0.52
MEAN	50.06	42.30	7.76	416.97	544.01	15.96	533.79	0.48
HUB	45.14	37.84	7.30	350.81	495.12	15.96	533.79	0.44

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	423.48	213.78	365.56	1145.38	0.37
MEAN	18.01	432.10	226.12	368.20	1143.59	0.38
HUB	15.22	467.49	284.03	371.31	1141.77	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	446.97	257.20	0.39	4367.89	
MEAN	415.39	414.00	189.27	0.36	4074.67	1.43
HUB	351.11	377.33	67.08	0.33	4325.59	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.72	1.10	17.04	560.16	1.03	545.18	0.92	0.91
MEAN	18.61	1.09	16.86	559.07	1.03	543.48	0.92	0.91
HUB	18.71	1.10	16.67	560.00	1.03	541.75	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.32	35.13	31.50	3.63	0.93	0.30	2.90	
MEAN	31.56	27.20	23.50	3.70	0.93	0.30	3.30	0.91
HUB	37.41	10.24	6.50	3.74	0.93	0.31	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     483.358     226.759     426.866    1140.168       0.424      -0.203

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.662      16.490     540.230      46.000      27.978      30.600       2.622

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     436.328     226.759     491.733    1143.973       0.381       0.006

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      18.648      16.865     543.842     455.853       0.018       0.267

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     430.396       0.000     430.396    1144.425       0.376       0.212

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      16.876     544.272       0.000       0.060       0.039       0.012

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      18.609       1.091     559.742      15.765     243.627       1.889

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98176.602       0.443     641.433 1017252.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.977

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.614    2643.000      18.609     559.742       1.000       1.000       0.880
W Kg/sec =   52.55191

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.873    2544.260       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88939.984   90718.586       1.773     489.817     276.298     384.470       1.392

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   402.55    -0.14   402.55     0.35   445.60
 MEAN    17.74     0.00    -0.02   402.55    -0.14   402.55     0.35
 HUB     15.05     0.00    -0.02   402.55    -0.14   402.55     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.00    46.36     2.64   462.91   613.56    17.09   546.21     0.54
 MEAN    45.47    43.40     2.07   409.13   574.06    17.09   546.21     0.50
 HUB     40.78    38.84     1.94   347.12   531.63    17.09   546.21     0.46

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   418.72   185.67   375.31  1159.50     0.36
 MEAN    17.51   428.46   203.44   377.09  1158.34     0.37
 HUB     14.85   464.65   268.29   379.38  1157.16     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   463.06   271.24     0.40  3680.86
 MEAN   403.78   427.00   200.35     0.37  3563.91     1.44
 HUB    342.51   386.57    74.22     0.33  3986.12
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	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.06	1.08	18.33	573.37	1.02	558.73	0.92	0.89
MEAN	20.01	1.08	18.21	572.94	1.02	557.61	0.92	0.89
HUB	20.18	1.08	18.06	574.50	1.03	556.47	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	26.32	35.86	31.50	4.36	0.93	0.30	2.90	
MEAN	28.35	27.98	23.50	4.48	0.91	0.31	3.28	0.89
HUB	35.27	11.07	6.50	4.57	0.91	0.34	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.977

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	433.116	204.770	381.653	1158.676	0.374	0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.067	18.220	557.941	46.000	28.215	31.500	3.285

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	395.835	204.770	445.664	1161.353	0.341	0.162

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.056	18.505	560.522	471.992	0.016	0.271

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	384.292	0.000	384.292	1162.132	0.331	0.175

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.549	561.273	0.000	0.060	0.040	0.186

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.849	20.010	1.075	573.605	13.863	262.272	2.033

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
86356.039	0.414	564.204	1144374.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.989

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
115.614	2643.000	20.010	573.605	1.000	1.000	0.980

W Kg/sec = 52.55191

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
89.315	2513.326	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
88939.984	90718.586	1.973	513.330	260.116	401.059	1.542

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	361.27	-0.12	361.27	0.31	422.42
MEAN	16.97	0.00	-0.02	361.27	-0.12	361.27	0.31	
HUB	14.32	0.00	-0.02	361.27	-0.12	361.27	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.89	46.36	4.53	444.22	572.68	18.72	562.71	0.49
MEAN	47.30	43.80	3.50	391.42	532.75	18.72	562.71	0.46
HUB	42.44	37.84	4.60	330.28	489.58	18.72	562.71	0.42

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	413.50	166.60	378.46	1172.11	0.35
MEAN	16.57	422.47	184.73	379.94	1171.15	0.36
HUB	13.89	456.23	249.63	381.88	1170.15	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	464.23	268.85	0.40	3147.88	
MEAN	382.27	428.22	197.54	0.37	3063.81	1.34
HUB	320.37	388.38	70.73	0.33	3469.17	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.32	1.07	19.56	585.26	1.02	570.98	0.92	0.91
MEAN	21.29	1.06	19.46	584.95	1.02	570.05	0.92	0.91
HUB	21.46	1.07	19.32	586.45	1.02	569.07	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	23.76	35.39	31.50	3.89	0.93	0.24	2.90	
MEAN	25.93	27.47	23.50	3.97	0.92	0.25	3.29	0.91
HUB	33.17	10.49	6.50	3.99	0.92	0.27	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.989

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	416.202	185.769	372.443	1172.216	0.355	0.053

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.339	19.556	571.090	46.000	26.509	32.400	5.891

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	392.013	185.769	433.802	1173.890	0.334	0.151

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.323	19.737	572.722	456.573	0.018	0.254

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	372.851	0.000	372.851	1175.143	0.317	0.144

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.831	573.946	0.000	0.060	0.048	0.201

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.845	21.266	1.063	585.552	11.947	284.326	2.204

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
74437.625	0.393	486.336	1041430.312

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.973

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
115.614	2643.000	21.266	585.552	1.000	1.000	0.980

W Kg/sec = 52.55191

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
84.913	2487.553	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
88939.984	90718.586	2.061	509.668	247.301	390.276	1.578

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	347.99	-0.12	347.99	0.30	397.68

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 MEAN    15.91     0.00    -0.02   347.99    -0.12   347.99     0.30
 HUB     13.07     0.00    -0.02   347.99    -0.12   347.99     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.53    47.36     3.17   422.54   547.49    20.01   575.44     0.47
 MEAN    46.53    44.80     1.73   367.03   505.86    20.01   575.44     0.43
 HUB     40.91    38.84     2.07   301.45   460.48    20.01   575.44     0.39

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   395.76   151.88   365.46  1183.91     0.33
 MEAN    15.50   402.43   165.18   366.97  1182.83     0.34
 HUB     12.59   430.35   221.65   368.88  1181.73     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   449.61   261.90     0.38  2726.85
 MEAN   357.44   414.28   192.27     0.35  2561.76     1.33
 HUB    290.38   375.23    68.74     0.32  2792.10

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.43     1.05    20.76   595.65     1.02   582.57     0.92     0.89
 MEAN    22.36     1.05    20.63   595.03     1.02   581.52     0.92     0.89
 HUB     22.46     1.06    20.49   595.89     1.02   580.43     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.57    35.63    31.50     4.13     0.93     0.23     2.90
 MEAN    24.23    27.65    23.50     4.15     0.91     0.23     3.34     0.89
 HUB     31.00    10.56     6.50     4.06     0.91     0.24     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     406.457     168.206     370.019    1183.052       0.344      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.377      20.620     581.732      46.000      24.446      33.000       8.554

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     394.121     168.206     428.514    1183.890       0.333       0.032

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.333      20.681     582.556     440.827       0.044       0.232

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     368.919       0.000     368.919    1185.520       0.311       0.131

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.854     584.161       0.000       0.060       0.060       0.128

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.808      22.304       1.049     595.523       9.970     318.403       2.468

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   62133.645       0.363     405.948 1093010.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     452885.97   2958.9141    112.9435      1.4764      0.8498      8.9532      1.1391


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**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 70% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.991

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     111.200    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   50.54562

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     108.632    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   85544.477   87255.180       2.629     831.557     316.359     619.754       1.959

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   253.30    -0.09   253.30     0.23   473.93
  MEAN    17.06     0.00    -0.02   253.30    -0.09   253.30     0.23
  HUB     12.51     0.00    -0.02   253.30    -0.09   253.30     0.23

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.98    50.47    11.51   475.82   539.12    14.57   517.45     0.48
  MEAN    57.23    47.20    10.03   393.48   468.04    14.57   517.45     0.42
  HUB     48.73    38.62    10.11   288.54   384.01    14.57   517.45     0.34

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   449.23   291.89   341.48  1127.51     0.40
  MEAN    18.04   465.30   311.56   345.60  1124.60     0.41
  HUB     15.00   519.31   381.42   352.41  1120.25     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   387.87   183.93     0.34  6023.48
  MEAN   415.99   361.03   104.44     0.32  5620.72     1.47
  HUB    345.97   354.19    35.46     0.32  5722.46

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.25     1.14    15.46   545.13     1.04   528.27     0.92     0.91
  MEAN    17.10     1.13    15.19   543.64     1.04   525.55     0.92     0.91
  HUB     17.14     1.13    14.79   544.01     1.04   521.49     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     40.52    28.31    24.20     4.11     0.93     0.37     2.90
  MEAN    42.03    16.81    12.70     4.11     0.94     0.33     3.51     0.91
  HUB     47.26    -5.75    -9.30     3.55     0.94     0.19     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.991

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
       R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
       18.071     471.222     310.951     354.061    1124.772       0.419      -0.004

       Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
       17.140      15.188     525.712      24.000      41.291      35.400      -5.891

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
       RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
       18.071     376.829     310.951     488.560    1131.902       0.333       0.350
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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.116      15.850     532.398     528.796       0.022       0.477

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     349.994       0.000     349.994    1133.632       0.309       0.388

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.970     534.027       0.000       0.060       0.048       0.409

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      17.063       1.129     544.258      21.448     195.486       1.515

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 133535.359       0.590     839.141 1065123.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      17.063     544.258       1.000       1.000       0.980
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     98.134    2580.196       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85544.477   87255.180       2.066     590.487     285.789     474.134       1.659

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   334.58    -0.12   334.58     0.29   462.70
 MEAN    18.08     0.00    -0.02   334.58    -0.12   334.58     0.29
 HUB     15.21     0.00    -0.02   334.58    -0.12   334.58     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.79    46.36     8.43   473.98   580.27    16.06   534.91     0.51
 MEAN    51.26    42.30     8.96   416.97   534.70    16.06   534.91     0.47
 HUB     46.37    37.84     8.53   350.81   484.87    16.06   534.91     0.43

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   415.86   225.21   349.60  1147.14     0.36
 MEAN    18.01   423.25   234.43   352.40  1145.13     0.37
 HUB     15.22   457.01   287.03   355.64  1143.10     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   427.34   245.76     0.37  4601.21
 MEAN   415.39   396.14   180.96     0.35  4224.12     1.47
 HUB    351.11   361.36    64.09     0.32  4371.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.82     1.10    17.19   561.30     1.03   546.86     0.92     0.91
 MEAN    18.67     1.09    16.99   559.90     1.03   544.94     0.92     0.91
 HUB     18.73     1.10    16.78   560.45     1.03   543.01     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.79    35.11    31.50     3.61     0.93     0.33     2.90
 MEAN    33.63    27.18    23.50     3.68     0.93     0.33     3.30     0.91
 HUB     38.91    10.22     6.50     3.72     0.93     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.996
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ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	470.753	235.086	407.852	1142.080	0.412	-0.190

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.724	16.655	542.045	46.000	29.959	30.600	0.641

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	416.005	235.086	477.834	1146.343	0.363	0.057

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	18.713	17.084	546.099	455.853	0.016	0.295

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	410.365	0.000	410.365	1146.752	0.358	0.249

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	17.093	546.489	0.000	0.060	0.037	0.062

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	18.677	1.095	560.552	16.294	232.621	1.803

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
101469.648	0.457	637.639	974203.812

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =10.034 EfDer = 0.989

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
111.200	2643.000	18.677	560.552	1.000	1.000	0.880

W Kg/sec = 50.54562

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
90.983	2542.420	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85544.477	87255.180	1.849	489.817	264.968	384.470	1.451

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	384.17	-0.13	384.17	0.33	445.28
MEAN	17.74	0.00	-0.02	384.17	-0.13	384.17	0.33	
HUB	15.05	0.00	-0.02	384.17	-0.13	384.17	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.32	46.36	3.96	462.91	601.66	17.28	548.23	0.52
MEAN	46.81	43.40	3.41	409.13	561.32	17.28	548.23	0.49
HUB	42.11	38.84	3.27	347.12	517.86	17.28	548.23	0.45

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	409.10	199.01	357.43	1162.04	0.35
MEAN	17.51	417.96	213.21	359.49	1160.60	0.36
HUB	14.85	452.82	272.08	361.96	1159.15	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	440.76	257.90	0.38	3945.06	
MEAN	403.78	406.88	190.57	0.35	3734.88	1.48
HUB	342.51	368.75	70.42	0.32	4042.44	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.26	1.08	18.59	575.16	1.03	561.19	0.92	0.90
MEAN	20.17	1.08	18.44	574.38	1.02	559.80	0.92	0.90

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 HUB     20.30     1.09    18.27   575.52     1.03   558.40     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.11    35.81    31.50     4.31     0.93     0.32     2.90
 MEAN    30.67    27.93    23.50     4.43     0.92     0.33     3.28     0.90
 HUB     36.93    11.01     6.50     4.51     0.92     0.36     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     422.389     214.607     363.809    1160.939       0.364       0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.226      18.456     560.124      46.000      30.536      31.500       0.964

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     376.471     214.607     433.344    1164.109       0.323       0.204

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.218      18.803     563.187     471.992       0.014       0.305

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     365.523       0.000     365.523    1164.810       0.314       0.215

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.844     563.866       0.000       0.060       0.037       0.226

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      20.177       1.080     575.022      14.470     248.116       1.923

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  90135.445       0.432     566.414 1093392.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      20.177     575.022       1.000       1.000       0.980
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     85.301    2510.227       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85544.477   87255.180       2.066     513.330     248.427     401.059       1.614

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   343.87    -0.12   343.87     0.29   421.89
 MEAN    16.97     0.00    -0.02   343.87    -0.12   343.87     0.29
 HUB     14.32     0.00    -0.02   343.87    -0.12   343.87     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.26    46.36     5.90   444.22   561.86    18.99   565.15     0.48
 MEAN    48.71    43.80     4.91   391.42   521.10    18.99   565.15     0.45
 HUB     43.86    37.84     6.02   330.28   476.88    18.99   565.15     0.41

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   402.03   180.70   359.13  1175.37     0.34
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 MEAN    16.57   410.21   194.96   360.92  1174.12     0.35
 HUB     13.89   442.78   253.43   363.08  1172.83     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   440.31   254.75     0.37  3413.99
 MEAN   382.27   406.63   187.31     0.35  3233.24     1.39
 HUB    320.37   369.20    66.94     0.31  3521.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.62     1.07    19.94   587.66     1.02   574.17     0.92     0.91
 MEAN    21.55     1.07    19.80   586.99     1.02   572.94     0.92     0.91
 HUB     21.67     1.07    19.64   588.06     1.02   571.69     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.71    35.35    31.50     3.85     0.93     0.27     2.90
 MEAN    28.38    27.43    23.50     3.93     0.92     0.28     3.29     0.91
 HUB     34.91    10.45     6.50     3.95     0.92     0.29     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     404.572     196.055     353.894    1175.099       0.344       0.051

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.595      19.893     573.906      46.000      28.986      32.400       3.414

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     371.565     196.055     420.117    1177.287       0.316       0.193

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.586      20.144     576.045     456.573       0.015       0.290

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     353.420       0.000     353.420    1178.409       0.300       0.188

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.235     577.143       0.000       0.060       0.041       0.243

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      21.539       1.068     587.571      12.549     267.342       2.072

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  78191.602       0.412     491.359  995213.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      21.539     587.571       1.000       1.000       0.980
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.773    2483.276       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85544.477   87255.180       2.167     509.668     235.245     390.276       1.659

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   330.10    -0.11   330.10     0.28   396.99
 MEAN    15.91     0.00    -0.02   330.10    -0.11   330.10     0.28
 HUB     13.07     0.00    -0.02   330.10    -0.11   330.10     0.28
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     52.01    47.36     4.65   422.54   536.29    20.40   578.48     0.45
MEAN    48.04    44.80     3.24   367.03   493.72    20.40   578.48     0.42
HUB     42.41    38.84     3.57   301.45   447.11    20.40   578.48     0.38

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   383.58   166.56   345.53  1187.74     0.32
MEAN    15.50   389.31   175.86   347.32  1186.38     0.33
HUB     12.59   415.92   225.59   349.43  1185.00     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.78   424.86   247.22     0.36  2990.18
MEAN   357.44   391.93   181.59     0.33  2727.19     1.37
HUB    290.38   355.39    64.80     0.30  2841.61

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.85     1.06    21.25   598.64     1.02   586.36     0.92     0.90
MEAN    22.73     1.06    21.09   597.67     1.02   585.01     0.92     0.90
HUB     22.78     1.06    20.92   598.09     1.02   583.65     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.74    35.58    31.50     4.08     0.93     0.26     2.90
MEAN    26.85    27.60    23.50     4.10     0.92     0.26     3.34     0.90
HUB     32.85    10.51     6.50     4.01     0.92     0.27     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     393.310     179.083     350.175    1186.588       0.331      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.751      21.082     585.218      46.000      27.086      33.000       5.914

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     371.791     179.083     412.673    1187.980       0.313       0.086

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.726      21.233     586.593     440.827       0.034       0.268

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     348.233       0.000     348.233    1189.413       0.293       0.181

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.390     588.009       0.000       0.060       0.048       0.178

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.845      22.702       1.054     598.131      10.560     297.022       2.302

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   65811.242       0.384     413.560 1043877.938

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     469143.28   2948.1121    108.6316      1.5028      0.8599     10.0345      1.1441


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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 70% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.986

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    107.366    2643.000      15.107     522.810      1.000       1.000       0.980
W Kg/sec =   48.80284

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.886    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 82594.961   84246.680       2.722     831.557     305.451     619.754       2.029

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   244.12    -0.08   244.12     0.22   473.93
MEAN    17.06     0.00    -0.02   244.12    -0.08   244.12     0.22
HUB     12.51     0.00    -0.02   244.12    -0.08   244.12     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     62.84    50.47    12.37   475.82   534.87    14.61   517.83     0.48
MEAN    58.19    47.20    10.99   393.48   463.13    14.61   517.83     0.41
HUB     49.77    38.62    11.15   288.54   378.02    14.61   517.83     0.34

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   444.15   298.79   328.62  1128.48     0.39
MEAN    18.04   458.46   315.43   332.70  1125.45     0.41
HUB     15.00   509.42   380.07   339.20  1121.08     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    475.82   373.27   177.03     0.33  6165.71
MEAN   415.99   347.56   100.56     0.31  5690.62     1.51
HUB    345.97   340.91    34.10     0.30  5702.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.29     1.14    15.54   545.65     1.04   529.18     0.92     0.90
MEAN    17.11     1.13    15.26   543.89     1.04   526.34     0.92     0.90
HUB     17.12     1.13    14.85   543.94     1.04   522.26     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.28    28.31    24.20     4.11     0.93     0.40     2.90
MEAN    43.47    16.82    12.70     4.12     0.94     0.35     3.51     0.90
HUB     48.25    -5.74    -9.30     3.56     0.94     0.21     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     463.961     314.822     340.803    1125.632       0.412      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.153      15.258     526.516      24.000      42.731      35.400      -7.331

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     362.256     314.822     479.940    1133.109       0.320       0.376

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.126      15.953     533.535     528.796       0.024       0.500
```

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	336.802	0.000	336.802	1134.687	0.297	0.407

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.053	535.021	0.000	0.060	0.054	0.427

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.858	17.067	1.130	544.495	21.685	190.336	1.475

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
135009.734	0.596	819.153	1026515.062

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =10.989 EfDer = 0.991

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
107.366	2643.000	17.067	544.495	1.000	1.000	0.980

W Kg/sec = 48.80284

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
94.749	2579.635	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
82594.961	84246.680	2.140	590.487	275.933	474.134	1.718

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	322.08	-0.11	322.08	0.28	462.60
MEAN	18.08	0.00	-0.02	322.08	-0.11	322.08	0.28	
HUB	15.21	0.00	-0.02	322.08	-0.11	322.08	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.81	46.36	9.45	473.98	573.14	16.14	535.83	0.50
MEAN	52.32	42.30	10.02	416.97	526.96	16.14	535.83	0.46
HUB	47.45	37.84	9.61	350.81	476.32	16.14	535.83	0.42

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	410.03	234.77	336.17	1148.57	0.36
MEAN	18.01	416.21	241.39	339.05	1146.39	0.36
HUB	15.22	448.37	289.52	342.36	1144.18	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	410.86	236.21	0.36	4796.18	
MEAN	415.39	381.09	174.00	0.33	4349.49	1.51
HUB	351.11	347.86	61.59	0.30	4409.12	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.89	1.11	17.30	562.26	1.03	548.22	0.92	0.91
MEAN	18.72	1.10	17.09	560.61	1.03	546.14	0.92	0.91
HUB	18.74	1.10	16.86	560.83	1.03	544.04	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.93	35.09	31.50	3.59	0.93	0.35	2.90	
MEAN	35.45	27.17	23.50	3.67	0.94	0.35	3.30	0.91
HUB	40.22	10.20	6.50	3.70	0.94	0.35	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.991

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	460.632	242.071	391.897	1143.623	0.403	-0.180

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.768      16.781     543.512      46.000      31.703      30.600      -1.103

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     399.072     242.071     466.751    1148.263       0.348       0.101

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      18.758      17.252     547.931     455.853       0.016       0.321

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     393.719       0.000     393.719    1148.634       0.343       0.280

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      17.258     548.286       0.000       0.060       0.037       0.104

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      18.722       1.097     561.231      16.736     223.694       1.734

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 104224.773       0.470     632.370  937301.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.366    2643.000      18.722     561.231       1.000       1.000       0.880
W Kg/sec =   48.80284

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.690    2540.881       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82594.961   84246.680       1.918     489.817     255.380     384.470       1.505

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   368.86    -0.13   368.86     0.32   445.01
 MEAN    17.74     0.00    -0.02   368.86    -0.13   368.86     0.32
 HUB     15.05     0.00    -0.02   368.86    -0.13   368.86     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.46    46.36     5.10   462.91   591.99    17.43   549.87     0.51
 MEAN    47.97    43.40     4.57   409.13   550.95    17.43   549.87     0.48
 HUB     43.27    38.84     4.43   347.12   506.59    17.43   549.87     0.44

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   401.93   210.01   342.70  1164.08     0.35
 MEAN    17.51   409.81   221.28   344.94  1162.43     0.35
 HUB     14.85   443.30   275.20   347.54  1160.77     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   422.38   246.90     0.36  4162.82
 MEAN   403.78   390.24   182.50     0.34  3876.10     1.52
 HUB    342.51   353.99    67.31     0.30  4088.67

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.41     1.09    18.79   576.65     1.03   563.16     0.92     0.91
 MEAN    20.29     1.08    18.61   575.58     1.03   561.56     0.92     0.91
 HUB     20.38     1.09    18.42   576.37     1.03   559.96     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     31.50    35.77    31.50     4.27     0.93     0.35     2.90
 MEAN    32.68    27.88    23.50     4.38     0.92     0.35     3.28     0.91
 HUB     38.37    10.96     6.50     4.46     0.92     0.37     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     414.074     222.732     349.067    1162.759       0.356       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.339      18.630     561.885      46.000      32.541      31.500      -1.041

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     360.587     222.732     423.831    1166.333       0.309       0.239

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.332      19.027     565.344     471.992       0.014       0.335

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     350.181       0.000     350.181    1166.970       0.300       0.247

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.062     565.962       0.000       0.060       0.037       0.259

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.876      20.292       1.084     576.201      14.970     237.002       1.837

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93250.836       0.447     565.787 1050082.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    107.366    2643.000      20.292     576.201       1.000       1.000       0.980
W Kg/sec =   48.80284

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     81.975    2507.657       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  82594.961   84246.680       2.150     513.330     238.742     401.059       1.680

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   329.61    -0.11   329.61     0.28   421.46
 MEAN    16.97     0.00    -0.02   329.61    -0.11   329.61     0.28
 HUB     14.32     0.00    -0.02   329.61    -0.11   329.61     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.43    46.36     7.07   444.22   553.24    19.20   567.13     0.47
 MEAN    49.91    43.80     6.11   391.42   511.80    19.20   567.13     0.44
 HUB     45.07    37.84     7.23   330.28   466.69    19.20   567.13     0.40

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   393.56   192.03   343.53  1177.95     0.33
 MEAN    16.57   400.85   203.24   345.50  1176.49     0.34
 HUB     13.89   432.16   256.48   347.82  1174.99     0.37
```

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	421.03	243.43	0.36	3627.66	
MEAN	382.27	389.13	179.03	0.33	3370.42	1.43
HUB	320.37	353.64	63.89	0.30	3564.13	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.84	1.08	20.22	589.63	1.02	576.70	0.92	0.91
MEAN	21.73	1.07	20.05	588.68	1.02	575.26	0.92	0.91
HUB	21.81	1.07	19.87	589.40	1.02	573.80	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	29.20	35.32	31.50	3.82	0.93	0.30	2.90	
MEAN	30.47	27.39	23.50	3.89	0.93	0.30	3.29	0.91
HUB	36.40	10.41	6.50	3.91	0.93	0.31	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	395.726	204.384	338.860	1177.402	0.336	0.050

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.778	20.138	576.162	46.000	31.096	32.400	1.304

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	355.119	204.384	409.735	1180.000	0.301	0.229

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.772	20.444	578.707	456.573	0.013	0.320

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	337.845	0.000	337.845	1181.019	0.286	0.223

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.528	579.706	0.000	0.060	0.037	0.277

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.876	21.730	1.071	589.236	13.034	254.399	1.972

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
81214.664	0.428	492.759	955982.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =10.989 EfDer = 0.995

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
107.366	2643.000	21.730	589.236	1.000	1.000	0.980

W Kg/sec = 48.80284

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
77.412	2479.767	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
82594.961	84246.680	2.261	509.668	225.458	390.276	1.731

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	315.73	-0.11	315.73	0.27	396.43
MEAN	15.91	0.00	-0.02	315.73	-0.11	315.73	0.27	
HUB	13.07	0.00	-0.02	315.73	-0.11	315.73	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.24	47.36	5.88	422.54	527.56	20.68	580.91	0.45
MEAN	49.30	44.80	4.50	367.03	484.22	20.68	580.91	0.41

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 HUB     43.69    38.84     4.85   301.45   436.61    20.68   580.91     0.37

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   374.81   178.19   329.74  1190.76     0.31
 MEAN    15.50   379.47   184.32   331.70  1189.19     0.32
 HUB     12.59   404.77   228.75   333.93  1187.60     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   405.25   235.59     0.34  3198.67
 MEAN   357.44   374.16   173.12     0.31  2858.29     1.41
 HUB    290.38   339.57    61.63     0.29  2881.43

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.15     1.07    21.61   601.07     1.02   589.35     0.92     0.91
 MEAN    23.00     1.06    21.43   599.81     1.02   587.79     0.92     0.91
 HUB     23.01     1.06    21.23   599.90     1.02   586.22     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.39    35.54    31.50     4.04     0.93     0.29     2.90
 MEAN    29.06    27.56    23.50     4.06     0.92     0.28     3.34     0.91
 HUB     34.41    10.46     6.50     3.96     0.92     0.29     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     383.483     187.703     334.405    1189.387       0.322       -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.017      21.416     587.988      46.000      29.306      33.000       3.694

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219     354.254     187.703     400.910    1191.206       0.297       0.130

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.003      21.633     589.788     440.827       0.029       0.300

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     331.965       0.000     331.965    1192.495       0.278       0.222

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.777     591.064       0.000       0.060       0.041       0.218

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      22.983       1.058     600.263      11.028     281.184       2.180

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  68729.164       0.401     417.005 1002324.312

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    482429.16   2927.0732    104.8861      1.5213      0.8629     10.9895      1.1481


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

    Fan-Core + 4 Stage LPC 70% Stat 2 10% Ice Block 8-2-2011
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COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
RESET = 0.000BLEED = 0.000 DPInc =11.953 EfDer = 0.981

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
103.556	2643.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 47.07069

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
101.163	2632.591	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
79663.445	81256.547	2.823	831.557	294.610	619.754	2.104

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	235.05	-0.08	235.05	0.21	473.93
MEAN	17.06	0.00	-0.02	235.05	-0.08	235.05	0.21	
HUB	12.51	0.00	-0.02	235.05	-0.08	235.05	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	63.72	50.47	13.25	475.82	530.78	14.65	518.20	0.48
MEAN	59.15	47.20	11.95	393.48	458.41	14.65	518.20	0.41
HUB	50.84	38.62	12.22	288.54	372.22	14.65	518.20	0.33

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	439.55	305.49	316.04	1129.38	0.39
MEAN	18.04	452.02	319.21	320.05	1126.24	0.40
HUB	15.00	499.87	378.72	326.25	1121.86	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	475.82	359.02	170.33	0.32	6303.87	
MEAN	415.99	334.36	96.78	0.30	5758.65	1.56
HUB	345.97	327.89	32.75	0.29	5681.81	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.33	1.15	15.61	546.17	1.04	530.03	0.92	0.90
MEAN	17.13	1.13	15.32	544.15	1.04	527.08	0.92	0.90
HUB	17.10	1.13	14.92	543.86	1.04	522.99	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.03	28.32	24.20	4.12	0.93	0.42	2.90	
MEAN	44.92	16.83	12.70	4.13	0.94	0.37	3.51	0.90
HUB	49.26	-5.73	-9.30	3.57	0.94	0.24	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.981

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	457.122	318.590	327.812	1126.439	0.406	-0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.164	15.321	527.272	24.000	44.183	35.400	-8.783

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	348.042	318.590	471.839	1134.248	0.307	0.403

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.132	16.048	534.607	528.796	0.027	0.524

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	323.919	0.000	323.919	1135.683	0.285	0.424

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.128	535.961	0.000	0.060	0.062	0.445

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.849	17.066	1.130	544.725	21.915	185.296	1.436

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
136438.906	0.603	798.443	988356.188

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =11.953 EfDer = 0.986

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
103.556	2643.000	17.066	544.725	1.000	1.000	0.980

W Kg/sec = 47.07069

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
91.409	2579.091	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
79663.445	81256.547	2.218	590.487	266.205	474.134	1.781

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	309.86	-0.11	309.86	0.27	462.50
MEAN	18.08	0.00	-0.02	309.86	-0.11	309.86	0.27	
HUB	15.21	0.00	-0.02	309.86	-0.11	309.86	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.83	46.36	10.47	473.98	566.36	16.21	536.71	0.50
MEAN	53.39	42.30	11.09	416.97	519.58	16.21	536.71	0.46
HUB	48.56	37.84	10.72	350.81	468.14	16.21	536.71	0.41

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	404.92	243.96	323.17	1149.90	0.35
MEAN	18.01	409.76	248.13	326.09	1147.56	0.36
HUB	15.22	440.16	291.91	329.44	1145.20	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	394.94	227.02	0.34	4983.81	
MEAN	415.39	366.49	167.26	0.32	4470.74	1.55
HUB	351.11	334.71	59.20	0.29	4445.34	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.96	1.11	17.40	563.19	1.03	549.49	0.92	0.90
MEAN	18.75	1.10	17.17	561.28	1.03	547.26	0.92	0.90
HUB	18.74	1.10	16.93	561.19	1.03	545.01	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.05	35.09	31.50	3.59	0.93	0.38	2.90	
MEAN	37.27	27.15	23.50	3.65	0.94	0.37	3.30	0.90
HUB	41.54	10.19	6.50	3.69	0.94	0.36	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.986

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	451.275	248.826	376.476	1145.060	0.394	-0.169

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.802	16.891	544.880	46.000	33.462	30.600	-2.862

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	382.796	248.826	456.561	1150.061	0.333	0.143

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	18.791	17.402	549.650	455.853	0.017	0.347

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	377.758	0.000	377.758	1150.396	0.328	0.309

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	17.402	549.970	0.000	0.060	0.039	0.144

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.870	18.753	1.099	561.887	17.162	215.309	1.669

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
106878.734	0.482	625.456	901036.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =11.953 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
103.556	2643.000	18.753	561.887	1.000	1.000	0.880

W Kg/sec = 47.07069

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
84.484	2539.398	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
79663.445	81256.547	1.991	489.817	246.044	384.470	1.563

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	354.14	-0.12	354.14	0.31	444.75
MEAN	17.74	0.00	-0.02	354.14	-0.12	354.14	0.31	
HUB	15.05	0.00	-0.02	354.14	-0.12	354.14	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.59	46.36	6.23	462.91	582.93	17.56	551.42	0.51
MEAN	49.13	43.40	5.73	409.13	541.20	17.56	551.42	0.47
HUB	44.44	38.84	5.60	347.12	495.97	17.56	551.42	0.43

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	395.76	220.43	328.69	1165.96	0.34
MEAN	17.51	402.50	228.93	331.05	1164.13	0.35
HUB	14.85	434.46	278.16	333.75	1162.29	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	404.91	236.48	0.35	4369.18	
MEAN	403.78	374.39	174.85	0.32	4010.02	1.56
HUB	342.51	339.89	64.35	0.29	4132.48	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.53	1.09	18.96	578.07	1.03	564.99	0.92	0.91
MEAN	20.38	1.09	18.76	576.74	1.03	563.21	0.92	0.91
HUB	20.43	1.09	18.55	577.19	1.03	561.43	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.85	35.73	31.50	4.23	0.93	0.37	2.90	
MEAN	34.67	27.84	23.50	4.34	0.92	0.37	3.28	0.91
HUB	39.81	10.91	6.50	4.41	0.92	0.39	3.87	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      406.609     230.437     335.007     1164.453       0.349       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     20.432      18.778      563.526      46.000      34.522      31.500      -3.022

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392      345.524     230.437     415.317     1168.410       0.296       0.274

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       20.424      19.220      567.362      471.992       0.015       0.365

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121      335.672       0.000     335.672     1168.987       0.287       0.277

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       19.246      567.923       0.000       0.060       0.040       0.289

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.879       20.382        1.087      577.331       15.444      226.856       1.759

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96204.547       0.461     562.991 1007821.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  1.000

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    103.556     2643.000       20.382      577.331       1.000        1.000        0.980
W Kg/sec =   47.07069

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     78.795     2505.203        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
  79663.445   81256.547        2.237      513.330      229.481      401.059       1.748

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00     -0.02    316.10     -0.11    316.10      0.27    421.05
 MEAN    16.97      0.00     -0.02    316.10     -0.11    316.10      0.27
 HUB     14.32      0.00     -0.02    316.10     -0.11    316.10      0.27

       BetaFlo    BetaBlade Incid    U1        W1        Ps1       Ts1      Rel Mach
 TIP     54.57     46.36      8.21    444.22    545.30     19.37    568.99      0.47
 MEAN    51.08     43.80      7.28    391.42    503.20     19.37    568.99      0.43
 HUB     46.27     37.84      8.43    330.28    457.25     19.37    568.99      0.39

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88    386.32    202.62    328.92   1180.34      0.33
 MEAN    16.57    392.53    210.94    331.03   1178.68      0.33
 HUB     13.89    422.42    259.32    333.45   1177.00      0.36

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    435.46    403.00    232.84      0.34   3827.49
 MEAN   382.27    372.74    171.33      0.32   3497.95      1.47
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 HUB    320.37   338.99    61.05     0.29  3603.48

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.02     1.08    20.45   591.50     1.02   579.04     0.92     0.91
 MEAN    21.88     1.07    20.26   590.28     1.02   577.42     0.92     0.91
 HUB     21.92     1.08    20.06   590.67     1.02   575.77     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.63    35.29    31.50     3.79     0.93     0.32     2.90
 MEAN    32.51    27.36    23.50     3.86     0.93     0.32     3.29     0.91
 HUB     37.87    10.37     6.50     3.87     0.93     0.33     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     387.881     212.127     324.736    1179.537       0.329       0.049

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.925      20.341     578.257      46.000      33.154      32.400      -0.754

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     339.767     212.127     400.549    1182.515       0.287       0.263

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.920      20.698     581.180     456.573       0.013       0.350

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     323.344       0.000     323.344    1183.439       0.273       0.255

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.773     582.089       0.000       0.060       0.037       0.307

    STAGE EXIT CONDITIONS, STAGE             4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      21.880       1.074     590.818      13.487     242.835       1.882

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  84034.172       0.443     491.769  917711.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.556    2643.000      21.880     590.818       1.000       1.000       0.980
W Kg/sec =   47.07069

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     74.253    2476.444       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79663.445   81256.547       2.357     509.668     216.256     390.276       1.805

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   302.33    -0.10   302.33     0.26   395.90
 MEAN    15.91     0.00    -0.02   302.33    -0.10   302.33     0.26
 HUB     13.07     0.00    -0.02   302.33    -0.10   302.33     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.42    47.36     7.06   422.54   519.65    20.91   583.19     0.44
 MEAN    50.53    44.80     5.73   367.03   475.59    20.91   583.19     0.40
 HUB     44.93    38.84     6.09   301.45   427.01    20.91   583.19     0.36

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   367.43   188.85   315.18  1193.53     0.31
MEAN    15.50   370.89   192.11   317.26  1191.78     0.31
HUB     12.59   394.68   231.61   319.57  1190.01     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.78   387.21   224.92     0.32  3389.95
MEAN   357.44   357.76   165.34     0.30  2978.88     1.46
HUB    290.38   324.93    58.77     0.27  2917.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.40     1.07    21.91   603.36     1.02   592.10     0.92     0.91
MEAN    23.21     1.06    21.70   601.84     1.02   590.36     0.92     0.91
HUB     23.18     1.06    21.48   601.62     1.02   588.61     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.93    35.51    31.50     4.01     0.93     0.32     2.90
MEAN    31.20    27.53    23.50     4.03     0.92     0.31     3.34     0.91
HUB     35.93    10.42     6.50     3.92     0.92     0.30     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     374.921     195.631     319.835    1191.961       0.315       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.232      21.691      590.541      46.000      31.453      33.000       1.547

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     338.197     195.631     390.703    1194.165       0.283       0.171

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.224      21.964     592.727     440.827       0.025       0.330

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     317.061       0.000     317.061    1195.329       0.265       0.259

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.096     593.883       0.000       0.060       0.037       0.255

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      23.205       1.061     602.274      11.456     267.387       2.073

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   71402.758       0.417     417.850  961889.688

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     494959.12   2896.5090    101.1634      1.5360      0.8616     11.9532      1.1520


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  0.974
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
99.590	2643.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 45.26799

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
97.289	2632.591	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
76612.523	78144.609	2.935	831.557	283.327	619.754	2.187

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	225.65	-0.08	225.65	0.20	473.93
MEAN	17.06	0.00	-0.02	225.65	-0.08	225.65	0.20	
HUB	12.51	0.00	-0.02	225.65	-0.08	225.65	0.20	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	64.63	50.47	14.16	475.82	526.69	14.68	518.56	0.47
MEAN	60.17	47.20	12.97	393.48	453.66	14.68	518.56	0.41
HUB	51.98	38.62	13.36	288.54	366.36	14.68	518.56	0.33

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	435.23	312.31	303.13	1130.27	0.39
MEAN	18.04	445.67	323.03	307.05	1127.02	0.40
HUB	15.00	490.16	377.28	312.92	1122.64	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	475.82	344.42	163.51	0.30	6444.60	
MEAN	415.99	320.81	92.97	0.28	5827.45	1.61
HUB	345.97	314.49	31.31	0.28	5660.16	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.36	1.15	15.67	546.69	1.05	530.87	0.92	0.89
MEAN	17.14	1.13	15.38	544.40	1.04	527.81	0.92	0.89
HUB	17.08	1.13	14.98	543.78	1.04	523.71	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.85	28.34	24.20	4.14	0.93	0.45	2.90	
MEAN	46.45	16.84	12.70	4.14	0.94	0.40	3.51	0.89
HUB	50.33	-5.71	-9.30	3.59	0.94	0.26	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.974

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	450.367	322.399	314.466	1127.234	0.400	-0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.173	15.382	528.016	24.000	45.714	35.400	-10.314

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	333.499	322.399	463.856	1135.372	0.294	0.430

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.136	16.138	535.667	528.796	0.030	0.549

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	310.718	0.000	310.718	1136.670	0.273	0.441

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.197	536.893	0.000	0.060	0.070	0.462

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.838	17.061	1.129	544.957	22.147	180.126	1.396

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
137884.031	0.609	775.997	948857.062

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =12.972 EfDer = 0.979

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
99.590	2643.000	17.061	544.957	1.000	1.000	0.980

W Kg/sec = 45.26799

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
87.951	2578.542	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
76612.523	78144.609	2.305	590.487	256.136	474.134	1.851

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	297.32	-0.10	297.32	0.26	462.40
MEAN	18.08	0.00	-0.02	297.32	-0.10	297.32	0.26	
HUB	15.21	0.00	-0.02	297.32	-0.10	297.32	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.91	46.36	11.55	473.98	559.60	16.27	537.57	0.49
MEAN	54.52	42.30	12.22	416.97	512.20	16.27	537.57	0.45
HUB	49.73	37.84	11.89	350.81	459.93	16.27	537.57	0.40

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	400.27	253.27	309.95	1151.20	0.35
MEAN	18.01	403.58	254.92	312.88	1148.72	0.35
HUB	15.22	431.99	294.32	316.22	1146.21	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	378.77	217.71	0.33	5173.78	
MEAN	415.39	351.63	160.47	0.31	4592.94	1.60
HUB	351.11	321.28	56.80	0.28	4481.93	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.01	1.11	17.48	564.12	1.04	550.74	0.92	0.90
MEAN	18.78	1.10	17.25	561.97	1.03	548.37	0.92	0.90
HUB	18.74	1.10	16.99	561.56	1.03	545.97	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.25	35.08	31.50	3.58	0.93	0.40	2.90	
MEAN	39.17	27.15	23.50	3.65	0.94	0.39	3.30	0.90
HUB	42.95	10.18	6.50	3.68	0.94	0.38	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.979

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	442.194	255.635	360.814	1146.466	0.386	-0.159

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.829	16.991	546.220	46.000	35.317	30.600	-4.717

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th

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     17.960     366.353     255.635     446.725    1151.827       0.318       0.187

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      18.816      17.540     551.341     455.853       0.018       0.376

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     361.664       0.000     361.664    1152.125       0.314       0.338

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      17.533     551.626       0.000       0.060       0.044       0.183

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.861      18.774       1.100     562.550      17.593     207.024       1.605

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 109560.031       0.494     616.593  863694.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2643.000      18.774     562.550       1.000       1.000       0.880
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     81.206    2537.902       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.071     489.817     236.497     384.470       1.626

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   339.26    -0.12   339.26     0.29   444.48
 MEAN    17.74     0.00    -0.02   339.26    -0.12   339.26     0.29
 HUB     15.05     0.00    -0.02   339.26    -0.12   339.26     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.77    46.36     7.41   462.91   574.01    17.68   552.94     0.50
 MEAN    50.34    43.40     6.94   409.13   531.58    17.68   552.94     0.46
 HUB     45.67    38.84     6.83   347.12   485.46    17.68   552.94     0.42

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   390.24   230.82   314.66  1167.80     0.33
 MEAN    17.51   395.64   236.57   317.12  1165.79     0.34
 HUB     14.85   425.83   281.09   319.88  1163.78     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   387.46   226.09     0.33  4574.89
 MEAN   403.78   358.50   167.21     0.31  4143.63     1.61
 HUB    342.51   325.72    61.42     0.28  4175.92

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.64     1.10    19.10   579.49     1.03   566.78     0.92     0.91
 MEAN    20.46     1.09    18.89   577.89     1.03   564.82     0.92     0.91
 HUB     20.47     1.09    18.66   578.01     1.03   562.87     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.26    35.70    31.50     4.20     0.93     0.39     2.90
 MEAN    36.72    27.80    23.50     4.30     0.93     0.39     3.28     0.91
 HUB     41.31    10.87     6.50     4.37     0.93     0.40     3.87


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       1.000

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      17.392     399.601     238.124     320.902    1166.109       0.343       0.010

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      20.509      18.906     565.133      46.000      36.577      31.500      -5.077

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      17.392     330.489     238.124     407.340    1170.447       0.282       0.309

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      20.498      19.392     569.346     471.992       0.017       0.396

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      17.121     321.222       0.000     321.222    1170.966       0.274       0.306

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      19.408     569.850       0.000       0.060       0.045       0.318

     STAGE EXIT CONDITIONS, STAGE             3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.877      20.451       1.089     578.466      15.916     217.077       1.683

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  99147.570       0.475     557.992  964574.062


      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  0.997

    W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
      99.590    2643.000      20.451     578.466       1.000       1.000       0.980
W Kg/sec =   45.26799

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
      75.597    2502.744       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.332     513.330     220.167     401.059       1.822

      ROTOR LEADING EDGE CONDITIONS, STAGE            4

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   302.62    -0.10   302.62     0.26   420.64
 MEAN    16.97     0.00    -0.02   302.62    -0.10   302.62     0.26
 HUB     14.32     0.00    -0.02   302.62    -0.10   302.62     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.74    46.36     9.38   444.22   537.59    19.52   570.82     0.46
 MEAN    52.30    43.80     8.50   391.42   494.85    19.52   570.82     0.42
 HUB     47.51    37.84     9.67   330.28   448.04    19.52   570.82     0.38

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   379.87   213.02   314.52  1182.65     0.32
 MEAN    16.57   384.79   218.54   316.71  1180.82     0.33
 HUB     13.89   413.02   262.09   319.20  1178.97     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   385.22   222.44     0.33  4023.88
 MEAN   382.27   356.53   163.73     0.30  3623.81     1.51
 HUB    320.37   324.48    58.27     0.28  3641.99

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     22.18     1.08    20.65   593.36     1.03   581.32     0.92     0.91
 MEAN    22.00     1.08    20.44   591.88     1.02   579.52     0.92     0.91
 HUB     22.01     1.08    20.22   591.95     1.02   577.71     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.11    35.27    31.50     3.77     0.93     0.35     2.90
 MEAN    34.61    27.34    23.50     3.84     0.93     0.35     3.29     0.91
 HUB     39.39    10.35     6.50     3.85     0.93     0.35     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     380.613     219.768     310.754    1181.617       0.322       0.047

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.046      20.515     580.304      46.000      35.268      32.400      -2.868

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     324.648     219.768     392.038    1184.967       0.274       0.298

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.040      20.919     583.599     456.573       0.014       0.382

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     309.097       0.000     309.097    1185.802       0.261       0.287

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.982     584.422       0.000       0.060       0.039       0.337

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      21.998       1.076     592.398      13.932     231.884       1.798

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  86808.383       0.458     488.549  878546.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2643.000      21.998     592.398       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     71.121    2473.140       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.461     509.668     207.136     390.276       1.884

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   289.13    -0.10   289.13     0.24   395.37
 MEAN    15.91     0.00    -0.02   289.13    -0.10   289.13     0.24
 HUB     13.07     0.00    -0.02   289.13    -0.10   289.13     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.62    47.36     8.26   422.54   512.08    21.11   585.42     0.43
 MEAN    51.78    44.80     6.98   367.03   467.31    21.11   585.42     0.39
 HUB     46.20    38.84     7.36   301.45   417.77    21.11   585.42     0.35

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   360.97   199.22   301.01  1196.20     0.30
 MEAN    15.50   363.02   199.69   303.16  1194.29     0.30
 HUB     12.59   385.09   234.41   305.52  1192.36     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   369.65   214.56     0.31  3575.85
 MEAN   357.44   341.74   157.75     0.29  3096.38     1.50
 HUB    290.38   310.61    55.97     0.26  2952.54

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.61     1.07    22.16   605.63     1.02   594.76     0.92     0.91
 MEAN    23.39     1.06    21.93   603.86     1.02   592.86     0.92     0.91
 HUB     23.32     1.06    21.69   603.33     1.02   590.95     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.50    35.48    31.50     3.98     0.93     0.34     2.90
 MEAN    33.37    27.49    23.50     3.99     0.93     0.33     3.34     0.91
 HUB     37.50    10.38     6.50     3.88     0.93     0.32     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     367.089     203.357     305.615    1194.456       0.307      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.408      21.922     593.024      46.000      33.640      33.000      -0.640

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     322.643     203.357     381.382    1197.030       0.270       0.211

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.402      22.248     595.582     440.827       0.024       0.363

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     302.622       0.000     302.622    1198.080       0.253       0.294

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.367     596.627       0.000       0.060       0.037       0.290

    STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.880      23.383       1.063     604.271      11.874     254.558       1.973

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   74006.344       0.432     416.500  920586.188

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     507406.34   2855.6313     97.2890      1.5478      0.8564     12.9716      1.1558


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*******************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.992   EfDer =  0.966

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      95.675    2643.000      15.107     522.810       1.000       1.000       0.980
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W Kg/sec = 43.48865

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
93.465	2632.591	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73601.117	75072.977	3.055	831.557	272.190	619.754	2.277

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	216.43	-0.07	216.43	0.19	473.93
MEAN	17.06	0.00	-0.02	216.43	-0.07	216.43	0.19	
HUB	12.51	0.00	-0.02	216.43	-0.07	216.43	0.19	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	65.54	50.47	15.07	475.82	522.80	14.72	518.90	0.47
MEAN	61.19	47.20	13.99	393.48	449.14	14.72	518.90	0.40
HUB	53.13	38.62	14.51	288.54	360.75	14.72	518.90	0.32

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	431.41	318.88	290.57	1131.10	0.38
MEAN	18.04	439.74	326.68	294.36	1127.75	0.39
HUB	15.00	480.83	375.82	299.92	1123.36	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	475.82	330.24	156.94	0.29	6580.11	
MEAN	415.99	307.61	89.31	0.27	5893.31	1.67
HUB	345.97	301.40	29.85	0.27	5638.27	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.39	1.15	15.73	547.19	1.05	531.65	0.92	0.88
MEAN	17.14	1.13	15.44	544.65	1.04	528.49	0.92	0.88
HUB	17.05	1.13	15.03	543.70	1.04	524.39	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	47.66	28.37	24.20	4.17	0.93	0.47	2.90	
MEAN	47.98	16.88	12.70	4.18	0.95	0.42	3.51	0.88
HUB	51.41	-5.68	-9.30	3.62	0.95	0.28	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.966

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	444.048	326.047	301.449	1127.974	0.394	0.000

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.178	15.435	528.709	24.000	47.245	35.400	-11.845

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	319.366	326.047	456.401	1136.423	0.281	0.457

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.136	16.220	536.660	528.796	0.034	0.574

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	297.866	0.000	297.866	1137.596	0.262	0.458

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.258	537.768	0.000	0.060	0.080	0.478

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.826      17.053       1.129     545.179      22.369     175.094       1.357

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 139263.422       0.615     752.953  910072.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =13.992   EfDer =  0.971

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     95.675    2643.000      17.053     545.179       1.000       1.000       0.980
W Kg/sec =   43.48865

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     84.553    2578.018       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73601.117   75072.977       2.398     590.487     246.239     474.134       1.926

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   285.10    -0.10   285.10     0.25   462.31
 MEAN    18.08     0.00    -0.02   285.10    -0.10   285.10     0.25
 HUB     15.21     0.00    -0.02   285.10    -0.10   285.10     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.98    46.36    12.62   473.98   553.20    16.32   538.39     0.49
 MEAN    55.64    42.30    13.34   416.97   505.20    16.32   538.39     0.44
 HUB     50.91    37.84    13.07   350.81   452.13    16.32   538.39     0.40

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   396.28   262.17   297.16  1152.41     0.34
 MEAN    18.01   397.98   261.44   300.06  1149.80     0.35
 HUB     15.22   424.26   296.58   303.37  1147.15     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   363.19   208.80     0.32  5355.61
 MEAN   415.39   337.25   153.95     0.29  4710.38     1.65
 HUB    351.11   308.23    54.53     0.27  4516.33

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.06     1.12    17.56   565.02     1.04   551.90     0.92     0.89
 MEAN    18.81     1.10    17.31   562.63     1.03   549.40     0.92     0.89
 HUB     18.73     1.10    17.04   561.91     1.03   546.88     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.42    35.09    31.50     3.59     0.93     0.42     2.90
 MEAN    41.07    27.16    23.50     3.66     0.94     0.41     3.30     0.89
 HUB     44.35    10.19     6.50     3.69     0.94     0.40     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     433.862     262.178     345.686    1147.768       0.378      -0.148

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.848      17.076     547.464      46.000      37.178      30.600      -6.578

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     350.543     262.178     437.742    1153.475       0.304       0.230

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.850      18.831      17.661     552.921     455.853       0.021       0.404

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     346.217       0.000     346.217    1153.737       0.300       0.364

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      17.645     553.173       0.000       0.060       0.051       0.220

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.851      18.784       1.102     563.183      18.005     199.237       1.544

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 112125.727       0.505     606.228  827207.312


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =13.992   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     95.675    2643.000      18.784     563.183       1.000       1.000       0.880
W Kg/sec =   43.48865

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     78.018    2536.474       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73601.117   75072.977       2.156     489.817     227.214     384.470       1.692

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   324.95    -0.11   324.95     0.28   444.23
 MEAN    17.74     0.00    -0.02   324.95    -0.11   324.95     0.28
 HUB     15.05     0.00    -0.02   324.95    -0.11   324.95     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.94    46.36     8.58   462.91   565.66    17.78   554.37     0.49
 MEAN    51.55    43.40     8.15   409.13   522.56    17.78   554.37     0.45
 HUB     46.90    38.84     8.06   347.12   475.56    17.78   554.37     0.41

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   385.62   240.69   301.29  1169.50     0.33
 MEAN    17.51   389.55   243.84   303.79  1167.34     0.33
 HUB     14.85   417.82   283.85   306.59  1165.17     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   370.84   216.22     0.32  4770.30
 MEAN   403.78   343.32   159.94     0.29  4270.80     1.65
 HUB    342.51   312.15    58.65     0.27  4216.92

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.73     1.10    19.22   580.85     1.03   568.43     0.92     0.91
 MEAN    20.52     1.09    18.99   579.00     1.03   566.33     0.92     0.91
 HUB     20.50     1.09    18.75   578.80     1.03   564.22     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.62    35.67    31.50     4.17     0.93     0.42     2.90
 MEAN    38.75    27.77    23.50     4.27     0.93     0.41     3.28     0.91
 HUB     42.79    10.83     6.50     4.33     0.93     0.42     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     393.382     245.441     307.421    1167.646       0.337       0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.565      19.010     566.627      46.000      38.603      31.500      -7.103

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     316.183     245.441     400.266    1172.349       0.270       0.343

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.551      19.536     571.201     471.992       0.019       0.428

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     17.121     307.495       0.000     307.495    1172.813       0.262       0.332

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      19.539     571.653       0.000       0.060       0.053       0.345

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      20.496       1.091     579.548      16.365     208.064       1.613

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 101943.375       0.488     551.175  922547.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =13.992   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     95.675    2643.000      20.496     579.548       1.000       1.000       0.980
W Kg/sec =   43.48865

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     72.531    2500.406       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73601.117   75072.977       2.430     513.330     211.239     401.059       1.899

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   289.80    -0.10   289.80     0.25   420.24
 MEAN    16.97     0.00    -0.02   289.80    -0.10   289.80     0.25
 HUB     14.32     0.00    -0.02   289.80    -0.10   289.80     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.89    46.36    10.53   444.22   530.48    19.64   572.54     0.45
 MEAN    53.49    43.80     9.69   391.42   487.11    19.64   572.54     0.42
 HUB     48.74    37.84    10.90   330.28   439.48    19.64   572.54     0.37

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   374.41   222.75   300.94  1184.78     0.32
 MEAN    16.57   377.95   225.67   303.18  1182.80     0.32
 HUB     13.89   404.36   264.67   305.70  1180.81     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   368.53   212.71     0.31  4207.38
 MEAN   382.27   341.23   156.59     0.29  3742.00     1.56
 HUB    320.37   310.73    55.69     0.26  3677.75

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.30     1.09    20.80   595.12     1.03   583.42     0.92     0.91
 MEAN    22.09     1.08    20.58   593.40     1.02   581.48     0.92     0.91
 HUB     22.06     1.08    20.34   593.16     1.02   579.51     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.51    35.25    31.50     3.75     0.93     0.38     2.90
 MEAN    36.66    27.32    23.50     3.82     0.94     0.37     3.29     0.91
 HUB     40.89    10.32     6.50     3.82     0.94     0.37     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     374.210     226.944     297.539    1183.547       0.316       0.045

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.135      20.651     582.206      46.000      37.334      32.400      -4.934

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     310.425     226.944     384.535    1187.246       0.261       0.332

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.127      21.098     585.852     456.573       0.015       0.414

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     295.718       0.000     295.718    1188.000       0.249       0.315

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.147     586.596       0.000       0.060       0.045       0.363

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      22.080       1.077     593.896      14.348     221.962       1.721

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  89403.344       0.471     483.375  840471.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.992   EfDer =  0.998

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     95.675    2643.000      22.080     593.896       1.000       1.000       0.980
W Kg/sec =   43.48865

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     68.158    2470.017       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  73601.117   75072.977       2.568     509.668     198.507     390.276       1.966

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   276.73    -0.10   276.73     0.23   394.88
 MEAN    15.91     0.00    -0.02   276.73    -0.10   276.73     0.23
 HUB     13.07     0.00    -0.02   276.73    -0.10   276.73     0.23

       BetaFlo   BetaBlade Incid   U1        W1       Ps1      Ts1     Rel Mach
 TIP     56.78    47.36     9.42   422.54   505.17    21.26   587.50     0.42
 MEAN    52.99    44.80     8.19   367.03   459.74    21.26   587.50     0.39
 HUB     47.46    38.84     8.62   301.45   409.28    21.26   587.50     0.34

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     17.94   355.60   208.84   287.81  1198.66      0.30
 MEAN    15.50   356.13   206.73   289.99  1196.61      0.30
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 HUB     12.59   376.34   236.96   292.37  1194.55     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   353.31   204.93     0.29  3748.40
 MEAN   357.44   326.82   150.72     0.27  3205.26     1.55
 HUB    290.38   297.21    53.42     0.25  2984.62

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.77     1.08    22.36   607.77     1.02   597.21     0.92     0.91
 MEAN    23.52     1.07    22.11   605.76     1.02   595.17     0.92     0.91
 HUB     23.42     1.06    21.86   604.94     1.02   593.12     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.97    35.45    31.50     3.95     0.93     0.37     2.90
 MEAN    35.48    27.46    23.50     3.96     0.93     0.36     3.34     0.91
 HUB     39.02    10.35     6.50     3.85     0.93     0.34     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     360.248     210.516     292.338    1196.762       0.301      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.538      22.103     595.324      46.000      35.758      33.000      -2.758

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     308.215     210.516     373.247    1199.677       0.257       0.249

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.530      22.474     598.227     440.827       0.025       0.394

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     289.228       0.000     289.228    1200.626       0.241       0.327

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.579     599.174       0.000       0.060       0.039       0.321

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      23.510       1.065     606.156      12.260     243.122       1.885

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  76416.914       0.446     413.162  880488.938

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    519152.78   2806.8945     93.4649      1.5562      0.8481     13.9922      1.1594


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 70% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =14.987   EfDer =  0.959

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      91.914    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   41.77924

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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    89.791    2632.591       1.402       0.249      53.349      32.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 70708.070   72122.078       3.180     831.557     261.491     619.754       2.370

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   207.61    -0.07   207.61     0.19   473.93
MEAN    17.06     0.00    -0.02   207.61    -0.07   207.61     0.19
HUB     12.51     0.00    -0.02   207.61    -0.07   207.61     0.19

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     66.43    50.47    15.96   475.82   519.21    14.75   519.21     0.46
MEAN    62.19    47.20    14.99   393.48   444.96    14.75   519.21     0.40
HUB     54.27    38.62    15.65   288.54   355.52    14.75   519.21     0.32

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   428.13   325.05   278.64  1131.85     0.38
MEAN    18.04   434.36   330.12   282.30  1128.41     0.38
HUB     15.00   472.08   374.39   287.55  1124.02     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    475.82   316.81   150.77     0.28  6707.27
MEAN   415.99   295.07    85.87     0.26  5955.26     1.73
HUB    345.97   288.95    28.43     0.26  5616.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.42     1.15    15.78   547.66     1.05   532.35     0.92     0.88
MEAN    17.15     1.14    15.48   544.87     1.04   529.12     0.92     0.88
HUB     17.03     1.13    15.08   543.62     1.04   525.01     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     49.40    28.42    24.20     4.22     0.93     0.50     2.90
MEAN    49.46    16.92    12.70     4.22     0.95     0.45     3.51     0.88
HUB     52.47    -5.65    -9.30     3.65     0.95     0.31     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.959

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     438.318     329.478     289.080    1128.645       0.388       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.181      15.482     529.339      24.000      48.737      35.400     -13.337

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     305.976     329.478     449.641    1137.382       0.269       0.482

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.133      16.292     537.566     528.796       0.037       0.599

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     285.663       0.000     285.663    1138.444       0.251       0.473

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.311     538.570       0.000       0.060       0.089       0.493

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.814      17.042       1.128     545.386      22.576     170.309       1.320

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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 140552.750       0.621     730.054  872992.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =14.987   EfDer =  0.963

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     91.914    2643.000      17.042     545.386       1.000       1.000       0.980
W Kg/sec =   41.77924

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.298    2577.529       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 70708.070   72122.078       2.494     590.487     236.759     474.134       2.003

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   273.49    -0.09   273.49     0.24   462.22
MEAN    18.08     0.00    -0.02   273.49    -0.09   273.49     0.24
HUB     15.21     0.00    -0.02   273.49    -0.09   273.49     0.24

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.02    46.36    13.66   473.98   547.30    16.37   539.14     0.48
MEAN    56.75    42.30    14.45   416.97   498.73    16.37   539.14     0.44
HUB     52.07    37.84    14.23   350.81   444.89    16.37   539.14     0.39

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   393.01   270.53   285.08  1153.51     0.34
MEAN    18.01   393.05   267.55   287.93  1150.78     0.34
HUB     15.22   417.14   298.70   291.18  1148.02     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    470.98   348.50   200.45     0.30  5526.09
MEAN   415.39   323.67   147.84     0.28  4820.35     1.70
HUB    351.11   295.86    52.41     0.26  4548.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.09     1.12    17.61   565.85     1.04   552.96     0.92     0.88
MEAN    18.82     1.10    17.36   563.24     1.03   550.34     0.92     0.88
HUB     18.72     1.10    17.08   562.23     1.03   547.70     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.50    35.11    31.50     3.61     0.93     0.45     2.90
MEAN    42.90    27.18    23.50     3.68     0.95     0.43     3.30     0.88
HUB     45.73    10.20     6.50     3.70     0.95     0.42     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.963

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     426.410     268.305     331.417    1148.948       0.371      -0.139

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.859      17.146     548.592      46.000      38.993      30.600      -8.393

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     335.689     268.305     429.738    1154.979       0.291       0.271

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      18.839      17.764     554.366     455.853       0.024       0.433

   VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	331.720	0.000	331.720	1155.209	0.287	0.388

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	17.737	554.587	0.000	0.060	0.060	0.253

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.839	18.784	1.102	563.776	18.391	192.057	1.489

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
114529.867	0.516	594.887	792474.812

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =14.987 EfDer = 0.994

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
91.914	2643.000	18.784	563.776	1.000	1.000	0.880

W Kg/sec = 41.77924

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
74.991	2535.140	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
70708.070	72122.078	2.243	489.817	218.399	384.470	1.760

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	311.49	-0.11	311.49	0.27	444.00
MEAN	17.74	0.00	-0.02	311.49	-0.11	311.49	0.27	
HUB	15.05	0.00	-0.02	311.49	-0.11	311.49	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.07	46.36	9.71	462.91	558.04	17.86	555.68	0.48
MEAN	52.72	43.40	9.32	409.13	514.30	17.86	555.68	0.44
HUB	48.11	38.84	9.27	347.12	466.47	17.86	555.68	0.40

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	381.87	249.83	288.81	1171.05	0.33
MEAN	17.51	384.26	250.57	291.33	1168.74	0.33
HUB	14.85	410.53	286.40	294.13	1166.44	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	355.37	207.07	0.30	4951.38	
MEAN	403.78	329.16	153.21	0.28	4388.52	1.70
HUB	342.51	299.43	56.11	0.26	4254.63	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.80	1.11	19.32	582.11	1.03	569.94	0.92	0.91
MEAN	20.56	1.09	19.07	580.03	1.03	567.70	0.92	0.91
HUB	20.50	1.09	18.82	579.53	1.03	565.46	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.86	35.64	31.50	4.14	0.93	0.44	2.90	
MEAN	40.70	27.74	23.50	4.24	0.93	0.43	3.28	0.91
HUB	44.24	10.80	6.50	4.30	0.93	0.44	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.994

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	387.978	252.214	294.814	1169.043	0.332	0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.604	19.089	567.988	46.000	40.547	31.500	-9.047

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	302.853	252.214	394.122	1174.085	0.258	0.376

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.585	19.653	572.899	471.992	0.022	0.459

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	294.717	0.000	294.717	1174.501	0.251	0.356

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.641	573.305	0.000	0.060	0.063	0.369

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.863	20.522	1.093	580.557	16.780	199.918	1.550

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
104530.734	0.501	542.950	882723.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =14.987 EfDer = 0.987

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
91.914	2643.000	20.522	580.557	1.000	1.000	0.980

W Kg/sec = 41.77924

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
69.655	2498.233	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
70708.070	72122.078	2.530	513.330	202.863	401.059	1.977

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	277.85	-0.10	277.85	0.24	419.88
MEAN	16.97	0.00	-0.02	277.85	-0.10	277.85	0.24	
HUB	14.32	0.00	-0.02	277.85	-0.10	277.85	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.98	46.36	11.62	444.22	524.04	19.74	574.11	0.45
MEAN	54.64	43.80	10.84	391.42	480.09	19.74	574.11	0.41
HUB	49.94	37.84	12.10	330.28	431.69	19.74	574.11	0.37

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	369.94	231.71	288.39	1186.72	0.31
MEAN	16.57	372.02	232.23	290.64	1184.61	0.31
HUB	13.89	396.54	267.02	293.16	1182.48	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	353.10	203.75	0.30	4376.46	
MEAN	382.27	327.08	150.04	0.28	3850.53	1.61
HUB	320.37	297.98	53.35	0.25	3710.26	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.38	1.09	20.92	596.76	1.03	585.33	0.92	0.90
MEAN	22.15	1.08	20.69	594.81	1.02	583.26	0.92	0.90
HUB	22.09	1.08	20.44	594.29	1.02	581.17	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.78	35.24	31.50	3.74	0.93	0.40	2.90	

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 MEAN    38.63    27.31    23.50     3.81     0.94     0.39     3.29     0.90
 HUB     42.33    10.31     6.50     3.81     0.94     0.39     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     368.678     233.533     285.282    1185.302       0.311        0.043

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.195      20.754     583.940      46.000      39.304      32.400      -6.904

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     297.287     233.533     378.044    1189.323       0.250        0.364

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.184      21.239     587.909     456.573       0.017        0.445

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096     283.374       0.000     283.374    1190.005       0.238        0.340

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      21.273     588.584       0.000       0.060       0.052        0.386

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.862      22.130       1.078     595.287      14.730     213.090        1.652

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91787.477       0.484     476.759  804375.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =14.987   EfDer =  0.994

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     91.914     2643.000       22.130     595.287       1.000        1.000        0.980
W Kg/sec =   41.77924

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     65.406     2467.130        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  70708.070   72122.078        2.676     509.668     190.493     390.276        2.049

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   265.27    -0.09   265.27      0.22   394.41
 MEAN    15.91      0.00    -0.02   265.27    -0.09   265.27      0.22
 HUB     13.07      0.00    -0.02   265.27    -0.09   265.27      0.22

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     57.89     47.36    10.53   422.54   498.99     21.38   589.41      0.42
 MEAN    54.15     44.80     9.35   367.03   452.93     21.38   589.41      0.38
 HUB     48.66     38.84     9.82   301.45   401.62     21.38   589.41      0.34

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   351.23    217.59    275.71   1200.89      0.29
 MEAN    15.50   350.22    213.14    277.89   1198.72      0.29
 HUB     12.59   368.53    239.29    280.27   1196.53      0.31

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
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 TIP    413.78   338.38   196.19     0.28  3905.28
 MEAN   357.44   313.12   144.30     0.26  3304.66     1.60
 HUB    290.38   284.89    51.09     0.24  3013.92

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.88     1.08    22.51   609.74     1.02   599.44     0.92     0.91
 MEAN    23.61     1.07    22.25   607.52     1.02   597.28     0.92     0.91
 HUB     23.48     1.06    21.98   606.44     1.02   595.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.28    35.43    31.50     3.93     0.93     0.40     2.90
 MEAN    37.49    27.44    23.50     3.94     0.93     0.38     3.34     0.91
 HUB     40.49    10.33     6.50     3.83     0.93     0.36     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     354.391     217.051     280.147    1198.855       0.296      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.627      22.236     597.417      46.000      37.768      33.000      -4.768

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     295.034     217.051     366.273    1202.079       0.245       0.284

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.616      22.646     600.634     440.827       0.028       0.425

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     276.991       0.000     276.991    1202.941       0.230       0.355

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.737     601.496       0.000       0.060       0.044       0.349

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      23.593       1.066     607.899      12.612     233.030       1.806

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   78612.773       0.459     408.327  842512.688

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     530013.62   2752.9763     89.7911      1.5617      0.8378     14.9870      1.1628



**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 70% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =15.956   EfDer =  0.950

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      88.301    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   40.13702

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      86.262    2632.591       1.402       0.249      53.349      32.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
67928.758	69287.188	3.310	831.557	251.213	619.754	2.467

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	199.18	-0.07	199.18	0.18	473.93
MEAN	17.06	0.00	-0.02	199.18	-0.07	199.18	0.18	
HUB	12.51	0.00	-0.02	199.18	-0.07	199.18	0.18	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	67.29	50.47	16.82	475.82	515.89	14.78	519.50	0.46
MEAN	63.16	47.20	15.96	393.48	441.08	14.78	519.50	0.39
HUB	55.39	38.62	16.77	288.54	350.66	14.78	519.50	0.31

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	425.35	330.87	267.30	1132.54	0.38
MEAN	18.04	429.46	333.31	270.82	1129.01	0.38
HUB	15.00	463.86	372.98	275.78	1124.62	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	475.82	304.08	144.95	0.27	6827.19	
MEAN	415.99	283.16	82.69	0.25	6012.67	1.79
HUB	345.97	277.10	27.01	0.25	5595.50	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.44	1.15	15.82	548.11	1.05	532.99	0.92	0.87
MEAN	17.15	1.14	15.52	545.09	1.04	529.68	0.92	0.87
HUB	17.00	1.13	15.12	543.54	1.04	525.57	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	51.07	28.47	24.20	4.27	0.93	0.52	2.90	
MEAN	50.90	16.98	12.70	4.28	0.95	0.47	3.51	0.87
HUB	53.52	-5.59	-9.30	3.71	0.95	0.33	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.950

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	433.085	332.658	277.311	1129.257	0.384	0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.181	15.521	529.912	24.000	50.185	35.400	-14.785

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	293.269	332.658	443.473	1138.259	0.258	0.507

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.129	16.355	538.395	528.796	0.041	0.624

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	274.055	0.000	274.055	1139.221	0.241	0.488

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.355	539.305	0.000	0.060	0.099	0.507

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.802	17.029	1.127	545.578	22.768	165.754	1.285

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
141752.406	0.626	707.344	837527.938

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =15.956   EfDer =  0.954

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    88.301    2643.000      17.029     545.578       1.000       1.000       0.980
W Kg/sec =   40.13702

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    78.177    2577.073       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 67928.758   69287.188       2.594     590.487     227.671     474.134       2.083

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   262.43    -0.09   262.43     0.23   462.14
MEAN    18.08     0.00    -0.02   262.43    -0.09   262.43     0.23
HUB     15.21     0.00    -0.02   262.43    -0.09   262.43     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.03    46.36    14.67   473.98   541.86    16.41   539.83     0.48
MEAN    57.82    42.30    15.52   416.97   492.76    16.41   539.83     0.43
HUB     53.21    37.84    15.37   350.81   438.18    16.41   539.83     0.38

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   390.35   278.37   273.65  1154.51     0.34
MEAN    18.01   388.70   273.27   276.43  1151.67     0.34
HUB     15.22   410.55   300.63   279.60  1148.81     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    470.98   334.64   192.61     0.29  5686.09
MEAN   415.39   310.82   142.12     0.27  4923.23     1.75
HUB    351.11   284.12    50.48     0.25  4577.89

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.12     1.12    17.66   566.64     1.04   553.92     0.92     0.87
MEAN    18.83     1.11    17.40   563.81     1.03   551.20     0.92     0.87
HUB     18.70     1.10    17.11   562.54     1.03   548.46     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     45.49    35.14    31.50     3.64     0.93     0.47     2.90
MEAN    44.67    27.21    23.50     3.71     0.95     0.45     3.30     0.87
HUB     47.08    10.23     6.50     3.73     0.95     0.44     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.954

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     419.730     274.038     317.925    1150.020       0.365      -0.130

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.864      17.203     549.618      46.000      40.760      30.600     -10.160

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     321.690     274.038     422.589    1156.353       0.278       0.310

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      18.838      17.851     555.688     455.853       0.027       0.461

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     318.066       0.000     318.066    1156.555       0.275       0.410
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	17.813	555.882	0.000	0.060	0.069	0.284

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.826	18.775	1.103	564.330	18.752	185.413	1.437

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
116776.953	0.526	582.716	759383.312

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =15.956 EfDer = 0.989

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
88.301	2643.000	18.775	564.330	1.000	1.000	0.880

W Kg/sec = 40.13702

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
72.111	2533.896	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
67928.758	69287.188	2.332	489.817	210.012	384.470	1.831

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	298.80	-0.10	298.80	0.26	443.78
MEAN	17.74	0.00	-0.02	298.80	-0.10	298.80	0.26	
HUB	15.05	0.00	-0.02	298.80	-0.10	298.80	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.16	46.36	10.80	462.91	551.05	17.92	556.88	0.48
MEAN	53.87	43.40	10.47	409.13	506.71	17.92	556.88	0.44
HUB	49.29	38.84	10.45	347.12	458.09	17.92	556.88	0.40

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	378.86	258.35	277.11	1172.45	0.32
MEAN	17.51	379.69	256.86	279.62	1170.03	0.32
HUB	14.85	403.87	288.73	282.40	1167.60	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	340.91	198.56	0.29	5119.91	
MEAN	403.78	315.86	146.92	0.27	4498.60	1.75
HUB	342.51	287.47	53.78	0.25	4289.21	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.84	1.11	19.39	583.29	1.03	571.30	0.92	0.91
MEAN	20.58	1.10	19.13	580.99	1.03	568.95	0.92	0.91
HUB	20.50	1.09	18.87	580.21	1.03	566.59	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.99	35.62	31.50	4.12	0.93	0.46	2.90	
MEAN	42.57	27.72	23.50	4.22	0.94	0.45	3.28	0.91
HUB	45.64	10.78	6.50	4.28	0.94	0.45	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.989

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	383.300	258.548	282.969	1170.316	0.328	0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.627	19.148	569.230	46.000	42.418	31.500	-10.918

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	290.368	258.548	388.794	1175.677	0.247	0.407

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.603	19.746	574.457	471.992	0.026	0.489

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	282.750	0.000	282.750	1176.050	0.240	0.378

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.720	574.822	0.000	0.060	0.074	0.390

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.853	20.530	1.093	581.497	17.167	192.486	1.492

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
106938.914	0.512	533.625	844933.688

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =15.956 EfDer = 0.981

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
88.301	2643.000	20.530	581.497	1.000	1.000	0.980

W Kg/sec = 40.13702

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
66.943	2496.213	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
67928.758	69287.188	2.633	513.330	194.966	401.059	2.057

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	266.65	-0.09	266.65	0.23	419.54
MEAN	16.97	0.00	-0.02	266.65	-0.09	266.65	0.23	
HUB	14.32	0.00	-0.02	266.65	-0.09	266.65	0.23	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.03	46.36	12.67	444.22	518.19	19.81	575.56	0.44
MEAN	55.74	43.80	11.94	391.42	473.69	19.81	575.56	0.40
HUB	51.09	37.84	13.25	330.28	424.56	19.81	575.56	0.36

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	366.26	239.97	276.69	1188.47	0.31
MEAN	16.57	366.85	238.28	278.93	1186.26	0.31
HUB	13.89	389.45	269.19	281.43	1184.02	0.33

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	338.79	195.49	0.29	4532.39	
MEAN	382.27	313.90	143.99	0.26	3950.75	1.66
HUB	320.37	286.05	51.17	0.24	3740.42	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.45	1.09	21.01	598.28	1.03	587.08	0.92	0.90
MEAN	22.19	1.08	20.77	596.12	1.03	584.89	0.92	0.90
HUB	22.10	1.08	20.50	595.34	1.02	582.68	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.93	35.24	31.50	3.74	0.93	0.43	2.90	
MEAN	40.51	27.30	23.50	3.80	0.94	0.41	3.29	0.90
HUB	43.73	10.31	6.50	3.81	0.94	0.41	3.90	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     363.873     239.618     273.837    1186.905       0.307       0.041

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.232      20.828     585.528      46.000      41.187      32.400      -8.787

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     285.060     239.618     372.392    1191.224       0.239       0.394

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.217      21.348     589.797     456.573       0.020       0.474

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     271.890       0.000     271.890    1191.842       0.228       0.362

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.366     590.409       0.000       0.060       0.062       0.407

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.851      22.155       1.079     596.580      15.083     205.073       1.590

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93988.906       0.496     469.004  770099.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =15.956   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     88.301    2643.000      22.155     596.580       1.000       1.000       0.980
W Kg/sec =   40.13702

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     62.832    2464.455       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  67928.758   69287.188       2.785     509.668     182.998     390.276       2.133

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   254.60    -0.09   254.60     0.21   393.99
 MEAN    15.91     0.00    -0.02   254.60    -0.09   254.60     0.21
 HUB     13.07     0.00    -0.02   254.60    -0.09   254.60     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.93    47.36    11.57   422.54   493.39    21.46   591.17     0.41
 MEAN    55.26    44.80    10.46   367.03   446.76    21.46   591.17     0.37
 HUB     49.83    38.84    10.99   301.45   394.65    21.46   591.17     0.33

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   347.66   225.62   264.51  1202.91     0.29
 MEAN    15.50   345.10   219.04   266.67  1200.64     0.29
 HUB     12.59   361.45   241.38   269.03  1198.36     0.30

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   324.61   188.16     0.27  4049.16
 MEAN   357.44   300.45   138.41     0.25  3395.93     1.65
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  HUB    290.38   273.45    49.00     0.23  3040.17

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     23.96     1.08    22.61   611.57     1.03   601.48     0.92     0.91
  MEAN    23.67     1.07    22.34   609.15     1.02   599.21     0.92     0.91
  HUB     23.50     1.06    22.06   607.83     1.02   596.93     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     40.46    35.43    31.50     3.93     0.93     0.42     2.90
  MEAN    39.40    27.43    23.50     3.93     0.94     0.40     3.34     0.91
  HUB     41.90    10.32     6.50     3.82     0.94     0.38     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.989

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     349.330     223.053     268.847    1200.764       0.291      -0.010

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      23.684      22.331     599.330      46.000      39.681      33.000      -6.681

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     282.869     223.053     360.233    1204.271       0.235       0.316

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      23.667      22.774     602.837     440.827       0.032       0.455

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     265.697       0.000     265.697    1205.057       0.220       0.381

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      22.852     603.623       0.000       0.060       0.051       0.373

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.865      23.640       1.067     609.515      12.935     224.011       1.737

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   80622.805       0.471     402.307  806476.812

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     540080.00   2694.9966     86.2617      1.5649      0.8261     15.9559      1.1658


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70% Stat 2 10% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =17.015   EfDer =  0.940

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      84.406    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   38.36656

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      82.457    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   64932.395   66230.898       3.463     831.557     240.132     619.754       2.581
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ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	190.12	-0.07	190.12	0.17	473.93
MEAN	17.06	0.00	-0.02	190.12	-0.07	190.12	0.17	
HUB	12.51	0.00	-0.02	190.12	-0.07	190.12	0.17	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	68.22	50.47	17.75	475.82	512.46	14.80	519.79	0.46
MEAN	64.21	47.20	17.01	393.48	437.07	14.80	519.79	0.39
HUB	56.62	38.62	18.00	288.54	345.60	14.80	519.79	0.31

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	422.71	336.97	255.22	1133.23	0.37
MEAN	18.04	424.50	336.67	258.57	1129.63	0.38
HUB	15.00	455.23	371.43	263.20	1125.24	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	475.82	290.54	138.85	0.26	6953.10	
MEAN	415.99	270.46	79.32	0.24	6073.28	1.86
HUB	345.97	264.43	25.47	0.23	5572.32	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.46	1.16	15.86	548.57	1.05	533.65	0.92	0.86
MEAN	17.15	1.14	15.55	545.31	1.04	530.26	0.92	0.86
HUB	16.97	1.12	15.16	543.46	1.04	526.15	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	52.86	28.55	24.20	4.35	0.93	0.55	2.90	
MEAN	52.48	17.06	12.70	4.36	0.95	0.49	3.51	0.86
HUB	54.68	-5.53	-9.30	3.77	0.95	0.36	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.940

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	427.782	336.014	264.749	1129.878	0.379	0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.178	15.558	530.495	24.000	51.765	35.400	-16.365

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	279.734	336.014	437.215	1139.156	0.246	0.534

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.120	16.416	539.244	528.796	0.044	0.650

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	261.657	0.000	261.657	1140.019	0.230	0.503

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.398	540.062	0.000	0.060	0.110	0.523

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.788	17.011	1.126	545.780	22.970	160.875	1.247

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
143008.281	0.632	682.133	799456.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =17.015 EfDer = 0.943

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
84.406	2643.000	17.011	545.780	1.000	1.000	0.980

W Kg/sec = 38.36656

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
74.818	2576.597	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
64932.395	66230.898	2.710	590.487	217.890	474.134	2.176

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	250.62	-0.09	250.62	0.22	462.05
MEAN	18.08	0.00	-0.02	250.62	-0.09	250.62	0.22	
HUB	15.21	0.00	-0.02	250.62	-0.09	250.62	0.22	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.14	46.36	15.78	473.98	536.23	16.45	540.54	0.47
MEAN	59.00	42.30	16.70	416.97	486.56	16.45	540.54	0.43
HUB	54.46	37.84	16.62	350.81	431.21	16.45	540.54	0.38

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	387.96	286.58	261.50	1155.53	0.34
MEAN	18.01	384.43	279.28	264.18	1152.59	0.33
HUB	15.22	403.72	302.62	267.24	1149.62	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	319.98	184.40	0.28	5853.71	
MEAN	415.39	297.18	136.11	0.26	5031.46	1.81
HUB	351.11	271.60	48.50	0.24	4608.02	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.13	1.12	17.70	567.46	1.04	554.89	0.92	0.86
MEAN	18.83	1.11	17.43	564.42	1.03	552.08	0.92	0.86
HUB	18.67	1.10	17.14	562.85	1.03	549.24	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	47.62	35.19	31.50	3.69	0.93	0.50	2.90	
MEAN	46.59	27.26	23.50	3.76	0.95	0.48	3.30	0.86
HUB	48.55	10.29	6.50	3.79	0.95	0.46	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.943

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	413.051	280.068	303.601	1151.110	0.359	-0.120

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.861	17.253	550.662	46.000	42.691	30.600	-12.091

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	306.870	280.068	415.461	1157.763	0.265	0.351

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	18.830	17.931	557.046	455.853	0.031	0.492

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	303.611	0.000	303.611	1157.936	0.262	0.432

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	17.881	557.212	0.000	0.060	0.081	0.316

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.810	18.757	1.103	564.909	19.129	178.501	1.384

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
119129.695	0.537	568.235	723990.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =17.015 EfDer = 0.982

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
84.406	2643.000	18.757	564.909	1.000	1.000	0.880

W Kg/sec = 38.36656

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
69.032	2532.596	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
64932.395	66230.898	2.436	489.817	201.046	384.470	1.912

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	285.34	-0.10	285.34	0.25	443.56
MEAN	17.74	0.00	-0.02	285.34	-0.10	285.34	0.25	
HUB	15.05	0.00	-0.02	285.34	-0.10	285.34	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.36	46.36	12.00	462.91	543.87	17.98	558.11	0.47
MEAN	55.11	43.40	11.71	409.13	498.89	17.98	558.11	0.43
HUB	50.59	38.84	11.75	347.12	449.42	17.98	558.11	0.39

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	376.19	267.24	264.77	1173.88	0.32
MEAN	17.51	375.24	263.43	267.23	1171.35	0.32
HUB	14.85	397.06	291.16	269.97	1168.80	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	325.69	189.67	0.28	5296.05	
MEAN	403.78	301.85	140.35	0.26	4613.44	1.81
HUB	342.51	274.81	51.35	0.24	4325.25	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.88	1.11	19.44	584.52	1.03	572.70	0.92	0.90
MEAN	20.60	1.10	19.18	581.99	1.03	570.24	0.92	0.90
HUB	20.48	1.09	18.90	580.93	1.03	567.76	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.27	35.62	31.50	4.12	0.93	0.49	2.90	
MEAN	44.59	27.71	23.50	4.21	0.94	0.47	3.28	0.90
HUB	47.16	10.77	6.50	4.27	0.94	0.47	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.982

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	378.749	265.156	270.450	1171.619	0.323	0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.637	19.194	570.503	46.000	44.434	31.500	-12.934

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th

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     17.392     277.208     265.156     383.604    1177.315       0.235       0.440

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.607      19.826     576.064     471.992       0.030       0.522

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     270.131       0.000     270.131    1177.646       0.229       0.400

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.784     576.387       0.000       0.060       0.087       0.412

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.840      20.523       1.094     582.480      17.570     184.852       1.433

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 109453.141       0.524     522.079  804662.688


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =17.015   EfDer =  0.973

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     84.406    2643.000      20.523     582.480       1.000       1.000       0.980
W Kg/sec =   38.36656

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     64.066    2494.105       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  64932.395   66230.898       2.751     513.330     186.586     401.059       2.149

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   254.83    -0.09   254.83     0.22   419.18
 MEAN    16.97     0.00    -0.02   254.83    -0.09   254.83     0.22
 HUB     14.32     0.00    -0.02   254.83    -0.09   254.83     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.16    46.36    13.80   444.22   512.20    19.86   577.06     0.43
 MEAN    56.94    43.80    13.14   391.42   467.14    19.86   577.06     0.40
 HUB     52.36    37.84    14.52   330.28   417.23    19.86   577.06     0.35

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   362.92   248.58   264.42  1190.28     0.30
 MEAN    16.57   361.81   244.59   266.61  1187.95     0.30
 HUB     13.89   382.17   271.39   269.08  1185.60     0.32

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   323.79   186.87     0.27  4694.97
 MEAN   382.27   300.06   137.68     0.25  4055.28     1.71
 HUB    320.37   273.50    48.97     0.23  3770.88

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.49     1.10    21.08   599.86     1.03   588.87     0.92     0.89
 MEAN    22.21     1.08    20.83   597.49     1.03   586.56     0.92     0.89
 HUB     22.09     1.08    20.56   596.44     1.02   584.25     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.23    35.25    31.50     3.75     0.93     0.45     2.90
 MEAN    42.53    27.31    23.50     3.81     0.94     0.44     3.29     0.89
 HUB     45.25    10.32     6.50     3.82     0.94     0.43     3.90


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.973

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     359.214     245.965     261.794    1188.550       0.302       0.038

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.250      20.883     587.159      46.000      43.214      32.400     -10.814

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     272.231     245.965     366.890    1193.181       0.228       0.427

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.231      21.438     591.744     456.573       0.024       0.507

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     259.841       0.000     259.841    1193.736       0.218       0.385

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.439     592.294       0.000       0.060       0.073       0.427

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.838      22.159       1.080     597.930      15.451     196.891       1.526

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96277.016       0.508     459.230  733546.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =17.015   EfDer =  0.982

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     84.406    2643.000      22.159     597.930       1.000       1.000       0.980
W Kg/sec =   38.36656

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     60.118    2461.671       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  64932.395   66230.898       2.911     509.668     175.095     390.276       2.229

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   243.39    -0.08   243.39     0.20   393.54
 MEAN    15.91     0.00    -0.02   243.39    -0.08   243.39     0.20
 HUB     13.07     0.00    -0.02   243.39    -0.08   243.39     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.06    47.36    12.70   422.54   487.70    21.53   592.99     0.41
 MEAN    56.46    44.80    11.66   367.03   440.46    21.53   592.99     0.37
 HUB     51.09    38.84    12.25   301.45   387.51    21.53   592.99     0.32

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   344.48   233.98   252.82  1204.99     0.29
 MEAN    15.50   340.13   225.16   254.94  1202.62     0.28
 HUB     12.59   354.25   243.55   257.25  1200.23     0.30

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   310.24   179.80     0.26  4199.08
 MEAN   357.44   287.22   132.28     0.24  3490.80     1.70
 HUB    290.38   261.47    46.83     0.22  3067.37

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     24.02     1.08    22.69   613.47     1.03   603.57     0.92     0.90
 MEAN    23.70     1.07    22.42   610.85     1.02   601.19     0.92     0.90
 HUB     23.51     1.06    22.13   609.28     1.02   598.81     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.78    35.42    31.50     3.92     0.93     0.45     2.90
 MEAN    41.45    27.42    23.50     3.92     0.94     0.42     3.34     0.90
 HUB     43.43    10.32     6.50     3.82     0.94     0.40     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     344.436     229.291     257.025    1202.724       0.286      -0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.715      22.401     601.299      46.000      41.736      33.000      -8.736

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     270.186     229.291     354.365    1206.527       0.224       0.350

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.692      22.877     605.108     440.827       0.038       0.488

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     253.917       0.000     253.917    1207.237       0.210       0.406

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.941     605.820       0.000       0.060       0.061       0.398

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854      23.660       1.068     611.200      13.270     214.857       1.666

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  82714.266       0.483     394.538  768068.688

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    550582.38   2626.2146     82.4566      1.5662      0.8119     17.0148      1.1691


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 70% Stat 2 10% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =17.702   EfDer =  0.933

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     81.906    2643.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   37.22986

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.014    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63008.605   64268.645       3.569     831.557     233.017     619.754       2.660

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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```
TIP     20.63     0.00    -0.02   184.33    -0.06   184.33     0.16   473.93
MEAN    17.06     0.00    -0.02   184.33    -0.06   184.33     0.16
HUB     12.51     0.00    -0.02   184.33    -0.06   184.33     0.16

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     68.83    50.47    18.36   475.82   510.34    14.82   519.97     0.46
MEAN    64.90    47.20    17.70   393.48   434.58    14.82   519.97     0.39
HUB     57.43    38.62    18.81   288.54   342.44    14.82   519.97     0.31

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   421.22   340.82   247.53  1133.65     0.37
MEAN    18.04   421.47   338.76   250.76  1130.01     0.37
HUB     15.00   449.79   370.39   255.19  1125.62     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    475.82   281.95   135.00     0.25  7032.35
MEAN   415.99   262.39    77.24     0.23  6110.90     1.91
HUB    345.97   256.36    24.42     0.23  5556.63

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.47     1.16    15.88   548.87     1.05   534.05     0.92     0.85
MEAN    17.15     1.13    15.57   545.45     1.04   530.61     0.92     0.85
HUB     16.95     1.12    15.18   543.40     1.04   526.50     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     54.01    28.61    24.20     4.41     0.93     0.56     2.90
MEAN    53.49    17.12    12.70     4.42     0.95     0.51     3.51     0.85
HUB     55.43    -5.47    -9.30     3.83     0.95     0.37     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.933

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     424.537     338.098     256.752    1130.257       0.376       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.173      15.577     530.851      24.000      52.787      35.400     -17.387

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     271.131     338.098     433.385    1139.706       0.238       0.551

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.113      16.451     539.765     528.796       0.047       0.668

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     253.757       0.000     253.757    1140.510       0.222       0.514

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.421     540.527       0.000       0.060       0.116       0.533

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.779      16.998       1.125     545.905      23.095     157.762       1.223

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 143786.141       0.635     665.523  775098.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =17.702   EfDer =  0.935

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     81.906    2643.000      16.998     545.905       1.000       1.000       0.980
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W Kg/sec = 37.22986

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
72.665	2576.302	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
63008.605	64268.645	2.790	590.487	211.620	474.134	2.240

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	243.08	-0.08	243.08	0.21	462.00
MEAN	18.08	0.00	-0.02	243.08	-0.08	243.08	0.21	
HUB	15.21	0.00	-0.02	243.08	-0.08	243.08	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.85	46.36	16.49	473.98	532.75	16.47	540.97	0.47
MEAN	59.76	42.30	17.46	416.97	482.72	16.47	540.97	0.42
HUB	55.29	37.84	17.45	350.81	426.87	16.47	540.97	0.37

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	386.69	291.75	253.80	1156.15	0.33
MEAN	18.01	381.92	283.06	256.39	1153.15	0.33
HUB	15.22	399.50	303.84	259.38	1150.12	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	310.70	179.23	0.27	5959.27	
MEAN	415.39	288.53	132.33	0.25	5099.37	1.85
HUB	351.11	263.65	47.27	0.23	4626.66	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.14	1.13	17.71	567.98	1.04	555.49	0.92	0.86
MEAN	18.82	1.11	17.44	564.79	1.03	552.61	0.92	0.86
HUB	18.65	1.10	17.15	563.04	1.03	549.72	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	48.98	35.23	31.50	3.73	0.93	0.51	2.90	
MEAN	47.83	27.30	23.50	3.80	0.95	0.49	3.30	0.86
HUB	49.51	10.33	6.50	3.83	0.95	0.47	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.935

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	409.041	283.852	294.521	1151.775	0.355	-0.114

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.854	17.278	551.299	46.000	43.943	30.600	-13.343

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	297.497	283.852	411.189	1158.629	0.257	0.377

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	18.820	17.975	557.881	455.853	0.034	0.512

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	294.465	0.000	294.465	1158.785	0.254	0.445

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	17.916	558.031	0.000	0.060	0.090	0.336

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.800      18.740       1.102     565.271      19.367     174.181       1.350

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 120606.672       0.544     558.236  701414.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =17.702   EfDer =  0.977

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     81.906    2643.000      18.740     565.271       1.000       1.000       0.880
W Kg/sec =   37.22986

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     67.069    2531.785       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63008.605   64268.645       2.508     489.817     195.330     384.470       1.968

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   276.82    -0.10   276.82     0.24   443.41
 MEAN    17.74     0.00    -0.02   276.82    -0.10   276.82     0.24
 HUB     15.05     0.00    -0.02   276.82    -0.10   276.82     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.13    46.36    12.77   462.91   539.44    18.01   558.87     0.47
 MEAN    55.92    43.40    12.52   409.13   494.06    18.01   558.87     0.43
 HUB     51.44    38.84    12.60   347.12   444.06    18.01   558.87     0.38

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   374.80   272.83   256.98  1174.75     0.32
 MEAN    17.51   372.65   267.54   259.41  1172.15     0.32
 HUB     14.85   392.87   292.66   262.10  1169.54     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   316.11   184.08     0.27  5406.62
 MEAN   403.78   293.00   136.24     0.25  4685.44     1.85
 HUB    342.51   266.80    49.85     0.23  4347.39

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.89     1.11    19.47   585.29     1.04   573.56     0.92     0.89
 MEAN    20.60     1.10    19.20   582.62     1.03   571.03     0.92     0.89
 HUB     20.46     1.09    18.92   581.37     1.03   568.48     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     46.71    35.61    31.50     4.11     0.93     0.50     2.90
 MEAN    45.88    27.71    23.50     4.21     0.94     0.49     3.28     0.89
 HUB     48.15    10.77     6.50     4.27     0.94     0.48     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     376.093     269.298     262.534    1172.418       0.321       0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.635      19.213     571.285      46.000      45.729      31.500     -14.229

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     268.904     269.298     380.567    1178.327       0.228       0.462

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      20.602      19.867     577.058     471.992       0.033       0.543

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     262.161       0.000     262.161    1178.632       0.222       0.414

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.815     577.357       0.000       0.060       0.095       0.426

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.831      20.511       1.094     583.095      17.823     180.130       1.396

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 111027.297       0.532     513.897  779047.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =17.702   EfDer =  0.967

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     81.906    2643.000      20.511     583.095       1.000       1.000       0.980
W Kg/sec =   37.22986

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     62.239    2492.790       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63008.605   64268.645       2.832     513.330     181.268     401.059       2.213

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   247.35    -0.09   247.35     0.21   418.96
 MEAN    16.97     0.00    -0.02   247.35    -0.09   247.35     0.21
 HUB     14.32     0.00    -0.02   247.35    -0.09   247.35     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.89    46.36    14.53   444.22   508.52    19.89   577.99     0.43
 MEAN    57.72    43.80    13.92   391.42   463.10    19.89   577.99     0.39
 HUB     53.18    37.84    15.34   330.28   412.71    19.89   577.99     0.35

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   361.09   253.96   256.69  1191.38     0.30
 MEAN    16.57   358.84   248.53   258.85  1188.99     0.30
 HUB     13.89   377.70   272.75   261.27  1186.58     0.32

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   314.38   181.50     0.26  4796.32
 MEAN   382.27   291.36   133.74     0.25  4120.49     1.75
 HUB    320.37   265.58    47.62     0.22  3789.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.50     1.10    21.11   600.85     1.03   589.97     0.92     0.88
 MEAN    22.22     1.08    20.85   598.35     1.03   587.60     0.92     0.88
 HUB     22.08     1.08    20.58   597.12     1.02   585.22     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.69    35.26    31.50     3.76     0.93     0.47     2.90
 MEAN    43.83    27.32    23.50     3.82     0.95     0.45     3.29     0.88
 HUB     46.23    10.33     6.50     3.83     0.95     0.44     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.967

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	356.482	249.924	254.200	1189.563	0.300	0.036

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.251	20.905	588.166	46.000	44.514	32.400	-12.114

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	264.159	249.924	363.651	1194.390	0.221	0.448

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.228	21.483	592.949	456.573	0.026	0.528

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	252.255	0.000	252.255	1194.907	0.211	0.400

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.472	593.462	0.000	0.060	0.081	0.440

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.828	22.150	1.080	598.774	15.679	191.856	1.487

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
97702.203	0.515	452.221	710281.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =17.702 EfDer = 0.978

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
81.906	2643.000	22.150	598.774	1.000	1.000	0.980

W Kg/sec = 37.22986

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
58.403	2459.936	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
63008.605	64268.645	2.996	509.668	170.101	390.276	2.294

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	236.32	-0.08	236.32	0.20	393.26
MEAN	15.91	0.00	-0.02	236.32	-0.08	236.32	0.20	
HUB	13.07	0.00	-0.02	236.32	-0.08	236.32	0.20	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.79	47.36	13.43	422.54	484.21	21.55	594.11	0.41
MEAN	57.23	44.80	12.43	367.03	436.60	21.55	594.11	0.37
HUB	51.91	38.84	13.07	301.45	383.11	21.55	594.11	0.32

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	342.72	239.14	245.49	1206.27	0.28
MEAN	15.50	337.22	228.98	247.57	1203.84	0.28
HUB	12.59	349.83	244.88	249.83	1201.39	0.29

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	301.27	174.63	0.25	4291.73	
MEAN	357.44	278.91	128.47	0.23	3549.86	1.74
HUB	290.38	253.94	45.50	0.21	3084.14	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.04	1.09	22.73	614.66	1.03	604.85	0.92	0.89
MEAN	23.70	1.07	22.45	611.91	1.02	602.42	0.92	0.89
HUB	23.50	1.06	22.15	610.19	1.02	599.97	0.92	0.89

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         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     44.25    35.43    31.50     3.93     0.93     0.46     2.90
  MEAN    42.77    27.43    23.50     3.93     0.94     0.44     3.34     0.89
  HUB     44.43    10.32     6.50     3.82     0.94     0.41     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.978

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     341.568     233.174     249.597    1203.932       0.284      -0.012

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      23.720      22.429     602.515      46.000      43.052      33.000     -10.052

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     262.237     233.174     350.910    1207.920       0.217       0.371

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      23.692      22.926     606.513     440.827       0.042       0.509

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     246.531       0.000     246.531    1208.583       0.204       0.422

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      22.980     607.179       0.000       0.060       0.069       0.412

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4         PR4       Texit        Del T       Ns        Ns nondim
       0.846      23.657       1.068     612.252      13.478     209.264       1.622

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   84009.711       0.491     388.844  743631.438

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     557132.00   2578.7219      80.0137      1.5659      0.8021     17.7024      1.1711


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 70% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 4.987   EfDer =  0.997

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     132.525     2643.000       15.107     522.810        1.000        1.000        0.980
 W Kg/sec =   60.23870

    W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     129.464     2632.591        1.402       0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  101949.258  103988.031        2.206     831.557     377.027     619.754        1.644

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   305.44    -0.11   305.44      0.27   473.93
  MEAN    17.06      0.00    -0.02   305.44    -0.11   305.44      0.27
  HUB     12.51      0.00    -0.02   305.44    -0.11   305.44      0.27
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.31    50.47     6.84   475.82   565.51    14.34   515.02     0.51
MEAN    52.19    47.20     4.99   393.48   498.20    14.34   515.02     0.45
HUB     43.38    38.62     4.76   288.54   420.25    14.34   515.02     0.38

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   487.13   250.24   417.94  1120.94     0.43
MEAN    18.04   510.65   288.07   421.64  1118.97     0.46
HUB     15.00   579.92   388.85   430.24  1114.73     0.52

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    475.82   474.93   225.58     0.42  5164.63
MEAN   415.99   440.62   127.93     0.39  5197.38     1.26
HUB    345.97   432.37    42.88     0.39  5834.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.94     1.12    14.88   541.95     1.04   522.13     0.92     0.91
MEAN    16.95     1.12    14.69   542.07     1.04   520.29     0.92     0.91
HUB     17.19     1.14    14.29   544.43     1.04   516.34     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.91    28.36    24.20     4.16     0.93     0.24     2.90
MEAN    34.34    16.88    12.70     4.18     0.92     0.20     3.51     0.91
HUB     42.11    -5.69    -9.30     3.61     0.92     0.08     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     519.288     287.507     432.435    1118.957       0.464      -0.011

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.003      14.667     520.290      24.000      33.618      35.400       1.782

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     464.872     287.507     546.596    1123.756       0.414       0.197

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.982      15.093     524.763     528.796       0.019       0.358

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     429.463       0.000     429.463    1126.585       0.381       0.271

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.318     527.408       0.000       0.060       0.038       0.290

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.871      16.936       1.121     542.813      20.003     226.198       1.753

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 124533.992       0.550     932.650 1284351.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 4.987   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    132.525    2643.000      16.936     542.813       1.000       1.000       0.980
W Kg/sec =   60.23870

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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   117.668    2583.630       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
101949.258  103988.031       1.723     590.487     342.678     474.134       1.384

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   409.54    -0.14   409.54     0.36   463.32
MEAN    18.08     0.00    -0.02   409.54    -0.14   409.54     0.36
HUB     15.21     0.00    -0.02   409.54    -0.14   409.54     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     49.18    46.36     2.82   473.98   626.50    15.46   528.81     0.56
MEAN    45.52    42.30     3.22   416.97   584.55    15.46   528.81     0.52
HUB     40.59    37.84     2.75   350.81   539.34    15.46   528.81     0.48

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   463.92   164.76   433.67  1137.10     0.41
MEAN    18.01   474.92   190.68   434.96  1136.46     0.42
HUB     15.22   514.25   271.09   436.99  1135.74     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    470.98   530.89   306.22     0.47  3367.31
MEAN   415.39   489.57   224.71     0.43  3436.76     1.28
HUB    351.11   444.26    80.02     0.39  4128.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.19     1.07    16.22   555.29     1.02   537.31     0.92     0.90
MEAN    18.22     1.08    16.16   555.54     1.02   536.71     0.92     0.90
HUB     18.49     1.09    16.06   558.11     1.03   536.02     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     20.80    35.23    31.50     3.73     0.93     0.20     2.90
MEAN    23.67    27.32    23.50     3.82     0.92     0.21     3.30     0.90
HUB     31.81    10.38     6.50     3.88     0.92     0.24     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.987

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     633.102     191.219     603.534    1121.666       0.564      -0.665

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.280      14.722     522.838      46.000      17.580      30.600      13.020

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     628.617     191.219     657.058    1122.173       0.560      -0.674

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      18.188      14.694     523.311     400.556       0.053       0.119

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     621.513       0.000     621.513    1122.969       0.553      -0.021

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750      14.677     524.053       0.000       0.060       0.104      -0.681

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.758      18.077       1.067     556.312      13.499     296.369       2.297

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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  84065.461       0.379     629.576 1189124.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 4.987   EfDer =  0.797

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    132.525    2643.000      18.077     556.312       1.000       1.000       0.780
W Kg/sec =   60.23870

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.606    2552.091       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 101949.258  103988.031       1.336     434.156     325.031     339.175       1.044

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   566.72    -0.20   566.72     0.50   446.97
 MEAN    17.74     0.00    -0.02   566.72    -0.20   566.72     0.50
 HUB     15.05     0.00    -0.02   566.72    -0.20   566.72     0.50

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     39.25    46.36    -7.11   462.91   731.87    15.21   529.49     0.65
 MEAN    35.84    43.40    -7.56   409.13   699.09    15.21   529.49     0.62
 HUB     31.50    38.84    -7.34   347.12   664.68    15.21   529.49     0.59

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   475.18   110.70   462.11  1145.80     0.41
 MEAN    17.51   484.74   147.38   461.80  1146.50     0.42
 HUB     14.85   523.04   242.38   463.49  1147.08     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   577.41   346.20     0.50  2196.95
 MEAN   403.78   528.20   256.40     0.46  2583.58     1.39
 HUB    342.51   474.18   100.13     0.41  3602.26

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.76     1.04    16.66   564.45     1.01   545.59     0.92     0.73
 MEAN    18.88     1.04    16.69   565.88     1.02   546.26     0.92     0.73
 HUB     19.20     1.06    16.65   569.65     1.02   546.81     0.92     0.73

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     13.47    36.84    31.50     5.34     0.93     0.24     2.90
 MEAN    17.70    29.04    23.50     5.54     0.86     0.28     3.28     0.73
 HUB     27.61    12.19     6.50     5.69     0.86     0.33     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.797

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     490.996     148.347     468.049    1146.765       0.428      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.925      16.681     546.530      46.000      17.586      31.500      13.914

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     493.100     148.347     514.931    1146.584       0.430      -0.031

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.850      16.597     546.357     471.992       0.043       0.124

    VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	479.810	0.000	479.810	1147.716	0.418	-0.031

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.610	547.437	0.000	0.060	0.093	-0.026

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.554	18.735	1.036	566.660	10.349	364.839	2.828

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
64456.832	0.309	482.725	1581898.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 4.987 EfDer = 0.900

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
132.525	2643.000	18.735	566.660	1.000	1.000	0.980

W Kg/sec = 60.23870

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
108.684	2528.680	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
101949.258	103988.031	1.622	513.330	316.526	401.059	1.267

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	449.06	-0.15	449.06	0.39	425.00
MEAN	16.97	0.00	-0.02	449.06	-0.15	449.06	0.39	
HUB	14.32	0.00	-0.02	449.06	-0.15	449.06	0.39	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	44.70	46.36	-1.66	444.22	631.76	16.86	549.82	0.55
MEAN	41.09	43.80	-2.71	391.42	595.81	16.86	549.82	0.52
HUB	36.35	37.84	-1.49	330.28	557.53	16.86	549.82	0.48

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	489.52	92.07	480.78	1153.63	0.42
MEAN	16.57	497.06	131.07	479.47	1154.65	0.43
HUB	13.89	531.86	229.74	479.68	1155.47	0.46

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	590.82	343.39	0.51	1741.20	
MEAN	382.27	541.29	251.19	0.47	2175.02	1.17
HUB	320.37	488.17	90.62	0.42	3193.36	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.35	1.03	17.10	573.11	1.01	553.10	0.92	0.82
MEAN	19.51	1.04	17.18	574.71	1.01	554.09	0.92	0.82
HUB	19.88	1.06	17.19	578.49	1.02	554.87	0.92	0.82

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	10.84	35.54	31.50	4.04	0.93	0.09	2.90	
MEAN	15.29	27.65	23.50	4.15	0.89	0.12	3.29	0.82
HUB	25.59	10.70	6.50	4.20	0.89	0.18	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.900

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	487.520	131.811	469.363	1156.195	0.422	0.053

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.559      17.305     555.593      46.000      15.686      32.400      16.714

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     502.469     131.811     519.470    1154.908       0.435      -0.029

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.460      17.084     554.358     456.573       0.051       0.109

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     478.659       0.000     478.659    1156.938       0.414      -0.059

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.163     556.308       0.000       0.060       0.112       0.003

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.563      19.311       1.031     575.436       8.776     399.580       3.098

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  54666.504       0.288     409.404 1237995.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 4.987   EfDer =  0.845

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    132.525    2643.000      19.311     575.436       1.000       1.000       0.980
W Kg/sec =   60.23870

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.254    2509.324       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 101949.258  103988.031       1.647     509.668     309.458     390.276       1.261

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   444.38    -0.15   444.38     0.38   401.16
 MEAN    15.91     0.00    -0.02   444.38    -0.15   444.38     0.38
 HUB     13.07     0.00    -0.02   444.38    -0.15   444.38     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.57    47.36    -3.79   422.54   613.31    17.45   558.95     0.53
 MEAN    39.57    44.80    -5.23   367.03   576.45    17.45   558.95     0.50
 HUB     34.17    38.84    -4.67   301.45   537.07    17.45   558.95     0.46

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   482.55    69.38   477.53  1161.40     0.42
 MEAN    15.50   487.90   105.72   476.31  1162.46     0.42
 HUB     12.59   516.78   199.67   476.65  1163.31     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   588.76   344.39     0.51  1247.57
 MEAN   357.44   538.73   251.72     0.46  1640.86     1.14
 HUB    290.38   485.20    90.72     0.42  2515.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.73     1.02    17.52   580.05     1.01   560.62     0.92     0.77
 MEAN    19.87     1.03    17.60   581.51     1.01   561.64     0.92     0.77
 HUB     20.17     1.04    17.61   584.75     1.02   562.46     0.92     0.77

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP      8.27    35.80    31.50     4.30     0.93     0.06     2.90
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  MEAN    12.51    27.86    23.50     4.36     0.88     0.09     3.34     0.77
  HUB     22.73    10.78     6.50     4.28     0.88     0.14     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.845

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
       R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
       15.219      492.843     107.660      480.940    1162.630       0.424       -0.015

       Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
       19.875      17.563      561.830       46.000      12.618      33.000      20.382

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
       RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
       15.219      525.763     107.660     536.672    1159.731       0.453       -0.223

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950       19.638      17.053     559.031     440.827       0.121       0.082

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
       14.701      488.770       0.000     488.770    1162.976       0.420       -0.085

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       17.364      562.164       0.000       0.060       0.133       -0.090

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4           PR4       Texit         Del T       Ns         Ns nondim
       0.380       19.610        1.015     582.106       6.670     486.523       3.771

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   41554.285       0.243     311.205 1306577.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc   TR
      369277.06   2765.5588     129.4638      1.2980       0.6848       4.9872      1.1134


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.998

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     130.475     2643.000       15.107      522.810        1.000        1.000        0.980
 W Kg/sec =   59.30701

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     127.461     2632.591        1.402        0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
  100372.453  102379.688        2.240      831.557      371.195      619.754       1.670

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   300.34    -0.10   300.34      0.27   473.93
  MEAN    17.06      0.00    -0.02   300.34    -0.10   300.34      0.27
  HUB     12.51      0.00    -0.02   300.34    -0.10   300.34      0.27

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
  TIP     57.75     50.47     7.28   475.82   562.77     14.36   515.28      0.51
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MEAN    52.65    47.20     5.45   393.48   495.09    14.36   515.28     0.44
HUB     43.86    38.62     5.24   288.54   416.56    14.36   515.28     0.37

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   482.69   254.51   410.14  1121.68     0.43
MEAN    18.04   505.70   290.48   413.95  1119.59     0.45
HUB     15.00   573.61   388.12   422.36  1115.34     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    475.82   466.04   221.31     0.42  5252.68
MEAN   415.99   432.56   125.51     0.39  5240.83     1.28
HUB    345.97   424.45    42.16     0.38  5823.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.98     1.12    14.94   542.27     1.04   522.81     0.92     0.91
MEAN    16.97     1.12    14.75   542.23     1.04   520.87     0.92     0.91
HUB     17.19     1.14    14.35   544.39     1.04   516.91     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.82    28.35    24.20     4.15     0.93     0.25     2.90
MEAN    35.06    16.87    12.70     4.17     0.92     0.21     3.51     0.91
HUB     42.58    -5.70    -9.30     3.60     0.92     0.09     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    18.071     514.034     289.914     424.477    1119.604       0.459      -0.010

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.021      14.728     520.892      24.000      34.333      35.400       1.067

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     455.749     289.914     540.145    1124.667       0.405       0.212

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.002      15.181     525.613     528.796       0.018       0.369

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     421.245       0.000     421.245    1127.367       0.374       0.283

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.397     528.141       0.000       0.060       0.037       0.303

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.874      16.957       1.122     542.962      20.152     223.057       1.729

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 125461.570       0.554     925.064 1262912.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    130.475    2643.000      16.957     542.962       1.000       1.000       0.980
W Kg/sec =   59.30701

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    115.721    2583.275       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 100372.453  102379.688       1.752     590.487     337.007     474.134       1.407

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   401.82    -0.14   401.82     0.36   463.25
MEAN    18.08     0.00    -0.02   401.82    -0.14   401.82     0.36
HUB     15.21     0.00    -0.02   401.82    -0.14   401.82     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     49.72    46.36     3.36   473.98   621.48    15.53   529.48     0.55
MEAN    46.07    42.30     3.77   416.97   579.17    15.53   529.48     0.51
HUB     41.13    37.84     3.29   350.81   533.50    15.53   529.48     0.47

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   457.91   171.24   424.69  1138.26     0.40
MEAN    18.01   468.85   195.34   426.21  1137.45     0.41
HUB     15.22   507.91   272.80   428.44  1136.57     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    470.98   519.81   299.74     0.46  3499.50
MEAN   415.39   479.67   220.05     0.42  3520.62     1.30
HUB    351.11   435.54    78.31     0.38  4154.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.27     1.08    16.34   555.92     1.02   538.41     0.92     0.91
MEAN    18.28     1.08    16.26   556.00     1.02   537.65     0.92     0.91
HUB     18.53     1.09    16.15   558.35     1.03   536.81     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     21.96    35.21    31.50     3.71     0.93     0.21     2.90
MEAN    24.62    27.31    23.50     3.81     0.92     0.22     3.30     0.91
HUB     32.49    10.36     6.50     3.86     0.92     0.25     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.991

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     620.778     195.891     589.060    1123.529       0.553      -0.645

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.339      14.900     524.576      46.000      18.394      30.600      12.206

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     611.881     195.891     642.473    1124.510       0.544      -0.629

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      18.258      14.924     525.492     400.556       0.049       0.132

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     604.367       0.000     604.367    1125.327       0.537       0.011

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750      14.922     526.256       0.000       0.060       0.093      -0.630

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.783      18.163       1.071     556.760      13.798     288.781       2.239

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  85926.641       0.387     633.562 1167598.125
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.453   EfDer =  0.810

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    130.475    2643.000      18.163     556.760       1.000       1.000       0.780
W Kg/sec =   59.30701

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    109.403    2551.064       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
100372.453  102379.688       1.363     434.156     318.612     339.175       1.065

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   552.17    -0.19   552.17     0.49   446.79
MEAN    17.74     0.00    -0.02   552.17    -0.19   552.17     0.49
HUB     15.05     0.00    -0.02   552.17    -0.19   552.17     0.49

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     39.99    46.36    -6.37   462.91   720.66    15.43   531.30     0.64
MEAN    36.55    43.40    -6.85   409.13   687.34    15.43   531.30     0.61
HUB     32.17    38.84    -6.67   347.12   652.31    15.43   531.30     0.58

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   466.15   119.67   450.52  1147.70     0.41
MEAN    17.51   476.10   153.97   450.52  1148.14     0.41
HUB     14.85   514.43   245.07   452.31  1148.49     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    456.91   562.76   337.24     0.49  2374.44
MEAN   403.78   515.14   249.81     0.45  2698.85     1.40
HUB    342.51   462.68    97.43     0.40  3642.20

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.92     1.04    16.88   565.55     1.02   547.41     0.92     0.74
MEAN    19.02     1.05    16.90   566.75     1.02   547.83     0.92     0.74
HUB     19.33     1.06    16.84   570.25     1.02   548.15     0.92     0.74

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     14.88    36.82    31.50     5.32     0.93     0.25     2.90
MEAN    18.87    29.01    23.50     5.51     0.87     0.28     3.28     0.74
HUB     28.45    12.16     6.50     5.66     0.87     0.34     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.810

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     482.119     154.980      456.530    1148.422       0.420      -0.004

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.066      16.887     548.110       46.000      18.751      31.500      12.749

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
    17.392     479.887     154.980      504.292    1148.610       0.418      -0.010

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.003      16.850     548.289     471.992       0.038       0.140

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
    17.121     466.762       0.000     466.762    1149.696       0.406      -0.008
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.868	549.327	0.000	0.060	0.086	-0.002

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.592	18.899	1.040	567.519	10.759	349.763	2.711

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
67014.945	0.321	494.120	1546447.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 5.453 EfDer = 0.916

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
130.475	2643.000	18.899	567.519	1.000	1.000	0.980

W Kg/sec = 59.30701

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
106.157	2526.767	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
100372.453	102379.688	1.660	513.330	309.169	401.059	1.297

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	437.16	-0.15	437.16	0.38	424.67
MEAN	16.97	0.00	-0.02	437.16	-0.15	437.16	0.38	
HUB	14.32	0.00	-0.02	437.16	-0.15	437.16	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.47	46.36	-0.89	444.22	623.36	17.11	551.56	0.54
MEAN	41.85	43.80	-1.95	391.42	586.89	17.11	551.56	0.51
HUB	37.08	37.84	-0.76	330.28	547.99	17.11	551.56	0.48

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	477.56	102.46	466.44	1156.28	0.41
MEAN	16.57	485.81	138.53	465.64	1156.98	0.42
HUB	13.89	520.89	232.48	466.13	1157.51	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	573.11	333.00	0.50	1937.30	
MEAN	382.27	525.58	243.74	0.45	2298.58	1.19
HUB	320.37	474.35	87.88	0.41	3231.36	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.61	1.04	17.43	574.69	1.01	555.65	0.92	0.84
MEAN	19.74	1.04	17.48	576.03	1.01	556.33	0.92	0.84
HUB	20.09	1.06	17.48	579.48	1.02	556.83	0.92	0.84

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	12.39	35.52	31.50	4.02	0.93	0.11	2.90	
MEAN	16.57	27.63	23.50	4.13	0.89	0.14	3.29	0.84
HUB	26.51	10.68	6.50	4.18	0.89	0.19	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.916

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	476.720	139.312	455.911	1158.450	0.412	0.054

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.788	17.608	557.762	46.000	16.991	32.400	15.409

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	486.716	139.312	506.261	1157.615	0.420	-0.008

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.705	17.446	556.958	456.573	0.046	0.126

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	463.540	0.000	463.540	1159.524	0.400	-0.035

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.526	558.797	0.000	0.060	0.103	0.026

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.618	19.569	1.035	576.736	9.217	380.001	2.946

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
57416.703	0.303	423.350	1212506.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 5.453 EfDer = 0.864

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
130.475	2643.000	19.569	576.736	1.000	1.000	0.980

W Kg/sec = 59.30701

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
103.349	2506.496	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
100372.453	102379.688	1.693	509.668	300.995	390.276	1.297

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	430.73	-0.15	430.73	0.37	400.71
MEAN	15.91	0.00	-0.02	430.73	-0.15	430.73	0.37	
HUB	13.07	0.00	-0.02	430.73	-0.15	430.73	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	44.46	47.36	-2.90	422.54	603.49	17.80	561.25	0.52
MEAN	40.45	44.80	-4.35	367.03	565.99	17.80	561.25	0.49
HUB	35.00	38.84	-3.84	301.45	525.83	17.80	561.25	0.45

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	468.34	81.32	461.23	1164.72	0.40
MEAN	15.50	474.49	114.28	460.52	1165.42	0.41
HUB	12.59	503.77	202.82	461.14	1165.94	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	568.56	332.46	0.49	1461.62	
MEAN	357.44	520.78	243.17	0.45	1773.38	1.16
HUB	290.38	469.38	87.56	0.40	2555.43	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.08	1.03	17.96	582.15	1.01	563.84	0.92	0.79
MEAN	20.19	1.03	18.01	583.30	1.01	564.51	0.92	0.79
HUB	20.47	1.05	18.00	586.20	1.02	565.01	0.92	0.79

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	10.00	35.78	31.50	4.28	0.93	0.08	2.90	
MEAN	13.94	27.84	23.50	4.34	0.88	0.11	3.34	0.79
HUB	23.74	10.75	6.50	4.25	0.88	0.15	4.06	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.864

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     479.213     116.372     464.869    1165.610       0.411      -0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.202      17.980     564.712      46.000      14.054      33.000      18.946

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     505.872     116.372     519.084    1163.346       0.435      -0.192

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.997      17.559     562.520     440.827       0.111       0.099

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     471.030       0.000     471.030    1166.280       0.404      -0.062

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.840     565.361       0.000       0.060       0.126      -0.067

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.463      19.964       1.020     583.882       7.146     454.832       3.526

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   44523.406       0.260     328.284 1278330.000

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     380343.28   2804.3792    127.4614      1.3215      0.7123      5.4532      1.1168


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 70% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.032   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     127.956    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   58.16170

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     125.000    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   98434.109  100402.578       2.284     831.557     364.027     619.754       1.702

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   294.10    -0.10   294.10     0.26   473.93
  MEAN    17.06     0.00    -0.02   294.10    -0.10   294.10     0.26
  HUB     12.51     0.00    -0.02   294.10    -0.10   294.10     0.26

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.29    50.47     7.82   475.82   559.46    14.39   515.59     0.50
  MEAN    53.23    47.20     6.03   393.48   491.33    14.39   515.59     0.44
  HUB     44.46    38.62     5.84   288.54   412.08    14.39   515.59     0.37
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      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   477.50   259.69   400.71  1122.55     0.43
MEAN    18.04   499.78   293.38   404.61  1120.33     0.45
HUB     15.00   565.99   387.22   412.80  1116.06     0.51

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    475.82   455.28   216.13     0.41  5359.44
MEAN   415.99   422.78   122.62     0.38  5293.07     1.30
HUB    345.97   414.85    41.25     0.37  5809.61

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.02     1.13    15.02   542.67     1.04   523.62     0.92     0.91
MEAN    16.99     1.12    14.82   542.42     1.04   521.56     0.92     0.91
HUB     17.19     1.14    14.42   544.34     1.04   517.58     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.95    28.34    24.20     4.14     0.93     0.27     2.90
MEAN    35.95    16.86    12.70     4.16     0.93     0.23     3.51     0.91
HUB     43.17    -5.71    -9.30     3.59     0.93     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     507.765     292.806     414.837    1120.372       0.453      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.042      14.799     521.607      24.000      35.216      35.400       0.184

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     444.762     292.806     532.493    1125.742       0.395       0.230

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.024      15.285     526.619     528.796       0.018       0.382

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     411.343       0.000     411.343    1128.293       0.365       0.298

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.489     529.009       0.000       0.060       0.037       0.318

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      16.980       1.124     543.141      20.331     219.263       1.700

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 126579.898       0.559     915.286 1236673.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.032   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    127.956    2643.000      16.980     543.141       1.000       1.000       0.980
W Kg/sec =   58.16170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    113.351    2582.848       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  98434.109  100402.578       1.789     590.487     330.107     474.134       1.436

     ROTOR LEADING EDGE CONDITIONS, STAGE            2
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   392.51    -0.14   392.51     0.35   463.18
MEAN    18.08     0.00    -0.02   392.51    -0.14   392.51     0.35
HUB     15.21     0.00    -0.02   392.51    -0.14   392.51     0.35

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.38    46.36     4.02   473.98   615.50    15.62   530.27     0.54
MEAN    46.74    42.30     4.44   416.97   572.74    15.62   530.28     0.51
HUB     41.80    37.84     3.96   350.81   526.52    15.62   530.27     0.47

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   450.98   178.97   413.95  1139.62     0.40
MEAN    18.01   461.75   200.92   415.75  1138.61     0.41
HUB     15.22   500.40   274.83   418.18  1137.55     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    470.98   506.58   292.01     0.44  3657.28
MEAN   415.39   467.81   214.47     0.41  3620.97     1.32
HUB    351.11   425.08    76.29     0.37  4185.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.36     1.08    16.48   556.69     1.02   539.70     0.92     0.91
MEAN    18.35     1.08    16.38   556.55     1.02   538.75     0.92     0.91
HUB     18.57     1.09    16.26   558.65     1.03   537.73     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     23.38    35.20    31.50     3.70     0.93     0.23     2.90
MEAN    25.79    27.29    23.50     3.79     0.92     0.24     3.30     0.91
HUB     33.31    10.34     6.50     3.84     0.92     0.26     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     606.500     201.482     572.055    1125.669       0.539      -0.622

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.407      15.104     526.576      46.000      19.403      30.600      11.197

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     592.449     201.482     625.772    1127.172       0.526      -0.577

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      18.338      15.188     527.983     400.556       0.044       0.147

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     584.624       0.000     584.624    1127.993       0.518       0.047

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750      15.200     528.752       0.000       0.060       0.082      -0.571

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.807      18.260       1.075     557.296      14.155     280.004       2.171

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  88148.195       0.397     637.390 1141429.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.032   EfDer =  0.828
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
127.956	2643.000	18.260	557.296	1.000	1.000	0.780

W Kg/sec = 58.16170

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
106.774	2549.836	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
98434.109	100402.578	1.396	434.156	310.958	339.175	1.091

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	535.24	-0.18	535.24	0.47	446.57
MEAN	17.74	0.00	-0.02	535.24	-0.18	535.24	0.47	
HUB	15.05	0.00	-0.02	535.24	-0.18	535.24	0.47	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	40.87	46.36	-5.49	462.91	707.77	15.67	533.37	0.62
MEAN	37.41	43.40	-5.99	409.13	673.81	15.67	533.37	0.59
HUB	32.98	38.84	-5.86	347.12	638.05	15.67	533.37	0.56

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	455.90	130.25	436.90	1149.90	0.40
MEAN	17.51	466.17	161.70	437.22	1150.04	0.41
HUB	14.85	504.41	248.23	439.11	1150.12	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	545.52	326.66	0.47	2583.89	
MEAN	403.78	499.77	242.08	0.43	2834.09	1.42
HUB	342.51	449.12	94.28	0.39	3688.99	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.10	1.05	17.14	566.87	1.02	549.51	0.92	0.76
MEAN	19.19	1.05	17.13	567.79	1.02	549.65	0.92	0.76
HUB	19.47	1.07	17.06	570.96	1.02	549.71	0.92	0.76

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	16.60	36.78	31.50	5.28	0.93	0.26	2.90	
MEAN	20.30	28.97	23.50	5.47	0.87	0.29	3.28	0.76
HUB	29.48	12.12	6.50	5.62	0.87	0.35	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.828

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	471.917	162.762	442.961	1150.341	0.410	-0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.231	17.125	549.942	46.000	20.175	31.500	11.325

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	464.457	162.762	492.150	1150.951	0.404	0.016

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.181	17.143	550.525	471.992	0.034	0.159

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	451.546	0.000	451.546	1151.983	0.392	0.020

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.168	551.513	0.000	0.060	0.076	0.027

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.635	19.089	1.045	568.538	11.242	333.199	2.583

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
70024.859	0.335	506.342	1504482.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.032 EfDer = 0.933

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
127.956	2643.000	19.089	568.538	1.000	1.000	0.980

W Kg/sec = 58.16170

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
103.162	2524.501	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
98434.109	100402.578	1.709	513.330	300.445	401.059	1.335

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	423.24	-0.15	423.24	0.37	424.29
MEAN	16.97	0.00	-0.02	423.24	-0.15	423.24	0.37	
HUB	14.32	0.00	-0.02	423.24	-0.15	423.24	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.39	46.36	0.03	444.22	613.68	17.39	553.58	0.53
MEAN	42.77	43.80	-1.03	391.42	576.59	17.39	553.58	0.50
HUB	37.98	37.84	0.14	330.28	536.95	17.39	553.58	0.47

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	464.21	114.54	449.85	1159.30	0.40
MEAN	16.57	473.07	147.16	449.59	1159.64	0.41
HUB	13.89	508.34	235.70	450.40	1159.85	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	552.59	320.91	0.48	2165.40	
MEAN	382.27	507.36	235.11	0.44	2441.53	1.21
HUB	320.37	458.28	84.66	0.40	3276.01	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.90	1.04	17.82	576.56	1.01	558.57	0.92	0.85
MEAN	20.01	1.05	17.84	577.58	1.02	558.90	0.92	0.85
HUB	20.33	1.06	17.81	580.67	1.02	559.09	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	14.29	35.50	31.50	4.00	0.93	0.13	2.90	
MEAN	18.12	27.61	23.50	4.11	0.90	0.16	3.29	0.85
HUB	27.62	10.65	6.50	4.15	0.90	0.20	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.933

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	464.496	147.991	440.290	1161.038	0.400	0.054

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.058	17.961	560.255	46.000	18.579	32.400	13.821

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	468.613	147.991	491.426	1160.705	0.404	0.018

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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.990      17.865     559.934     456.573       0.040       0.147

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     446.157       0.000     446.157    1162.481       0.384      -0.005

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.949     561.649       0.000       0.060       0.093       0.055

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.676      19.871       1.041     578.268       9.730     359.015       2.783

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  60613.277       0.320     438.288 1182023.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.032   EfDer =  0.888

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    127.956    2643.000      19.871     578.268       1.000       1.000       0.980
W Kg/sec =   58.16170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     99.946    2503.172       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  98434.109  100402.578       1.751     509.668     291.085     390.276       1.341

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   414.98    -0.14   414.98     0.36   400.18
 MEAN    15.91     0.00    -0.02   414.98    -0.14   414.98     0.36
 HUB     13.07     0.00    -0.02   414.98    -0.14   414.98     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.53    47.36    -1.83   422.54   592.35    18.20   563.89     0.51
 MEAN    41.50    44.80    -3.30   367.03   554.10    18.20   563.89     0.48
 HUB     36.01    38.84    -2.83   301.45   513.00    18.20   563.89     0.44

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   452.67    95.03   442.58  1168.48     0.39
 MEAN    15.50   459.50   124.12   442.42  1168.78     0.39
 HUB     12.59   489.02   206.42   443.32  1168.95     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   545.42   318.75     0.47  1707.44
 MEAN   357.44   500.18   233.33     0.43  1925.78     1.19
 HUB    290.38   451.20    83.97     0.39  2600.64

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.49     1.03    18.48   584.59     1.01   567.48     0.92     0.81
 MEAN    20.57     1.04    18.49   585.40     1.01   567.77     0.92     0.81
 HUB     20.82     1.05    18.46   587.90     1.02   567.93     0.92     0.81

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     12.12    35.76    31.50     4.26     0.93     0.11     2.90
 MEAN    15.67    27.81    23.50     4.31     0.89     0.13     3.34     0.81
 HUB     24.97    10.73     6.50     4.23     0.89     0.17     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.888
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     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     464.005     126.392     446.459    1168.989       0.397      -0.012

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      20.588      18.467     567.989      46.000      15.807      33.000      17.193

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     483.448     126.392     499.697    1167.405       0.414      -0.154

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      20.420      18.144     566.451     440.827       0.098       0.120

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     450.834       0.000     450.834    1170.023       0.385      -0.033

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      18.397     568.994       0.000       0.060       0.115      -0.037

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.550      20.383       1.026     585.961       7.693     422.404       3.274

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   47933.016       0.280     346.599 1244814.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     393299.25   2843.9058    125.0000      1.3492      0.7424      6.0315      1.1208


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 70% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.474   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     126.046    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   57.29363

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     123.134    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   96964.961   98904.055       2.319     831.557     358.594     619.754       1.728

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   289.39    -0.10   289.39     0.26   473.93
  MEAN    17.06     0.00    -0.02   289.39    -0.10   289.39     0.26
  HUB     12.51     0.00    -0.02   289.39    -0.10   289.39     0.26

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.70    50.47     8.23   475.82   557.00    14.41   515.82     0.50
  MEAN    53.67    47.20     6.47   393.48   488.52    14.41   515.82     0.44
  HUB     44.93    38.62     6.31   288.54   408.73    14.41   515.82     0.37

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000
```

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	473.73	263.53	393.67	1123.18	0.42
MEAN	18.04	495.44	295.55	397.63	1120.87	0.44
HUB	15.00	560.34	386.57	405.65	1116.59	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	475.82	447.26	212.29	0.40	5438.73	
MEAN	415.99	415.47	120.45	0.37	5332.19	1.32
HUB	345.97	407.67	40.60	0.37	5799.72	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.05	1.13	15.08	542.96	1.04	524.22	0.92	0.91
MEAN	17.01	1.13	14.87	542.57	1.04	522.07	0.92	0.91
HUB	17.18	1.14	14.46	544.30	1.04	518.07	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.80	28.34	24.20	4.14	0.93	0.28	2.90	
MEAN	36.62	16.85	12.70	4.15	0.93	0.24	3.51	0.91
HUB	43.62	-5.72	-9.30	3.58	0.93	0.11	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	503.162	294.973	407.631	1120.933	0.449	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.057	14.851	522.130	24.000	35.891	35.400	-0.491

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	436.592	294.973	526.898	1126.528	0.388	0.244

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.039	15.360	527.355	528.796	0.018	0.393

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	403.975	0.000	403.975	1128.971	0.358	0.309

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.554	529.645	0.000	0.060	0.037	0.329

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	16.996	1.125	543.275	20.465	216.431	1.678

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
127414.367	0.563	907.569	1216867.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 6.474 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
126.046	2643.000	16.996	543.275	1.000	1.000	0.980

W Kg/sec = 57.29363

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
111.572	2582.530	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96964.961	98904.055	1.817	590.487	324.924	474.134	1.459

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	385.57	-0.13	385.57	0.34	463.12

```
MEAN    18.08     0.00    -0.02   385.57    -0.13   385.57     0.34
HUB     15.21     0.00    -0.02   385.57    -0.13   385.57     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.88    46.36     4.52   473.98   611.10    15.68   530.86     0.54
MEAN    47.25    42.30     4.95   416.97   568.01    15.68   530.86     0.50
HUB     42.31    37.84     4.47   350.81   521.37    15.68   530.86     0.46

     ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   446.06   184.68   406.03  1140.61     0.39
MEAN    18.01   456.63   205.03   408.01  1139.46     0.40
HUB     15.22   494.91   276.34   410.57  1138.26     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    470.98   496.82   286.29     0.44  3773.95
MEAN   415.39   459.05   210.36     0.40  3695.02     1.34
HUB    351.11   417.33    74.77     0.37  4208.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.43     1.08    16.58   557.25     1.03   540.64     0.92     0.91
MEAN    18.40     1.08    16.47   556.96     1.03   539.55     0.92     0.91
HUB     18.60     1.09    16.33   558.86     1.03   538.41     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     24.46    35.19    31.50     3.69     0.93     0.24     2.90
MEAN    26.68    27.27    23.50     3.77     0.92     0.25     3.30     0.91
HUB     33.94    10.32     6.50     3.82     0.92     0.27     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     596.250     205.608     559.678    1127.193       0.529      -0.605

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.455      15.249     528.004      46.000      20.172      30.600      10.428

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     578.453     205.608     613.907    1129.056       0.512      -0.539

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      18.394      15.374     529.750     400.556       0.040       0.159

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     570.496       0.000     570.496    1129.869       0.505       0.073

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      15.395     530.513       0.000       0.060       0.074      -0.528

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.823      18.326       1.078     557.694      14.419     273.700       2.122

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  89791.922       0.405     639.585 1121797.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.474   EfDer =  0.842

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    2643.000      18.326     557.694       1.000       1.000       0.780
W Kg/sec =   57.29363
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
104.836	2548.927	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96964.961	98904.055	1.422	434.156	305.312	339.175	1.111

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	523.03	-0.18	523.03	0.46	446.42
MEAN	17.74	0.00	-0.02	523.03	-0.18	523.03	0.46	
HUB	15.05	0.00	-0.02	523.03	-0.18	523.03	0.46	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	41.52	46.36	-4.84	462.91	698.58	15.84	534.85	0.62
MEAN	38.05	43.40	-5.35	409.13	664.15	15.84	534.85	0.59
HUB	33.58	38.84	-5.26	347.12	627.84	15.84	534.85	0.55

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	448.70	137.93	426.98	1151.47	0.39
MEAN	17.51	459.10	167.33	427.52	1151.41	0.40
HUB	14.85	497.21	250.54	429.47	1151.29	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	532.97	318.97	0.46	2736.10	
MEAN	403.78	488.56	236.45	0.42	2932.54	1.43
HUB	342.51	439.21	91.97	0.38	3723.19	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.24	1.05	17.32	567.83	1.02	551.01	0.92	0.77
MEAN	19.30	1.05	17.30	568.55	1.02	550.95	0.92	0.77
HUB	19.57	1.07	17.22	571.48	1.02	550.84	0.92	0.77

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	17.90	36.76	31.50	5.26	0.93	0.27	2.90	
MEAN	21.37	28.95	23.50	5.45	0.88	0.30	3.28	0.77
HUB	30.26	12.09	6.50	5.59	0.88	0.35	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.842

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	464.670	168.426	433.072	1151.717	0.403	-0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.351	17.296	551.258	46.000	21.252	31.500	10.248

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	453.299	168.426	483.578	1152.627	0.393	0.036

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.308	17.353	552.130	471.992	0.030	0.174

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	440.560	0.000	440.560	1153.619	0.382	0.042

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.383	553.081	0.000	0.060	0.070	0.050

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.665	19.225	1.049	569.288	11.594	321.856	2.495

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  72215.312       0.346     514.388 1473700.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.474   EfDer =  0.945

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    2643.000      19.225     569.288       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    100.967    2522.838       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 96964.961   98904.055       1.746     513.330     294.053     401.059       1.364

    ROTOR LEADING EDGE CONDITIONS, STAGE             4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   413.17    -0.14   413.17     0.36   424.01
MEAN    16.97     0.00    -0.02   413.17    -0.14   413.17     0.36
HUB     14.32     0.00    -0.02   413.17    -0.14   413.17     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     47.08    46.36     0.72   444.22   606.77    17.60   555.04     0.53
MEAN    43.46    43.80    -0.34   391.42   569.24    17.60   555.04     0.49
HUB     38.65    37.84     0.81   330.28   529.05    17.60   555.04     0.46

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   454.96   123.18   437.97  1161.44     0.39
MEAN    16.57   464.14   153.38   438.07  1161.54     0.40
HUB     13.89   499.44   238.00   439.08  1161.53     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   537.90   312.28     0.46  2328.40
MEAN   382.27   494.26   228.89     0.43  2544.57     1.23
HUB    320.37   446.74    82.37     0.38  3307.85

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.12     1.05    18.10   577.91     1.02   560.63     0.92     0.86
MEAN    20.20     1.05    18.09   578.71     1.02   560.72     0.92     0.86
HUB     20.50     1.07    18.05   581.54     1.02   560.71     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     15.71    35.49    31.50     3.99     0.93     0.15     2.90
MEAN    19.30    27.59    23.50     4.09     0.90     0.17     3.29     0.86
HUB     28.46    10.62     6.50     4.12     0.90     0.21     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.945

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     455.952     154.246     429.069    1162.875       0.392       0.054

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.252      18.213     562.028      46.000      19.773      32.400      12.627

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     455.723     154.246     481.119    1162.893       0.392       0.038

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.196      18.164     562.046     456.573       0.036       0.162
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	433.784	0.000	433.784	1164.577	0.372	0.017

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.251	563.675	0.000	0.060	0.085	0.077

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.714	20.088	1.045	579.385	10.097	344.986	2.674

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
62903.453	0.332	448.060	1159473.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 6.474 EfDer = 0.904

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
126.046	2643.000	20.088	579.385	1.000	1.000	0.980

W Kg/sec = 57.29363

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
97.485	2500.758	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96964.961	98904.055	1.795	509.668	283.917	390.276	1.375

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	403.74	-0.14	403.74	0.35	399.79
MEAN	15.91	0.00	-0.02	403.74	-0.14	403.74	0.35	
HUB	13.07	0.00	-0.02	403.74	-0.14	403.74	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.31	47.36	-1.05	422.54	584.52	18.49	565.78	0.50
MEAN	42.28	44.80	-2.52	367.03	545.72	18.49	565.78	0.47
HUB	36.76	38.84	-2.08	301.45	503.95	18.49	565.78	0.43

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	441.97	104.75	429.38	1171.11	0.38
MEAN	15.50	449.12	131.07	429.57	1171.14	0.38
HUB	12.59	478.70	209.01	430.66	1171.07	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	529.02	309.03	0.45	1881.70	
MEAN	357.44	485.56	226.37	0.41	2033.56	1.21
HUB	290.38	438.28	81.37	0.37	2633.31	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.79	1.04	18.84	586.35	1.01	570.05	0.92	0.83
MEAN	20.85	1.04	18.84	586.91	1.01	570.08	0.92	0.83
HUB	21.08	1.05	18.79	589.13	1.02	570.00	0.92	0.83

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	13.71	35.74	31.50	4.24	0.93	0.13	2.90	
MEAN	16.97	27.79	23.50	4.29	0.89	0.15	3.34	0.83
HUB	25.89	10.70	6.50	4.20	0.89	0.18	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.904

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

```
     15.219     453.496     133.478     433.407    1171.365       0.387      -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.867      18.815     570.299      46.000      17.118      33.000      15.882

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     467.781     133.478     486.452    1170.236       0.400      -0.125

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.724      18.561     569.200     440.827       0.088       0.137

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     436.615       0.000     436.615    1172.652       0.372      -0.009

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.796     571.553       0.000       0.060       0.106      -0.013

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.606      20.687       1.030     587.466       8.081     401.530       3.113

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  50353.168       0.294     358.664 1220190.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    402678.22   2868.2661     123.1343      1.3693      0.7626      6.4740      1.1237


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 70% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    123.994    2643.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   56.36100

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    121.130    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95386.555   97294.086       2.357     831.557     352.757     619.754       1.757

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   284.35    -0.10   284.35     0.26   473.93
 MEAN    17.06     0.00    -0.02   284.35    -0.10   284.35     0.26
 HUB     12.51     0.00    -0.02   284.35    -0.10   284.35     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.14    50.47     8.67   475.82   554.39    14.44   516.06     0.50
 MEAN    54.15    47.20     6.95   393.48   485.55    14.44   516.06     0.44
 HUB     45.43    38.62     6.81   288.54   405.17    14.44   516.06     0.36

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   469.86   267.63   386.19  1123.84     0.42
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 MEAN    18.04   490.89   297.85   390.21  1121.44     0.44
 HUB     15.00   554.36   385.84   398.05  1117.14     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    475.82   438.73   208.19     0.39  5523.20
 MEAN   415.99   407.70   118.14     0.36  5373.71     1.33
 HUB    345.97   400.05    39.87     0.36  5788.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.08     1.13    15.14   543.27     1.04   524.83     0.92     0.91
 MEAN    17.02     1.13    14.92   542.72     1.04   522.59     0.92     0.91
 HUB     17.18     1.14    14.51   544.26     1.04   518.59     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.72    28.33    24.20     4.13     0.93     0.29     2.90
 MEAN    37.35    16.84    12.70     4.14     0.93     0.25     3.51     0.91
 HUB     44.11    -5.72    -9.30     3.58     0.93     0.12     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    18.071     498.350     297.272     399.978    1121.518       0.444       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.071      14.904     522.674      24.000      36.621      35.400      -1.221

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     427.953     297.272     521.071    1127.346       0.380       0.259

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.054      15.438     528.121     528.796       0.018       0.404

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     396.182       0.000     396.182    1129.678       0.351       0.321

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.622     530.308       0.000       0.060       0.037       0.341

   STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.878      17.011       1.126     543.417      20.607     213.427       1.654

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 128299.383       0.567     898.997 1195665.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    123.994    2643.000      17.011     543.417       1.000       1.000       0.980
W Kg/sec =   56.36100

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    109.675    2582.192       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95386.555   97294.086       1.849     590.487     319.400     474.134       1.484

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   378.23    -0.13   378.23     0.33   463.06
 MEAN    18.08     0.00    -0.02   378.23    -0.13   378.23     0.33
 HUB     15.21     0.00    -0.02   378.23    -0.13   378.23     0.33
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	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.42	46.36	5.06	473.98	606.49	15.74	531.47	0.54
MEAN	47.80	42.30	5.50	416.97	563.05	15.74	531.47	0.50
HUB	42.86	37.84	5.02	350.81	515.96	15.74	531.47	0.46

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	441.06	190.67	397.72	1141.62	0.39
MEAN	18.01	451.35	209.35	399.86	1140.33	0.40
HUB	15.22	489.17	277.90	402.56	1139.00	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	486.57	280.30	0.43	3896.23	
MEAN	415.39	449.83	206.04	0.39	3772.74	1.35
HUB	351.11	409.17	73.21	0.36	4232.40	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.49	1.09	16.68	557.85	1.03	541.60	0.92	0.91
MEAN	18.45	1.08	16.56	557.39	1.03	540.38	0.92	0.91
HUB	18.63	1.09	16.41	559.09	1.03	539.11	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.61	35.18	31.50	3.68	0.93	0.25	2.90	
MEAN	27.63	27.26	23.50	3.76	0.92	0.26	3.30	0.91
HUB	34.62	10.31	6.50	3.81	0.92	0.28	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	585.742	209.938	546.827	1128.746	0.519	-0.588

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.502	15.395	529.459	46.000	21.003	30.600	9.597

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	564.038	209.938	601.841	1130.965	0.499	-0.499

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	18.449	15.563	531.543	400.556	0.037	0.171

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	556.037	0.000	556.037	1131.761	0.491	0.099

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	15.591	532.292	0.000	0.060	0.066	-0.485

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.837	18.392	1.081	558.112	14.695	267.252	2.072

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
91511.305	0.413	641.222	1100887.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 6.953 EfDer = 0.857

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
123.994	2643.000	18.392	558.112	1.000	1.000	0.780

W Kg/sec = 56.36100

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
102.802	2547.972	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
95386.555	97294.086	1.450	434.156	299.391	339.175	1.133

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	510.46	-0.18	510.46	0.45	446.25
MEAN	17.74	0.00	-0.02	510.46	-0.18	510.46	0.45	
HUB	15.05	0.00	-0.02	510.46	-0.18	510.46	0.45	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	42.21	46.36	-4.15	462.91	689.22	16.01	536.35	0.61
MEAN	38.72	43.40	-4.68	409.13	654.30	16.01	536.35	0.58
HUB	34.23	38.84	-4.61	347.12	617.40	16.01	536.35	0.54

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	441.50	145.90	416.69	1153.08	0.38
MEAN	17.51	451.96	173.19	417.46	1152.81	0.39
HUB	14.85	489.83	252.94	419.47	1152.50	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	519.96	311.01	0.45	2893.84	
MEAN	403.78	476.91	230.59	0.41	3035.05	1.45
HUB	342.51	428.92	89.56	0.37	3758.87	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.38	1.05	17.51	568.83	1.02	552.55	0.92	0.78
MEAN	19.43	1.06	17.47	569.35	1.02	552.30	0.92	0.78
HUB	19.68	1.07	17.38	572.03	1.02	552.00	0.92	0.78

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	19.30	36.74	31.50	5.24	0.93	0.28	2.90	
MEAN	22.53	28.91	23.50	5.41	0.88	0.31	3.28	0.78
HUB	31.09	12.05	6.50	5.55	0.88	0.36	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.857

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	457.341	174.325	422.814	1153.124	0.397	0.000

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.473	17.470	552.606	46.000	22.406	31.500	9.094

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	441.796	174.325	474.945	1154.341	0.383	0.057

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.438	17.567	553.773	471.992	0.027	0.189

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	429.254	0.000	429.254	1155.292	0.372	0.064

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.601	554.685	0.000	0.060	0.063	0.073

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.694	19.364	1.053	570.071	11.959	310.652	2.408

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
74490.578	0.357	521.957	1441507.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
RESET = 0.000BLEED = 0.000 DPInc = 6.953 EfDer = 0.956

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
123.994	2643.000	19.364	570.071	1.000	1.000	0.980

W Kg/sec = 56.36100

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
98.682	2521.104	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
95386.555	97294.086	1.786	513.330	287.396	401.059	1.395

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	402.78	-0.14	402.78	0.35	423.72
MEAN	16.97	0.00	-0.02	402.78	-0.14	402.78	0.35	
HUB	14.32	0.00	-0.02	402.78	-0.14	402.78	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.81	46.36	1.45	444.22	599.74	17.81	556.53	0.52
MEAN	44.19	43.80	0.39	391.42	561.74	17.81	556.53	0.49
HUB	39.36	37.84	1.52	330.28	520.97	17.81	556.53	0.45

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	445.83	132.04	425.83	1163.60	0.38
MEAN	16.57	455.21	159.75	426.26	1163.46	0.39
HUB	13.89	490.42	240.35	427.48	1163.23	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	522.87	303.42	0.45	2495.63	
MEAN	382.27	480.84	222.51	0.41	2650.10	1.25
HUB	320.37	434.91	80.02	0.37	3340.44	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.34	1.05	18.38	579.31	1.02	562.72	0.92	0.87
MEAN	20.40	1.05	18.35	579.88	1.02	562.58	0.92	0.87
HUB	20.68	1.07	18.29	582.44	1.02	562.36	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	17.23	35.47	31.50	3.97	0.93	0.17	2.90	
MEAN	20.55	27.57	23.50	4.07	0.90	0.19	3.29	0.87
HUB	29.35	10.60	6.50	4.10	0.90	0.22	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.956

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	447.410	160.653	417.572	1164.740	0.384	0.054

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.450	18.469	563.833	46.000	21.043	32.400	11.357

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	442.613	160.653	470.867	1165.109	0.380	0.059

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.404	18.468	564.189	456.573	0.032	0.179

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4

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     16.096     421.208       0.000     421.208    1166.701       0.361       0.041

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.557     565.733       0.000       0.060       0.077       0.101

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.748      20.308       1.049     580.545      10.474     331.386       2.569

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  65251.531       0.344     457.219 1135730.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.920

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    123.994    2643.000      20.308     580.545       1.000       1.000       0.980
W Kg/sec =   56.36100

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     94.952    2498.258       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95386.555   97294.086       1.843     509.668     276.539     390.276       1.411

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   392.28    -0.14   392.28     0.34   399.39
 MEAN    15.91     0.00    -0.02   392.28    -0.14   392.28     0.34
 HUB     13.07     0.00    -0.02   392.28    -0.14   392.28     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.14    47.36    -0.22   422.54   576.66    18.78   567.70     0.49
 MEAN    43.11    44.80    -1.69   367.03   537.30    18.78   567.70     0.46
 HUB     37.55    38.84    -1.29   301.45   494.81    18.78   567.70     0.42

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   431.51   114.56   416.03  1173.75     0.37
 MEAN    15.50   438.86   138.17   416.54  1173.53     0.37
 HUB     12.59   468.36   211.63   417.83  1173.23     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   512.45   299.22     0.44  2057.71
 MEAN   357.44   470.73   219.27     0.40  2143.46     1.23
 HUB    290.38   425.18    78.75     0.36  2666.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.10     1.04    19.22   588.16     1.01   572.62     0.92     0.84
 MEAN    21.14     1.04    19.19   588.48     1.01   572.40     0.92     0.84
 HUB     21.34     1.05    19.12   590.42     1.02   572.10     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.40    35.72    31.50     4.22     0.93     0.15     2.90
 MEAN    18.35    27.76    23.50     4.26     0.89     0.16     3.34     0.84
 HUB     26.86    10.67     6.50     4.17     0.89     0.19     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.920

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     443.129     140.704     420.197    1173.755       0.378      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     21.153      19.169     572.628      46.000      18.513      33.000      14.487

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     452.106     140.704     473.495    1173.067       0.385      -0.095

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.035      18.984     571.957     440.827       0.079       0.154

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     422.312       0.000     422.312    1175.295       0.359       0.017

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.203     574.131       0.000       0.060       0.097       0.013

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.658      20.997       1.034     589.019       8.474     381.933       2.961

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   52803.922       0.308     369.998 1194403.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    412356.69   2889.3936    121.1299      1.3899      0.7817      6.9532      1.1266


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 70% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.767    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   54.43945

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    117.000    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92134.484   93976.977       2.441     831.557     340.730     619.754       1.819

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   274.02    -0.09   274.02     0.25   473.93
  MEAN    17.06     0.00    -0.02   274.02    -0.09   274.02     0.25
  HUB     12.51     0.00    -0.02   274.02    -0.09   274.02     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.07    50.47     9.60   475.82   549.16    14.48   516.54     0.49
  MEAN    55.15    47.20     7.95   393.48   479.57    14.48   516.54     0.43
  HUB     46.49    38.62     7.87   288.54   397.99    14.48   516.54     0.36

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   462.38   275.86   371.08  1125.13     0.41
  MEAN    18.04   481.94   302.52   375.17  1122.55     0.43
  HUB     15.00   542.39   384.39   382.67  1118.23     0.49
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	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	475.82	421.52	199.96	0.37	5692.94	
MEAN	415.99	391.95	113.47	0.35	5457.87	1.38
HUB	345.97	384.59	38.42	0.34	5767.05	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.14	1.13	15.26	543.90	1.04	526.05	0.92	0.91
MEAN	17.05	1.13	15.02	543.03	1.04	523.63	0.92	0.91
HUB	17.17	1.14	14.61	544.18	1.04	519.61	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.63	28.32	24.20	4.12	0.93	0.32	2.90	
MEAN	38.88	16.83	12.70	4.13	0.93	0.28	3.51	0.91
HUB	45.13	-5.73	-9.30	3.57	0.93	0.14	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	488.867	301.932	384.484	1122.664	0.435	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.098	15.007	523.743	24.000	38.142	35.400	-2.742

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	410.573	301.932	509.641	1128.950	0.364	0.289

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.080	15.587	529.625	528.796	0.018	0.428

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	380.494	0.000	380.494	1131.066	0.336	0.344

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.750	531.612	0.000	0.060	0.039	0.365

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	17.035	1.128	543.704	20.894	207.354	1.607

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
130084.227	0.575	880.427	1152223.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.954 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
119.767	2643.000	17.035	543.704	1.000	1.000	0.980

W Kg/sec = 54.43945

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
105.811	2581.511	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
92134.484	93976.977	1.916	590.487	308.146	474.134	1.539

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	363.43	-0.13	363.43	0.32	462.94
MEAN	18.08	0.00	-0.02	363.43	-0.13	363.43	0.32	
HUB	15.21	0.00	-0.02	363.43	-0.13	363.43	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.53	46.36	6.17	473.98	597.37	15.86	532.67	0.53
MEAN	48.93	42.30	6.63	416.97	553.21	15.86	532.67	0.49

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HUB     44.00    37.84     6.16   350.81   505.21    15.86   532.67     0.45

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   431.65   202.58   381.16  1143.59     0.38
MEAN    18.01   441.20   217.97   383.59  1142.04     0.39
HUB     15.22   477.91   281.06   386.53  1140.44     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    470.98   466.17   268.39     0.41  4139.32
MEAN   415.39   431.41   197.42     0.38  3927.97     1.39
HUB    351.11   392.82    70.05     0.34  4280.53

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.62     1.09    16.87   559.04     1.03   543.48     0.92     0.91
MEAN    18.53     1.09    16.72   558.25     1.03   542.00     0.92     0.91
HUB     18.67     1.10    16.55   559.56     1.03   540.49     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     27.99    35.15    31.50     3.65     0.93     0.28     2.90
MEAN    29.61    27.23    23.50     3.73     0.93     0.28     3.30     0.91
HUB     36.02    10.27     6.50     3.77     0.93     0.29     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960      565.569     218.586     521.621    1131.702       0.500       -0.553

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.590      15.671      532.237      46.000      22.736      30.600       7.864

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960      536.082     218.586     578.933    1134.583       0.472       -0.419

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      18.551      15.918     534.950     400.556       0.030       0.195

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.823     528.424       0.000     528.424    1135.304       0.465       0.145

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750      15.945     535.631       0.000       0.060       0.057      -0.405

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.854      18.501       1.086     558.950      15.246     254.834       1.975

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94944.328       0.428     642.596 1058360.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  0.887

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.767    2643.000      18.501     558.950       1.000       1.000       0.780
W Kg/sec =   54.43945

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     98.785    2546.061       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92134.484   93976.977       1.509     434.156     287.691     339.175       1.179
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ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	486.26	-0.17	486.26	0.43	445.91
MEAN	17.74	0.00	-0.02	486.26	-0.17	486.26	0.43	
HUB	15.05	0.00	-0.02	486.26	-0.17	486.26	0.43	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	43.60	46.36	-2.76	462.91	671.48	16.32	539.21	0.59
MEAN	40.09	43.40	-3.31	409.13	635.59	16.32	539.21	0.56
HUB	35.53	38.84	-3.31	347.12	597.54	16.32	539.21	0.52

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	428.30	161.37	396.74	1156.13	0.37
MEAN	17.51	438.61	184.55	397.90	1155.48	0.38
HUB	14.85	475.78	257.57	400.03	1154.82	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	494.72	295.54	0.43	3200.01	
MEAN	403.78	454.30	219.23	0.39	3233.76	1.48
HUB	342.51	408.94	84.93	0.35	3827.49	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.64	1.06	17.86	570.80	1.02	555.48	0.92	0.81
MEAN	19.65	1.06	17.79	570.93	1.02	554.86	0.92	0.81
HUB	19.86	1.07	17.67	573.12	1.03	554.22	0.92	0.81

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	22.13	36.68	31.50	5.18	0.93	0.30	2.90	
MEAN	24.88	28.85	23.50	5.35	0.89	0.33	3.28	0.81
HUB	32.78	11.99	6.50	5.49	0.89	0.37	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.887

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	443.660	185.758	402.899	1155.807	0.384	0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.697	17.790	555.181	46.000	24.752	31.500	6.748

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	419.663	185.758	458.937	1157.607	0.363	0.099

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.675	17.965	556.911	471.992	0.021	0.222

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	407.566	0.000	407.566	1158.475	0.352	0.110

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.004	557.746	0.000	0.060	0.052	0.120

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.746	19.615	1.060	571.617	12.667	290.397	2.251

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
78900.383	0.378	534.008	1377707.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

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 RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  0.975

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.767    2643.000      19.615     571.617       1.000       1.000       0.980
W Kg/sec =   54.43945

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.222    2517.693       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 92134.484   93976.977       1.871     513.330     274.409     401.059       1.462

    ROTOR LEADING EDGE CONDITIONS, STAGE             4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   382.79    -0.13   382.79     0.33   423.15
MEAN    16.97     0.00    -0.02   382.79    -0.13   382.79     0.33
HUB     14.32     0.00    -0.02   382.79    -0.13   382.79     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     49.26    46.36     2.90   444.22   586.50    18.19   559.38     0.51
MEAN    45.65    43.80     1.85   391.42   547.58    18.19   559.38     0.47
HUB     40.80    37.84     2.96   330.28   505.67    18.19   559.38     0.44

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
TIP     18.88   429.41   148.86   402.78  1167.64     0.37
MEAN    16.57   438.85   171.89   403.78  1167.08     0.38
HUB     13.89   473.59   244.85   405.38  1166.46     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   494.34   286.60     0.42  2812.95
MEAN   382.27   455.30   210.38     0.39  2851.14     1.29
HUB    320.37   412.35    75.51     0.35  3402.90

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.75     1.06    18.90   582.03     1.02   566.64     0.92     0.89
MEAN    20.77     1.06    18.83   582.17     1.02   566.09     0.92     0.89
HUB     20.99     1.07    18.74   584.22     1.02   565.49     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     20.28    35.43    31.50     3.93     0.93     0.20     2.90
MEAN    23.06    27.52    23.50     4.02     0.91     0.22     3.29     0.89
HUB     31.13    10.55     6.50     4.05     0.91     0.25     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.975

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     431.788     172.858     395.677    1168.256       0.370       0.053

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.816      18.940     567.241      46.000      23.599      32.400       8.801

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     417.902     172.858     452.241    1169.270       0.357       0.102

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.787      19.028     568.227     456.573       0.024       0.214

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     397.548       0.000     397.548    1170.695       0.340       0.090

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      19.122     569.612       0.000       0.060       0.062       0.148

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.803      20.712       1.056     582.807      11.190     307.410       2.383

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  69717.734       0.368     471.859 1088252.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  0.949

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.767    2643.000      20.712     582.807       1.000       1.000       0.980
W Kg/sec =   54.43945

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     90.102    2493.405       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92134.484   93976.977       1.942     509.668     262.415     390.276       1.487

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   370.65    -0.13   370.65     0.32   398.61
 MEAN    15.91     0.00    -0.02   370.65    -0.13   370.65     0.32
 HUB     13.07     0.00    -0.02   370.65    -0.13   370.65     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.75    47.36     1.39   422.54   562.17    19.32   571.34     0.48
 MEAN    44.73    44.80    -0.07   367.03   521.71    19.32   571.34     0.44
 HUB     39.13    38.84     0.29   301.45   477.84    19.32   571.34     0.41

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   413.09   132.94   391.12  1178.64     0.35
 MEAN    15.50   420.40   151.44   392.17  1177.98     0.36
 HUB     12.59   449.40   216.55   393.78  1177.26     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   481.50   280.84     0.41  2387.32
 MEAN   357.44   442.98   206.00     0.38  2349.04     1.27
 HUB    290.38   400.65    73.83     0.34  2728.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.68     1.05    19.91   591.64     1.02   577.40     0.92     0.87
 MEAN    21.66     1.05    19.84   591.50     1.01   576.75     0.92     0.87
 HUB     21.82     1.05    19.73   592.91     1.02   576.05     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.77    35.68    31.50     4.18     0.93     0.18     2.90
 MEAN    21.11    27.71    23.50     4.21     0.90     0.19     3.34     0.87
 HUB     28.81    10.62     6.50     4.12     0.90     0.22     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.949

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     424.514     154.220     395.510    1178.202       0.360      -0.008

    Pt3        Ps3        Ts3        Vane No.     Alpha3     Vane A3      Incid3
    21.683     19.820     576.974      46.000      21.302      33.000      11.698

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     423.285     154.220     450.505    1178.291       0.359      -0.035

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.606      19.760     577.061     440.827       0.061       0.190

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     395.851       0.000     395.851    1180.204       0.335       0.070

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.954     578.937       0.000       0.060       0.079       0.067

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.742      21.572       1.041     592.018       9.211     348.749       2.703

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  57395.695       0.335     388.462 1143211.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    431042.38   2917.3511    117.0002      1.4279      0.8123      7.9535      1.1324


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 70% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.614    2643.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   52.55191

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    112.943    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88939.984   90718.586       2.528     831.557     328.916     619.754       1.884

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   263.94    -0.09   263.94     0.24   473.93
 MEAN    17.06     0.00    -0.02   263.94    -0.09   263.94     0.24
 HUB     12.51     0.00    -0.02   263.94    -0.09   263.94     0.24

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.99    50.47    10.52   475.82   544.20    14.53   516.99     0.49
 MEAN    56.15    47.20     8.95   393.48   473.88    14.53   516.99     0.42
 HUB     47.56    38.62     8.94   288.54   391.12    14.53   516.99     0.35

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   455.69   283.74   356.57  1126.33     0.40
 MEAN    18.04   473.63   306.96   360.70  1123.58     0.42
 HUB     15.00   531.01   382.95   367.86  1119.24     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    475.82   405.02   192.08     0.36  5855.37
 MEAN   415.99   376.81   109.03     0.34  5537.91     1.42
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 HUB    345.97   369.71    36.98     0.33  5745.39

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.19     1.14    15.36   544.50     1.04   527.16     0.92     0.91
 MEAN    17.08     1.13    15.11   543.33     1.04   524.59     0.92     0.91
 HUB     17.15     1.14    14.70   544.10     1.04   520.55     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.51    28.31    24.20     4.11     0.93     0.35     2.90
 MEAN    40.40    16.82    12.70     4.12     0.93     0.30     3.51     0.91
 HUB     46.15    -5.74    -9.30     3.56     0.93     0.17     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     480.056     306.365     369.587    1123.720       0.427       -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.120      15.099     524.729      24.000      39.657      35.400      -4.257

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     393.992     306.365     499.089    1130.427       0.349       0.319

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.100      15.721     531.012     528.796       0.020       0.452

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     365.514       0.000     365.514    1132.348       0.323       0.366

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.863     532.818       0.000       0.060       0.043       0.387

    STAGE EXIT CONDITIONS, STAGE             1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      17.052       1.129     543.977      21.167     201.536       1.562

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 131782.047       0.582     860.993 1109851.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     115.614    2643.000      17.052     543.977       1.000       1.000       0.980
W Kg/sec =   52.55191

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     102.067    2580.864       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88939.984   90718.586       1.987     590.487     297.243     474.134       1.595

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   349.27    -0.12   349.27     0.31   462.82
 MEAN    18.08     0.00    -0.02   349.27    -0.12   349.27     0.31
 HUB     15.21     0.00    -0.02   349.27    -0.12   349.27     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.62    46.36     7.26   473.98   588.86    15.96   533.79     0.52
 MEAN    50.06    42.30     7.76   416.97   544.01    15.96   533.79     0.48
 HUB     45.14    37.84     7.30   350.81   495.12    15.96   533.79     0.44

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   423.48   213.78   365.56  1145.38     0.37
MEAN    18.01   432.10   226.12   368.20  1143.59     0.38
HUB     15.22   467.49   284.03   371.31  1141.77     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    470.98   446.97   257.20     0.39  4367.89
MEAN   415.39   414.00   189.27     0.36  4074.67     1.43
HUB    351.11   377.33    67.08     0.33  4325.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.72     1.10    17.04   560.16     1.03   545.18     0.92     0.91
MEAN    18.61     1.09    16.86   559.07     1.03   543.48     0.92     0.91
HUB     18.71     1.10    16.67   560.00     1.03   541.75     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.32    35.13    31.50     3.63     0.93     0.30     2.90
MEAN    31.56    27.20    23.50     3.70     0.93     0.30     3.30     0.91
HUB     37.41    10.24     6.50     3.74     0.93     0.31     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     547.459     226.759     498.289    1134.330       0.483      -0.521

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.662      15.909     534.712      46.000      24.469      30.600       6.131

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     510.537     226.759     558.630    1137.785       0.449      -0.344

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      18.634      16.226     537.974     400.556       0.025       0.219

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.823     503.202       0.000     503.202    1138.441       0.442       0.188

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750      16.254     538.595       0.000       0.060       0.049      -0.329

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.865      18.590       1.090     559.742      15.765     243.627       1.889

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98176.602       0.443     641.433 1017252.188


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.915

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.614    2643.000      18.590     559.742       1.000       1.000       0.780
W Kg/sec =   52.55191

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.968    2544.260       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88939.984   90718.586       1.570     434.156     276.576     339.175       1.226

    ROTOR LEADING EDGE CONDITIONS, STAGE            3
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   463.95    -0.16   463.95     0.41   445.60
MEAN    17.74     0.00    -0.02   463.95    -0.16   463.95     0.41
HUB     15.05     0.00    -0.02   463.95    -0.16   463.95     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     44.95    46.36    -1.41   462.91   655.50    16.59   541.77     0.57
MEAN    41.42    43.40    -1.98   409.13   618.68    16.59   541.77     0.54
HUB     36.82    38.84    -2.02   347.12   579.53    16.59   541.77     0.51

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   417.05   175.72   378.23  1158.87     0.36
MEAN    17.51   426.90   195.08   379.72  1157.89     0.37
HUB     14.85   463.12   261.88   381.97  1156.92     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    456.91   471.30   281.19     0.41  3484.26
MEAN   403.78   433.30   208.70     0.37  3418.01     1.52
HUB    342.51   390.39    80.63     0.34  3891.36

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.87     1.07    18.17   572.64     1.02   558.12     0.92     0.84
MEAN    19.85     1.07    18.07   572.40     1.02   557.18     0.92     0.84
HUB     20.03     1.08    17.93   574.15     1.03   556.24     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     24.92    36.63    31.50     5.13     0.93     0.33     2.90
MEAN    27.19    28.79    23.50     5.29     0.89     0.35     3.28     0.84
HUB     34.43    11.92     6.50     5.42     0.89     0.38     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.915

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     431.665     196.360     384.419    1158.224       0.373       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.896      18.075     557.506      46.000      27.058      31.500       4.442

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     399.341     196.360     445.006    1160.552       0.344       0.141

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.883      18.317     559.749     471.992       0.017       0.254

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.121     387.738       0.000     387.738    1161.342       0.334       0.153

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.360     560.512       0.000       0.060       0.043       0.164

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4        Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.787       19.834       1.067     573.065      13.324     273.098       2.117

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  82993.852       0.398     542.237 1317596.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
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    115.614    2643.000      19.834     573.065       1.000       1.000       0.980
W Kg/sec =   52.55191

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     90.065    2514.509       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 88939.984   90718.586       1.957     513.330     262.300     401.059       1.529

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   364.46    -0.13   364.46     0.31   422.61
 MEAN    16.97     0.00    -0.02   364.46    -0.13   364.46     0.31
 HUB     14.32     0.00    -0.02   364.46    -0.13   364.46     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.64    46.36     4.28   444.22   574.70    18.53   561.98     0.49
 MEAN    47.05    43.80     3.25   391.42   534.92    18.53   561.98     0.46
 HUB     42.19    37.84     4.35   330.28   491.94    18.53   561.98     0.42

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   415.74   164.01   382.02  1171.21     0.35
 MEAN    16.57   424.81   182.84   383.45  1170.30     0.36
 HUB     13.89   458.75   248.93   385.34  1169.35     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   468.65   271.45     0.40  3098.86
 MEAN   382.27   432.20   199.43     0.37  3032.54     1.33
 HUB    320.37   391.90    71.43     0.34  3459.49

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.11     1.06    19.35   584.54     1.02   570.11     0.92     0.90
 MEAN    21.09     1.06    19.25   584.29     1.02   569.23     0.92     0.90
 HUB     21.27     1.07    19.12   585.87     1.02   568.30     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.23    35.40    31.50     3.90     0.93     0.23     2.90
 MEAN    25.49    27.48    23.50     3.98     0.92     0.24     3.29     0.90
 HUB     32.86    10.50     6.50     4.00     0.92     0.27     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     418.423     183.871     375.858    1171.385       0.357       0.053

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.137      19.351     570.285      46.000      26.068      32.400       6.332

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     395.798     183.871     436.422    1172.964       0.337       0.144

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.120      19.517     571.823     456.573       0.019       0.248

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     376.454       0.000     376.454    1174.242       0.321       0.136

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.611     573.070       0.000       0.060       0.050       0.193

    STAGE EXIT CONDITIONS, STAGE            4
```

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.840	21.061	1.062	584.902	11.836	287.585	2.229

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
73745.898	0.389	481.816	1043101.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.970

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
115.614	2643.000	21.061	584.902	1.000	1.000	0.980

W Kg/sec = 52.55191

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
85.693	2488.936	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
88939.984	90718.586	2.042	509.668	249.572	390.276	1.564

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	351.30	-0.12	351.30	0.30	397.90
MEAN	15.91	0.00	-0.02	351.30	-0.12	351.30	0.30	
HUB	13.07	0.00	-0.02	351.30	-0.12	351.30	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.27	47.36	2.91	422.54	549.60	19.79	574.60	0.47
MEAN	46.26	44.80	1.46	367.03	508.14	19.79	574.60	0.43
HUB	40.64	38.84	1.80	301.45	462.99	19.79	574.60	0.39

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	398.15	149.12	369.17	1182.90	0.34
MEAN	15.50	404.95	163.17	370.62	1181.88	0.34
HUB	12.59	433.07	220.90	372.50	1180.83	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	454.24	264.66	0.38	2677.45	
MEAN	357.44	418.46	194.28	0.35	2530.63	1.32
HUB	290.38	378.92	69.48	0.32	2782.70	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.19	1.05	20.51	594.81	1.02	581.58	0.92	0.89
MEAN	22.12	1.05	20.40	594.27	1.02	580.58	0.92	0.89
HUB	22.23	1.06	20.26	595.20	1.02	579.55	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	22.00	35.64	31.50	4.14	0.93	0.22	2.90	
MEAN	23.76	27.66	23.50	4.16	0.91	0.22	3.34	0.89
HUB	30.67	10.57	6.50	4.07	0.91	0.24	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.970

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	408.989	166.160	373.715	1182.099	0.346	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.145	20.383	580.798	46.000	23.971	33.000	9.029

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	398.316	166.160	431.584	1182.830	0.337	0.022

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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.097      20.427     581.518     440.827       0.047       0.226

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     372.799       0.000     372.799    1184.500       0.315       0.122

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.602     583.160       0.000       0.060       0.063       0.119

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.800      22.068       1.048     594.761       9.860     322.609       2.501

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  61442.547       0.359     401.433 1094886.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    448140.94   2927.9126    112.9435      1.4608      0.8340      8.9532      1.1376


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 70% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.632    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85544.477   87255.180       2.629     831.557     316.359     619.754       1.959

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   253.30    -0.09   253.30     0.23   473.93
 MEAN    17.06     0.00    -0.02   253.30    -0.09   253.30     0.23
 HUB     12.51     0.00    -0.02   253.30    -0.09   253.30     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.98    50.47    11.51   475.82   539.12    14.57   517.45     0.48
 MEAN    57.23    47.20    10.03   393.48   468.04    14.57   517.45     0.42
 HUB     48.73    38.62    10.11   288.54   384.01    14.57   517.45     0.34

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   449.23   291.89   341.48  1127.51     0.40
 MEAN    18.04   465.30   311.56   345.60  1124.60     0.41
 HUB     15.00   519.31   381.42   352.41  1120.25     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    475.82   387.87   183.93     0.34  6023.48
 MEAN   415.99   361.03   104.44     0.32  5620.72     1.47
 HUB    345.97   354.19    35.46     0.32  5722.46

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     17.25     1.14    15.46   545.13     1.04   528.27     0.92     0.91
 MEAN    17.10     1.13    15.19   543.64     1.04   525.55     0.92     0.91
 HUB     17.14     1.13    14.79   544.01     1.04   521.49     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.52    28.31    24.20     4.11     0.93     0.37     2.90
 MEAN    42.03    16.81    12.70     4.11     0.94     0.33     3.51     0.91
 HUB     47.26    -5.75    -9.30     3.55     0.94     0.19     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     471.222     310.951     354.061    1124.772       0.419      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.140      15.188     525.712      24.000      41.291      35.400      -5.891

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     376.829     310.951     488.560    1131.902       0.333       0.350

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.116      15.850     532.398     528.796       0.022       0.477

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     349.994       0.000     349.994    1133.632       0.309       0.388

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.970     534.027       0.000       0.060       0.048       0.409

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      17.063       1.129     544.258      21.448     195.486       1.515

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 133535.359       0.590     839.141 1065123.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      17.063     544.258       1.000       1.000       0.980
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     98.134    2580.196       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85544.477   87255.180       2.066     590.487     285.789     474.134       1.659

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   334.58    -0.12   334.58     0.29   462.70
 MEAN    18.08     0.00    -0.02   334.58    -0.12   334.58     0.29
 HUB     15.21     0.00    -0.02   334.58    -0.12   334.58     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.79    46.36     8.43   473.98   580.27    16.06   534.91     0.51
 MEAN    51.26    42.30     8.96   416.97   534.70    16.06   534.91     0.47
 HUB     46.37    37.84     8.53   350.81   484.87    16.06   534.91     0.43

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   415.86   225.21   349.60  1147.14      0.36
 MEAN    18.01   423.25   234.43   352.40  1145.13      0.37
 HUB     15.22   457.01   287.03   355.64  1143.10      0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   427.34   245.76     0.37  4601.21
 MEAN   415.39   396.14   180.96     0.35  4224.12     1.47
 HUB    351.11   361.36    64.09     0.32  4371.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.82     1.10    17.19   561.30     1.03   546.86     0.92     0.91
 MEAN    18.67     1.09    16.99   559.90     1.03   544.94     0.92     0.91
 HUB     18.73     1.10    16.78   560.45     1.03   543.01     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.79    35.11    31.50     3.61     0.93     0.33     2.90
 MEAN    33.63    27.18    23.50     3.68     0.93     0.33     3.30     0.91
 HUB     38.91    10.22     6.50     3.72     0.93     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     529.776     235.086     474.760    1136.873       0.466      -0.488

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.724      16.133     537.113      46.000      26.343      30.600       4.257

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     485.068     235.086     539.033    1140.876       0.425      -0.266

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      18.704      16.515     540.902     400.556       0.021       0.246

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     478.086       0.000     478.086    1141.468       0.419       0.233

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      16.542     541.464       0.000       0.060       0.043      -0.251

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.872      18.667       1.094     560.552      16.294     232.621       1.803

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 101469.648       0.457     637.639  974203.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.941

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      18.667     560.552       1.000       1.000       0.780
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.034    2542.420       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85544.477   87255.180       1.638     434.156     265.119     339.175       1.279

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   441.56    -0.15   441.56     0.39   445.28
 MEAN    17.74     0.00    -0.02   441.56    -0.15   441.56     0.39
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HUB     15.05     0.00    -0.02   441.56    -0.15   441.56     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     46.36    46.36     0.00   462.91   639.84    16.84   544.27     0.56
MEAN    42.83    43.40    -0.57   409.13   602.07    16.84   544.27     0.53
HUB     38.18    38.84    -0.66   347.12   561.76    16.84   544.27     0.49

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   406.79   190.13   359.63  1161.53     0.35
MEAN    17.51   415.87   205.72   361.42  1160.25     0.36
HUB     14.85   450.79   266.21   363.79  1158.98     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    456.91   447.78   266.78     0.39  3769.48
MEAN   403.78   412.14   198.06     0.36  3604.08     1.56
HUB    342.51   371.71    76.30     0.32  3955.52

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.10     1.08    18.46   574.51     1.02   560.69     0.92     0.86
MEAN    20.04     1.07    18.33   573.90     1.02   559.46     0.92     0.86
HUB     20.17     1.08    18.17   575.20     1.03   558.23     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     27.86    36.57    31.50     5.07     0.93     0.35     2.90
MEAN    29.65    28.72    23.50     5.22     0.90     0.37     3.28     0.86
HUB     36.20    11.84     6.50     5.34     0.90     0.40     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.941

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     420.369     207.066     365.833    1160.582       0.362       0.006

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.085      18.342     559.781      46.000      29.510      31.500       1.990

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     379.088     207.066     431.954    1163.436       0.326       0.185

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.077      18.651     562.537     471.992       0.015       0.290

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     368.064       0.000     368.064    1164.147       0.316       0.197

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.693     563.224       0.000       0.060       0.038       0.208

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.821      20.035       1.073     574.536      13.984     256.927       1.992

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  87110.891       0.417     547.408 1256009.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      20.035     574.536       1.000       1.000       0.980
W Kg/sec =   50.54562
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
85.868	2511.288	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85544.477	87255.180	2.053	513.330	250.077	401.059	1.604

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	346.22	-0.12	346.22	0.30	422.07
MEAN	16.97	0.00	-0.02	346.22	-0.12	346.22	0.30	
HUB	14.32	0.00	-0.02	346.22	-0.12	346.22	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.07	46.36	5.71	444.22	563.30	18.84	564.53	0.48
MEAN	48.51	43.80	4.71	391.42	522.66	18.84	564.53	0.45
HUB	43.66	37.84	5.82	330.28	478.58	18.84	564.53	0.41

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	403.50	178.81	361.72	1174.63	0.34
MEAN	16.57	411.81	193.58	363.47	1173.42	0.35
HUB	13.89	444.56	252.90	365.61	1172.17	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	443.52	256.65	0.38	3378.21	
MEAN	382.27	409.53	188.69	0.35	3210.43	1.38
HUB	320.37	371.79	67.47	0.32	3514.44	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.46	1.07	19.77	587.04	1.02	573.45	0.92	0.91
MEAN	21.38	1.07	19.64	586.42	1.02	572.26	0.92	0.91
HUB	21.52	1.07	19.48	587.55	1.02	571.05	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	26.30	35.36	31.50	3.86	0.93	0.27	2.90	
MEAN	28.04	27.43	23.50	3.93	0.92	0.27	3.29	0.91
HUB	34.67	10.46	6.50	3.96	0.92	0.29	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	406.089	194.671	356.387	1174.411	0.346	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.434	19.730	573.237	46.000	28.645	32.400	3.755

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	374.302	194.671	421.899	1176.531	0.318	0.187

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.424	19.971	575.308	456.573	0.015	0.285

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	356.016	0.000	356.016	1177.670	0.302	0.182

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.062	576.423	0.000	0.060	0.041	0.237

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.864	21.377	1.067	587.005	12.468	269.570	2.090

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
77684.477	0.410	488.172	996473.562

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =10.034 EfDer = 0.986

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
111.200	2643.000	21.377	587.005	1.000	1.000	0.980

W Kg/sec = 50.54562

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
81.348	2484.474	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85544.477	87255.180	2.151	509.668	236.920	390.276	1.647

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	332.49	-0.11	332.49	0.28	397.19
MEAN	15.91	0.00	-0.02	332.49	-0.11	332.49	0.28	
HUB	13.07	0.00	-0.02	332.49	-0.11	332.49	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.81	47.36	4.45	422.54	537.77	20.23	577.78	0.46
MEAN	47.83	44.80	3.03	367.03	495.32	20.23	577.78	0.42
HUB	42.21	38.84	3.37	301.45	448.88	20.23	577.78	0.38

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	385.13	164.61	348.17	1186.94	0.32
MEAN	15.50	391.00	174.43	349.93	1185.61	0.33
HUB	12.59	417.82	225.07	352.02	1184.26	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	428.14	249.16	0.36	2955.28	
MEAN	357.44	394.90	183.01	0.33	2705.12	1.37
HUB	290.38	358.02	65.31	0.30	2835.14	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.66	1.06	21.06	597.94	1.02	585.56	0.92	0.90
MEAN	22.55	1.05	20.91	597.02	1.02	584.26	0.92	0.90
HUB	22.60	1.06	20.74	597.50	1.02	582.93	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.30	35.59	31.50	4.09	0.93	0.26	2.90	
MEAN	26.50	27.61	23.50	4.11	0.91	0.25	3.34	0.90
HUB	32.59	10.51	6.50	4.01	0.91	0.26	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.986

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	395.002	177.632	352.808	1185.819	0.333	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.568	20.898	584.462	46.000	26.724	33.000	6.276

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	374.737	177.632	414.706	1187.139	0.316	0.078

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.542	21.036	585.764	440.827	0.036	0.263

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     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     350.963       0.000     350.963    1188.597       0.295       0.174

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      21.194     587.205       0.000       0.060       0.050       0.172

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.841      22.518       1.053     597.487      10.482     299.762       2.324

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   65323.820       0.382     410.497 1045263.688

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     465124.16   2922.8557    108.6316      1.4905      0.8489     10.0345      1.1428

*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.986

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     107.366    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   48.80284

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     104.886    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   82594.961   84246.680       2.722     831.557     305.451     619.754       2.029

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   244.12    -0.08   244.12     0.22   473.93
  MEAN    17.06     0.00    -0.02   244.12    -0.08   244.12     0.22
  HUB     12.51     0.00    -0.02   244.12    -0.08   244.12     0.22

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.84    50.47    12.37   475.82   534.87    14.61   517.83     0.48
  MEAN    58.19    47.20    10.99   393.48   463.13    14.61   517.83     0.41
  HUB     49.77    38.62    11.15   288.54   378.02    14.61   517.83     0.34

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   444.15   298.79   328.62  1128.48     0.39
  MEAN    18.04   458.46   315.43   332.70  1125.45     0.41
  HUB     15.00   509.42   380.07   339.20  1121.08     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   373.27   177.03     0.33  6165.71
  MEAN   415.99   347.56   100.56     0.31  5690.62     1.51
  HUB    345.97   340.91    34.10     0.30  5702.12

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.29     1.14    15.54   545.65     1.04   529.18     0.92     0.90
  MEAN    17.11     1.13    15.26   543.89     1.04   526.34     0.92     0.90
  HUB     17.12     1.13    14.85   543.94     1.04   522.26     0.92     0.90
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.28    28.31    24.20     4.11     0.93     0.40     2.90
 MEAN    43.47    16.82    12.70     4.12     0.94     0.35     3.51     0.90
 HUB     48.25    -5.74    -9.30     3.56     0.94     0.21     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     463.961     314.822     340.803    1125.632       0.412      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.153      15.258     526.516      24.000      42.731      35.400      -7.331

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     362.256     314.822     479.940    1133.109       0.320       0.376

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.126      15.953     533.535     528.796       0.024       0.500

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     336.802       0.000     336.802    1134.687       0.297       0.407

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.053     535.021       0.000       0.060       0.054       0.427

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.858      17.067       1.130     544.495      21.685     190.336       1.475

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 135009.734       0.596     819.153 1026515.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.991

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    107.366    2643.000      17.067     544.495       1.000       1.000       0.980
W Kg/sec =   48.80284

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     94.749    2579.635       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82594.961   84246.680       2.140     590.487     275.933     474.134       1.718

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   322.08    -0.11   322.08     0.28   462.60
 MEAN    18.08     0.00    -0.02   322.08    -0.11   322.08     0.28
 HUB     15.21     0.00    -0.02   322.08    -0.11   322.08     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.81    46.36     9.45   473.98   573.14    16.14   535.83     0.50
 MEAN    52.32    42.30    10.02   416.97   526.96    16.14   535.83     0.46
 HUB     47.45    37.84     9.61   350.81   476.32    16.14   535.83     0.42

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   410.03   234.77   336.17  1148.57     0.36
 MEAN    18.01   416.21   241.39   339.05  1146.39     0.36
 HUB     15.22   448.37   289.52   342.36  1144.18     0.39
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   410.86   236.21     0.36  4796.18
 MEAN   415.39   381.09   174.00     0.33  4349.49     1.51
 HUB    351.11   347.86    61.59     0.30  4409.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.89     1.11    17.30   562.26     1.03   548.22     0.92     0.91
 MEAN    18.72     1.10    17.09   560.61     1.03   546.14     0.92     0.91
 HUB     18.74     1.10    16.86   560.83     1.03   544.04     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.93    35.09    31.50     3.59     0.93     0.35     2.90
 MEAN    35.45    27.17    23.50     3.67     0.94     0.35     3.30     0.91
 HUB     40.22    10.20     6.50     3.70     0.94     0.35     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     515.569     242.071     455.207    1138.901       0.453      -0.460

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.768      16.303     539.033      46.000      28.003      30.600       2.597

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     464.100     242.071     523.438    1143.341       0.406      -0.201

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      18.753      16.739     543.244     400.556       0.019       0.270

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     457.440       0.000     457.440    1143.880       0.400       0.270

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      16.763     543.756       0.000       0.060       0.039      -0.186

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.873      18.719       1.097     561.231      16.736     223.694       1.734

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 104224.773       0.470     632.370  937301.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.960

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.366    2643.000      18.719     561.231       1.000       1.000       0.780
W Kg/sec =   48.80284

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      87.705    2540.881       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82594.961   84246.680       1.700     434.156     255.424     339.175       1.328

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   423.05    -0.15   423.05     0.37   445.01
 MEAN    17.74     0.00    -0.02   423.05    -0.15   423.05     0.37
 HUB     15.05     0.00    -0.02   423.05    -0.15   423.05     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.58    46.36     1.22   462.91   627.20    17.04   546.29     0.55
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 MEAN    44.05    43.40     0.65   409.13   588.62    17.04   546.29     0.51
 HUB     39.38    38.84     0.54   347.12   547.32    17.04   546.29     0.48

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   399.17   202.02   344.27  1163.66     0.34
 MEAN    17.51   407.33   214.48   346.29  1162.15     0.35
 HUB     14.85   440.93   269.80   348.76  1160.65     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   428.36   254.89     0.37  4004.98
 MEAN   403.78   394.65   189.30     0.34  3757.46     1.60
 HUB    342.51   356.25    72.71     0.31  4008.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.28     1.08    18.69   576.06     1.03   562.76     0.92     0.88
 MEAN    20.18     1.08    18.53   575.15     1.02   561.29     0.92     0.88
 HUB     20.28     1.08    18.35   576.08     1.03   559.84     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.40    36.51    31.50     5.01     0.93     0.37     2.90
 MEAN    31.77    28.66    23.50     5.16     0.90     0.38     3.28     0.88
 HUB     37.73    11.78     6.50     5.28     0.90     0.41     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.960

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     411.632     215.892     350.474    1162.478       0.354       0.008

     Pt3          Ps3         Ts3          Vane No.     Alpha3     Vane A3      Incid3
     20.228      18.547     561.613      46.000      31.633      31.500      -0.133

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth         Cmth         Aoth         Machth      cp 2-Th
     17.392     362.480     215.892     421.901    1165.761       0.311       0.223

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.222      18.909     564.790     471.992       0.014       0.321

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     351.994       0.000     351.994    1166.407       0.302       0.232

   Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.945     565.416       0.000       0.060       0.037       0.244

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.843      20.183       1.078     575.761      14.530     244.365       1.894

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  90510.336       0.434     549.159 1204141.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    107.366    2643.000      20.183     575.761       1.000       1.000       0.980
W Kg/sec =   48.80284

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     82.390    2508.615       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 82594.961   84246.680       2.139     513.330     239.949     401.059       1.671

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   331.29    -0.11   331.29     0.28   421.62
MEAN    16.97     0.00    -0.02   331.29    -0.11   331.29     0.28
HUB     14.32     0.00    -0.02   331.29    -0.11   331.29     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.29    46.36     6.93   444.22   554.25    19.08   566.60     0.47
MEAN    49.76    43.80     5.96   391.42   512.89    19.08   566.60     0.44
HUB     44.92    37.84     7.08   330.28   467.89    19.08   566.60     0.40

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   394.51   190.71   345.35  1177.35     0.34
MEAN    16.57   401.91   202.25   347.31  1175.90     0.34
HUB     13.89   433.39   256.12   349.61  1174.43     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   423.29   244.75     0.36  3602.76
MEAN   382.27   391.19   180.02     0.33  3353.99     1.42
HUB    320.37   355.47    64.24     0.30  3559.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.71     1.08    20.09   589.10     1.02   576.11     0.92     0.91
MEAN    21.61     1.07    19.93   588.18     1.02   574.69     0.92     0.91
HUB     21.69     1.07    19.75   588.94     1.02   573.26     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     28.91    35.33    31.50     3.83     0.93     0.30     2.90
MEAN    30.21    27.40    23.50     3.90     0.92     0.30     3.29     0.91
HUB     36.23    10.41     6.50     3.91     0.92     0.31     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     396.723     203.386     340.622    1176.826       0.337       0.050

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.654      20.014     575.599      46.000      30.842      32.400       1.558

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     357.040     203.386     410.906    1179.376       0.303       0.224

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.648      20.313     578.096     456.573       0.014       0.316

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     339.661       0.000     339.661    1180.406       0.288       0.219

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      20.397     579.107       0.000       0.060       0.037       0.273

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.875      21.606       1.071     588.739      12.977     255.890       1.984

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  80858.734       0.426     490.599  956945.938
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.366    2643.000      21.606     588.739       1.000       1.000       0.980
W Kg/sec =   48.80284

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.825    2480.813       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 82594.961   84246.680       2.249     509.668     226.658     390.276       1.722

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   317.41    -0.11   317.41     0.27   396.60
MEAN    15.91     0.00    -0.02   317.41    -0.11   317.41     0.27
HUB     13.07     0.00    -0.02   317.41    -0.11   317.41     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.09    47.36     5.73   422.54   528.57    20.55   580.33     0.45
MEAN    49.15    44.80     4.35   367.03   485.32    20.55   580.33     0.41
HUB     43.53    38.84     4.69   301.45   437.82    20.55   580.33     0.37

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   375.77   176.82   331.57  1190.11     0.32
MEAN    15.50   380.58   183.33   333.51  1188.56     0.32
HUB     12.59   406.04   228.37   335.73  1186.99     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.78   407.54   236.96     0.34  3174.20
MEAN   357.44   376.23   174.11     0.32  2842.93     1.41
HUB    290.38   341.41    62.01     0.29  2876.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.01     1.06    21.47   600.49     1.02   588.70     0.92     0.91
MEAN    22.86     1.06    21.29   599.26     1.02   587.17     0.92     0.91
HUB     22.87     1.06    21.09   599.39     1.02   585.62     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     28.07    35.55    31.50     4.05     0.93     0.29     2.90
MEAN    28.80    27.57    23.50     4.07     0.92     0.28     3.34     0.91
HUB     34.22    10.46     6.50     3.96     0.92     0.28     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.994

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    15.219     384.587     186.692     336.233    1188.756       0.324       -0.007

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.879      21.277     587.365      46.000      29.041      33.000       3.959

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     356.278     186.692     402.229    1190.526       0.299       0.125

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.864      21.485     589.116     440.827       0.029       0.296

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    14.701     333.842       0.000     333.842    1191.832       0.280       0.217
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   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.630     590.408       0.000       0.060       0.042       0.214

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.863      22.843       1.057     599.711      10.973     282.992       2.194

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  68385.336       0.399     414.919 1003366.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    478988.91   2906.2000    104.8861      1.5121      0.8558     10.9895      1.1471


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 70% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.556    2643.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   47.07069

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    101.163    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79663.445   81256.547       2.823     831.557     294.610     619.754       2.104

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   235.05    -0.08   235.05     0.21   473.93
 MEAN    17.06     0.00    -0.02   235.05    -0.08   235.05     0.21
 HUB     12.51     0.00    -0.02   235.05    -0.08   235.05     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.72    50.47    13.25   475.82   530.78    14.65   518.20     0.48
 MEAN    59.15    47.20    11.95   393.48   458.41    14.65   518.20     0.41
 HUB     50.84    38.62    12.22   288.54   372.22    14.65   518.20     0.33

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   439.55   305.49   316.04  1129.38     0.39
 MEAN    18.04   452.02   319.21   320.05  1126.24     0.40
 HUB     15.00   499.87   378.72   326.25  1121.86     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    475.82   359.02   170.33     0.32  6303.87
 MEAN   415.99   334.36    96.78     0.30  5758.65     1.56
 HUB    345.97   327.89    32.75     0.29  5681.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.33     1.15    15.61   546.17     1.04   530.03     0.92     0.90
 MEAN    17.13     1.13    15.32   544.15     1.04   527.08     0.92     0.90
 HUB     17.10     1.13    14.92   543.86     1.04   522.99     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.03    28.32    24.20     4.12     0.93     0.42     2.90
 MEAN    44.92    16.83    12.70     4.13     0.94     0.37     3.51     0.90
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 HUB     49.26    -5.73    -9.30     3.57     0.94     0.24     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     457.122     318.590     327.812    1126.439       0.406      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.164      15.321     527.272      24.000      44.183      35.400      -8.783

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     348.042     318.590     471.839    1134.248       0.307       0.403

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.132      16.048     534.607     528.796       0.027       0.524

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     323.919       0.000     323.919    1135.683       0.285       0.424

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.128     535.961       0.000       0.060       0.062       0.445

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.849      17.066       1.130     544.725      21.915     185.296       1.436

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 136438.906       0.603     798.443  988356.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.556    2643.000      17.066     544.725       1.000       1.000       0.980
W Kg/sec =   47.07069

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.409    2579.091       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79663.445   81256.547       2.218     590.487     266.205     474.134       1.781

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   309.86    -0.11   309.86     0.27   462.50
 MEAN    18.08     0.00    -0.02   309.86    -0.11   309.86     0.27
 HUB     15.21     0.00    -0.02   309.86    -0.11   309.86     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.83    46.36    10.47   473.98   566.36    16.21   536.71     0.50
 MEAN    53.39    42.30    11.09   416.97   519.58    16.21   536.71     0.46
 HUB     48.56    37.84    10.72   350.81   468.14    16.21   536.71     0.41

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   404.92   243.96   323.17  1149.90     0.35
 MEAN    18.01   409.76   248.13   326.09  1147.56     0.36
 HUB     15.22   440.16   291.91   329.44  1145.20     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   394.94   227.02     0.34  4983.81
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 MEAN   415.39   366.49   167.26     0.32  4470.74     1.55
 HUB    351.11   334.71    59.20     0.29  4445.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.96     1.11    17.40   563.19     1.03   549.49     0.92     0.90
 MEAN    18.75     1.10    17.17   561.28     1.03   547.26     0.92     0.90
 HUB     18.74     1.10    16.93   561.19     1.03   545.01     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.05    35.09    31.50     3.59     0.93     0.38     2.90
 MEAN    37.27    27.15    23.50     3.65     0.94     0.37     3.30     0.90
 HUB     41.54    10.19     6.50     3.69     0.94     0.36     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     502.401     248.826     436.454    1140.773       0.440      -0.433

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.802      16.454     540.808      46.000      29.688      30.600       0.912

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     444.140     248.826     509.092    1145.620       0.388      -0.137

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      18.790      16.937     545.414     400.556       0.017       0.294

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     437.817       0.000     437.817    1146.109       0.382       0.305

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      16.959     545.879       0.000       0.060       0.037      -0.124

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      18.758       1.099     561.887      17.162     215.309       1.669

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 106878.734       0.482     625.456  901036.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.975

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    103.556    2643.000      18.758     561.887       1.000       1.000       0.780
W Kg/sec =   47.07069

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     84.465    2539.398       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79663.445   81256.547       1.765     434.156     245.989     339.175       1.379

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   405.37    -0.14   405.37     0.35   444.75
 MEAN    17.74     0.00    -0.02   405.37    -0.14   405.37     0.35
 HUB     15.05     0.00    -0.02   405.37    -0.14   405.37     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.80    46.36     2.44   462.91   615.41    17.21   548.17     0.54
 MEAN    45.27    43.40     1.87   409.13   576.04    17.21   548.17     0.50
 HUB     40.59    38.84     1.75   347.12   533.77    17.21   548.17     0.46
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      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   392.67   213.32   329.67  1165.64     0.34
MEAN    17.51   399.72   222.81   331.86  1163.91     0.34
HUB     14.85   431.82   273.19   334.42  1162.20     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    456.91   409.90   243.59     0.35  4228.65
MEAN   403.78   378.00   180.97     0.32  3903.16     1.63
HUB    342.51   341.53    69.32     0.29  4058.97

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.44     1.09    18.89   577.55     1.03   564.67     0.92     0.89
MEAN    20.30     1.08    18.71   576.34     1.03   563.00     0.92     0.89
HUB     20.37     1.09    18.51   576.92     1.03   561.35     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.91    36.46    31.50     4.96     0.93     0.39     2.90
MEAN    33.88    28.60    23.50     5.10     0.91     0.40     3.28     0.89
HUB     39.25    11.71     6.50     5.21     0.91     0.43     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.975

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     403.846     224.275     335.846    1164.237       0.347       0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.351      18.724     563.317      46.000      33.735      31.500      -2.235

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     346.761     224.275     412.968    1167.929       0.297       0.259

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.344      19.136     566.895     471.992       0.014       0.352

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     336.833       0.000     336.833    1168.512       0.288       0.265

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.165     567.461       0.000       0.060       0.038       0.277

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      20.304       1.082     576.935      15.048     233.001       1.806

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93737.078       0.449     548.551 1153874.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.556    2643.000      20.304     576.935       1.000       1.000       0.980
W Kg/sec =   47.07069

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     79.070    2506.062       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79663.445   81256.547       2.229     513.330     230.282     401.059       1.742

     ROTOR LEADING EDGE CONDITIONS, STAGE            4
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   317.18    -0.11   317.18     0.27   421.19
MEAN    16.97     0.00    -0.02   317.18    -0.11   317.18     0.27
HUB     14.32     0.00    -0.02   317.18    -0.11   317.18     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.48    46.36     8.12   444.22   545.92    19.29   568.54     0.47
MEAN    50.99    43.80     7.19   391.42   503.88    19.29   568.54     0.43
HUB     46.17    37.84     8.33   330.28   458.00    19.29   568.54     0.39

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   386.88   201.79   330.08  1179.84     0.33
MEAN    16.57   393.18   210.35   332.18  1178.20     0.33
HUB     13.89   423.17   259.08   334.59  1176.53     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   404.41   233.66     0.34  3811.97
MEAN   382.27   374.03   171.92     0.32  3488.22     1.46
HUB    320.37   340.16    61.29     0.29  3600.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.93     1.08    20.36   591.05     1.02   578.55     0.92     0.91
MEAN    21.79     1.07    20.17   589.85     1.02   576.94     0.92     0.91
HUB     21.84     1.08    19.97   590.26     1.02   575.31     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.44    35.29    31.50     3.79     0.93     0.32     2.90
MEAN    32.34    27.36    23.50     3.86     0.93     0.32     3.29     0.91
HUB     37.75    10.38     6.50     3.88     0.93     0.33     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     388.497     211.536     325.856    1179.056       0.329       0.049

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.839      20.255     577.786      46.000      32.990      32.400      -0.590

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     340.977     211.536     401.264    1182.005       0.288       0.260

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.834      20.606     580.680     456.573       0.013       0.348

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     324.486       0.000     324.486    1182.937       0.274       0.253

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      20.682     581.596       0.000       0.060       0.037       0.305

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.879      21.793       1.073     590.386      13.452     243.728       1.889

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  83814.617       0.442     490.485  918433.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.999
```

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
103.556	2643.000	21.793	590.386	1.000	1.000	0.980

W Kg/sec = 47.07069

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
74.520	2477.349	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
79663.445	81256.547	2.348	509.668	217.036	390.276	1.798

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	303.38	-0.10	303.38	0.26	396.05
MEAN	15.91	0.00	-0.02	303.38	-0.10	303.38	0.26	
HUB	13.07	0.00	-0.02	303.38	-0.10	303.38	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.33	47.36	6.97	422.54	520.26	20.82	582.70	0.44
MEAN	50.43	44.80	5.63	367.03	476.26	20.82	582.70	0.40
HUB	44.83	38.84	5.99	301.45	427.76	20.82	582.70	0.36

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	367.98	188.03	316.32	1193.00	0.31
MEAN	15.50	371.54	191.51	318.39	1191.27	0.31
HUB	12.59	395.45	231.37	320.70	1189.52	0.33

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	388.61	225.75	0.33	3375.20	
MEAN	357.44	359.03	165.94	0.30	2969.54	1.45
HUB	290.38	326.08	59.01	0.27	2914.30	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.30	1.07	21.81	602.88	1.02	591.58	0.92	0.91
MEAN	23.11	1.06	21.61	601.38	1.02	589.85	0.92	0.91
HUB	23.09	1.06	21.39	601.17	1.02	588.12	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.73	35.51	31.50	4.01	0.93	0.31	2.90	
MEAN	31.03	27.53	23.50	4.03	0.92	0.31	3.34	0.91
HUB	35.81	10.43	6.50	3.93	0.92	0.30	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	375.574	195.017	320.974	1191.450	0.315	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.137	21.595	590.035	46.000	31.282	33.000	1.718

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	339.445	195.017	391.478	1193.625	0.284	0.168

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.128	21.864	592.192	440.827	0.025	0.328

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	318.219	0.000	318.219	1194.799	0.266	0.256

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.996	593.357	0.000	0.060	0.038	0.252

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    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      23.109       1.060     601.810      11.423     268.441       2.081

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   71194.211       0.416     416.630  962654.750

    OVERALL EXIT CONDITIONS; ALL          5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     492063.56   2879.5640    101.1634      1.5297      0.8578     11.9532      1.1511


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  0.974

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      99.590    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   45.26799

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      97.289    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   76612.523   78144.609       2.935     831.557     283.327     619.754       2.187

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   225.65    -0.08   225.65     0.20   473.93
  MEAN    17.06     0.00    -0.02   225.65    -0.08   225.65     0.20
  HUB     12.51     0.00    -0.02   225.65    -0.08   225.65     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.63    50.47    14.16   475.82   526.69    14.68   518.56     0.47
  MEAN    60.17    47.20    12.97   393.48   453.66    14.68   518.56     0.41
  HUB     51.98    38.62    13.36   288.54   366.36    14.68   518.56     0.33

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   435.23   312.31   303.13  1130.27     0.39
  MEAN    18.04   445.67   323.03   307.05  1127.02     0.40
  HUB     15.00   490.16   377.28   312.92  1122.64     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   344.42   163.51     0.30  6444.60
  MEAN   415.99   320.81    92.97     0.28  5827.45     1.61
  HUB    345.97   314.49    31.31     0.28  5660.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.36      1.15    15.67   546.69     1.05   530.87     0.92     0.89
  MEAN    17.14      1.13    15.38   544.40     1.04   527.81     0.92     0.89
  HUB     17.08      1.13    14.98   543.78     1.04   523.71     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     45.85    28.34    24.20     4.14     0.93     0.45     2.90
  MEAN    46.45    16.84    12.70     4.14     0.94     0.40     3.51     0.89
  HUB     50.33    -5.71    -9.30     3.59     0.94     0.26     4.78
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     450.367     322.399     314.466    1127.234       0.400      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.173      15.382     528.016      24.000      45.714      35.400     -10.314

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     333.499     322.399     463.856    1135.372       0.294       0.430

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.136      16.138     535.667     528.796       0.030       0.549

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     310.718       0.000     310.718    1136.670       0.273       0.441

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.197     536.893       0.000       0.060       0.070       0.462

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.838      17.061       1.129     544.957      22.147     180.126       1.396

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 137884.031       0.609     775.997  948857.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2643.000      17.061     544.957       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.951    2578.542       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.305     590.487     256.136     474.134       1.851

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   297.32    -0.10   297.32     0.26   462.40
 MEAN    18.08     0.00    -0.02   297.32    -0.10   297.32     0.26
 HUB     15.21     0.00    -0.02   297.32    -0.10   297.32     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.91    46.36    11.55   473.98   559.60    16.27   537.57     0.49
 MEAN    54.52    42.30    12.22   416.97   512.20    16.27   537.57     0.45
 HUB     49.73    37.84    11.89   350.81   459.93    16.27   537.57     0.40

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   400.27   253.27   309.95  1151.20     0.35
 MEAN    18.01   403.58   254.92   312.88  1148.72     0.35
 HUB     15.22   431.99   294.32   316.22  1146.21     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   378.77   217.71     0.33  5173.78
 MEAN   415.39   351.63   160.47     0.31  4592.94     1.60
 HUB    351.11   321.28    56.80     0.28  4481.93
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.01     1.11    17.48   564.12     1.04   550.74     0.92     0.90
MEAN    18.78     1.10    17.25   561.97     1.03   548.37     0.92     0.90
HUB     18.74     1.10    16.99   561.56     1.03   545.97     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.25    35.08    31.50     3.58     0.93     0.40     2.90
MEAN    39.17    27.15    23.50     3.65     0.94     0.39     3.30     0.90
HUB     42.95    10.18     6.50     3.68     0.94     0.38     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     489.580     255.635     417.539    1142.590       0.428       -0.406

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.829      16.594     542.533      46.000      31.477      30.600      -0.877

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     424.147     255.635     495.227    1147.835       0.370       -0.073

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      18.818      17.123     547.526     400.556       0.017       0.321

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.823     418.196       0.000     418.196    1148.274       0.364       0.339

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.750      17.139     547.945       0.000       0.060       0.037       -0.062

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      18.786       1.101     562.550      17.593     207.024       1.605

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 109560.031       0.494     616.593  863694.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2643.000      18.786     562.550       1.000       1.000       0.780
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.155    2537.902       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       1.837     434.156     236.350     339.175       1.435

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   387.61    -0.13   387.61     0.34   444.48
 MEAN    17.74     0.00    -0.02   387.61    -0.13   387.61     0.34
 HUB     15.05     0.00    -0.02   387.61    -0.13   387.61     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.07    46.36     3.71   462.91   603.86    17.36   550.00     0.52
 MEAN    46.56    43.40     3.16   409.13   563.68    17.36   550.00     0.49
 HUB     41.86    38.84     3.02   347.12   520.41    17.36   550.00     0.45

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   386.93   224.56   315.10  1167.55     0.33
MEAN    17.51   392.67   231.15   317.42  1165.63     0.34
HUB     14.85   423.00   276.57   320.06  1163.73     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    456.91   391.50   232.35     0.34  4451.21
MEAN   403.78   361.33   172.63     0.31  4049.09     1.68
HUB    342.51   326.78    65.93     0.28  4109.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.58     1.10    19.07   579.03     1.03   566.53     0.92     0.90
MEAN    20.41     1.09    18.87   577.54     1.03   564.67     0.92     0.90
HUB     20.44     1.09    18.65   577.77     1.03   562.83     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.48    36.40    31.50     4.90     0.93     0.42     2.90
MEAN    36.06    28.54    23.50     5.04     0.91     0.42     3.28     0.90
HUB     40.83    11.64     6.50     5.14     0.91     0.44     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     396.633     232.672     321.220    1165.950       0.340       0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.459      18.882     564.978      46.000      35.917      31.500      -4.417

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     331.126     232.672     404.698    1170.050       0.283       0.297

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.450      19.342     568.959     471.992       0.016       0.386

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     321.793       0.000     321.793    1170.573       0.275       0.296

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.360     569.468       0.000       0.060       0.043       0.309

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      20.405       1.086     578.114      15.565     222.144       1.722

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96956.180       0.464     545.659 1102746.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2643.000      20.405     578.114       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     75.742    2503.505       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.327     513.330     220.590     401.059       1.818

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   303.15    -0.10   303.15     0.26   420.76
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MEAN    16.97     0.00    -0.02   303.15    -0.10   303.15     0.26
HUB     14.32     0.00    -0.02   303.15    -0.10   303.15     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.70    46.36     9.34   444.22   537.89    19.48   570.44     0.46
MEAN    52.25    43.80     8.45   391.42   495.17    19.48   570.44     0.42
HUB     47.46    37.84     9.62   330.28   448.40    19.48   570.44     0.38

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   380.10   212.62   315.08  1182.25     0.32
MEAN    16.57   385.09   218.26   317.27  1180.43     0.33
HUB     13.89   413.36   261.96   319.76  1178.58     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   385.92   222.84     0.33  4016.21
MEAN   382.27   357.15   164.01     0.30  3619.21     1.51
HUB    320.37   325.05    58.40     0.28  3640.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.13     1.08    20.59   592.98     1.03   580.92     0.92     0.91
MEAN    21.95     1.08    20.39   591.51     1.02   579.13     0.92     0.91
HUB     21.96     1.08    20.17   591.59     1.02   577.33     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.01    35.27    31.50     3.77     0.93     0.35     2.90
MEAN    34.53    27.34    23.50     3.84     0.93     0.34     3.29     0.91
HUB     39.33    10.35     6.50     3.85     0.93     0.35     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     380.897     219.489     311.300    1181.224       0.322       0.047

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.996      20.465     579.916      46.000      35.187      32.400      -2.787

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     325.233     219.489     392.367    1184.561       0.275       0.297

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.990      20.867     583.198     456.573       0.014       0.381

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     309.647       0.000     309.647    1185.400       0.261       0.285

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.930     584.024       0.000       0.060       0.039       0.336

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      21.948       1.076     592.029      13.914     232.306       1.801

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  86700.141       0.457     487.940  879064.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2643.000      21.948     592.029       1.000       1.000       0.980
W Kg/sec =   45.26799
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
71.260	2473.910	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
76612.523	78144.609	2.456	509.668	207.540	390.276	1.880

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	289.64	-0.10	289.64	0.24	395.50
MEAN	15.91	0.00	-0.02	289.64	-0.10	289.64	0.24	
HUB	13.07	0.00	-0.02	289.64	-0.10	289.64	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.58	47.36	8.22	422.54	512.37	21.06	585.03	0.43
MEAN	51.73	44.80	6.93	367.03	467.63	21.06	585.03	0.39
HUB	46.15	38.84	7.31	301.45	418.12	21.06	585.03	0.35

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	361.20	198.83	301.55	1195.79	0.30
MEAN	15.50	363.31	199.41	303.69	1193.88	0.30
HUB	12.59	385.45	234.30	306.06	1191.96	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	370.32	214.95	0.31	3568.76	
MEAN	357.44	342.35	158.03	0.29	3091.98	1.50
HUB	290.38	311.16	56.08	0.26	2951.11	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.55	1.07	22.11	605.24	1.02	594.35	0.92	0.91
MEAN	23.33	1.06	21.88	603.47	1.02	592.45	0.92	0.91
HUB	23.27	1.06	21.64	602.95	1.02	590.55	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.40	35.48	31.50	3.98	0.93	0.34	2.90	
MEAN	33.29	27.49	23.50	3.99	0.93	0.33	3.34	0.91
HUB	37.43	10.38	6.50	3.88	0.93	0.32	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	367.381	203.068	306.158	1194.051	0.308	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.354	21.869	592.621	46.000	33.555	33.000	-0.555

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	323.232	203.068	381.727	1196.612	0.270	0.210

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.348	22.192	595.166	440.827	0.024	0.361

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	303.169	0.000	303.169	1197.667	0.253	0.293

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.311	596.215	0.000	0.060	0.037	0.289

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.880	23.329	1.063	603.887	11.858	255.039	1.977

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 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   73906.828       0.432     415.940  921125.938

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     505007.19   2842.1292     97.2890      1.5442      0.8556     12.9716      1.1551


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.992   EfDer =  0.966

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      95.675    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   43.48865

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      93.465    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   73601.117   75072.977       3.055     831.557     272.190     619.754       2.277

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   216.43    -0.07   216.43     0.19   473.93
  MEAN    17.06     0.00    -0.02   216.43    -0.07   216.43     0.19
  HUB     12.51     0.00    -0.02   216.43    -0.07   216.43     0.19

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     65.54    50.47    15.07   475.82   522.80    14.72   518.90     0.47
  MEAN    61.19    47.20    13.99   393.48   449.14    14.72   518.90     0.40
  HUB     53.13    38.62    14.51   288.54   360.75    14.72   518.90     0.32

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   431.41   318.88   290.57  1131.10     0.38
  MEAN    18.04   439.74   326.68   294.36  1127.75     0.39
  HUB     15.00   480.83   375.82   299.92  1123.36     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   330.24   156.94     0.29  6580.11
  MEAN   415.99   307.61    89.31     0.27  5893.31     1.67
  HUB    345.97   301.40    29.85     0.27  5638.27

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.39     1.15    15.73   547.19     1.05   531.65     0.92     0.88
  MEAN    17.14     1.13    15.44   544.65     1.04   528.49     0.92     0.88
  HUB     17.05     1.13    15.03   543.70     1.04   524.39     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     47.66    28.37    24.20     4.17     0.93     0.47     2.90
  MEAN    47.98    16.88    12.70     4.18     0.95     0.42     3.51     0.88
  HUB     51.41    -5.68    -9.30     3.62     0.95     0.28     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.966
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ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	444.048	326.047	301.449	1127.974	0.394	0.000

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.178	15.435	528.709	24.000	47.245	35.400	-11.845

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	319.366	326.047	456.401	1136.423	0.281	0.457

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.136	16.220	536.660	528.796	0.034	0.574

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	297.866	0.000	297.866	1137.596	0.262	0.458

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.258	537.768	0.000	0.060	0.080	0.478

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.826	17.053	1.129	545.179	22.369	175.094	1.357

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
139263.422	0.615	752.953	910072.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =13.992 EfDer = 0.971

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
95.675	2643.000	17.053	545.179	1.000	1.000	0.980

W Kg/sec = 43.48865

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
84.553	2578.018	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73601.117	75072.977	2.398	590.487	246.239	474.134	1.926

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	285.10	-0.10	285.10	0.25	462.31
MEAN	18.08	0.00	-0.02	285.10	-0.10	285.10	0.25	
HUB	15.21	0.00	-0.02	285.10	-0.10	285.10	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.98	46.36	12.62	473.98	553.20	16.32	538.39	0.49
MEAN	55.64	42.30	13.34	416.97	505.20	16.32	538.39	0.44
HUB	50.91	37.84	13.07	350.81	452.13	16.32	538.39	0.40

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	396.28	262.17	297.16	1152.41	0.34
MEAN	18.01	397.98	261.44	300.06	1149.80	0.35
HUB	15.22	424.26	296.58	303.37	1147.15	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	363.19	208.80	0.32	5355.61	
MEAN	415.39	337.25	153.95	0.29	4710.38	1.65
HUB	351.11	308.23	54.53	0.27	4516.33	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.06	1.12	17.56	565.02	1.04	551.90	0.92	0.89
MEAN	18.81	1.10	17.31	562.63	1.03	549.40	0.92	0.89

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 HUB     18.73     1.10    17.04   561.91     1.03   546.88     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.42    35.09    31.50     3.59     0.93     0.42     2.90
 MEAN    41.07    27.16    23.50     3.66     0.94     0.41     3.30     0.89
 HUB     44.35    10.19     6.50     3.69     0.94     0.40     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     477.751     262.178     399.386    1144.260       0.418      -0.379

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.848      16.715     544.122      46.000      33.283      30.600      -2.683

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     405.074     262.178     482.517    1149.880       0.352      -0.010

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      18.836      17.286     549.480     400.556       0.017       0.347

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     399.510       0.000     399.510    1150.271       0.347       0.372

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      17.296     549.854       0.000       0.060       0.039      -0.004

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.860      18.803       1.103     563.183      18.005     199.237       1.544

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 112125.727       0.505     606.228  827207.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =13.992   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     95.675    2643.000      18.803     563.183       1.000       1.000       0.780
W Kg/sec =   43.48865

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.941    2536.474       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73601.117   75072.977       1.913     434.156     226.988     339.175       1.494

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   370.64    -0.13   370.64     0.32   444.23
 MEAN    17.74     0.00    -0.02   370.64    -0.13   370.64     0.32
 HUB     15.05     0.00    -0.02   370.64    -0.13   370.64     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.32    46.36     4.96   462.91   593.11    17.50   551.71     0.51
 MEAN    47.83    43.40     4.43   409.13   552.15    17.50   551.71     0.48
 HUB     43.13    38.84     4.29   347.12   507.89    17.50   551.71     0.44

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   382.21   235.21   301.26  1169.32     0.33
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 MEAN    17.51   386.47   239.04   303.68  1167.22     0.33
 HUB     14.85   414.88   279.76   306.37  1165.15     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   374.04   221.70     0.32  4662.10
 MEAN   403.78   345.48   164.74     0.30  4187.06     1.72
 HUB    342.51   312.72    62.75     0.27  4156.38

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.70     1.10    19.22   580.45     1.03   568.25     0.92     0.91
 MEAN    20.50     1.09    19.00   578.69     1.03   566.22     0.92     0.91
 HUB     20.49     1.09    18.76   578.57     1.03   564.20     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.98    36.35    31.50     4.85     0.93     0.44     2.90
 MEAN    38.21    28.48    23.50     4.98     0.92     0.44     3.28     0.91
 HUB     42.40    11.57     6.50     5.07     0.92     0.46     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     390.293     240.610     307.304    1167.533       0.334       0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.545      19.013     566.518      46.000      38.060      31.500      -6.560

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     316.321     240.610     397.432    1172.022       0.270       0.334

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.532      19.517     570.882     471.992       0.018       0.419

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     307.581       0.000     307.581    1172.489       0.262       0.325

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.522     571.337       0.000       0.060       0.051       0.337

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      20.480       1.089     579.237      16.053     212.246       1.645

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 100001.469       0.479     540.676 1053326.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =13.992   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     95.675    2643.000      20.480     579.237       1.000       1.000       0.980
W Kg/sec =   43.48865

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     72.568    2501.079       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73601.117   75072.977       2.429     513.330     211.347     401.059       1.898

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   289.88    -0.10   289.88     0.25   420.36
 MEAN    16.97     0.00    -0.02   289.88    -0.10   289.88     0.25
 HUB     14.32     0.00    -0.02   289.88    -0.10   289.88     0.25
```

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.88	46.36	10.52	444.22	530.52	19.63	572.22	0.45
MEAN	53.48	43.80	9.68	391.42	487.16	19.63	572.22	0.42
HUB	48.74	37.84	10.90	330.28	439.53	19.63	572.22	0.37

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	374.44	222.69	301.02	1184.46	0.32
MEAN	16.57	377.99	225.63	303.26	1182.48	0.32
HUB	13.89	404.41	264.66	305.78	1180.49	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	368.62	212.76	0.31	4206.39	
MEAN	382.27	341.32	156.64	0.29	3741.28	1.56
HUB	320.37	310.82	55.71	0.26	3677.54	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.28	1.09	20.79	594.81	1.03	583.10	0.92	0.91
MEAN	22.08	1.08	20.56	593.09	1.02	581.16	0.92	0.91
HUB	22.05	1.08	20.33	592.85	1.02	579.20	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.49	35.25	31.50	3.75	0.93	0.38	2.90	
MEAN	36.65	27.32	23.50	3.82	0.94	0.37	3.29	0.91
HUB	40.88	10.32	6.50	3.82	0.94	0.37	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.993

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	374.244	226.900	297.615	1183.226	0.316	0.045

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.118	20.635	581.890	46.000	37.322	32.400	-4.922

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	310.505	226.900	384.573	1186.925	0.262	0.332

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.110	21.082	585.533	456.573	0.015	0.414

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	295.793	0.000	295.793	1187.680	0.249	0.315

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.131	586.278	0.000	0.060	0.045	0.363

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.871	22.063	1.077	593.582	14.346	222.021	1.721

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
89388.133	0.471	483.293	840834.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =13.992 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
95.675	2643.000	22.063	593.582	1.000	1.000	0.980

W Kg/sec = 43.48865

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
68.191	2470.671	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73601.117	75072.977	2.566	509.668	198.603	390.276	1.965

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	276.80	-0.10	276.80	0.23	394.98
MEAN	15.91	0.00	-0.02	276.80	-0.10	276.80	0.23	
HUB	13.07	0.00	-0.02	276.80	-0.10	276.80	0.23	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.78	47.36	9.42	422.54	505.21	21.24	587.19	0.43
MEAN	52.98	44.80	8.18	367.03	459.78	21.24	587.19	0.39
HUB	47.45	38.84	8.61	301.45	409.33	21.24	587.19	0.34

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	355.62	208.78	287.87	1198.34	0.30
MEAN	15.50	356.17	206.71	290.05	1196.29	0.30
HUB	12.59	376.39	236.95	292.44	1194.23	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	353.40	204.99	0.29	3747.33	
MEAN	357.44	326.88	150.74	0.27	3204.96	1.55
HUB	290.38	297.28	53.43	0.25	2984.47	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.75	1.08	22.34	607.45	1.02	596.90	0.92	0.91
MEAN	23.50	1.07	22.10	605.44	1.02	594.85	0.92	0.91
HUB	23.40	1.06	21.84	604.63	1.02	592.80	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.95	35.45	31.50	3.95	0.93	0.37	2.90	
MEAN	35.48	27.46	23.50	3.96	0.93	0.36	3.34	0.91
HUB	39.02	10.35	6.50	3.85	0.93	0.34	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	360.293	210.496	292.408	1196.444	0.301	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.521	22.085	595.006	46.000	35.749	33.000	-2.749

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	308.288	210.496	373.296	1199.358	0.257	0.249

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.513	22.456	597.908	440.827	0.025	0.394

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	289.295	0.000	289.295	1200.308	0.241	0.327

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.561	598.855	0.000	0.060	0.039	0.321

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	23.493	1.065	605.841	12.259	243.179	1.885

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
76405.516	0.446	413.100	880858.688

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   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    517184.25   2796.2512     93.4649      1.5551      0.8498     13.9922      1.1588


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

   Fan-Core + 4 Stage LPC 70% Stat 2 20% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc =14.987   EfDer =  0.959

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     91.914    2643.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   41.77924

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.791    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  70708.070   72122.078       3.180     831.557     261.491     619.754       2.370

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   207.61    -0.07   207.61     0.19   473.93
 MEAN    17.06     0.00    -0.02   207.61    -0.07   207.61     0.19
 HUB     12.51     0.00    -0.02   207.61    -0.07   207.61     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     66.43    50.47    15.96   475.82   519.21    14.75   519.21     0.46
 MEAN    62.19    47.20    14.99   393.48   444.96    14.75   519.21     0.40
 HUB     54.27    38.62    15.65   288.54   355.52    14.75   519.21     0.32

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   428.13   325.05   278.64  1131.85     0.38
 MEAN    18.04   434.36   330.12   282.30  1128.41     0.38
 HUB     15.00   472.08   374.39   287.55  1124.02     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    475.82   316.81   150.77     0.28  6707.27
 MEAN   415.99   295.07    85.87     0.26  5955.26     1.73
 HUB    345.97   288.95    28.43     0.26  5616.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.42     1.15    15.78   547.66     1.05   532.35     0.92     0.88
 MEAN    17.15     1.14    15.48   544.87     1.04   529.12     0.92     0.88
 HUB     17.03     1.13    15.08   543.62     1.04   525.01     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.40    28.42    24.20     4.22     0.93     0.50     2.90
 MEAN    49.46    16.92    12.70     4.22     0.95     0.45     3.51     0.88
 HUB     52.47    -5.65    -9.30     3.65     0.95     0.31     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.959

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     438.318     329.478     289.080    1128.645       0.388       0.001
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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.181      15.482     529.339      24.000      48.737      35.400     -13.337

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     305.976     329.478     449.641    1137.382       0.269       0.482

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.133      16.292     537.566     528.796       0.037       0.599

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     285.663       0.000     285.663    1138.444       0.251       0.473

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.311     538.570       0.000       0.060       0.089       0.493

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.814      17.042       1.128     545.386      22.576     170.309       1.320

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 140552.750       0.621     730.054  872992.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =14.987   EfDer =  0.963

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     91.914    2643.000      17.042     545.386       1.000       1.000       0.980
W Kg/sec =   41.77924

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.298    2577.529       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  70708.070   72122.078       2.494     590.487     236.759     474.134       2.003

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   273.49    -0.09   273.49     0.24   462.22
 MEAN    18.08     0.00    -0.02   273.49    -0.09   273.49     0.24
 HUB     15.21     0.00    -0.02   273.49    -0.09   273.49     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.02    46.36    13.66   473.98   547.30    16.37   539.14     0.48
 MEAN    56.75    42.30    14.45   416.97   498.73    16.37   539.14     0.44
 HUB     52.07    37.84    14.23   350.81   444.89    16.37   539.14     0.39

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   393.01   270.53   285.08  1153.51     0.34
 MEAN    18.01   393.05   267.55   287.93  1150.78     0.34
 HUB     15.22   417.14   298.70   291.18  1148.02     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   348.50   200.45     0.30  5526.09
 MEAN   415.39   323.67   147.84     0.28  4820.35     1.70
 HUB    351.11   295.86    52.41     0.26  4548.50

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.09     1.12    17.61   565.85     1.04   552.96     0.92     0.88
 MEAN    18.82     1.10    17.36   563.24     1.03   550.34     0.92     0.88
 HUB     18.72     1.10    17.08   562.23     1.03   547.70     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     43.50    35.11    31.50     3.61     0.93     0.45     2.90
 MEAN    42.90    27.18    23.50     3.68     0.95     0.43     3.30     0.88
 HUB     45.73    10.20     6.50     3.70     0.95     0.42     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.963

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     467.101     268.305     382.356    1145.765       0.408       -0.355

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.859      16.817     545.556      46.000      35.058      30.600      -4.458

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     387.275     268.305     471.137    1151.730       0.336       0.049

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      18.846      17.425     551.251     400.556       0.019       0.374

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     382.099       0.000     382.099    1152.077       0.332       0.400

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      17.428     551.584       0.000       0.060       0.043       0.050

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.851       18.809       1.104     563.776      18.391     192.057       1.489

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 114529.867       0.516     594.887  792474.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =14.987   EfDer =  0.999

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     91.914     2643.000       18.809     563.776       1.000        1.000        0.780
W Kg/sec =   41.77924

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     74.893     2535.140        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  70708.070   72122.078        1.991     434.156     218.112     339.175       1.555

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   354.78    -0.12   354.78      0.31   444.00
 MEAN    17.74      0.00    -0.02   354.78    -0.12   354.78      0.31
 HUB     15.05      0.00    -0.02   354.78    -0.12   354.78      0.31

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     52.54     46.36      6.18   462.91   583.32     17.61   553.27      0.51
 MEAN    49.08     43.40      5.68   409.13   541.62     17.61   553.27      0.47
 HUB     44.39     38.84      5.55   347.12   496.43     17.61   553.27      0.43

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   378.47    245.07    288.42  1170.91      0.32
 MEAN    17.51   381.20    246.36    290.89  1168.67      0.33
 HUB     14.85   407.59    282.72    293.60  1166.44      0.35
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	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	357.86	211.84	0.31	4857.21	
MEAN	403.78	330.75	157.42	0.28	4315.15	1.77
HUB	342.51	299.63	59.79	0.26	4200.18	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.79	1.11	19.34	581.76	1.03	569.80	0.92	0.91
MEAN	20.56	1.09	19.10	579.76	1.03	567.62	0.92	0.91
HUB	20.52	1.09	18.85	579.33	1.03	565.46	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.35	36.30	31.50	4.80	0.93	0.46	2.90	
MEAN	40.26	28.42	23.50	4.92	0.92	0.46	3.28	0.91
HUB	43.92	11.51	6.50	5.01	0.92	0.47	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	384.891	247.980	294.358	1168.967	0.329	0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.609	19.116	567.914	46.000	40.112	31.500	-8.612

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	302.603	247.980	391.232	1173.818	0.258	0.369

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.591	19.660	572.637	471.992	0.021	0.451

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	294.428	0.000	294.428	1174.236	0.251	0.351

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.652	573.045	0.000	0.060	0.061	0.363

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.869	20.531	1.092	580.283	16.506	203.365	1.576

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
102823.836	0.493	534.084	1006715.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =14.987 EfDer = 0.987

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
91.914	2643.000	20.531	580.283	1.000	1.000	0.980

W Kg/sec = 41.77924

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
69.606	2498.823	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
70708.070	72122.078	2.532	513.330	202.721	401.059	1.978

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	277.58	-0.10	277.58	0.24	419.98
MEAN	16.97	0.00	-0.02	277.58	-0.10	277.58	0.24	
HUB	14.32	0.00	-0.02	277.58	-0.10	277.58	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.01	46.36	11.65	444.22	523.90	19.75	573.85	0.45
MEAN	54.66	43.80	10.86	391.42	479.94	19.75	573.85	0.41

```
HUB     49.96    37.84    12.12   330.28   431.51    19.75   573.85     0.37

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   369.84   231.91   288.10  1186.46     0.31
MEAN    16.57   371.89   232.38   290.35  1184.35     0.31
HUB     13.89   396.36   267.07   292.88  1182.22     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   352.75   203.55     0.30  4380.21
MEAN   382.27   326.75   149.89     0.28  3853.06     1.61
HUB    320.37   297.68    53.29     0.25  3710.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.40     1.09    20.94   596.50     1.03   585.08     0.92     0.90
MEAN    22.17     1.08    20.70   594.55     1.02   583.00     0.92     0.90
HUB     22.10     1.08    20.45   594.02     1.02   580.91     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.83    35.24    31.50     3.74     0.93     0.40     2.90
MEAN    38.67    27.30    23.50     3.80     0.94     0.39     3.29     0.90
HUB     42.36    10.31     6.50     3.81     0.94     0.39     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.987

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     368.558     233.687     285.001    1185.042       0.311       0.043

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.207      20.765     583.682      46.000      39.350      32.400      -6.950

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     296.983     233.687     377.900    1189.072       0.250       0.365

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.196      21.252     587.659     456.573       0.018       0.445

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     283.088       0.000     283.088    1189.753       0.238       0.341

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      21.285     588.332       0.000       0.060       0.053       0.387

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.861      22.142       1.078     595.022      14.739     212.892       1.650

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91841.695       0.484     477.041  804623.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =14.987   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     91.914    2643.000      22.142     595.022       1.000       1.000       0.980
W Kg/sec =   41.77924

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     65.357    2467.680       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  70708.070   72122.078       2.678     509.668     190.351     390.276       2.050
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ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	265.00	-0.09	265.00	0.22	394.50
MEAN	15.91	0.00	-0.02	265.00	-0.09	265.00	0.22	
HUB	13.07	0.00	-0.02	265.00	-0.09	265.00	0.22	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.91	47.36	10.55	422.54	498.84	21.39	589.16	0.42
MEAN	54.18	44.80	9.38	367.03	452.77	21.39	589.16	0.38
HUB	48.69	38.84	9.85	301.45	401.44	21.39	589.16	0.34

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	351.13	217.79	275.42	1200.64	0.29
MEAN	15.50	350.08	213.29	277.60	1198.47	0.29
HUB	12.59	368.34	239.33	279.99	1196.28	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	338.04	195.99	0.28	3908.80	
MEAN	357.44	312.80	144.15	0.26	3306.98	1.60
HUB	290.38	284.60	51.05	0.24	3014.37	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.90	1.08	22.52	609.49	1.02	599.20	0.92	0.91
MEAN	23.62	1.07	22.26	607.26	1.02	597.03	0.92	0.91
HUB	23.49	1.06	21.99	606.18	1.02	594.85	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.33	35.44	31.50	3.94	0.93	0.40	2.90	
MEAN	37.54	27.44	23.50	3.94	0.94	0.38	3.34	0.91
HUB	40.52	10.33	6.50	3.83	0.94	0.36	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.994

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	354.259	217.204	279.861	1198.607	0.296	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.641	22.249	597.167	46.000	37.815	33.000	-4.815

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	294.724	217.204	366.114	1201.839	0.245	0.285

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	23.630	22.660	600.392	440.827	0.028	0.426

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	276.703	0.000	276.703	1202.699	0.230	0.356

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	22.751	601.251	0.000	0.060	0.044	0.350

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.873	23.607	1.066	607.642	12.620	232.805	1.805

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
78661.305	0.459	408.580	842758.062

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
528409.44	2744.6443	89.7911	1.5626	0.8415	14.9870	1.1623

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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Fan-Core + 4 Stage LPC 70% Stat 2 20% Ice Block 8-22-2011

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1

RESET = 0.000 BLEED = 0.000 DPInc = 15.956 EfDer = 0.950

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
88.301	2643.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 40.13702

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
86.262	2632.591	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
67928.758	69287.188	3.310	831.557	251.213	619.754	2.467

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	199.18	-0.07	199.18	0.18	473.93
MEAN	17.06	0.00	-0.02	199.18	-0.07	199.18	0.18	
HUB	12.51	0.00	-0.02	199.18	-0.07	199.18	0.18	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	67.29	50.47	16.82	475.82	515.89	14.78	519.50	0.46
MEAN	63.16	47.20	15.96	393.48	441.08	14.78	519.50	0.39
HUB	55.39	38.62	16.77	288.54	350.66	14.78	519.50	0.31

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	425.35	330.87	267.30	1132.54	0.38
MEAN	18.04	429.46	333.31	270.82	1129.01	0.38
HUB	15.00	463.86	372.98	275.78	1124.62	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	475.82	304.08	144.95	0.27	6827.19	
MEAN	415.99	283.16	82.69	0.25	6012.67	1.79
HUB	345.97	277.10	27.01	0.25	5595.50	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.44	1.15	15.82	548.11	1.05	532.99	0.92	0.87
MEAN	17.15	1.14	15.52	545.09	1.04	529.68	0.92	0.87
HUB	17.00	1.13	15.12	543.54	1.04	525.57	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	51.07	28.47	24.20	4.27	0.93	0.52	2.90	
MEAN	50.90	16.98	12.70	4.28	0.95	0.47	3.51	0.87
HUB	53.52	-5.59	-9.30	3.71	0.95	0.33	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.950

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	433.085	332.658	277.311	1129.257	0.384	0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.181	15.521	529.912	24.000	50.185	35.400	-14.785

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	293.269	332.658	443.473	1138.259	0.258	0.507

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.129	16.355	538.395	528.796	0.041	0.624

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	274.055	0.000	274.055	1139.221	0.241	0.488

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.355	539.305	0.000	0.060	0.099	0.507

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.802	17.029	1.127	545.578	22.768	165.754	1.285

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
141752.406	0.626	707.344	837527.938

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =15.956 EfDer = 0.954

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
88.301	2643.000	17.029	545.578	1.000	1.000	0.980

W Kg/sec = 40.13702

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
78.177	2577.073	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
67928.758	69287.188	2.594	590.487	227.671	474.134	2.083

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	262.43	-0.09	262.43	0.23	462.14
MEAN	18.08	0.00	-0.02	262.43	-0.09	262.43	0.23	
HUB	15.21	0.00	-0.02	262.43	-0.09	262.43	0.23	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.03	46.36	14.67	473.98	541.86	16.41	539.83	0.48
MEAN	57.82	42.30	15.52	416.97	492.76	16.41	539.83	0.43
HUB	53.21	37.84	15.37	350.81	438.18	16.41	539.83	0.38

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	390.35	278.37	273.65	1154.51	0.34
MEAN	18.01	388.70	273.27	276.43	1151.67	0.34
HUB	15.22	410.55	300.63	279.60	1148.81	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	334.64	192.61	0.29	5686.09	
MEAN	415.39	310.82	142.12	0.27	4923.23	1.75
HUB	351.11	284.12	50.48	0.25	4577.89	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.12	1.12	17.66	566.64	1.04	553.92	0.92	0.87
MEAN	18.83	1.11	17.40	563.81	1.03	551.20	0.92	0.87
HUB	18.70	1.10	17.11	562.54	1.03	548.46	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	45.49	35.14	31.50	3.64	0.93	0.47	2.90	
MEAN	44.67	27.21	23.50	3.71	0.95	0.45	3.30	0.87
HUB	47.08	10.23	6.50	3.73	0.95	0.44	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.954

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      457.487     274.038     366.329     1147.123       0.399       -0.331

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     18.864      16.903      546.852      46.000      36.799       30.600       -6.199

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     17.960      370.601     274.038     460.915     1153.407       0.321        0.104

   BlockageThr  PtTh        PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.750       18.847      17.545      552.860      400.556       0.021        0.401

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4        cp 3-4
     17.823      365.809       0.000     365.809     1153.715       0.317        0.426

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.750       17.538      553.155       0.000       0.060       0.049        0.099

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.840       18.805        1.104      564.330       18.752     185.413        1.437

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 116776.953       0.526     582.716  759383.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =15.956   EfDer =  1.000

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     88.301     2643.000       18.805      564.330        1.000        1.000        0.780
W Kg/sec =   40.13702

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     71.997     2533.896        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
  67928.758   69287.188        2.071      434.156      209.681      339.175       1.618

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02    339.89    -0.12    339.89      0.29    443.78
 MEAN    17.74      0.00    -0.02    339.89    -0.12    339.89      0.29
 HUB     15.05      0.00    -0.02    339.89    -0.12    339.89      0.29

       BetaFlo    BetaBlade Incid    U1        W1        Ps1       Ts1      Rel Mach
 TIP     53.72     46.36      7.36    462.91    574.38     17.71    554.68      0.50
 MEAN    50.29     43.40      6.89    409.13    531.99     17.71    554.68      0.46
 HUB     45.61     38.84      6.77    347.12    485.90     17.71    554.68      0.42

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500        0.050        0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP      19.81    375.57    254.22    276.44   1172.35      0.32
 MEAN     17.51    376.68    253.15    278.93   1169.98      0.32
 HUB      14.85    400.98    285.41    281.65   1167.62      0.34

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP     456.91    342.78    202.68      0.29   5038.55
 MEAN    403.78    317.00    150.63      0.27   4433.88      1.82
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 HUB    342.51   287.38    57.10     0.25  4240.13

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.87     1.11    19.43   582.99     1.03   571.21     0.92     0.91
 MEAN    20.61     1.10    19.18   580.75     1.03   568.90     0.92     0.91
 HUB     20.53     1.09    18.92   580.03     1.03   566.61     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.60    36.25    31.50     4.75     0.93     0.48     2.90
 MEAN    42.23    28.37    23.50     4.87     0.93     0.48     3.28     0.91
 HUB     45.38    11.46     6.50     4.96     0.93     0.48     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     380.265     254.812     282.262    1170.268       0.325       0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.653      19.195     569.182      46.000      42.074      31.500     -10.574

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     289.828     254.812     385.914    1175.458       0.247       0.401

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.631      19.775     574.242     471.992       0.025       0.483

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     282.185       0.000     282.185    1175.832       0.240       0.374

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.752     574.607       0.000       0.060       0.072       0.386

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864       20.561       1.093     581.256      16.926     195.340       1.514

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 105438.133       0.505     526.136  962659.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =15.956   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     88.301    2643.000      20.561     581.256       1.000       1.000       0.980
W Kg/sec =   40.13702

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     66.830    2496.730       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  67928.758   69287.188       2.637     513.330     194.636     401.059       2.061

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   266.12    -0.09   266.12     0.23   419.63
 MEAN    16.97     0.00    -0.02   266.12    -0.09   266.12     0.23
 HUB     14.32     0.00    -0.02   266.12    -0.09   266.12     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.08    46.36    12.72   444.22   517.92    19.84   575.34     0.44
 MEAN    55.79    43.80    11.99   391.42   473.40    19.84   575.34     0.40
 HUB     51.15    37.84    13.31   330.28   424.23    19.84   575.34     0.36

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
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B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	366.09	240.35	276.14	1188.27	0.31
MEAN	16.57	366.62	238.58	278.37	1186.05	0.31
HUB	13.89	389.11	269.28	280.88	1183.80	0.33

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	338.11	195.10	0.28	4539.67	
MEAN	382.27	313.27	143.69	0.26	3955.74	1.66
HUB	320.37	285.48	51.09	0.24	3741.60	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.48	1.09	21.05	598.06	1.03	586.87	0.92	0.90
MEAN	22.23	1.08	20.80	595.90	1.03	584.68	0.92	0.90
HUB	22.14	1.08	20.54	595.11	1.02	582.47	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.04	35.24	31.50	3.74	0.93	0.43	2.90	
MEAN	40.60	27.30	23.50	3.80	0.94	0.41	3.29	0.90
HUB	43.79	10.31	6.50	3.81	0.94	0.41	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.980

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	363.663	239.921	273.293	1186.693	0.306	0.040

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.267	20.862	585.316	46.000	41.280	32.400	-8.880

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	284.476	239.921	372.141	1191.029	0.239	0.396

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.252	21.385	589.600	456.573	0.020	0.476

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	271.342	0.000	271.342	1191.644	0.228	0.364

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.402	590.210	0.000	0.060	0.062	0.408

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.850	22.190	1.079	596.356	15.100	204.700	1.587

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
94092.406	0.496	469.521	770264.688

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =15.956 EfDer = 0.989

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
88.301	2643.000	22.190	596.356	1.000	1.000	0.980

W Kg/sec = 40.13702

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
62.723	2464.918	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
67928.758	69287.188	2.790	509.668	182.680	390.276	2.136

ROTOR LEADING EDGE CONDITIONS, STAGE 5

```
       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   254.09    -0.09   254.09     0.21   394.06
MEAN    15.91     0.00    -0.02   254.09    -0.09   254.09     0.21
HUB     13.07     0.00    -0.02   254.09    -0.09   254.09     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.99    47.36    11.63   422.54   493.13    21.50   590.97     0.41
MEAN    55.31    44.80    10.51   367.03   446.47    21.50   590.97     0.37
HUB     49.88    38.84    11.04   301.45   394.32    21.50   590.97     0.33

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   347.51   226.00   263.98  1202.73     0.29
MEAN    15.50   344.87   219.33   266.13  1200.45     0.29
HUB     12.59   361.11   241.48   268.49  1198.16     0.30

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.78   323.95   187.78     0.27  4056.07
MEAN   357.44   299.84   138.11     0.25  3400.53     1.65
HUB    290.38   272.91    48.90     0.23  3041.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.00     1.08    22.65   611.37     1.03   601.29     0.92     0.90
MEAN    23.70     1.07    22.38   608.94     1.02   599.01     0.92     0.90
HUB     23.54     1.06    22.10   607.61     1.02   596.73     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.57    35.43    31.50     3.93     0.93     0.42     2.90
MEAN    39.49    27.43    23.50     3.93     0.94     0.40     3.34     0.90
HUB     41.97    10.32     6.50     3.82     0.94     0.38     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     349.106     223.355     268.305    1200.571       0.291      -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.722      22.369     599.134      46.000      39.776      33.000      -6.776

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     282.284     223.355     359.961    1204.094       0.234       0.318

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.705      22.815     602.656     440.827       0.032       0.456

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     265.154       0.000     265.154    1204.875       0.220       0.382

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.892     603.438       0.000       0.060       0.052       0.375

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      23.679       1.067     609.306      12.950     223.583       1.733

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  80720.609       0.471     402.795  806634.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    538780.50   2688.5122     86.2617      1.5674      0.8313     15.9559      1.1654
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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 70% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =17.015   EfDer =  0.940

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      84.406    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   38.36656

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
      82.457    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  64932.395   66230.898       3.463     831.557     240.132     619.754       2.581

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   190.12    -0.07   190.12     0.17   473.93
  MEAN    17.06     0.00    -0.02   190.12    -0.07   190.12     0.17
  HUB     12.51     0.00    -0.02   190.12    -0.07   190.12     0.17

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.22    50.47    17.75   475.82   512.46    14.80   519.79     0.46
  MEAN    64.21    47.20    17.01   393.48   437.07    14.80   519.79     0.39
  HUB     56.62    38.62    18.00   288.54   345.60    14.80   519.79     0.31

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   422.71   336.97   255.22  1133.23     0.37
  MEAN    18.04   424.50   336.67   258.57  1129.63     0.38
  HUB     15.00   455.23   371.43   263.20  1125.24     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   290.54   138.85     0.26  6953.10
  MEAN   415.99   270.46    79.32     0.24  6073.28     1.86
  HUB    345.97   264.43    25.47     0.23  5572.32

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.46     1.16    15.86   548.57     1.05   533.65     0.92     0.86
  MEAN    17.15     1.14    15.55   545.31     1.04   530.26     0.92     0.86
  HUB     16.97     1.12    15.16   543.46     1.04   526.15     0.92     0.86

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     52.86    28.55    24.20     4.35     0.93     0.55     2.90
  MEAN    52.48    17.06    12.70     4.36     0.95     0.49     3.51     0.86
  HUB     54.68    -5.53    -9.30     3.77     0.95     0.36     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.940

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     427.782     336.014     264.749    1129.878       0.379       0.002

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      17.178      15.558     530.495      24.000      51.765      35.400     -16.365

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     279.734     336.014     437.215    1139.156       0.246       0.534

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.120      16.416     539.244     528.796       0.044       0.650

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     261.657       0.000     261.657    1140.019       0.230       0.503

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.398     540.062       0.000       0.060       0.110       0.523

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.788      17.011       1.126     545.780      22.970     160.875       1.247

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 143008.281       0.632     682.133  799456.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =17.015   EfDer =  0.943

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     84.406    2643.000      17.011     545.780       1.000       1.000       0.980
W Kg/sec =   38.36656

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     74.818    2576.597       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  64932.395   66230.898       2.710     590.487     217.890     474.134       2.176

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   250.62    -0.09   250.62     0.22   462.05
 MEAN    18.08     0.00    -0.02   250.62    -0.09   250.62     0.22
 HUB     15.21     0.00    -0.02   250.62    -0.09   250.62     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.14    46.36    15.78   473.98   536.23    16.45   540.54     0.47
 MEAN    59.00    42.30    16.70   416.97   486.56    16.45   540.54     0.43
 HUB     54.46    37.84    16.62   350.81   431.21    16.45   540.54     0.38

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   387.96   286.58   261.50  1155.53     0.34
 MEAN    18.01   384.43   279.28   264.18  1152.59     0.33
 HUB     15.22   403.72   302.62   267.24  1149.62     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   319.98   184.40     0.28  5853.71
 MEAN   415.39   297.18   136.11     0.26  5031.46     1.81
 HUB    351.11   271.60    48.50     0.24  4608.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.13     1.12    17.70   567.46     1.04   554.89     0.92     0.86
 MEAN    18.83     1.11    17.43   564.42     1.03   552.08     0.92     0.86
 HUB     18.67     1.10    17.14   562.85     1.03   549.24     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.62    35.19    31.50     3.69     0.93     0.50     2.90
 MEAN    46.59    27.26    23.50     3.76     0.95     0.48     3.30     0.86
 HUB     48.55    10.29     6.50     3.79     0.95     0.46     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.750       1.000       0.943

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     447.784     280.068     349.389    1148.497       0.390      -0.307

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.861      16.982     548.165      46.000      38.715      30.600      -8.115

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     353.046     280.068     450.644    1155.115       0.306       0.162

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      18.840      17.657     554.501     400.556       0.024       0.431

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     348.673       0.000     348.673    1155.382       0.302       0.452

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      17.639     554.757       0.000       0.060       0.058       0.150

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.826      18.791       1.105     564.909      19.129     178.501       1.384

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 119129.695       0.537     568.235  723990.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =17.015   EfDer =  0.998

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     84.406    2643.000      18.791     564.909       1.000       1.000       0.780
W Kg/sec =   38.36656

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     68.909    2532.596       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  64932.395   66230.898       2.163     434.156     200.686     339.175       1.690

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   324.20    -0.11   324.20     0.28   443.56
 MEAN    17.74     0.00    -0.02   324.20    -0.11   324.20     0.28
 HUB     15.05     0.00    -0.02   324.20    -0.11   324.20     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.00    46.36     8.64   462.91   565.23    17.79   556.13     0.49
 MEAN    51.61    43.40     8.21   409.13   522.10    17.79   556.13     0.45
 HUB     46.96    38.84     8.12   347.12   475.05    17.79   556.13     0.41

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   373.08   263.72   263.89  1173.82     0.32
 MEAN    17.51   372.38   260.22   266.37  1171.32     0.32
 HUB     14.85   394.29   288.22   269.06  1168.83     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   327.04   193.19     0.28  5226.59
 MEAN   403.78   302.59   143.56     0.26  4557.60     1.88
 HUB    342.51   274.49    54.29     0.23  4281.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     20.92     1.11    19.51   584.26     1.03   572.64     0.92     0.91
 MEAN    20.64     1.10    19.24   581.79     1.03   570.21     0.92     0.91
 HUB     20.53     1.09    18.97   580.76     1.03   567.78     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.98    36.21    31.50     4.71     0.93     0.50     2.90
 MEAN    44.33    28.32    23.50     4.82     0.93     0.50     3.28     0.91
 HUB     46.97    11.41     6.50     4.91     0.93     0.50     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     375.856     261.931     269.554    1171.593       0.321       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.682      19.257     570.477      46.000      44.178      31.500     -12.678

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     276.444     261.931     380.827    1177.140       0.235       0.436

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.654      19.875     575.891     471.992       0.029       0.517

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     269.354       0.000     269.354    1177.470       0.229       0.397

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.835     576.214       0.000       0.060       0.085       0.409

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.856      20.572       1.095     582.271      17.362     187.172       1.451

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 108154.688       0.518     515.885  915879.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =17.015   EfDer =  0.972

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     84.406    2643.000      20.572     582.271       1.000       1.000       0.980
W Kg/sec =   38.36656

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     63.902    2494.552       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  64932.395   66230.898       2.758     513.330     186.109     401.059       2.155

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   254.10    -0.09   254.10     0.22   419.26
 MEAN    16.97     0.00    -0.02   254.10    -0.09   254.10     0.22
 HUB     14.32     0.00    -0.02   254.10    -0.09   254.10     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.23    46.36    13.87   444.22   511.84    19.92   576.88     0.43
 MEAN    57.02    43.80    13.22   391.42   466.74    19.92   576.88     0.40
 HUB     52.43    37.84    14.59   330.28   416.79    19.92   576.88     0.35

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	362.73	249.11	263.66	1190.12	0.30
MEAN	16.57	361.52	244.99	265.85	1187.78	0.30
HUB	13.89	381.72	271.52	268.31	1185.43	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	322.86	186.34	0.27	4704.97	
MEAN	382.27	299.20	137.28	0.25	4061.88	1.72
HUB	320.37	272.72	48.85	0.23	3772.62	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.55	1.10	21.14	599.69	1.03	588.71	0.92	0.89
MEAN	22.27	1.08	20.88	597.31	1.03	586.40	0.92	0.89
HUB	22.15	1.08	20.61	596.24	1.02	584.07	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.38	35.25	31.50	3.75	0.93	0.45	2.90	
MEAN	42.66	27.31	23.50	3.81	0.94	0.44	3.29	0.89
HUB	45.34	10.32	6.50	3.82	0.94	0.43	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.972

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	358.947	246.366	261.050	1188.381	0.302	0.038

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.306	20.936	586.989	46.000	43.342	32.400	-10.942

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	271.437	246.366	366.571	1193.034	0.228	0.429

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.286	21.496	591.594	456.573	0.024	0.509

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	259.095	0.000	259.095	1193.585	0.217	0.387

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.495	592.141	0.000	0.060	0.074	0.429

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.837	22.213	1.080	597.745	15.473	196.393	1.522

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
96417.961	0.508	459.903	733648.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =17.015 EfDer = 0.982

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
84.406	2643.000	22.213	597.745	1.000	1.000	0.980

W Kg/sec = 38.36656

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
59.963	2462.053	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
64932.395	66230.898	2.918	509.668	174.641	390.276	2.235

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	242.69	-0.08	242.69	0.20	393.60
MEAN	15.91	0.00	-0.02	242.69	-0.08	242.69	0.20	

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HUB     13.07     0.00    -0.02   242.69    -0.08   242.69     0.20

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.13    47.36    12.77   422.54   487.35    21.58   592.83     0.41
MEAN    56.53    44.80    11.73   367.03   440.08    21.58   592.83     0.37
HUB     51.17    38.84    12.33   301.45   387.07    21.58   592.83     0.32

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   344.29   234.48   252.10  1204.85     0.29
MEAN    15.50   339.83   225.52   254.21  1202.47     0.28
HUB     12.59   353.83   243.71   256.51  1200.08     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.78   309.36   179.30     0.26  4208.09
MEAN   357.44   286.40   131.93     0.24  3496.34     1.71
HUB    290.38   260.73    46.67     0.22  3069.41

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     24.08     1.08    22.75   613.32     1.03   603.43     0.92     0.90
MEAN    23.76     1.07    22.47   610.68     1.02   601.05     0.92     0.90
HUB     23.57     1.06    22.18   609.10     1.02   598.66     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.93    35.42    31.50     3.92     0.93     0.45     2.90
MEAN    41.58    27.43    23.50     3.93     0.94     0.42     3.34     0.90
HUB     43.53    10.31     6.50     3.81     0.94     0.40     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     344.130     229.654     256.290    1202.580       0.286      -0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.775      22.460     601.151      46.000      41.863      33.000      -8.863

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     269.397     229.654     354.000    1206.401       0.223       0.352

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.751      22.940     604.978     440.827       0.038       0.490

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     253.184       0.000     253.184    1207.106       0.210       0.408

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.002     605.685       0.000       0.060       0.062       0.399

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.853      23.719       1.068     611.035      13.290     214.302       1.661

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   82841.906       0.484     395.146  768158.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     549552.50   2621.3020     82.4566      1.5701      0.8183     17.0148      1.1688


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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
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*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 70% Stat 2 20% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =17.475   EfDer =  0.935

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      82.731    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   37.60497

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
      80.820    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   63643.449   64916.180       3.533     831.557     235.365     619.754       2.633

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   186.24    -0.06   186.24     0.17   473.93
  MEAN    17.06     0.00    -0.02   186.24    -0.06   186.24     0.17
  HUB     12.51     0.00    -0.02   186.24    -0.06   186.24     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.63    50.47    18.16   475.82   511.03    14.82   519.91     0.46
  MEAN    64.67    47.20    17.47   393.48   435.39    14.82   519.91     0.39
  HUB     57.16    38.62    18.54   288.54   343.48    14.82   519.91     0.31

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   421.69   339.54   250.06  1133.52     0.37
  MEAN    18.04   422.46   338.08   253.33  1129.88     0.37
  HUB     15.00   451.58   370.75   257.83  1125.49     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   284.78   136.28     0.25  7006.09
  MEAN   415.99   265.04    77.92     0.23  6098.66     1.90
  HUB    345.97   259.02    24.78     0.23  5562.00

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.47     1.16    15.87   548.77     1.05   533.92     0.92     0.86
  MEAN    17.15     1.14    15.57   545.41     1.04   530.50     0.92     0.86
  HUB     16.96     1.12    15.18   543.42     1.04   526.39     0.92     0.86

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     53.63    28.59    24.20     4.39     0.93     0.56     2.90
  MEAN    53.15    17.10    12.70     4.40     0.95     0.51     3.51     0.86
  HUB     55.18    -5.49    -9.30     3.81     0.95     0.37     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.935

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     425.598     337.421     259.385    1130.133       0.377       0.002

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      17.175      15.571     530.735      24.000      52.449      35.400     -17.049

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      18.071     273.962     337.421     434.635    1139.527       0.240       0.545

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      17.115      16.439     539.595     528.796       0.046       0.662

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     256.359       0.000     256.359    1140.350       0.225       0.510

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.414     540.375       0.000       0.060       0.114       0.529

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.782      17.003       1.125     545.864      23.054     158.788       1.231

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 143531.547       0.634     671.039  783129.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =17.475   EfDer =  0.938

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     82.731    2643.000      17.003     545.864       1.000       1.000       0.980
W Kg/sec =   37.60497

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     73.375    2576.398       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63643.449   64916.180       2.763     590.487     213.688     474.134       2.219

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   245.57    -0.08   245.57     0.22   462.02
 MEAN    18.08     0.00    -0.02   245.57    -0.08   245.57     0.22
 HUB     15.21     0.00    -0.02   245.57    -0.08   245.57     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.62    46.36    16.26   473.98   533.89    16.46   540.83     0.47
 MEAN    59.51    42.30    17.21   416.97   483.98    16.46   540.83     0.42
 HUB     55.01    37.84    17.17   350.81   428.29    16.46   540.83     0.38

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   387.09   290.06   256.33  1155.94     0.33
 MEAN    18.01   382.73   281.83   258.96  1152.96     0.33
 HUB     15.22   400.88   303.44   261.97  1149.96     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   313.75   180.92     0.27  5924.70
 MEAN   415.39   291.37   133.56     0.25  5077.21     1.84
 HUB    351.11   266.27    47.67     0.23  4620.56

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.14     1.13    17.71   567.81     1.04   555.30     0.92     0.86
 MEAN    18.82     1.11    17.44   564.67     1.03   552.44     0.92     0.86
 HUB     18.65     1.10    17.15   562.98     1.03   549.56     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.53    35.21    31.50     3.71     0.93     0.51     2.90
 MEAN    47.42    27.28    23.50     3.78     0.95     0.49     3.30     0.86
 HUB     49.20    10.31     6.50     3.81     0.95     0.47     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.938

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	443.820	282.617	342.204	1149.061	0.386	-0.296

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.857	17.011	548.704	46.000	39.552	30.600	-8.952

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	345.620	282.617	446.459	1155.819	0.299	0.187

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	18.834	17.700	555.178	400.556	0.026	0.444

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	341.429	0.000	341.429	1156.070	0.295	0.462

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	17.677	555.418	0.000	0.060	0.063	0.171

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.819	18.781	1.105	565.153	19.289	175.595	1.361

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
120123.602	0.542	561.602	708852.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =17.475 EfDer = 0.996

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
82.731	2643.000	18.781	565.153	1.000	1.000	0.780

W Kg/sec = 37.60497

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
67.590	2532.050	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
63643.449	64916.180	2.206	434.156	196.846	339.175	1.723

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	317.55	-0.11	317.55	0.27	443.46
MEAN	17.74	0.00	-0.02	317.55	-0.11	317.55	0.27	
HUB	15.05	0.00	-0.02	317.55	-0.11	317.55	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.56	46.36	9.20	462.91	561.45	17.82	556.73	0.49
MEAN	52.19	43.40	8.79	409.13	517.99	17.82	556.73	0.45
HUB	47.56	38.84	8.72	347.12	470.54	17.82	556.73	0.41

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	372.22	267.73	258.59	1174.42	0.32
MEAN	17.51	370.69	263.18	261.05	1171.87	0.32
HUB	14.85	391.54	289.39	263.74	1169.33	0.33

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	320.40	189.18	0.27	5305.93	
MEAN	403.78	296.51	140.60	0.25	4609.27	1.90
HUB	342.51	269.03	53.11	0.23	4299.14	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.94	1.11	19.53	584.80	1.03	573.23	0.92	0.91
MEAN	20.65	1.10	19.26	582.22	1.03	570.75	0.92	0.91
HUB	20.52	1.09	18.98	581.07	1.03	568.27	0.92	0.91

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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.99    36.19    31.50     4.69     0.93     0.51     2.90
 MEAN    45.23    28.31    23.50     4.81     0.93     0.50     3.28     0.91
 HUB     47.66    11.39     6.50     4.89     0.93     0.51     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     374.121     264.905     264.182    1172.141       0.319       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.688      19.276     571.012      46.000      45.078      31.500     -13.578

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     270.798     264.905     378.822    1177.837       0.230       0.451

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.658      19.910     576.576     471.992       0.031       0.532

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     263.938       0.000     263.938    1178.150       0.224       0.407

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.864     576.882       0.000       0.060       0.091       0.419

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.851      20.571       1.095     582.698      17.545     183.790       1.425

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 109296.539       0.524     510.983  895968.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =17.475   EfDer =  0.968

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
     82.731    2643.000       20.571     582.698       1.000       1.000       0.980
W Kg/sec =   37.60497

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     62.660    2493.638        1.402       0.249      53.349      56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  63643.449   64916.180        2.813     513.330     182.493     401.059       2.198

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   249.02    -0.09   249.02     0.21   419.11
 MEAN    16.97      0.00    -0.02   249.02    -0.09   249.02     0.21
 HUB     14.32      0.00    -0.02   249.02    -0.09   249.02     0.21

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     60.73    46.36    14.37   444.22   509.33     19.94   577.52      0.43
 MEAN    57.54    43.80    13.74   391.42   463.99     19.94   577.52      0.39
 HUB     52.99    37.84    15.15   330.28   413.71     19.94   577.52      0.35

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   361.47   252.76   258.41  1190.88      0.30
 MEAN    16.57   359.49   247.65   260.58  1188.50      0.30
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HUB     13.89   378.68   272.45   263.01  1186.10     0.32

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   316.47   182.69     0.27  4773.82
MEAN   382.27   293.29   134.62     0.25  4105.99     1.74
HUB    320.37   267.34    47.92     0.23  3785.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.57     1.10    21.17   600.37     1.03   589.46     0.92     0.89
MEAN    22.28     1.08    20.91   597.90     1.03   587.11     0.92     0.89
HUB     22.14     1.08    20.63   596.71     1.02   584.74     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.37    35.26    31.50     3.76     0.93     0.46     2.90
MEAN    43.54    27.32    23.50     3.82     0.94     0.45     3.29     0.89
HUB     46.01    10.33     6.50     3.83     0.94     0.44     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.968

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     357.073     249.043     255.888    1189.081       0.300       0.037

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.314      20.959     587.684      46.000      44.223      32.400     -11.823

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     265.951     249.043     364.352    1193.865       0.223       0.443

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.292      21.534     592.422     456.573       0.026       0.524

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     253.939       0.000     253.939    1194.390       0.213       0.396

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.525     592.944       0.000       0.060       0.080       0.437

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.830      22.215       1.080     598.327      15.628     192.970       1.496

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  97385.531       0.514     455.297  718022.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =17.475   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     82.731    2643.000      22.215     598.327       1.000       1.000       0.980
W Kg/sec =   37.60497

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     58.797    2460.855       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63643.449   64916.180       2.976     509.668     171.246     390.276       2.279

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   237.89    -0.08   237.89     0.20   393.41
 MEAN    15.91     0.00    -0.02   237.89    -0.08   237.89     0.20
 HUB     13.07     0.00    -0.02   237.89    -0.08   237.89     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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 TIP     60.63    47.36    13.27   422.54   484.98    21.61   593.60     0.41
 MEAN    57.06    44.80    12.26   367.03   437.45    21.61   593.60     0.37
 HUB     51.73    38.84    12.89   301.45   384.08    21.61   593.60     0.32

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   343.09   238.01   247.11  1205.73     0.28
 MEAN    15.50   337.85   228.13   249.20  1203.31     0.28
 HUB     12.59   350.83   244.62   251.48  1200.88     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   303.24   175.77     0.25  4271.44
 MEAN   357.44   280.75   129.32     0.23  3536.77     1.73
 HUB    290.38   255.61    45.76     0.21  3080.82

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     24.10     1.09    22.78   614.13     1.03   604.31     0.92     0.90
 MEAN    23.77     1.07    22.50   611.42     1.02   601.89     0.92     0.90
 HUB     23.57     1.06    22.21   609.73     1.02   599.46     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.93    35.42    31.50     3.92     0.93     0.46     2.90
 MEAN    42.47    27.43    23.50     3.93     0.94     0.44     3.34     0.90
 HUB     44.21    10.31     6.50     3.81     0.94     0.41     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     342.186     232.313     251.241    1203.411       0.284      -0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.788      22.487     601.987      46.000      42.758      33.000      -9.758

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     263.994     232.313     351.656    1207.358       0.219       0.366

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.760      22.981     605.943     440.827       0.041       0.504

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     248.164       0.000     248.164    1208.032       0.205       0.418

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      23.037     606.619       0.000       0.060       0.067       0.409

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.848      23.726       1.068     611.759      13.432     210.487       1.632

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   83727.422       0.489     391.442  751744.562

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     554064.62   2590.3628     80.8198      1.5705      0.8122     17.4748      1.1701



****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
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****************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 70% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.032   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     127.956    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   58.16170

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     125.000    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   98434.109  100402.578       2.284     831.557     364.027     619.754       1.702

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   294.10    -0.10   294.10     0.26   473.93
  MEAN    17.06     0.00    -0.02   294.10    -0.10   294.10     0.26
  HUB     12.51     0.00    -0.02   294.10    -0.10   294.10     0.26

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.29    50.47     7.82   475.82   559.46    14.39   515.59     0.50
  MEAN    53.23    47.20     6.03   393.48   491.33    14.39   515.59     0.44
  HUB     44.46    38.62     5.84   288.54   412.08    14.39   515.59     0.37

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   477.50   259.69   400.71  1122.55     0.43
  MEAN    18.04   499.78   293.38   404.61  1120.33     0.45
  HUB     15.00   565.99   387.22   412.80  1116.06     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   455.28   216.13     0.41  5359.44
  MEAN   415.99   422.78   122.62     0.38  5293.07     1.30
  HUB    345.97   414.85    41.25     0.37  5809.61

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.02     1.13    15.02   542.67     1.04   523.62     0.92     0.91
  MEAN    16.99     1.12    14.82   542.42     1.04   521.56     0.92     0.91
  HUB     17.19     1.14    14.42   544.34     1.04   517.58     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     32.95    28.34    24.20     4.14     0.93     0.27     2.90
  MEAN    35.95    16.86    12.70     4.16     0.93     0.23     3.51     0.91
  HUB     43.17    -5.71    -9.30     3.59     0.93     0.10     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.999

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     507.765     292.806     414.837    1120.372       0.453      -0.009

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      17.042      14.799     521.607      24.000      35.216      35.400       0.184

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      18.071     444.762     292.806     532.493    1125.742       0.395       0.230

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      17.024      15.285     526.619     528.796       0.018       0.382
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	411.343	0.000	411.343	1128.293	0.365	0.298

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.489	529.009	0.000	0.060	0.037	0.318

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	16.980	1.124	543.141	20.331	219.263	1.700

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
126579.898	0.559	915.286	1236673.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 6.032 EfDer = 0.995

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
127.956	2643.000	16.980	543.141	1.000	1.000	0.980

W Kg/sec = 58.16170

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
113.351	2582.848	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
98434.109	100402.578	1.789	590.487	330.107	474.134	1.436

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	392.51	-0.14	392.51	0.35	463.18
MEAN	18.08	0.00	-0.02	392.51	-0.14	392.51	0.35	
HUB	15.21	0.00	-0.02	392.51	-0.14	392.51	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.38	46.36	4.02	473.98	615.50	15.62	530.27	0.54
MEAN	46.74	42.30	4.44	416.97	572.74	15.62	530.28	0.51
HUB	41.80	37.84	3.96	350.81	526.52	15.62	530.27	0.47

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	450.98	178.97	413.95	1139.62	0.40
MEAN	18.01	461.75	200.92	415.75	1138.61	0.41
HUB	15.22	500.40	274.83	418.18	1137.55	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	506.58	292.01	0.44	3657.28	
MEAN	415.39	467.81	214.47	0.41	3620.97	1.32
HUB	351.11	425.08	76.29	0.37	4185.72	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.36	1.08	16.48	556.69	1.02	539.70	0.92	0.91
MEAN	18.35	1.08	16.38	556.55	1.02	538.75	0.92	0.91
HUB	18.57	1.09	16.26	558.65	1.03	537.73	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	23.38	35.20	31.50	3.70	0.93	0.23	2.90	
MEAN	25.79	27.29	23.50	3.79	0.92	0.24	3.30	0.91
HUB	33.31	10.34	6.50	3.84	0.92	0.26	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

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     17.960     691.642     201.482     661.645    1115.759       0.620      -1.062

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.407      14.200     517.346      46.000      16.936      30.600      13.664

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     690.960     201.482     719.737    1115.844       0.619      -1.093

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      18.302      14.127     517.424     361.848       0.061       0.109

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     683.809       0.000     683.809    1116.737       0.612      -0.050

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      14.098     518.246       0.000       0.060       0.128      -1.108

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.748      18.163       1.070     557.296      14.155     280.004       2.171

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  88148.195       0.397     637.390 1141429.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.032   EfDer =  0.769

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    127.956    2643.000      18.163     557.296       1.000       1.000       0.710
W Kg/sec =   58.16170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    107.340    2549.836       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  98434.109  100402.578       1.264     395.194     312.607     307.469       0.984

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   611.87    -0.21   611.87     0.54   446.57
 MEAN    17.74     0.00    -0.02   611.87    -0.21   611.87     0.54
 HUB     15.05     0.00    -0.02   611.87    -0.21   611.87     0.54

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     37.12    46.36    -9.24   462.91   767.37    14.85   526.03     0.68
 MEAN    33.78    43.40    -9.62   409.13   736.17    14.85   526.03     0.65
 HUB     29.58    38.84    -9.26   347.12   703.58    14.85   526.03     0.63

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   457.28   117.40   441.96  1148.80     0.40
 MEAN    17.51   467.14   150.99   442.06  1149.24     0.41
 HUB     14.85   504.94   240.38   444.05  1149.62     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   557.31   339.51     0.49  2329.95
 MEAN   403.78   509.24   252.79     0.44  2647.07     1.51
 HUB    342.51   455.64   102.13     0.40  3572.80

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.86     1.04    16.91   565.92     1.02   548.46     0.92     0.70
 MEAN    18.96     1.04    16.92   567.10     1.02   548.88     0.92     0.70
 HUB     19.24     1.06    16.85   570.53     1.02   549.24     0.92     0.70
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     14.88    37.53    31.50     6.03     0.93     0.30     2.90
 MEAN    18.86    29.76    23.50     6.26     0.85     0.34     3.28     0.70
 HUB     28.43    12.95     6.50     6.45     0.85     0.40     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.769

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     473.082     151.982     448.005    1149.521       0.412      -0.005

     Pt3          Ps3         Ts3          Vane No.     Alpha3     Vane A3      Incid3
     19.002       16.908     549.163       46.000      18.739      31.500      12.761

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth         Cmth         Aoth         Machth      cp 2-Th
     17.392     470.836     151.982     494.758    1149.707       0.410      -0.009

   BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.950       18.943       16.874     549.340     471.992       0.038       0.140

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     457.999       0.000     457.999    1150.748       0.398      -0.009

   Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       16.890     550.335       0.000       0.060       0.086      -0.002

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4           PR4        Texit        Del T       Ns         Ns nondim
      0.557       18.841        1.037     567.851      10.555     356.370       2.763

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  65741.195       0.315     475.368 1710803.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.032   EfDer =  0.926

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    127.956    2643.000       18.841     567.851       1.000        1.000       0.980
W Kg/sec =   58.16170

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
    104.458    2526.029        1.402        0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  98434.109  100402.578        1.687     513.330     304.221     401.059       1.318

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   429.15    -0.15   429.15      0.37   424.55
 MEAN    16.97      0.00    -0.02   429.15    -0.15   429.15      0.37
 HUB     14.32      0.00    -0.02   429.15    -0.15   429.15      0.37

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     46.00     46.36    -0.36   444.22   617.76     17.12   552.48      0.54
 MEAN    42.38     43.80    -1.42   391.42   580.94     17.12   552.48      0.50
 HUB     37.60     37.84    -0.24   330.28   541.62     17.12   552.48      0.47

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   469.79   109.43   456.86  1157.76      0.41
 MEAN    16.57   478.41   143.51   456.38  1158.25      0.41
 HUB     13.89   513.63   234.34   457.05  1158.60      0.44
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   561.26   326.02     0.48  2068.96
 MEAN   382.27   515.06   238.76     0.44  2381.00     1.20
 HUB    320.37   465.08    86.03     0.40  3257.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.60     1.04    17.50   575.51     1.01   557.09     0.92     0.85
 MEAN    19.72     1.05    17.53   576.67     1.02   557.56     0.92     0.85
 HUB     20.05     1.06    17.52   579.91     1.02   557.89     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     13.47    35.51    31.50     4.01     0.93     0.12     2.90
 MEAN    17.46    27.62    23.50     4.12     0.90     0.15     3.29     0.85
 HUB     27.15    10.66     6.50     4.16     0.90     0.20     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.926

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     469.620     144.316     446.896    1159.680       0.405       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.768      17.654     558.951      46.000      17.897      32.400      14.503

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     476.248     144.316     497.633    1159.137       0.411       0.007

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.694      17.531     558.428     456.573       0.042       0.138

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     453.487       0.000     453.487    1160.969       0.391      -0.018

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.613     560.195       0.000       0.060       0.097       0.043

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.653      19.569       1.039     577.363       9.513     367.680       2.850

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  59260.988       0.313     428.510 1185428.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.032   EfDer =  0.878

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    127.956    2643.000      19.569     577.363       1.000       1.000       0.980
W Kg/sec =   58.16170

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.408    2505.132       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  98434.109  100402.578       1.726     509.668     295.342     390.276       1.321

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   421.63    -0.15   421.63     0.36   400.49
 MEAN    15.91     0.00    -0.02   421.63    -0.15   421.63     0.36
 HUB     13.07     0.00    -0.02   421.63    -0.15   421.63     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.07    47.36    -2.29   422.54   597.02    17.87   562.52     0.51
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MEAN    41.05    44.80    -3.75   367.03   559.09    17.87   562.52     0.48
HUB     35.58    38.84    -3.26   301.45   518.40    17.87   562.52     0.45

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   459.18    89.25   450.43  1166.64     0.39
MEAN    15.50   465.76   119.96   450.04  1167.10     0.40
HUB     12.59   495.21   204.91   450.83  1167.42     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.78   555.16   324.53     0.48  1603.74
MEAN   357.44   508.86   237.48     0.44  1861.47     1.18
HUB    290.38   458.86    85.47     0.39  2581.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.14     1.03    18.10   583.30     1.01   565.70     0.92     0.80
MEAN    20.23     1.03    18.13   584.26     1.01   566.15     0.92     0.80
HUB     20.49     1.05    18.10   586.92     1.02   566.45     0.92     0.80

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     11.21    35.77    31.50     4.27     0.93     0.10     2.90
MEAN    14.93    27.82    23.50     4.32     0.88     0.12     3.34     0.80
HUB     24.44    10.74     6.50     4.24     0.88     0.16     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.878

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     470.349     122.164     454.207    1167.305       0.403      -0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.244      18.100     566.359      46.000      15.054      33.000      17.946

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     492.846     122.164     507.761    1165.439       0.423      -0.170

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.063      17.738     564.551     440.827       0.103       0.111

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     459.318       0.000     459.318    1168.187       0.393      -0.046

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.000     567.216       0.000       0.060       0.120      -0.050

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.514      20.027       1.023     584.826       7.463     435.604       3.377

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  46496.160       0.272     336.209 1248953.625

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     386226.44   2792.7632    125.0000      1.3257      0.7098      6.0315      1.1186


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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Fan-Core + 4 Stage LPC 70% Stat 2 27% Ice Block 8-22-2011

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
RESET = 0.000BLEED = 0.000 DPInc = 6.474 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
126.046	2643.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 57.29363

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
123.134	2632.591	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96964.961	98904.055	2.319	831.557	358.594	619.754	1.728

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	289.39	-0.10	289.39	0.26	473.93
MEAN	17.06	0.00	-0.02	289.39	-0.10	289.39	0.26	
HUB	12.51	0.00	-0.02	289.39	-0.10	289.39	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.70	50.47	8.23	475.82	557.00	14.41	515.82	0.50
MEAN	53.67	47.20	6.47	393.48	488.52	14.41	515.82	0.44
HUB	44.93	38.62	6.31	288.54	408.73	14.41	515.82	0.37

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	473.73	263.53	393.67	1123.18	0.42
MEAN	18.04	495.44	295.55	397.63	1120.87	0.44
HUB	15.00	560.34	386.57	405.65	1116.59	0.50

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	475.82	447.26	212.29	0.40	5438.73	
MEAN	415.99	415.47	120.45	0.37	5332.19	1.32
HUB	345.97	407.67	40.60	0.37	5799.72	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.05	1.13	15.08	542.96	1.04	524.22	0.92	0.91
MEAN	17.01	1.13	14.87	542.57	1.04	522.07	0.92	0.91
HUB	17.18	1.14	14.46	544.30	1.04	518.07	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.80	28.34	24.20	4.14	0.93	0.28	2.90	
MEAN	36.62	16.85	12.70	4.15	0.93	0.24	3.51	0.91
HUB	43.62	-5.72	-9.30	3.58	0.93	0.11	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	503.162	294.973	407.631	1120.933	0.449	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.057	14.851	522.130	24.000	35.891	35.400	-0.491

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	436.592	294.973	526.898	1126.528	0.388	0.244

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.039	15.360	527.355	528.796	0.018	0.393

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4

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     18.083     403.975       0.000     403.975    1128.971       0.358       0.309

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.554     529.645       0.000       0.060       0.037       0.329

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      16.996       1.125     543.275      20.465     216.431       1.678

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 127414.367       0.563     907.569 1216867.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.474   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    2643.000      16.996     543.275       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    111.572    2582.530       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       1.817     590.487     324.924     474.134       1.459

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   385.57    -0.13   385.57     0.34   463.12
 MEAN    18.08     0.00    -0.02   385.57    -0.13   385.57     0.34
 HUB     15.21     0.00    -0.02   385.57    -0.13   385.57     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.88    46.36     4.52   473.98   611.10    15.68   530.86     0.54
 MEAN    47.25    42.30     4.95   416.97   568.01    15.68   530.86     0.50
 HUB     42.31    37.84     4.47   350.81   521.37    15.68   530.86     0.46

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   446.06   184.68   406.03  1140.61     0.39
 MEAN    18.01   456.63   205.03   408.01  1139.46     0.40
 HUB     15.22   494.91   276.34   410.57  1138.26     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   496.82   286.29     0.44  3773.95
 MEAN   415.39   459.05   210.36     0.40  3695.02     1.34
 HUB    351.11   417.33    74.77     0.37  4208.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.43     1.08    16.58   557.25     1.03   540.64     0.92     0.91
 MEAN    18.40     1.08    16.47   556.96     1.03   539.55     0.92     0.91
 HUB     18.60     1.09    16.33   558.86     1.03   538.41     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.46    35.19    31.50     3.69     0.93     0.24     2.90
 MEAN    26.68    27.27    23.50     3.77     0.92     0.25     3.30     0.91
 HUB     33.94    10.32     6.50     3.82     0.92     0.27     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     677.335     205.608     645.374    1117.950       0.606      -1.028

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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    18.455      14.397     519.380      46.000      17.671      30.600      12.929

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     671.794     205.608     702.554    1118.622       0.601      -1.030

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      18.361      14.385     520.004     361.848       0.056       0.121

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.823     663.983       0.000     663.983    1119.563       0.593      -0.011

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.680      14.375     520.875       0.000       0.060       0.116      -1.035

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.772      18.242       1.073     557.694      14.419     273.700       2.122

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  89791.922       0.405     639.585 1121797.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.474   EfDer =  0.776

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    2643.000      18.242     557.694       1.000       1.000       0.710
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    105.322    2548.927       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       1.288     395.194     306.730     307.469       1.002

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   596.00    -0.21   596.00     0.53   446.42
 MEAN    17.74     0.00    -0.02   596.00    -0.21   596.00     0.53
 HUB     15.05     0.00    -0.02   596.00    -0.21   596.00     0.53

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     37.85    46.36    -8.51   462.91   754.77    15.08   528.03     0.67
 MEAN    34.48    43.40    -8.92   409.13   723.03    15.08   528.03     0.64
 HUB     30.23    38.84    -8.61   347.12   689.82    15.08   528.03     0.61

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   449.70   125.61   431.80  1150.45     0.39
 MEAN    17.51   459.79   157.03   432.14  1150.66     0.40
 HUB     14.85   497.58   242.96   434.23  1150.82     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   544.25   331.30     0.47  2492.41
 MEAN   403.78   497.63   246.75     0.43  2752.68     1.52
 HUB    342.51   445.50    99.55     0.39  3611.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.00     1.04    17.10   566.92     1.02   550.04     0.92     0.71
 MEAN    19.08     1.05    17.09   567.89     1.02   550.24     0.92     0.71
 HUB     19.35     1.06    17.01   571.07     1.02   550.39     0.92     0.71

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.22    37.50    31.50     6.00     0.93     0.31     2.90
 MEAN    19.97    29.73    23.50     6.23     0.86     0.34     3.28     0.71
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HUB     29.23    12.91     6.50     6.41     0.86     0.40     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.776

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     465.548     158.059     437.895    1150.951       0.404       -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.123      17.083     550.529      46.000      19.847      31.500      11.653

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     459.354     158.059     485.787    1151.451       0.399       0.011

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.073      17.090     551.007     471.992       0.034       0.155

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     446.665       0.000     446.665    1152.454       0.388       0.013

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.111     551.967       0.000       0.060       0.079       0.021

    STAGE EXIT CONDITIONS, STAGE            3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.584      18.981       1.041     568.627      10.933     342.553       2.655

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  68096.672       0.326     485.051 1671520.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.474   EfDer =  0.938

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    2643.000      18.981     568.627       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.209    2524.305       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       1.724     513.330     297.669     401.059       1.347

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   418.77    -0.14   418.77     0.36   424.26
 MEAN    16.97     0.00    -0.02   418.77    -0.14   418.77     0.36
 HUB     14.32     0.00    -0.02   418.77    -0.14   418.77     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.70    46.36     0.34   444.22   610.60    17.33   553.99     0.53
 MEAN    43.08    43.80    -0.72   391.42   573.32    17.33   553.99     0.50
 HUB     38.28    37.84     0.44   330.28   533.43    17.33   553.99     0.46

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   460.05   118.39   444.56  1160.00     0.40
 MEAN    16.57   469.07   149.94   444.46  1160.23     0.40
 HUB     13.89   504.36   236.73   445.36  1160.34     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   546.04   317.06     0.47  2238.07
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 MEAN   382.27   501.52   232.33     0.43  2487.53     1.22
 HUB    320.37   453.14    83.64     0.39  3290.22

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.82     1.04    17.78   576.91     1.01   559.24     0.92     0.86
 MEAN    19.92     1.05    17.79   577.84     1.02   559.47     0.92     0.86
 HUB     20.23     1.07    17.76   580.81     1.02   559.57     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     14.91    35.50    31.50     4.00     0.93     0.14     2.90
 MEAN    18.64    27.60    23.50     4.10     0.90     0.16     3.29     0.86
 HUB     27.99    10.64     6.50     4.14     0.90     0.21     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.938

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     460.667     150.783     435.291    1161.601       0.397       0.054

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.967      17.913     560.803      46.000      19.106      32.400      13.294

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     462.860     150.783     486.801    1161.426       0.399       0.027

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.905      17.839     560.634     456.573       0.038       0.154

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     440.632       0.000     440.632    1163.161       0.379       0.005

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.924     562.311       0.000       0.060       0.089       0.065

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.693      19.792       1.043     578.520       9.894     352.662       2.734

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  61635.137       0.325     439.025 1162594.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.474   EfDer =  0.895

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    126.046    2643.000      19.792     578.520       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     98.869    2502.626       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       1.770     509.668     287.948     390.276       1.355

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   409.96    -0.14   409.96     0.35   400.09
 MEAN    15.91     0.00    -0.02   409.96    -0.14   409.96     0.35
 HUB     13.07     0.00    -0.02   409.96    -0.14   409.96     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.88    47.36    -1.48   422.54   588.84    18.17   564.49     0.51
 MEAN    41.85    44.80    -2.95   367.03   550.35    18.17   564.49     0.47
 HUB     36.34    38.84    -2.50   301.45   508.95    18.17   564.49     0.44
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      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   447.83    99.36   436.67  1169.40     0.38
MEAN    15.50   454.83   127.24   436.67  1169.58     0.39
HUB     12.59   484.39   207.57   437.66  1169.64     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.78   538.09   314.42     0.46  1785.05
MEAN   357.44   493.63   230.20     0.42  1974.21     1.20
HUB    290.38   445.43    82.81     0.38  2615.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.45     1.03    18.48   585.13     1.01   568.39     0.92     0.82
MEAN    20.52     1.04    18.48   585.83     1.01   568.56     0.92     0.82
HUB     20.75     1.05    18.44   588.20     1.02   568.62     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     12.82    35.76    31.50     4.26     0.93     0.12     2.90
MEAN    16.25    27.80    23.50     4.30     0.89     0.14     3.34     0.82
HUB     25.37    10.71     6.50     4.21     0.89     0.17     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.895

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     459.279     129.576     440.622    1169.797       0.393      -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.530      18.458     568.779      46.000      16.387      33.000      16.613

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     476.422     129.576     493.728    1168.419       0.408      -0.141

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.375      18.169     567.440     440.827       0.094       0.128

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     444.464       0.000     444.464    1170.946       0.380      -0.022

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.411     569.897       0.000       0.060       0.111      -0.026

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.576      20.338       1.028     586.387       7.867     412.878       3.201

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  49013.957       0.286     349.125 1223939.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    395952.03   2820.3557    123.1343      1.3462      0.7318      6.4740      1.1216


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
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 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    123.994    2643.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   56.36100

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    121.130    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 95386.555   97294.086       2.357     831.557     352.757     619.754       1.757

    ROTOR LEADING EDGE CONDITIONS, STAGE             1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   284.35    -0.10   284.35     0.26   473.93
MEAN    17.06     0.00    -0.02   284.35    -0.10   284.35     0.26
HUB     12.51     0.00    -0.02   284.35    -0.10   284.35     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.14    50.47     8.67   475.82   554.39    14.44   516.06     0.50
MEAN    54.15    47.20     6.95   393.48   485.55    14.44   516.06     0.44
HUB     45.43    38.62     6.81   288.54   405.17    14.44   516.06     0.36

     ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
TIP     20.63   469.86   267.63   386.19  1123.84     0.42
MEAN    18.04   490.89   297.85   390.21  1121.44     0.44
HUB     15.00   554.36   385.84   398.05  1117.14     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    475.82   438.73   208.19     0.39  5523.20
MEAN   415.99   407.70   118.14     0.36  5373.71     1.33
HUB    345.97   400.05    39.87     0.36  5788.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.08     1.13    15.14   543.27     1.04   524.83     0.92     0.91
MEAN    17.02     1.13    14.92   542.72     1.04   522.59     0.92     0.91
HUB     17.18     1.14    14.51   544.26     1.04   518.59     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.72    28.33    24.20     4.13     0.93     0.29     2.90
MEAN    37.35    16.84    12.70     4.14     0.93     0.25     3.51     0.91
HUB     44.11    -5.72    -9.30     3.58     0.93     0.12     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     498.350     297.272     399.978    1121.518       0.444      -0.008

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.071      14.904     522.674      24.000      36.621      35.400      -1.221

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     427.953     297.272     521.071    1127.346       0.380       0.259

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.054      15.438     528.121     528.796       0.018       0.404

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     396.182       0.000     396.182    1129.678       0.351       0.321

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      15.622     530.308       0.000       0.060       0.037       0.341

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      17.011       1.126     543.417      20.607     213.427       1.654

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 128299.383       0.567     898.997 1195665.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    123.994    2643.000      17.011     543.417       1.000       1.000       0.980
W Kg/sec =   56.36100

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    109.675    2582.192       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 95386.555   97294.086       1.849     590.487     319.400     474.134       1.484

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   378.23    -0.13   378.23     0.33   463.06
 MEAN    18.08     0.00    -0.02   378.23    -0.13   378.23     0.33
 HUB     15.21     0.00    -0.02   378.23    -0.13   378.23     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.42    46.36     5.06   473.98   606.49    15.74   531.47     0.54
 MEAN    47.80    42.30     5.50   416.97   563.05    15.74   531.47     0.50
 HUB     42.86    37.84     5.02   350.81   515.96    15.74   531.47     0.46

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   441.06   190.67   397.72  1141.62     0.39
 MEAN    18.01   451.35   209.35   399.86  1140.33     0.40
 HUB     15.22   489.17   277.90   402.56  1139.00     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   486.57   280.30     0.43  3896.23
 MEAN   415.39   449.83   206.04     0.39  3772.74     1.35
 HUB    351.11   409.17    73.21     0.36  4232.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.49     1.09    16.68   557.85     1.03   541.60     0.92     0.91
 MEAN    18.45     1.08    16.56   557.39     1.03   540.38     0.92     0.91
 HUB     18.63     1.09    16.41   559.09     1.03   539.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.61    35.18    31.50     3.68     0.93     0.25     2.90
 MEAN    27.63    27.26    23.50     3.76     0.92     0.26     3.30     0.91
 HUB     34.62    10.31     6.50     3.81     0.92     0.28     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     662.853     209.938     628.729    1120.142       0.592      -0.993

    Pt3        Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.502     14.595     521.419      46.000      18.465      30.600      12.135

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	652.472	209.938	685.415	1121.366	0.582	-0.966

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	18.420	14.641	522.559	361.848	0.052	0.134

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	644.189	0.000	644.189	1122.331	0.574	0.027

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	14.648	523.456	0.000	0.060	0.103	-0.963

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.794	18.318	1.077	558.112	14.695	267.252	2.072

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
91511.305	0.413	641.222	1100887.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 6.953 EfDer = 0.787

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
123.994	2643.000	18.318	558.112	1.000	1.000	0.710

W Kg/sec = 56.36100

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
103.215	2547.972	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
95386.555	97294.086	1.315	395.194	300.591	307.469	1.023

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	579.90	-0.20	579.90	0.51	446.25
MEAN	17.74	0.00	-0.02	579.90	-0.20	579.90	0.51	
HUB	15.05	0.00	-0.02	579.90	-0.20	579.90	0.51	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	38.61	46.36	-7.75	462.91	742.13	15.30	530.03	0.66
MEAN	35.22	43.40	-8.18	409.13	709.81	15.30	530.03	0.63
HUB	30.92	38.84	-7.92	347.12	675.96	15.30	530.03	0.60

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	442.08	134.09	421.26	1152.13	0.38
MEAN	17.51	452.34	163.32	421.82	1152.11	0.39
HUB	14.85	490.02	245.66	423.99	1152.07	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	530.73	322.82	0.46	2660.29	
MEAN	403.78	485.55	240.46	0.42	2862.73	1.53
HUB	342.51	434.91	96.84	0.38	3651.12	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.14	1.05	17.29	567.96	1.02	551.65	0.92	0.72
MEAN	19.21	1.05	17.27	568.71	1.02	551.63	0.92	0.72
HUB	19.46	1.06	17.18	571.63	1.02	551.58	0.92	0.72

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	17.66	37.46	31.50	5.96	0.93	0.32	2.90	
MEAN	21.17	29.69	23.50	6.19	0.86	0.35	3.28	0.72
HUB	30.09	12.87	6.50	6.37	0.86	0.40	3.87	

```
   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.787

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     457.907     164.393     427.380    1152.414       0.397      -0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.249      17.262     551.929      46.000      21.039      31.500      10.461

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     447.489     164.393     476.730    1153.236       0.388       0.032

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.207      17.311     552.716     471.992       0.030       0.171

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     434.972       0.000     434.972    1154.198       0.377       0.037

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.337     553.639       0.000       0.060       0.071       0.045

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.613      19.125       1.044     569.437      11.325     329.074       2.551

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  70541.508       0.338     494.286 1631055.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.950

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    123.994    2643.000      19.125     569.437       1.000       1.000       0.980
W Kg/sec =   56.36100

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     99.859    2522.507       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95386.555   97294.086       1.765     513.330     290.826     401.059       1.379

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   408.04    -0.14   408.04     0.35   423.96
 MEAN    16.97     0.00    -0.02   408.04    -0.14   408.04     0.35
 HUB     14.32     0.00    -0.02   408.04    -0.14   408.04     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.44    46.36     1.08   444.22   603.28    17.54   555.54     0.52
 MEAN    43.82    43.80     0.02   391.42   565.52    17.54   555.54     0.49
 HUB     39.00    37.84     1.16   330.28   525.05    17.54   555.54     0.45

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   450.39   127.57   431.95  1162.26     0.39
 MEAN    16.57   459.69   156.52   432.22  1162.24     0.40
 HUB     13.89   494.94   239.14   433.34  1162.12     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   530.45   307.89     0.46  2411.23
 MEAN   382.27   487.62   225.75     0.42  2596.52     1.24
 HUB    320.37   440.88    81.22     0.38  3323.70
```

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.05	1.05	18.08	578.37	1.02	561.43	0.92	0.87
MEAN	20.12	1.05	18.06	579.05	1.02	561.41	0.92	0.87
HUB	20.41	1.07	18.01	581.74	1.02	561.29	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	16.45	35.48	31.50	3.98	0.93	0.16	2.90	
MEAN	19.91	27.58	23.50	4.08	0.90	0.18	3.29	0.87
HUB	28.89	10.62	6.50	4.12	0.90	0.22	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.950

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	451.685	157.400	423.373	1163.551	0.388	0.054

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.172	18.179	562.687	46.000	20.394	32.400	12.006

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	449.219	157.400	475.996	1163.743	0.386	0.048

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.122	18.154	562.873	456.573	0.034	0.171

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	427.542	0.000	427.542	1165.382	0.367	0.029

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.241	564.460	0.000	0.060	0.081	0.089

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.731	20.021	1.047	579.720	10.283	338.176	2.622

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
64061.887	0.338	448.883	1138564.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 6.953 EfDer = 0.912

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
123.994	2643.000	20.021	579.720	1.000	1.000	0.980

W Kg/sec = 56.36100

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
96.249	2500.035	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
95386.555	97294.086	1.818	509.668	280.317	390.276	1.392

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	398.05	-0.14	398.05	0.34	399.67
MEAN	15.91	0.00	-0.02	398.05	-0.14	398.05	0.34	
HUB	13.07	0.00	-0.02	398.05	-0.14	398.05	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.72	47.36	-0.64	422.54	580.61	18.47	566.49	0.50
MEAN	42.69	44.80	-2.11	367.03	541.53	18.47	566.49	0.46
HUB	37.15	38.84	-1.69	301.45	499.40	18.47	566.49	0.43

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

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         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   436.72   109.63   422.74  1172.18     0.37
 MEAN    15.50   443.99   134.60   423.09  1172.08     0.38
 HUB     12.59   473.55   210.31   424.28  1171.89     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   520.78   304.15     0.44  1969.24
 MEAN   357.44   478.19   222.84     0.41  2088.22     1.22
 HUB    290.38   431.77    80.07     0.37  2649.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.76     1.04    18.86   587.01     1.01   571.09     0.92     0.83
 MEAN    20.81     1.04    18.85   587.45     1.01   571.00     0.92     0.83
 HUB     21.02     1.05    18.79   589.53     1.02   570.81     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     14.54    35.73    31.50     4.23     0.93     0.14     2.90
 MEAN    17.65    27.78    23.50     4.28     0.89     0.15     3.34     0.83
 HUB     26.37    10.69     6.50     4.19     0.89     0.19     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.912

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     448.308     137.072     426.839    1172.306       0.382      -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.825      18.824     571.220      46.000      17.804      33.000      15.196

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     459.967     137.072     479.956    1171.398       0.393      -0.111

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.696      18.607     570.337     440.827       0.084       0.145

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     429.491       0.000     429.491    1173.720       0.366       0.004

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.831     572.599       0.000       0.060       0.102       0.000

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.632      20.658       1.032     587.997       8.277     391.606       3.036

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   51571.891       0.301     361.366 1197770.250

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     405985.94   2844.7539    121.1299      1.3675      0.7530      6.9532      1.1247


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 7.494   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
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    121.700    2643.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.889    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 93621.680   95493.914       2.402     831.557     346.230     619.754       1.790

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   278.73    -0.10   278.73     0.25   473.93
 MEAN    17.06     0.00    -0.02   278.73    -0.10   278.73     0.25
 HUB     12.51     0.00    -0.02   278.73    -0.10   278.73     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.64    50.47     9.17   475.82   551.53    14.46   516.32     0.49
 MEAN    54.69    47.20     7.49   393.48   482.28    14.46   516.32     0.43
 HUB     46.00    38.62     7.38   288.54   401.25    14.46   516.32     0.36

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   465.72   272.13   377.94  1124.55     0.41
 MEAN    18.04   485.98   300.41   382.01  1122.05     0.43
 HUB     15.00   547.82   385.06   389.66  1117.74     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    475.82   429.34   203.70     0.38  5615.93
 MEAN   415.99   399.11   115.58     0.36  5419.83     1.36
 HUB    345.97   391.62    39.09     0.35  5777.09

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.11     1.13    15.20   543.62     1.04   525.50     0.92     0.91
 MEAN    17.04     1.13    14.98   542.89     1.04   523.17     0.92     0.91
 HUB     17.17     1.14    14.57   544.21     1.04   519.15     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.75    28.32    24.20     4.12     0.93     0.31     2.90
 MEAN    38.18    16.83    12.70     4.13     0.93     0.26     3.51     0.91
 HUB     44.66    -5.73    -9.30     3.57     0.93     0.13     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     493.141     299.826     391.526    1122.149       0.439      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.086      14.961     523.263      24.000      37.444      35.400      -2.044

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     418.454     299.826     514.781    1128.230       0.371       0.275

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.069      15.520     528.949     528.796       0.018       0.417

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     387.609       0.000     387.609    1130.442       0.343       0.334

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.693     531.026       0.000       0.060       0.038       0.354

    STAGE EXIT CONDITIONS, STAGE            1
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Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	17.025	1.127	543.574	20.764	210.109	1.629

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
129276.734	0.571	889.085	1172050.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
RESET = 0.000BLEED = 0.000 DPInc = 7.494 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
121.700	2643.000	17.025	543.574	1.000	1.000	0.980

W Kg/sec = 55.31819

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
107.571	2581.819	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
93621.680	95493.914	1.885	590.487	313.271	474.134	1.513

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	370.14	-0.13	370.14	0.33	462.99
MEAN	18.08	0.00	-0.02	370.14	-0.13	370.14	0.33	
HUB	15.21	0.00	-0.02	370.14	-0.13	370.14	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.02	46.36	5.66	473.98	601.48	15.81	532.13	0.53
MEAN	48.41	42.30	6.11	416.97	557.65	15.81	532.13	0.49
HUB	43.47	37.84	5.63	350.81	510.06	15.81	532.13	0.45

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	435.81	197.22	388.64	1142.71	0.38
MEAN	18.01	445.73	214.09	390.95	1141.27	0.39
HUB	15.22	482.98	279.64	393.79	1139.80	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	475.38	273.76	0.42	4029.75	
MEAN	415.39	439.73	201.30	0.39	3858.02	1.37
HUB	351.11	400.22	71.47	0.35	4258.89	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.56	1.09	16.79	558.50	1.03	542.64	0.92	0.91
MEAN	18.50	1.09	16.65	557.86	1.03	541.27	0.92	0.91
HUB	18.65	1.10	16.48	559.35	1.03	539.87	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	26.91	35.16	31.50	3.66	0.93	0.27	2.90	
MEAN	28.71	27.24	23.50	3.74	0.93	0.27	3.30	0.91
HUB	35.38	10.29	6.50	3.79	0.93	0.29	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	647.626	214.689	611.006	1122.424	0.577	-0.956

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.552	14.801	523.545	46.000	19.360	30.600	11.240

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	632.172	214.689	667.632	1124.193	0.562	-0.898

```
   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      18.480      14.907     525.197     361.848       0.047       0.148

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     623.570       0.000     623.570    1125.159       0.554       0.065

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      14.927     526.099       0.000       0.060       0.091      -0.887

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.813      18.395       1.080     558.572      14.997     260.366       2.018

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93397.547       0.421     642.330 1077719.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.494   EfDer =  0.800

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    2643.000      18.395     558.572       1.000       1.000       0.710
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.921    2546.923       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       1.345     395.194     293.913     307.469       1.046

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   562.89    -0.19   562.89     0.50   446.06
 MEAN    17.74     0.00    -0.02   562.89    -0.19   562.89     0.50
 HUB     15.05     0.00    -0.02   562.89    -0.19   562.89     0.50

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     39.44    46.36    -6.92   462.91   728.91    15.53   532.11     0.64
 MEAN    36.02    43.40    -7.38   409.13   695.99    15.53   532.11     0.62
 HUB     31.68    38.84    -7.16   347.12   661.42    15.53   532.11     0.58

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   434.19   143.26   409.87  1153.91     0.38
 MEAN    17.51   444.49   170.10   410.66  1153.66     0.39
 HUB     14.85   481.93   248.57   412.88  1153.40     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   516.11   313.64     0.45  2841.96
 MEAN   403.78   472.49   233.68     0.41  2981.28     1.55
 HUB    342.51   423.43    93.94     0.37  3694.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.30     1.05    17.50   569.10     1.02   553.35     0.92     0.73
 MEAN    19.34     1.05    17.46   569.61     1.02   553.12     0.92     0.73
 HUB     19.57     1.06    17.35   572.25     1.02   552.86     0.92     0.73

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.27    37.42    31.50     5.92     0.93     0.33     2.90
 MEAN    22.50    29.64    23.50     6.14     0.86     0.36     3.28     0.73
 HUB     31.05    12.82     6.50     6.32     0.86     0.41     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.800
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     449.861     171.215     416.006    1153.973       0.390      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.383      17.453     553.422      46.000      22.371      31.500       9.129

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     434.742     171.215     467.242    1155.136       0.376       0.056

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.351      17.546     554.539     471.992       0.027       0.189

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     422.435       0.000     422.435    1156.053       0.365       0.063

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.577     555.420       0.000       0.060       0.064       0.072

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.643      19.278       1.048     570.321      11.749     315.403       2.445

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  73180.711       0.351     503.291 1587609.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.494   EfDer =  0.962

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    2643.000      19.278     570.321       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.307    2520.553       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       1.811     513.330     283.393     401.059       1.415

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   396.50    -0.14   396.50     0.34   423.63
 MEAN    16.97     0.00    -0.02   396.50    -0.14   396.50     0.34
 HUB     14.32     0.00    -0.02   396.50    -0.14   396.50     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.26    46.36     1.90   444.22   595.54    17.77   557.20     0.51
 MEAN    44.64    43.80     0.84   391.42   557.25    17.77   557.20     0.48
 HUB     39.81    37.84     1.97   330.28   516.13    17.77   557.20     0.45

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   440.50   137.36   418.54  1164.64     0.38
 MEAN    16.57   449.95   163.58   419.16  1164.36     0.39
 HUB     13.89   485.05   241.76   420.51  1164.01     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   513.84   298.10     0.44  2596.00
 MEAN   382.27   472.78   218.69     0.41  2713.52     1.26
 HUB    320.37   427.79    78.60     0.37  3360.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.29     1.05    18.38   579.93     1.02   563.73     0.92     0.88
 MEAN    20.34     1.06    18.35   580.37     1.02   563.47     0.92     0.88
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 HUB     20.60     1.07    18.28   582.76     1.02   563.12     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.17    35.46    31.50     3.96     0.93     0.18     2.90
 MEAN    21.32    27.55    23.50     4.05     0.91     0.20     3.29     0.88
 HUB     29.90    10.59     6.50     4.09     0.91     0.23     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.962

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     442.380     164.503     410.657    1165.612       0.380       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.392      18.460     564.682      46.000      21.830      32.400      10.570

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     434.775     164.503     464.855    1166.187       0.373       0.072

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.352      18.488     565.239     456.573       0.029       0.190

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     413.694       0.000     413.694    1167.726       0.354       0.057

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.577     566.733       0.000       0.060       0.072       0.116

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.767      20.264       1.051     581.021      10.700     323.563       2.508

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  66661.844       0.352     458.459 1112245.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.494   EfDer =  0.930

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    2643.000      20.264     581.021       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.440    2497.235       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       1.873     509.668     272.136     390.276       1.434

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   385.42    -0.13   385.42     0.33   399.23
 MEAN    15.91     0.00    -0.02   385.42    -0.13   385.42     0.33
 HUB     13.07     0.00    -0.02   385.42    -0.13   385.42     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.64    47.36     0.28   422.54   572.02    18.79   568.62     0.49
 MEAN    43.61    44.80    -1.19   367.03   532.31    18.79   568.62     0.46
 HUB     38.04    38.84    -0.80   301.45   489.39    18.79   568.62     0.42

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   425.47   120.41   408.08  1175.07     0.36
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 MEAN    15.50   432.87   142.39   408.78  1174.71     0.37
 HUB     12.59   462.26   213.18   410.17  1174.27     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   502.59   293.37     0.43  2162.52
 MEAN   357.44   461.90   215.06     0.39  2208.80     1.24
 HUB    290.38   417.37    77.20     0.36  2685.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.10     1.04    19.27   589.03     1.01   573.92     0.92     0.85
 MEAN    21.12     1.04    19.23   589.20     1.01   573.56     0.92     0.85
 HUB     21.31     1.05    19.15   590.96     1.02   573.13     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.44    35.71    31.50     4.21     0.93     0.16     2.90
 MEAN    19.20    27.75    23.50     4.25     0.90     0.17     3.34     0.85
 HUB     27.46    10.66     6.50     4.16     0.90     0.20     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.930

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     437.081     145.000     412.329    1174.932       0.372       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.141      19.212     573.782      46.000      19.375      33.000      13.625

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     442.857     145.000     465.991    1174.498       0.377       -0.076

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.037      19.068     573.358     440.827       0.073       0.165

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     413.839       0.000     413.839    1176.621       0.352       0.033

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.277     575.433       0.000       0.060       0.091       0.030

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.687      21.001       1.036     589.729       8.708     370.921       2.875

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  54262.453       0.317     373.183 1169259.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     416779.31   2866.3486     118.8887      1.3901      0.7738      7.4939      1.1280


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     119.767    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   54.43945
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
117.000	2632.591	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
92134.484	93976.977	2.441	831.557	340.730	619.754	1.819

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	274.02	-0.09	274.02	0.25	473.93
MEAN	17.06	0.00	-0.02	274.02	-0.09	274.02	0.25	
HUB	12.51	0.00	-0.02	274.02	-0.09	274.02	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.07	50.47	9.60	475.82	549.16	14.48	516.54	0.49
MEAN	55.15	47.20	7.95	393.48	479.57	14.48	516.54	0.43
HUB	46.49	38.62	7.87	288.54	397.99	14.48	516.54	0.36

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	462.38	275.86	371.08	1125.13	0.41
MEAN	18.04	481.94	302.52	375.17	1122.55	0.43
HUB	15.00	542.39	384.39	382.67	1118.23	0.49

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	475.82	421.52	199.96	0.37	5692.94	
MEAN	415.99	391.95	113.47	0.35	5457.87	1.38
HUB	345.97	384.59	38.42	0.34	5767.05	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.14	1.13	15.26	543.90	1.04	526.05	0.92	0.91
MEAN	17.05	1.13	15.02	543.03	1.04	523.63	0.92	0.91
HUB	17.17	1.14	14.61	544.18	1.04	519.61	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.63	28.32	24.20	4.12	0.93	0.32	2.90	
MEAN	38.88	16.83	12.70	4.13	0.93	0.28	3.51	0.91
HUB	45.13	-5.73	-9.30	3.57	0.93	0.14	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	488.867	301.932	384.484	1122.664	0.435	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.098	15.007	523.743	24.000	38.142	35.400	-2.742

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	410.573	301.932	509.641	1128.950	0.364	0.289

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.080	15.587	529.625	528.796	0.018	0.428

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	380.494	0.000	380.494	1131.066	0.336	0.344

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.750	531.612	0.000	0.060	0.039	0.365

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	17.035	1.128	543.704	20.894	207.354	1.607

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
130084.227	0.575	880.427	1152223.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.954 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
119.767	2643.000	17.035	543.704	1.000	1.000	0.980

W Kg/sec = 54.43945

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
105.811	2581.511	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
92134.484	93976.977	1.916	590.487	308.146	474.134	1.539

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	363.43	-0.13	363.43	0.32	462.94
MEAN	18.08	0.00	-0.02	363.43	-0.13	363.43	0.32	
HUB	15.21	0.00	-0.02	363.43	-0.13	363.43	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.53	46.36	6.17	473.98	597.37	15.86	532.67	0.53
MEAN	48.93	42.30	6.63	416.97	553.21	15.86	532.67	0.49
HUB	44.00	37.84	6.16	350.81	505.21	15.86	532.67	0.45

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	431.65	202.58	381.16	1143.59	0.38
MEAN	18.01	441.20	217.97	383.59	1142.04	0.39
HUB	15.22	477.91	281.06	386.53	1140.44	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	466.17	268.39	0.41	4139.32	
MEAN	415.39	431.41	197.42	0.38	3927.97	1.39
HUB	351.11	392.82	70.05	0.34	4280.53	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.62	1.09	16.87	559.04	1.03	543.48	0.92	0.91
MEAN	18.53	1.09	16.72	558.25	1.03	542.00	0.92	0.91
HUB	18.67	1.10	16.55	559.56	1.03	540.49	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.99	35.15	31.50	3.65	0.93	0.28	2.90	
MEAN	29.61	27.23	23.50	3.73	0.93	0.28	3.30	0.91
HUB	36.02	10.27	6.50	3.77	0.93	0.29	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	635.491	218.586	596.715	1124.221	0.565	-0.927

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.590	14.962	525.223	46.000	20.119	30.600	10.481

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	615.992	218.586	653.625	1126.400	0.547	-0.843

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	18.527	15.114	527.261	361.848	0.043	0.160

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	607.248	0.000	607.248	1127.354	0.539	0.096

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	15.144	528.155	0.000	0.060	0.082	-0.827

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.827	18.454	1.083	558.950	15.246	254.834	1.975

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
94944.328	0.428	642.596	1058360.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 7.954 EfDer = 0.813

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
119.767	2643.000	18.454	558.950	1.000	1.000	0.710

W Kg/sec = 54.43945

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
99.037	2546.061	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
92134.484	93976.977	1.370	395.194	288.426	307.469	1.066

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	549.27	-0.19	549.27	0.48	445.91
MEAN	17.74	0.00	-0.02	549.27	-0.19	549.27	0.48	
HUB	15.05	0.00	-0.02	549.27	-0.19	549.27	0.48	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	40.13	46.36	-6.23	462.91	718.44	15.71	533.76	0.63
MEAN	36.69	43.40	-6.71	409.13	685.01	15.71	533.76	0.60
HUB	32.31	38.84	-6.53	347.12	649.87	15.71	533.76	0.57

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	428.01	150.72	400.59	1155.34	0.37
MEAN	17.51	438.27	175.64	401.54	1154.90	0.38
HUB	14.85	475.40	250.91	403.79	1154.47	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	504.21	306.19	0.44	2989.49	
MEAN	403.78	461.83	228.14	0.40	3078.15	1.56
HUB	342.51	414.05	91.60	0.36	3728.83	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.42	1.05	17.66	570.02	1.02	554.72	0.92	0.74
MEAN	19.45	1.05	17.61	570.35	1.02	554.31	0.92	0.74
HUB	19.66	1.07	17.50	572.76	1.02	553.89	0.92	0.74

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.62	37.39	31.50	5.89	0.93	0.33	2.90	
MEAN	23.62	29.60	23.50	6.10	0.87	0.36	3.28	0.74
HUB	31.86	12.78	6.50	6.28	0.87	0.41	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.813

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	443.481	176.789	406.720	1155.222	0.384	-0.001

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.492      17.606     554.620      46.000      23.493      31.500       8.007

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     424.398     176.789     459.748    1156.661       0.367       0.076

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.466      17.735     556.003     471.992       0.024       0.204

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     412.283       0.000     412.283    1157.541       0.356       0.085

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.770     556.850       0.000       0.060       0.058       0.094

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.668      19.401       1.051     571.043      12.093     304.882       2.363

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  75326.672       0.361     509.821 1552282.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  0.971

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.767    2643.000      19.401     571.043       1.000       1.000       0.980
W Kg/sec =   54.43945

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.217    2518.957       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92134.484   93976.977       1.851     513.330     277.307     401.059       1.446

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   387.15    -0.13   387.15     0.33   423.36
 MEAN    16.97     0.00    -0.02   387.15    -0.13   387.15     0.33
 HUB     14.32     0.00    -0.02   387.15    -0.13   387.15     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.94    46.36     2.58   444.22   589.35    17.96   558.53     0.51
 MEAN    45.32    43.80     1.52   391.42   550.63    17.96   558.53     0.47
 HUB     40.48    37.84     2.64   330.28   508.98    17.96   558.53     0.44

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   432.85   145.23   407.76  1166.53     0.37
 MEAN    16.57   442.30   169.24   408.64  1166.05     0.38
 HUB     13.89   477.19   243.88   410.16  1165.52     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   500.50   290.23     0.43  2744.55
 MEAN   382.27   460.84   213.03     0.40  2807.27     1.28
 HUB    320.37   417.23    76.48     0.36  3389.45

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.49     1.06    18.63   581.21     1.02   565.56     0.92     0.89
 MEAN    20.52     1.06    18.58   581.44     1.02   565.10     0.92     0.89
 HUB     20.75     1.07    18.49   583.59     1.02   564.58     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     19.60    35.44    31.50     3.94     0.93     0.19     2.90
 MEAN    22.50    27.53    23.50     4.03     0.91     0.21     3.29     0.89
 HUB     30.74    10.56     6.50     4.06     0.91     0.24     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     435.082     170.195     400.412    1167.255       0.373       0.054

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.568      18.684     566.275      46.000      23.028      32.400       9.372

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     423.221     170.195     456.160    1168.131       0.362       0.093

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.536      18.753     567.125     456.573       0.026       0.206

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     402.634       0.000     402.634    1169.591       0.344       0.079

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.845     568.544       0.000       0.060       0.065       0.138

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.792      20.457       1.054     582.079      11.035     312.408       2.422

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  68750.945       0.363     465.315 1090486.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  0.943

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    119.767    2643.000       20.457     582.079       1.000        1.000        0.980
W Kg/sec =   54.43945

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     91.170    2494.965        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  92134.484   93976.977        1.919     509.668     265.525     390.276       1.470

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   375.31    -0.13   375.31      0.32   398.86
 MEAN    15.91      0.00    -0.02   375.31    -0.13   375.31      0.32
 HUB     13.07      0.00    -0.02   375.31    -0.13   375.31      0.32

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     48.40     47.36     1.04   422.54   565.25     19.05   570.32      0.48
 MEAN    44.37     44.80    -0.43   367.03   525.03     19.05   570.32      0.45
 HUB     38.78     38.84    -0.06   301.45   481.47     19.05   570.32      0.41

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   416.90    129.01    396.44  1177.35      0.35
 MEAN    15.50   424.27    148.61    397.39  1176.78      0.36
 HUB     12.59   453.42    215.51    398.93  1176.15      0.39
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   488.12   284.77     0.41  2316.75
 MEAN   357.44   448.92   208.84     0.38  2305.11     1.26
 HUB    290.38   405.90    74.87     0.35  2714.97

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.38     1.05    19.60   590.65     1.01   576.15     0.92     0.86
 MEAN    21.37     1.04    19.54   590.61     1.01   575.59     0.92     0.86
 HUB     21.54     1.05    19.44   592.13     1.02   574.97     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.03    35.69    31.50     4.19     0.93     0.18     2.90
 MEAN    20.50    27.72    23.50     4.22     0.90     0.19     3.34     0.86
 HUB     28.38    10.63     6.50     4.13     0.90     0.21     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.943

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     428.411     151.332     400.792    1177.009       0.364      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.393      19.520     575.811      46.000      20.686      33.000      12.314

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     429.402     151.332     455.289    1176.936       0.365      -0.048

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.308      19.434     575.740     440.827       0.065       0.182

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     401.480       0.000     401.480    1178.914       0.341       0.058

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.631     577.677       0.000       0.060       0.083       0.055

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.725      21.273       1.040     591.132       9.053     355.501       2.756

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   56414.285       0.329     381.819 1145799.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    425520.47   2879.9780    117.0002      1.4082      0.7891      7.9535      1.1307


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 70% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.496   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    117.504    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   53.41085

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    114.790    2632.591       1.402       0.249      53.349      32.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
90393.664	92201.352	2.488	831.557	334.292	619.754	1.854

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	268.52	-0.09	268.52	0.24	473.93
MEAN	17.06	0.00	-0.02	268.52	-0.09	268.52	0.24	
HUB	12.51	0.00	-0.02	268.52	-0.09	268.52	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.57	50.47	10.10	475.82	546.44	14.51	516.79	0.49
MEAN	55.70	47.20	8.50	393.48	476.45	14.51	516.79	0.43
HUB	47.07	38.62	8.45	288.54	394.22	14.51	516.79	0.35

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	458.66	280.18	363.13	1125.79	0.41
MEAN	18.04	477.36	304.96	367.25	1123.12	0.43
HUB	15.00	536.15	383.61	374.56	1118.79	0.48

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	475.82	412.48	195.64	0.37	5782.08	
MEAN	415.99	383.67	111.03	0.34	5501.82	1.40
HUB	345.97	376.45	37.64	0.34	5755.33	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.17	1.14	15.31	544.23	1.04	526.66	0.92	0.91
MEAN	17.07	1.13	15.07	543.19	1.04	524.16	0.92	0.91
HUB	17.16	1.14	14.66	544.13	1.04	520.13	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.65	28.31	24.20	4.11	0.93	0.33	2.90	
MEAN	39.71	16.82	12.70	4.12	0.93	0.29	3.51	0.91
HUB	45.68	-5.74	-9.30	3.56	0.93	0.16	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	484.006	304.366	376.328	1123.247	0.431	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.111	15.058	524.288	24.000	38.965	35.400	-3.565

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	401.481	304.366	503.811	1129.766	0.355	0.305

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.092	15.661	530.391	528.796	0.019	0.441

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	372.281	0.000	372.281	1131.775	0.329	0.357

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.813	532.278	0.000	0.060	0.041	0.377

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.875	17.045	1.128	543.854	21.044	204.165	1.583

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
131017.117	0.579	869.987	1129097.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
RESET = 0.000BLEED = 0.000 DPInc = 8.496 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
117.504	2643.000	17.045	543.854	1.000	1.000	0.980

W Kg/sec = 53.41085

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
103.764	2581.155	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
90393.664	92201.352	1.954	590.487	302.187	474.134	1.569

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	355.67	-0.12	355.67	0.31	462.87
MEAN	18.08	0.00	-0.02	355.67	-0.12	355.67	0.31	
HUB	15.21	0.00	-0.02	355.67	-0.12	355.67	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.12	46.36	6.76	473.98	592.68	15.92	533.29	0.52
MEAN	49.54	42.30	7.24	416.97	548.15	15.92	533.29	0.48
HUB	44.62	37.84	6.78	350.81	499.66	15.92	533.29	0.44

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	427.07	208.74	372.58	1144.58	0.37
MEAN	18.01	436.14	222.45	375.14	1142.90	0.38
HUB	15.22	472.15	282.69	378.18	1141.18	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	455.61	262.23	0.40	4265.08	
MEAN	415.39	421.85	192.94	0.37	4008.54	1.41
HUB	351.11	384.32	68.42	0.34	4305.21	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.68	1.10	16.96	559.65	1.03	544.42	0.92	0.91
MEAN	18.58	1.09	16.80	558.70	1.03	542.82	0.92	0.91
HUB	18.69	1.10	16.61	559.80	1.03	541.18	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	29.26	35.14	31.50	3.64	0.93	0.29	2.90	
MEAN	30.67	27.22	23.50	3.72	0.93	0.29	3.30	0.91
HUB	36.78	10.26	6.50	3.76	0.93	0.30	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	622.017	223.075	580.640	1126.199	0.552	-0.893

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.631	15.139	527.073	46.000	21.016	30.600	9.584

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	597.966	223.075	638.221	1128.814	0.530	-0.781

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	18.577	15.341	529.524	361.848	0.039	0.173

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	589.162	0.000	589.162	1129.744	0.522	0.129

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	15.379	530.397	0.000	0.060	0.072	-0.761

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.840	18.515	1.086	559.385	15.531	248.619	1.927

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
96720.695	0.436	642.250	1035881.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 8.496 EfDer = 0.830

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
117.504	2643.000	18.515	559.385	1.000	1.000	0.710

W Kg/sec = 53.41085

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
96.880	2545.071	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
90393.664	92201.352	1.401	395.194	282.144	307.469	1.090

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	534.03	-0.18	534.03	0.47	445.74
MEAN	17.74	0.00	-0.02	534.03	-0.18	534.03	0.47	
HUB	15.05	0.00	-0.02	534.03	-0.18	534.03	0.47	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	40.93	46.36	-5.43	462.91	706.85	15.91	535.57	0.62
MEAN	37.47	43.40	-5.93	409.13	672.85	15.91	535.57	0.59
HUB	33.04	38.84	-5.80	347.12	637.03	15.91	535.57	0.56

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	421.27	159.16	390.05	1156.93	0.36
MEAN	17.51	431.39	181.88	391.17	1156.30	0.37
HUB	14.85	468.10	253.61	393.45	1155.67	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	490.70	297.75	0.42	3156.61	
MEAN	403.78	449.73	221.90	0.39	3187.35	1.58
HUB	342.51	403.37	88.90	0.35	3768.90	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.56	1.06	17.85	571.07	1.02	556.26	0.92	0.76
MEAN	19.57	1.06	17.78	571.19	1.02	555.65	0.92	0.76
HUB	19.77	1.07	17.65	573.34	1.02	555.05	0.92	0.76

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	22.20	37.36	31.50	5.86	0.93	0.34	2.90	
MEAN	24.94	29.57	23.50	6.07	0.87	0.37	3.28	0.76
HUB	32.81	12.73	6.50	6.23	0.87	0.42	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.830

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	436.417	183.073	396.161	1156.621	0.377	0.000

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.614	17.776	555.965	46.000	24.802	31.500	6.698

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	412.706	183.073	451.489	1158.368	0.356	0.100

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.594	17.946	557.646	471.992	0.021	0.222

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	400.835	0.000	400.835	1159.205	0.346	0.111

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.984	558.452	0.000	0.060	0.052	0.120

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.695	19.536	1.055	571.868	12.483	293.542	2.276

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
77759.008	0.372	516.339	1512203.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 8.496 EfDer = 0.979

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
117.504	2643.000	19.536	571.868	1.000	1.000	0.980

W Kg/sec = 53.41085

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
92.836	2517.139	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
90393.664	92201.352	1.899	513.330	270.372	401.059	1.483

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	376.58	-0.13	376.58	0.32	423.06
MEAN	16.97	0.00	-0.02	376.58	-0.13	376.58	0.32	
HUB	14.32	0.00	-0.02	376.58	-0.13	376.58	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.72	46.36	3.36	444.22	582.46	18.16	560.03	0.50
MEAN	46.12	43.80	2.32	391.42	543.25	18.16	560.03	0.47
HUB	41.26	37.84	3.42	330.28	500.98	18.16	560.03	0.43

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	424.62	154.04	395.69	1168.62	0.36
MEAN	16.57	433.97	175.63	396.85	1167.94	0.37
HUB	13.89	468.49	246.25	398.55	1167.20	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	485.56	281.42	0.42	2910.74	
MEAN	382.27	447.42	206.64	0.38	2913.09	1.31
HUB	320.37	405.38	74.12	0.35	3422.21	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.71	1.06	18.90	582.65	1.02	567.59	0.92	0.90
MEAN	20.71	1.06	18.83	582.65	1.02	566.93	0.92	0.90
HUB	20.92	1.07	18.72	584.54	1.02	566.22	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	21.27	35.42	31.50	3.92	0.93	0.21	2.90	
MEAN	23.87	27.51	23.50	4.01	0.91	0.22	3.29	0.90
HUB	31.71	10.54	6.50	4.04	0.91	0.25	3.90	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481      427.145     176.619     388.920     1169.081       0.365       0.053

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     20.763      18.932      568.047      46.000      24.424       32.400       7.976

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481      410.337     176.619     446.734     1170.289       0.351       0.116

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       20.739      19.046      569.223     456.573       0.023       0.225

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096      390.320       0.000     390.320     1171.664       0.333       0.106

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       19.139      570.561       0.000       0.060       0.057       0.164

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4           PR4        Texit        Del T        Ns        Ns nondim
      0.817       20.670        1.058      583.280      11.411      300.465       2.329

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  71094.281       0.375     472.084 1065451.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.496   EfDer =  0.957

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    117.504     2643.000       20.670      583.280       1.000        1.000        0.980
W Kg/sec =   53.41085

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     88.616     2492.395        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  90393.664   92201.352        1.975      509.668     258.087      390.276       1.512

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   364.03    -0.13   364.03      0.31   398.45
 MEAN    15.91      0.00    -0.02   364.03    -0.13   364.03      0.31
 HUB     13.07      0.00    -0.02   364.03    -0.13   364.03      0.31

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     49.26     47.36     1.90   422.54   557.82     19.33   572.22      0.48
 MEAN    45.24     44.80     0.44   367.03   517.03     19.33   572.22      0.44
 HUB     39.64     38.84     0.80   301.45   472.72     19.33   572.22      0.40

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   407.80    138.51    383.56   1179.86      0.35
 MEAN    15.50   414.99    155.49    384.76   1179.07      0.35
 HUB     12.59   443.73    218.04    386.47   1178.24      0.38

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    413.78    472.11    275.27      0.40   2487.14
 MEAN   357.44    434.54    201.95      0.37   2411.74      1.29
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  HUB    290.38   393.18    72.34     0.33  2746.78

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     21.68     1.05    19.96   592.49     1.02   578.60     0.92     0.88
  MEAN    21.65     1.05    19.87   592.21     1.02   577.83     0.92     0.88
  HUB     21.79     1.05    19.76   593.45     1.02   577.01     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     19.86    35.67    31.50     4.17     0.93     0.20     2.90
  MEAN    22.00    27.69    23.50     4.19     0.90     0.20     3.34     0.88
  HUB     29.43    10.60     6.50     4.10     0.90     0.22     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.957

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     419.079     158.343     388.014    1179.298       0.355      -0.008

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      21.672      19.859     578.054      46.000      22.200      33.000      10.800

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     414.649     158.343     443.854    1179.612       0.352      -0.016

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      21.606      19.835     578.362     440.827       0.056       0.202

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     387.886       0.000     387.886    1181.439       0.328       0.088

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      20.021     580.155       0.000       0.060       0.073       0.085

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.763      21.574       1.044     592.714       9.434     339.457       2.631

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   58788.906       0.343     390.373 1118913.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     435380.00   2891.0322    114.7895      1.4281      0.8045      8.4962      1.1337


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
******************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     115.614    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   52.55191

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     112.943    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   88939.984   90718.586       2.528     831.557     328.916     619.754       1.884
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ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	263.94	-0.09	263.94	0.24	473.93
MEAN	17.06	0.00	-0.02	263.94	-0.09	263.94	0.24	
HUB	12.51	0.00	-0.02	263.94	-0.09	263.94	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.99	50.47	10.52	475.82	544.20	14.53	516.99	0.49
MEAN	56.15	47.20	8.95	393.48	473.88	14.53	516.99	0.42
HUB	47.56	38.62	8.94	288.54	391.12	14.53	516.99	0.35

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	455.69	283.74	356.57	1126.33	0.40
MEAN	18.04	473.63	306.96	360.70	1123.58	0.42
HUB	15.00	531.01	382.95	367.86	1119.24	0.47

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	475.82	405.02	192.08	0.36	5855.37	
MEAN	415.99	376.81	109.03	0.34	5537.91	1.42
HUB	345.97	369.71	36.98	0.33	5745.39	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.19	1.14	15.36	544.50	1.04	527.16	0.92	0.91
MEAN	17.08	1.13	15.11	543.33	1.04	524.59	0.92	0.91
HUB	17.15	1.14	14.70	544.10	1.04	520.55	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.51	28.31	24.20	4.11	0.93	0.35	2.90	
MEAN	40.40	16.82	12.70	4.12	0.93	0.30	3.51	0.91
HUB	46.15	-5.74	-9.30	3.56	0.93	0.17	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	480.056	306.365	369.587	1123.720	0.427	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.120	15.099	524.729	24.000	39.657	35.400	-4.257

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	393.992	306.365	499.089	1130.427	0.349	0.319

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.100	15.721	531.012	528.796	0.020	0.452

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	365.514	0.000	365.514	1132.348	0.323	0.366

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.863	532.818	0.000	0.060	0.043	0.387

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.873	17.052	1.129	543.977	21.167	201.536	1.562

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
131782.047	0.582	860.993	1109851.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
115.614	2643.000	17.052	543.977	1.000	1.000	0.980

W Kg/sec = 52.55191

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
102.067	2580.864	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
88939.984	90718.586	1.987	590.487	297.243	474.134	1.595

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	349.27	-0.12	349.27	0.31	462.82
MEAN	18.08	0.00	-0.02	349.27	-0.12	349.27	0.31	
HUB	15.21	0.00	-0.02	349.27	-0.12	349.27	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.62	46.36	7.26	473.98	588.86	15.96	533.79	0.52
MEAN	50.06	42.30	7.76	416.97	544.01	15.96	533.79	0.48
HUB	45.14	37.84	7.30	350.81	495.12	15.96	533.79	0.44

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	423.48	213.78	365.56	1145.38	0.37
MEAN	18.01	432.10	226.12	368.20	1143.59	0.38
HUB	15.22	467.49	284.03	371.31	1141.77	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	446.97	257.20	0.39	4367.89	
MEAN	415.39	414.00	189.27	0.36	4074.67	1.43
HUB	351.11	377.33	67.08	0.33	4325.59	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.72	1.10	17.04	560.16	1.03	545.18	0.92	0.91
MEAN	18.61	1.09	16.86	559.07	1.03	543.48	0.92	0.91
HUB	18.71	1.10	16.67	560.00	1.03	541.75	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.32	35.13	31.50	3.63	0.93	0.30	2.90	
MEAN	31.56	27.20	23.50	3.70	0.93	0.30	3.30	0.91
HUB	37.41	10.24	6.50	3.74	0.93	0.31	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	611.313	226.759	567.701	1127.756	0.542	-0.867

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.662	15.277	528.533	46.000	21.773	30.600	8.827

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	583.580	226.759	626.087	1130.705	0.516	-0.731

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	18.614	15.519	531.300	361.848	0.036	0.184

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	574.793	0.000	574.793	1131.609	0.508	0.155

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	15.561	532.150	0.000	0.060	0.065	-0.708

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    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.849      18.562       1.089     559.742      15.765     243.627       1.889

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98176.602       0.443     641.433 1017252.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.844

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.614    2643.000      18.562     559.742       1.000       1.000       0.710
W Kg/sec =   52.55191

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.115    2544.260       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 88939.984   90718.586       1.427     395.194     277.004     307.469       1.110

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   521.82    -0.18   521.82     0.46   445.60
 MEAN    17.74     0.00    -0.02   521.82    -0.18   521.82     0.46
 HUB     15.05     0.00    -0.02   521.82    -0.18   521.82     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     41.59    46.36    -4.77   462.91   697.67    16.06   537.00     0.61
 MEAN    38.11    43.40    -5.29   409.13   663.20    16.06   537.00     0.58
 HUB     33.65    38.84    -5.19   347.12   626.83    16.06   537.00     0.55

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   416.04   166.02   381.48  1158.20     0.36
 MEAN    17.51   425.98   186.99   382.74  1157.41     0.37
 HUB     14.85   462.25   255.77   385.04  1156.64     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   479.74   290.89     0.41  3292.37
 MEAN   403.78   439.88   216.79     0.38  3276.73     1.59
 HUB    342.51   394.69    86.74     0.34  3800.85

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.67     1.06    17.99   571.93     1.02   557.48     0.92     0.77
 MEAN    19.67     1.06    17.91   571.88     1.02   556.72     0.92     0.77
 HUB     19.85     1.07    17.78   573.82     1.03   555.98     0.92     0.77

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.52    37.33    31.50     5.83     0.93     0.35     2.90
 MEAN    26.04    29.53    23.50     6.03     0.88     0.38     3.28     0.77
 HUB     33.59    12.70     6.50     6.20     0.88     0.42     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.844

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     430.873     188.217     387.590    1157.739       0.372       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.712      17.912     557.040      46.000      25.902      31.500       5.598

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     17.392     403.261     188.217     445.023    1159.735       0.348       0.120

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.696      18.114     558.964     471.992       0.019       0.238

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     391.606       0.000     391.606    1160.538       0.337       0.131

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.153     559.737       0.000       0.060       0.047       0.141

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.716      19.643       1.058     572.542      12.801     284.754       2.207

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79736.141       0.382     520.953 1479667.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.614    2643.000      19.643     572.542       1.000       1.000       0.980
W Kg/sec =   52.55191

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     90.898    2515.657       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 88939.984   90718.586       1.939     513.330     264.729     401.059       1.515

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   368.04    -0.13   368.04     0.32   422.81
 MEAN    16.97     0.00    -0.02   368.04    -0.13   368.04     0.32
 HUB     14.32     0.00    -0.02   368.04    -0.13   368.04     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.37    46.36     4.01   444.22   576.98    18.32   561.23     0.50
 MEAN    46.77    43.80     2.97   391.42   537.37    18.32   561.23     0.46
 HUB     41.92    37.84     4.08   330.28   494.60    18.32   561.23     0.43

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   418.30   161.07   386.04  1170.27     0.36
 MEAN    16.57   427.47   180.71   387.39  1169.43     0.37
 HUB     13.89   461.60   248.14   389.23  1168.54     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   473.62   274.39     0.40  3043.45
 MEAN   382.27   436.69   201.56     0.37  2997.26     1.33
 HUB    320.37   395.88    72.23     0.34  3448.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.89     1.06    19.12   583.81     1.02   569.20     0.92     0.90
 MEAN    20.87     1.06    19.03   583.64     1.02   568.38     0.92     0.90
 HUB     21.06     1.07    18.91   585.31     1.02   567.52     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.65    35.40    31.50     3.90     0.93     0.23     2.90
 MEAN    25.01    27.49    23.50     3.99     0.91     0.24     3.29     0.90
 HUB     32.52    10.51     6.50     4.01     0.91     0.26     3.90


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     420.951     181.729     379.703    1170.533       0.360       0.053

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.918      19.127     569.460      46.000      25.576      32.400       6.824

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     400.067     181.729     439.408    1172.003       0.341       0.136

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.898      19.278     570.891     456.573       0.020       0.241

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     380.522       0.000     380.522    1173.310       0.324       0.127

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.371     572.165       0.000       0.060       0.052       0.184

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.833      20.837       1.061     584.254      11.711     291.315       2.258

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  72963.602       0.385     476.705 1044872.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.966

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    115.614    2643.000      20.837     584.254       1.000       1.000       0.980
W Kg/sec =   52.55191

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     86.565    2490.317       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88939.984   90718.586       2.022     509.668     252.113     390.276       1.548

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   355.04    -0.12   355.04     0.30   398.12
 MEAN    15.91     0.00    -0.02   355.04    -0.12   355.04     0.30
 HUB     13.07     0.00    -0.02   355.04    -0.12   355.04     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.97    47.36     2.61   422.54   551.99    19.56   573.73     0.47
 MEAN    45.96    44.80     1.16   367.03   510.73    19.56   573.73     0.43
 HUB     40.35    38.84     1.51   301.45   465.83    19.56   573.73     0.40

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   400.92   146.03   373.38  1181.84     0.34
 MEAN    15.50   407.85   160.93   374.76  1180.88     0.35
 HUB     12.59   436.16   220.05   376.59  1179.89     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   459.45   267.75     0.39  2622.00
 MEAN   357.44   423.16   196.52     0.36  2495.93     1.31
 HUB    290.38   383.10    70.34     0.32  2771.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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  TIP     21.92     1.05    20.24   593.96     1.02   580.54     0.92     0.88
  MEAN    21.87     1.05    20.14   593.49     1.02   579.61     0.92     0.88
  HUB     21.99     1.06    20.01   594.51     1.02   578.63     0.92     0.88

          Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     21.36    35.64    31.50     4.14     0.93     0.21     2.90
  MEAN    23.24    27.67    23.50     4.17     0.91     0.22     3.34     0.88
  HUB     30.30    10.58     6.50     4.08     0.91     0.23     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.966

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     411.900     163.878     377.896    1181.105       0.349      -0.007

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      21.892      20.124     579.827      46.000      23.444      33.000       9.556

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     403.073     163.878     435.113    1181.716       0.341       0.011

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      21.839      20.148     580.427     440.827       0.049       0.219

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     377.196       0.000     377.196    1183.431       0.319       0.112

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      20.325     582.112       0.000       0.060       0.066       0.109

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.790      21.809       1.047     593.989       9.735     327.425       2.538

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   60666.945       0.354     396.365 1096894.625

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     443325.34   2896.4500    112.9435      1.4437      0.8155      8.9532      1.1361


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 70% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.991

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     111.200    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   50.54562

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     108.632    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   85544.477   87255.180       2.629     831.557     316.359     619.754       1.959

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     20.63     0.00    -0.02   253.30    -0.09   253.30     0.23   473.93
MEAN    17.06     0.00    -0.02   253.30    -0.09   253.30     0.23
HUB     12.51     0.00    -0.02   253.30    -0.09   253.30     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.98    50.47    11.51   475.82   539.12    14.57   517.45     0.48
MEAN    57.23    47.20    10.03   393.48   468.04    14.57   517.45     0.42
HUB     48.73    38.62    10.11   288.54   384.01    14.57   517.45     0.34

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   449.23   291.89   341.48  1127.51     0.40
MEAN    18.04   465.30   311.56   345.60  1124.60     0.41
HUB     15.00   519.31   381.42   352.41  1120.25     0.46

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    475.82   387.87   183.93     0.34  6023.48
MEAN   415.99   361.03   104.44     0.32  5620.72     1.47
HUB    345.97   354.19    35.46     0.32  5722.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.25     1.14    15.46   545.13     1.04   528.27     0.92     0.91
MEAN    17.10     1.13    15.19   543.64     1.04   525.55     0.92     0.91
HUB     17.14     1.13    14.79   544.01     1.04   521.49     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.52    28.31    24.20     4.11     0.93     0.37     2.90
MEAN    42.03    16.81    12.70     4.11     0.94     0.33     3.51     0.91
HUB     47.26    -5.75    -9.30     3.55     0.94     0.19     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.991

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     471.222     310.951     354.061    1124.772       0.419      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.140      15.188     525.712      24.000      41.291      35.400      -5.891

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     376.829     310.951     488.560    1131.902       0.333       0.350

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.116      15.850     532.398     528.796       0.022       0.477

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     349.994       0.000     349.994    1133.632       0.309       0.388

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.970     534.027       0.000       0.060       0.048       0.409

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.866      17.063       1.129     544.258      21.448     195.486       1.515

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 133535.359       0.590     839.141 1065123.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      17.063     544.258       1.000       1.000       0.980
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W Kg/sec = 50.54562

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
98.134	2580.196	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85544.477	87255.180	2.066	590.487	285.789	474.134	1.659

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	334.58	-0.12	334.58	0.29	462.70
MEAN	18.08	0.00	-0.02	334.58	-0.12	334.58	0.29	
HUB	15.21	0.00	-0.02	334.58	-0.12	334.58	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.79	46.36	8.43	473.98	580.27	16.06	534.91	0.51
MEAN	51.26	42.30	8.96	416.97	534.70	16.06	534.91	0.47
HUB	46.37	37.84	8.53	350.81	484.87	16.06	534.91	0.43

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	415.86	225.21	349.60	1147.14	0.36
MEAN	18.01	423.25	234.43	352.40	1145.13	0.37
HUB	15.22	457.01	287.03	355.64	1143.10	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	427.34	245.76	0.37	4601.21	
MEAN	415.39	396.14	180.96	0.35	4224.12	1.47
HUB	351.11	361.36	64.09	0.32	4371.15	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.82	1.10	17.19	561.30	1.03	546.86	0.92	0.91
MEAN	18.67	1.09	16.99	559.90	1.03	544.94	0.92	0.91
HUB	18.73	1.10	16.78	560.45	1.03	543.01	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.79	35.11	31.50	3.61	0.93	0.33	2.90	
MEAN	33.63	27.18	23.50	3.68	0.93	0.33	3.30	0.91
HUB	38.91	10.22	6.50	3.72	0.93	0.33	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	587.978	235.086	538.937	1131.108	0.520	-0.807

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.724	15.571	531.680	46.000	23.567	30.600	7.033

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	551.963	235.086	599.940	1134.749	0.486	-0.620

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	18.690	15.894	535.109	361.848	0.030	0.209

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	543.518	0.000	543.518	1135.568	0.479	0.210

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	15.939	535.882	0.000	0.060	0.053	-0.594

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

```
      0.862      18.649       1.093     560.552      16.294     232.621       1.803

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 101469.648       0.457     637.639  974203.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.876

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      18.649     560.552       1.000       1.000       0.710
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     91.122    2542.420       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85544.477   87255.180       1.489     395.194     265.375     307.469       1.159

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   494.96    -0.17   494.96     0.43   445.28
 MEAN    17.74     0.00    -0.02   494.96    -0.17   494.96     0.43
 HUB     15.05     0.00    -0.02   494.96    -0.17   494.96     0.43

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.09    46.36    -3.27   462.91   677.81    16.38   540.10     0.59
 MEAN    39.59    43.40    -3.81   409.13   642.27    16.38   540.10     0.56
 HUB     35.06    38.84    -3.78   347.12   604.65    16.38   540.10     0.53

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   405.20   181.31   362.37  1160.97     0.35
 MEAN    17.51   414.45   198.33   363.92  1159.86     0.36
 HUB     14.85   449.51   260.58   366.27  1158.76     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   455.26   275.60     0.39  3595.14
 MEAN   403.78   417.91   205.45     0.36  3475.12     1.63
 HUB    342.51   375.32    81.92     0.32  3872.25

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.92      1.07    18.31   573.87     1.02   560.16     0.92     0.80
 MEAN    19.87      1.07    18.19   573.42     1.02   559.08     0.92     0.80
 HUB     20.02      1.07    18.04   574.89     1.03   558.02     0.92     0.80

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.58    37.25    31.50     5.75     0.93     0.37     2.90
 MEAN    28.59    29.45    23.50     5.95     0.88     0.40     3.28     0.80
 HUB     35.43    12.61     6.50     6.11     0.88     0.43     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.876

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     419.054     199.633     368.447    1160.183       0.361       0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.919      18.200     559.396      46.000      28.450      31.500       3.050

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     382.318     199.633     431.301    1162.729       0.329       0.166

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      19.909      18.471     561.854     471.992       0.015       0.274

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     371.215       0.000     371.215    1163.452       0.319       0.178

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.512     562.553       0.000       0.060       0.040       0.189

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.759      19.867       1.065     574.059      13.507     266.372       2.065

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  84138.758       0.403     528.731 1406544.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      19.867     574.059       1.000       1.000       0.980
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.561    2512.331       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85544.477   87255.180       2.036     513.330     252.096     401.059       1.591

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   349.15    -0.12   349.15     0.30   422.25
 MEAN    16.97     0.00    -0.02   349.15    -0.12   349.15     0.30
 HUB     14.32     0.00    -0.02   349.15    -0.12   349.15     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.84    46.36     5.48   444.22   565.11    18.66   563.88     0.49
 MEAN    48.28    43.80     4.48   391.42   524.60    18.66   563.88     0.45
 HUB     43.42    37.84     5.58   330.28   480.70    18.66   563.88     0.41

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   405.37   176.47   364.95  1173.84     0.35
 MEAN    16.57   413.83   191.90   366.65  1172.68     0.35
 HUB     13.89   446.79   252.27   368.76  1171.47     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   447.50   258.99     0.38  3334.07
 MEAN   382.27   413.13   190.37     0.35  3182.54     1.37
 HUB    320.37   374.99    68.10     0.32  3505.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.26     1.07    19.57   586.40     1.02   572.68     0.92     0.91
 MEAN    21.19     1.07    19.44   585.84     1.02   571.54     0.92     0.91
 HUB     21.33     1.07    19.29   587.04     1.02   570.37     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.81    35.36    31.50     3.86     0.93     0.26     2.90
 MEAN    27.63    27.44    23.50     3.94     0.92     0.27     3.29     0.91
 HUB     34.38    10.46     6.50     3.96     0.92     0.29     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
```

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	408.008	192.978	359.486	1173.683	0.348	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.242	19.536	572.530	46.000	28.228	32.400	4.172

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	377.707	192.978	424.150	1175.719	0.321	0.180

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.231	19.764	574.518	456.573	0.016	0.279

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	359.247	0.000	359.247	1176.880	0.305	0.175

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.855	575.654	0.000	0.060	0.043	0.230

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.861	21.182	1.066	586.428	12.369	272.340	2.111

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
77063.500	0.406	484.270	997875.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =10.034 EfDer = 0.984

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
111.200	2643.000	21.182	586.428	1.000	1.000	0.980

W Kg/sec = 50.54562

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
82.055	2485.695	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85544.477	87255.180	2.133	509.668	238.978	390.276	1.633

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	335.47	-0.12	335.47	0.28	397.38
MEAN	15.91	0.00	-0.02	335.47	-0.12	335.47	0.28	
HUB	13.07	0.00	-0.02	335.47	-0.12	335.47	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.56	47.36	4.20	422.54	539.61	20.02	577.03	0.46
MEAN	47.58	44.80	2.78	367.03	497.33	20.02	577.03	0.42
HUB	41.95	38.84	3.11	301.45	451.09	20.02	577.03	0.38

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	387.08	162.18	351.47	1186.06	0.33
MEAN	15.50	393.13	172.65	353.18	1184.78	0.33
HUB	12.59	420.18	224.40	355.24	1183.47	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	432.24	251.60	0.36	2911.60	
MEAN	357.44	398.61	184.79	0.34	2677.52	1.36
HUB	290.38	361.32	65.98	0.31	2826.71	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.43	1.06	20.83	597.21	1.02	584.70	0.92	0.90
MEAN	22.33	1.05	20.69	596.34	1.02	583.44	0.92	0.90
HUB	22.39	1.06	20.52	596.89	1.02	582.15	0.92	0.90

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         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     24.77    35.60    31.50     4.10     0.93     0.25     2.90
  MEAN    26.05    27.62    23.50     4.12     0.91     0.25     3.34     0.90
  HUB     32.28    10.52     6.50     4.02     0.91     0.26     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.984

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     397.133     175.817     356.094    1184.988       0.335      -0.007

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      22.350      20.676     583.647      46.000      26.277      33.000       6.723

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     378.421     175.817     417.270    1186.217       0.319       0.069

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      22.321      20.799     584.858     440.827       0.037       0.257

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     354.376       0.000     354.376    1187.707       0.298       0.166

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      20.959     586.329       0.000       0.060       0.052       0.163

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.835      22.296       1.053     596.812      10.384     303.238       2.351

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   64710.707       0.378     406.644 1046820.938

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     460917.97   2896.4238    108.6316      1.4759      0.8342     10.0345      1.1415


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.986

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     107.366    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   48.80284

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     104.886    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   82594.961   84246.680       2.722     831.557     305.451     619.754       2.029

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   244.12    -0.08   244.12     0.22   473.93
  MEAN    17.06     0.00    -0.02   244.12    -0.08   244.12     0.22
  HUB     12.51     0.00    -0.02   244.12    -0.08   244.12     0.22
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     62.84    50.47    12.37   475.82   534.87    14.61   517.83     0.48
MEAN    58.19    47.20    10.99   393.48   463.13    14.61   517.83     0.41
HUB     49.77    38.62    11.15   288.54   378.02    14.61   517.83     0.34

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   444.15   298.79   328.62  1128.48     0.39
MEAN    18.04   458.46   315.43   332.70  1125.45     0.41
HUB     15.00   509.42   380.07   339.20  1121.08     0.45

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    475.82   373.27   177.03     0.33  6165.71
MEAN   415.99   347.56   100.56     0.31  5690.62     1.51
HUB    345.97   340.91    34.10     0.30  5702.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.29     1.14    15.54   545.65     1.04   529.18     0.92     0.90
MEAN    17.11     1.13    15.26   543.89     1.04   526.34     0.92     0.90
HUB     17.12     1.13    14.85   543.94     1.04   522.26     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.28    28.31    24.20     4.11     0.93     0.40     2.90
MEAN    43.47    16.82    12.70     4.12     0.94     0.35     3.51     0.90
HUB     48.25    -5.74    -9.30     3.56     0.94     0.21     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.986

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     463.961     314.822     340.803    1125.632       0.412      -0.002

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.153      15.258     526.516      24.000      42.731      35.400      -7.331

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     362.256     314.822     479.940    1133.109       0.320       0.376

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.126      15.953     533.535     528.796       0.024       0.500

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     336.802       0.000     336.802    1134.687       0.297       0.407

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.053     535.021       0.000       0.060       0.054       0.427

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.858      17.067       1.130     544.495      21.685     190.336       1.475

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 135009.734       0.596     819.153 1026515.062


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.366    2643.000      17.067     544.495       1.000       1.000       0.980
W Kg/sec =   48.80284

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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    94.749    2579.635       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 82594.961   84246.680       2.140     590.487     275.933     474.134       1.718

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   322.08    -0.11   322.08     0.28   462.60
MEAN    18.08     0.00    -0.02   322.08    -0.11   322.08     0.28
HUB     15.21     0.00    -0.02   322.08    -0.11   322.08     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.81    46.36     9.45   473.98   573.14    16.14   535.83     0.50
MEAN    52.32    42.30    10.02   416.97   526.96    16.14   535.83     0.46
HUB     47.45    37.84     9.61   350.81   476.32    16.14   535.83     0.42

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

        R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   410.03   234.77   336.17  1148.57     0.36
MEAN    18.01   416.21   241.39   339.05  1146.39     0.36
HUB     15.22   448.37   289.52   342.36  1144.18     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    470.98   410.86   236.21     0.36  4796.18
MEAN   415.39   381.09   174.00     0.33  4349.49     1.51
HUB    351.11   347.86    61.59     0.30  4409.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.89     1.11    17.30   562.26     1.03   548.22     0.92     0.91
MEAN    18.72     1.10    17.09   560.61     1.03   546.14     0.92     0.91
HUB     18.74     1.10    16.86   560.83     1.03   544.04     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.93    35.09    31.50     3.59     0.93     0.35     2.90
MEAN    35.45    27.17    23.50     3.67     0.94     0.35     3.30     0.91
HUB     40.22    10.20     6.50     3.70     0.94     0.35     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.991

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     569.373     242.071     515.352    1133.739       0.502      -0.758

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.768      15.795     534.158      46.000      25.160      30.600       5.440

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     526.364     242.071     579.360    1137.908       0.463      -0.527

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      18.742      16.182     538.094     361.848       0.025       0.232

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     518.370       0.000     518.370    1138.646       0.455       0.252

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.680      16.224     538.791       0.000       0.060       0.047      -0.503

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.867      18.705       1.096     561.231      16.736     223.694       1.734

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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 104224.773       0.470     632.370  937301.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.904

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.366    2643.000      18.705     561.231       1.000       1.000       0.710
W Kg/sec =   48.80284

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.767    2540.881       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 82594.961   84246.680       1.546     395.194     255.603     307.469       1.203

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   473.11    -0.16   473.11     0.41   445.01
MEAN    17.74     0.00    -0.02   473.11    -0.16   473.11     0.41
HUB     15.05     0.00    -0.02   473.11    -0.16   473.11     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     44.39    46.36    -1.97   462.91   662.02    16.62   542.54     0.58
MEAN    40.86    43.40    -2.54   409.13   625.59    16.62   542.54     0.55
HUB     36.28    38.84    -2.56   347.12   586.89    16.62   542.54     0.51

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   397.16   193.91   346.60  1163.19     0.34
MEAN    17.51   405.57   207.67   348.37  1161.81     0.35
HUB     14.85   439.35   264.55   350.78  1160.47     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    456.91   435.09   263.00     0.37  3844.63
MEAN   403.78   399.78   196.11     0.34  3638.51     1.66
HUB    342.51   359.34    77.96     0.31  3931.01

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.11     1.08    18.55   575.47     1.03   562.30     0.92     0.83
MEAN    20.03     1.07    18.41   574.71     1.02   560.97     0.92     0.83
HUB     20.14     1.08    18.24   575.79     1.03   559.67     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     29.23    37.19    31.50     5.69     0.93     0.39     2.90
MEAN    30.80    29.38    23.50     5.88     0.89     0.41     3.28     0.83
HUB     37.02    12.53     6.50     6.03     0.89     0.45     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.904

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     409.951     209.034     352.654    1162.141       0.353       0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.079      18.421     561.288      46.000      30.657      31.500       0.843

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     365.182     209.034     420.777    1165.136       0.313       0.205

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.072      18.749     564.185     471.992       0.014       0.306

   VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	354.601	0.000	354.601	1165.793	0.304	0.216

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.786	564.821	0.000	0.060	0.037	0.227

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.791	20.033	1.071	575.321	14.089	252.314	1.956

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
87765.172	0.420	532.503	1345710.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =10.989 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
107.366	2643.000	20.033	575.321	1.000	1.000	0.980

W Kg/sec = 48.80284

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
82.973	2509.576	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
82594.961	84246.680	2.124	513.330	241.647	401.059	1.660

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	333.72	-0.11	333.72	0.29	421.79
MEAN	16.97	0.00	-0.02	333.72	-0.11	333.72	0.29	
HUB	14.32	0.00	-0.02	333.72	-0.11	333.72	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.09	46.36	6.73	444.22	555.70	18.93	566.02	0.48
MEAN	49.56	43.80	5.76	391.42	514.46	18.93	566.02	0.44
HUB	44.71	37.84	6.87	330.28	469.61	18.93	566.02	0.40

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	395.91	188.80	347.99	1176.66	0.34
MEAN	16.57	403.47	200.86	349.92	1175.25	0.34
HUB	13.89	435.17	255.60	352.20	1173.82	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	426.54	246.66	0.36	3566.81	
MEAN	382.27	394.14	181.40	0.34	3331.06	1.41
HUB	320.37	358.10	64.76	0.31	3551.99	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.54	1.08	19.91	588.53	1.02	575.44	0.92	0.91
MEAN	21.44	1.07	19.76	587.65	1.02	574.06	0.92	0.91
HUB	21.53	1.07	19.58	588.47	1.02	572.66	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.48	35.33	31.50	3.83	0.93	0.29	2.90	
MEAN	29.86	27.40	23.50	3.90	0.92	0.29	3.29	0.91
HUB	35.97	10.42	6.50	3.92	0.92	0.31	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	398.201	201.995	343.165	1176.189	0.339	0.050

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.485	19.844	574.979	46.000	30.482	32.400	1.918

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	359.815	201.995	412.636	1178.671	0.305	0.218

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.478	20.132	577.408	456.573	0.014	0.311

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	342.286	0.000	342.286	1179.719	0.290	0.213

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.218	578.436	0.000	0.060	0.038	0.267

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.874	21.436	1.070	588.217	12.896	258.041	2.000

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
80350.781	0.424	487.517	958089.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =10.989 EfDer = 0.993

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
107.366	2643.000	21.436	588.217	1.000	1.000	0.980

W Kg/sec = 48.80284

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
78.407	2481.913	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
82594.961	84246.680	2.232	509.668	228.356	390.276	1.709

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	319.83	-0.11	319.83	0.27	396.78
MEAN	15.91	0.00	-0.02	319.83	-0.11	319.83	0.27	
HUB	13.07	0.00	-0.02	319.83	-0.11	319.83	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.88	47.36	5.52	422.54	530.02	20.37	579.68	0.45
MEAN	48.94	44.80	4.14	367.03	486.91	20.37	579.68	0.41
HUB	43.32	38.84	4.48	301.45	439.58	20.37	579.68	0.37

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	377.20	174.88	334.21	1189.36	0.32
MEAN	15.50	382.20	181.90	336.13	1187.84	0.32
HUB	12.59	407.90	227.84	338.33	1186.31	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	410.82	238.90	0.35	3139.29	
MEAN	357.44	379.21	175.54	0.32	2820.81	1.40
HUB	290.38	344.07	62.54	0.29	2869.96	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.81	1.06	21.27	599.84	1.02	587.96	0.92	0.91
MEAN	22.67	1.06	21.10	598.66	1.02	586.46	0.92	0.91
HUB	22.69	1.06	20.90	598.84	1.02	584.95	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.62	35.56	31.50	4.06	0.93	0.28	2.90	

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 MEAN    28.42    27.58    23.50     4.08     0.92     0.28     3.34     0.91
 HUB     33.96    10.47     6.50     3.97     0.92     0.28     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     386.202     185.238     338.879    1188.040       0.325       -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.689      21.086     586.661      46.000      28.662      33.000       4.338

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     359.211     185.238     404.161    1189.740       0.302       0.117

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.673      21.282     588.340     440.827       0.030       0.290

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     336.562       0.000     336.562    1191.069       0.283       0.210

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.428     589.656       0.000       0.060       0.043       0.207

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.860      22.651       1.057     599.111      10.894     285.606       2.214

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  67895.570       0.397     411.947 1004618.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    475246.03   2883.4902     104.8861      1.4994      0.8438     10.9895      1.1459


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*******************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 70% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.556    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   47.07069

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.163    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79663.445   81256.547       2.823     831.557     294.610     619.754       2.104

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   235.05    -0.08   235.05     0.21   473.93
  MEAN    17.06     0.00    -0.02   235.05    -0.08   235.05     0.21
  HUB     12.51     0.00    -0.02   235.05    -0.08   235.05     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.72    50.47    13.25   475.82   530.78    14.65   518.20     0.48
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 MEAN    59.15    47.20    11.95   393.48   458.41    14.65   518.20     0.41
 HUB     50.84    38.62    12.22   288.54   372.22    14.65   518.20     0.33

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   439.55   305.49   316.04  1129.38     0.39
 MEAN    18.04   452.02   319.21   320.05  1126.24     0.40
 HUB     15.00   499.87   378.72   326.25  1121.86     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    475.82   359.02   170.33     0.32  6303.87
 MEAN   415.99   334.36    96.78     0.30  5758.65     1.56
 HUB    345.97   327.89    32.75     0.29  5681.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.33     1.15    15.61   546.17     1.04   530.03     0.92     0.90
 MEAN    17.13     1.13    15.32   544.15     1.04   527.08     0.92     0.90
 HUB     17.10     1.13    14.92   543.86     1.04   522.99     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.03    28.32    24.20     4.12     0.93     0.42     2.90
 MEAN    44.92    16.83    12.70     4.13     0.94     0.37     3.51     0.90
 HUB     49.26    -5.73    -9.30     3.57     0.94     0.24     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     457.122     318.590     327.812    1126.439       0.406      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.164      15.321     527.272      24.000      44.183      35.400      -8.783

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     348.042     318.590     471.839    1134.248       0.307       0.403

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.132      16.048     534.607     528.796       0.027       0.524

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     323.919       0.000     323.919    1135.683       0.285       0.424

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.128     535.961       0.000       0.060       0.062       0.445

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.849      17.066       1.130     544.725      21.915     185.296       1.436

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 136438.906       0.603     798.443  988356.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.986

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    103.556    2643.000      17.066     544.725       1.000       1.000       0.980
W Kg/sec =   47.07069

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.409    2579.091       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 79663.445   81256.547       2.218     590.487     266.205     474.134       1.781

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   309.86    -0.11   309.86     0.27   462.50
MEAN    18.08     0.00    -0.02   309.86    -0.11   309.86     0.27
HUB     15.21     0.00    -0.02   309.86    -0.11   309.86     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.83    46.36    10.47   473.98   566.36    16.21   536.71     0.50
MEAN    53.39    42.30    11.09   416.97   519.58    16.21   536.71     0.46
HUB     48.56    37.84    10.72   350.81   468.14    16.21   536.71     0.41

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   404.92   243.96   323.17  1149.90     0.35
MEAN    18.01   409.76   248.13   326.09  1147.56     0.36
HUB     15.22   440.16   291.91   329.44  1145.20     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    470.98   394.94   227.02     0.34  4983.81
MEAN   415.39   366.49   167.26     0.32  4470.74     1.55
HUB    351.11   334.71    59.20     0.29  4445.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.96     1.11    17.40   563.19     1.03   549.49     0.92     0.90
MEAN    18.75     1.10    17.17   561.28     1.03   547.26     0.92     0.90
HUB     18.74     1.10    16.93   561.19     1.03   545.01     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.05    35.09    31.50     3.59     0.93     0.38     2.90
MEAN    37.27    27.15    23.50     3.65     0.94     0.37     3.30     0.90
HUB     41.54    10.19     6.50     3.69     0.94     0.36     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.986

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     552.204     248.826     492.965    1136.138       0.486      -0.712

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.802      15.994     536.422      46.000      26.783      30.600       3.817

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     502.303     248.826     560.556    1140.782       0.440      -0.439

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      18.783      16.438     540.816     361.848       0.022       0.255

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     494.735       0.000     494.735    1141.447       0.433       0.292

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.680      16.476     541.447       0.000       0.060       0.042      -0.416

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.868      18.750       1.099     561.887      17.162     215.309       1.669

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 106878.734       0.482     625.456  901036.000
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.928

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.556    2643.000      18.750     561.887       1.000       1.000       0.710
W Kg/sec =   47.07069

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     84.500    2539.398       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 79663.445   81256.547       1.606     395.194     246.091     307.469       1.249

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   452.40    -0.16   452.40     0.40   444.75
MEAN    17.74     0.00    -0.02   452.40    -0.16   452.40     0.40
HUB     15.05     0.00    -0.02   452.40    -0.16   452.40     0.40

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     45.67    46.36    -0.69   462.91   647.38    16.83   544.80     0.57
MEAN    42.14    43.40    -1.26   409.13   610.07    16.83   544.80     0.53
HUB     37.51    38.84    -1.33   347.12   570.33    16.83   544.80     0.50

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   390.29   205.92   331.54  1165.24     0.33
MEAN    17.51   397.66   216.59   333.51  1163.64     0.34
HUB     14.85   429.99   268.35   335.97  1162.06     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    456.91   415.83   250.99     0.36  4082.39
MEAN   403.78   382.45   187.19     0.33  3794.44     1.70
HUB    342.51   344.06    74.16     0.30  3987.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.29     1.08    18.77   577.00     1.03   564.29     0.92     0.85
MEAN    20.18     1.08    18.61   575.94     1.03   562.73     0.92     0.85
HUB     20.25     1.08    18.42   576.65     1.03   561.21     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.84    37.13    31.50     5.63     0.93     0.41     2.90
MEAN    33.00    29.31    23.50     5.81     0.90     0.43     3.28     0.85
HUB     38.62    12.45     6.50     5.95     0.90     0.46     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.928

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     401.842     218.008     337.565    1163.960       0.345       0.007

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.222      18.620     563.048      46.000      32.855      31.500      -1.355

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     348.917     218.008     411.425    1167.384       0.299       0.244

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.216      19.000     566.366     471.992       0.014       0.339

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.121     338.889       0.000     338.889    1167.977       0.290       0.251
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.031	566.942	0.000	0.060	0.037	0.263

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.816	20.178	1.076	576.532	14.645	239.677	1.858

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
91225.391	0.437	533.852	1287235.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =11.953 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
103.556	2643.000	20.178	576.532	1.000	1.000	0.980

W Kg/sec = 47.07069

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
79.538	2506.938	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
79663.445	81256.547	2.216	513.330	231.644	401.059	1.731

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	319.09	-0.11	319.09	0.27	421.34
MEAN	16.97	0.00	-0.02	319.09	-0.11	319.09	0.27	
HUB	14.32	0.00	-0.02	319.09	-0.11	319.09	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.32	46.36	7.96	444.22	547.04	19.16	568.03	0.47
MEAN	50.82	43.80	7.02	391.42	505.09	19.16	568.03	0.43
HUB	46.00	37.84	8.16	330.28	459.33	19.16	568.03	0.39

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	387.86	200.30	332.13	1179.25	0.33
MEAN	16.57	394.32	209.25	334.22	1177.64	0.33
HUB	13.89	424.54	258.69	336.62	1176.00	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	406.96	235.16	0.35	3783.80	
MEAN	382.27	376.35	173.02	0.32	3469.95	1.46
HUB	320.37	342.22	61.67	0.29	3594.82	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.79	1.08	20.21	590.54	1.02	577.98	0.92	0.91
MEAN	21.65	1.07	20.03	589.38	1.02	576.40	0.92	0.91
HUB	21.70	1.08	19.83	589.84	1.02	574.79	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.09	35.30	31.50	3.80	0.93	0.32	2.90	
MEAN	32.05	27.37	23.50	3.87	0.93	0.32	3.29	0.91
HUB	37.54	10.38	6.50	3.88	0.93	0.33	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	389.568	210.427	327.847	1178.506	0.331	0.049

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.696	20.113	577.250	46.000	32.694	32.400	-0.294

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	343.136	210.427	402.520	1181.402	0.290	0.255

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.691	20.456	580.090	456.573	0.013	0.344

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	326.523	0.000	326.523	1182.347	0.276	0.248

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.533	581.019	0.000	0.060	0.037	0.301

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	21.651	1.073	589.919	13.388	245.337	1.902

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
83416.352	0.440	488.154	919345.062

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =11.953 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
103.556	2643.000	21.651	589.919	1.000	1.000	0.980

W Kg/sec = 47.07069

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
74.980	2478.329	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
79663.445	81256.547	2.334	509.668	218.374	390.276	1.787

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	305.26	-0.11	305.26	0.26	396.20
MEAN	15.91	0.00	-0.02	305.26	-0.11	305.26	0.26	
HUB	13.07	0.00	-0.02	305.26	-0.11	305.26	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.16	47.36	6.80	422.54	521.36	20.67	582.14	0.44
MEAN	50.26	44.80	5.46	367.03	477.46	20.67	582.14	0.40
HUB	44.65	38.84	5.81	301.45	429.10	20.67	582.14	0.36

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	368.98	186.54	318.35	1192.37	0.31
MEAN	15.50	372.73	190.43	320.40	1190.66	0.31
HUB	12.59	396.87	231.00	322.71	1188.93	0.33

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	391.13	227.24	0.33	3348.46	
MEAN	357.44	361.32	167.01	0.30	2952.93	1.45
HUB	290.38	328.12	59.38	0.28	2909.71	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.14	1.07	21.65	602.31	1.02	590.95	0.92	0.91
MEAN	22.96	1.06	21.45	600.85	1.02	589.25	0.92	0.91
HUB	22.94	1.06	21.23	600.69	1.02	587.54	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.37	35.52	31.50	4.02	0.93	0.31	2.90	
MEAN	30.73	27.53	23.50	4.03	0.92	0.30	3.34	0.91
HUB	35.60	10.43	6.50	3.93	0.92	0.30	4.06	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     376.753     193.925     323.010    1190.842       0.316      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.979      21.437     589.436      46.000      30.979      33.000       2.021

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     341.681     193.925     392.878    1192.965       0.286       0.162

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.970      21.697     591.539     440.827       0.026       0.324

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     320.294       0.000     320.294    1194.156       0.268       0.251

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.830     592.721       0.000       0.060       0.038       0.247

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      22.951       1.060     601.284      11.364     270.323       2.096

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   70825.914       0.414     414.474  963642.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    488785.28   2860.3796    101.1634      1.5192      0.8487     11.9532      1.1501


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 70% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  0.974

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.289    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.935     831.557     283.327     619.754       2.187

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   225.65    -0.08   225.65     0.20   473.93
  MEAN    17.06     0.00    -0.02   225.65    -0.08   225.65     0.20
  HUB     12.51     0.00    -0.02   225.65    -0.08   225.65     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.63    50.47    14.16   475.82   526.69    14.68   518.56     0.47
  MEAN    60.17    47.20    12.97   393.48   453.66    14.68   518.56     0.41
  HUB     51.98    38.62    13.36   288.54   366.36    14.68   518.56     0.33
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      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   435.23   312.31   303.13  1130.27     0.39
MEAN    18.04   445.67   323.03   307.05  1127.02     0.40
HUB     15.00   490.16   377.28   312.92  1122.64     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    475.82   344.42   163.51     0.30  6444.60
MEAN   415.99   320.81    92.97     0.28  5827.45     1.61
HUB    345.97   314.49    31.31     0.28  5660.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.36     1.15    15.67   546.69     1.05   530.87     0.92     0.89
MEAN    17.14     1.13    15.38   544.40     1.04   527.81     0.92     0.89
HUB     17.08     1.13    14.98   543.78     1.04   523.71     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     45.85    28.34    24.20     4.14     0.93     0.45     2.90
MEAN    46.45    16.84    12.70     4.14     0.94     0.40     3.51     0.89
HUB     50.33    -5.71    -9.30     3.59     0.94     0.26     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     450.367     322.399     314.466    1127.234       0.400      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.173      15.382     528.016      24.000      45.714      35.400     -10.314

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     333.499     322.399     463.856    1135.372       0.294       0.430

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.136      16.138     535.667     528.796       0.030       0.549

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     310.718       0.000     310.718    1136.670       0.273       0.441

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.197     536.893       0.000       0.060       0.070       0.462

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.838      17.061       1.129     544.957      22.147     180.126       1.396

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 137884.031       0.609     775.997  948857.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2643.000      17.061     544.957       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.951    2578.542       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.305     590.487     256.136     474.134       1.851

     ROTOR LEADING EDGE CONDITIONS, STAGE            2
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   297.32    -0.10   297.32     0.26   462.40
MEAN    18.08     0.00    -0.02   297.32    -0.10   297.32     0.26
HUB     15.21     0.00    -0.02   297.32    -0.10   297.32     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.91    46.36    11.55   473.98   559.60    16.27   537.57     0.49
MEAN    54.52    42.30    12.22   416.97   512.20    16.27   537.57     0.45
HUB     49.73    37.84    11.89   350.81   459.93    16.27   537.57     0.40

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   400.27   253.27   309.95  1151.20     0.35
MEAN    18.01   403.58   254.92   312.88  1148.72     0.35
HUB     15.22   431.99   294.32   316.22  1146.21     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    470.98   378.77   217.71     0.33  5173.78
MEAN   415.39   351.63   160.47     0.31  4592.94     1.60
HUB    351.11   321.28    56.80     0.28  4481.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.01     1.11    17.48   564.12     1.04   550.74     0.92     0.90
MEAN    18.78     1.10    17.25   561.97     1.03   548.37     0.92     0.90
HUB     18.74     1.10    16.99   561.56     1.03   545.97     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.25    35.08    31.50     3.58     0.93     0.40     2.90
MEAN    39.17    27.15    23.50     3.65     0.94     0.39     3.30     0.90
HUB     42.95    10.18     6.50     3.68     0.94     0.38     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.979

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     535.539     255.635     470.588    1138.439       0.470      -0.665

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.829      16.178     538.599      46.000      28.512      30.600       2.088

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     478.463     255.635     542.473    1143.536       0.418      -0.350

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      18.814      16.677     543.432     361.848       0.019       0.280

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.823     471.333       0.000     471.333    1144.130       0.412       0.332

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.680      16.710     543.997       0.000       0.060       0.038      -0.329

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.866      18.784       1.101     562.550      17.593     207.024       1.605

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 109560.031       0.494     616.593  863694.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  0.951
```

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
99.590	2643.000	18.784	562.550	1.000	1.000	0.710

W Kg/sec = 45.26799

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
81.164	2537.902	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
76612.523	78144.609	1.672	395.194	236.375	307.469	1.301

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	431.75	-0.15	431.75	0.38	444.48
MEAN	17.74	0.00	-0.02	431.75	-0.15	431.75	0.38	
HUB	15.05	0.00	-0.02	431.75	-0.15	431.75	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.00	46.36	0.64	462.91	633.11	17.03	546.99	0.55
MEAN	43.47	43.40	0.07	409.13	594.91	17.03	546.99	0.52
HUB	38.81	38.84	-0.03	347.12	554.08	17.03	546.99	0.48

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	384.26	217.93	316.48	1167.23	0.33
MEAN	17.51	390.34	225.51	318.61	1165.41	0.33
HUB	14.85	420.91	272.10	321.13	1163.63	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	396.57	238.98	0.34	4320.18	
MEAN	403.78	365.09	178.27	0.31	3950.51	1.74
HUB	342.51	328.76	70.41	0.28	4042.88	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.46	1.09	18.98	578.55	1.03	566.22	0.92	0.87
MEAN	20.31	1.08	18.79	577.18	1.03	564.46	0.92	0.87
HUB	20.35	1.08	18.59	577.52	1.03	562.73	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.55	37.06	31.50	5.56	0.93	0.43	2.90	
MEAN	35.29	29.23	23.50	5.73	0.90	0.44	3.28	0.87
HUB	40.27	12.37	6.50	5.87	0.90	0.47	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.951

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	394.336	226.988	322.456	1165.729	0.338	0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.355	18.803	564.765	46.000	35.143	31.500	-3.643

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	332.724	226.988	402.776	1169.583	0.284	0.284

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.347	19.234	568.505	471.992	0.015	0.373

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	323.296	0.000	323.296	1170.114	0.276	0.285

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.255	569.022	0.000	0.060	0.041	0.297

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.835	20.305	1.081	577.749	15.199	227.702	1.765

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
94681.023	0.454	532.855	1228179.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =12.972 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
99.590	2643.000	20.305	577.749	1.000	1.000	0.980

W Kg/sec = 45.26799

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
76.091	2504.296	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
76612.523	78144.609	2.316	513.330	221.607	401.059	1.810

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	304.56	-0.10	304.56	0.26	420.90
MEAN	16.97	0.00	-0.02	304.56	-0.10	304.56	0.26	
HUB	14.32	0.00	-0.02	304.56	-0.10	304.56	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.57	46.36	9.21	444.22	538.68	19.37	570.01	0.46
MEAN	52.12	43.80	8.32	391.42	496.03	19.37	570.01	0.42
HUB	47.33	37.84	9.49	330.28	449.34	19.37	570.01	0.38

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	380.74	211.55	316.56	1181.76	0.32
MEAN	16.57	385.87	217.48	318.75	1179.95	0.33
HUB	13.89	414.34	261.70	321.23	1178.13	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	387.75	223.91	0.33	3996.02	
MEAN	382.27	358.82	164.79	0.30	3606.31	1.51
HUB	320.37	326.54	58.66	0.28	3636.56	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.01	1.08	20.48	592.54	1.03	580.44	0.92	0.91
MEAN	21.84	1.08	20.28	591.10	1.02	578.67	0.92	0.91
HUB	21.85	1.08	20.06	591.21	1.02	576.88	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.75	35.27	31.50	3.77	0.93	0.35	2.90	
MEAN	34.31	27.34	23.50	3.84	0.93	0.34	3.29	0.91
HUB	39.17	10.35	6.50	3.85	0.93	0.35	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	381.629	218.706	312.744	1180.757	0.323	0.047

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.884	20.355	579.460	46.000	34.966	32.400	-2.566

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	326.789	218.706	393.222	1184.056	0.276	0.293

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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.879      20.750     582.703     456.573       0.013       0.378

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     311.112       0.000     311.112    1184.904       0.263       0.282

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.814     583.538       0.000       0.060       0.039       0.333

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      21.837       1.075     591.618      13.869     233.413       1.809

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  86417.656       0.456     486.350  879770.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2643.000      21.837     591.618       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     71.597    2474.768       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.444     509.668     208.522     390.276       1.872

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   291.00    -0.10   291.00     0.25   395.63
 MEAN    15.91     0.00    -0.02   291.00    -0.10   291.00     0.25
 HUB     13.07     0.00    -0.02   291.00    -0.10   291.00     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.45    47.36     8.09   422.54   513.14    20.94   584.55     0.43
 MEAN    51.60    44.80     6.80   367.03   468.47    20.94   584.55     0.40
 HUB     46.02    38.84     7.18   301.45   419.07    20.94   584.55     0.35

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   361.83   197.77   303.00  1195.27     0.30
 MEAN    15.50   364.10   198.64   305.14  1193.38     0.31
 HUB     12.59   386.41   234.00   307.50  1191.47     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   372.11   216.00     0.31  3549.89
 MEAN   357.44   343.99   158.80     0.29  3080.06     1.50
 HUB    290.38   312.63    56.38     0.26  2947.43

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.43     1.07    21.98   604.76     1.02   593.83     0.92     0.91
 MEAN    23.21     1.06    21.76   603.02     1.02   591.95     0.92     0.91
 HUB     23.15     1.06    21.52   602.53     1.02   590.06     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.13    35.48    31.50     3.98     0.93     0.34     2.90
 MEAN    33.06    27.49    23.50     3.99     0.93     0.33     3.34     0.91
 HUB     37.27    10.39     6.50     3.89     0.93     0.32     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000
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     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     368.163     202.284     307.612    1193.545       0.308      -0.007

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      23.232      21.747     592.120      46.000      33.329      33.000      -0.329

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     324.817     202.284     382.655    1196.070       0.272       0.206

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      23.225      22.064     594.627     440.827       0.024       0.358

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     304.639       0.000     304.639    1197.135       0.254       0.289

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      22.184     595.687       0.000       0.060       0.037       0.285

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.880      23.207       1.063     603.434      11.816     256.326       1.987

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   73641.812       0.430     414.449  921879.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     502184.56   2826.2437     97.2890      1.5361      0.8494     12.9716      1.1542


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 70% Stat 2 27% Ice Block 8-22-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.992   EfDer =  0.966

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      95.675    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   43.48865

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      93.465    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   73601.117   75072.977       3.055     831.557     272.190     619.754       2.277

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   216.43    -0.07   216.43     0.19   473.93
  MEAN    17.06     0.00    -0.02   216.43    -0.07   216.43     0.19
  HUB     12.51     0.00    -0.02   216.43    -0.07   216.43     0.19

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     65.54    50.47    15.07   475.82   522.80    14.72   518.90     0.47
  MEAN    61.19    47.20    13.99   393.48   449.14    14.72   518.90     0.40
  HUB     53.13    38.62    14.51   288.54   360.75    14.72   518.90     0.32

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	431.41	318.88	290.57	1131.10	0.38
MEAN	18.04	439.74	326.68	294.36	1127.75	0.39
HUB	15.00	480.83	375.82	299.92	1123.36	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	475.82	330.24	156.94	0.29	6580.11	
MEAN	415.99	307.61	89.31	0.27	5893.31	1.67
HUB	345.97	301.40	29.85	0.27	5638.27	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.39	1.15	15.73	547.19	1.05	531.65	0.92	0.88
MEAN	17.14	1.13	15.44	544.65	1.04	528.49	0.92	0.88
HUB	17.05	1.13	15.03	543.70	1.04	524.39	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	47.66	28.37	24.20	4.17	0.93	0.47	2.90	
MEAN	47.98	16.88	12.70	4.18	0.95	0.42	3.51	0.88
HUB	51.41	-5.68	-9.30	3.62	0.95	0.28	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.966

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	444.048	326.047	301.449	1127.974	0.394	0.000

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.178	15.435	528.709	24.000	47.245	35.400	-11.845

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	319.366	326.047	456.401	1136.423	0.281	0.457

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.136	16.220	536.660	528.796	0.034	0.574

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	297.866	0.000	297.866	1137.596	0.262	0.458

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.258	537.768	0.000	0.060	0.080	0.478

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.826	17.053	1.129	545.179	22.369	175.094	1.357

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
139263.422	0.615	752.953	910072.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =13.992 EfDer = 0.971

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
95.675	2643.000	17.053	545.179	1.000	1.000	0.980

W Kg/sec = 43.48865

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
84.553	2578.018	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73601.117	75072.977	2.398	590.487	246.239	474.134	1.926

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	285.10	-0.10	285.10	0.25	462.31

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 MEAN    18.08     0.00    -0.02   285.10    -0.10   285.10     0.25
 HUB     15.21     0.00    -0.02   285.10    -0.10   285.10     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.98    46.36    12.62   473.98   553.20    16.32   538.39     0.49
 MEAN    55.64    42.30    13.34   416.97   505.20    16.32   538.39     0.44
 HUB     50.91    37.84    13.07   350.81   452.13    16.32   538.39     0.40

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   396.28   262.17   297.16  1152.41     0.34
 MEAN    18.01   397.98   261.44   300.06  1149.80     0.35
 HUB     15.22   424.26   296.58   303.37  1147.15     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   363.19   208.80     0.32  5355.61
 MEAN   415.39   337.25   153.95     0.29  4710.38     1.65
 HUB    351.11   308.23    54.53     0.27  4516.33

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.06     1.12    17.56   565.02     1.04   551.90     0.92     0.89
 MEAN    18.81     1.10    17.31   562.63     1.03   549.40     0.92     0.89
 HUB     18.73     1.10    17.04   561.91     1.03   546.88     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.42    35.09    31.50     3.59     0.93     0.42     2.90
 MEAN    41.07    27.16    23.50     3.66     0.94     0.41     3.30     0.89
 HUB     44.35    10.19     6.50     3.69     0.94     0.40     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     520.182     262.178     449.279    1140.536       0.456      -0.620

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.848      16.339     540.586      46.000      30.266      30.600       0.334

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     455.935     262.178     525.941    1146.047       0.398      -0.265

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      18.836      16.887     545.823     361.848       0.018       0.305

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     449.241       0.000     449.241    1146.578       0.392       0.369

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      16.915     546.329       0.000       0.060       0.037      -0.247

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      18.806       1.103     563.183      18.005     199.237       1.544

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 112125.727       0.505     606.228  827207.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.992   EfDer =  0.969

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     95.675    2643.000      18.806     563.183       1.000       1.000       0.710
W Kg/sec =   43.48865
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
77.925	2536.474	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73601.117	75072.977	1.741	395.194	226.942	307.469	1.355

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	412.12	-0.14	412.12	0.36	444.23
MEAN	17.74	0.00	-0.02	412.12	-0.14	412.12	0.36	
HUB	15.05	0.00	-0.02	412.12	-0.14	412.12	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.33	46.36	1.97	462.91	619.88	17.21	549.00	0.54
MEAN	44.80	43.40	1.40	409.13	580.82	17.21	549.00	0.51
HUB	40.12	38.84	1.28	347.12	538.92	17.21	549.00	0.47

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	379.33	229.31	302.17	1169.06	0.32
MEAN	17.51	383.97	234.00	304.43	1167.05	0.33
HUB	14.85	412.61	275.67	307.01	1165.08	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	378.30	227.60	0.32	4545.45	
MEAN	403.78	348.57	169.78	0.30	4099.04	1.79
HUB	342.51	314.20	66.84	0.27	4095.80	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.60	1.10	19.15	580.02	1.03	568.00	0.92	0.89
MEAN	20.42	1.09	18.95	578.36	1.03	566.05	0.92	0.89
HUB	20.42	1.09	18.72	578.35	1.03	564.14	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.19	36.99	31.50	5.49	0.93	0.45	2.90	
MEAN	37.55	29.15	23.50	5.65	0.91	0.46	3.28	0.89
HUB	41.92	12.28	6.50	5.78	0.91	0.48	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.969

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	387.808	235.535	308.088	1167.362	0.332	0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.467	18.959	566.352	46.000	37.398	31.500	-5.898

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	317.402	235.535	395.247	1171.627	0.271	0.322

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.456	19.437	570.497	471.992	0.017	0.408

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	308.576	0.000	308.576	1172.101	0.263	0.316

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.447	570.959	0.000	0.060	0.048	0.328

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.849	20.408	1.085	578.909	15.726	216.855	1.681

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  97962.062       0.469     529.650 1171450.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =13.992   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     95.675    2643.000      20.408     578.909       1.000       1.000       0.980
W Kg/sec =   43.48865

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     72.806    2501.785       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73601.117   75072.977       2.421     513.330     212.039     401.059       1.891

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   290.81    -0.10   290.81     0.25   420.48
 MEAN    16.97     0.00    -0.02   290.81    -0.10   290.81     0.25
 HUB     14.32     0.00    -0.02   290.81    -0.10   290.81     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.80    46.36    10.44   444.22   531.03    19.55   571.85     0.45
 MEAN    53.40    43.80     9.60   391.42   487.71    19.55   571.85     0.42
 HUB     48.65    37.84    10.81   330.28   440.14    19.55   571.85     0.38

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   374.80   221.99   301.99  1184.05     0.32
 MEAN    16.57   378.47   225.13   304.23  1182.09     0.32
 HUB     13.89   405.02   264.47   306.76  1180.10     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   369.82   213.47     0.31  4193.06
 MEAN   382.27   342.41   157.14     0.29  3733.03     1.56
 HUB    320.37   311.81    55.89     0.26  3674.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.20     1.09    20.71   594.43     1.03   582.70     0.92     0.91
 MEAN    21.99     1.08    20.49   592.73     1.02   580.77     0.92     0.91
 HUB     21.97     1.08    20.25   592.51     1.02   578.82     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.32    35.26    31.50     3.76     0.93     0.37     2.90
 MEAN    36.50    27.32    23.50     3.82     0.94     0.37     3.29     0.91
 HUB     40.77    10.33     6.50     3.83     0.94     0.37     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     374.698     226.399     298.566    1182.834       0.317       0.045

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.038      20.556     581.504      46.000      37.173      32.400      -4.773

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     311.524     226.399     385.102    1186.509       0.263       0.329

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.030      20.998     585.123     456.573       0.015       0.411
```

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	296.751	0.000	296.751	1187.269	0.250	0.313

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	21.048	585.873	0.000	0.060	0.044	0.361

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.871	21.984	1.077	593.225	14.316	222.724	1.727

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
89202.453	0.470	482.289	841368.438

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =13.992 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
95.675	2643.000	21.984	593.225	1.000	1.000	0.980

W Kg/sec = 43.48865

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
68.417	2471.414	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73601.117	75072.977	2.558	509.668	199.262	390.276	1.959

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	277.69	-0.10	277.69	0.23	395.10
MEAN	15.91	0.00	-0.02	277.69	-0.10	277.69	0.23	
HUB	13.07	0.00	-0.02	277.69	-0.10	277.69	0.23	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.69	47.36	9.33	422.54	505.70	21.16	586.79	0.43
MEAN	52.90	44.80	8.10	367.03	460.31	21.16	586.79	0.39
HUB	47.36	38.84	8.52	301.45	409.93	21.16	586.79	0.35

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	355.98	208.11	288.81	1197.92	0.30
MEAN	15.50	356.64	206.19	290.99	1195.88	0.30
HUB	12.59	376.99	236.76	293.38	1193.82	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	354.56	205.67	0.30	3735.17	
MEAN	357.44	327.95	151.25	0.27	3197.05	1.55
HUB	290.38	298.24	53.63	0.25	2982.00	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.66	1.08	22.25	607.05	1.02	596.47	0.92	0.91
MEAN	23.41	1.07	22.01	605.06	1.02	594.44	0.92	0.91
HUB	23.32	1.06	21.76	604.26	1.02	592.40	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.77	35.46	31.50	3.96	0.93	0.37	2.90	
MEAN	35.32	27.46	23.50	3.96	0.93	0.35	3.34	0.91
HUB	38.90	10.36	6.50	3.86	0.93	0.34	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

```
     15.219     360.757     209.976     293.352    1196.029       0.302      -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.434      21.999     594.593      46.000      35.594      33.000      -2.594

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     309.310     209.976     373.848    1198.919       0.258       0.247

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.426      22.366     597.470     440.827       0.025       0.392

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     290.243       0.000     290.243    1199.876       0.242       0.324

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.471     598.424       0.000       0.060       0.039       0.319

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      23.406       1.065     605.456      12.231     243.984       1.891

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  76231.992       0.445     412.162  881421.812

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    514785.69   2783.2827     93.4649      1.5494      0.8462     13.9922      1.1581


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 70% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =14.987   EfDer =  0.959

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     91.914    2643.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   41.77924

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.791    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  70708.070   72122.078       3.180     831.557     261.491     619.754       2.370

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   207.61    -0.07   207.61     0.19   473.93
 MEAN    17.06     0.00    -0.02   207.61    -0.07   207.61     0.19
 HUB     12.51     0.00    -0.02   207.61    -0.07   207.61     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     66.43    50.47    15.96   475.82   519.21    14.75   519.21     0.46
 MEAN    62.19    47.20    14.99   393.48   444.96    14.75   519.21     0.40
 HUB     54.27    38.62    15.65   288.54   355.52    14.75   519.21     0.32

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   428.13   325.05   278.64  1131.85     0.38
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 MEAN    18.04   434.36   330.12   282.30  1128.41     0.38
 HUB     15.00   472.08   374.39   287.55  1124.02     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    475.82   316.81   150.77     0.28  6707.27
 MEAN   415.99   295.07    85.87     0.26  5955.26     1.73
 HUB    345.97   288.95    28.43     0.26  5616.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.42     1.15    15.78   547.66     1.05   532.35     0.92     0.88
 MEAN    17.15     1.14    15.48   544.87     1.04   529.12     0.92     0.88
 HUB     17.03     1.13    15.08   543.62     1.04   525.01     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     49.40    28.42    24.20     4.22     0.93     0.50     2.90
 MEAN    49.46    16.92    12.70     4.22     0.95     0.45     3.51     0.88
 HUB     52.47    -5.65    -9.30     3.65     0.95     0.31     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.959

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     438.318     329.478     289.080    1128.645       0.388       0.001

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.181      15.482     529.339      24.000      48.737      35.400     -13.337

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     305.976     329.478     449.641    1137.382       0.269       0.482

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.133      16.292     537.566     528.796       0.037       0.599

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     285.663       0.000     285.663    1138.444       0.251       0.473

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.311     538.570       0.000       0.060       0.089       0.493

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.814      17.042       1.128     545.386      22.576     170.309       1.320

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 140552.750       0.621     730.054  872992.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =14.987   EfDer =  0.963

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     91.914    2643.000      17.042     545.386       1.000       1.000       0.980
W Kg/sec =   41.77924

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.298    2577.529       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  70708.070   72122.078       2.494     590.487     236.759     474.134       2.003

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   273.49    -0.09   273.49     0.24   462.22
 MEAN    18.08     0.00    -0.02   273.49    -0.09   273.49     0.24
 HUB     15.21     0.00    -0.02   273.49    -0.09   273.49     0.24
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	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.02	46.36	13.66	473.98	547.30	16.37	539.14	0.48
MEAN	56.75	42.30	14.45	416.97	498.73	16.37	539.14	0.44
HUB	52.07	37.84	14.23	350.81	444.89	16.37	539.14	0.39

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	393.01	270.53	285.08	1153.51	0.34
MEAN	18.01	393.05	267.55	287.93	1150.78	0.34
HUB	15.22	417.14	298.70	291.18	1148.02	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	348.50	200.45	0.30	5526.09	
MEAN	415.39	323.67	147.84	0.28	4820.35	1.70
HUB	351.11	295.86	52.41	0.26	4548.50	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.09	1.12	17.61	565.85	1.04	552.96	0.92	0.88
MEAN	18.82	1.10	17.36	563.24	1.03	550.34	0.92	0.88
HUB	18.72	1.10	17.08	562.23	1.03	547.70	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.50	35.11	31.50	3.61	0.93	0.45	2.90	
MEAN	42.90	27.18	23.50	3.68	0.95	0.43	3.30	0.88
HUB	45.73	10.20	6.50	3.70	0.95	0.42	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.963

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	506.351	268.305	429.422	1142.409	0.443	-0.578

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.859	16.477	542.365	46.000	31.997	30.600	-1.397

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	435.079	268.305	511.157	1148.295	0.379	-0.186

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	18.848	17.068	547.969	361.848	0.018	0.331

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	428.812	0.000	428.812	1148.769	0.373	0.402

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	17.090	548.421	0.000	0.060	0.037	-0.172

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.855	18.818	1.104	563.776	18.391	192.057	1.489

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
114529.867	0.516	594.887	792474.812

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =14.987 EfDer = 0.983

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
91.914	2643.000	18.818	563.776	1.000	1.000	0.710

W Kg/sec = 41.77924

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
74.856	2535.140	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
70708.070	72122.078	1.813	395.194	218.004	307.469	1.410

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	393.88	-0.14	393.88	0.34	444.00
MEAN	17.74	0.00	-0.02	393.88	-0.14	393.88	0.34	
HUB	15.05	0.00	-0.02	393.88	-0.14	393.88	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.61	46.36	3.25	462.91	607.90	17.35	550.82	0.53
MEAN	46.10	43.40	2.70	409.13	568.01	17.35	550.82	0.49
HUB	41.40	38.84	2.56	347.12	525.10	17.35	550.82	0.46

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	375.49	239.84	288.91	1170.71	0.32
MEAN	17.51	378.57	241.83	291.26	1168.54	0.32
HUB	14.85	405.21	278.98	293.88	1166.39	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	361.37	217.07	0.31	4753.95	
MEAN	403.78	333.26	161.95	0.29	4235.95	1.83
HUB	342.51	300.66	63.52	0.26	4144.95	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.73	1.10	19.30	581.38	1.03	569.61	0.92	0.90
MEAN	20.51	1.09	19.07	579.46	1.03	567.50	0.92	0.90
HUB	20.48	1.09	18.83	579.13	1.03	565.42	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.70	36.92	31.50	5.42	0.93	0.47	2.90	
MEAN	39.70	29.08	23.50	5.58	0.91	0.48	3.28	0.90
HUB	43.51	12.20	6.50	5.70	0.91	0.50	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.983

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	382.263	243.413	294.746	1168.839	0.327	0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.556	19.087	567.789	46.000	39.551	31.500	-8.051

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	303.235	243.413	388.847	1173.485	0.258	0.359

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.541	19.608	572.312	471.992	0.020	0.442

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	294.989	0.000	294.989	1173.907	0.251	0.343

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.603	572.724	0.000	0.060	0.058	0.356

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.856	20.485	1.089	579.989	16.213	207.206	1.606

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
100996.258	0.484	524.591	1118223.875

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =14.987   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     91.914    2643.000      20.485     579.989       1.000       1.000       0.980
W Kg/sec =   41.77924

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     69.747    2499.455       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 70708.070   72122.078       2.527     513.330     203.131     401.059       1.974

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   278.11    -0.10   278.11     0.24   420.08
MEAN    16.97     0.00    -0.02   278.11    -0.10   278.11     0.24
HUB     14.32     0.00    -0.02   278.11    -0.10   278.11     0.24

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.96    46.36    11.60   444.22   524.18    19.70   573.53     0.45
MEAN    54.61    43.80    10.81   391.42   480.24    19.70   573.53     0.41
HUB     49.91    37.84    12.07   330.28   431.85    19.70   573.53     0.37

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   370.02   231.52   288.64  1186.12     0.31
MEAN    16.57   372.13   232.08   290.89  1184.02     0.31
HUB     13.89   396.71   266.99   293.42  1181.89     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   353.42   203.94     0.30  4372.99
MEAN   382.27   327.37   150.19     0.28  3848.12     1.61
HUB    320.37   298.24    53.37     0.25  3709.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.34     1.09    20.88   596.18     1.03   584.75     0.92     0.90
MEAN    22.11     1.08    20.65   594.23     1.02   582.67     0.92     0.90
HUB     22.05     1.08    20.40   593.72     1.02   580.58     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.73    35.24    31.50     3.74     0.93     0.40     2.90
MEAN    38.58    27.31    23.50     3.81     0.94     0.39     3.29     0.90
HUB     42.30    10.31     6.50     3.81     0.94     0.39     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.987

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     368.779     233.387     285.532    1184.714       0.311       0.043

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.156      20.715     583.359      46.000      39.262      32.400      -6.862

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     297.550     233.387     378.161    1188.730       0.250       0.363

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.145      21.199     587.321     456.573       0.017       0.444

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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    16.096     283.620       0.000     283.620    1189.414       0.238       0.339

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950     21.233     587.997       0.000       0.060       0.052       0.386

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862     22.092       1.078     594.712      14.723     213.271       1.653

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91739.906       0.484     476.512  805022.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =14.987   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     91.914    2643.000      22.092     594.712       1.000       1.000       0.980
W Kg/sec =   41.77924

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     65.489    2468.323       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  70708.070   72122.078       2.672     509.668     190.736     390.276       2.046

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   265.50    -0.09   265.50     0.22   394.60
 MEAN    15.91     0.00    -0.02   265.50    -0.09   265.50     0.22
 HUB     13.07     0.00    -0.02   265.50    -0.09   265.50     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.86    47.36    10.50   422.54   499.11    21.34   588.83     0.42
 MEAN    54.13    44.80     9.33   367.03   453.06    21.34   588.83     0.38
 HUB     48.64    38.84     9.80   301.45   401.77    21.34   588.83     0.34

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   351.30   217.42   275.94  1200.30     0.29
 MEAN    15.50   350.32   213.01   278.12  1198.13     0.29
 HUB     12.59   368.67   239.23   280.51  1195.95     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   338.67   196.36     0.28  3902.11
 MEAN   357.44   313.39   144.43     0.26  3302.63     1.60
 HUB    290.38   285.13    51.15     0.24  3013.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.84     1.08    22.46   609.15     1.02   598.85     0.92     0.91
 MEAN    23.57     1.07    22.21   606.93     1.02   596.69     0.92     0.91
 HUB     23.44     1.06    21.94   605.86     1.02   594.52     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.24    35.44    31.50     3.94     0.93     0.40     2.90
 MEAN    37.45    27.44    23.50     3.94     0.93     0.38     3.34     0.91
 HUB     40.46    10.33     6.50     3.83     0.93     0.36     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.994

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     354.496     216.918     280.382    1198.267       0.296      -0.009

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     23.587      22.195     596.828      46.000      37.727      33.000      -4.727

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     295.285     216.918     366.396    1201.487       0.246       0.284

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.575      22.604     600.040     440.827       0.028       0.425

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     277.223       0.000     277.223    1202.350       0.231       0.355

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.696     600.903       0.000       0.060       0.044       0.349

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      23.552       1.066     607.317      12.605     233.231       1.808

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   78567.117       0.459     408.090  843173.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    526385.88   2734.1335     89.7911      1.5590      0.8401     14.9870      1.1616


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 70% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =15.956   EfDer =  0.950

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     88.301    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   40.13702

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.262    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  67928.758   69287.188       3.310     831.557     251.213     619.754       2.467

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   199.18    -0.07   199.18     0.18   473.93
  MEAN    17.06     0.00    -0.02   199.18    -0.07   199.18     0.18
  HUB     12.51     0.00    -0.02   199.18    -0.07   199.18     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     67.29    50.47    16.82   475.82   515.89    14.78   519.50     0.46
  MEAN    63.16    47.20    15.96   393.48   441.08    14.78   519.50     0.39
  HUB     55.39    38.62    16.77   288.54   350.66    14.78   519.50     0.31

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   425.35   330.87   267.30  1132.54     0.38
  MEAN    18.04   429.46   333.31   270.82  1129.01     0.38
  HUB     15.00   463.86   372.98   275.78  1124.62     0.41
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    475.82   304.08   144.95     0.27  6827.19
 MEAN   415.99   283.16    82.69     0.25  6012.67     1.79
 HUB    345.97   277.10    27.01     0.25  5595.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.44     1.15    15.82   548.11     1.05   532.99     0.92     0.87
 MEAN    17.15     1.14    15.52   545.09     1.04   529.68     0.92     0.87
 HUB     17.00     1.13    15.12   543.54     1.04   525.57     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     51.07    28.47    24.20     4.27     0.93     0.52     2.90
 MEAN    50.90    16.98    12.70     4.28     0.95     0.47     3.51     0.87
 HUB     53.52    -5.59    -9.30     3.71     0.95     0.33     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.950

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     433.085     332.658     277.311    1129.257       0.384       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.181      15.521     529.912      24.000      50.185      35.400     -14.785

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     293.269     332.658     443.473    1138.259       0.258       0.507

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.129      16.355     538.395     528.796       0.041       0.624

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     274.055       0.000     274.055    1139.221       0.241       0.488

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.355     539.305       0.000       0.060       0.099       0.507

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.802      17.029       1.127     545.578      22.768     165.754       1.285

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 141752.406       0.626     707.344  837527.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =15.956   EfDer =  0.954

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     88.301    2643.000      17.029     545.578       1.000       1.000       0.980
W Kg/sec =   40.13702

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     78.177    2577.073       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  67928.758   69287.188       2.594     590.487     227.671     474.134       2.083

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   262.43    -0.09   262.43     0.23   462.14
 MEAN    18.08     0.00    -0.02   262.43    -0.09   262.43     0.23
 HUB     15.21     0.00    -0.02   262.43    -0.09   262.43     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.03    46.36    14.67   473.98   541.86    16.41   539.83     0.48
 MEAN    57.82    42.30    15.52   416.97   492.76    16.41   539.83     0.43
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HUB     53.21    37.84    15.37   350.81   438.18    16.41   539.83     0.38

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   390.35   278.37   273.65  1154.51     0.34
MEAN    18.01   388.70   273.27   276.43  1151.67     0.34
HUB     15.22   410.55   300.63   279.60  1148.81     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    470.98   334.64   192.61     0.29  5686.09
MEAN   415.39   310.82   142.12     0.27  4923.23     1.75
HUB    351.11   284.12    50.48     0.25  4577.89

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.12     1.12    17.66   566.64     1.04   553.92     0.92     0.87
MEAN    18.83     1.11    17.40   563.81     1.03   551.20     0.92     0.87
HUB     18.70     1.10    17.11   562.54     1.03   548.46     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     45.49    35.14    31.50     3.64     0.93     0.47     2.90
MEAN    44.67    27.21    23.50     3.71     0.95     0.45     3.30     0.87
HUB     47.08    10.23     6.50     3.73     0.95     0.44     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.954

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     493.849     274.038     410.841    1144.089       0.432      -0.539

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.864      16.594     543.963      46.000      33.704      30.600      -3.104

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     415.674     274.038     497.877    1150.316       0.361      -0.112

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      18.851      17.223     549.901     361.848       0.018       0.356

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     409.826       0.000     409.826    1150.738       0.356       0.432

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.680      17.238     550.304       0.000       0.060       0.040      -0.102

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.846      18.819       1.105     564.330      18.752     185.413       1.437

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 116776.953       0.526     582.716  759383.312


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =15.956   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     88.301    2643.000      18.819     564.330       1.000       1.000       0.710
W Kg/sec =   40.13702

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     71.943    2533.896       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  67928.758   69287.188       1.886     395.194     209.522     307.469       1.467
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ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	376.85	-0.13	376.85	0.33	443.78
MEAN	17.74	0.00	-0.02	376.85	-0.13	376.85	0.33	
HUB	15.05	0.00	-0.02	376.85	-0.13	376.85	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.86	46.36	4.50	462.91	597.01	17.48	552.47	0.52
MEAN	47.36	43.40	3.96	409.13	556.34	17.48	552.47	0.48
HUB	42.66	38.84	3.82	347.12	512.44	17.48	552.47	0.44

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	372.55	249.60	276.58	1172.20	0.32
MEAN	17.51	374.02	249.11	278.99	1169.88	0.32
HUB	14.85	398.56	282.03	281.62	1167.59	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	345.64	207.31	0.29	4947.22	
MEAN	403.78	318.99	154.67	0.27	4363.44	1.88
HUB	342.51	288.04	60.48	0.25	4190.13	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.83	1.11	19.42	582.65	1.03	571.06	0.92	0.91
MEAN	20.58	1.09	19.17	580.49	1.03	568.81	0.92	0.91
HUB	20.51	1.09	18.92	579.85	1.03	566.58	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.07	36.85	31.50	5.35	0.93	0.49	2.90	
MEAN	41.76	29.00	23.50	5.50	0.92	0.49	3.28	0.91
HUB	45.04	12.12	6.50	5.62	0.92	0.51	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	377.598	250.749	282.320	1170.174	0.323	0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.625	19.188	569.090	46.000	41.611	31.500	-10.111

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	290.087	250.749	383.439	1175.179	0.247	0.394

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.604	19.748	573.968	471.992	0.024	0.475

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	282.388	0.000	282.388	1175.555	0.240	0.368

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.728	574.336	0.000	0.060	0.069	0.380

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.859	20.538	1.091	580.994	16.665	198.543	1.539

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
103809.836	0.497	518.011	1068136.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

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 RESET =  0.000BLEED =  0.000 DPInc =15.956   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    88.301    2643.000      20.538     580.994       1.000       1.000       0.980
W Kg/sec =   40.13702

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    66.889    2497.292       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 67928.758   69287.188       2.635     513.330     194.809     401.059       2.059

    ROTOR LEADING EDGE CONDITIONS, STAGE             4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   266.31    -0.09   266.31     0.23   419.72
MEAN    16.97     0.00    -0.02   266.31    -0.09   266.31     0.23
HUB     14.32     0.00    -0.02   266.31    -0.09   266.31     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.06    46.36    12.70   444.22   518.01    19.82   575.07     0.44
MEAN    55.78    43.80    11.98   391.42   473.50    19.82   575.07     0.40
HUB     51.13    37.84    13.29   330.28   424.35    19.82   575.07     0.36

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
TIP     18.88   366.14   240.22   276.33  1187.99     0.31
MEAN    16.57   366.70   238.47   278.56  1185.77     0.31
HUB     13.89   389.21   269.23   281.07  1183.53     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   338.34   195.24     0.28  4537.06
MEAN   382.27   313.49   143.80     0.26  3953.96     1.66
HUB    320.37   285.69    51.14     0.24  3740.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.46     1.09    21.02   597.79     1.03   586.60     0.92     0.90
MEAN    22.20     1.08    20.78   595.63     1.03   584.41     0.92     0.90
HUB     22.11     1.08    20.51   594.84     1.02   582.20     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.00    35.24    31.50     3.74     0.93     0.43     2.90
MEAN    40.57    27.30    23.50     3.80     0.94     0.41     3.29     0.90
HUB     43.77    10.31     6.50     3.81     0.94     0.41     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.980

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     363.734     239.813     273.482    1186.418       0.307       0.040

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.243      20.838     585.044      46.000      41.247      32.400      -8.847

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     284.676     239.813     372.224    1190.750       0.239       0.395

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.227      21.359     589.323     456.573       0.020       0.475

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     271.530       0.000     271.530    1191.366       0.228       0.363

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      21.377     589.934       0.000       0.060       0.062       0.407

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.851      22.166       1.079     596.088      15.094     204.836       1.588

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94053.562       0.496     469.327  770558.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =15.956   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     88.301    2643.000      22.166     596.088       1.000       1.000       0.980
W Kg/sec =   40.13702

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     62.778    2465.472       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 67928.758   69287.188       2.788     509.668     182.839     390.276       2.135

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   254.26    -0.09   254.26     0.21   394.15
 MEAN    15.91     0.00    -0.02   254.26    -0.09   254.26     0.21
 HUB     13.07     0.00    -0.02   254.26    -0.09   254.26     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.97    47.36    11.61   422.54   493.22    21.47   590.69     0.41
 MEAN    55.29    44.80    10.49   367.03   446.56    21.47   590.69     0.37
 HUB     49.86    38.84    11.02   301.45   394.43    21.47   590.69     0.33

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   347.56   225.88   264.15  1202.45     0.29
 MEAN    15.50   344.93   219.21   266.31  1200.17     0.29
 HUB     12.59   361.23   241.47   268.67  1197.88     0.30

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   324.17   187.90     0.27  4053.88
 MEAN   357.44   300.05   138.23     0.25  3398.69     1.65
 HUB    290.38   273.09    48.92     0.23  3041.22

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.98     1.08    22.63   611.09     1.03   601.01     0.92     0.90
 MEAN    23.68     1.07    22.36   608.67     1.02   598.74     0.92     0.90
 HUB     23.52     1.06    22.08   607.34     1.02   596.45     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.53    35.42    31.50     3.92     0.93     0.42     2.90
 MEAN    39.46    27.43    23.50     3.93     0.94     0.40     3.34     0.90
 HUB     41.95    10.32     6.50     3.82     0.94     0.38     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     349.167     223.234     268.485    1200.295       0.291      -0.010

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.697      22.343     598.858      46.000      39.742      33.000      -6.742

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     282.477     223.234     360.037    1203.813       0.235       0.317

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.680      22.788     602.374     440.827       0.032       0.456

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     265.332       0.000     265.332    1204.596       0.220       0.381

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.866     603.158       0.000       0.060       0.052       0.374

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      23.653       1.067     609.034      12.945     223.727       1.734

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  80688.242       0.471     402.634  806936.438

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    537081.00   2680.0317     86.2617      1.5657      0.8318     15.9559      1.1649


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 70% Stat 2 27% Ice Block 8-22-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =16.431   EfDer =  0.946

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     86.549    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   39.34029

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     84.549    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  66580.336   67911.805       3.377     831.557     246.226     619.754       2.517

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   195.10    -0.07   195.10     0.17   473.93
  MEAN    17.06     0.00    -0.02   195.10    -0.07   195.10     0.17
  HUB     12.51     0.00    -0.02   195.10    -0.07   195.10     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     67.71    50.47    17.24   475.82   514.33    14.79   519.63     0.46
  MEAN    63.63    47.20    16.43   393.48   439.26    14.79   519.63     0.39
  HUB     55.94    38.62    17.32   288.54   348.36    14.79   519.63     0.31

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   424.11   333.63   261.85  1132.85     0.37
  MEAN    18.04   427.19   334.83   265.29  1129.29     0.38
  HUB     15.00   459.95   372.29   270.10  1124.90     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   297.96   142.19     0.26  6884.14
  MEAN   415.99   277.43    81.17     0.25  6040.07     1.82
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 HUB    345.97   271.38    26.33     0.24  5585.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.45     1.16    15.84   548.32     1.05   533.29     0.92     0.87
 MEAN    17.15     1.14    15.54   545.19     1.04   529.95     0.92     0.87
 HUB     16.99     1.12    15.14   543.50     1.04   525.83     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     51.87    28.50    24.20     4.30     0.93     0.53     2.90
 MEAN    51.61    17.01    12.70     4.31     0.95     0.48     3.51     0.87
 HUB     54.04    -5.57    -9.30     3.73     0.95     0.34     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.946

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     430.653     334.175     271.642    1129.541       0.381       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.180      15.538     530.179      24.000      50.893      35.400     -15.493

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     287.157     334.175     440.605    1138.669       0.252       0.519

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.125      16.383     538.783     528.796       0.042       0.636

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     268.462       0.000     268.462    1139.585       0.236       0.495

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.375     539.650       0.000       0.060       0.104       0.514

    STAGE EXIT CONDITIONS, STAGE             1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.796      17.021       1.127     545.670      22.860     163.555       1.268

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 142322.391       0.629     696.091  820374.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =16.431   EfDer =  0.949

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     86.549    2643.000      17.021     545.670       1.000       1.000       0.980
W Kg/sec =   39.34029

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     76.665    2576.857       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  66580.336   67911.805       2.645     590.487     223.267     474.134       2.124

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   257.10    -0.09   257.10     0.23   462.10
 MEAN    18.08     0.00    -0.02   257.10    -0.09   257.10     0.23
 HUB     15.21     0.00    -0.02   257.10    -0.09   257.10     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.53    46.36    15.17   473.98   539.30    16.43   540.15     0.47
 MEAN    58.35    42.30    16.05   416.97   489.94    16.43   540.15     0.43
 HUB     53.77    37.84    15.93   350.81   435.01    16.43   540.15     0.38

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   389.21   282.09   268.16  1154.97     0.34
MEAN    18.01   386.73   276.00   270.89  1152.09     0.34
HUB     15.22   407.44   301.53   274.02  1149.18     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    470.98   328.01   188.89     0.28  5762.05
MEAN   415.39   304.65   139.39     0.26  4972.29     1.78
HUB    351.11   278.47    49.58     0.24  4591.60

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.13     1.12    17.68   567.01     1.04   554.36     0.92     0.87
MEAN    18.83     1.11    17.41   564.09     1.03   551.60     0.92     0.87
HUB     18.68     1.10    17.13   562.68     1.03   548.81     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.45    35.16    31.50     3.66     0.93     0.48     2.90
MEAN    45.53    27.23    23.50     3.73     0.95     0.46     3.30     0.87
HUB     47.74    10.26     6.50     3.76     0.95     0.45     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.949

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     488.053     276.771     401.987    1144.864       0.426      -0.521

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.864      16.645     544.701      46.000      34.548      30.600      -3.948

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     406.461     276.771     491.744    1151.251       0.353      -0.077

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      18.850      17.292     550.796     361.848       0.019       0.369

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.823     400.819       0.000     400.819    1151.649       0.348       0.446

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.680      17.303     551.177       0.000       0.060       0.042      -0.070

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.841      18.817       1.105     564.593      18.923     182.273       1.413

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 117843.867       0.531     576.367  743420.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =16.431   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     86.549    2643.000      18.817     564.593       1.000       1.000       0.710
W Kg/sec =   39.34029

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     70.542    2533.306       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  66580.336   67911.805       1.924     395.194     205.441     307.469       1.497

    ROTOR LEADING EDGE CONDITIONS, STAGE            3
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   368.75    -0.13   368.75     0.32   443.68
MEAN    17.74     0.00    -0.02   368.75    -0.13   368.75     0.32
HUB     15.05     0.00    -0.02   368.75    -0.13   368.75     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.47    46.36     5.11   462.91   591.92    17.53   553.24     0.51
MEAN    47.98    43.40     4.58   409.13   550.88    17.53   553.24     0.48
HUB     43.28    38.84     4.44   347.12   506.51    17.53   553.24     0.44

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   371.37   254.21   270.73  1172.89     0.32
MEAN    17.51   372.03   252.56   273.16  1170.51     0.32
HUB     14.85   395.49   283.46   275.80  1168.15     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    456.91   338.21   202.70     0.29  5038.38
MEAN   403.78   312.22   151.22     0.27  4423.78     1.90
HUB    342.51   282.05    59.04     0.24  4211.35

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.87     1.11    19.47   583.25     1.03   571.73     0.92     0.91
MEAN    20.61     1.10    19.21   580.97     1.03   569.42     0.92     0.91
HUB     20.52     1.09    18.95   580.19     1.03   567.13     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.20    36.82    31.50     5.32     0.93     0.50     2.90
MEAN    42.76    28.97    23.50     5.47     0.92     0.50     3.28     0.91
HUB     45.79    12.08     6.50     5.58     0.92     0.52     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     375.549     254.221     276.422    1170.793       0.321       0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.651      19.228     569.695      46.000      42.604      31.500     -11.104

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     283.858     254.221     381.057    1175.969       0.241       0.410

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.628      19.807     574.743     471.992       0.026       0.491

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     276.419       0.000     276.419    1176.325       0.235       0.379

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.780     575.091       0.000       0.060       0.075       0.391

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      20.556       1.092     581.470      16.878     194.534       1.508

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 105137.703       0.504     514.222 1044173.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =16.431   EfDer =  0.977

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
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    86.549    2643.000      20.556     581.470       1.000       1.000       0.980
W Kg/sec =   39.34029

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    65.529    2496.270       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 66580.336   67911.805       2.690     513.330     190.848     401.059       2.101

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   260.72    -0.09   260.72     0.22   419.55
MEAN    16.97     0.00    -0.02   260.72    -0.09   260.72     0.22
HUB     14.32     0.00    -0.02   260.72    -0.09   260.72     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.60    46.36    13.24   444.22   515.16    19.86   575.80     0.44
MEAN    56.34    43.80    12.54   391.42   470.38    19.86   575.80     0.40
HUB     51.72    37.84    13.88   330.28   420.86    19.86   575.80     0.36

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   364.52   244.32   270.52  1188.86     0.31
MEAN    16.57   364.27   241.46   272.74  1186.59     0.31
HUB     13.89   385.76   270.29   275.23  1184.29     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   331.23   191.13     0.28  4614.57
MEAN   382.27   306.94   140.80     0.26  4003.53     1.68
HUB    320.37   279.74    50.07     0.24  3755.64

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     22.50     1.09    21.08   598.55     1.03   587.46     0.92     0.89
MEAN    22.24     1.08    20.83   596.29     1.03   585.21     0.92     0.89
HUB     22.13     1.08    20.56   595.37     1.02   582.95     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.09    35.24    31.50     3.74     0.93     0.44     2.90
MEAN    41.52    27.31    23.50     3.81     0.94     0.42     3.29     0.89
HUB     44.48    10.31     6.50     3.81     0.94     0.42     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.977

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     361.484     242.823     267.783    1187.214       0.304       0.039

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    22.275      20.887     585.831      46.000      42.201      32.400      -9.801

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     278.601     242.823     369.569    1191.693       0.234       0.411

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      22.258      21.426     590.260     456.573       0.022       0.491

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     265.825       0.000     265.825    1192.279       0.223       0.374

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      21.435     590.840       0.000       0.060       0.067       0.417

   STAGE EXIT CONDITIONS, STAGE            4
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Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.844	22.191	1.080	596.739	15.269	200.930	1.558

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
95143.766	0.502	465.343	753986.312

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
RESET = 0.000BLEED = 0.000 DPInc =16.431 EfDer = 0.986

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
86.549	2643.000	22.191	596.739	1.000	1.000	0.980

W Kg/sec = 39.34029

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
61.493	2464.127	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
66580.336	67911.805	2.846	509.668	179.098	390.276	2.179

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	248.95	-0.09	248.95	0.21	393.93
MEAN	15.91	0.00	-0.02	248.95	-0.09	248.95	0.21	
HUB	13.07	0.00	-0.02	248.95	-0.09	248.95	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.50	47.36	12.14	422.54	490.50	21.53	591.57	0.41
MEAN	55.86	44.80	11.06	367.03	443.56	21.53	591.57	0.37
HUB	50.46	38.84	11.62	301.45	391.03	21.53	591.57	0.33

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	345.99	229.85	258.61	1203.45	0.29
MEAN	15.50	342.53	222.12	260.76	1201.13	0.29
HUB	12.59	357.79	242.47	263.09	1198.79	0.30

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	317.35	183.93	0.26	4125.03	
MEAN	357.44	293.78	135.33	0.24	3443.64	1.67
HUB	290.38	267.42	47.91	0.22	3053.88	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	24.03	1.08	22.69	612.01	1.03	602.01	0.92	0.90
MEAN	23.72	1.07	22.42	609.48	1.02	599.69	0.92	0.90
HUB	23.54	1.06	22.13	608.04	1.02	597.36	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.63	35.42	31.50	3.92	0.93	0.43	2.90	
MEAN	40.43	27.43	23.50	3.93	0.94	0.41	3.34	0.90
HUB	42.66	10.32	6.50	3.82	0.94	0.39	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.986

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	346.800	226.190	262.885	1201.240	0.289	-0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
23.738	22.402	599.805	46.000	40.709	33.000	-7.709

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	276.464	226.190	357.204	1204.898	0.229	0.333

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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.718      22.863     603.464     440.827       0.035       0.471

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     259.748       0.000     259.748    1205.645       0.215       0.394

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.934     604.212       0.000       0.060       0.056       0.386

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.860      23.689       1.067     609.843      13.104     219.364       1.700

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  81678.922       0.477     399.487  789517.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    542126.62   2651.5098     84.5493      1.5681      0.8270     16.4306      1.1665


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

   Fan-Core + 4 Stage LPC 70%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 6.032   EfDer =  0.999

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    127.956    2643.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   58.16170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    125.000    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  98434.109  100402.578       2.284     831.557     364.027     619.754       1.702

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   294.10    -0.10   294.10     0.26   473.93
 MEAN    17.06     0.00    -0.02   294.10    -0.10   294.10     0.26
 HUB     12.51     0.00    -0.02   294.10    -0.10   294.10     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.29    50.47     7.82   475.82   559.46    14.39   515.59     0.50
 MEAN    53.23    47.20     6.03   393.48   491.33    14.39   515.59     0.44
 HUB     44.46    38.62     5.84   288.54   412.08    14.39   515.59     0.37

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   477.50   259.69   400.71  1122.55     0.43
 MEAN    18.04   499.78   293.38   404.61  1120.33     0.45
 HUB     15.00   565.99   387.22   412.80  1116.06     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    475.82   455.28   216.13     0.41  5359.44
 MEAN   415.99   422.78   122.62     0.38  5293.07     1.30
 HUB    345.97   414.85    41.25     0.37  5809.61

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     17.02     1.13    15.02   542.67     1.04   523.62     0.92     0.91
 MEAN    16.99     1.12    14.82   542.42     1.04   521.56     0.92     0.91
 HUB     17.19     1.14    14.42   544.34     1.04   517.58     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.95    28.34    24.20     4.14     0.93     0.27     2.90
 MEAN    35.95    16.86    12.70     4.16     0.93     0.23     3.51     0.91
 HUB     43.17    -5.71    -9.30     3.59     0.93     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     507.765     292.806     414.837    1120.372       0.453      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.042      14.799     521.607      24.000      35.216      35.400       0.184

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     444.762     292.806     532.493    1125.742       0.395       0.230

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.024      15.285     526.619     528.796       0.018       0.382

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     411.343       0.000     411.343    1128.293       0.365       0.298

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.489     529.009       0.000       0.060       0.037       0.318

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      16.980       1.124     543.141      20.331     219.263       1.700

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 126579.898       0.559     915.286 1236673.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.032   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    127.956    2643.000      16.980     543.141       1.000       1.000       0.980
W Kg/sec =   58.16170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    113.351    2582.848       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  98434.109  100402.578       1.789     590.487     330.107     474.134       1.436

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   392.51    -0.14   392.51     0.35   463.18
 MEAN    18.08     0.00    -0.02   392.51    -0.14   392.51     0.35
 HUB     15.21     0.00    -0.02   392.51    -0.14   392.51     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.38    46.36     4.02   473.98   615.50    15.62   530.27     0.54
 MEAN    46.74    42.30     4.44   416.97   572.74    15.62   530.28     0.51
 HUB     41.80    37.84     3.96   350.81   526.52    15.62   530.27     0.47

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
```

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	450.98	178.97	413.95	1139.62	0.40
MEAN	18.01	461.75	200.92	415.75	1138.61	0.41
HUB	15.22	500.40	274.83	418.18	1137.55	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	506.58	292.01	0.44	3657.28	
MEAN	415.39	467.81	214.47	0.41	3620.97	1.32
HUB	351.11	425.08	76.29	0.37	4185.72	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.36	1.08	16.48	556.69	1.02	539.70	0.92	0.91
MEAN	18.35	1.08	16.38	556.55	1.02	538.75	0.92	0.91
HUB	18.57	1.09	16.26	558.65	1.03	537.73	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	23.38	35.20	31.50	3.70	0.93	0.23	2.90	
MEAN	25.79	27.29	23.50	3.79	0.92	0.24	3.30	0.91
HUB	33.31	10.34	6.50	3.84	0.92	0.26	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	741.652	201.482	713.760	1109.286	0.669	-1.337

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.407	13.635	511.360	46.000	15.763	30.600	14.837

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	750.697	201.482	777.265	1108.063	0.677	-1.429

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	18.281	13.438	510.232	345.258	0.071	0.086

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	745.264	0.000	745.264	1108.835	0.672	-0.133

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	13.363	510.914	0.000	0.060	0.162	-1.466

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.705	18.094	1.066	557.296	14.155	280.004	2.171

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
88148.195	0.397	637.390	1141429.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 6.032 EfDer = 0.768

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
127.956	2643.000	18.094	557.296	1.000	1.000	0.680

W Kg/sec = 58.16170

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
107.754	2549.836	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
98434.109	100402.578	1.206	378.495	313.813	293.880	0.936

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	655.58	-0.23	655.58	0.59	446.57
MEAN	17.74	0.00	-0.02	655.58	-0.23	655.58	0.59	

```
HUB     15.05     0.00    -0.02   655.58    -0.23   655.58     0.59

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     35.24    46.36   -11.12   462.91   802.67    14.34   521.41     0.72
MEAN    31.98    43.40   -11.42   409.13   772.89    14.34   521.41     0.69
HUB     27.92    38.84   -10.92   347.12   741.91    14.34   521.41     0.66

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   457.95   110.67   444.38  1148.23     0.40
MEAN    17.51   467.46   145.37   444.28  1148.83     0.41
HUB     14.85   504.72   236.21   446.03  1149.40     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    456.91   563.34   346.24     0.49  2196.95
MEAN   403.78   513.96   258.41     0.45  2548.96     1.57
HUB    342.51   458.52   106.30     0.40  3511.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.75     1.04    16.80   565.43     1.01   547.92     0.92     0.70
MEAN    18.86     1.04    16.82   566.74     1.02   548.49     0.92     0.70
HUB     19.15     1.06    16.77   570.30     1.02   549.03     0.92     0.70

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     13.98    37.92    31.50     6.42     0.93     0.32     2.90
MEAN    18.12    30.18    23.50     6.68     0.84     0.36     3.28     0.70
HUB     27.90    13.41     6.50     6.91     0.84     0.42     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.768

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     473.438     146.326     450.258    1149.110       0.412      -0.005

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.898      16.811     548.773      46.000      18.003      31.500      13.497

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     473.757     146.326     495.840    1149.084       0.412      -0.022

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.834      16.752     548.748     471.992       0.040       0.130

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     460.978       0.000     460.978    1150.128       0.401      -0.023

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.763     549.745       0.000       0.060       0.091      -0.017

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.542      18.727       1.035     567.489      10.193     370.563       2.873

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  63489.395       0.304     459.085 1825984.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.032   EfDer =  0.922

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    127.956    2643.000      18.727     567.489       1.000       1.000       0.980
W Kg/sec =   58.16170
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
105.057	2526.833	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
98434.109	100402.578	1.678	513.330	305.966	401.059	1.311

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	431.87	-0.15	431.87	0.37	424.69
MEAN	16.97	0.00	-0.02	431.87	-0.15	431.87	0.37	
HUB	14.32	0.00	-0.02	431.87	-0.15	431.87	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.82	46.36	-0.54	444.22	619.66	16.99	551.92	0.54
MEAN	42.20	43.80	-1.60	391.42	582.96	16.99	551.92	0.51
HUB	37.42	37.84	-0.42	330.28	543.78	16.99	551.92	0.47

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	472.40	107.08	460.11	1157.00	0.41
MEAN	16.57	480.91	141.81	459.52	1157.56	0.42
HUB	13.89	516.09	233.72	460.13	1157.97	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	565.27	328.38	0.49	2024.53	
MEAN	382.27	518.63	240.46	0.45	2352.87	1.20
HUB	320.37	468.22	86.65	0.40	3248.48	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.47	1.04	17.35	574.99	1.01	556.36	0.92	0.84
MEAN	19.59	1.05	17.39	576.20	1.02	556.89	0.92	0.84
HUB	19.92	1.06	17.38	579.52	1.02	557.28	0.92	0.84

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	13.10	35.52	31.50	4.02	0.93	0.12	2.90	
MEAN	17.15	27.62	23.50	4.12	0.89	0.15	3.29	0.84
HUB	26.93	10.66	6.50	4.16	0.89	0.19	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.922

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	472.008	142.608	449.950	1159.004	0.407	0.054

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.636	17.514	558.302	46.000	17.586	32.400	14.814

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	479.790	142.608	500.535	1158.362	0.414	0.002

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.559	17.379	557.684	456.573	0.043	0.134

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	456.889	0.000	456.889	1160.220	0.394	-0.024

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.459	559.475	0.000	0.060	0.099	0.037

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.641	19.432	1.038	576.902	9.413	371.787	2.882

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
58636.637	0.309	423.995	1187091.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 6.032 EfDer = 0.873

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
127.956	2643.000	19.432	576.902	1.000	1.000	0.980

W Kg/sec = 58.16170

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
102.085	2506.134	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
98434.109	100402.578	1.714	509.668	297.317	390.276	1.313

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	424.71	-0.15	424.71	0.37	400.65
MEAN	15.91	0.00	-0.02	424.71	-0.15	424.71	0.37	
HUB	13.07	0.00	-0.02	424.71	-0.15	424.71	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	44.86	47.36	-2.50	422.54	599.20	17.72	561.85	0.52
MEAN	40.84	44.80	-3.96	367.03	561.42	17.72	561.85	0.48
HUB	35.38	38.84	-3.46	301.45	520.90	17.72	561.85	0.45

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	462.25	86.58	454.07	1165.73	0.40
MEAN	15.50	468.69	118.05	453.58	1166.27	0.40
HUB	12.59	498.08	204.17	454.31	1166.66	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	559.68	327.20	0.48	1555.89	
MEAN	357.44	512.88	239.39	0.44	1831.90	1.17
HUB	290.38	462.42	86.21	0.40	2572.44	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.98	1.03	17.92	582.66	1.01	564.83	0.92	0.80
MEAN	20.08	1.03	17.96	583.68	1.01	565.35	0.92	0.80
HUB	20.34	1.05	17.94	586.43	1.02	565.72	0.92	0.80

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	10.80	35.78	31.50	4.28	0.93	0.09	2.90	
MEAN	14.59	27.82	23.50	4.32	0.88	0.12	3.34	0.80
HUB	24.20	10.74	6.50	4.24	0.88	0.16	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.873

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	473.329	120.220	457.808	1166.474	0.406	-0.013

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.088	17.932	565.556	46.000	14.714	33.000	18.286

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	497.236	120.220	511.562	1164.475	0.427	-0.178

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.900	17.553	563.620	440.827	0.106	0.107

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    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    14.701     463.268       0.000     463.268    1167.285       0.397      -0.051

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950     17.819     566.343       0.000       0.060       0.122      -0.056

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.497     19.865        1.022     584.258       7.356     441.955       3.426

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  45829.148       0.268     331.386 1250969.625

   OVERALL EXIT CONDITIONS; ALL          5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    382683.28   2767.1428    125.0000      1.3149      0.6949      6.0315      1.1175


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 70%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 6.474   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    2643.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    123.134    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       2.319     831.557     358.594     619.754       1.728

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   289.39    -0.10   289.39     0.26   473.93
 MEAN    17.06     0.00    -0.02   289.39    -0.10   289.39     0.26
 HUB     12.51     0.00    -0.02   289.39    -0.10   289.39     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.70    50.47     8.23   475.82   557.00    14.41   515.82     0.50
 MEAN    53.67    47.20     6.47   393.48   488.52    14.41   515.82     0.44
 HUB     44.93    38.62     6.31   288.54   408.73    14.41   515.82     0.37

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   473.73   263.53   393.67  1123.18     0.42
 MEAN    18.04   495.44   295.55   397.63  1120.87     0.44
 HUB     15.00   560.34   386.57   405.65  1116.59     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    475.82   447.26   212.29     0.40  5438.73
 MEAN   415.99   415.47   120.45     0.37  5332.19     1.32
 HUB    345.97   407.67    40.60     0.37  5799.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.05     1.13    15.08   542.96     1.04   524.22     0.92     0.91
 MEAN    17.01     1.13    14.87   542.57     1.04   522.07     0.92     0.91
 HUB     17.18     1.14    14.46   544.30     1.04   518.07     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.80    28.34    24.20     4.14     0.93     0.28     2.90
 MEAN    36.62    16.85    12.70     4.15     0.93     0.24     3.51     0.91
 HUB     43.62    -5.72    -9.30     3.58     0.93     0.11     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     503.162     294.973     407.631    1120.933       0.449      -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.057      14.851     522.130      24.000      35.891      35.400      -0.491

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     436.592     294.973     526.898    1126.528       0.388       0.244

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.039      15.360     527.355     528.796       0.018       0.393

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     403.975       0.000     403.975    1128.971       0.358       0.309

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.554     529.645       0.000       0.060       0.037       0.329

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      16.996       1.125     543.275      20.465     216.431       1.678

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 127414.367       0.563     907.569 1216867.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 6.474   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    2643.000      16.996     543.275       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.572    2582.530       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       1.817     590.487     324.924     474.134       1.459

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   385.57    -0.13   385.57     0.34   463.12
 MEAN    18.08     0.00    -0.02   385.57    -0.13   385.57     0.34
 HUB     15.21     0.00    -0.02   385.57    -0.13   385.57     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.88    46.36     4.52   473.98   611.10    15.68   530.86     0.54
 MEAN    47.25    42.30     4.95   416.97   568.01    15.68   530.86     0.50
 HUB     42.31    37.84     4.47   350.81   521.37    15.68   530.86     0.46

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   446.06   184.68   406.03  1140.61     0.39
 MEAN    18.01   456.63   205.03   408.01  1139.46     0.40
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 HUB     15.22   494.91   276.34   410.57  1138.26     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   496.82   286.29     0.44  3773.95
 MEAN   415.39   459.05   210.36     0.40  3695.02     1.34
 HUB    351.11   417.33    74.77     0.37  4208.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.43     1.08    16.58   557.25     1.03   540.64     0.92     0.91
 MEAN    18.40     1.08    16.47   556.96     1.03   539.55     0.92     0.91
 HUB     18.60     1.09    16.33   558.86     1.03   538.41     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.46    35.19    31.50     3.69     0.93     0.24     2.90
 MEAN    26.68    27.27    23.50     3.77     0.92     0.25     3.30     0.91
 HUB     33.94    10.32     6.50     3.82     0.92     0.27     3.92


   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     724.267     205.608     694.469    1112.022       0.651      -1.288

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.455      13.873     513.886      46.000      16.492      30.600      14.108

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     727.085     205.608     755.597    1111.653       0.654      -1.342

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      18.342      13.756     513.544     345.258       0.066       0.101

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     720.278       0.000     720.278    1112.563       0.647      -0.080

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      13.713     514.369       0.000       0.060       0.145      -1.363

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.736      18.182       1.070     557.694      14.419     273.700       2.122

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  89791.922       0.405     639.585 1121797.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.474   EfDer =  0.765

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    2643.000      18.182     557.694       1.000       1.000       0.680
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    105.670    2548.927       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       1.230     378.495     307.742     293.880       0.955

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   636.91    -0.22   636.91     0.57   446.42
 MEAN    17.74     0.00    -0.02   636.91    -0.22   636.91     0.57
 HUB     15.05     0.00    -0.02   636.91    -0.22   636.91     0.57

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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TIP     36.02    46.36   -10.34   462.91   787.49    14.61   523.82     0.70
MEAN    32.73    43.40   -10.67   409.13   757.11    14.61   523.82     0.67
HUB     28.61    38.84   -10.23   347.12   725.47    14.61   523.82     0.65

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   450.16   119.21   434.08  1149.92     0.39
MEAN    17.51   460.01   151.71   434.28  1150.28     0.40
HUB     14.85   497.44   239.00   436.26  1150.61     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    456.91   549.97   337.69     0.48  2366.02
MEAN   403.78   502.13   252.07     0.44  2659.81     1.57
HUB    342.51   448.37   103.50     0.39  3552.52

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.89     1.04    16.99   566.46     1.02   549.54     0.92     0.70
MEAN    18.98     1.04    17.00   567.54     1.02   549.87     0.92     0.70
HUB     19.25     1.06    16.93   570.85     1.02   550.19     0.92     0.70

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     15.36    37.88    31.50     6.38     0.93     0.33     2.90
MEAN    19.26    30.13    23.50     6.63     0.84     0.37     3.28     0.70
HUB     28.72    13.35     6.50     6.85     0.84     0.42     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.765

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     465.828     152.705     440.087    1150.568       0.405      -0.005

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.019      16.986     550.165      46.000      19.136      31.500      12.364

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     462.161     152.705     486.736    1150.865       0.402      -0.002

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.965      16.969     550.449     471.992       0.036       0.145

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.121     449.516       0.000     449.516    1151.870       0.390      -0.001

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.985     551.411       0.000       0.060       0.083       0.006

   STAGE EXIT CONDITIONS, STAGE             3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.562      18.868       1.038     568.284      10.590     354.937       2.751

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  65960.461       0.316     469.835 1780399.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.474   EfDer =  0.935

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    2643.000      18.868     568.284       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.789    2525.066       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96964.961	98904.055	1.715	513.330	299.359	401.059	1.340

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	421.38	-0.15	421.38	0.37	424.39
MEAN	16.97	0.00	-0.02	421.38	-0.15	421.38	0.37	
HUB	14.32	0.00	-0.02	421.38	-0.15	421.38	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.52	46.36	0.16	444.22	612.39	17.21	553.46	0.53
MEAN	42.90	43.80	-0.90	391.42	575.23	17.21	553.46	0.50
HUB	38.10	37.84	0.26	330.28	535.49	17.21	553.46	0.46

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	462.46	116.15	447.64	1159.28	0.40
MEAN	16.57	471.39	148.33	447.45	1159.58	0.41
HUB	13.89	506.67	236.12	448.29	1159.75	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	549.86	319.31	0.47	2195.62	
MEAN	382.27	504.91	233.94	0.44	2460.85	1.22
HUB	320.37	456.14	84.24	0.39	3281.80	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.69	1.04	17.64	576.41	1.01	558.56	0.92	0.86
MEAN	19.79	1.05	17.66	577.40	1.02	558.84	0.92	0.86
HUB	20.10	1.07	17.63	580.44	1.02	559.00	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	14.55	35.50	31.50	4.00	0.93	0.13	2.90	
MEAN	18.34	27.60	23.50	4.10	0.90	0.16	3.29	0.86
HUB	27.78	10.64	6.50	4.14	0.90	0.20	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.935

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	462.894	149.163	438.202	1160.966	0.399	0.054

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.835	17.775	560.193	46.000	18.798	32.400	13.602

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	466.209	149.163	489.490	1160.700	0.402	0.022

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.771	17.689	559.936	456.573	0.039	0.150

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	443.847	0.000	443.847	1162.459	0.382	-0.001

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.772	561.635	0.000	0.060	0.091	0.059

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.684	19.655	1.042	578.082	9.798	356.351	2.762

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
61038.512	0.322	434.776	1164122.375

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.474   EfDer =  0.891

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    2643.000      19.655     578.082       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     99.518    2503.575       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 96964.961   98904.055       1.758     509.668     289.839     390.276       1.347

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   412.88    -0.14   412.88     0.35   400.24
 MEAN    15.91     0.00    -0.02   412.88    -0.14   412.88     0.35
 HUB     13.07     0.00    -0.02   412.88    -0.14   412.88     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.67    47.36    -1.69   422.54   590.88    18.02   563.85     0.51
 MEAN    41.65    44.80    -3.15   367.03   552.53    18.02   563.85     0.47
 HUB     36.15    38.84    -2.69   301.45   511.30    18.02   563.85     0.44

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   450.63    96.85   440.10  1168.56     0.39
 MEAN    15.50   457.53   125.40   440.01  1168.81     0.39
 HUB     12.59   487.07   206.89   440.95  1168.93     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   542.34   316.93     0.46  1740.11
 MEAN   357.44   497.44   232.04     0.43  1945.70     1.19
 HUB    290.38   448.79    83.50     0.38  2606.55

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.29     1.03    18.31   584.52     1.01   567.57     0.92     0.82
 MEAN    20.36     1.04    18.32   585.29     1.01   567.81     0.92     0.82
 HUB     20.60     1.05    18.28   587.73     1.02   567.93     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     12.41    35.76    31.50     4.26     0.93     0.11     2.90
 MEAN    15.91    27.81    23.50     4.31     0.89     0.13     3.34     0.82
 HUB     25.14    10.72     6.50     4.22     0.89     0.17     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.891

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     462.011     127.702     444.011    1169.023       0.395      -0.012

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.375      18.293     568.030      46.000      16.046      33.000      16.954

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     480.505     127.702     497.185    1167.525       0.412      -0.149

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.214      17.987     566.575     440.827       0.096       0.123

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    14.701     448.164       0.000     448.164    1170.105       0.383      -0.028
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   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.233     569.082       0.000       0.060       0.113      -0.033

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.561      20.177       1.027     585.847       7.765     418.391       3.243

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  48383.023       0.283     344.631 1225774.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    392588.28   2796.3960    123.1343      1.3356      0.7175      6.4740      1.1206


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 70%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    123.994    2643.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   56.36100

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    121.130    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95386.555   97294.086       2.357     831.557     352.757     619.754       1.757

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   284.35    -0.10   284.35     0.26   473.93
 MEAN    17.06     0.00    -0.02   284.35    -0.10   284.35     0.26
 HUB     12.51     0.00    -0.02   284.35    -0.10   284.35     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.14    50.47     8.67   475.82   554.39    14.44   516.06     0.50
 MEAN    54.15    47.20     6.95   393.48   485.55    14.44   516.06     0.44
 HUB     45.43    38.62     6.81   288.54   405.17    14.44   516.06     0.36

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   469.86   267.63   386.19  1123.84     0.42
 MEAN    18.04   490.89   297.85   390.21  1121.44     0.44
 HUB     15.00   554.36   385.84   398.05  1117.14     0.50

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    475.82   438.73   208.19     0.39  5523.20
 MEAN   415.99   407.70   118.14     0.36  5373.71     1.33
 HUB    345.97   400.05    39.87     0.36  5788.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.08     1.13    15.14   543.27     1.04   524.83     0.92     0.91
 MEAN    17.02     1.13    14.92   542.72     1.04   522.59     0.92     0.91
 HUB     17.18     1.14    14.51   544.26     1.04   518.59     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.72    28.33    24.20     4.13     0.93     0.29     2.90
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 MEAN    37.35    16.84    12.70     4.14     0.93     0.25     3.51     0.91
 HUB     44.11    -5.72    -9.30     3.58     0.93     0.12     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     498.350     297.272     399.978    1121.518       0.444       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.071      14.904     522.674      24.000      36.621      35.400      -1.221

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     427.953     297.272     521.071    1127.346       0.380       0.259

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.054      15.438     528.121     528.796       0.018       0.404

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     396.182       0.000     396.182    1129.678       0.351       0.321

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.622     530.308       0.000       0.060       0.037       0.341

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      17.011       1.126     543.417      20.607     213.427       1.654

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 128299.383       0.567     898.997 1195665.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    123.994    2643.000      17.011     543.417       1.000       1.000       0.980
W Kg/sec =   56.36100

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    109.675    2582.192       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95386.555   97294.086       1.849     590.487     319.400     474.134       1.484

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   378.23    -0.13   378.23     0.33   463.06
 MEAN    18.08     0.00    -0.02   378.23    -0.13   378.23     0.33
 HUB     15.21     0.00    -0.02   378.23    -0.13   378.23     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.42    46.36     5.06   473.98   606.49    15.74   531.47     0.54
 MEAN    47.80    42.30     5.50   416.97   563.05    15.74   531.47     0.50
 HUB     42.86    37.84     5.02   350.81   515.96    15.74   531.47     0.46

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   441.06   190.67   397.72  1141.62     0.39
 MEAN    18.01   451.35   209.35   399.86  1140.33     0.40
 HUB     15.22   489.17   277.90   402.56  1139.00     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
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 TIP    470.98   486.57   280.30     0.43  3896.23
 MEAN   415.39   449.83   206.04     0.39  3772.74     1.35
 HUB    351.11   409.17    73.21     0.36  4232.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.49     1.09    16.68   557.85     1.03   541.60     0.92     0.91
 MEAN    18.45     1.08    16.56   557.39     1.03   540.38     0.92     0.91
 HUB     18.63     1.09    16.41   559.09     1.03   539.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.61    35.18    31.50     3.68     0.93     0.25     2.90
 MEAN    27.63    27.26    23.50     3.76     0.92     0.26     3.30     0.91
 HUB     34.62    10.31     6.50     3.81     0.92     0.28     3.92


   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     706.901     209.938     675.007    1114.717       0.634      -1.239

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.502      14.109     516.380      46.000      17.277      30.600      13.323

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     703.804     209.938     734.448    1115.111       0.631      -1.256

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      18.402      14.067     516.745     345.258       0.061       0.115

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     696.010       0.000     696.010    1116.104       0.624      -0.030

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      14.050     517.657       0.000       0.060       0.129      -1.265

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.763      18.267       1.074     558.112      14.695     267.252       2.072

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91511.305       0.413     641.222 1100887.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.768

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    123.994    2643.000      18.267     558.112       1.000       1.000       0.680
W Kg/sec =   56.36100

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.505    2547.972       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 95386.555   97294.086       1.256     378.495     301.438     293.880       0.975

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   618.27    -0.21   618.27     0.55   446.25
 MEAN    17.74     0.00    -0.02   618.27    -0.21   618.27     0.55
 HUB     15.05     0.00    -0.02   618.27    -0.21   618.27     0.55

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     36.84    46.36    -9.52   462.91   772.49    14.87   526.19     0.69
 MEAN    33.51    43.40    -9.89   409.13   741.50    14.87   526.19     0.66
 HUB     29.33    38.84    -9.51   347.12   709.16    14.87   526.19     0.63
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      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   442.36   127.99   423.44  1151.64     0.38
 MEAN    17.51   452.46   158.23   423.89  1151.76     0.39
 HUB     14.85   489.89   241.87   426.02  1151.86     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   536.18   328.92     0.47  2539.69
 MEAN   403.78   489.87   245.55     0.43  2773.85     1.58
 HUB    342.51   437.74   100.64     0.38  3595.02

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.03     1.04    17.19   567.52     1.02   551.18     0.92     0.70
 MEAN    19.10     1.05    17.17   568.38     1.02   551.29     0.92     0.70
 HUB     19.36     1.06    17.09   571.43     1.02   551.39     0.92     0.70

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.82    37.84    31.50     6.34     0.93     0.33     2.90
 MEAN    20.47    30.08    23.50     6.58     0.85     0.37     3.28     0.70
 HUB     29.59    13.29     6.50     6.79     0.85     0.43     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.768

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      458.091     159.269     429.512    1152.055       0.398       -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.144      17.165      551.587      46.000      20.345      31.500      11.155

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392      450.190     159.269     477.533    1152.681       0.391       0.020

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.100      17.190     552.186     471.992       0.032       0.161

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     437.702       0.000     437.702    1153.647       0.379       0.023

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.212     553.112       0.000       0.060       0.075       0.031

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.585      19.012       1.041     569.109      10.997     339.938       2.635

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  68499.609       0.328     479.978 1734106.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.948

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    123.994    2643.000       19.012     569.109       1.000       1.000       0.980
W Kg/sec =   56.36100

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.420    2523.233       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95386.555   97294.086       1.755     513.330     292.462     401.059       1.371
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ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	410.54	-0.14	410.54	0.36	424.08
MEAN	16.97	0.00	-0.02	410.54	-0.14	410.54	0.36	
HUB	14.32	0.00	-0.02	410.54	-0.14	410.54	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.27	46.36	0.91	444.22	604.98	17.42	555.04	0.52
MEAN	43.64	43.80	-0.16	391.42	567.33	17.42	555.04	0.49
HUB	38.83	37.84	0.99	330.28	527.00	17.42	555.04	0.46

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	452.61	125.44	434.88	1161.59	0.39
MEAN	16.57	461.85	154.98	435.07	1161.63	0.40
HUB	13.89	497.12	238.57	436.14	1161.56	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	534.07	310.02	0.46	2371.03	
MEAN	382.27	490.86	227.28	0.42	2571.09	1.24
HUB	320.37	443.74	81.79	0.38	3315.81	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.91	1.05	17.93	577.89	1.02	560.79	0.92	0.87
MEAN	19.99	1.05	17.93	578.63	1.02	560.82	0.92	0.87
HUB	20.28	1.07	17.88	581.39	1.02	560.76	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	16.09	35.48	31.50	3.98	0.93	0.15	2.90	
MEAN	19.61	27.58	23.50	4.08	0.90	0.18	3.29	0.87
HUB	28.68	10.62	6.50	4.12	0.90	0.22	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.948

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	453.753	155.856	426.146	1162.954	0.390	0.054

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.041	18.042	562.113	46.000	20.089	32.400	12.311

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	452.384	155.856	478.479	1163.061	0.389	0.043

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.989	18.006	562.217	456.573	0.035	0.167

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	430.578	0.000	430.578	1164.723	0.370	0.023

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.092	563.824	0.000	0.060	0.083	0.083

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.723	19.885	1.046	579.302	10.193	341.475	2.647

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
63496.785	0.335	444.924	1139969.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 6.953 EfDer = 0.908

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
123.994	2643.000	19.885	579.302	1.000	1.000	0.980

W Kg/sec = 56.36100

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
96.869	2500.937	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
95386.555	97294.086	1.807	509.668	282.125	390.276	1.383

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	400.82	-0.14	400.82	0.34	399.82
MEAN	15.91	0.00	-0.02	400.82	-0.14	400.82	0.34	
HUB	13.07	0.00	-0.02	400.82	-0.14	400.82	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.52	47.36	-0.84	422.54	582.51	18.32	565.89	0.50
MEAN	42.49	44.80	-2.31	367.03	543.57	18.32	565.89	0.47
HUB	36.96	38.84	-1.88	301.45	501.61	18.32	565.89	0.43

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	439.25	107.24	425.96	1171.39	0.37
MEAN	15.50	446.48	132.92	426.23	1171.36	0.38
HUB	12.59	476.04	209.66	427.38	1171.23	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	524.80	306.54	0.45	1926.33	
MEAN	357.44	481.75	224.53	0.41	2062.11	1.21
HUB	290.38	434.94	80.72	0.37	2641.44	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.60	1.04	18.70	586.43	1.01	570.33	0.92	0.83
MEAN	20.66	1.04	18.68	586.94	1.01	570.30	0.92	0.83
HUB	20.88	1.05	18.63	589.08	1.02	570.17	0.92	0.83

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	14.13	35.74	31.50	4.24	0.93	0.13	2.90	
MEAN	17.32	27.78	23.50	4.28	0.89	0.15	3.34	0.83
HUB	26.13	10.70	6.50	4.20	0.89	0.18	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.908

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	450.828	135.355	430.029	1171.582	0.385	-0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.671	18.662	570.518	46.000	17.472	33.000	15.528

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	463.758	135.355	483.107	1170.568	0.396	-0.118

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.536	18.428	569.531	440.827	0.086	0.141

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	432.946	0.000	432.946	1172.936	0.369	-0.003

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.656	571.837	0.000	0.060	0.104	-0.006

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     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.620      20.499       1.031     587.484       8.182     396.391       3.073

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   50978.180       0.298     357.205 1199437.250

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     402785.28   2822.3262    121.1299      1.3569      0.7393      6.9532      1.1237


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.494   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     121.700    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   55.31819

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     118.889    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   93621.680   95493.914       2.402     831.557     346.230     619.754       1.790

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   278.73    -0.10   278.73     0.25   473.93
  MEAN    17.06     0.00    -0.02   278.73    -0.10   278.73     0.25
  HUB     12.51     0.00    -0.02   278.73    -0.10   278.73     0.25

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.64    50.47     9.17   475.82   551.53    14.46   516.32     0.49
  MEAN    54.69    47.20     7.49   393.48   482.28    14.46   516.32     0.43
  HUB     46.00    38.62     7.38   288.54   401.25    14.46   516.32     0.36

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   465.72   272.13   377.94  1124.55     0.41
  MEAN    18.04   485.98   300.41   382.01  1122.05     0.43
  HUB     15.00   547.82   385.06   389.66  1117.74     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   429.34   203.70     0.38  5615.93
  MEAN   415.99   399.11   115.58     0.36  5419.83     1.36
  HUB    345.97   391.62    39.09     0.35  5777.09

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.11     1.13    15.20   543.62     1.04   525.50     0.92     0.91
  MEAN    17.04     1.13    14.98   542.89     1.04   523.17     0.92     0.91
  HUB     17.17     1.14    14.57   544.21     1.04   519.15     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     35.75    28.32    24.20     4.12     0.93     0.31     2.90
  MEAN    38.18    16.83    12.70     4.13     0.93     0.26     3.51     0.91
  HUB     44.66    -5.73    -9.30     3.57     0.93     0.13     4.78
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     493.141     299.826     391.526    1122.149       0.439      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.086      14.961     523.263      24.000      37.444      35.400      -2.044

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     418.454     299.826     514.781    1128.230       0.371       0.275

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.069      15.520     528.949     528.796       0.018       0.417

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     387.609       0.000     387.609    1130.442       0.343       0.334

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.693     531.026       0.000       0.060       0.038       0.354

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      17.025       1.127     543.574      20.764     210.109       1.629

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 129276.734       0.571     889.085 1172050.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.494   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    121.700    2643.000      17.025     543.574       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    107.571    2581.819       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       1.885     590.487     313.271     474.134       1.513

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   370.14    -0.13   370.14     0.33   462.99
 MEAN    18.08     0.00    -0.02   370.14    -0.13   370.14     0.33
 HUB     15.21     0.00    -0.02   370.14    -0.13   370.14     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.02    46.36     5.66   473.98   601.48    15.81   532.13     0.53
 MEAN    48.41    42.30     6.11   416.97   557.65    15.81   532.13     0.49
 HUB     43.47    37.84     5.63   350.81   510.06    15.81   532.13     0.45

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   435.81   197.22   388.64  1142.71     0.38
 MEAN    18.01   445.73   214.09   390.95  1141.27     0.39
 HUB     15.22   482.98   279.64   393.79  1139.80     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   475.38   273.76     0.42  4029.75
 MEAN   415.39   439.73   201.30     0.39  3858.02     1.37
 HUB    351.11   400.22    71.47     0.35  4258.89
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.56     1.09    16.79   558.50     1.03   542.64     0.92     0.91
 MEAN    18.50     1.09    16.65   557.86     1.03   541.27     0.92     0.91
 HUB     18.65     1.10    16.48   559.35     1.03   539.87     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.91    35.16    31.50     3.66     0.93     0.27     2.90
 MEAN    28.71    27.24    23.50     3.74     0.93     0.27     3.30     0.91
 HUB     35.38    10.29     6.50     3.79     0.93     0.29     3.92


   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     688.848     214.689     654.539    1117.481       0.616      -1.189

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.552      14.352     518.944      46.000      18.160      30.600      12.440

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     679.801     214.689     712.896    1118.594       0.608      -1.168

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      18.464      14.384     519.978     345.258       0.055       0.130

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     671.305       0.000     671.305    1119.630       0.600       0.019

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      14.388     520.937       0.000       0.060       0.114      -1.166

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.788      18.352       1.078     558.572      14.997     260.366       2.018

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93397.547       0.421     642.330 1077719.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.494   EfDer =  0.775

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    2643.000      18.352     558.572       1.000       1.000       0.680
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.161    2546.923       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       1.285     378.495     294.612     293.880       0.998

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   598.84    -0.21   598.84     0.53   446.06
 MEAN    17.74     0.00    -0.02   598.84    -0.21   598.84     0.53
 HUB     15.05     0.00    -0.02   598.84    -0.21   598.84     0.53

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     37.72    46.36    -8.64   462.91   757.02    15.14   528.63     0.67
 MEAN    34.35    43.40    -9.05   409.13   725.37    15.14   528.63     0.64
 HUB     30.11    38.84    -8.73   347.12   692.28    15.14   528.63     0.61

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
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     0.500       0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   434.29   137.44   411.96  1153.46     0.38
 MEAN    17.51   444.50   165.24   412.64  1153.33     0.39
 HUB     14.85   481.77   244.92   414.87  1153.20     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   521.32   319.47     0.45  2726.85
 MEAN   403.78   476.63   238.54     0.41  2896.45     1.59
 HUB    342.51   426.20    97.59     0.37  3640.12

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.19     1.05    17.39   568.67     1.02   552.92     0.92     0.71
 MEAN    19.24     1.05    17.36   569.30     1.02   552.80     0.92     0.71
 HUB     19.47     1.06    17.26   572.05     1.02   552.67     0.92     0.71

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.45    37.79    31.50     6.29     0.93     0.34     2.90
 MEAN    21.82    30.03    23.50     6.53     0.85     0.38     3.28     0.71
 HUB     30.55    13.24     6.50     6.74     0.85     0.43     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.775

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     449.938     166.325     418.067    1153.638       0.390      -0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.279      17.357     553.103      46.000      21.695      31.500       9.805

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     437.324     166.325     467.885    1154.612       0.379       0.044

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.243      17.427     554.037     471.992       0.028       0.179

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     425.031       0.000     425.031    1155.534       0.368       0.050

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.454     554.923       0.000       0.060       0.067       0.058

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.612      19.166       1.044     570.007      11.435     324.896       2.519

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  71227.797       0.341     489.861 1685000.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.494   EfDer =  0.960

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    2643.000      19.166     570.007       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.848    2521.246       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       1.801     513.330     284.968     401.059       1.407

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     19.26     0.00    -0.02   398.89    -0.14   398.89     0.34   423.75
MEAN    16.97     0.00    -0.02   398.89    -0.14   398.89     0.34
HUB     14.32     0.00    -0.02   398.89    -0.14   398.89     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     48.09    46.36     1.73   444.22   597.14    17.65   556.72     0.52
MEAN    44.47    43.80     0.67   391.42   558.96    17.65   556.72     0.48
HUB     39.64    37.84     1.80   330.28   517.97    17.65   556.72     0.45

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   442.51   135.36   421.30  1164.02     0.38
MEAN    16.57   451.94   162.14   421.85  1163.79     0.39
HUB     13.89   487.08   241.22   423.15  1163.48     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   517.26   300.10     0.44  2558.20
MEAN   382.27   475.83   220.13     0.41  2689.58     1.26
HUB    320.37   430.49    79.15     0.37  3352.49

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.16     1.05    18.24   579.48     1.02   563.13     0.92     0.88
MEAN    20.21     1.05    18.21   579.97     1.02   562.91     0.92     0.88
HUB     20.48     1.07    18.15   582.42     1.02   562.61     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     17.81    35.46    31.50     3.96     0.93     0.17     2.90
MEAN    21.02    27.56    23.50     4.06     0.90     0.19     3.29     0.88
HUB     29.69    10.59     6.50     4.09     0.90     0.23     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.960

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     444.281     163.049     413.280    1165.053       0.381       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.262      18.325     564.143      46.000      21.530      32.400      10.870

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     437.744     163.049     467.124    1165.550       0.376       0.067

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.220      18.342     564.624     456.573       0.030       0.186

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     416.539       0.000     416.539    1167.110       0.357       0.051

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.431     566.137       0.000       0.060       0.074       0.110

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.760      20.130       1.050     580.622      10.615     326.496       2.531

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  66128.648       0.349     454.792 1113527.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.494   EfDer =  0.926

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     121.700    2643.000      20.130     580.622       1.000       1.000       0.980
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W Kg/sec = 55.31819

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
94.029	2498.093	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
93621.680	95493.914	1.861	509.668	273.852	390.276	1.425

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	388.02	-0.13	388.02	0.33	399.36
MEAN	15.91	0.00	-0.02	388.02	-0.13	388.02	0.33	
HUB	13.07	0.00	-0.02	388.02	-0.13	388.02	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.45	47.36	0.09	422.54	573.77	18.65	568.05	0.49
MEAN	43.42	44.80	-1.38	367.03	534.19	18.65	568.05	0.46
HUB	37.86	38.84	-0.98	301.45	491.44	18.65	568.05	0.42

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	427.74	118.22	411.08	1174.35	0.36
MEAN	15.50	435.12	140.80	411.71	1174.04	0.37
HUB	12.59	464.57	212.62	413.06	1173.65	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	506.30	295.56	0.43	2123.28	
MEAN	357.44	465.23	216.65	0.40	2184.17	1.24
HUB	290.38	420.32	77.76	0.36	2678.60	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.95	1.04	19.11	588.48	1.01	573.21	0.92	0.85
MEAN	20.97	1.04	19.07	588.71	1.01	572.90	0.92	0.85
HUB	21.16	1.05	19.00	590.54	1.02	572.52	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	16.04	35.72	31.50	4.22	0.93	0.15	2.90	
MEAN	18.88	27.75	23.50	4.25	0.90	0.17	3.34	0.85
HUB	27.24	10.66	6.50	4.16	0.90	0.20	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.926

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	439.353	143.380	415.299	1174.261	0.374	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.988	19.053	573.130	46.000	19.047	33.000	13.953

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	446.343	143.380	468.807	1173.732	0.380	-0.084

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.880	18.895	572.613	440.827	0.075	0.161

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	417.033	0.000	417.033	1175.895	0.355	0.027

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.106	574.725	0.000	0.060	0.094	0.024

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.676      20.844       1.035     589.243       8.621     374.999       2.907

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   53717.004       0.314     369.432 1170761.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     413747.72   2845.4995    118.8887      1.3797      0.7609      7.4939      1.1271


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     119.767    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   54.43945

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     117.000    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   92134.484   93976.977       2.441     831.557     340.730     619.754       1.819

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   274.02    -0.09   274.02     0.25   473.93
  MEAN    17.06     0.00    -0.02   274.02    -0.09   274.02     0.25
  HUB     12.51     0.00    -0.02   274.02    -0.09   274.02     0.25

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.07    50.47     9.60   475.82   549.16    14.48   516.54     0.49
  MEAN    55.15    47.20     7.95   393.48   479.57    14.48   516.54     0.43
  HUB     46.49    38.62     7.87   288.54   397.99    14.48   516.54     0.36

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   462.38   275.86   371.08  1125.13     0.41
  MEAN    18.04   481.94   302.52   375.17  1122.55     0.43
  HUB     15.00   542.39   384.39   382.67  1118.23     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   421.52   199.96     0.37  5692.94
  MEAN   415.99   391.95   113.47     0.35  5457.87     1.38
  HUB    345.97   384.59    38.42     0.34  5767.05

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.14     1.13    15.26   543.90     1.04   526.05     0.92     0.91
  MEAN    17.05     1.13    15.02   543.03     1.04   523.63     0.92     0.91
  HUB     17.17     1.14    14.61   544.18     1.04   519.61     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     36.63    28.32    24.20     4.12     0.93     0.32     2.90
  MEAN    38.88    16.83    12.70     4.13     0.93     0.28     3.51     0.91
  HUB     45.13    -5.73    -9.30     3.57     0.93     0.14     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.998
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     488.867     301.932     384.484    1122.664       0.435      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.098      15.007     523.743      24.000      38.142      35.400      -2.742

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     410.573     301.932     509.641    1128.950       0.364       0.289

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.080      15.587     529.625     528.796       0.018       0.428

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     380.494       0.000     380.494    1131.066       0.336       0.344

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.750     531.612       0.000       0.060       0.039       0.365

    STAGE EXIT CONDITIONS, STAGE             1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.877      17.035       1.128     543.704      20.894     207.354       1.607

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 130084.227       0.575     880.427 1152223.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.767    2643.000      17.035     543.704       1.000       1.000       0.980
W Kg/sec =   54.43945

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    105.811    2581.511       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92134.484   93976.977       1.916     590.487     308.146     474.134       1.539

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   363.43    -0.13   363.43     0.32   462.94
 MEAN    18.08     0.00    -0.02   363.43    -0.13   363.43     0.32
 HUB     15.21     0.00    -0.02   363.43    -0.13   363.43     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.53    46.36     6.17   473.98   597.37    15.86   532.67     0.53
 MEAN    48.93    42.30     6.63   416.97   553.21    15.86   532.67     0.49
 HUB     44.00    37.84     6.16   350.81   505.21    15.86   532.67     0.45

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2       Cm2     Ao2          Mach2
 TIP     20.42   431.65   202.58   381.16  1143.59     0.38
 MEAN    18.01   441.20   217.97   383.59  1142.04     0.39
 HUB     15.22   477.91   281.06   386.53  1140.44     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   466.17   268.39     0.41  4139.32
 MEAN   415.39   431.41   197.42     0.38  3927.97     1.39
 HUB    351.11   392.82    70.05     0.34  4280.53

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.62     1.09    16.87   559.04     1.03   543.48     0.92     0.91
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 MEAN    18.53     1.09    16.72   558.25     1.03   542.00     0.92     0.91
 HUB     18.67     1.10    16.55   559.56     1.03   540.49     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.99    35.15    31.50     3.65     0.93     0.28     2.90
 MEAN    29.61    27.23    23.50     3.73     0.93     0.28     3.30     0.91
 HUB     36.02    10.27     6.50     3.77     0.93     0.29     3.92


   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     674.596     218.586     638.201    1119.633       0.603       -1.148

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.590      14.541     520.945      46.000      18.907      30.600      11.693

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     660.948     218.586     696.156    1121.267       0.589       -1.099

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      18.512      14.629     522.467     345.258       0.051       0.142

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     652.091       0.000     652.091    1122.312       0.581       0.056

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      14.647     523.439       0.000       0.060       0.102      -1.089

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.806      18.416       1.081     558.950      15.246     254.834       1.975

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94944.328       0.428     642.596 1058360.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  0.784

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    119.767    2643.000      18.416     558.950       1.000       1.000       0.680
W Kg/sec =   54.43945

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     99.242    2546.061       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92134.484   93976.977       1.310     378.495     289.023     293.880       1.017

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   583.44    -0.20   583.44     0.52   445.91
 MEAN    17.74     0.00    -0.02   583.44    -0.20   583.44     0.52
 HUB     15.05     0.00    -0.02   583.44    -0.20   583.44     0.52

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     38.44    46.36    -7.92   462.91   744.90    15.35   530.53     0.66
 MEAN    35.05    43.40    -8.35   409.13   712.71    15.35   530.53     0.63
 HUB     30.77    38.84    -8.07   347.12   679.00    15.35   530.53     0.60

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     19.81   427.96   145.10   402.61  1154.91     0.37
 MEAN    17.51   438.17   170.92   403.46  1154.59     0.38
 HUB     14.85   475.24   247.44   405.74  1154.28     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   509.23   311.80     0.44  2878.55
 MEAN   403.78   465.83   232.86     0.40  2995.81     1.61
 HUB    342.51   416.73    95.07     0.36  3677.53

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.31     1.05    17.56   569.61     1.02   554.32     0.92     0.72
 MEAN    19.35     1.05    17.51   570.04     1.02   554.01     0.92     0.72
 HUB     19.56     1.06    17.41   572.57     1.02   553.71     0.92     0.72

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.82    37.76    31.50     6.26     0.93     0.35     2.90
 MEAN    22.96    29.99    23.50     6.49     0.86     0.38     3.28     0.72
 HUB     31.38    13.19     6.50     6.69     0.86     0.43     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.784

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     443.446     172.043     408.712    1154.908       0.384       -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.387      17.510     554.321      46.000      22.828      31.500       8.672

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     426.877     172.043     460.242    1156.162       0.369       0.064

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.359      17.617     555.525     471.992       0.025       0.195

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     414.764       0.000     414.764    1157.047       0.358       0.072

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.649     556.377       0.000       0.060       0.061       0.081

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.634       19.290       1.047     570.741      11.791     313.399       2.429

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  73446.008       0.352     497.092 1645449.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  0.969

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    119.767     2643.000       19.290     570.741       1.000        1.000        0.980
W Kg/sec =   54.43945

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     95.739     2519.624        1.402       0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  92134.484   93976.977         1.841     513.330     278.827     401.059       1.438

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa     C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   389.43    -0.13   389.43      0.34   423.47
 MEAN    16.97      0.00    -0.02   389.43    -0.13   389.43      0.34
 HUB     14.32      0.00    -0.02   389.43    -0.13   389.43      0.34
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     48.77    46.36     2.41   444.22   590.86    17.84   558.08     0.51
MEAN    45.16    43.80     1.36   391.42   552.24    17.84   558.08     0.48
HUB     40.31    37.84     2.47   330.28   510.72    17.84   558.08     0.44

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   434.69   143.32   410.38  1165.94     0.37
MEAN    16.57   444.15   167.88   411.20  1165.51     0.38
HUB     13.89   479.10   243.37   412.68  1165.02     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   503.74   292.14     0.43  2708.43
MEAN   382.27   463.73   214.39     0.40  2784.74     1.28
HUB    320.37   419.81    77.00     0.36  3382.32

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.36     1.06    18.49   580.77     1.02   564.99     0.92     0.89
MEAN    20.39     1.06    18.44   581.05     1.02   564.58     0.92     0.89
HUB     20.63     1.07    18.36   583.26     1.02   564.10     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     19.25    35.45    31.50     3.95     0.93     0.19     2.90
MEAN    22.21    27.54    23.50     4.04     0.91     0.21     3.29     0.89
HUB     30.53    10.57     6.50     4.07     0.91     0.24     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.969

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     436.849     168.827     402.907    1166.725       0.374       0.054

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.439      18.552     565.763      46.000      22.735      32.400       9.665

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     426.027     168.827     458.259    1167.529       0.365       0.088

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.406      18.610     566.543     456.573       0.027       0.202

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     405.318       0.000     405.318    1169.009       0.347       0.074

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.701     567.980       0.000       0.060       0.067       0.133

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.786      20.325       1.054     581.696      10.954     315.069       2.442

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  68245.102       0.360     461.892 1091670.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  0.940

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.767    2643.000      20.325     581.696       1.000       1.000       0.980
W Kg/sec =   54.43945

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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    91.731    2495.786       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
92134.484   93976.977       1.908     509.668     267.161     390.276       1.461

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   377.76    -0.13   377.76     0.32   398.99
MEAN    15.91     0.00    -0.02   377.76    -0.13   377.76     0.32
HUB     13.07     0.00    -0.02   377.76    -0.13   377.76     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     48.21    47.36     0.85   422.54   566.88    18.91   569.78     0.48
MEAN    44.18    44.80    -0.62   367.03   526.79    18.91   569.78     0.45
HUB     38.60    38.84    -0.24   301.45   483.38    18.91   569.78     0.41

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   418.95   126.94   399.26  1176.68     0.36
MEAN    15.50   426.33   147.10   400.14  1176.15     0.36
HUB     12.59   455.56   214.96   401.66  1175.56     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.78   491.61   286.84     0.42  2279.69
MEAN   357.44   452.06   210.35     0.38  2281.71     1.26
HUB    290.38   408.68    75.43     0.35  2707.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.22     1.04    19.44   590.13     1.01   575.48     0.92     0.86
MEAN    21.22     1.04    19.38   590.14     1.01   574.97     0.92     0.86
HUB     21.40     1.05    19.29   591.72     1.02   574.40     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     17.64    35.69    31.50     4.19     0.93     0.17     2.90
MEAN    20.18    27.73    23.50     4.23     0.90     0.18     3.34     0.86
HUB     28.15    10.64     6.50     4.14     0.90     0.21     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.940

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     430.485     149.794     403.583    1176.377       0.366       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.243      19.364     575.197      46.000      20.363      33.000      12.637

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     432.647     149.794     457.845    1176.218       0.368       -0.055

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.154      19.265     575.041     440.827       0.067       0.178

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     404.463       0.000     404.463    1178.231       0.343       0.052

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      19.464     577.010       0.000       0.060       0.085       0.049

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.716      21.119       1.039     590.666       8.970     359.142       2.784

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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   55895.422       0.326     378.307 1147173.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     422615.06   2860.3140    117.0002      1.3980      0.7768      7.9535      1.1298


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     115.614    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   52.55191

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     112.943    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   88939.984   90718.586       2.528     831.557     328.916     619.754       1.884

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   263.94    -0.09   263.94     0.24   473.93
  MEAN    17.06     0.00    -0.02   263.94    -0.09   263.94     0.24
  HUB     12.51     0.00    -0.02   263.94    -0.09   263.94     0.24

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.99    50.47    10.52   475.82   544.20    14.53   516.99     0.49
  MEAN    56.15    47.20     8.95   393.48   473.88    14.53   516.99     0.42
  HUB     47.56    38.62     8.94   288.54   391.12    14.53   516.99     0.35

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   455.69   283.74   356.57  1126.33     0.40
  MEAN    18.04   473.63   306.96   360.70  1123.58     0.42
  HUB     15.00   531.01   382.95   367.86  1119.24     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   405.02   192.08     0.36  5855.37
  MEAN   415.99   376.81   109.03     0.34  5537.91     1.42
  HUB    345.97   369.71    36.98     0.33  5745.39

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.19     1.14    15.36   544.50     1.04   527.16     0.92     0.91
  MEAN    17.08     1.13    15.11   543.33     1.04   524.59     0.92     0.91
  HUB     17.15     1.14    14.70   544.10     1.04   520.55     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     38.51    28.31    24.20     4.11     0.93     0.35     2.90
  MEAN    40.40    16.82    12.70     4.12     0.93     0.30     3.51     0.91
  HUB     46.15    -5.74    -9.30     3.56     0.93     0.17     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.996

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
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    18.071     480.056     306.365     369.587    1123.720       0.427      -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.120      15.099     524.729      24.000      39.657      35.400      -4.257

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     393.992     306.365     499.089    1130.427       0.349       0.319

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.100      15.721     531.012     528.796       0.020       0.452

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     365.514       0.000     365.514    1132.348       0.323       0.366

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.863     532.818       0.000       0.060       0.043       0.387

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      17.052       1.129     543.977      21.167     201.536       1.562

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 131782.047       0.582     860.993 1109851.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.614    2643.000      17.052     543.977       1.000       1.000       0.980
W Kg/sec =   52.55191

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.067    2580.864       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88939.984   90718.586       1.987     590.487     297.243     474.134       1.595

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   349.27    -0.12   349.27     0.31   462.82
 MEAN    18.08     0.00    -0.02   349.27    -0.12   349.27     0.31
 HUB     15.21     0.00    -0.02   349.27    -0.12   349.27     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.62    46.36     7.26   473.98   588.86    15.96   533.79     0.52
 MEAN    50.06    42.30     7.76   416.97   544.01    15.96   533.79     0.48
 HUB     45.14    37.84     7.30   350.81   495.12    15.96   533.79     0.44

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   423.48   213.78   365.56  1145.38     0.37
 MEAN    18.01   432.10   226.12   368.20  1143.59     0.38
 HUB     15.22   467.49   284.03   371.31  1141.77     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   446.97   257.20     0.39  4367.89
 MEAN   415.39   414.00   189.27     0.36  4074.67     1.43
 HUB    351.11   377.33    67.08     0.33  4325.59

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.72     1.10    17.04   560.16     1.03   545.18     0.92     0.91
 MEAN    18.61     1.09    16.86   559.07     1.03   543.48     0.92     0.91
 HUB     18.71     1.10    16.67   560.00     1.03   541.75     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.32    35.13    31.50     3.63     0.93     0.30     2.90
 MEAN    31.56    27.20    23.50     3.70     0.93     0.30     3.30     0.91
 HUB     37.41    10.24     6.50     3.74     0.93     0.31     3.92


   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     646.486     226.759     605.413    1123.808       0.575      -1.069

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.662      14.908     524.838      46.000      20.534      30.600      10.066

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     623.784     226.759     663.722    1126.383       0.554      -0.960

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      18.603      15.100     527.246     345.258       0.042       0.167

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     614.604       0.000     614.604    1127.398       0.545       0.126

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      15.138     528.196       0.000       0.060       0.081      -0.939

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.834       18.533       1.087     559.742      15.765     243.627       1.889

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98176.602       0.443     641.433 1017252.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.810

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    115.614    2643.000       18.533     559.742       1.000        1.000        0.680
W Kg/sec =   52.55191

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     95.262    2544.260        1.402        0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  88939.984   90718.586        1.364     378.495     277.430     293.880        1.059

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   552.77    -0.19   552.77     0.49   445.60
 MEAN    17.74      0.00    -0.02   552.77    -0.19   552.77     0.49
 HUB     15.05      0.00    -0.02   552.77    -0.19   552.77     0.49

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     39.96     46.36    -6.40   462.91   721.12     15.75   534.23      0.64
 MEAN    36.52     43.40    -6.88   409.13   687.82     15.75   534.23      0.61
 HUB     32.14     38.84    -6.70   347.12   652.82     15.75   534.23      0.58

     ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   415.72   160.86   383.34  1157.83      0.36
 MEAN    17.51   425.68   182.66   384.49  1157.14      0.37
 HUB     14.85   461.96   252.53   386.83  1156.47      0.40
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   484.35   296.05     0.42  3190.48
 MEAN   403.78   443.54   221.12     0.38  3201.17     1.63
 HUB    342.51   397.15    89.97     0.34  3752.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.56     1.06    17.89   571.56     1.02   557.13     0.92     0.74
 MEAN    19.57     1.06    17.82   571.60     1.02   556.47     0.92     0.74
 HUB     19.75     1.07    17.69   573.64     1.02   555.82     0.92     0.74

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.76    37.68    31.50     6.18     0.93     0.37     2.90
 MEAN    25.41    29.90    23.50     6.40     0.87     0.40     3.28     0.74
 HUB     33.14    13.09     6.50     6.59     0.87     0.44     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.810

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     430.637     183.861     389.414    1157.466       0.372       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.609      17.820     556.779      46.000      25.274      31.500       6.226

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     405.496     183.861     445.233    1159.289       0.350       0.109

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.591      18.000     558.535     471.992       0.020       0.229

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     393.819       0.000     393.819    1160.098       0.339       0.119

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.037     559.314       0.000       0.060       0.050       0.129

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.681      19.537       1.054     572.264      12.523     291.581       2.260

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  78003.781       0.374     509.635 1565009.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.984

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.614    2643.000      19.537     572.264       1.000       1.000       0.980
W Kg/sec =   52.55191

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      91.372    2516.269       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88939.984   90718.586       1.929     513.330     266.110     401.059       1.507

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   370.09    -0.13   370.09     0.32   422.91
 MEAN    16.97     0.00    -0.02   370.09    -0.13   370.09     0.32
 HUB     14.32     0.00    -0.02   370.09    -0.13   370.09     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.21    46.36     3.85   444.22   578.28    18.21   560.83     0.50
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 MEAN    46.61    43.80     2.81   391.42   538.77    18.21   560.83     0.46
 HUB     41.76    37.84     3.92   330.28   496.12    18.21   560.83     0.43

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   419.79   159.41   388.35  1169.76     0.36
 MEAN    16.57   429.01   179.50   389.65  1168.95     0.37
 HUB     13.89   463.23   247.67   391.46  1168.10     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   476.46   276.05     0.41  3012.03
 MEAN   382.27   439.25   202.77     0.38  2977.11     1.32
 HUB    320.37   398.15    72.70     0.34  3441.95

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.76     1.06    18.99   583.42     1.02   568.70     0.92     0.90
 MEAN    20.74     1.06    18.90   583.29     1.02   567.92     0.92     0.90
 HUB     20.94     1.07    18.78   585.01     1.02   567.09     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.32    35.41    31.50     3.91     0.93     0.22     2.90
 MEAN    24.73    27.49    23.50     3.99     0.91     0.23     3.29     0.90
 HUB     32.32    10.52     6.50     4.02     0.91     0.26     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     422.414     180.506     381.905    1170.065       0.361       0.053

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.795      19.002     569.007      46.000      25.298      32.400       7.102

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     402.516     180.506     441.136    1171.473       0.344       0.131

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.774      19.143     570.378     456.573       0.021       0.237

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     382.856       0.000     382.856    1172.796       0.326       0.122

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.236     571.667       0.000       0.060       0.053       0.179

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.830      20.711       1.060     583.904      11.640     293.471       2.275

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  72517.445       0.382     473.790 1045862.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.964

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    115.614    2643.000      20.711     583.904       1.000       1.000       0.980
W Kg/sec =   52.55191

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     87.063    2491.062       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 88939.984   90718.586       2.010     509.668     253.564     390.276       1.539

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   357.18    -0.12   357.18     0.30   398.24
MEAN    15.91     0.00    -0.02   357.18    -0.12   357.18     0.30
HUB     13.07     0.00    -0.02   357.18    -0.12   357.18     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     49.80    47.36     2.44   422.54   553.37    19.42   573.25     0.47
MEAN    45.79    44.80     0.99   367.03   512.23    19.42   573.25     0.44
HUB     40.18    38.84     1.34   301.45   467.47    19.42   573.25     0.40

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   402.52   144.23   375.79  1181.25     0.34
MEAN    15.50   409.53   159.63   377.14  1180.33     0.35
HUB     12.59   437.96   219.59   378.94  1179.38     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.78   462.47   269.54     0.39  2589.79
MEAN   357.44   425.87   197.81     0.36  2475.86     1.30
HUB    290.38   385.49    70.79     0.33  2766.30

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.78     1.05    20.09   593.49     1.02   579.97     0.92     0.88
MEAN    21.73     1.05    19.99   593.07     1.02   579.07     0.92     0.88
HUB     21.85     1.06    19.86   594.14     1.02   578.13     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     21.00    35.65    31.50     4.15     0.93     0.21     2.90
MEAN    22.94    27.68    23.50     4.18     0.91     0.21     3.34     0.88
HUB     30.09    10.58     6.50     4.08     0.91     0.23     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.964

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     413.585     162.558     380.299    1180.555       0.350      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.750      19.978     579.290      46.000      23.144      33.000       9.856

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     405.815     162.558     437.162    1181.097       0.344       0.004

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.695      19.991     579.821     440.827       0.051       0.215

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     379.729       0.000     379.729    1182.837       0.321       0.106

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.169     581.531       0.000       0.060       0.068       0.103

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.784      21.664       1.046     593.568       9.664     330.235       2.560

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  60220.707       0.352     393.450 1098022.375

   OVERALL EXIT CONDITIONS; ALL          5   STAGES
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   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     440700.59   2879.3013    112.9435      1.4340      0.8046      8.9532      1.1353


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 70%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.991

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     111.200    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   50.54562

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     108.632    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   85544.477   87255.180       2.629     831.557     316.359     619.754       1.959

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   253.30    -0.09   253.30     0.23   473.93
  MEAN    17.06     0.00    -0.02   253.30    -0.09   253.30     0.23
  HUB     12.51     0.00    -0.02   253.30    -0.09   253.30     0.23

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.98    50.47    11.51   475.82   539.12    14.57   517.45     0.48
  MEAN    57.23    47.20    10.03   393.48   468.04    14.57   517.45     0.42
  HUB     48.73    38.62    10.11   288.54   384.01    14.57   517.45     0.34

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   449.23   291.89   341.48  1127.51     0.40
  MEAN    18.04   465.30   311.56   345.60  1124.60     0.41
  HUB     15.00   519.31   381.42   352.41  1120.25     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   387.87   183.93     0.34  6023.48
  MEAN   415.99   361.03   104.44     0.32  5620.72     1.47
  HUB    345.97   354.19    35.46     0.32  5722.46

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.25     1.14    15.46   545.13     1.04   528.27     0.92     0.91
  MEAN    17.10     1.13    15.19   543.64     1.04   525.55     0.92     0.91
  HUB     17.14     1.13    14.79   544.01     1.04   521.49     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     40.52    28.31    24.20     4.11     0.93     0.37     2.90
  MEAN    42.03    16.81    12.70     4.11     0.94     0.33     3.51     0.91
  HUB     47.26    -5.75    -9.30     3.55     0.94     0.19     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.991

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     471.222     310.951     354.061    1124.772       0.419      -0.004

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     17.140      15.188     525.712      24.000      41.291      35.400      -5.891

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     376.829     310.951     488.560    1131.902       0.333       0.350

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.116      15.850     532.398     528.796       0.022       0.477

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     349.994       0.000     349.994    1133.632       0.309       0.388

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.970     534.027       0.000       0.060       0.048       0.409

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      17.063       1.129     544.258      21.448     195.486       1.515

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 133535.359       0.590     839.141 1065123.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      17.063     544.258       1.000       1.000       0.980
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     98.134    2580.196       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85544.477   87255.180       2.066     590.487     285.789     474.134       1.659

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   334.58    -0.12   334.58     0.29   462.70
 MEAN    18.08     0.00    -0.02   334.58    -0.12   334.58     0.29
 HUB     15.21     0.00    -0.02   334.58    -0.12   334.58     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.79    46.36     8.43   473.98   580.27    16.06   534.91     0.51
 MEAN    51.26    42.30     8.96   416.97   534.70    16.06   534.91     0.47
 HUB     46.37    37.84     8.53   350.81   484.87    16.06   534.91     0.43

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   415.86   225.21   349.60  1147.14     0.36
 MEAN    18.01   423.25   234.43   352.40  1145.13     0.37
 HUB     15.22   457.01   287.03   355.64  1143.10     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   427.34   245.76     0.37  4601.21
 MEAN   415.39   396.14   180.96     0.35  4224.12     1.47
 HUB    351.11   361.36    64.09     0.32  4371.15

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.82     1.10    17.19   561.30     1.03   546.86     0.92     0.91
 MEAN    18.67     1.09    16.99   559.90     1.03   544.94     0.92     0.91
 HUB     18.73     1.10    16.78   560.45     1.03   543.01     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.79    35.11    31.50     3.61     0.93     0.33     2.90
 MEAN    33.63    27.18    23.50     3.68     0.93     0.33     3.30     0.91
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 HUB     38.91    10.22     6.50     3.72     0.93     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     619.651     235.086     573.326    1127.705       0.549      -0.991

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.724      15.247     528.486      46.000      22.296      30.600       8.304

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     588.148     235.086     633.391    1131.090       0.520      -0.825

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      18.681      15.533     531.664     345.258       0.035       0.193

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     579.035       0.000     579.035    1132.035       0.511       0.191

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      15.582     532.552       0.000       0.060       0.063      -0.797

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.853      18.632       1.092     560.552      16.294     232.621       1.803

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 101469.648       0.457     637.639  974203.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.842

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      18.632     560.552       1.000       1.000       0.680
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.206    2542.420       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85544.477   87255.180       1.425     378.495     265.619     293.880       1.106

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   523.00    -0.18   523.00     0.46   445.28
 MEAN    17.74     0.00    -0.02   523.00    -0.18   523.00     0.46
 HUB     15.05     0.00    -0.02   523.00    -0.18   523.00     0.46

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     41.52    46.36    -4.84   462.91   698.55    16.11   537.71     0.61
 MEAN    38.05    43.40    -5.35   409.13   664.12    16.11   537.71     0.58
 HUB     33.59    38.84    -5.25   347.12   627.81    16.11   537.71     0.55

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   404.54   176.65   363.93  1160.66     0.35
 MEAN    17.51   413.88   194.42   365.37  1159.63     0.36
 HUB     14.85   449.01   257.64   367.73  1158.63     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   459.34   280.26     0.40  3502.97
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 MEAN   403.78   421.10   209.36     0.36  3406.88     1.67
 HUB    342.51   377.40    84.86     0.33  3828.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.82     1.06    18.22   573.52     1.02   559.86     0.92     0.77
 MEAN    19.78     1.06    18.11   573.17     1.02   558.87     0.92     0.77
 HUB     19.93     1.07    17.97   574.73     1.03   557.90     0.92     0.77

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.89    37.60    31.50     6.10     0.93     0.39     2.90
 MEAN    28.02    29.81    23.50     6.31     0.88     0.41     3.28     0.77
 HUB     35.02    13.00     6.50     6.50     0.88     0.45     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.842

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     418.536     195.699     369.965    1159.958       0.361       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.826      18.118     559.181      46.000      27.877      31.500       3.623

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     384.171     195.699     431.144    1162.345       0.331       0.155

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.816      18.370     561.484     471.992       0.016       0.266

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     373.028       0.000     373.028    1163.074       0.321       0.167

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.410     562.189       0.000       0.060       0.041       0.178

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.726      19.772       1.061     573.808      13.256     271.772       2.107

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  82570.703       0.396     518.877 1484848.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      19.772     573.808       1.000       1.000       0.980
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.957    2512.882       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85544.477   87255.180       2.027     513.330     253.252     401.059       1.584

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   350.83    -0.12   350.83     0.30   422.34
 MEAN    16.97     0.00    -0.02   350.83    -0.12   350.83     0.30
 HUB     14.32     0.00    -0.02   350.83    -0.12   350.83     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.71    46.36     5.35   444.22   566.15    18.56   563.53     0.49
 MEAN    48.14    43.80     4.34   391.42   525.73    18.56   563.53     0.45
 HUB     43.28    37.84     5.44   330.28   481.92    18.56   563.53     0.41
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      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   406.45   175.10   366.81  1173.41     0.35
MEAN    16.57   414.99   190.89   368.48  1172.27     0.35
HUB     13.89   448.09   251.92   370.57  1171.09     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   449.82   260.36     0.38  3308.16
MEAN   382.27   415.22   191.38     0.35  3165.86     1.37
HUB    320.37   376.84    68.45     0.32  3500.85

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.14     1.07    19.46   586.06     1.02   572.26     0.92     0.91
MEAN    21.08     1.07    19.33   585.53     1.02   571.15     0.92     0.91
HUB     21.23     1.07    19.18   586.77     1.02   570.01     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.52    35.37    31.50     3.87     0.93     0.26     2.90
MEAN    27.39    27.45    23.50     3.95     0.92     0.26     3.29     0.91
HUB     34.21    10.47     6.50     3.97     0.92     0.28     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     409.106     191.965     361.272    1173.286       0.349       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.133      19.427     572.145      46.000      27.984      32.400       4.416

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     379.674     191.965     425.444    1175.272       0.323       0.176

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.122      19.647     574.083     456.573       0.016       0.275

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     361.115       0.000     361.115    1176.446       0.307       0.170

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.738     575.231       0.000       0.060       0.043       0.226

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      21.072       1.066     586.118      12.310     273.969       2.124

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  76698.367       0.404     481.975  998654.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      21.072     586.118       1.000       1.000       0.980
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     82.461    2486.353       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85544.477   87255.180       2.122     509.668     240.162     390.276       1.625

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
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	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	337.19	-0.12	337.19	0.29	397.49
MEAN	15.91	0.00	-0.02	337.19	-0.12	337.19	0.29	
HUB	13.07	0.00	-0.02	337.19	-0.12	337.19	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.42	47.36	4.06	422.54	540.68	19.91	576.63	0.46
MEAN	47.43	44.80	2.63	367.03	498.49	19.91	576.63	0.42
HUB	41.81	38.84	2.97	301.45	452.37	19.91	576.63	0.38

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	388.23	160.76	353.38	1185.57	0.33
MEAN	15.50	394.38	171.65	355.07	1184.32	0.33
HUB	12.59	421.56	224.03	357.11	1183.04	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	434.62	253.02	0.37	2886.17	
MEAN	357.44	400.74	185.79	0.34	2662.03	1.35
HUB	290.38	363.22	66.35	0.31	2822.06	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.30	1.06	20.70	596.80	1.02	584.22	0.92	0.90
MEAN	22.20	1.05	20.56	595.97	1.02	582.99	0.92	0.90
HUB	22.27	1.06	20.40	596.56	1.02	581.73	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	24.46	35.60	31.50	4.10	0.93	0.25	2.90	
MEAN	25.80	27.62	23.50	4.12	0.91	0.25	3.34	0.90
HUB	32.10	10.53	6.50	4.03	0.91	0.26	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.982

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	398.393	174.799	357.997	1184.529	0.336	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.226	20.550	583.197	46.000	26.025	33.000	6.975

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	380.556	174.799	418.781	1185.706	0.321	0.064

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.195	20.665	584.357	440.827	0.038	0.254

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	356.354	0.000	356.354	1187.215	0.300	0.161

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.825	585.846	0.000	0.060	0.053	0.158

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.832	22.170	1.052	596.446	10.328	305.256	2.366

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
64359.957	0.376	404.440	1047693.375

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
458634.03	2882.0715	108.6316	1.4675	0.8254	10.0345	1.1408

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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 70%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.986

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     107.366    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   48.80284

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     104.886    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   82594.961   84246.680       2.722     831.557     305.451     619.754       2.029

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   244.12    -0.08   244.12     0.22   473.93
  MEAN    17.06     0.00    -0.02   244.12    -0.08   244.12     0.22
  HUB     12.51     0.00    -0.02   244.12    -0.08   244.12     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.84    50.47    12.37   475.82   534.87    14.61   517.83     0.48
  MEAN    58.19    47.20    10.99   393.48   463.13    14.61   517.83     0.41
  HUB     49.77    38.62    11.15   288.54   378.02    14.61   517.83     0.34

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   444.15   298.79   328.62  1128.48     0.39
  MEAN    18.04   458.46   315.43   332.70  1125.45     0.41
  HUB     15.00   509.42   380.07   339.20  1121.08     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   373.27   177.03     0.33  6165.71
  MEAN   415.99   347.56   100.56     0.31  5690.62     1.51
  HUB    345.97   340.91    34.10     0.30  5702.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.29     1.14    15.54   545.65     1.04   529.18     0.92     0.90
  MEAN    17.11     1.13    15.26   543.89     1.04   526.34     0.92     0.90
  HUB     17.12     1.13    14.85   543.94     1.04   522.26     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     42.28    28.31    24.20     4.11     0.93     0.40     2.90
  MEAN    43.47    16.82    12.70     4.12     0.94     0.35     3.51     0.90
  HUB     48.25    -5.74    -9.30     3.56     0.94     0.21     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     463.961     314.822     340.803    1125.632       0.412      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.153      15.258     526.516      24.000      42.731      35.400      -7.331

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	362.256	314.822	479.940	1133.109	0.320	0.376

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.126	15.953	533.535	528.796	0.024	0.500

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	336.802	0.000	336.802	1134.687	0.297	0.407

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.053	535.021	0.000	0.060	0.054	0.427

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.858	17.067	1.130	544.495	21.685	190.336	1.475

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
135009.734	0.596	819.153	1026515.062

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =10.989 EfDer = 0.991

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
107.366	2643.000	17.067	544.495	1.000	1.000	0.980

W Kg/sec = 48.80284

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
94.749	2579.635	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
82594.961	84246.680	2.140	590.487	275.933	474.134	1.718

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	322.08	-0.11	322.08	0.28	462.60
MEAN	18.08	0.00	-0.02	322.08	-0.11	322.08	0.28	
HUB	15.21	0.00	-0.02	322.08	-0.11	322.08	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.81	46.36	9.45	473.98	573.14	16.14	535.83	0.50
MEAN	52.32	42.30	10.02	416.97	526.96	16.14	535.83	0.46
HUB	47.45	37.84	9.61	350.81	476.32	16.14	535.83	0.42

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	410.03	234.77	336.17	1148.57	0.36
MEAN	18.01	416.21	241.39	339.05	1146.39	0.36
HUB	15.22	448.37	289.52	342.36	1144.18	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	410.86	236.21	0.36	4796.18	
MEAN	415.39	381.09	174.00	0.33	4349.49	1.51
HUB	351.11	347.86	61.59	0.30	4409.12	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.89	1.11	17.30	562.26	1.03	548.22	0.92	0.91
MEAN	18.72	1.10	17.09	560.61	1.03	546.14	0.92	0.91
HUB	18.74	1.10	16.86	560.83	1.03	544.04	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.93	35.09	31.50	3.59	0.93	0.35	2.90	
MEAN	35.45	27.17	23.50	3.67	0.94	0.35	3.30	0.91
HUB	40.22	10.20	6.50	3.70	0.94	0.35	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     598.416     242.071     547.269    1130.729       0.529      -0.929

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.768      15.505     531.326      46.000      23.861      30.600       6.739

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     559.649     242.071     609.758    1134.712       0.493      -0.715

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      18.735      15.862     535.075     345.258       0.029       0.215

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     550.850       0.000     550.850    1135.577       0.485       0.240

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      15.914     535.891       0.000       0.060       0.052      -0.685

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      18.697       1.096     561.231      16.736     223.694       1.734

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 104224.773       0.470     632.370  937301.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.871

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.366    2643.000      18.697     561.231       1.000       1.000       0.680
W Kg/sec =   48.80284

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.808    2540.881       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82594.961   84246.680       1.480     378.495     255.723     293.880       1.149

     ROTOR LEADING EDGE CONDITIONS, STAGE           3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   499.02    -0.17   499.02     0.44   445.01
 MEAN    17.74     0.00    -0.02   499.02    -0.17   499.02     0.44
 HUB     15.05     0.00    -0.02   499.02    -0.17   499.02     0.44

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.86    46.36    -3.50   462.91   680.78    16.39   540.44     0.60
 MEAN    39.36    43.40    -4.04   409.13   645.40    16.39   540.44     0.57
 HUB     34.84    38.84    -4.00   347.12   607.97    16.39   540.44     0.53

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   396.24   189.64   347.91  1162.93     0.34
 MEAN    17.51   404.78   204.10   349.56  1161.63     0.35
 HUB     14.85   438.66   261.82   351.95  1160.36     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   438.72   267.27     0.38  3760.27
 MEAN   403.78   402.57   199.68     0.35  3576.12     1.70
 HUB    342.51   361.08    80.69     0.31  3890.60
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	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.02	1.07	18.47	575.16	1.02	562.05	0.92	0.80
MEAN	19.95	1.07	18.34	574.47	1.02	560.79	0.92	0.80
HUB	20.07	1.07	18.18	575.64	1.03	559.57	0.92	0.80

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.59	37.53	31.50	6.03	0.93	0.40	2.90	
MEAN	30.28	29.74	23.50	6.24	0.88	0.42	3.28	0.80
HUB	36.65	12.91	6.50	6.41	0.88	0.46	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.871

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	409.204	205.438	353.897	1161.954	0.352	0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.996	18.351	561.108	46.000	30.135	31.500	1.365

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	366.705	205.438	420.330	1164.801	0.315	0.196

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.989	18.660	563.861	471.992	0.014	0.298

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	356.077	0.000	356.077	1165.464	0.306	0.207

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.698	564.503	0.000	0.060	0.037	0.218

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.760	19.950	1.067	575.090	13.858	256.760	1.990

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
86326.047	0.414	523.771	1418723.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =10.989 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
107.366	2643.000	19.950	575.090	1.000	1.000	0.980

W Kg/sec = 48.80284

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
83.301	2510.080	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
82594.961	84246.680	2.116	513.330	242.604	401.059	1.653

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	335.09	-0.12	335.09	0.29	421.87
MEAN	16.97	0.00	-0.02	335.09	-0.12	335.09	0.29	
HUB	14.32	0.00	-0.02	335.09	-0.12	335.09	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.98	46.36	6.62	444.22	556.52	18.84	565.72	0.48
MEAN	49.44	43.80	5.64	391.42	515.35	18.84	565.72	0.44
HUB	44.60	37.84	6.76	330.28	470.58	18.84	565.72	0.40

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	396.70	187.71	349.48	1176.29	0.34
MEAN	16.57	404.36	200.07	351.40	1174.90	0.34
HUB	13.89	436.19	255.32	353.66	1173.49	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	428.39	247.75	0.36	3546.20	
MEAN	382.27	395.82	182.20	0.34	3317.86	1.41
HUB	320.37	359.59	65.05	0.31	3548.06	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.44	1.07	19.82	588.22	1.02	575.08	0.92	0.91
MEAN	21.34	1.07	19.66	587.37	1.02	573.72	0.92	0.91
HUB	21.44	1.07	19.49	588.23	1.02	572.34	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.24	35.33	31.50	3.83	0.93	0.29	2.90	
MEAN	29.66	27.41	23.50	3.91	0.92	0.29	3.29	0.91
HUB	35.83	10.42	6.50	3.92	0.92	0.30	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	399.039	201.193	344.606	1175.846	0.339	0.051

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.390	19.750	574.646	46.000	30.278	32.400	2.122

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	361.389	201.193	413.618	1178.289	0.307	0.215

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.384	20.032	577.036	456.573	0.014	0.308

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	343.775	0.000	343.775	1179.347	0.291	0.210

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.117	578.073	0.000	0.060	0.038	0.264

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.873	21.341	1.070	587.939	12.850	259.273	2.010

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
80060.609	0.422	485.757	958715.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =10.989 EfDer = 0.993

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
107.366	2643.000	21.341	587.939	1.000	1.000	0.980

W Kg/sec = 48.80284

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
78.737	2482.499	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
82594.961	84246.680	2.223	509.668	229.315	390.276	1.702

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	321.20	-0.11	321.20	0.27	396.87

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 MEAN    15.91     0.00    -0.02   321.20    -0.11   321.20     0.27
 HUB     13.07     0.00    -0.02   321.20    -0.11   321.20     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.77    47.36     5.41   422.54   530.86    20.27   579.33     0.45
 MEAN    48.82    44.80     4.02   367.03   487.81    20.27   579.33     0.41
 HUB     43.19    38.84     4.35   301.45   440.58    20.27   579.33     0.37

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   378.03   173.78   335.72  1188.95     0.32
 MEAN    15.50   383.12   181.09   337.62  1187.45     0.32
 HUB     12.59   408.96   227.54   339.81  1185.94     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   412.68   239.99     0.35  3119.72
 MEAN   357.44   380.90   176.35     0.32  2808.29     1.40
 HUB    290.38   345.58    62.84     0.29  2866.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.70     1.06    21.16   599.49     1.02   587.56     0.92     0.91
 MEAN    22.56     1.06    20.99   598.33     1.02   586.08     0.92     0.91
 HUB     22.59     1.06    20.80   598.55     1.02   584.59     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.37    35.56    31.50     4.06     0.93     0.28     2.90
 MEAN    28.21    27.58    23.50     4.08     0.92     0.27     3.34     0.91
 HUB     33.81    10.48     6.50     3.98     0.92     0.28     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     387.129     184.415     340.382    1187.652       0.326      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.583      20.979     586.280      46.000      28.448      33.000       4.552

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     360.880     184.415     405.269    1189.311       0.303       0.113

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.566      21.168     587.919     440.827       0.030       0.287

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     338.110       0.000     338.110    1190.654       0.284       0.206

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.315     589.247       0.000       0.060       0.044       0.203

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      22.544       1.056     598.790      10.850     287.094       2.226

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   67619.805       0.395     410.274 1005306.812

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     473241.00   2871.3250    104.8861      1.4923      0.8369     10.9895      1.1453


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**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 70%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.981

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     103.556    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   47.07069

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     101.163    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   79663.445   81256.547       2.823     831.557     294.610     619.754       2.104

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   235.05    -0.08   235.05     0.21   473.93
  MEAN    17.06     0.00    -0.02   235.05    -0.08   235.05     0.21
  HUB     12.51     0.00    -0.02   235.05    -0.08   235.05     0.21

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.72    50.47    13.25   475.82   530.78    14.65   518.20     0.48
  MEAN    59.15    47.20    11.95   393.48   458.41    14.65   518.20     0.41
  HUB     50.84    38.62    12.22   288.54   372.22    14.65   518.20     0.33

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   439.55   305.49   316.04  1129.38     0.39
  MEAN    18.04   452.02   319.21   320.05  1126.24     0.40
  HUB     15.00   499.87   378.72   326.25  1121.86     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   359.02   170.33     0.32  6303.87
  MEAN   415.99   334.36    96.78     0.30  5758.65     1.56
  HUB    345.97   327.89    32.75     0.29  5681.81

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.33     1.15    15.61   546.17     1.04   530.03     0.92     0.90
  MEAN    17.13     1.13    15.32   544.15     1.04   527.08     0.92     0.90
  HUB     17.10     1.13    14.92   543.86     1.04   522.99     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     44.03    28.32    24.20     4.12     0.93     0.42     2.90
  MEAN    44.92    16.83    12.70     4.13     0.94     0.37     3.51     0.90
  HUB     49.26    -5.73    -9.30     3.57     0.94     0.24     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.981

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     457.122     318.590     327.812    1126.439       0.406      -0.002

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      17.164      15.321     527.272      24.000      44.183      35.400      -8.783

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      18.071     348.042     318.590     471.839    1134.248       0.307       0.403
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BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.132	16.048	534.607	528.796	0.027	0.524

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	323.919	0.000	323.919	1135.683	0.285	0.424

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.128	535.961	0.000	0.060	0.062	0.445

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.849	17.066	1.130	544.725	21.915	185.296	1.436

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
136438.906	0.603	798.443	988356.188

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =11.953 EfDer = 0.986

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
103.556	2643.000	17.066	544.725	1.000	1.000	0.980

W Kg/sec = 47.07069

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
91.409	2579.091	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
79663.445	81256.547	2.218	590.487	266.205	474.134	1.781

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	309.86	-0.11	309.86	0.27	462.50
MEAN	18.08	0.00	-0.02	309.86	-0.11	309.86	0.27	
HUB	15.21	0.00	-0.02	309.86	-0.11	309.86	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.83	46.36	10.47	473.98	566.36	16.21	536.71	0.50
MEAN	53.39	42.30	11.09	416.97	519.58	16.21	536.71	0.46
HUB	48.56	37.84	10.72	350.81	468.14	16.21	536.71	0.41

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	404.92	243.96	323.17	1149.90	0.35
MEAN	18.01	409.76	248.13	326.09	1147.56	0.36
HUB	15.22	440.16	291.91	329.44	1145.20	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	394.94	227.02	0.34	4983.81	
MEAN	415.39	366.49	167.26	0.32	4470.74	1.55
HUB	351.11	334.71	59.20	0.29	4445.34	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.96	1.11	17.40	563.19	1.03	549.49	0.92	0.90
MEAN	18.75	1.10	17.17	561.28	1.03	547.26	0.92	0.90
HUB	18.74	1.10	16.93	561.19	1.03	545.01	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.05	35.09	31.50	3.59	0.93	0.38	2.90	
MEAN	37.27	27.15	23.50	3.65	0.94	0.37	3.30	0.90
HUB	41.54	10.19	6.50	3.69	0.94	0.36	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.986

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     578.916     248.826     522.713    1133.463       0.511      -0.869

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.802      15.733     533.899      46.000      25.456      30.600       5.144

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     533.096     248.826     588.308    1137.970       0.468      -0.611

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      18.777      16.153     538.154     345.258       0.025       0.237

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     524.815       0.000     524.815    1138.744       0.461       0.283

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      16.200     538.885       0.000       0.060       0.046      -0.583

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      18.743       1.098     561.887      17.162     215.309       1.669

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 106878.734       0.482     625.456  901036.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.899

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.556    2643.000      18.743     561.887       1.000       1.000       0.680
W Kg/sec =   47.07069

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     84.530    2539.398       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79663.445   81256.547       1.537     378.495     246.178     293.880       1.194

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   476.61    -0.16   476.61     0.42   444.75
 MEAN    17.74     0.00    -0.02   476.61    -0.16   476.61     0.42
 HUB     15.05     0.00    -0.02   476.61    -0.16   476.61     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.17    46.36    -2.19   462.91   664.52    16.63   542.92     0.58
 MEAN    40.65    43.40    -2.75   409.13   628.23    16.63   542.92     0.55
 HUB     36.08    38.84    -2.76   347.12   589.71    16.63   542.92     0.52

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   389.21   201.99   332.69  1165.01     0.33
 MEAN    17.51   396.74   213.28   334.53  1163.48     0.34
 HUB     14.85   429.17   265.79   336.97  1161.98     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   419.13   254.92     0.36  4004.66
 MEAN   403.78   384.97   190.50     0.33  3736.77     1.73
 HUB    342.51   345.59    76.72     0.30  3949.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.20     1.08    18.70   576.72     1.03   564.07     0.92     0.82
 MEAN    20.10     1.07    18.55   575.72     1.02   562.58     0.92     0.82
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 HUB     20.18     1.08    18.36   576.51     1.03   561.13     0.92     0.82

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.26    37.46    31.50     5.96     0.93     0.42     2.90
 MEAN    32.52    29.66    23.50     6.16     0.89     0.44     3.28     0.82
 HUB     38.27    12.83     6.50     6.33     0.89     0.47     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.899

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     400.955     214.683     338.639    1163.800       0.345       0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.146      18.556     562.894      46.000      32.373      31.500      -0.873

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     350.230     214.683     410.792    1167.084       0.300       0.235

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.140      18.919     566.076     471.992       0.014       0.331

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     340.148       0.000     340.148    1167.683       0.291       0.243

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.951     566.657       0.000       0.060       0.037       0.255

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.789      20.102       1.072     576.318      14.431     243.422       1.887

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  89893.109       0.431     526.056 1355620.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.556    2643.000      20.102     576.318       1.000       1.000       0.980
W Kg/sec =   47.07069

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     79.822    2507.404       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79663.445   81256.547       2.208     513.330     232.472     401.059       1.725

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   320.27    -0.11   320.27     0.27   421.42
 MEAN    16.97     0.00    -0.02   320.27    -0.11   320.27     0.27
 HUB     14.32     0.00    -0.02   320.27    -0.11   320.27     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.22    46.36     7.86   444.22   547.72    19.08   567.75     0.47
 MEAN    50.72    43.80     6.92   391.42   505.83    19.08   567.75     0.43
 HUB     45.89    37.84     8.05   330.28   460.14    19.08   567.75     0.39

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   388.47   199.38   333.40  1178.93     0.33
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 MEAN    16.57   395.04   208.60   335.47  1177.33     0.34
 HUB     13.89   425.38   258.45   337.86  1175.70     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   408.52   236.08     0.35  3766.43
 MEAN   382.27   377.76   173.67     0.32  3459.16     1.45
 HUB    320.37   343.49    61.92     0.29  3591.41

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.70     1.08    20.12   590.26     1.02   577.66     0.92     0.91
 MEAN    21.56     1.07    19.95   589.12     1.02   576.10     0.92     0.91
 HUB     21.62     1.08    19.75   589.61     1.02   574.51     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.88    35.30    31.50     3.80     0.93     0.32     2.90
 MEAN    31.87    27.37    23.50     3.87     0.93     0.32     3.29     0.91
 HUB     37.41    10.39     6.50     3.89     0.93     0.32     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     390.243     209.772     329.068    1178.202       0.331       0.049

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.611      20.028     576.953      46.000      32.516      32.400      -0.116

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     344.460     209.772     403.308    1181.066       0.292       0.252

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.606      20.366     579.761     456.573       0.013       0.341

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     327.772       0.000     327.772    1182.019       0.277       0.246

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.443     580.698       0.000       0.060       0.037       0.298

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      21.566       1.073     589.667      13.349     246.325       1.909

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  83173.742       0.439     486.734  919864.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.556    2643.000      21.566     589.667       1.000       1.000       0.980
W Kg/sec =   47.07069

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     75.260    2478.860       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79663.445   81256.547       2.325     509.668     219.190     390.276       1.781

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   306.42    -0.11   306.42     0.26   396.29
 MEAN    15.91     0.00    -0.02   306.42    -0.11   306.42     0.26
 HUB     13.07     0.00    -0.02   306.42    -0.11   306.42     0.26
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.06    47.36     6.70   422.54   522.04    20.58   581.83     0.44
MEAN    50.15    44.80     5.35   367.03   478.20    20.58   581.83     0.40
HUB     44.54    38.84     5.70   301.45   429.92    20.58   581.83     0.36

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   369.60   185.63   319.60  1192.01     0.31
MEAN    15.50   373.44   189.75   321.65  1190.32     0.31
HUB     12.59   397.71   230.74   323.94  1188.60     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.78   392.68   228.15     0.33  3332.13
MEAN   357.44   362.74   167.70     0.30  2942.35     1.44
HUB    290.38   329.39    59.65     0.28  2906.33

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.04     1.07    21.55   602.00     1.02   590.60     0.92     0.91
MEAN    22.86     1.06    21.35   600.56     1.02   588.92     0.92     0.91
HUB     22.85     1.06    21.14   600.42     1.02   587.22     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.15    35.52    31.50     4.02     0.93     0.31     2.90
MEAN    30.54    27.54    23.50     4.04     0.92     0.30     3.34     0.91
HUB     35.46    10.43     6.50     3.93     0.92     0.30     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     377.469     193.229     324.261    1190.502       0.317      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.884      21.342     589.101      46.000      30.791      33.000       2.209

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     343.058     193.229     393.734    1192.592       0.288       0.158

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.875      21.596     591.170     440.827       0.026       0.321

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     321.571       0.000     321.571    1193.793       0.269       0.248

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.730     592.362       0.000       0.060       0.038       0.244

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      22.856       1.060     600.994      11.327     271.504       2.105

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   70592.789       0.412     413.110  964207.625

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     486977.28   2849.7991    101.1634      1.5129      0.8429     11.9532      1.1495


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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 70%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  0.974

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     99.590    2643.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.289    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 76612.523   78144.609       2.935     831.557     283.327     619.754       2.187

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   225.65    -0.08   225.65     0.20   473.93
MEAN    17.06     0.00    -0.02   225.65    -0.08   225.65     0.20
HUB     12.51     0.00    -0.02   225.65    -0.08   225.65     0.20

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     64.63    50.47    14.16   475.82   526.69    14.68   518.56     0.47
MEAN    60.17    47.20    12.97   393.48   453.66    14.68   518.56     0.41
HUB     51.98    38.62    13.36   288.54   366.36    14.68   518.56     0.33

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   435.23   312.31   303.13  1130.27     0.39
MEAN    18.04   445.67   323.03   307.05  1127.02     0.40
HUB     15.00   490.16   377.28   312.92  1122.64     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    475.82   344.42   163.51     0.30  6444.60
MEAN   415.99   320.81    92.97     0.28  5827.45     1.61
HUB    345.97   314.49    31.31     0.28  5660.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.36     1.15    15.67   546.69     1.05   530.87     0.92     0.89
MEAN    17.14     1.13    15.38   544.40     1.04   527.81     0.92     0.89
HUB     17.08     1.13    14.98   543.78     1.04   523.71     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     45.85    28.34    24.20     4.14     0.93     0.45     2.90
MEAN    46.45    16.84    12.70     4.14     0.94     0.40     3.51     0.89
HUB     50.33    -5.71    -9.30     3.59     0.94     0.26     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     450.367     322.399     314.466    1127.234       0.400      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.173      15.382     528.016      24.000      45.714      35.400     -10.314

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     333.499     322.399     463.856    1135.372       0.294       0.430

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.136      16.138     535.667     528.796       0.030       0.549
```

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	310.718	0.000	310.718	1136.670	0.273	0.441

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.197	536.893	0.000	0.060	0.070	0.462

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.838	17.061	1.129	544.957	22.147	180.126	1.396

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
137884.031	0.609	775.997	948857.062

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =12.972 EfDer = 0.979

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
99.590	2643.000	17.061	544.957	1.000	1.000	0.980

W Kg/sec = 45.26799

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
87.951	2578.542	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
76612.523	78144.609	2.305	590.487	256.136	474.134	1.851

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	297.32	-0.10	297.32	0.26	462.40
MEAN	18.08	0.00	-0.02	297.32	-0.10	297.32	0.26	
HUB	15.21	0.00	-0.02	297.32	-0.10	297.32	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.91	46.36	11.55	473.98	559.60	16.27	537.57	0.49
MEAN	54.52	42.30	12.22	416.97	512.20	16.27	537.57	0.45
HUB	49.73	37.84	11.89	350.81	459.93	16.27	537.57	0.40

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	400.27	253.27	309.95	1151.20	0.35
MEAN	18.01	403.58	254.92	312.88	1148.72	0.35
HUB	15.22	431.99	294.32	316.22	1146.21	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	378.77	217.71	0.33	5173.78	
MEAN	415.39	351.63	160.47	0.31	4592.94	1.60
HUB	351.11	321.28	56.80	0.28	4481.93	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.01	1.11	17.48	564.12	1.04	550.74	0.92	0.90
MEAN	18.78	1.10	17.25	561.97	1.03	548.37	0.92	0.90
HUB	18.74	1.10	16.99	561.56	1.03	545.97	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.25	35.08	31.50	3.58	0.93	0.40	2.90	
MEAN	39.17	27.15	23.50	3.65	0.94	0.39	3.30	0.90
HUB	42.95	10.18	6.50	3.68	0.94	0.38	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.979

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	560.059	255.635	498.314	1136.066	0.493	-0.810

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.829      15.944     536.355      46.000      27.158      30.600       3.442

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     506.980     255.635     567.784    1141.064       0.444      -0.508

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      18.811      16.424     541.085     345.258       0.021       0.261

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     499.203       0.000     499.203    1141.753       0.437       0.325

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      16.466     541.739       0.000       0.060       0.041      -0.481

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864      18.780       1.101     562.550      17.593     207.024       1.605

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 109560.031       0.494     616.593  863694.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  0.926

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2643.000      18.780     562.550       1.000       1.000       0.680
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.182    2537.902       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       1.601     378.495     236.426     293.880       1.243

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   454.34    -0.16   454.34     0.40   444.48
 MEAN    17.74     0.00    -0.02   454.34    -0.16   454.34     0.40
 HUB     15.05     0.00    -0.02   454.34    -0.16   454.34     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.54    46.36    -0.82   462.91   648.73    16.85   545.31     0.57
 MEAN    42.01    43.40    -1.39   409.13   611.51    16.85   545.31     0.53
 HUB     37.39    38.84    -1.45   347.12   571.86    16.85   545.31     0.50

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   383.01   214.34   317.42  1167.04     0.33
 MEAN    17.51   389.29   222.49   319.44  1165.28     0.33
 HUB     14.85   419.99   269.74   321.92  1163.56     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   399.50   242.57     0.34  4249.14
 MEAN   403.78   367.30   181.29     0.32  3897.88     1.77
 HUB    342.51   330.04    72.77     0.28  4008.03

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.38     1.09    18.91   578.28     1.03   566.04     0.92     0.85
 MEAN    20.24     1.08    18.74   576.98     1.03   564.33     0.92     0.85
 HUB     20.29     1.08    18.54   577.39     1.03   562.66     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     34.03    37.39    31.50     5.89     0.93     0.44     2.90
 MEAN    34.86    29.58    23.50     6.08     0.90     0.45     3.28     0.85
 HUB     39.96    12.74     6.50     6.24     0.90     0.48     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.926

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     393.312     223.954     323.325    1165.597       0.337       0.007

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.287      18.748     564.637      46.000      34.709      31.500      -3.209

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     333.794     223.954     401.963    1169.320       0.285       0.276

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.280      19.163     568.250     471.992       0.015       0.367

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     324.310       0.000     324.310    1169.857       0.277       0.278

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.186     568.771       0.000       0.060       0.040       0.291

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.813       20.240       1.078     577.553      15.004     230.829       1.789

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93462.047       0.448     525.995 1292169.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  0.998

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     99.590     2643.000       20.240     577.553       1.000        1.000        0.980
W Kg/sec =   45.26799

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     76.324     2504.720        1.402       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  76612.523   78144.609        2.309     513.330     222.284     401.059       1.804

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   305.50    -0.11   305.50      0.26   420.97
 MEAN    16.97      0.00    -0.02   305.50    -0.11   305.50      0.26
 HUB     14.32      0.00    -0.02   305.50    -0.11   305.50      0.26

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     55.49     46.36      9.13   444.22   539.22     19.30   569.76      0.46
 MEAN    52.04     43.80      8.24   391.42   496.61     19.30   569.76      0.42
 HUB     47.24     37.84      9.40   330.28   449.99     19.30   569.76      0.38

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   381.17    210.81    317.57   1181.48      0.32
 MEAN    16.57   386.39    216.94    319.75   1179.68      0.33
 HUB     13.89   414.98    261.49    322.23   1177.87      0.35
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   388.99   224.65     0.33  3982.14
MEAN   382.27   359.96   165.33     0.31  3597.26     1.50
HUB    320.37   327.57    58.88     0.28  3633.55

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.93     1.08    20.41   592.30     1.03   580.17     0.92     0.91
MEAN    21.77     1.08    20.21   590.87     1.02   578.41     0.92     0.91
HUB     21.78     1.08    19.99   591.01     1.02   576.63     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.58    35.28    31.50     3.78     0.93     0.35     2.90
MEAN    34.16    27.34    23.50     3.84     0.93     0.34     3.29     0.91
HUB     39.06    10.36     6.50     3.86     0.93     0.35     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     382.117     218.156     313.721    1180.492       0.324       0.047

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.811      20.282     579.201      46.000      34.814      32.400      -2.414

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     327.844     218.156     393.794    1183.765       0.277       0.290

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.806      20.673     582.418     456.573       0.013       0.375

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     312.106       0.000     312.106    1184.619       0.263       0.280

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      20.738     583.258       0.000       0.060       0.039       0.331

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.878      21.765       1.075     591.391      13.837     234.181       1.815

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  86218.094       0.455     485.227  880187.688


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2643.000      21.765     591.391       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     71.822    2475.244       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.437     509.668     209.179     390.276       1.866

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   291.92    -0.10   291.92     0.25   395.71
MEAN    15.91     0.00    -0.02   291.92    -0.10   291.92     0.25
HUB     13.07     0.00    -0.02   291.92    -0.10   291.92     0.25

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.37    47.36     8.01   422.54   513.66    20.86   584.28     0.43
MEAN    51.51    44.80     6.71   367.03   469.04    20.86   584.28     0.40
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HUB     45.93    38.84     7.09   301.45   419.71    20.86   584.28     0.35

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   362.26   197.05   303.98  1194.96     0.30
MEAN    15.50   364.64   198.13   306.11  1193.08     0.31
HUB     12.59   387.06   233.80   308.48  1191.19     0.32

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.78   373.32   216.72     0.31  3537.00
MEAN   357.44   345.09   159.32     0.29  3072.07     1.49
HUB    290.38   313.62    56.59     0.26  2944.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.34     1.07    21.90   604.48     1.02   593.53     0.92     0.91
MEAN    23.13     1.06    21.68   602.76     1.02   591.66     0.92     0.91
HUB     23.07     1.06    21.44   602.29     1.02   589.78     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.95    35.49    31.50     3.99     0.93     0.34     2.90
MEAN    32.91    27.50    23.50     4.00     0.93     0.33     3.34     0.91
HUB     37.16    10.39     6.50     3.89     0.93     0.32     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     368.701     201.759     308.600    1193.252       0.309       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.151      21.667     591.831      46.000      33.176      33.000      -0.176

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     325.894     201.759     383.292    1195.752       0.273       0.203

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.145      21.979     594.312     440.827       0.024       0.356

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     305.638       0.000     305.638    1196.825       0.255       0.287

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.100     595.380       0.000       0.060       0.037       0.283

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      23.126       1.063     603.177      11.787     257.204       1.994

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  73461.242       0.429     413.432  922330.562

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    500585.47   2817.2439     97.2890      1.5308      0.8447     12.9716      1.1537


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

    Fan-Core + 4 Stage LPC 70%  Stat 2 30% Ice Block 9-1-2011
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COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
RESET = 0.000BLEED = 0.000 DPInc =13.992 EfDer = 0.966

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
95.675	2643.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 43.48865

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
93.465	2632.591	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73601.117	75072.977	3.055	831.557	272.190	619.754	2.277

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	216.43	-0.07	216.43	0.19	473.93
MEAN	17.06	0.00	-0.02	216.43	-0.07	216.43	0.19	
HUB	12.51	0.00	-0.02	216.43	-0.07	216.43	0.19	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	65.54	50.47	15.07	475.82	522.80	14.72	518.90	0.47
MEAN	61.19	47.20	13.99	393.48	449.14	14.72	518.90	0.40
HUB	53.13	38.62	14.51	288.54	360.75	14.72	518.90	0.32

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	431.41	318.88	290.57	1131.10	0.38
MEAN	18.04	439.74	326.68	294.36	1127.75	0.39
HUB	15.00	480.83	375.82	299.92	1123.36	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	475.82	330.24	156.94	0.29	6580.11	
MEAN	415.99	307.61	89.31	0.27	5893.31	1.67
HUB	345.97	301.40	29.85	0.27	5638.27	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.39	1.15	15.73	547.19	1.05	531.65	0.92	0.88
MEAN	17.14	1.13	15.44	544.65	1.04	528.49	0.92	0.88
HUB	17.05	1.13	15.03	543.70	1.04	524.39	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	47.66	28.37	24.20	4.17	0.93	0.47	2.90	
MEAN	47.98	16.88	12.70	4.18	0.95	0.42	3.51	0.88
HUB	51.41	-5.68	-9.30	3.62	0.95	0.28	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.966

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	444.048	326.047	301.449	1127.974	0.394	0.000

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.178	15.435	528.709	24.000	47.245	35.400	-11.845

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	319.366	326.047	456.401	1136.423	0.281	0.457

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.136	16.220	536.660	528.796	0.034	0.574

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	297.866	0.000	297.866	1137.596	0.262	0.458

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.258	537.768	0.000	0.060	0.080	0.478

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.826	17.053	1.129	545.179	22.369	175.094	1.357

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
139263.422	0.615	752.953	910072.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =13.992 EfDer = 0.971

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
95.675	2643.000	17.053	545.179	1.000	1.000	0.980

W Kg/sec = 43.48865

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
84.553	2578.018	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73601.117	75072.977	2.398	590.487	246.239	474.134	1.926

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	285.10	-0.10	285.10	0.25	462.31
MEAN	18.08	0.00	-0.02	285.10	-0.10	285.10	0.25	
HUB	15.21	0.00	-0.02	285.10	-0.10	285.10	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.98	46.36	12.62	473.98	553.20	16.32	538.39	0.49
MEAN	55.64	42.30	13.34	416.97	505.20	16.32	538.39	0.44
HUB	50.91	37.84	13.07	350.81	452.13	16.32	538.39	0.40

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	396.28	262.17	297.16	1152.41	0.34
MEAN	18.01	397.98	261.44	300.06	1149.80	0.35
HUB	15.22	424.26	296.58	303.37	1147.15	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	363.19	208.80	0.32	5355.61	
MEAN	415.39	337.25	153.95	0.29	4710.38	1.65
HUB	351.11	308.23	54.53	0.27	4516.33	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.06	1.12	17.56	565.02	1.04	551.90	0.92	0.89
MEAN	18.81	1.10	17.31	562.63	1.03	549.40	0.92	0.89
HUB	18.73	1.10	17.04	561.91	1.03	546.88	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.42	35.09	31.50	3.59	0.93	0.42	2.90	
MEAN	41.07	27.16	23.50	3.66	0.94	0.41	3.30	0.89
HUB	44.35	10.19	6.50	3.69	0.94	0.40	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.971

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	542.726	262.178	475.199	1138.423	0.477	-0.754

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.848	16.129	538.585	46.000	28.887	30.600	1.713

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	482.451	262.178	549.087	1143.864	0.422	-0.409

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	18.834	16.662	543.745	345.258	0.019	0.286

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	475.156	0.000	475.156	1144.477	0.415	0.365

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	16.699	544.329	0.000	0.060	0.038	-0.386

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.861	18.805	1.103	563.183	18.005	199.237	1.544

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
112125.727	0.505	606.228	827207.312

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =13.992 EfDer = 0.949

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
95.675	2643.000	18.805	563.183	1.000	1.000	0.680

W Kg/sec = 43.48865

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
77.931	2536.474	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73601.117	75072.977	1.668	378.495	226.960	293.880	1.295

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	433.26	-0.15	433.26	0.38	444.23
MEAN	17.74	0.00	-0.02	433.26	-0.15	433.26	0.38	
HUB	15.05	0.00	-0.02	433.26	-0.15	433.26	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.90	46.36	0.54	462.91	634.14	17.04	547.51	0.55
MEAN	43.37	43.40	-0.03	409.13	596.01	17.04	547.51	0.52
HUB	38.71	38.84	-0.13	347.12	555.26	17.04	547.51	0.48

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	377.96	226.06	302.90	1168.91	0.32
MEAN	17.51	382.79	231.23	305.06	1166.95	0.33
HUB	14.85	411.61	273.52	307.59	1165.03	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	380.84	230.84	0.33	4481.34	
MEAN	403.78	350.48	172.55	0.30	4050.70	1.82
HUB	342.51	315.23	68.99	0.27	4063.98	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.54	1.09	19.10	579.78	1.03	567.85	0.92	0.87
MEAN	20.37	1.08	18.90	578.18	1.03	565.95	0.92	0.87
HUB	20.37	1.08	18.69	578.23	1.03	564.09	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.74	37.31	31.50	5.81	0.93	0.46	2.90	
MEAN	37.16	29.49	23.50	5.99	0.90	0.47	3.28	0.87
HUB	41.64	12.64	6.50	6.14	0.90	0.50	3.87	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.949

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      386.644     232.748     308.743    1167.256       0.331       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.411      18.916      566.249      46.000      37.011      31.500      -5.511

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392      318.226     232.748     394.258    1171.399       0.272       0.316

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.401      19.380      570.276     471.992       0.017       0.402

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121      309.347       0.000     309.347    1171.877       0.264       0.311

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.391     570.741       0.000       0.060       0.047       0.323

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.831      20.354       1.082     578.731      15.548     219.466       1.701

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96852.602       0.464     523.651 1231445.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =13.992   EfDer =  0.994

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     95.675    2643.000      20.354     578.731       1.000       1.000       0.980
W Kg/sec =   43.48865

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     72.986    2502.171       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73601.117   75072.977       2.415     513.330     212.563     401.059       1.887

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   291.53    -0.10   291.53     0.25   420.54
 MEAN    16.97     0.00    -0.02   291.53    -0.10   291.53     0.25
 HUB     14.32     0.00    -0.02   291.53    -0.10   291.53     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.73    46.36    10.37   444.22   531.43    19.50   571.64     0.45
 MEAN    53.33    43.80     9.53   391.42   488.14    19.50   571.64     0.42
 HUB     48.57    37.84    10.73   330.28   440.62    19.50   571.64     0.38

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   375.10   221.46   302.75  1183.82     0.32
 MEAN    16.57   378.83   224.71   304.99  1181.86     0.32
 HUB     13.89   405.49   264.31   307.51  1179.88     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   370.75   214.00     0.31  4183.10
 MEAN   382.27   343.28   157.55     0.29  3726.10     1.55
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 HUB    320.37   312.58    56.05     0.26  3672.75

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.14     1.09    20.65   594.22     1.03   582.47     0.92     0.91
 MEAN    21.94     1.08    20.43   592.53     1.02   580.54     0.92     0.91
 HUB     21.91     1.08    20.19   592.33     1.02   578.60     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.19    35.25    31.50     3.75     0.93     0.37     2.90
 MEAN    36.38    27.32    23.50     3.82     0.94     0.37     3.29     0.91
 HUB     40.68    10.33     6.50     3.83     0.94     0.37     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     375.032     225.979     299.304    1182.607       0.317       0.045

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.978      20.497     581.282      46.000      37.053      32.400      -4.653

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     312.316     225.979     385.497    1186.262       0.263       0.327

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.971      20.936     584.880     456.573       0.015       0.410

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     297.495       0.000     297.495    1187.027       0.251       0.311

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.987     585.635       0.000       0.060       0.044       0.360

    STAGE EXIT CONDITIONS, STAGE             4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      21.925       1.077     593.023      14.292     223.275       1.731

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  89055.461       0.470     481.495  841697.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.992   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     95.675    2643.000      21.925     593.023       1.000       1.000       0.980
W Kg/sec =   43.48865

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     68.589    2471.834       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73601.117   75072.977       2.551     509.668     199.763     390.276       1.954

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   278.38    -0.10   278.38     0.23   395.17
 MEAN    15.91     0.00    -0.02   278.38    -0.10   278.38     0.23
 HUB     13.07     0.00    -0.02   278.38    -0.10   278.38     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.63    47.36     9.27   422.54   506.08    21.10   586.56     0.43
 MEAN    52.83    44.80     8.03   367.03   460.73    21.10   586.56     0.39
 HUB     47.29    38.84     8.45   301.45   410.40    21.10   586.56     0.35

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   356.26   207.57   289.54  1197.66     0.30
MEAN    15.50   357.01   205.81   291.72  1195.63     0.30
HUB     12.59   377.49   236.64   294.11  1193.58     0.32

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.78   355.46   206.20     0.30  3725.64
MEAN   357.44   328.78   151.63     0.27  3191.10     1.54
HUB    290.38   298.98    53.75     0.25  2980.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.59     1.08    22.19   606.81     1.02   596.22     0.92     0.91
MEAN    23.35     1.06    21.95   604.83     1.02   594.20     0.92     0.91
HUB     23.25     1.06    21.69   604.05     1.02   592.16     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.64    35.46    31.50     3.96     0.93     0.37     2.90
MEAN    35.20    27.47    23.50     3.97     0.93     0.35     3.34     0.91
HUB     38.82    10.36     6.50     3.86     0.93     0.34     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     361.128     209.585     294.088    1195.781       0.302      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.369      21.935     594.348      46.000      35.476      33.000      -2.476

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     310.106     209.585     374.288    1198.654       0.259       0.244

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.362      22.298     597.207     440.827       0.025       0.390

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     290.983       0.000     290.983    1199.616       0.243       0.323

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.405     598.166       0.000       0.060       0.039       0.317

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      23.342       1.065     605.233      12.210     244.601       1.896

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  76101.727       0.444     411.458  881773.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    513398.94   2775.7849     93.4649      1.5451      0.8428     13.9922      1.1577


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 70%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =14.987   EfDer =  0.959
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
91.914	2643.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 41.77924

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
89.791	2632.591	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
70708.070	72122.078	3.180	831.557	261.491	619.754	2.370

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	207.61	-0.07	207.61	0.19	473.93
MEAN	17.06	0.00	-0.02	207.61	-0.07	207.61	0.19	
HUB	12.51	0.00	-0.02	207.61	-0.07	207.61	0.19	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	66.43	50.47	15.96	475.82	519.21	14.75	519.21	0.46
MEAN	62.19	47.20	14.99	393.48	444.96	14.75	519.21	0.40
HUB	54.27	38.62	15.65	288.54	355.52	14.75	519.21	0.32

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	428.13	325.05	278.64	1131.85	0.38
MEAN	18.04	434.36	330.12	282.30	1128.41	0.38
HUB	15.00	472.08	374.39	287.55	1124.02	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	475.82	316.81	150.77	0.28	6707.27	
MEAN	415.99	295.07	85.87	0.26	5955.26	1.73
HUB	345.97	288.95	28.43	0.26	5616.80	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.42	1.15	15.78	547.66	1.05	532.35	0.92	0.88
MEAN	17.15	1.14	15.48	544.87	1.04	529.12	0.92	0.88
HUB	17.03	1.13	15.08	543.62	1.04	525.01	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	49.40	28.42	24.20	4.22	0.93	0.50	2.90	
MEAN	49.46	16.92	12.70	4.22	0.95	0.45	3.51	0.88
HUB	52.47	-5.65	-9.30	3.65	0.95	0.31	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.959

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	438.318	329.478	289.080	1128.645	0.388	0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.181	15.482	529.339	24.000	48.737	35.400	-13.337

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	305.976	329.478	449.641	1137.382	0.269	0.482

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.133	16.292	537.566	528.796	0.037	0.599

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	285.663	0.000	285.663	1138.444	0.251	0.473

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.311	538.570	0.000	0.060	0.089	0.493

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    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.814      17.042       1.128     545.386      22.576     170.309       1.320

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 140552.750       0.621     730.054  872992.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =14.987   EfDer =  0.963

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     91.914    2643.000      17.042     545.386       1.000       1.000       0.980
W Kg/sec =   41.77924

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.298    2577.529       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  70708.070   72122.078       2.494     590.487     236.759     474.134       2.003

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   273.49    -0.09   273.49     0.24   462.22
 MEAN    18.08     0.00    -0.02   273.49    -0.09   273.49     0.24
 HUB     15.21     0.00    -0.02   273.49    -0.09   273.49     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.02    46.36    13.66   473.98   547.30    16.37   539.14     0.48
 MEAN    56.75    42.30    14.45   416.97   498.73    16.37   539.14     0.44
 HUB     52.07    37.84    14.23   350.81   444.89    16.37   539.14     0.39

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   393.01   270.53   285.08  1153.51     0.34
 MEAN    18.01   393.05   267.55   287.93  1150.78     0.34
 HUB     15.22   417.14   298.70   291.18  1148.02     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   348.50   200.45     0.30  5526.09
 MEAN   415.39   323.67   147.84     0.28  4820.35     1.70
 HUB    351.11   295.86    52.41     0.26  4548.50

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.09     1.12    17.61   565.85     1.04   552.96     0.92     0.88
 MEAN    18.82     1.10    17.36   563.24     1.03   550.34     0.92     0.88
 HUB     18.72     1.10    17.08   562.23     1.03   547.70     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.50    35.11    31.50     3.61     0.93     0.45     2.90
 MEAN    42.90    27.18    23.50     3.68     0.95     0.43     3.30     0.88
 HUB     45.73    10.20     6.50     3.70     0.95     0.42     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.963

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     527.141     268.305     453.751    1140.518       0.462      -0.702

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.859      16.287     540.571      46.000      30.596      30.600       0.004

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     17.960     459.857     268.305     532.406    1146.353       0.401      -0.318

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      18.847      16.867     546.117     345.258       0.018       0.311

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     453.023       0.000     453.023    1146.900       0.395       0.401

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      16.898     546.638       0.000       0.060       0.037      -0.298

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.855      18.819       1.104     563.776      18.391     192.057       1.489

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 114529.867       0.516     594.887  792474.812


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =14.987   EfDer =  0.968

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     91.914    2643.000      18.819     563.776       1.000       1.000       0.680
W Kg/sec =   41.77924

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     74.852    2535.140       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  70708.070   72122.078       1.736     378.495     217.992     293.880       1.348

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   413.73    -0.14   413.73     0.36   444.00
 MEAN    17.74     0.00    -0.02   413.73    -0.14   413.73     0.36
 HUB     15.05     0.00    -0.02   413.73    -0.14   413.73     0.36

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.22    46.36     1.86   462.91   620.96    17.21   549.48     0.54
 MEAN    44.69    43.40     1.29   409.13   581.96    17.21   549.48     0.51
 HUB     40.01    38.84     1.17   347.12   540.15    17.21   549.48     0.47

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   374.04   236.94   289.42  1170.59     0.32
 MEAN    17.51   377.33   239.36   291.70  1168.45     0.32
 HUB     14.85   404.11   276.97   294.26  1166.36     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   363.53   219.97     0.31  4696.56
 MEAN   403.78   334.85   164.42     0.29  4192.82     1.86
 HUB    342.51   301.47    65.54     0.26  4115.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.67     1.10    19.26   581.17     1.03   569.49     0.92     0.89
 MEAN    20.47     1.09    19.04   579.30     1.03   567.41     0.92     0.89
 HUB     20.44     1.09    18.81   579.01     1.03   565.38     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.31    37.24    31.50     5.74     0.93     0.48     2.90
 MEAN    39.37    29.41    23.50     5.91     0.91     0.49     3.28     0.89
 HUB     43.27    12.56     6.50     6.06     0.91     0.51     3.87


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.968

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     381.035     240.926     295.199    1168.754       0.326       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.512      19.055     567.706      46.000      39.220      31.500      -7.720

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     303.828     240.926     387.759    1173.290       0.259       0.353

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.498      19.563     572.121     471.992       0.020       0.437

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     295.536       0.000     295.536    1173.715       0.252       0.339

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.560     572.536       0.000       0.060       0.056       0.351

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.844      20.444       1.086     579.828      16.052     209.389       1.623

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  99994.047       0.479     519.385 1174649.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =14.987   EfDer =  0.988

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     91.914    2643.000      20.444     579.828       1.000       1.000       0.980
W Kg/sec =   41.77924

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     69.877    2499.802       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  70708.070   72122.078       2.522     513.330     203.510     401.059       1.971

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   278.62    -0.10   278.62     0.24   420.14
 MEAN    16.97     0.00    -0.02   278.62    -0.10   278.62     0.24
 HUB     14.32     0.00    -0.02   278.62    -0.10   278.62     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.91    46.36    11.55   444.22   524.45    19.66   573.35     0.45
 MEAN    54.56    43.80    10.76   391.42   480.54    19.66   573.35     0.41
 HUB     49.86    37.84    12.02   330.28   432.18    19.66   573.35     0.37

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   370.20   231.15   289.17  1185.92     0.31
 MEAN    16.57   372.38   231.81   291.43  1183.82     0.31
 HUB     13.89   397.03   266.88   293.96  1181.70     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   354.07   204.31     0.30  4365.88
 MEAN   382.27   327.97   150.46     0.28  3843.64     1.60
 HUB    320.37   298.78    53.49     0.25  3708.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     22.30     1.09    20.84   595.99     1.03   584.55     0.92     0.90
 MEAN    22.07     1.08    20.61   594.06     1.02   582.48     0.92     0.90
 HUB     22.01     1.08    20.35   593.56     1.02   580.40     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.64    35.24    31.50     3.74     0.93     0.40     2.90
 MEAN    38.50    27.31    23.50     3.81     0.94     0.39     3.29     0.90
 HUB     42.24    10.31     6.50     3.81     0.94     0.39     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     369.011     233.115     286.053    1184.519       0.312       0.043

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.111      20.670     583.168      46.000      39.178      32.400      -6.778

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     298.107     233.115     378.431    1188.523       0.251       0.362

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.100      21.152     587.116     456.573       0.017       0.443

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     284.143       0.000     284.143    1189.209       0.239       0.338

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.187     587.795       0.000       0.060       0.052       0.385

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.862      22.047       1.078     594.535      14.707     213.644       1.656

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91638.281       0.483     475.984  805277.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =14.987   EfDer =  0.995

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     91.914    2643.000      22.047     594.535       1.000       1.000       0.980
W Kg/sec =   41.77924

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     65.612    2468.690       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  70708.070   72122.078       2.667     509.668     191.094     390.276       2.042

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   265.98    -0.09   265.98     0.22   394.66
 MEAN    15.91     0.00    -0.02   265.98    -0.09   265.98     0.22
 HUB     13.07     0.00    -0.02   265.98    -0.09   265.98     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.82    47.36    10.46   422.54   499.37    21.29   588.63     0.42
 MEAN    54.08    44.80     9.28   367.03   453.34    21.29   588.63     0.38
 HUB     48.59    38.84     9.75   301.45   402.09    21.29   588.63     0.34

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   351.47   217.04   276.45  1200.09      0.29
MEAN    15.50   350.57   212.75   278.63  1197.92      0.29
HUB     12.59   369.00   239.15   281.02  1195.74      0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.78   339.31   196.74     0.28  3895.38
MEAN   357.44   313.96   144.70     0.26  3298.55     1.60
HUB    290.38   285.65    51.23     0.24  3012.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.79     1.08    22.42   608.95     1.02   598.64     0.92     0.91
MEAN    23.52     1.07    22.16   606.74     1.02   596.49     0.92     0.91
HUB     23.39     1.06    21.89   605.68     1.02   594.32     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.14    35.44    31.50     3.94     0.93     0.39     2.90
MEAN    37.36    27.44    23.50     3.94     0.93     0.38     3.34     0.91
HUB     40.40    10.33     6.50     3.83     0.93     0.36     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     354.738     216.650     280.895    1198.060       0.296      -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.538      22.147     596.622      46.000      37.642      33.000      -4.642

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     295.837     216.650     366.684    1201.267       0.246       0.282

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.527      22.553     599.821     440.827       0.028       0.423

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     14.701     277.736       0.000     277.736    1202.135       0.231       0.354

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.646     600.687       0.000       0.060       0.044       0.347

    STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.874      23.504       1.066     607.126      12.591     233.648       1.811

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   78475.750       0.458     407.616  843443.188

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     525190.75   2727.9253     89.7911      1.5558      0.8378     14.9870      1.1613


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =15.475   EfDer =  0.954

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      90.090    2643.000      15.107     522.810       1.000       1.000       0.980
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W Kg/sec = 40.94990

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
88.009	2632.591	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
69304.477	70690.422	3.244	831.557	256.300	619.754	2.418

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	203.35	-0.07	203.35	0.18	473.93
MEAN	17.06	0.00	-0.02	203.35	-0.07	203.35	0.18	
HUB	12.51	0.00	-0.02	203.35	-0.07	203.35	0.18	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	66.86	50.47	16.39	475.82	517.52	14.76	519.36	0.46
MEAN	62.67	47.20	15.47	393.48	442.98	14.76	519.36	0.40
HUB	54.83	38.62	16.21	288.54	353.05	14.76	519.36	0.32

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	426.68	328.00	272.90	1132.20	0.38
MEAN	18.04	431.85	331.73	276.49	1128.72	0.38
HUB	15.00	467.90	373.68	281.59	1124.33	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	475.82	310.36	147.83	0.27	6768.00	
MEAN	415.99	289.04	84.26	0.26	5984.29	1.76
HUB	345.97	282.95	27.71	0.25	5606.05	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.43	1.15	15.80	547.89	1.05	532.68	0.92	0.87
MEAN	17.15	1.14	15.50	544.98	1.04	529.41	0.92	0.87
HUB	17.02	1.13	15.10	543.58	1.04	525.30	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	50.24	28.44	24.20	4.24	0.93	0.51	2.90	
MEAN	50.19	16.95	12.70	4.25	0.95	0.46	3.51	0.87
HUB	53.00	-5.62	-9.30	3.68	0.95	0.32	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.954

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	435.633	331.086	283.122	1128.958	0.386	0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.181	15.502	529.632	24.000	49.465	35.400	-14.065

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	299.541	331.086	446.478	1137.830	0.263	0.495

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.131	16.324	537.989	528.796	0.039	0.611

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	279.788	0.000	279.788	1138.840	0.246	0.480

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.334	538.945	0.000	0.060	0.094	0.500

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.808      17.035       1.128     545.483      22.673     168.007       1.302

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 141160.359       0.623     718.655  855063.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =15.475   EfDer =  0.959

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     90.090    2643.000      17.035     545.483       1.000       1.000       0.980
W Kg/sec =   40.94990

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     79.721    2577.298       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  69304.477   70690.422       2.543     590.487     232.168     474.134       2.042

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   267.89    -0.09   267.89     0.24   462.18
 MEAN    18.08     0.00    -0.02   267.89    -0.09   267.89     0.24
 HUB     15.21     0.00    -0.02   267.89    -0.09   267.89     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.53    46.36    14.17   473.98   544.53    16.39   539.49     0.48
 MEAN    57.29    42.30    14.99   416.97   495.69    16.39   539.49     0.44
 HUB     52.64    37.84    14.80   350.81   441.48    16.39   539.49     0.39

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   391.61   274.51   279.29  1154.02     0.34
 MEAN    18.01   390.81   270.47   282.10  1151.23     0.34
 HUB     15.22   413.77   299.67   285.32  1148.42     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   341.47   196.47     0.30  5607.31
 MEAN   415.39   317.15   144.92     0.28  4872.78     1.72
 HUB    351.11   289.92    51.44     0.25  4563.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.10     1.12    17.64   566.25     1.04   553.45     0.92     0.88
 MEAN    18.82     1.10    17.38   563.53     1.03   550.78     0.92     0.88
 HUB     18.71     1.10    17.10   562.39     1.03   548.09     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.51    35.13    31.50     3.63     0.93     0.46     2.90
 MEAN    43.79    27.19    23.50     3.69     0.95     0.44     3.30     0.88
 HUB     46.41    10.22     6.50     3.72     0.95     0.43     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.959

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     519.933     271.227     443.583    1141.478       0.455      -0.678

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.862      16.358     541.482      46.000      31.443      30.600      -0.843

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     449.197     271.227     524.730    1147.496       0.391      -0.275

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.650      18.850      16.958     547.207     345.258       0.018       0.323

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     442.587       0.000     442.587    1148.012       0.386       0.417

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      16.986     547.699       0.000       0.060       0.037      -0.256

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.852      18.822       1.105     564.057      18.574     188.674       1.463

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 115670.891       0.521     588.887  775730.938


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =15.475   EfDer =  0.975

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     90.090    2643.000      18.822     564.057       1.000       1.000       0.680
W Kg/sec =   40.94990

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     73.372    2534.508       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  69304.477   70690.422       1.771     378.495     213.683     293.880       1.375

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   404.48    -0.14   404.48     0.35   443.89
 MEAN    17.74     0.00    -0.02   404.48    -0.14   404.48     0.35
 HUB     15.05     0.00    -0.02   404.48    -0.14   404.48     0.35

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.86    46.36     2.50   462.91   614.83    17.28   550.40     0.53
 MEAN    45.34    43.40     1.94   409.13   575.42    17.28   550.40     0.50
 HUB     40.65    38.84     1.81   347.12   533.10    17.28   550.40     0.46

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   372.43   242.05   283.05  1171.36     0.32
 MEAN    17.51   374.93   243.19   285.36  1169.15     0.32
 HUB     14.85   400.67   278.62   287.94  1166.98     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   355.36   214.86     0.30  4797.72
 MEAN   403.78   327.45   160.59     0.28  4259.89     1.89
 HUB    342.51   294.94    63.89     0.25  4139.54

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.73     1.10    19.33   581.82     1.03   570.24     0.92     0.89
 MEAN    20.51     1.09    19.10   579.83     1.03   568.09     0.92     0.89
 HUB     20.46     1.09    18.86   579.39     1.03   565.98     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.53    37.20    31.50     5.70     0.93     0.49     2.90
 MEAN    40.44    29.37    23.50     5.87     0.91     0.49     3.28     0.89
 HUB     44.06    12.51     6.50     6.01     0.91     0.51     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.975

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     378.572     244.786     288.785    1169.446       0.324       0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.555      19.114     568.381      46.000      40.286      31.500      -8.786

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     297.029     244.786     384.898    1174.169       0.253       0.371

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.538      19.643     572.980     471.992       0.021       0.454

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     17.121     289.018       0.000     289.018    1174.570       0.246       0.352

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      19.633     573.372       0.000       0.060       0.062       0.364

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.848      20.479       1.088     580.347      16.290     204.765       1.587

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 101475.180       0.486     516.616 1147585.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =15.475   EfDer =  0.984

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     90.090    2643.000      20.479     580.347       1.000       1.000       0.980
W Kg/sec =   40.94990

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     68.402    2498.685       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  69304.477   70690.422       2.577     513.330     199.214     401.059       2.013

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   272.52    -0.09   272.52     0.23   419.95
 MEAN    16.97     0.00    -0.02   272.52    -0.09   272.52     0.23
 HUB     14.32     0.00    -0.02   272.52    -0.09   272.52     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.48    46.36    12.12   444.22   521.23    19.73   574.15     0.44
 MEAN    55.16    43.80    11.36   391.42   477.02    19.73   574.15     0.41
 HUB     50.48    37.84    12.64   330.28   428.27    19.73   574.15     0.36

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   368.11   235.65   282.80  1186.90     0.31
 MEAN    16.57   369.50   235.12   285.04  1184.73     0.31
 HUB     13.89   393.14   268.07   287.57  1182.55     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   346.26   199.81     0.29  4450.89
 MEAN   382.27   320.78   147.15     0.27  3898.49     1.63
 HUB    320.37   292.28    52.30     0.25  3724.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.37     1.09    20.92   596.82     1.03   585.51     0.92     0.90
 MEAN    22.12     1.08    20.68   594.78     1.02   583.38     0.92     0.90
 HUB     22.05     1.08    20.42   594.14     1.02   581.23     0.92     0.90
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.80    35.24    31.50     3.74     0.93     0.41     2.90
 MEAN    39.52    27.30    23.50     3.80     0.94     0.40     3.29     0.90
 HUB     42.99    10.31     6.50     3.81     0.94     0.40     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.984

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     366.338     236.445     279.816    1185.406       0.309       0.042

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.165      20.743     584.043      46.000      40.198      32.400      -7.798

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     291.437     236.445     375.289    1189.572       0.245       0.379

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.151      21.244     588.156     456.573       0.019       0.459

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     277.879       0.000     277.879    1190.224       0.233       0.351

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.271     588.800       0.000       0.060       0.057       0.396

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      22.094       1.079     595.246      14.899     209.237       1.622

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  92840.422       0.490     472.656  787790.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =15.475   EfDer =  0.992

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     90.090    2643.000      22.094     595.246       1.000       1.000       0.980
W Kg/sec =   40.94990

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     64.209    2467.215       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  69304.477   70690.422       2.725     509.668     187.009     390.276       2.087

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   260.16    -0.09   260.16     0.22   394.43
 MEAN    15.91     0.00    -0.02   260.16    -0.09   260.16     0.22
 HUB     13.07     0.00    -0.02   260.16    -0.09   260.16     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.38    47.36    11.02   422.54   496.29    21.37   589.60     0.42
 MEAN    54.68    44.80     9.88   367.03   449.95    21.37   589.60     0.38
 HUB     49.21    38.84    10.37   301.45   398.26    21.37   589.60     0.33

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     17.94   349.45   221.45   270.33  1201.21     0.29
 MEAN    15.50   347.72   215.99   272.51  1198.99     0.29
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 HUB     12.59   365.10   240.28   274.88  1196.75     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   331.77   192.33     0.28  3974.40
 MEAN   357.44   307.03   141.46     0.26  3348.73     1.62
 HUB    290.38   279.41    50.10     0.23  3026.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.87     1.08    22.51   609.96     1.02   599.76     0.92     0.91
 MEAN    23.59     1.07    22.25   607.64     1.02   597.55     0.92     0.91
 HUB     23.44     1.06    21.97   606.45     1.02   595.32     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.32    35.43    31.50     3.93     0.93     0.41     2.90
 MEAN    38.40    27.43    23.50     3.93     0.94     0.39     3.34     0.91
 HUB     41.16    10.33     6.50     3.83     0.94     0.37     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     351.926     219.949     274.727    1199.114       0.293      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.605      22.234     597.677      46.000      38.681      33.000      -5.681

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     289.189     219.949     363.328    1202.477       0.240       0.300

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.592      22.660     601.034     440.827       0.030       0.439

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     271.563       0.000     271.563    1203.302       0.226       0.368

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.745     601.859       0.000       0.060       0.047       0.361

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      23.567       1.067     608.014      12.767     228.672       1.773

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79578.406       0.465     405.138  825051.438

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    530725.25   2701.9514     88.0087      1.5600      0.8344     15.4747      1.1630


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 70%  Stat 2 35% Ice Block 8-31-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 6.032   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    127.956    2643.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   58.16170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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   125.000    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  98434.109  100402.578       2.284     831.557     364.027     619.754       1.702

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   294.10    -0.10   294.10     0.26   473.93
MEAN    17.06     0.00    -0.02   294.10    -0.10   294.10     0.26
HUB     12.51     0.00    -0.02   294.10    -0.10   294.10     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.29    50.47     7.82   475.82   559.46    14.39   515.59     0.50
MEAN    53.23    47.20     6.03   393.48   491.33    14.39   515.59     0.44
HUB     44.46    38.62     5.84   288.54   412.08    14.39   515.59     0.37

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   477.50   259.69   400.71  1122.55     0.43
MEAN    18.04   499.78   293.38   404.61  1120.33     0.45
HUB     15.00   565.99   387.22   412.80  1116.06     0.51

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    475.82   455.28   216.13     0.41  5359.44
MEAN   415.99   422.78   122.62     0.38  5293.07     1.30
HUB    345.97   414.85    41.25     0.37  5809.61

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.02     1.13    15.02   542.67     1.04   523.62     0.92     0.91
MEAN    16.99     1.12    14.82   542.42     1.04   521.56     0.92     0.91
HUB     17.19     1.14    14.42   544.34     1.04   517.58     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.95    28.34    24.20     4.14     0.93     0.27     2.90
MEAN    35.95    16.86    12.70     4.16     0.93     0.23     3.51     0.91
HUB     43.17    -5.71    -9.30     3.59     0.93     0.10     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     507.765     292.806     414.837    1120.372       0.453      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.042      14.799     521.607      24.000      35.216      35.400       0.184

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     444.762     292.806     532.493    1125.742       0.395       0.230

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.024      15.285     526.619     528.796       0.018       0.382

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     411.343       0.000     411.343    1128.293       0.365       0.298

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.489     529.009       0.000       0.060       0.037       0.318

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      16.980       1.124     543.141      20.331     219.263       1.700

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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 126579.898       0.559     915.286 1236673.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 6.032   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    127.956    2643.000      16.980     543.141       1.000       1.000       0.980
W Kg/sec =   58.16170

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    113.351    2582.848       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 98434.109  100402.578       1.789     590.487     330.107     474.134       1.436

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   392.51    -0.14   392.51     0.35   463.18
 MEAN    18.08     0.00    -0.02   392.51    -0.14   392.51     0.35
 HUB     15.21     0.00    -0.02   392.51    -0.14   392.51     0.35

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.38    46.36     4.02   473.98   615.50    15.62   530.27     0.54
 MEAN    46.74    42.30     4.44   416.97   572.74    15.62   530.28     0.51
 HUB     41.80    37.84     3.96   350.81   526.52    15.62   530.27     0.47

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   450.98   178.97   413.95  1139.62     0.40
 MEAN    18.01   461.75   200.92   415.75  1138.61     0.41
 HUB     15.22   500.40   274.83   418.18  1137.55     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   506.58   292.01     0.44  3657.28
 MEAN   415.39   467.81   214.47     0.41  3620.97     1.32
 HUB    351.11   425.08    76.29     0.37  4185.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.36     1.08    16.48   556.69     1.02   539.70     0.92     0.91
 MEAN    18.35     1.08    16.38   556.55     1.02   538.75     0.92     0.91
 HUB     18.57     1.09    16.26   558.65     1.03   537.73     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.38    35.20    31.50     3.70     0.93     0.23     2.90
 MEAN    25.79    27.29    23.50     3.79     0.92     0.24     3.30     0.91
 HUB     33.31    10.34     6.50     3.84     0.92     0.26     3.92


  blockage3   Cor/U1    Cor/Incid
     0.600       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     866.586     201.482     842.838    1090.961       0.794      -2.066

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.407      12.138     494.583      46.000      13.444      30.600      17.156

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     920.615     201.482     942.405    1082.183       0.851      -2.445

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.600      18.227      11.351     486.536     317.610       0.098       0.004

   VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	930.941	0.000	930.941	1081.256	0.861	-0.556

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.600	10.995	485.039	0.000	0.060	0.283	-2.618

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.551	17.846	1.051	557.296	14.155	280.004	2.171

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
88148.195	0.397	637.390	1141429.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 6.032 EfDer = 0.897

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
127.956	2643.000	17.846	557.296	1.000	1.000	0.630

W Kg/sec = 58.16170

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
109.247	2549.836	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
98434.109	100402.578	1.102	350.665	318.163	271.233	0.852

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	762.83	-0.26	762.83	0.69	446.57
MEAN	17.74	0.00	-0.02	762.83	-0.26	762.83	0.69	
HUB	15.05	0.00	-0.02	762.83	-0.26	762.83	0.69	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	31.26	46.36	-15.10	462.91	892.43	12.98	508.71	0.81
MEAN	28.22	43.40	-15.18	409.13	865.74	12.98	508.71	0.78
HUB	24.48	38.84	-14.36	347.12	838.20	12.98	508.71	0.76

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	459.91	95.40	449.91	1146.89	0.40
MEAN	17.51	467.96	132.99	448.67	1147.94	0.41
HUB	14.85	502.60	227.06	448.39	1149.05	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	577.16	361.51	0.50	1895.10	
MEAN	403.78	524.05	270.79	0.46	2332.81	1.71
HUB	342.51	463.01	115.45	0.40	3375.79	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.50	1.04	16.56	564.31	1.01	546.65	0.92	0.82
MEAN	18.65	1.05	16.63	565.94	1.02	547.65	0.92	0.82
HUB	19.02	1.07	16.67	569.80	1.02	548.71	0.92	0.82

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	11.97	38.78	31.50	7.28	0.93	0.37	2.90	
MEAN	16.51	31.11	23.50	7.61	0.81	0.42	3.28	0.82
HUB	26.86	14.44	6.50	7.94	0.81	0.48	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.897

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	473.735	133.860	454.430	1148.231	0.413	0.000

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.702	16.632	547.944	46.000	16.413	31.500	15.087

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	479.318	133.860	497.659	1147.765	0.418	-0.048

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.629	16.520	547.500	471.992	0.045	0.110

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	466.704	0.000	466.704	1148.809	0.406	-0.054

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.519	548.496	0.000	0.060	0.101	-0.048

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.625	18.510	1.037	566.683	9.387	409.286	3.173

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
58465.961	0.280	422.761	2095677.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.032 EfDer = 0.916

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
127.956	2643.000	18.510	566.683	1.000	1.000	0.980

W Kg/sec = 58.16170

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
106.211	2528.630	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
98434.109	100402.578	1.659	513.330	309.328	401.059	1.297

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	437.10	-0.15	437.10	0.38	424.99
MEAN	16.97	0.00	-0.02	437.10	-0.15	437.10	0.38	
HUB	14.32	0.00	-0.02	437.10	-0.15	437.10	0.38	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.47	46.36	-0.89	444.22	623.32	16.76	550.73	0.54
MEAN	41.86	43.80	-1.94	391.42	586.84	16.76	550.73	0.51
HUB	37.09	37.84	-0.75	330.28	547.94	16.76	550.73	0.48

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	477.50	102.53	466.36	1155.41	0.41
MEAN	16.57	485.74	138.55	465.56	1156.11	0.42
HUB	13.89	520.82	232.50	466.05	1156.64	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	573.00	332.93	0.50	1938.70	
MEAN	382.27	525.49	243.72	0.45	2298.84	1.19
HUB	320.37	474.26	87.87	0.41	3231.53	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.21	1.04	17.07	573.86	1.01	554.83	0.92	0.84
MEAN	19.34	1.04	17.12	575.20	1.02	555.50	0.92	0.84
HUB	19.68	1.06	17.12	578.65	1.02	556.00	0.92	0.84

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	12.40	35.52	31.50	4.02	0.93	0.11	2.90	

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 MEAN    16.57    27.63    23.50     4.13     0.89     0.14     3.29     0.84
 HUB     26.51    10.68     6.50     4.18     0.89     0.19     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.916

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     476.642     139.328     455.824    1157.581       0.412       0.054

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.384      17.246     556.936      46.000      16.996      32.400      15.404

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     486.627     139.328     506.180    1156.746       0.421      -0.008

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.302      17.087     556.133     456.573       0.046       0.126

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     463.452       0.000     463.452    1158.656       0.400      -0.035

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.166     557.971       0.000       0.060       0.103       0.026

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.619       19.169       1.036     575.902       9.219     379.904       2.945

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  57430.973       0.303     415.277 1190505.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.032   EfDer =  0.865

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    127.956     2643.000       19.169     575.902       1.000        1.000        0.980
W Kg/sec =   58.16170

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    103.395     2508.308        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  98434.109  100402.578        1.693     509.668     301.131     390.276       1.296

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1       Stator    Alfa     C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   430.64    -0.15   430.64      0.37   401.00
 MEAN    15.91      0.00    -0.02   430.64    -0.15   430.64      0.37
 HUB     13.07      0.00    -0.02   430.64    -0.15   430.64      0.37

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     44.47     47.36    -2.89   422.54   603.43     17.43   560.42      0.52
 MEAN    40.45     44.80    -4.35   367.03   565.93     17.43   560.42      0.49
 HUB     35.01     38.84    -3.83   301.45   525.75     17.43   560.42      0.45

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   468.25     81.40   461.12  1163.87      0.40
 MEAN    15.50   474.40    114.33   460.42  1164.56      0.41
 HUB     12.59   503.68    202.82   461.03  1165.08      0.43

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
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 TIP    413.78   568.42   332.38     0.49  1463.04
 MEAN   357.44   520.66   243.11     0.45  1774.24     1.16
 HUB    290.38   469.27    87.56     0.40  2555.48

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.67     1.03    17.59   581.32     1.01   563.02     0.92     0.79
 MEAN    19.78     1.03    17.64   582.47     1.01   563.69     0.92     0.79
 HUB     20.05     1.05    17.63   585.36     1.02   564.19     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     10.01    35.78    31.50     4.28     0.93     0.08     2.90
 MEAN    13.95    27.84    23.50     4.34     0.88     0.11     3.34     0.79
 HUB     23.75    10.75     6.50     4.25     0.88     0.15     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.865

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     479.121     116.429     464.760    1164.750       0.411      -0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.790      17.612     563.890      46.000      14.064      33.000      18.936

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     505.762     116.429     518.990    1162.486       0.435      -0.192

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.589      17.198     561.700     440.827       0.111       0.099

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     470.917       0.000     470.917    1165.422       0.404      -0.062

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.474     564.541       0.000       0.060       0.126      -0.067

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.464      19.557       1.020     583.052       7.149     454.649       3.524

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   44541.230       0.260     322.073 1255090.250

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     375166.25   2712.7878    125.0000      1.2945      0.6667      6.0315      1.1152


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 70%  Stat 2 35% Ice Block 8-31-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 6.474   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     126.046    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   57.29363

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     123.134    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 96964.961   98904.055       2.319     831.557     358.594     619.754       1.728

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   289.39    -0.10   289.39     0.26   473.93
MEAN    17.06     0.00    -0.02   289.39    -0.10   289.39     0.26
HUB     12.51     0.00    -0.02   289.39    -0.10   289.39     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.70    50.47     8.23   475.82   557.00    14.41   515.82     0.50
MEAN    53.67    47.20     6.47   393.48   488.52    14.41   515.82     0.44
HUB     44.93    38.62     6.31   288.54   408.73    14.41   515.82     0.37

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   473.73   263.53   393.67  1123.18     0.42
MEAN    18.04   495.44   295.55   397.63  1120.87     0.44
HUB     15.00   560.34   386.57   405.65  1116.59     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    475.82   447.26   212.29     0.40  5438.73
MEAN   415.99   415.47   120.45     0.37  5332.19     1.32
HUB    345.97   407.67    40.60     0.37  5799.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.05     1.13    15.08   542.96     1.04   524.22     0.92     0.91
MEAN    17.01     1.13    14.87   542.57     1.04   522.07     0.92     0.91
HUB     17.18     1.14    14.46   544.30     1.04   518.07     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.80    28.34    24.20     4.14     0.93     0.28     2.90
MEAN    36.62    16.85    12.70     4.15     0.93     0.24     3.51     0.91
HUB     43.62    -5.72    -9.30     3.58     0.93     0.11     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     503.162     294.973     407.631    1120.933       0.449      -0.008

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.057      14.851     522.130      24.000      35.891      35.400      -0.491

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     436.592     294.973     526.898    1126.528       0.388       0.244

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.039      15.360     527.355     528.796       0.018       0.393

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     403.975       0.000     403.975    1128.971       0.358       0.309

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.554     529.645       0.000       0.060       0.037       0.329

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.878      16.996       1.125     543.275      20.465     216.431       1.678

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 127414.367       0.563     907.569 1216867.750
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 6.474   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    126.046    2643.000      16.996     543.275       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    111.572    2582.530       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 96964.961   98904.055       1.817     590.487     324.924     474.134       1.459

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   385.57    -0.13   385.57     0.34   463.12
MEAN    18.08     0.00    -0.02   385.57    -0.13   385.57     0.34
HUB     15.21     0.00    -0.02   385.57    -0.13   385.57     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.88    46.36     4.52   473.98   611.10    15.68   530.86     0.54
MEAN    47.25    42.30     4.95   416.97   568.01    15.68   530.86     0.50
HUB     42.31    37.84     4.47   350.81   521.37    15.68   530.86     0.46

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   446.06   184.68   406.03  1140.61     0.39
MEAN    18.01   456.63   205.03   408.01  1139.46     0.40
HUB     15.22   494.91   276.34   410.57  1138.26     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    470.98   496.82   286.29     0.44  3773.95
MEAN   415.39   459.05   210.36     0.40  3695.02     1.34
HUB    351.11   417.33    74.77     0.37  4208.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.43     1.08    16.58   557.25     1.03   540.64     0.92     0.91
MEAN    18.40     1.08    16.47   556.96     1.03   539.55     0.92     0.91
HUB     18.60     1.09    16.33   558.86     1.03   538.41     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     24.46    35.19    31.50     3.69     0.93     0.24     2.90
MEAN    26.68    27.27    23.50     3.77     0.92     0.25     3.30     0.91
HUB     33.94    10.32     6.50     3.82     0.92     0.27     3.92


  blockage3   Cor/U1    Cor/Incid
     0.600       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     836.897     205.608     811.247    1096.029       0.764      -1.950

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.455      12.539     499.203      46.000      14.222      30.600      16.378

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
    17.960     871.211     205.608     895.144    1090.684       0.799      -2.209

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.600      18.294      12.010     494.312     317.610       0.090       0.039

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
    17.823     873.155       0.000     873.155    1090.750       0.801      -0.371
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.600	11.791	494.068	0.000	0.060	0.240	-2.318

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.619	17.990	1.059	557.694	14.419	273.700	2.122

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
89791.922	0.405	639.585	1121797.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 6.474 EfDer = 0.840

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
126.046	2643.000	17.990	557.694	1.000	1.000	0.630

W Kg/sec = 57.29363

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
106.794	2548.927	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96964.961	98904.055	1.127	350.665	311.018	271.233	0.872

ROTOR LEADING EDGE CONDITIONS, STAGE 3

R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP 20.07	0.00	-0.02	731.99	-0.25	731.99	0.66	446.42
MEAN 17.74	0.00	-0.02	731.99	-0.25	731.99	0.66	
HUB 15.05	0.00	-0.02	731.99	-0.25	731.99	0.66	

BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP 32.32	46.36	-14.04	462.91	866.21	13.44	512.96	0.78
MEAN 29.22	43.40	-14.18	409.13	838.69	13.44	512.96	0.75
HUB 25.39	38.84	-13.45	347.12	810.23	13.44	512.96	0.73

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

R2	C2	Cu2	Cm2	Ao2	Mach2
TIP 19.81	451.12	105.63	438.58	1148.80	0.39
MEAN 17.51	460.04	140.47	438.07	1149.51	0.40
HUB 14.85	495.71	230.58	438.82	1150.27	0.43

U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP 456.91	561.92	351.28	0.49	2097.57	
MEAN 403.78	511.12	263.31	0.44	2463.61	1.70
HUB 342.51	452.87	111.92	0.39	3427.98	

Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP 18.67	1.04	16.79	565.46	1.01	548.47	0.92	0.77
MEAN 18.79	1.04	16.83	566.82	1.02	549.15	0.92	0.77
HUB 19.11	1.06	16.82	570.39	1.02	549.87	0.92	0.77

Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP 13.54	38.69	31.50	7.19	0.93	0.37	2.90	
MEAN 17.78	31.01	23.50	7.51	0.82	0.42	3.28	0.77
HUB 27.72	14.31	6.50	7.81	0.82	0.48	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.840

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	465.759	141.391	443.780	1149.805	0.405	-0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.838	16.823	549.443	46.000	17.672	31.500	13.828

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	467.068	141.391	488.000	1149.698	0.406	-0.026

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.776	16.757	549.341	471.992	0.040	0.126

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	454.558	0.000	454.558	1150.705	0.395	-0.029

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.763	550.304	0.000	0.060	0.093	-0.023

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.603	18.669	1.038	567.556	9.863	386.329	2.995

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
61429.949	0.294	437.564	2024634.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.474 EfDer = 0.929

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
126.046	2643.000	18.669	567.557	1.000	1.000	0.980

W Kg/sec = 57.29363

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
103.819	2526.683	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
96964.961	98904.055	1.698	513.330	302.360	401.059	1.326

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	425.99	-0.15	425.99	0.37	424.66
MEAN	16.97	0.00	-0.02	425.99	-0.15	425.99	0.37	
HUB	14.32	0.00	-0.02	425.99	-0.15	425.99	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.21	46.36	-0.15	444.22	615.58	16.99	552.41	0.53
MEAN	42.59	43.80	-1.21	391.42	578.62	16.99	552.41	0.50
HUB	37.80	37.84	-0.04	330.28	539.13	16.99	552.41	0.47

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	466.78	112.17	453.11	1157.89	0.40
MEAN	16.57	475.54	145.46	452.74	1158.30	0.41
HUB	13.89	510.78	235.05	453.48	1158.58	0.44

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	556.62	323.29	0.48	2120.52	
MEAN	382.27	510.94	236.81	0.44	2413.30	1.21
HUB	320.37	461.44	85.32	0.40	3266.94	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.45	1.04	17.38	575.41	1.01	557.22	0.92	0.85
MEAN	19.56	1.05	17.41	576.49	1.02	557.61	0.92	0.85
HUB	19.88	1.06	17.39	579.65	1.02	557.87	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	13.90	35.51	31.50	4.01	0.93	0.13	2.90	
MEAN	17.81	27.61	23.50	4.11	0.90	0.15	3.29	0.85
HUB	27.40	10.65	6.50	4.15	0.90	0.20	3.90	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.929

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     466.860     146.276     443.353    1159.714       0.403       0.054

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.604      17.531     558.989      46.000      18.259      32.400      14.141

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     472.154     146.276     494.293    1159.283       0.407       0.013

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.535      17.424     558.574     456.573       0.041       0.143

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     449.554       0.000     449.554    1161.087       0.387      -0.011

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.505     560.313       0.000       0.060       0.095       0.049

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.666      19.415       1.040     577.185       9.629     363.021       2.814

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  59981.547       0.316     427.247 1167047.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.474   EfDer =  0.883

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    126.046    2643.000      19.415     577.185       1.000       1.000       0.980
W Kg/sec =   57.29363

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    100.674    2505.519       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  96964.961   98904.055       1.738     509.668     293.206     390.276       1.331

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   418.06    -0.14   418.06     0.36   400.55
 MEAN    15.91     0.00    -0.02   418.06    -0.14   418.06     0.36
 HUB     13.07     0.00    -0.02   418.06    -0.14   418.06     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.32    47.36    -2.04   422.54   594.51    17.76   562.60     0.51
 MEAN    41.29    44.80    -3.51   367.03   556.41    17.76   562.60     0.48
 HUB     35.81    38.84    -3.03   301.45   515.49    17.76   562.60     0.44

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   455.66    92.37   446.20  1166.94     0.39
 MEAN    15.50   462.38   122.21   445.94  1167.31     0.40
 HUB     12.59   491.87   205.70   446.79  1167.55     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   549.91   321.41     0.47  1659.74
 MEAN   357.44   504.18   235.24     0.43  1896.19     1.18
 HUB    290.38   454.74    84.68     0.39  2591.70
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    20.00     1.03    18.01   583.33     1.01   566.00     0.92     0.81
 MEAN   20.09     1.03    18.03   584.21     1.01   566.36     0.92     0.81
 HUB    20.34     1.05    18.00   586.78     1.02   566.59     0.92     0.81

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    11.70    35.77    31.50     4.27     0.93     0.10     2.90
 MEAN   15.33    27.81    23.50     4.31     0.89     0.13     3.34     0.81
 HUB    24.72    10.73     6.50     4.23     0.89     0.17     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.883

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     466.925     124.447     450.036    1167.520       0.400      -0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.102      18.002     566.574      46.000      15.458      33.000      17.542

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     487.792     124.447     503.416    1165.806       0.418      -0.162

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.930      17.666     564.911     440.827       0.100       0.116

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     454.750       0.000     454.750    1168.485       0.389      -0.039

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.919     567.511       0.000       0.060       0.117      -0.043

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.534      19.894       1.025     584.772       7.587     428.418       3.321

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  47270.043       0.276     336.703 1229262.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     385887.78   2748.6685    123.1343      1.3169      0.6929      6.4740      1.1185

*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70%  Stat 2 35% Ice Block 8-31-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     123.994    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   56.36100

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     121.130    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   95386.555   97294.086       2.357     831.557     352.757     619.754       1.757

      ROTOR LEADING EDGE CONDITIONS, STAGE            1
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   284.35    -0.10   284.35     0.26   473.93
MEAN    17.06     0.00    -0.02   284.35    -0.10   284.35     0.26
HUB     12.51     0.00    -0.02   284.35    -0.10   284.35     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.14    50.47     8.67   475.82   554.39    14.44   516.06     0.50
MEAN    54.15    47.20     6.95   393.48   485.55    14.44   516.06     0.44
HUB     45.43    38.62     6.81   288.54   405.17    14.44   516.06     0.36

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   469.86   267.63   386.19  1123.84     0.42
MEAN    18.04   490.89   297.85   390.21  1121.44     0.44
HUB     15.00   554.36   385.84   398.05  1117.14     0.50

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    475.82   438.73   208.19     0.39  5523.20
MEAN   415.99   407.70   118.14     0.36  5373.71     1.33
HUB    345.97   400.05    39.87     0.36  5788.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.08     1.13    15.14   543.27     1.04   524.83     0.92     0.91
MEAN    17.02     1.13    14.92   542.72     1.04   522.59     0.92     0.91
HUB     17.18     1.14    14.51   544.26     1.04   518.59     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.72    28.33    24.20     4.13     0.93     0.29     2.90
MEAN    37.35    16.84    12.70     4.14     0.93     0.25     3.51     0.91
HUB     44.11    -5.72    -9.30     3.58     0.93     0.12     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     498.350     297.272     399.978    1121.518       0.444       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.071      14.904     522.674      24.000      36.621      35.400      -1.221

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     427.953     297.272     521.071    1127.346       0.380       0.259

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.054      15.438     528.121     528.796       0.018       0.404

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     396.182       0.000     396.182    1129.678       0.351       0.321

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.622     530.308       0.000       0.060       0.037       0.341

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4        Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.878       17.011       1.126     543.417      20.607     213.427       1.654

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 128299.383       0.567     898.997 1195665.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
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    123.994    2643.000      17.011     543.417       1.000       1.000       0.980
W Kg/sec =   56.36100

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    109.675    2582.192       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 95386.555   97294.086       1.849     590.487     319.400     474.134       1.484

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   378.23    -0.13   378.23     0.33   463.06
MEAN    18.08     0.00    -0.02   378.23    -0.13   378.23     0.33
HUB     15.21     0.00    -0.02   378.23    -0.13   378.23     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.42    46.36     5.06   473.98   606.49    15.74   531.47     0.54
MEAN    47.80    42.30     5.50   416.97   563.05    15.74   531.47     0.50
HUB     42.86    37.84     5.02   350.81   515.96    15.74   531.47     0.46

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   441.06   190.67   397.72  1141.62     0.39
MEAN    18.01   451.35   209.35   399.86  1140.33     0.40
HUB     15.22   489.17   277.90   402.56  1139.00     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    470.98   486.57   280.30     0.43  3896.23
MEAN   415.39   449.83   206.04     0.39  3772.74     1.35
HUB    351.11   409.17    73.21     0.36  4232.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.49     1.09    16.68   557.85     1.03   541.60     0.92     0.91
MEAN    18.45     1.08    16.56   557.39     1.03   540.38     0.92     0.91
HUB     18.63     1.09    16.41   559.09     1.03   539.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.61    35.18    31.50     3.68     0.93     0.25     2.90
MEAN    27.63    27.26    23.50     3.76     0.92     0.26     3.30     0.91
HUB     34.62    10.31     6.50     3.81     0.92     0.28     3.92


  blockage3   Cor/U1    Cor/Incid
     0.600       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     809.267     209.938     781.562    1100.642       0.735      -1.846

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.502      12.912     503.419      46.000      15.035      30.600      15.565

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     829.719     209.938     855.867    1097.589       0.756      -2.017

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.600      18.360      12.566     500.620     317.610       0.082       0.065

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     826.813       0.000     826.813    1098.206       0.753      -0.242

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.600      12.434     501.039       0.000       0.060       0.207      -2.084

   STAGE EXIT CONDITIONS, STAGE            2
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Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.672	18.114	1.065	558.112	14.695	267.252	2.072

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
91511.305	0.413	641.222	1100887.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
RESET = 0.000BLEED = 0.000 DPInc = 6.953 EfDer = 0.803

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
123.994	2643.000	18.114	558.112	1.000	1.000	0.630

W Kg/sec = 56.36100

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
104.378	2547.972	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
95386.555	97294.086	1.154	350.665	303.982	271.233	0.892

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	704.12	-0.24	704.12	0.63	446.25
MEAN	17.74	0.00	-0.02	704.12	-0.24	704.12	0.63	
HUB	15.05	0.00	-0.02	704.12	-0.24	704.12	0.63	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	33.34	46.36	-13.02	462.91	842.78	13.84	516.72	0.76
MEAN	30.17	43.40	-13.23	409.13	814.47	13.84	516.72	0.73
HUB	26.26	38.84	-12.58	347.12	785.14	13.84	516.72	0.70

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	442.74	115.53	427.40	1150.65	0.38
MEAN	17.51	452.24	147.82	427.40	1151.06	0.39
HUB	14.85	488.52	234.04	428.81	1151.52	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	547.00	341.37	0.48	2293.59	
MEAN	403.78	498.18	255.96	0.43	2592.14	1.70
HUB	342.51	442.31	108.47	0.38	3479.19	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.83	1.04	17.00	566.61	1.02	550.24	0.92	0.73
MEAN	18.92	1.04	17.01	567.71	1.02	550.64	0.92	0.73
HUB	19.21	1.06	16.97	571.00	1.02	551.07	0.92	0.73

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	15.13	38.62	31.50	7.12	0.93	0.37	2.90	
MEAN	19.08	30.92	23.50	7.42	0.83	0.42	3.28	0.73
HUB	28.63	14.20	6.50	7.70	0.83	0.47	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.803

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	457.852	148.791	433.000	1151.367	0.398	-0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.968	17.007	550.935	46.000	18.964	31.500	12.536

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	454.771	148.791	478.493	1151.612	0.395	-0.004

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.916	16.986	551.170	471.992	0.036	0.143

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	442.385	0.000	442.385	1152.581	0.384	-0.004

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.999	552.098	0.000	0.060	0.084	0.003

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.595	18.820	1.039	568.438	10.326	366.064	2.838

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
64319.375	0.308	450.687	1958361.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.953 EfDer = 0.943

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
123.994	2643.000	18.820	568.438	1.000	1.000	0.980

W Kg/sec = 56.36100

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
101.389	2524.722	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
95386.555	97294.086	1.738	513.330	295.282	401.059	1.358

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	414.84	-0.14	414.84	0.36	424.33
MEAN	16.97	0.00	-0.02	414.84	-0.14	414.84	0.36	
HUB	14.32	0.00	-0.02	414.84	-0.14	414.84	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.97	46.36	0.61	444.22	607.91	17.21	554.07	0.53
MEAN	43.35	43.80	-0.45	391.42	570.45	17.21	554.07	0.49
HUB	38.54	37.84	0.70	330.28	530.35	17.21	554.07	0.46

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	456.46	121.77	439.92	1160.32	0.39
MEAN	16.57	465.59	152.35	439.96	1160.46	0.40
HUB	13.89	500.88	237.61	440.94	1160.49	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	540.31	313.69	0.47	2301.68	
MEAN	382.27	496.41	229.92	0.43	2527.38	1.23
HUB	320.37	448.64	82.76	0.39	3302.41	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.68	1.05	17.69	576.96	1.01	559.57	0.92	0.86
MEAN	19.77	1.05	17.69	577.80	1.02	559.70	0.92	0.86
HUB	20.07	1.07	17.65	580.67	1.02	559.72	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	15.47	35.49	31.50	3.99	0.93	0.15	2.90	
MEAN	19.10	27.59	23.50	4.09	0.90	0.17	3.29	0.86
HUB	28.32	10.63	6.50	4.13	0.90	0.21	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.943

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     457.331     153.202     430.907    1161.813       0.394       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.818      17.808     561.014      46.000      19.572      32.400      12.828

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     457.833     153.202     482.785    1161.773       0.394       0.035

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.761      17.752     560.976     456.573       0.036       0.160

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     435.806       0.000     435.806    1163.474       0.375       0.013

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.837     562.619       0.000       0.060       0.086       0.074

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.708      19.653       1.044     578.475      10.037     347.253       2.692

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  62524.223       0.330     438.109 1142574.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.901

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    123.994    2643.000      19.653     578.475       1.000       1.000       0.980
W Kg/sec =   56.36100

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.942    2502.724       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  95386.555   97294.086       1.787     509.668     285.250     390.276       1.368

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   405.57    -0.14   405.57     0.35   400.10
 MEAN    15.91     0.00    -0.02   405.57    -0.14   405.57     0.35
 HUB     13.07     0.00    -0.02   405.57    -0.14   405.57     0.35

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.18    47.36    -1.18   422.54   585.79    18.07   564.74     0.50
 MEAN    42.15    44.80    -2.65   367.03   547.08    18.07   564.74     0.47
 HUB     36.64    38.84    -2.20   301.45   505.42    18.07   564.74     0.43

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   443.68   103.17   431.52  1169.93     0.38
 MEAN    15.50   450.78   129.94   431.65  1170.00     0.39
 HUB     12.59   480.36   208.57   432.72  1169.97     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   531.68   310.61     0.45  1853.36
 MEAN   357.44   487.93   227.50     0.42  2016.06     1.20
 HUB    290.38   440.38    81.81     0.38  2627.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.33     1.03    18.41   585.34     1.01   568.91     0.92     0.82
 MEAN    20.39     1.04    18.41   585.94     1.01   568.98     0.92     0.82
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 HUB     20.62     1.05    18.36   588.20     1.02   568.94     0.92     0.82

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     13.45    35.75    31.50     4.25     0.93     0.12     2.90
 MEAN    16.75    27.79    23.50     4.29     0.89     0.14     3.34     0.82
 HUB     25.73    10.71     6.50     4.21     0.89     0.18     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.901

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     455.182     132.328     435.523    1170.223       0.389      -0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.408      18.384     569.199      46.000      16.901      33.000      16.099

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     470.320     132.328     488.581    1169.020       0.402      -0.130

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.264      18.123     568.029     440.827       0.090       0.134

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     438.916       0.000     438.916    1171.470       0.375      -0.013

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.357     570.413       0.000       0.060       0.108      -0.017

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.597      20.227       1.029     586.493       8.018     404.829       3.138

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  49957.570       0.292     350.054 1202510.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    396611.84   2779.0691    121.1299      1.3389      0.7165      6.9532      1.1218


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 70%  Stat 2 35% Ice Block 8-31-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 7.494   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    2643.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    118.889    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       2.402     831.557     346.230     619.754       1.790

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   278.73    -0.10   278.73     0.25   473.93
 MEAN    17.06     0.00    -0.02   278.73    -0.10   278.73     0.25
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 HUB     12.51     0.00    -0.02   278.73    -0.10   278.73     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.64    50.47     9.17   475.82   551.53    14.46   516.32     0.49
 MEAN    54.69    47.20     7.49   393.48   482.28    14.46   516.32     0.43
 HUB     46.00    38.62     7.38   288.54   401.25    14.46   516.32     0.36

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   465.72   272.13   377.94  1124.55     0.41
 MEAN    18.04   485.98   300.41   382.01  1122.05     0.43
 HUB     15.00   547.82   385.06   389.66  1117.74     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    475.82   429.34   203.70     0.38  5615.93
 MEAN   415.99   399.11   115.58     0.36  5419.83     1.36
 HUB    345.97   391.62    39.09     0.35  5777.09

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.11     1.13    15.20   543.62     1.04   525.50     0.92     0.91
 MEAN    17.04     1.13    14.98   542.89     1.04   523.17     0.92     0.91
 HUB     17.17     1.14    14.57   544.21     1.04   519.15     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.75    28.32    24.20     4.12     0.93     0.31     2.90
 MEAN    38.18    16.83    12.70     4.13     0.93     0.26     3.51     0.91
 HUB     44.66    -5.73    -9.30     3.57     0.93     0.13     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     493.141     299.826     391.526    1122.149       0.439      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.086      14.961     523.263      24.000      37.444      35.400      -2.044

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     418.454     299.826     514.781    1128.230       0.371       0.275

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.069      15.520     528.949     528.796       0.018       0.417

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     387.609       0.000     387.609    1130.442       0.343       0.334

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.693     531.026       0.000       0.060       0.038       0.354

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      17.025       1.127     543.574      20.764     210.109       1.629

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 129276.734       0.571     889.085 1172050.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.494   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    2643.000      17.025     543.574       1.000       1.000       0.980
W Kg/sec =   55.31819
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
107.571	2581.819	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
93621.680	95493.914	1.885	590.487	313.271	474.134	1.513

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	370.14	-0.13	370.14	0.33	462.99
MEAN	18.08	0.00	-0.02	370.14	-0.13	370.14	0.33	
HUB	15.21	0.00	-0.02	370.14	-0.13	370.14	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.02	46.36	5.66	473.98	601.48	15.81	532.13	0.53
MEAN	48.41	42.30	6.11	416.97	557.65	15.81	532.13	0.49
HUB	43.47	37.84	5.63	350.81	510.06	15.81	532.13	0.45

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	435.81	197.22	388.64	1142.71	0.38
MEAN	18.01	445.73	214.09	390.95	1141.27	0.39
HUB	15.22	482.98	279.64	393.79	1139.80	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	475.38	273.76	0.42	4029.75	
MEAN	415.39	439.73	201.30	0.39	3858.02	1.37
HUB	351.11	400.22	71.47	0.35	4258.89	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.56	1.09	16.79	558.50	1.03	542.64	0.92	0.91
MEAN	18.50	1.09	16.65	557.86	1.03	541.27	0.92	0.91
HUB	18.65	1.10	16.48	559.35	1.03	539.87	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	26.91	35.16	31.50	3.66	0.93	0.27	2.90	
MEAN	28.71	27.24	23.50	3.74	0.93	0.27	3.30	0.91
HUB	35.38	10.29	6.50	3.79	0.93	0.29	3.92	

blockage3	Cor/U1	Cor/Incid
0.600	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	782.087	214.689	752.043	1105.081	0.708	-1.745

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.552	13.277	507.490	46.000	15.933	30.600	14.667

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	791.342	214.689	819.948	1103.760	0.717	-1.845

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.600	18.427	13.078	506.275	317.610	0.075	0.088

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	785.331	0.000	785.331	1104.702	0.711	-0.139

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.600	13.009	507.073	0.000	0.060	0.177	-1.881

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.717	18.229	1.071	558.572	14.997	260.366	2.018

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
93397.547	0.421	642.330	1077719.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 7.494 EfDer = 0.779

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
121.700	2643.000	18.229	558.572	1.000	1.000	0.630

W Kg/sec = 55.31819

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
101.844	2546.923	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
93621.680	95493.914	1.182	350.665	296.600	271.233	0.914

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	676.93	-0.23	676.93	0.60	446.06
MEAN	17.74	0.00	-0.02	676.93	-0.23	676.93	0.60	
HUB	15.05	0.00	-0.02	676.93	-0.23	676.93	0.60	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	34.38	46.36	-11.98	462.91	820.20	14.23	520.31	0.73
MEAN	31.16	43.40	-12.24	409.13	791.08	14.23	520.31	0.71
HUB	27.16	38.84	-11.68	347.12	760.85	14.23	520.31	0.68

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	434.25	125.85	415.62	1152.57	0.38
MEAN	17.51	444.11	155.50	416.00	1152.70	0.39
HUB	14.85	480.68	237.60	417.85	1152.87	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	531.36	331.06	0.46	2497.68	
MEAN	403.78	484.46	248.28	0.42	2726.33	1.70
HUB	342.51	430.82	104.91	0.37	3531.83	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.99	1.04	17.22	567.82	1.02	552.08	0.92	0.71
MEAN	19.06	1.05	17.20	568.67	1.02	552.20	0.92	0.71
HUB	19.31	1.06	17.13	571.65	1.02	552.36	0.92	0.71

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	16.85	38.54	31.50	7.04	0.93	0.38	2.90	
MEAN	20.50	30.83	23.50	7.33	0.83	0.42	3.28	0.71
HUB	29.62	14.09	6.50	7.59	0.83	0.47	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.779

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	449.585	156.516	421.461	1153.007	0.390	-0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.102	17.198	552.503	46.000	20.373	31.500	11.127

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	441.711	156.516	468.622	1153.618	0.383	0.021

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.060	17.224	553.089	471.992	0.031	0.162

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	429.484	0.000	429.484	1154.545	0.372	0.024

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.244	553.979	0.000	0.060	0.075	0.031

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.598	18.975	1.041	569.381	10.809	346.841	2.689

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
67325.188	0.322	463.021	1891963.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 7.494 EfDer = 0.956

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
121.700	2643.000	18.975	569.381	1.000	1.000	0.980

W Kg/sec = 55.31819

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
98.779	2522.632	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
93621.680	95493.914	1.784	513.330	287.681	401.059	1.394

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	402.99	-0.14	402.99	0.35	423.98
MEAN	16.97	0.00	-0.02	402.99	-0.14	402.99	0.35	
HUB	14.32	0.00	-0.02	402.99	-0.14	402.99	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.80	46.36	1.44	444.22	599.88	17.44	555.82	0.52
MEAN	44.18	43.80	0.38	391.42	561.89	17.44	555.82	0.49
HUB	39.35	37.84	1.51	330.28	521.13	17.44	555.82	0.45

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	445.99	131.87	426.05	1162.85	0.38
MEAN	16.57	455.38	159.64	426.48	1162.71	0.39
HUB	13.89	490.58	240.30	427.70	1162.49	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	523.15	303.59	0.45	2492.42	
MEAN	382.27	481.09	222.63	0.41	2648.21	1.25
HUB	320.37	435.13	80.07	0.37	3339.72	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.93	1.05	18.00	578.61	1.02	562.00	0.92	0.87
MEAN	19.99	1.05	17.98	579.19	1.02	561.87	0.92	0.87
HUB	20.26	1.07	17.92	581.75	1.02	561.66	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	17.20	35.47	31.50	3.97	0.93	0.17	2.90	
MEAN	20.52	27.57	23.50	4.07	0.90	0.19	3.29	0.87
HUB	29.33	10.60	6.50	4.10	0.90	0.22	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.956

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	447.567	160.538	417.785	1163.996	0.385	0.054

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.040      18.095     563.125      46.000      21.020      32.400      11.380

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     442.857     160.538     471.057    1164.358       0.380       0.059

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.995      18.093     563.475     456.573       0.032       0.179

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     421.438       0.000     421.438    1165.954       0.361       0.041

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.181     565.020       0.000       0.060       0.077       0.101

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.748      19.901       1.049     579.848      10.467     331.643       2.571

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  65206.590       0.344     448.450 1115882.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.494   EfDer =  0.920

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    121.700    2643.000      19.901     579.848       1.000       1.000       0.980
W Kg/sec =   55.31819

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.047    2499.760       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  93621.680   95493.914       1.841     509.668     276.817     390.276       1.410

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   392.49    -0.14   392.49     0.34   399.63
 MEAN    15.91     0.00    -0.02   392.49    -0.14   392.49     0.34
 HUB     13.07     0.00    -0.02   392.49    -0.14   392.49     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.12    47.36    -0.24   422.54   576.80    18.40   566.99     0.49
 MEAN    43.09    44.80    -1.71   367.03   537.45    18.40   566.99     0.46
 HUB     37.54    38.84    -1.30   301.45   494.98    18.40   566.99     0.42

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   431.69   114.39   416.26  1173.00     0.37
 MEAN    15.50   439.03   138.03   416.77  1172.78     0.37
 HUB     12.59   468.54   211.58   418.05  1172.48     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   512.74   299.39     0.44  2054.64
 MEAN   357.44   470.99   219.41     0.40  2141.36     1.23
 HUB    290.38   425.41    78.80     0.36  2665.57

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.68     1.04    18.83   587.45     1.01   571.90     0.92     0.84
 MEAN    20.71     1.04    18.80   587.78     1.01   571.69     0.92     0.84
 HUB     20.91     1.05    18.73   589.72     1.02   571.39     0.92     0.84

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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  TIP     15.37    35.73    31.50     4.23     0.93     0.14     2.90
  MEAN    18.33    27.77    23.50     4.27     0.89     0.16     3.34     0.84
  HUB     26.84    10.67     6.50     4.17     0.89     0.19     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.920

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
       R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
       15.219     443.301     140.566     420.425    1173.009       0.378       -0.010

       Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
       20.728       18.781     571.912      46.000      18.487      33.000      14.513

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
       RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
       15.219     452.383     140.566     473.718    1172.312       0.386       -0.096

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950       20.612      18.598     571.233     440.827       0.079       0.154

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     422.559       0.000     422.559    1174.545       0.360       0.016

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       18.813     573.411       0.000       0.060       0.097       0.013

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.657       20.575       1.034     588.315       8.468     382.273       2.963

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   52759.824       0.308     362.849 1173511.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     407965.88   2805.7358     118.8887      1.3620      0.7392      7.4939      1.1253


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 70%  Stat 2 35% Ice Block 8-31-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  0.998

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     119.767     2643.000       15.107     522.810       1.000        1.000        0.980
 W Kg/sec =   54.43945

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     117.000     2632.591        1.402        0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
   92134.484   93976.977        2.441     831.557     340.730     619.754       1.819

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   274.02    -0.09   274.02      0.25   473.93
  MEAN    17.06      0.00    -0.02   274.02    -0.09   274.02      0.25
  HUB     12.51      0.00    -0.02   274.02    -0.09   274.02      0.25

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
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 TIP     60.07    50.47     9.60   475.82   549.16    14.48   516.54     0.49
 MEAN    55.15    47.20     7.95   393.48   479.57    14.48   516.54     0.43
 HUB     46.49    38.62     7.87   288.54   397.99    14.48   516.54     0.36

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   462.38   275.86   371.08  1125.13     0.41
 MEAN    18.04   481.94   302.52   375.17  1122.55     0.43
 HUB     15.00   542.39   384.39   382.67  1118.23     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    475.82   421.52   199.96     0.37  5692.94
 MEAN   415.99   391.95   113.47     0.35  5457.87     1.38
 HUB    345.97   384.59    38.42     0.34  5767.05

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.14     1.13    15.26   543.90     1.04   526.05     0.92     0.91
 MEAN    17.05     1.13    15.02   543.03     1.04   523.63     0.92     0.91
 HUB     17.17     1.14    14.61   544.18     1.04   519.61     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.63    28.32    24.20     4.12     0.93     0.32     2.90
 MEAN    38.88    16.83    12.70     4.13     0.93     0.28     3.51     0.91
 HUB     45.13    -5.73    -9.30     3.57     0.93     0.14     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     488.867     301.932     384.484    1122.664       0.435      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.098      15.007     523.743      24.000      38.142      35.400      -2.742

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     410.573     301.932     509.641    1128.950       0.364       0.289

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.080      15.587     529.625     528.796       0.018       0.428

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     380.494       0.000     380.494    1131.066       0.336       0.344

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.750     531.612       0.000       0.060       0.039       0.365

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      17.035       1.128     543.704      20.894     207.354       1.607

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 130084.227       0.575     880.427 1152223.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
  RESET =  0.000BLEED =  0.000 DPInc = 7.954   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    119.767    2643.000      17.035     543.704       1.000       1.000       0.980
W Kg/sec =   54.43945

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    105.811    2581.511       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
92134.484	93976.977	1.916	590.487	308.146	474.134	1.539

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	363.43	-0.13	363.43	0.32	462.94
MEAN	18.08	0.00	-0.02	363.43	-0.13	363.43	0.32	
HUB	15.21	0.00	-0.02	363.43	-0.13	363.43	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.53	46.36	6.17	473.98	597.37	15.86	532.67	0.53
MEAN	48.93	42.30	6.63	416.97	553.21	15.86	532.67	0.49
HUB	44.00	37.84	6.16	350.81	505.21	15.86	532.67	0.45

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	431.65	202.58	381.16	1143.59	0.38
MEAN	18.01	441.20	217.97	383.59	1142.04	0.39
HUB	15.22	477.91	281.06	386.53	1140.44	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	466.17	268.39	0.41	4139.32	
MEAN	415.39	431.41	197.42	0.38	3927.97	1.39
HUB	351.11	392.82	70.05	0.34	4280.53	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.62	1.09	16.87	559.04	1.03	543.48	0.92	0.91
MEAN	18.53	1.09	16.72	558.25	1.03	542.00	0.92	0.91
HUB	18.67	1.10	16.55	559.56	1.03	540.49	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.99	35.15	31.50	3.65	0.93	0.28	2.90	
MEAN	29.61	27.23	23.50	3.73	0.93	0.28	3.30	0.91
HUB	36.02	10.27	6.50	3.77	0.93	0.29	3.92	

blockage3	Cor/U1	Cor/Incid
0.600	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	761.474	218.586	729.426	1108.380	0.687	-1.670

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.590	13.552	510.526	46.000	16.682	30.600	13.918

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	763.268	218.586	793.951	1108.133	0.689	-1.721

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.600	18.478	13.450	510.297	317.610	0.069	0.104

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	755.673	0.000	755.673	1109.222	0.681	-0.071

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.600	13.416	511.264	0.000	0.060	0.157	-1.738

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.746	18.311	1.075	558.950	15.246	254.834	1.975

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
94944.328	0.428	642.596	1058360.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
RESET = 0.000BLEED = 0.000 DPInc = 7.954 EfDer = 0.769

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
119.767	2643.000	18.311	558.950	1.000	1.000	0.630

W Kg/sec = 54.43945

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
99.807	2546.061	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
92134.484	93976.977	1.206	350.665	290.668	271.233	0.933

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	656.31	-0.23	656.31	0.59	445.91
MEAN	17.74	0.00	-0.02	656.31	-0.23	656.31	0.59	
HUB	15.05	0.00	-0.02	656.31	-0.23	656.31	0.59	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	35.21	46.36	-11.15	462.91	803.26	14.52	522.98	0.72
MEAN	31.95	43.40	-11.45	409.13	773.51	14.52	522.98	0.69
HUB	27.89	38.84	-10.95	347.12	742.56	14.52	522.98	0.66

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	427.68	134.07	406.12	1154.08	0.37
MEAN	17.51	437.68	161.66	406.73	1154.00	0.38
HUB	14.85	474.27	240.43	408.81	1153.96	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	518.80	322.84	0.45	2660.42	
MEAN	403.78	473.34	242.12	0.41	2834.08	1.70
HUB	342.51	421.36	102.08	0.37	3573.74	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.12	1.04	17.38	568.80	1.02	553.53	0.92	0.70
MEAN	19.17	1.05	17.36	569.45	1.02	553.45	0.92	0.70
HUB	19.40	1.06	17.27	572.18	1.02	553.40	0.92	0.70

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	18.27	38.48	31.50	6.98	0.93	0.38	2.90	
MEAN	21.68	30.76	23.50	7.26	0.84	0.42	3.28	0.70
HUB	30.46	14.02	6.50	7.52	0.84	0.47	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.769

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	443.027	162.719	412.063	1154.314	0.384	-0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.209	17.350	553.756	46.000	21.548	31.500	9.952

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	431.148	162.719	460.832	1155.218	0.373	0.042

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.174	17.414	554.623	471.992	0.028	0.177

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	419.072	0.000	419.072	1156.110	0.362	0.047

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.439	555.480	0.000	0.060	0.068	0.055

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.606	19.098	1.043	570.144	11.194	332.655	2.579

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
69727.109	0.334	471.922	1840481.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 7.954 EfDer = 0.965

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
119.767	2643.000	19.098	570.144	1.000	1.000	0.980

W Kg/sec = 54.43945

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
96.647	2520.942	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
92134.484	93976.977	1.824	513.330	281.474	401.059	1.425

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	393.40	-0.14	393.40	0.34	423.70
MEAN	16.97	0.00	-0.02	393.40	-0.14	393.40	0.34	
HUB	14.32	0.00	-0.02	393.40	-0.14	393.40	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.48	46.36	2.12	444.22	593.48	17.63	557.22	0.51
MEAN	44.87	43.80	1.07	391.42	555.05	17.63	557.22	0.48
HUB	40.03	37.84	2.19	330.28	513.75	17.63	557.22	0.44

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	437.92	139.98	414.95	1164.83	0.38
MEAN	16.57	447.38	165.46	415.66	1164.49	0.38
HUB	13.89	482.43	242.48	417.06	1164.08	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	509.40	295.48	0.44	2645.40	
MEAN	382.27	468.80	216.81	0.40	2744.64	1.27
HUB	320.37	424.27	77.89	0.36	3369.98	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.13	1.05	18.26	579.94	1.02	563.93	0.92	0.88
MEAN	20.17	1.06	18.21	580.31	1.02	563.60	0.92	0.88
HUB	20.42	1.07	18.14	582.62	1.02	563.19	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	18.64	35.45	31.50	3.95	0.93	0.18	2.90	
MEAN	21.71	27.55	23.50	4.05	0.91	0.20	3.29	0.88
HUB	30.17	10.58	6.50	4.08	0.91	0.23	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.965

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	439.926	166.392	407.245	1165.726	0.377	0.054

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.218	18.323	564.799	46.000	22.224	32.400	10.176

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	430.919	166.392	461.928	1166.402	0.369	0.079

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.181	18.364	565.454	456.573	0.028	0.195

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	410.000	0.000	410.000	1167.915	0.351	0.064

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.453	566.923	0.000	0.060	0.069	0.123

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.776	20.097	1.052	580.956	10.812	319.796	2.479

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
67357.227	0.355	455.882	1093853.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 7.954 EfDer = 0.934

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
119.767	2643.000	20.097	580.956	1.000	1.000	0.980

W Kg/sec = 54.43945

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
92.713	2497.374	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
92134.484	93976.977	1.888	509.668	270.021	390.276	1.445

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	382.04	-0.13	382.04	0.33	399.25
MEAN	15.91	0.00	-0.02	382.04	-0.13	382.04	0.33	
HUB	13.07	0.00	-0.02	382.04	-0.13	382.04	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.89	47.36	0.53	422.54	569.75	18.66	568.77	0.49
MEAN	43.86	44.80	-0.94	367.03	529.87	18.66	568.77	0.45
HUB	38.29	38.84	-0.55	301.45	486.73	18.66	568.77	0.42

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	422.56	123.29	404.18	1175.41	0.36
MEAN	15.50	429.96	144.48	404.96	1174.97	0.37
HUB	12.59	459.29	213.98	406.41	1174.47	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	497.74	290.49	0.42	2214.16	
MEAN	357.44	457.54	212.96	0.39	2241.24	1.25
HUB	290.38	413.53	76.41	0.35	2695.67	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.96	1.04	19.16	589.15	1.01	574.25	0.92	0.85
MEAN	20.97	1.04	19.11	589.25	1.01	573.82	0.92	0.85
HUB	21.15	1.05	19.03	590.94	1.02	573.33	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	16.96	35.71	31.50	4.21	0.93	0.16	2.90	
MEAN	19.64	27.74	23.50	4.24	0.90	0.18	3.34	0.85
HUB	27.77	10.65	6.50	4.15	0.90	0.20	4.06	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.934

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      434.153     147.133     408.461     1175.197       0.369       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     20.984      19.095      574.047      46.000      19.810       33.000       13.190

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      438.334     147.133     462.369     1174.885       0.373       -0.067

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       20.888      18.972      573.743      440.827       0.070        0.171

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4        cp 3-4
     14.701      409.685       0.000     409.685     1176.960       0.348        0.042

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       19.174      575.771       0.000       0.060       0.088        0.038

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4        Pt4           PR4        Texit        Del T        Ns         Ns nondim
      0.700       20.852        1.038      589.781       8.825      365.643       2.834

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  54985.727       0.321     372.151 1149703.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    417098.62   2822.9778     117.0002      1.3803       0.7558       7.9535       1.1281


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

   Fan-Core + 4 Stage LPC 70%  Stat 2 35% Ice Block 8-31-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    115.614     2643.000       15.107      522.810        1.000        1.000        0.980
 W Kg/sec =   52.55191

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
    112.943     2632.591        1.402        0.249       53.349       32.000        0.050

   CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
  88939.984   90718.586        2.528      831.557      328.916      619.754       1.884

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00     -0.02   263.94     -0.09   263.94      0.24    473.93
  MEAN    17.06      0.00     -0.02   263.94     -0.09   263.94      0.24
  HUB     12.51      0.00     -0.02   263.94     -0.09   263.94      0.24

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
  TIP     60.99     50.47    10.52   475.82   544.20     14.53   516.99      0.49
  MEAN    56.15     47.20     8.95   393.48   473.88     14.53   516.99      0.42
  HUB     47.56     38.62     8.94   288.54   391.12     14.53   516.99      0.35
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     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   455.69   283.74   356.57  1126.33     0.40
MEAN    18.04   473.63   306.96   360.70  1123.58     0.42
HUB     15.00   531.01   382.95   367.86  1119.24     0.47

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    475.82   405.02   192.08     0.36  5855.37
MEAN   415.99   376.81   109.03     0.34  5537.91     1.42
HUB    345.97   369.71    36.98     0.33  5745.39

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.19     1.14    15.36   544.50     1.04   527.16     0.92     0.91
MEAN    17.08     1.13    15.11   543.33     1.04   524.59     0.92     0.91
HUB     17.15     1.14    14.70   544.10     1.04   520.55     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.51    28.31    24.20     4.11     0.93     0.35     2.90
MEAN    40.40    16.82    12.70     4.12     0.93     0.30     3.51     0.91
HUB     46.15    -5.74    -9.30     3.56     0.93     0.17     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     480.056     306.365     369.587    1123.720       0.427      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.120      15.099     524.729      24.000      39.657      35.400      -4.257

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     393.992     306.365     499.089    1130.427       0.349       0.319

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.100      15.721     531.012     528.796       0.020       0.452

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     18.083     365.514       0.000     365.514    1132.348       0.323       0.366

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.863     532.818       0.000       0.060       0.043       0.387

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      17.052       1.129     543.977      21.167     201.536       1.562

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 131782.047       0.582     860.993 1109851.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.614    2643.000      17.052     543.977       1.000       1.000       0.980
W Kg/sec =   52.55191

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.067    2580.864       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88939.984   90718.586       1.987     590.487     297.243     474.134       1.595
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ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	349.27	-0.12	349.27	0.31	462.82
MEAN	18.08	0.00	-0.02	349.27	-0.12	349.27	0.31	
HUB	15.21	0.00	-0.02	349.27	-0.12	349.27	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.62	46.36	7.26	473.98	588.86	15.96	533.79	0.52
MEAN	50.06	42.30	7.76	416.97	544.01	15.96	533.79	0.48
HUB	45.14	37.84	7.30	350.81	495.12	15.96	533.79	0.44

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	423.48	213.78	365.56	1145.38	0.37
MEAN	18.01	432.10	226.12	368.20	1143.59	0.38
HUB	15.22	467.49	284.03	371.31	1141.77	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	446.97	257.20	0.39	4367.89	
MEAN	415.39	414.00	189.27	0.36	4074.67	1.43
HUB	351.11	377.33	67.08	0.33	4325.59	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.72	1.10	17.04	560.16	1.03	545.18	0.92	0.91
MEAN	18.61	1.09	16.86	559.07	1.03	543.48	0.92	0.91
HUB	18.71	1.10	16.67	560.00	1.03	541.75	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.32	35.13	31.50	3.63	0.93	0.30	2.90	
MEAN	31.56	27.20	23.50	3.70	0.93	0.30	3.30	0.91
HUB	37.41	10.24	6.50	3.74	0.93	0.31	3.92	

blockage3	Cor/U1	Cor/Incid
0.600	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	722.423	226.759	685.912	1114.475	0.648	-1.530

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.662	14.065	516.157	46.000	18.294	30.600	12.306

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	711.459	226.759	746.722	1115.891	0.638	-1.494

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.600	18.575	14.125	517.470	317.610	0.057	0.133

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	702.130	0.000	702.130	1117.091	0.629	0.041

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.600	14.140	518.572	0.000	0.060	0.122	-1.486

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.793	18.458	1.082	559.742	15.765	243.627	1.889

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
98176.602	0.443	641.433	1017252.188

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.768

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
115.614	2643.000	18.458	559.742	1.000	1.000	0.630

W Kg/sec = 52.55191

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
95.650	2544.260	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
88939.984	90718.586	1.259	350.665	278.562	271.233	0.974

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	616.92	-0.21	616.92	0.55	445.60
MEAN	17.74	0.00	-0.02	616.92	-0.21	616.92	0.55	
HUB	15.05	0.00	-0.02	616.92	-0.21	616.92	0.55	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	36.90	46.36	-9.46	462.91	771.41	15.05	527.96	0.68
MEAN	33.57	43.40	-9.83	409.13	740.37	15.05	527.96	0.66
HUB	29.38	38.84	-9.46	347.12	707.98	15.05	527.96	0.63

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	415.00	150.74	386.65	1157.11	0.36
MEAN	17.51	424.94	174.14	387.62	1156.62	0.37
HUB	14.85	461.12	246.14	389.93	1156.17	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	493.19	306.17	0.43	2990.42	
MEAN	403.78	450.54	229.64	0.39	3052.42	1.72
HUB	342.51	401.66	96.36	0.35	3658.44	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.37	1.05	17.72	570.82	1.02	556.44	0.92	0.70
MEAN	19.39	1.05	17.66	571.05	1.02	555.97	0.92	0.70
HUB	19.58	1.06	17.54	573.29	1.02	555.54	0.92	0.70

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	21.30	38.37	31.50	6.87	0.93	0.39	2.90	
MEAN	24.19	30.64	23.50	7.14	0.85	0.43	3.28	0.70
HUB	32.26	13.88	6.50	7.38	0.85	0.48	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.768

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	430.001	175.286	392.652	1156.941	0.372	-0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.426	17.657	556.278	46.000	24.057	31.500	7.443

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	409.528	175.286	445.465	1158.433	0.354	0.087

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.405	17.796	557.713	471.992	0.022	0.212

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	397.834	0.000	397.834	1159.251	0.343	0.096

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.829	558.502	0.000	0.060	0.055	0.105

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    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.633      19.345       1.048     571.717      11.975     306.602       2.377

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  74594.461       0.357     487.360 1739551.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.614    2643.000      19.345     571.717       1.000       1.000       0.980
W Kg/sec =   52.55191

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.234    2517.472       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 88939.984   90718.586       1.911     513.330     268.620     401.059       1.493

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   373.80    -0.13   373.80     0.32   423.11
 MEAN    16.97     0.00    -0.02   373.80    -0.13   373.80     0.32
 HUB     14.32     0.00    -0.02   373.80    -0.13   373.80     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.93    46.36     3.57   444.22   580.67    18.00   560.05     0.50
 MEAN    46.33    43.80     2.53   391.42   541.33    18.00   560.05     0.47
 HUB     41.47    37.84     3.63   330.28   498.90    18.00   560.05     0.43

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   422.52   156.33   392.54  1168.77     0.36
 MEAN    16.57   431.82   177.27   393.76  1168.04     0.37
 HUB     13.89   466.22   246.84   395.51  1167.25     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   481.66   279.13     0.41  2953.97
 MEAN   382.27   443.92   205.00     0.38  2940.25     1.31
 HUB    320.37   402.28    73.52     0.34  3430.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.53     1.06    18.75   582.65     1.02   567.75     0.92     0.90
 MEAN    20.52     1.06    18.67   582.60     1.02   567.04     0.92     0.90
 HUB     20.73     1.07    18.57   584.42     1.02   566.27     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.72    35.42    31.50     3.92     0.93     0.22     2.90
 MEAN    24.24    27.50    23.50     4.00     0.91     0.23     3.29     0.90
 HUB     31.97    10.53     6.50     4.03     0.91     0.26     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     425.092     178.268     385.907    1169.168       0.364       0.053

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.574      18.776     568.140      46.000      24.794      32.400       7.606

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
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     16.481     406.975     178.268     444.306    1170.463       0.348       0.122

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.551      18.901     569.398     456.573       0.022       0.230

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     387.109       0.000     387.109    1171.815       0.330       0.113

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.993     570.715       0.000       0.060       0.056       0.170

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.822      20.486       1.059     583.226      11.509     297.459       2.306

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  71699.430       0.378     468.446 1047732.312


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.960

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.614    2643.000      20.486     583.226       1.000       1.000       0.980
W Kg/sec =   52.55191

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.971    2492.510       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 88939.984   90718.586       1.989     509.668     256.209     390.276       1.523

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   361.08    -0.12   361.08     0.31   398.47
 MEAN    15.91     0.00    -0.02   361.08    -0.12   361.08     0.31
 HUB     13.07     0.00    -0.02   361.08    -0.12   361.08     0.31

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.49    47.36     2.13   422.54   555.90    19.18   572.34     0.47
 MEAN    45.48    44.80     0.68   367.03   514.96    19.18   572.34     0.44
 HUB     39.87    38.84     1.03   301.45   470.46    19.18   572.34     0.40

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   405.50   140.98   380.21  1180.13     0.34
 MEAN    15.50   412.62   157.28   381.47  1179.28     0.35
 HUB     12.59   441.24   218.72   383.22  1178.40     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   467.95   272.80     0.40  2531.45
 MEAN   357.44   430.80   200.17     0.37  2439.44     1.29
 HUB    290.38   389.86    71.67     0.33  2755.26

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.51     1.05    19.82   592.60     1.02   578.87     0.92     0.88
 MEAN    21.47     1.05    19.73   592.26     1.02   578.04     0.92     0.88
 HUB     21.61     1.05    19.61   593.43     1.02   577.17     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.34    35.66    31.50     4.16     0.93     0.20     2.90
 MEAN    22.41    27.69    23.50     4.19     0.90     0.21     3.34     0.88
 HUB     29.71    10.59     6.50     4.09     0.90     0.23     4.06


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.960

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     416.696     160.164     384.685    1179.507       0.353      -0.008

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      21.495      19.716     578.266      46.000      22.604      33.000      10.396

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     410.831     160.164     440.948    1179.920       0.348      -0.007

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      21.434      19.708     578.671     440.827       0.054       0.207

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     384.361       0.000     384.361    1181.710       0.325       0.096

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      19.889     580.428       0.000       0.060       0.071       0.093

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.772      21.403       1.045     592.760       9.534     335.435       2.600

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   59407.867       0.347     388.139 1100152.625

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     435660.44   2846.3716     112.9435      1.4167      0.7851      8.9532      1.1338


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 70%  Stat 2 35% Ice Block 8-31-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.991

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     111.200     2643.000       15.107      522.810       1.000        1.000        0.980
 W Kg/sec =   50.54562

    W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     108.632     2632.591        1.402       0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
   85544.477    87255.180        2.629      831.557     316.359      619.754       1.959

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator     Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00     -0.02    253.30     -0.09    253.30      0.23    473.93
  MEAN    17.06      0.00     -0.02    253.30     -0.09    253.30      0.23
  HUB     12.51      0.00     -0.02    253.30     -0.09    253.30      0.23

        BetaFlo    BetaBlade Incid    U1        W1        Ps1       Ts1      Rel Mach
  TIP     61.98     50.47     11.51    475.82    539.12     14.57    517.45      0.48
  MEAN    57.23     47.20     10.03    393.48    468.04     14.57    517.45      0.42
  HUB     48.73     38.62     10.11    288.54    384.01     14.57    517.45      0.34

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK         AeroBl      Blades2
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     0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   449.23   291.89   341.48  1127.51     0.40
 MEAN    18.04   465.30   311.56   345.60  1124.60     0.41
 HUB     15.00   519.31   381.42   352.41  1120.25     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    475.82   387.87   183.93     0.34  6023.48
 MEAN   415.99   361.03   104.44     0.32  5620.72     1.47
 HUB    345.97   354.19    35.46     0.32  5722.46

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.25     1.14    15.46   545.13     1.04   528.27     0.92     0.91
 MEAN    17.10     1.13    15.19   543.64     1.04   525.55     0.92     0.91
 HUB     17.14     1.13    14.79   544.01     1.04   521.49     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.52    28.31    24.20     4.11     0.93     0.37     2.90
 MEAN    42.03    16.81    12.70     4.11     0.94     0.33     3.51     0.91
 HUB     47.26    -5.75    -9.30     3.55     0.94     0.19     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     471.222     310.951     354.061    1124.772       0.419      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.140      15.188     525.712      24.000      41.291      35.400      -5.891

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     376.829     310.951     488.560    1131.902       0.333       0.350

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.116      15.850     532.398     528.796       0.022       0.477

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     349.994       0.000     349.994    1133.632       0.309       0.388

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.970     534.027       0.000       0.060       0.048       0.409

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      17.063       1.129     544.258      21.448     195.486       1.515

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 133535.359       0.590     839.141 1065123.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.996

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    111.200    2643.000      17.063     544.258       1.000       1.000       0.980
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     98.134    2580.196       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85544.477   87255.180       2.066     590.487     285.789     474.134       1.659

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     20.55     0.00    -0.02   334.58    -0.12   334.58     0.29   462.70
MEAN    18.08     0.00    -0.02   334.58    -0.12   334.58     0.29
HUB     15.21     0.00    -0.02   334.58    -0.12   334.58     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.79    46.36     8.43   473.98   580.27    16.06   534.91     0.51
MEAN    51.26    42.30     8.96   416.97   534.70    16.06   534.91     0.47
HUB     46.37    37.84     8.53   350.81   484.87    16.06   534.91     0.43

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   415.86   225.21   349.60  1147.14     0.36
MEAN    18.01   423.25   234.43   352.40  1145.13     0.37
HUB     15.22   457.01   287.03   355.64  1143.10     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    470.98   427.34   245.76     0.37  4601.21
MEAN   415.39   396.14   180.96     0.35  4224.12     1.47
HUB    351.11   361.36    64.09     0.32  4371.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.82     1.10    17.19   561.30     1.03   546.86     0.92     0.91
MEAN    18.67     1.09    16.99   559.90     1.03   544.94     0.92     0.91
HUB     18.73     1.10    16.78   560.45     1.03   543.01     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.79    35.11    31.50     3.61     0.93     0.33     2.90
MEAN    33.63    27.18    23.50     3.68     0.93     0.33     3.30     0.91
HUB     38.91    10.22     6.50     3.72     0.93     0.33     3.92


  blockage3   Cor/U1    Cor/Incid
     0.600       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     686.612     235.086     645.113    1119.885       0.613      -1.402

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.724      14.524     521.181      46.000      20.022      30.600      10.578

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     664.749     235.086     705.094    1122.532       0.592      -1.291

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.600      18.659      14.714     523.649     317.610       0.047       0.161

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     654.846       0.000     654.846    1123.705       0.583       0.132

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600      14.756     524.740       0.000       0.060       0.094      -1.267

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.824      18.577       1.089     560.552      16.294     232.621       1.803

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 101469.648       0.457     637.639  974203.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.786

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      18.577     560.552       1.000       1.000       0.630
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W Kg/sec = 50.54562

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
91.472	2542.420	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85544.477	87255.180	1.316	350.665	266.395	271.233	1.018

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	580.20	-0.20	580.20	0.51	445.28
MEAN	17.74	0.00	-0.02	580.20	-0.20	580.20	0.51	
HUB	15.05	0.00	-0.02	580.20	-0.20	580.20	0.51	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	38.60	46.36	-7.76	462.91	742.36	15.53	532.44	0.66
MEAN	35.20	43.40	-8.20	409.13	710.06	15.53	532.44	0.63
HUB	30.91	38.84	-7.93	347.12	676.21	15.53	532.44	0.60

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	403.40	167.35	367.05	1160.04	0.35
MEAN	17.51	412.87	186.61	368.29	1159.18	0.36
HUB	14.85	448.08	251.76	370.66	1158.36	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	467.51	289.56	0.40	3319.24	
MEAN	403.78	427.55	217.17	0.37	3270.43	1.74
HUB	342.51	381.61	90.75	0.33	3741.61	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.62	1.06	18.04	572.84	1.02	559.26	0.92	0.72
MEAN	19.60	1.06	17.96	572.66	1.02	558.43	0.92	0.72
HUB	19.76	1.06	17.82	574.41	1.02	557.64	0.92	0.72

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	24.51	38.27	31.50	6.77	0.93	0.41	2.90	
MEAN	26.87	30.53	23.50	7.03	0.86	0.44	3.28	0.72
HUB	34.18	13.76	6.50	7.26	0.86	0.48	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.786

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	417.625	187.834	373.001	1159.501	0.360	0.000

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.643	17.956	558.742	46.000	26.729	31.500	4.771

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	387.882	187.834	430.968	1161.575	0.334	0.135

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.631	18.170	560.742	471.992	0.017	0.249

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	376.675	0.000	376.675	1162.315	0.324	0.146

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.208	561.458	0.000	0.060	0.044	0.156

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.670      19.584       1.054     573.305      12.753     283.632       2.199

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79439.000       0.381     499.197 1642460.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      19.584     573.305       1.000       1.000       0.980
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     87.753    2513.984       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85544.477   87255.180       2.009     513.330     255.570     401.059       1.569

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   354.21    -0.12   354.21     0.30   422.53
 MEAN    16.97     0.00    -0.02   354.21    -0.12   354.21     0.30
 HUB     14.32     0.00    -0.02   354.21    -0.12   354.21     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.44    46.36     5.08   444.22   568.25    18.36   562.83     0.49
 MEAN    47.87    43.80     4.07   391.42   527.99    18.36   562.83     0.45
 HUB     43.01    37.84     5.17   330.28   484.39    18.36   562.83     0.42

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   408.68   172.37   370.55  1172.54     0.35
 MEAN    16.57   417.37   188.90   372.17  1171.45     0.36
 HUB     13.89   450.70   251.18   374.22  1170.33     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   454.45   263.09     0.39  3256.72
 MEAN   382.27   419.41   193.37     0.36  3132.92     1.36
 HUB    320.37   380.56    69.19     0.33  3490.57

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.92     1.07    19.23   585.36     1.02   571.42     0.92     0.91
 MEAN    20.87     1.07    19.11   584.90     1.02   570.36     0.92     0.91
 HUB     21.02     1.07    18.97   586.23     1.02   569.27     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.95    35.37    31.50     3.87     0.93     0.25     2.90
 MEAN    26.91    27.45    23.50     3.95     0.92     0.26     3.29     0.91
 HUB     33.87    10.48     6.50     3.98     0.92     0.28     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.993

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     411.359     189.965     364.869    1172.488       0.351       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.918      19.209     571.372      46.000      27.503      32.400       4.897

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     383.638     189.965     428.094    1174.375       0.327       0.168

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      20.905      19.414     573.212     456.573       0.017       0.268

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     364.881       0.000     364.881    1175.575       0.310       0.162

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.505     574.384       0.000       0.060       0.045       0.218

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.855      20.854       1.065     585.499      12.194     277.262       2.149

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  75970.414       0.401     477.401 1000228.062


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      20.854     585.499       1.000       1.000       0.980
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.278    2487.667       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85544.477   87255.180       2.101     509.668     242.543     390.276       1.609

    ROTOR LEADING EDGE CONDITIONS, STAGE           5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   340.66    -0.12   340.66     0.29   397.70
 MEAN    15.91     0.00    -0.02   340.66    -0.12   340.66     0.29
 HUB     13.07     0.00    -0.02   340.66    -0.12   340.66     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.13    47.36     3.77   422.54   542.85    19.67   575.81     0.46
 MEAN    47.14    44.80     2.34   367.03   500.84    19.67   575.81     0.43
 HUB     41.52    38.84     2.68   301.45   454.96    19.67   575.81     0.39

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   390.59   157.94   357.23  1184.59     0.33
 MEAN    15.50   396.92   169.58   358.87  1183.39     0.34
 HUB     12.59   424.36   223.29   360.87  1182.17     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   439.39   255.84     0.37  2835.61
 MEAN   357.44   405.07   187.87     0.34  2629.95     1.34
 HUB    290.38   367.06    67.10     0.31  2812.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.05     1.06    20.45   596.00     1.02   583.26     0.92     0.90
 MEAN    21.96     1.05    20.31   595.23     1.02   582.08     0.92     0.90
 HUB     22.04     1.06    20.16   595.91     1.02   580.88     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.85    35.61    31.50     4.11     0.93     0.24     2.90
 MEAN    25.29    27.63    23.50     4.13     0.91     0.24     3.34     0.90
 HUB     31.75    10.53     6.50     4.03     0.91     0.25     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.980

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219      400.934     172.689      361.837    1183.608       0.339       -0.007

      Pt3          Ps3         Ts3          Vane No.     Alpha3     Vane A3      Incid3
      21.981       20.301      582.295       46.000      25.513      33.000       7.487

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG          Cth         Cuth         Cmth         Aoth         Machth      cp 2-Th
      15.219      384.876     172.689      421.843    1184.678       0.325       0.054

    BlockageThr  PtTh         PsTh        TsTh         AreaTh         w 2-Th  DiffFact4
       0.950       21.946       20.397      583.349      440.827       0.040       0.247

     VANED DIFFUSER EXIT:
    R4           C4           Cu4         Cm4          Ao4           Mach4       cp 3-4
      14.701      360.356       0.000      360.356    1186.226       0.304       0.152

    Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       20.560      584.874       0.000        0.060       0.055       0.149

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
       0.825       21.921        1.051      595.713       10.214     309.374       2.398

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   63652.793       0.372     399.996 1049455.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc   TR
     454067.19   2853.3733     108.6316       1.4510       0.8078      10.0345       1.1394


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 70%  Stat 2 35% Ice Block 8-31-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.986

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     107.366     2643.000       15.107      522.810        1.000        1.000        0.980
 W Kg/sec =   48.80284

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     104.886     2632.591        1.402        0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
   82594.961   84246.680        2.722      831.557      305.451      619.754       2.029

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   244.12    -0.08   244.12      0.22   473.93
  MEAN    17.06      0.00    -0.02   244.12    -0.08   244.12      0.22
  HUB     12.51      0.00    -0.02   244.12    -0.08   244.12      0.22

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
  TIP     62.84     50.47    12.37   475.82   534.87     14.61   517.83      0.48
  MEAN    58.19     47.20    10.99   393.48   463.13     14.61   517.83      0.41
  HUB     49.77     38.62    11.15   288.54   378.02     14.61   517.83      0.34

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK         AeroBl     Blades2
       0.700       0.050        0.950      32.000

           R2      C2       Cu2       Cm2      Ao2          Mach2
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 TIP     20.63   444.15   298.79   328.62  1128.48     0.39
 MEAN    18.04   458.46   315.43   332.70  1125.45     0.41
 HUB     15.00   509.42   380.07   339.20  1121.08     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    475.82   373.27   177.03     0.33  6165.71
 MEAN   415.99   347.56   100.56     0.31  5690.62     1.51
 HUB    345.97   340.91    34.10     0.30  5702.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.29     1.14    15.54   545.65     1.04   529.18     0.92     0.90
 MEAN    17.11     1.13    15.26   543.89     1.04   526.34     0.92     0.90
 HUB     17.12     1.13    14.85   543.94     1.04   522.26     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.28    28.31    24.20     4.11     0.93     0.40     2.90
 MEAN    43.47    16.82    12.70     4.12     0.94     0.35     3.51     0.90
 HUB     48.25    -5.74    -9.30     3.56     0.94     0.21     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     463.961     314.822     340.803    1125.632       0.412      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.153      15.258     526.516      24.000      42.731      35.400      -7.331

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     362.256     314.822     479.940    1133.109       0.320       0.376

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.126      15.953     533.535     528.796       0.024       0.500

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     336.802       0.000     336.802    1134.687       0.297       0.407

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.053     535.021       0.000       0.060       0.054       0.427

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.858      17.067       1.130     544.495      21.685     190.336       1.475

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 135009.734       0.596     819.153 1026515.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.991

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     107.366    2643.000      17.067     544.495       1.000       1.000       0.980
W Kg/sec =   48.80284

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      94.749    2579.635       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   82594.961   84246.680       2.140     590.487     275.933     474.134       1.718

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   322.08    -0.11   322.08     0.28   462.60
 MEAN    18.08     0.00    -0.02   322.08    -0.11   322.08     0.28
 HUB     15.21     0.00    -0.02   322.08    -0.11   322.08     0.28
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.81    46.36     9.45   473.98   573.14    16.14   535.83     0.50
MEAN    52.32    42.30    10.02   416.97   526.96    16.14   535.83     0.46
HUB     47.45    37.84     9.61   350.81   476.32    16.14   535.83     0.42

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   410.03   234.77   336.17  1148.57     0.36
MEAN    18.01   416.21   241.39   339.05  1146.39     0.36
HUB     15.22   448.37   289.52   342.36  1144.18     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    470.98   410.86   236.21     0.36  4796.18
MEAN   415.39   381.09   174.00     0.33  4349.49     1.51
HUB    351.11   347.86    61.59     0.30  4409.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.89     1.11    17.30   562.26     1.03   548.22     0.92     0.91
MEAN    18.72     1.10    17.09   560.61     1.03   546.14     0.92     0.91
HUB     18.74     1.10    16.86   560.83     1.03   544.04     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     34.93    35.09    31.50     3.59     0.93     0.35     2.90
MEAN    35.45    27.17    23.50     3.67     0.94     0.35     3.30     0.91
HUB     40.22    10.20     6.50     3.70     0.94     0.35     3.92


  blockage3   Cor/U1    Cor/Incid
     0.600       1.000       0.991

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     659.002     242.071     612.932    1123.939       0.586      -1.303

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.768      14.867     524.964      46.000      21.551      30.600       9.049

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     628.821     242.071     673.806    1127.409       0.558      -1.134

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.600      18.717      15.149     528.209     317.610       0.040       0.184

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     618.925       0.000     618.925    1128.510       0.548       0.198

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.600      15.204     529.241       0.000       0.060       0.075      -1.102

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.842      18.658       1.093     561.231      16.736     223.694       1.734

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 104224.773       0.470     632.370  937301.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.811

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.366    2643.000      18.658     561.231       1.000       1.000       0.630
W Kg/sec =   48.80284

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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    87.991    2540.881       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 82594.961   84246.680       1.368     350.665     256.258     271.233       1.058

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   551.32    -0.19   551.32     0.49   445.01
MEAN    17.74     0.00    -0.02   551.32    -0.19   551.32     0.49
HUB     15.05     0.00    -0.02   551.32    -0.19   551.32     0.49

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     40.03    46.36    -6.33   462.91   720.01    15.88   535.85     0.63
MEAN    36.59    43.40    -6.81   409.13   686.66    15.88   535.85     0.60
HUB     32.21    38.84    -6.63   347.12   651.60    15.88   535.85     0.57

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   394.72   181.05   350.75  1162.38     0.34
MEAN    17.51   403.48   196.88   352.19  1161.24     0.35
HUB     14.85   437.56   256.38   354.58  1160.14     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    456.91   446.23   275.86     0.38  3590.43
MEAN   403.78   408.47   206.90     0.35  3450.02     1.77
HUB    342.51   364.89    86.13     0.31  3810.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.83     1.06    18.30   574.53     1.02   561.52     0.92     0.74
MEAN    19.78     1.06    18.19   574.01     1.02   560.41     0.92     0.74
HUB     19.90     1.07    18.04   575.34     1.03   559.35     0.92     0.74

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     27.30    38.18    31.50     6.68     0.93     0.42     2.90
MEAN    29.21    30.43    23.50     6.93     0.87     0.45     3.28     0.74
HUB     35.87    13.65     6.50     7.15     0.87     0.49     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.811

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     407.998     198.170     356.638    1161.556       0.351       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.820      18.197     560.726      46.000      29.059      31.500       2.441

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     370.024     198.170     419.749    1164.109       0.318       0.176

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.812      18.471     563.193     471.992       0.015       0.282

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     359.305       0.000     359.305    1164.783       0.308       0.188

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.508     563.845       0.000       0.060       0.039       0.199

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.703      19.772       1.060     574.625      13.394     266.499       2.066

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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  83431.656       0.400     506.210 1564154.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.366    2643.000      19.772     574.625       1.000       1.000       0.980
W Kg/sec =   48.80284

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     84.015    2511.094       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82594.961   84246.680       2.098     513.330     244.685     401.059       1.639

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   338.09    -0.12   338.09     0.29   422.04
 MEAN    16.97     0.00    -0.02   338.09    -0.12   338.09     0.29
 HUB     14.32     0.00    -0.02   338.09    -0.12   338.09     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.73    46.36     6.37   444.22   558.34    18.65   565.08     0.48
 MEAN    49.19    43.80     5.39   391.42   517.31    18.65   565.08     0.44
 HUB     44.34    37.84     6.50   330.28   472.72    18.65   565.08     0.41

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   398.48   185.33   352.76  1175.52     0.34
 MEAN    16.57   406.32   198.33   354.63  1174.18     0.35
 HUB     13.89   438.41   254.65   356.87  1172.81     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    435.46   432.44   250.13     0.37  3501.26
 MEAN   382.27   399.50   183.94     0.34  3289.11     1.40
 HUB    320.37   362.87    65.71     0.31  3538.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.23     1.07    19.61   587.59     1.02   574.33     0.92     0.91
 MEAN    21.14     1.07    19.46   586.80     1.02   573.02     0.92     0.91
 HUB     21.25     1.07    19.29   587.73     1.02   571.68     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.72    35.34    31.50     3.84     0.93     0.28     2.90
 MEAN    29.22    27.41    23.50     3.91     0.92     0.29     3.29     0.91
 HUB     35.51    10.43     6.50     3.93     0.92     0.30     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     400.897     199.447     347.763    1175.135       0.341       0.051

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.188      19.547     573.955      46.000      29.835      32.400       2.565

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     364.841     199.447     415.798    1177.492       0.310       0.207

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.181      19.815     576.260     456.573       0.014       0.302

   VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	347.044	0.000	347.044	1178.572	0.294	0.202

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.902	577.318	0.000	0.060	0.039	0.257

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.871	21.138	1.069	587.372	12.747	261.999	2.031

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
79422.445	0.419	481.885	960038.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =10.989 EfDer = 0.991

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
107.366	2643.000	21.138	587.372	1.000	1.000	0.980

W Kg/sec = 48.80284

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
79.456	2483.696	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
82594.961	84246.680	2.202	509.668	231.410	390.276	1.687

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	324.22	-0.11	324.22	0.27	397.06
MEAN	15.91	0.00	-0.02	324.22	-0.11	324.22	0.27	
HUB	13.07	0.00	-0.02	324.22	-0.11	324.22	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.51	47.36	5.15	422.54	532.69	20.06	578.60	0.45
MEAN	48.55	44.80	3.75	367.03	489.80	20.06	578.60	0.42
HUB	42.93	38.84	4.09	301.45	442.79	20.06	578.60	0.38

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	379.86	171.34	339.03	1188.09	0.32
MEAN	15.50	385.19	179.33	340.90	1186.64	0.32
HUB	12.59	411.31	226.91	343.06	1185.17	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	416.79	242.44	0.35	3075.88	
MEAN	357.44	384.62	178.11	0.32	2780.99	1.39
HUB	290.38	348.88	63.48	0.29	2858.21	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.46	1.06	20.93	598.76	1.02	586.71	0.92	0.91
MEAN	22.33	1.06	20.76	597.67	1.02	585.28	0.92	0.91
HUB	22.37	1.06	20.58	597.95	1.02	583.83	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	26.81	35.57	31.50	4.07	0.93	0.27	2.90	
MEAN	27.75	27.59	23.50	4.09	0.92	0.27	3.34	0.91
HUB	33.48	10.48	6.50	3.98	0.92	0.27	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.991

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	389.192	182.620	343.686	1186.840	0.328	-0.006

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.355      20.749     585.482      46.000      27.984      33.000       5.016

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     364.552     182.620     407.736    1188.410       0.307       0.104

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.336      20.923     587.032     440.827       0.032       0.281

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     341.516       0.000     341.516    1189.784       0.287       0.198

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.072     588.390       0.000       0.060       0.045       0.195

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.854      22.314       1.056     598.125      10.753     290.400       2.251

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  67011.539       0.391     406.583 1006770.688

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    469100.12   2846.2012    104.8861      1.4771      0.8214     10.9895      1.1441


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 70%  Stat 2 35% Ice Block 8-31-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.556    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   47.07069

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.163    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79663.445   81256.547       2.823     831.557     294.610     619.754       2.104

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   235.05    -0.08   235.05     0.21   473.93
  MEAN    17.06     0.00    -0.02   235.05    -0.08   235.05     0.21
  HUB     12.51     0.00    -0.02   235.05    -0.08   235.05     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.72    50.47    13.25   475.82   530.78    14.65   518.20     0.48
  MEAN    59.15    47.20    11.95   393.48   458.41    14.65   518.20     0.41
  HUB     50.84    38.62    12.22   288.54   372.22    14.65   518.20     0.33

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   439.55   305.49   316.04  1129.38     0.39
  MEAN    18.04   452.02   319.21   320.05  1126.24     0.40
  HUB     15.00   499.87   378.72   326.25  1121.86     0.45
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    475.82   359.02   170.33     0.32  6303.87
 MEAN   415.99   334.36    96.78     0.30  5758.65     1.56
 HUB    345.97   327.89    32.75     0.29  5681.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.33     1.15    15.61   546.17     1.04   530.03     0.92     0.90
 MEAN    17.13     1.13    15.32   544.15     1.04   527.08     0.92     0.90
 HUB     17.10     1.13    14.92   543.86     1.04   522.99     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.03    28.32    24.20     4.12     0.93     0.42     2.90
 MEAN    44.92    16.83    12.70     4.13     0.94     0.37     3.51     0.90
 HUB     49.26    -5.73    -9.30     3.57     0.94     0.24     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     457.122     318.590     327.812    1126.439       0.406      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.164      15.321     527.272      24.000      44.183      35.400      -8.783

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     348.042     318.590     471.839    1134.248       0.307       0.403

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.132      16.048     534.607     528.796       0.027       0.524

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     323.919       0.000     323.919    1135.683       0.285       0.424

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.128     535.961       0.000       0.060       0.062       0.445

    STAGE EXIT CONDITIONS, STAGE             1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.849      17.066       1.130     544.725      21.915     185.296       1.436

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 136438.906       0.603     798.443  988356.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.986

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     103.556    2643.000      17.066     544.725       1.000       1.000       0.980
W Kg/sec =   47.07069

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      91.409    2579.091       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79663.445   81256.547       2.218     590.487     266.205     474.134       1.781

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   309.86    -0.11   309.86     0.27   462.50
 MEAN    18.08     0.00    -0.02   309.86    -0.11   309.86     0.27
 HUB     15.21     0.00    -0.02   309.86    -0.11   309.86     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.83    46.36    10.47   473.98   566.36    16.21   536.71     0.50
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MEAN    53.39    42.30    11.09   416.97   519.58    16.21   536.71     0.46
HUB     48.56    37.84    10.72   350.81   468.14    16.21   536.71     0.41

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   404.92   243.96   323.17  1149.90     0.35
MEAN    18.01   409.76   248.13   326.09  1147.56     0.36
HUB     15.22   440.16   291.91   329.44  1145.20     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    470.98   394.94   227.02     0.34  4983.81
MEAN   415.39   366.49   167.26     0.32  4470.74     1.55
HUB    351.11   334.71    59.20     0.29  4445.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.96     1.11    17.40   563.19     1.03   549.49     0.92     0.90
MEAN    18.75     1.10    17.17   561.28     1.03   547.26     0.92     0.90
HUB     18.74     1.10    16.93   561.19     1.03   545.01     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.05    35.09    31.50     3.59     0.93     0.38     2.90
MEAN    37.27    27.15    23.50     3.65     0.94     0.37     3.30     0.90
HUB     41.54    10.19     6.50     3.69     0.94     0.36     3.92


  blockage3   Cor/U1    Cor/Incid
     0.600       1.000       0.986

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     634.074     248.826     583.211    1127.516       0.562      -1.212

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.802      15.166     528.311      46.000      23.105      30.600       7.495

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     596.197     248.826     646.038    1131.661       0.527      -0.990

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.600      18.764      15.527     532.203     317.610       0.033       0.206

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    17.823     586.550       0.000     586.550    1132.674       0.518       0.255

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.600      15.588     533.156       0.000       0.060       0.060      -0.953

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.853      18.720       1.097     561.887      17.162     215.309       1.669

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 106878.734       0.482     625.456  901036.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.840

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    103.556    2643.000      18.720     561.887       1.000       1.000       0.630
W Kg/sec =   47.07069

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     84.636    2539.398       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 79663.445   81256.547       1.423     350.665     246.486     271.233       1.100

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   524.69    -0.18   524.69     0.46   444.75
MEAN    17.74     0.00    -0.02   524.69    -0.18   524.69     0.46
HUB     15.05     0.00    -0.02   524.69    -0.18   524.69     0.46

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     41.43    46.36    -4.93   462.91   699.82    16.18   538.90     0.61
MEAN    37.96    43.40    -5.44   409.13   665.46    16.18   538.90     0.58
HUB     33.50    38.84    -5.34   347.12   629.22    16.18   538.90     0.55

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   387.28   194.09   335.14  1164.54     0.33
MEAN    17.51   395.12   206.68   336.76  1163.15     0.34
HUB     14.85   427.81   260.76   339.15  1161.79     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    456.91   425.90   262.82     0.37  3848.48
MEAN   403.78   390.20   197.10     0.34  3621.40     1.80
HUB    342.51   348.87    81.75     0.30  3874.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.02     1.07    18.55   576.14     1.03   563.61     0.92     0.77
MEAN    19.95     1.07    18.41   575.30     1.02   562.26     0.92     0.77
HUB     20.03     1.07    18.24   576.24     1.03   560.95     0.92     0.77

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.08    38.10    31.50     6.60     0.93     0.44     2.90
MEAN    31.54    30.34    23.50     6.84     0.88     0.46     3.28     0.77
HUB     37.55    13.55     6.50     7.05     0.88     0.50     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.840

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     399.416     208.033     340.963    1163.463       0.343       0.003

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.985      18.419     562.570      46.000      31.389      31.500       0.111

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     353.042     208.033     409.776    1166.472       0.303       0.217

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.980      18.748     565.484     471.992       0.013       0.316

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     342.854       0.000     342.854    1167.083       0.294       0.227

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.782     566.076       0.000       0.060       0.037       0.238

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.734      19.943       1.065     575.891      14.004     251.440       1.949

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  87232.250       0.418     510.485 1490527.250
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.556    2643.000      19.943     575.891       1.000       1.000       0.980
W Kg/sec =   47.07069

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.430    2508.333       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 79663.445   81256.547       2.191     513.330     234.242     401.059       1.712

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   322.78    -0.11   322.78     0.28   421.58
MEAN    16.97     0.00    -0.02   322.78    -0.11   322.78     0.28
HUB     14.32     0.00    -0.02   322.78    -0.11   322.78     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.00    46.36     7.64   444.22   549.20    18.91   567.19     0.47
MEAN    50.50    43.80     6.70   391.42   507.43    18.91   567.19     0.43
HUB     45.67    37.84     7.83   330.28   461.90    18.91   567.19     0.40

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   389.79   197.41   336.11  1178.26     0.33
MEAN    16.57   396.56   207.14   338.16  1176.69     0.34
HUB     13.89   427.18   257.90   340.54  1175.10     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   411.87   238.05     0.35  3729.16
MEAN   382.27   380.82   175.13     0.32  3434.99     1.45
HUB    320.37   346.22    62.46     0.29  3583.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.51     1.08    19.94   589.70     1.02   577.01     0.92     0.91
MEAN    21.38     1.07    19.77   588.61     1.02   575.48     0.92     0.91
HUB     21.45     1.08    19.57   589.16     1.02   573.93     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.43    35.31    31.50     3.81     0.93     0.31     2.90
MEAN    31.49    27.38    23.50     3.88     0.93     0.31     3.29     0.91
HUB     37.14    10.39     6.50     3.89     0.93     0.32     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     391.678     208.304     331.694    1177.580       0.333       0.049

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.431      19.849     576.348      46.000      32.129      32.400       0.271

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     347.313     208.304     404.990    1180.372       0.294       0.246

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.426      20.175     579.085     456.573       0.013       0.335

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    16.096     330.466       0.000     330.466    1181.344       0.280       0.240
```

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.253	580.038	0.000	0.060	0.037	0.292

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	21.386	1.072	589.155	13.264	248.481	1.926

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
82643.258	0.436	483.630	920946.312

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =11.953 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
103.556	2643.000	21.386	589.155	1.000	1.000	0.980

W Kg/sec = 47.07069

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
75.860	2479.937	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
79663.445	81256.547	2.307	509.668	220.940	390.276	1.766

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	308.91	-0.11	308.91	0.26	396.46
MEAN	15.91	0.00	-0.02	308.91	-0.11	308.91	0.26	
HUB	13.07	0.00	-0.02	308.91	-0.11	308.91	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.84	47.36	6.48	422.54	523.50	20.39	581.19	0.44
MEAN	49.92	44.80	5.12	367.03	479.80	20.39	581.19	0.41
HUB	44.31	38.84	5.47	301.45	431.70	20.39	581.19	0.37

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	370.94	183.64	322.30	1191.28	0.31
MEAN	15.50	375.03	188.31	324.32	1189.61	0.32
HUB	12.59	399.59	230.22	326.60	1187.93	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	396.03	230.14	0.33	3296.48	
MEAN	357.44	365.78	169.14	0.31	2920.03	1.44
HUB	290.38	332.10	60.16	0.28	2899.86	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.83	1.07	21.34	601.36	1.02	589.87	0.92	0.91
MEAN	22.66	1.06	21.15	599.96	1.02	588.22	0.92	0.91
HUB	22.65	1.06	20.94	599.89	1.02	586.56	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	29.67	35.53	31.50	4.03	0.93	0.30	2.90	
MEAN	30.14	27.54	23.50	4.04	0.92	0.30	3.34	0.91
HUB	35.18	10.44	6.50	3.94	0.92	0.30	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	379.046	191.762	326.961	1189.801	0.319	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.684	21.141	588.410	46.000	30.391	33.000	2.609

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     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     346.030     191.762     395.612    1191.819       0.290       0.151

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      22.673      21.383     590.408     440.827       0.027       0.315

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     324.329       0.000     324.329    1193.044       0.272       0.241

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      21.519     591.622       0.000       0.060       0.039       0.237

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4         PR4       Texit        Del T       Ns        Ns nondim
       0.872      22.654       1.059     600.402      11.248     274.050       2.124

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   70096.836       0.409     410.208  965389.438

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     483289.97   2828.2209    101.1634      1.4996      0.8301     11.9532      1.1484


*********************************************************************
**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70%  Stat 2 35% Ice Block 8-31-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  0.974

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      99.590    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   45.26799

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      97.289    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   76612.523   78144.609       2.935     831.557     283.327     619.754       2.187

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   225.65    -0.08   225.65     0.20   473.93
  MEAN    17.06     0.00    -0.02   225.65    -0.08   225.65     0.20
  HUB     12.51     0.00    -0.02   225.65    -0.08   225.65     0.20

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.63    50.47    14.16   475.82   526.69    14.68   518.56     0.47
  MEAN    60.17    47.20    12.97   393.48   453.66    14.68   518.56     0.41
  HUB     51.98    38.62    13.36   288.54   366.36    14.68   518.56     0.33

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   435.23   312.31   303.13  1130.27     0.39
  MEAN    18.04   445.67   323.03   307.05  1127.02     0.40
  HUB     15.00   490.16   377.28   312.92  1122.64     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   344.42   163.51     0.30  6444.60
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 MEAN   415.99   320.81    92.97     0.28  5827.45     1.61
 HUB    345.97   314.49    31.31     0.28  5660.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.36     1.15    15.67   546.69     1.05   530.87     0.92     0.89
 MEAN    17.14     1.13    15.38   544.40     1.04   527.81     0.92     0.89
 HUB     17.08     1.13    14.98   543.78     1.04   523.71     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.85    28.34    24.20     4.14     0.93     0.45     2.90
 MEAN    46.45    16.84    12.70     4.14     0.94     0.40     3.51     0.89
 HUB     50.33    -5.71    -9.30     3.59     0.94     0.26     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     450.367     322.399     314.466    1127.234       0.400      -0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.173      15.382     528.016      24.000      45.714      35.400     -10.314

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     333.499     322.399     463.856    1135.372       0.294       0.430

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.136      16.138     535.667     528.796       0.030       0.549

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     310.718       0.000     310.718    1136.670       0.273       0.441

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.197     536.893       0.000       0.060       0.070       0.462

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.838      17.061       1.129     544.957      22.147     180.126       1.396

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 137884.031       0.609     775.997  948857.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  0.979

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     99.590    2643.000      17.061     544.957       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     87.951    2578.542       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.305     590.487     256.136     474.134       1.851

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   297.32    -0.10   297.32     0.26   462.40
 MEAN    18.08     0.00    -0.02   297.32    -0.10   297.32     0.26
 HUB     15.21     0.00    -0.02   297.32    -0.10   297.32     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.91    46.36    11.55   473.98   559.60    16.27   537.57     0.49
 MEAN    54.52    42.30    12.22   416.97   512.20    16.27   537.57     0.45
 HUB     49.73    37.84    11.89   350.81   459.93    16.27   537.57     0.40
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      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   400.27   253.27   309.95  1151.20     0.35
MEAN    18.01   403.58   254.92   312.88  1148.72     0.35
HUB     15.22   431.99   294.32   316.22  1146.21     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    470.98   378.77   217.71     0.33  5173.78
MEAN   415.39   351.63   160.47     0.31  4592.94     1.60
HUB    351.11   321.28    56.80     0.28  4481.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.01     1.11    17.48   564.12     1.04   550.74     0.92     0.90
MEAN    18.78     1.10    17.25   561.97     1.03   548.37     0.92     0.90
HUB     18.74     1.10    16.99   561.56     1.03   545.97     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.25    35.08    31.50     3.58     0.93     0.40     2.90
MEAN    39.17    27.15    23.50     3.65     0.94     0.39     3.30     0.90
HUB     42.95    10.18     6.50     3.68     0.94     0.38     3.92


   blockage3   Cor/U1    Cor/Incid
      0.600       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     610.277     255.635     554.156    1130.856       0.540      -1.124

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.829      15.441     531.447      46.000      24.764      30.600       5.836

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     564.741     255.635     619.904    1135.600       0.497      -0.850

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.600      18.801      15.874     535.915     317.610       0.028       0.230

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     555.517       0.000     555.517    1136.514       0.489       0.308

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600      15.936     536.778       0.000       0.060       0.048      -0.811

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      18.768       1.100     562.550      17.593     207.024       1.605

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 109560.031       0.494     616.593  863694.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  0.872

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2643.000      18.768     562.550       1.000       1.000       0.630
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.233    2537.902       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       1.482     350.665     236.576     271.233       1.146

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   498.71    -0.17   498.71     0.44   444.48
MEAN    17.74     0.00    -0.02   498.71    -0.17   498.71     0.44
HUB     15.05     0.00    -0.02   498.71    -0.17   498.71     0.44

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     42.88    46.36    -3.48   462.91   680.55    16.46   541.78     0.60
MEAN    39.38    43.40    -4.02   409.13   645.16    16.46   541.78     0.57
HUB     34.85    38.84    -3.99   347.12   607.72    16.46   541.78     0.53

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   380.76   207.15   319.47  1166.65     0.33
MEAN    17.51   387.39   216.45   321.27  1165.00     0.33
HUB     14.85   418.40   265.12   323.68  1163.41     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    456.91   405.51   249.75     0.35  4107.15
MEAN   403.78   371.90   187.33     0.32  3792.39     1.84
HUB    342.51   332.80    77.39     0.29  3939.56

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.22     1.08    18.78   577.76     1.03   565.65     0.92     0.80
MEAN    20.10     1.07    18.62   576.59     1.02   564.06     0.92     0.80
HUB     20.16     1.07    18.43   577.14     1.03   562.52     0.92     0.80

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.96    38.02    31.50     6.52     0.93     0.46     2.90
MEAN    33.97    30.25    23.50     6.75     0.88     0.47     3.28     0.80
HUB     39.32    13.45     6.50     6.95     0.88     0.51     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.872

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     391.465     217.873     325.233    1165.318       0.336       0.005

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.145      18.629     564.368      46.000      33.818      31.500      -2.318

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     336.112     217.873     400.549    1168.785       0.288       0.260

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.139      19.014     567.731     471.992       0.014       0.353

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    17.121     326.516       0.000     326.516    1169.332       0.279       0.265

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      19.040     568.261       0.000       0.060       0.038       0.277

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.764      20.101       1.071     577.163      14.614     237.419       1.840

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91032.797       0.436     512.323 1417451.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =12.972   EfDer =  0.998
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
99.590	2643.000	20.101	577.163	1.000	1.000	0.980

W Kg/sec = 45.26799

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
76.827	2505.566	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
76612.523	78144.609	2.294	513.330	223.749	401.059	1.792

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	307.56	-0.11	307.56	0.26	421.11
MEAN	16.97	0.00	-0.02	307.56	-0.11	307.56	0.26	
HUB	14.32	0.00	-0.02	307.56	-0.11	307.56	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.31	46.36	8.95	444.22	540.39	19.16	569.27	0.46
MEAN	51.85	43.80	8.05	391.42	497.88	19.16	569.27	0.43
HUB	47.05	37.84	9.21	330.28	451.39	19.16	569.27	0.39

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	382.14	209.25	319.76	1180.90	0.32
MEAN	16.57	387.56	215.79	321.93	1179.13	0.33
HUB	13.89	416.41	261.09	324.40	1177.34	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	391.68	226.21	0.33	3952.61	
MEAN	382.27	362.43	166.48	0.31	3578.26	1.50
HUB	320.37	329.77	59.28	0.28	3628.00	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.77	1.08	20.25	591.80	1.03	579.61	0.92	0.91
MEAN	21.61	1.08	20.05	590.41	1.02	577.87	0.92	0.91
HUB	21.63	1.08	19.84	590.59	1.02	576.12	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.20	35.28	31.50	3.78	0.93	0.34	2.90	
MEAN	33.83	27.35	23.50	3.85	0.93	0.34	3.29	0.91
HUB	38.83	10.36	6.50	3.86	0.93	0.34	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	383.210	217.003	315.847	1179.952	0.325	0.047

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.655	20.128	578.675	46.000	34.491	32.400	-2.091

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	330.138	217.003	395.071	1183.170	0.279	0.285

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.650	20.509	581.835	456.573	0.013	0.370

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	314.266	0.000	314.266	1184.038	0.265	0.275

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.575	582.689	0.000	0.060	0.038	0.326

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	21.609	1.075	590.934	13.771	235.822	1.828

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
85802.180	0.452	482.886	881057.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =12.972 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
99.590	2643.000	21.609	590.934	1.000	1.000	0.980

W Kg/sec = 45.26799

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
72.311	2476.200	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
76612.523	78144.609	2.420	509.668	210.601	390.276	1.853

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	293.92	-0.10	293.92	0.25	395.86
MEAN	15.91	0.00	-0.02	293.92	-0.10	293.92	0.25	
HUB	13.07	0.00	-0.02	293.92	-0.10	293.92	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.18	47.36	7.82	422.54	514.80	20.70	583.72	0.43
MEAN	51.32	44.80	6.52	367.03	470.29	20.70	583.72	0.40
HUB	45.73	38.84	6.89	301.45	421.10	20.70	583.72	0.36

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	363.22	195.49	306.12	1194.34	0.30
MEAN	15.50	365.79	196.95	308.25	1192.48	0.31
HUB	12.59	388.51	233.39	310.60	1190.61	0.33

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	375.97	218.28	0.31	3509.02	
MEAN	357.44	347.53	160.49	0.29	3053.89	1.49
HUB	290.38	315.79	57.00	0.27	2939.65	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	23.16	1.07	21.72	603.92	1.02	592.91	0.92	0.91
MEAN	22.96	1.06	21.51	602.24	1.02	591.07	0.92	0.91
HUB	22.91	1.06	21.28	601.81	1.02	589.22	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.56	35.49	31.50	3.99	0.93	0.33	2.90	
MEAN	32.58	27.50	23.50	4.00	0.93	0.32	3.34	0.91
HUB	36.92	10.40	6.50	3.90	0.93	0.32	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	369.851	200.563	310.748	1192.654	0.310	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.979	21.495	591.240	46.000	32.839	33.000	0.161

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	328.240	200.563	384.665	1195.097	0.275	0.197

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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.973      21.798     593.665     440.827       0.024       0.351

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     307.816       0.000     307.816    1196.188       0.257       0.282

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.920     594.749       0.000       0.060       0.037       0.277

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      22.954       1.062     602.658      11.724     259.128       2.009

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  73066.594       0.427     411.211  923269.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    497345.66   2799.0107     97.2890      1.5194      0.8344     12.9716      1.1527


********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
********************************************************************

   Fan-Core + 4 Stage LPC 70%  Stat 2 35% Ice Block 8-31-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =13.992   EfDer =  0.966

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     95.675    2643.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   43.48865

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.465    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73601.117   75072.977       3.055     831.557     272.190     619.754       2.277

     ROTOR LEADING EDGE CONDITIONS, STAGE           1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   216.43    -0.07   216.43     0.19   473.93
 MEAN    17.06     0.00    -0.02   216.43    -0.07   216.43     0.19
 HUB     12.51     0.00    -0.02   216.43    -0.07   216.43     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     65.54    50.47    15.07   475.82   522.80    14.72   518.90     0.47
 MEAN    61.19    47.20    13.99   393.48   449.14    14.72   518.90     0.40
 HUB     53.13    38.62    14.51   288.54   360.75    14.72   518.90     0.32

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   431.41   318.88   290.57  1131.10     0.38
 MEAN    18.04   439.74   326.68   294.36  1127.75     0.39
 HUB     15.00   480.83   375.82   299.92  1123.36     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    475.82   330.24   156.94     0.29  6580.11
 MEAN   415.99   307.61    89.31     0.27  5893.31     1.67
 HUB    345.97   301.40    29.85     0.27  5638.27
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	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.39	1.15	15.73	547.19	1.05	531.65	0.92	0.88
MEAN	17.14	1.13	15.44	544.65	1.04	528.49	0.92	0.88
HUB	17.05	1.13	15.03	543.70	1.04	524.39	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	47.66	28.37	24.20	4.17	0.93	0.47	2.90	
MEAN	47.98	16.88	12.70	4.18	0.95	0.42	3.51	0.88
HUB	51.41	-5.68	-9.30	3.62	0.95	0.28	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.966

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	444.048	326.047	301.449	1127.974	0.394	0.000

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.178	15.435	528.709	24.000	47.245	35.400	-11.845

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	319.366	326.047	456.401	1136.423	0.281	0.457

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.136	16.220	536.660	528.796	0.034	0.574

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	297.866	0.000	297.866	1137.596	0.262	0.458

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.258	537.768	0.000	0.060	0.080	0.478

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.826	17.053	1.129	545.179	22.369	175.094	1.357

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
139263.422	0.615	752.953	910072.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =13.992 EfDer = 0.971

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
95.675	2643.000	17.053	545.179	1.000	1.000	0.980

W Kg/sec = 43.48865

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
84.553	2578.018	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73601.117	75072.977	2.398	590.487	246.239	474.134	1.926

ROTOR LEADING EDGE CONDITIONS, STAGE 2

R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP 20.55	0.00	-0.02	285.10	-0.10	285.10	0.25	462.31
MEAN 18.08	0.00	-0.02	285.10	-0.10	285.10	0.25	
HUB 15.21	0.00	-0.02	285.10	-0.10	285.10	0.25	

BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP 58.98	46.36	12.62	473.98	553.20	16.32	538.39	0.49
MEAN 55.64	42.30	13.34	416.97	505.20	16.32	538.39	0.44
HUB 50.91	37.84	13.07	350.81	452.13	16.32	538.39	0.40

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   396.28   262.17   297.16  1152.41     0.34
MEAN    18.01   397.98   261.44   300.06  1149.80     0.35
HUB     15.22   424.26   296.58   303.37  1147.15     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    470.98   363.19   208.80     0.32  5355.61
MEAN   415.39   337.25   153.95     0.29  4710.38     1.65
HUB    351.11   308.23    54.53     0.27  4516.33

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.06     1.12    17.56   565.02     1.04   551.90     0.92     0.89
MEAN    18.81     1.10    17.31   562.63     1.03   549.40     0.92     0.89
HUB     18.73     1.10    17.04   561.91     1.03   546.88     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.42    35.09    31.50     3.59     0.93     0.42     2.90
MEAN    41.07    27.16    23.50     3.66     0.94     0.41     3.30     0.89
HUB     44.35    10.19     6.50     3.69     0.94     0.40     3.92


   blockage3   Cor/U1    Cor/Incid
      0.600       1.000       0.971

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     588.605     262.178     526.990    1133.833       0.519      -1.041

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.848      15.681     534.251      46.000      26.450      30.600       4.150

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     535.662     262.178     596.382    1139.095       0.470      -0.720

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.600      18.827      16.177     539.221     317.610       0.024       0.254

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     527.085       0.000     527.085    1139.899       0.462       0.353

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600      16.232     539.983       0.000       0.060       0.042      -0.685

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      18.797       1.102     563.183      18.005     199.237       1.544

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 112125.727       0.505     606.228  827207.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.992   EfDer =  0.902

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     95.675    2643.000      18.797     563.183       1.000       1.000       0.630
W Kg/sec =   43.48865

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.963    2536.474       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73601.117   75072.977       1.544     350.665     227.052     271.233       1.195

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   474.56    -0.16   474.56     0.41   444.23
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MEAN    17.74     0.00    -0.02   474.56    -0.16   474.56     0.41
HUB     15.05     0.00    -0.02   474.56    -0.16   474.56     0.41

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     44.30    46.36    -2.06   462.91   663.06    16.70   544.38     0.58
MEAN    40.78    43.40    -2.62   409.13   626.68    16.70   544.38     0.55
HUB     36.20    38.84    -2.64   347.12   588.06    16.70   544.38     0.51

     ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   375.46   219.49   304.63  1168.57     0.32
MEAN    17.51   380.70   225.69   306.58  1166.72     0.33
HUB     14.85   409.83   269.20   309.01  1164.91     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    456.91   386.22   237.42     0.33  4351.30
MEAN   403.78   354.56   178.09     0.30  3953.94     1.88
HUB    342.51   317.59    73.31     0.27  4000.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.39     1.08    18.98   579.30     1.03   567.53     0.92     0.83
MEAN    20.24     1.08    18.80   577.82     1.03   565.72     0.92     0.83
HUB     20.26     1.08    18.60   578.00     1.03   563.97     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.77    37.93    31.50     6.43     0.93     0.47     2.90
MEAN    36.36    30.15    23.50     6.65     0.89     0.49     3.28     0.83
HUB     41.06    13.35     6.50     6.85     0.89     0.52     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.902

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     384.590     227.170     310.328    1167.022       0.330       0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.283      18.812     566.022      46.000      36.205      31.500      -4.705

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     320.160     227.170     392.567    1170.924       0.273       0.302

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.274      19.247     569.814     471.992       0.016       0.389

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     311.169       0.000     311.169    1171.411       0.266       0.299

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.262     570.288       0.000       0.060       0.044       0.311

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.790      20.231       1.076     578.372      15.189     224.988       1.744

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94617.664       0.453     511.568 1348283.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =13.992   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     95.675    2643.000      20.231     578.372       1.000       1.000       0.980
W Kg/sec =   43.48865
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
73.406	2502.946	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73601.117	75072.977	2.401	513.330	213.789	401.059	1.876

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	293.23	-0.10	293.23	0.25	420.67
MEAN	16.97	0.00	-0.02	293.23	-0.10	293.23	0.25	
HUB	14.32	0.00	-0.02	293.23	-0.10	293.23	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.58	46.36	10.22	444.22	532.36	19.37	571.19	0.45
MEAN	53.17	43.80	9.37	391.42	489.16	19.37	571.19	0.42
HUB	48.41	37.84	10.57	330.28	441.75	19.37	571.19	0.38

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	375.79	220.16	304.54	1183.31	0.32
MEAN	16.57	379.72	223.78	306.78	1181.37	0.32
HUB	13.89	406.65	264.00	309.30	1179.41	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	372.96	215.29	0.32	4158.64	
MEAN	382.27	345.30	158.49	0.29	3710.53	1.55
HUB	320.37	314.39	56.36	0.27	3668.46	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.99	1.09	20.51	593.77	1.03	581.98	0.92	0.91
MEAN	21.80	1.08	20.29	592.11	1.02	580.07	0.92	0.91
HUB	21.78	1.08	20.06	591.95	1.02	578.15	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.86	35.26	31.50	3.76	0.93	0.37	2.90	
MEAN	36.11	27.32	23.50	3.82	0.93	0.36	3.29	0.91
HUB	40.48	10.33	6.50	3.83	0.93	0.36	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.994

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	375.861	225.033	301.051	1182.131	0.318	0.045

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.841	20.362	580.817	46.000	36.778	32.400	-4.378

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	314.192	225.033	386.467	1185.740	0.265	0.323

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.834	20.793	584.369	456.573	0.015	0.405

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	299.259	0.000	299.259	1186.516	0.252	0.307

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.845	585.134	0.000	0.060	0.043	0.356

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.873	21.789	1.077	592.610	14.238	224.571	1.741

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  88714.586       0.468     479.652  842407.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.992   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     95.675    2643.000      21.789     592.610       1.000       1.000       0.980
W Kg/sec =   43.48865

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     68.992    2472.696       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73601.117   75072.977       2.536     509.668     200.937     390.276       1.942

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   280.01    -0.10   280.01     0.24   395.30
 MEAN    15.91     0.00    -0.02   280.01    -0.10   280.01     0.24
 HUB     13.07     0.00    -0.02   280.01    -0.10   280.01     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.47    47.36     9.11   422.54   506.98    20.96   586.07     0.43
 MEAN    52.67    44.80     7.87   367.03   461.72    20.96   586.07     0.39
 HUB     47.12    38.84     8.28   301.45   411.51    20.96   586.07     0.35

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   356.94   206.32   291.27  1197.12     0.30
 MEAN    15.50   357.89   204.88   293.45  1195.10     0.30
 HUB     12.59   378.61   236.27   295.84  1193.07     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   357.60   207.46     0.30  3703.10
 MEAN   357.44   330.74   152.57     0.28  3176.67     1.54
 HUB    290.38   300.75    54.11     0.25  2975.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     23.44     1.08    22.04   606.32     1.02   595.68     0.92     0.91
 MEAN    23.20     1.06    21.80   604.37     1.02   593.68     0.92     0.91
 HUB     23.11     1.06    21.55   603.62     1.02   591.66     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.31    35.46    31.50     3.96     0.93     0.36     2.90
 MEAN    34.92    27.47    23.50     3.97     0.93     0.35     3.34     0.91
 HUB     38.61    10.37     6.50     3.87     0.93     0.34     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     362.001     208.636     295.831    1195.259       0.303      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     23.220      21.787     593.831      46.000      35.194      33.000      -2.194

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     311.996     208.636     375.327    1198.087       0.260       0.239

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      23.213      22.142     596.644     440.827       0.025       0.386
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     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     292.737       0.000     292.737    1199.062       0.244       0.318

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      22.250     597.616       0.000       0.060       0.038       0.313

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.880      23.193       1.064     604.769      12.159     246.094       1.908

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   75782.102       0.443     409.730  882534.688

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     510503.50   2760.1304     93.4649      1.5353      0.8343     13.9922      1.1568


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70%  Stat 2 35% Ice Block 8-31-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =14.493   EfDer =  0.963

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      93.776    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   42.62537

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      91.610    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   72140.094   73582.742       3.117     831.557     266.787     619.754       2.323

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   211.97    -0.07   211.97     0.19   473.93
  MEAN    17.06     0.00    -0.02   211.97    -0.07   211.97     0.19
  HUB     12.51     0.00    -0.02   211.97    -0.07   211.97     0.19

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     65.99    50.47    15.52   475.82   520.97    14.73   519.06     0.47
  MEAN    61.69    47.20    14.49   393.48   447.01    14.73   519.06     0.40
  HUB     53.70    38.62    15.08   288.54   358.09    14.73   519.06     0.32

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   429.72   322.03   284.52  1131.49     0.38
  MEAN    18.04   436.98   328.42   288.25  1128.09     0.39
  HUB     15.00   476.39   375.12   293.66  1123.70     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   323.43   153.79     0.29  6644.93
  MEAN   415.99   301.26    87.57     0.27  5924.67     1.70
  HUB    345.97   295.10    29.15     0.26  5627.71

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.41     1.15    15.76   547.43     1.05   532.01     0.92     0.88
  MEAN    17.15     1.14    15.46   544.76     1.04   528.81     0.92     0.88
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 HUB     17.04     1.13    15.06   543.66     1.04   524.71     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.54    28.39    24.20     4.19     0.93     0.49     2.90
 MEAN    48.73    16.90    12.70     4.20     0.95     0.43     3.51     0.88
 HUB     51.94    -5.67    -9.30     3.63     0.95     0.30     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.963

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     441.109     327.784     295.186    1128.319       0.391       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.180      15.460     529.033      24.000      47.995      35.400     -12.595

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     312.582     327.784     452.935    1136.914       0.275       0.470

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.135      16.257     537.124     528.796       0.035       0.587

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     291.686       0.000     291.686    1138.030       0.256       0.465

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.285     538.178       0.000       0.060       0.085       0.486

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.820      17.048       1.128     545.284      22.474     172.669       1.339

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 139922.344       0.618     741.498  891325.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =14.493   EfDer =  0.967

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     93.776    2643.000      17.048     545.284       1.000       1.000       0.980
W Kg/sec =   42.62537

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     82.908    2577.768       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  72140.094   73582.742       2.446     590.487     241.448     474.134       1.964

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   279.22    -0.10   279.22     0.25   462.26
 MEAN    18.08     0.00    -0.02   279.22    -0.10   279.22     0.25
 HUB     15.21     0.00    -0.02   279.22    -0.10   279.22     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.50    46.36    13.14   473.98   550.19    16.35   538.77     0.48
 MEAN    56.20    42.30    13.90   416.97   501.90    16.35   538.77     0.44
 HUB     51.49    37.84    13.65   350.81   448.44    16.35   538.77     0.39

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   394.57   266.42   291.04  1152.97     0.34
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 MEAN    18.01   395.44   264.56   293.91  1150.30     0.34
 HUB     15.22   420.63   297.66   297.20  1147.60     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   355.73   204.55     0.31  5442.35
 MEAN   415.39   330.36   150.83     0.29  4766.38     1.67
 HUB    351.11   301.96    53.45     0.26  4532.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.07     1.12    17.59   565.44     1.04   552.44     0.92     0.88
 MEAN    18.81     1.10    17.33   562.94     1.03   549.88     0.92     0.88
 HUB     18.72     1.10    17.06   562.07     1.03   547.30     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.47    35.10    31.50     3.60     0.93     0.44     2.90
 MEAN    41.99    27.17    23.50     3.67     0.95     0.42     3.30     0.88
 HUB     45.04    10.20     6.50     3.70     0.95     0.41     3.92


  blockage3   Cor/U1    Cor/Incid
     0.600       1.000       0.967

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     578.663     265.299     514.264    1135.180       0.510       -1.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.855      15.787     535.522      46.000      27.288      30.600       3.312

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     522.138     265.299     585.672    1140.674       0.458       -0.659

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.600      18.836      16.312     540.719     317.610       0.022       0.265

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     513.854       0.000     513.854    1141.430       0.450       0.373

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.600      16.363     541.435       0.000       0.060       0.040       -0.626

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.856      18.808       1.103     563.486      18.201     195.573       1.516

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 113349.656       0.511     600.680  809628.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =14.493   EfDer =  0.916

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     93.776    2643.000      18.808     563.486       1.000       1.000       0.630
W Kg/sec =   42.62537

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     76.393    2535.794       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  72140.094   73582.742       1.576     350.665     222.480     271.233       1.219

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   463.23    -0.16   463.23     0.40   444.12
 MEAN    17.74     0.00    -0.02   463.23    -0.16   463.23     0.40
 HUB     15.05     0.00    -0.02   463.23    -0.16   463.23     0.40
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     44.99     46.36    -1.37   462.91   654.99    16.80   545.57     0.57
MEAN    41.46     43.40    -1.94   409.13   618.14    16.80   545.57     0.54
HUB     36.86     38.84    -1.98   347.12   578.95    16.80   545.57     0.51

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   373.27   225.31   297.59  1169.46     0.32
MEAN    17.51   377.76   230.08   299.62  1167.51     0.32
HUB     14.85   405.92   271.16   302.06  1165.60     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    456.91   377.09   231.59     0.32  4466.68
MEAN   403.78   346.33   173.70     0.30  4030.68     1.90
HUB    342.51   310.37    71.34     0.27  4029.20

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.47     1.09    19.07   580.03     1.03   568.39     0.92     0.84
MEAN    20.30     1.08    18.88   578.41     1.03   566.50     0.92     0.84
HUB     20.30     1.08    18.67   578.41     1.03   564.65     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.13    37.89    31.50     6.39     0.93     0.48     2.90
MEAN    37.52    30.10    23.50     6.60     0.89     0.50     3.28     0.84
HUB     41.91    13.29     6.50     6.79     0.89     0.52     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.916

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     381.574     231.587     303.260    1167.813       0.327       0.007

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.345      18.893     566.791      46.000      37.367      31.500      -5.867

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     312.622     231.587     389.057    1171.923       0.267       0.321

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.335      19.353     570.787     471.992       0.017       0.407

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     303.931       0.000     303.931    1172.382       0.259       0.315

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      19.361     571.235       0.000       0.060       0.048       0.327

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.800      20.289       1.079     578.948      15.462     219.334       1.700

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96319.016       0.461     510.429 1315592.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =14.493   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     93.776    2643.000      20.289     578.948       1.000       1.000       0.980
W Kg/sec =   42.62537

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     71.782    2501.702       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
72140.094	73582.742	2.455	513.330	209.058	401.059	1.918

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	286.47	-0.10	286.47	0.24	420.46
MEAN	16.97	0.00	-0.02	286.47	-0.10	286.47	0.24	
HUB	14.32	0.00	-0.02	286.47	-0.10	286.47	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.19	46.36	10.83	444.22	528.66	19.46	572.10	0.45
MEAN	53.81	43.80	10.01	391.42	485.13	19.46	572.10	0.41
HUB	49.07	37.84	11.23	330.28	437.28	19.46	572.10	0.37

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	373.09	225.27	297.41	1184.43	0.31
MEAN	16.57	376.24	227.51	299.66	1182.41	0.32
HUB	13.89	402.15	265.34	302.19	1180.38	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	364.19	210.19	0.31	4254.96	
MEAN	382.27	337.26	154.76	0.29	3772.40	1.57
HUB	320.37	307.16	55.02	0.26	3687.03	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.09	1.09	20.62	594.70	1.03	583.08	0.92	0.91
MEAN	21.88	1.08	20.40	592.91	1.02	581.10	0.92	0.91
HUB	21.84	1.08	20.16	592.60	1.02	579.10	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.14	35.25	31.50	3.75	0.93	0.38	2.90	
MEAN	37.21	27.31	23.50	3.81	0.94	0.38	3.29	0.91
HUB	41.29	10.32	6.50	3.82	0.94	0.37	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.991

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	372.609	228.789	294.097	1183.143	0.315	0.044

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.923	20.465	581.813	46.000	37.881	32.400	-5.481

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	306.724	228.789	382.654	1186.936	0.258	0.341

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.914	20.918	585.550	456.573	0.016	0.422

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	292.239	0.000	292.239	1187.670	0.246	0.322

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.963	586.274	0.000	0.060	0.047	0.370

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.869	21.866	1.078	593.404	14.456	219.449	1.701

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
90073.961	0.475	477.334	823876.312

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =14.493   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     93.776    2643.000      21.866     593.404       1.000       1.000       0.980
W Kg/sec =   42.62537

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     67.431    2471.042       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 72140.094   73582.742       2.595     509.668     196.390     390.276       1.987

    ROTOR LEADING EDGE CONDITIONS, STAGE           5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   273.50    -0.09   273.50     0.23   395.04
MEAN    15.91     0.00    -0.02   273.50    -0.09   273.50     0.23
HUB     13.07     0.00    -0.02   273.50    -0.09   273.50     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.09    47.36     9.73   422.54   503.41    21.07   587.16     0.42
MEAN    53.31    44.80     8.51   367.03   457.80    21.07   587.16     0.39
HUB     47.79    38.84     8.95   301.45   407.10    21.07   587.16     0.34

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   354.29   211.32   284.37  1198.40     0.30
MEAN    15.50   354.42   208.56   286.56  1196.32     0.30
HUB     12.59   374.10   237.62   288.95  1194.22     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.78   349.08   202.46     0.29  3792.81
MEAN   357.44   322.93   148.89     0.27  3233.63     1.56
HUB    290.38   293.73    52.77     0.25  2992.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     23.56     1.08    22.17   607.44     1.02   596.96     0.92     0.91
MEAN    23.30     1.07    21.92   605.37     1.02   594.89     0.92     0.91
HUB     23.19     1.06    21.67   604.48     1.02   592.80     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     36.62    35.45    31.50     3.95     0.93     0.38     2.90
MEAN    36.05    27.46    23.50     3.96     0.93     0.36     3.34     0.91
HUB     39.43    10.35     6.50     3.85     0.93     0.35     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     358.552     212.381     288.883    1196.466       0.300      -0.008

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    23.323      21.912     595.034      46.000      36.323      33.000      -3.323

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     304.467     212.381     371.222    1199.471       0.254       0.259

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      23.314      22.291     598.027     440.827       0.026       0.403

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     14.701     285.747       0.000     285.747    1200.395       0.238       0.335

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      22.392     598.949       0.000       0.060       0.040       0.329

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      23.293       1.065     605.764      12.361     240.231       1.862

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  77039.766       0.450     408.261  863022.938

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     516704.75   2738.2029     91.6096      1.5419      0.8331     14.4928      1.1587


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 70%  Stat 2 40% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 7.782   EfDer =  0.999

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    120.486    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   54.76639

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    117.703    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92687.805   94541.367       2.426     831.557     342.776     619.754       1.808

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   275.77    -0.09   275.77     0.25   473.93
  MEAN    17.06     0.00    -0.02   275.77    -0.09   275.77     0.25
  HUB     12.51     0.00    -0.02   275.77    -0.09   275.77     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.91    50.47     9.44   475.82   550.04    14.48   516.46     0.49
  MEAN    54.98    47.20     7.78   393.48   480.58    14.48   516.46     0.43
  HUB     46.31    38.62     7.69   288.54   399.20    14.48   516.46     0.36

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   463.60   274.47   373.62  1124.92     0.41
  MEAN    18.04   483.42   301.72   377.71  1122.37     0.43
  HUB     15.00   544.40   384.64   385.26  1118.05     0.49

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   424.42   201.35     0.38  5664.29
  MEAN   415.99   394.61   114.27     0.35  5443.45     1.37
  HUB    345.97   387.20    38.67     0.35  5770.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.13     1.13    15.24   543.80     1.04   525.85     0.92     0.91
  MEAN    17.05     1.13    15.00   542.98     1.04   523.46     0.92     0.91
  HUB     17.17     1.14    14.60   544.19     1.04   519.44     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.30    28.32    24.20     4.12     0.93     0.31     2.90
 MEAN    38.62    16.83    12.70     4.13     0.93     0.27     3.51     0.91
 HUB     44.95    -5.73    -9.30     3.57     0.93     0.14     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     490.433     301.134     387.095    1122.474       0.437      -0.006

     Pt3          Ps3         Ts3          Vane No.     Alpha3     Vane A3      Incid3
     17.094      14.990     523.566       24.000      37.881      35.400      -2.481

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     413.494     301.134     511.526    1128.684       0.366       0.284

   BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.950      17.076       15.562     529.375     528.796       0.018       0.424

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     383.131       0.000     383.131    1130.835       0.339       0.341

   Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.729     531.395        0.000       0.060       0.039       0.361

    STAGE EXIT CONDITIONS, STAGE             1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.877      17.032        1.127     543.656      20.846     208.379       1.615

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 129781.750       0.573     883.655 1159592.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 7.782   EfDer =  1.000

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    120.486    2643.000       17.032     543.656       1.000        1.000        0.980
W Kg/sec =   54.76639

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
    106.464    2581.626        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  92687.805   94541.367        1.904     590.487     310.050     474.134       1.529

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55      0.00    -0.02   365.92    -0.13   365.92     0.32   462.96
 MEAN    18.08      0.00    -0.02   365.92    -0.13   365.92     0.32
 HUB     15.21      0.00    -0.02   365.92    -0.13   365.92     0.32

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     52.34     46.36     5.98   473.98   598.89     15.84   532.47     0.53
 MEAN    48.74     42.30     6.44   416.97   554.85     15.84   532.47     0.49
 HUB     43.80     37.84     5.96   350.81   507.00     15.84   532.47     0.45

     ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     20.42   433.17   200.61   383.92  1143.27      0.38
 MEAN    18.01   442.87   216.55   386.32  1141.76      0.39
 HUB     15.22   479.79   280.54   389.22  1140.21      0.42
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   469.57   270.37     0.41  4098.98
 MEAN   415.39   434.49   198.84     0.38  3902.27     1.38
 HUB    351.11   395.56    70.57     0.35  4272.64

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.60     1.09    16.84   558.84     1.03   543.17     0.92     0.91
 MEAN    18.52     1.09    16.69   558.11     1.03   541.73     0.92     0.91
 HUB     18.67     1.10    16.52   559.48     1.03   540.26     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.59    35.15    31.50     3.65     0.93     0.27     2.90
 MEAN    29.27    27.24    23.50     3.74     0.93     0.28     3.30     0.91
 HUB     35.78    10.28     6.50     3.78     0.93     0.29     3.92


   blockage3   Cor/U1    Cor/Incid
      0.550       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     932.216     217.154     906.571    1081.834       0.862      -2.754

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.576      11.436     486.252      46.000      13.470      30.600      17.130

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960    1019.097     217.154    1041.976    1066.996       0.955      -3.384

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.550      18.393      10.225     472.238     289.961       0.106      -0.032

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823    1034.292       0.000    1034.292    1066.328       0.970      -0.859

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.550       9.796     469.956       0.000       0.060       0.353      -3.609

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.527      17.921       1.052     558.810      15.155     256.860       1.991

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94375.641       0.425     642.583 1065546.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.782   EfDer =  0.972

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    120.486    2643.000      17.921     558.810       1.000       1.000       0.580
W Kg/sec =   54.76639

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.581    2546.380       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  92687.805   94541.367       1.081     322.834     298.749     248.585       0.832

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   794.39    -0.27   794.39     0.72   445.97
 MEAN    17.74     0.00    -0.02   794.39    -0.27   794.39     0.72
 HUB     15.05     0.00    -0.02   794.39    -0.27   794.39     0.72

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     30.24    46.36   -16.12   462.91   919.56    12.69   506.12     0.83
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 MEAN    27.27    43.40   -16.13   409.13   893.68    12.69   506.12     0.81
 HUB     23.62    38.84   -15.22   347.12   867.03    12.69   506.12     0.79

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   430.66   113.34   415.47  1152.12     0.37
 MEAN    17.51   439.52   144.84   414.97  1152.57     0.38
 HUB     14.85   473.53   228.50   414.75  1153.17     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   539.12   343.56     0.47  2250.83
 MEAN   403.78   489.13   258.94     0.42  2540.42     1.89
 HUB    342.51   430.14   114.01     0.37  3397.38

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.76     1.05    17.04   567.15     1.01   551.66     0.92     0.89
 MEAN    18.88     1.05    17.07   568.22     1.02   552.09     0.92     0.89
 HUB     19.20     1.07    17.10   571.39     1.02   552.67     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.26    39.59    31.50     8.09     0.93     0.43     2.90
 MEAN    19.24    31.96    23.50     8.46     0.81     0.48     3.28     0.89
 HUB     28.85    15.37     6.50     8.87     0.81     0.54     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.972

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     444.617     145.786     420.036    1152.898       0.386       0.006

     Pt3          Ps3         Ts3          Vane No.     Alpha3     Vane A3      Incid3
     18.929      17.082     552.414       46.000      19.141      31.500      12.359

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth         Cmth          Aoth          Machth      cp 2-Th
     17.392     440.949     145.786     464.423    1153.181       0.382       0.001

   BlockageThr  PtTh        PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.950      18.884      17.070     552.685     471.992       0.034       0.145

    VANED DIFFUSER EXIT:
   R4           C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     428.948       0.000     428.948    1154.090       0.372      -0.001

   Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.080     553.557       0.000       0.060       0.083       0.006

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.757      18.792       1.049     568.919      10.109     379.083       2.939

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  62963.531       0.302     428.705 2181172.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.782   EfDer =  0.956

    W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     120.486    2643.000      18.792     568.919       1.000       1.000       0.980
W Kg/sec =   54.76639

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
      98.707    2523.656       1.402       0.249      53.349      56.000       0.050

    CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
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 92687.805   94541.367       1.786     513.330     287.472     401.059       1.395

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   402.49    -0.14   402.49     0.35   424.15
MEAN    16.97     0.00    -0.02   402.49    -0.14   402.49     0.35
HUB     14.32     0.00    -0.02   402.49    -0.14   402.49     0.35

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     47.83    46.36     1.47   444.22   599.55    17.28   555.39     0.52
MEAN    44.21    43.80     0.41   391.42   561.53    17.28   555.39     0.49
HUB     39.38    37.84     1.54   330.28   520.75    17.28   555.39     0.45

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   445.56   132.31   425.46  1162.43     0.38
MEAN    16.57   454.95   159.94   425.91  1162.28     0.39
HUB     13.89   490.15   240.41   427.14  1162.05     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   522.42   303.15     0.45  2500.63
MEAN   382.27   480.44   222.32     0.41  2653.25     1.25
HUB    320.37   434.56    79.95     0.37  3341.32

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.74     1.05    17.84   578.18     1.02   561.61     0.92     0.87
MEAN    19.80     1.05    17.81   578.74     1.02   561.46     0.92     0.87
HUB     20.07     1.07    17.76   581.29     1.02   561.24     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     17.27    35.47    31.50     3.97     0.93     0.17     2.90
MEAN    20.58    27.56    23.50     4.06     0.90     0.19     3.29     0.87
HUB     29.37    10.60     6.50     4.10     0.90     0.22     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.956

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     447.154     160.844     417.224    1163.566       0.384       0.054

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.850      17.926     562.712      46.000      21.082      32.400      11.318

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     442.221     160.844     470.564    1163.944       0.380       0.060

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.806      17.926     563.079     456.573       0.031       0.180

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     420.827       0.000     420.827    1165.536       0.361       0.042

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.013     564.620       0.000       0.060       0.076       0.102

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.749      19.713       1.049     579.404      10.486     331.003       2.566

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  65320.828       0.344     444.755 1105309.250
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.782   EfDer =  0.921

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    120.486    2643.000      19.713     579.404       1.000       1.000       0.980
W Kg/sec =   54.76639

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.958    2500.716       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 92687.805   94541.367       1.843     509.668     276.561     390.276       1.411

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   391.93    -0.13   391.93     0.34   399.78
MEAN    15.91     0.00    -0.02   391.93    -0.13   391.93     0.34
HUB     13.07     0.00    -0.02   391.93    -0.13   391.93     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     47.16    47.36    -0.20   422.54   576.42    18.23   566.58     0.49
MEAN    43.13    44.80    -1.67   367.03   537.04    18.23   566.58     0.46
HUB     37.58    38.84    -1.26   301.45   494.53    18.23   566.58     0.42

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   431.18   114.87   415.60  1172.61     0.37
MEAN    15.50   438.54   138.41   416.12  1172.38     0.37
HUB     12.59   468.04   211.72   417.42  1172.07     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    413.78   511.93   298.91     0.44  2063.17
MEAN   357.44   470.25   219.04     0.40  2147.13     1.23
HUB    290.38   424.76    78.66     0.36  2667.33

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.49     1.04    18.66   587.04     1.01   571.52     0.92     0.84
MEAN    20.52     1.04    18.63   587.35     1.01   571.30     0.92     0.84
HUB     20.72     1.05    18.56   589.28     1.02   570.99     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     15.45    35.72    31.50     4.22     0.93     0.15     2.90
MEAN    18.40    27.76    23.50     4.26     0.89     0.16     3.34     0.84
HUB     26.89    10.67     6.50     4.17     0.89     0.19     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.921

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     442.805     140.945     419.775    1172.608       0.378       -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.536      18.609     571.526      46.000      18.560      33.000      14.440

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     451.620     140.945     473.103    1171.932       0.385       -0.094

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.422      18.431     570.867     440.827       0.078       0.155

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     421.855       0.000     421.855    1174.158       0.359       0.018
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   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.644     573.038       0.000       0.060       0.097       0.014

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.660      20.386       1.034     587.892       8.488     381.332       2.956

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  52883.074       0.309     360.069 1162332.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    405324.81   2759.7661    117.7028      1.3494      0.7208      7.7821      1.1245


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 70%  Stat 2 40% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 8.212   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    118.688    2643.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   53.94899

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    115.946    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  91304.422   93130.320       2.463     831.557     337.660     619.754       1.835

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   271.39    -0.09   271.39     0.24   473.93
 MEAN    17.06     0.00    -0.02   271.39    -0.09   271.39     0.24
 HUB     12.51     0.00    -0.02   271.39    -0.09   271.39     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.31    50.47     9.84   475.82   547.86    14.50   516.66     0.49
 MEAN    55.41    47.20     8.21   393.48   478.08    14.50   516.66     0.43
 HUB     46.76    38.62     8.14   288.54   396.18    14.50   516.66     0.36

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   460.58   277.93   367.28  1125.45     0.41
 MEAN    18.04   479.74   303.69   371.38  1122.82     0.43
 HUB     15.00   539.39   384.00   378.79  1118.50     0.48

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    475.82   417.20   197.89     0.37  5735.59
 MEAN   415.99   387.99   112.30     0.35  5478.95     1.39
 HUB    345.97   380.70    38.03     0.34  5761.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.15     1.14    15.28   544.06     1.04   526.34     0.92     0.91
 MEAN    17.06     1.13    15.04   543.11     1.04   523.89     0.92     0.91
 HUB     17.16     1.14    14.64   544.16     1.04   519.86     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.12    28.32    24.20     4.12     0.93     0.33     2.90
 MEAN    39.27    16.82    12.70     4.12     0.93     0.28     3.51     0.91
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HUB     45.39    -5.73    -9.30     3.57     0.93     0.15     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     486.533     303.100     380.585    1122.944       0.433      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.104      15.032     524.004      24.000      38.534      35.400      -3.134

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     406.221     303.100     506.839    1129.342       0.360       0.297

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.086      15.623     529.993     528.796       0.019       0.434

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     376.563       0.000     376.563    1131.406       0.333       0.350

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.781     531.932       0.000       0.060       0.040       0.371

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.876      17.040       1.128     543.776      20.966     205.831       1.596

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 130528.820       0.577     875.477 1141185.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.212   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    118.688    2643.000      17.040     543.776       1.000       1.000       0.980
W Kg/sec =   53.94899

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.833    2581.342       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  91304.422   93130.320       1.934     590.487     305.300     474.134       1.553

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   359.72    -0.12   359.72     0.32   462.90
 MEAN    18.08     0.00    -0.02   359.72    -0.12   359.72     0.32
 HUB     15.21     0.00    -0.02   359.72    -0.12   359.72     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.81    46.36     6.45   473.98   595.12    15.89   532.97     0.53
 MEAN    49.22    42.30     6.92   416.97   550.78    15.89   532.97     0.49
 HUB     44.29    37.84     6.45   350.81   502.54    15.89   532.97     0.44

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   429.43   205.54   377.05  1144.07     0.38
 MEAN    18.01   438.76   220.13   379.54  1142.45     0.38
 HUB     15.22   475.15   281.85   382.53  1140.80     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   461.11   265.44     0.40  4199.65
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 MEAN   415.39   426.82   195.26     0.37  3966.80     1.40
 HUB    351.11   388.75    69.26     0.34  4292.47

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.65     1.09    16.92   559.33     1.03   543.93     0.92     0.91
 MEAN    18.56     1.09    16.76   558.47     1.03   542.39     0.92     0.91
 HUB     18.68     1.10    16.58   559.68     1.03   540.82     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.60    35.15    31.50     3.65     0.93     0.28     2.90
 MEAN    30.11    27.22    23.50     3.72     0.93     0.29     3.30     0.91
 HUB     36.38    10.26     6.50     3.76     0.93     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
      0.550       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     893.440     220.749     865.739    1088.683       0.821      -2.559

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.610      11.952     492.501      46.000      14.305      30.600      16.295

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     940.307     220.749     965.871    1080.940       0.870      -2.925

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.550      18.448      11.259     485.350     289.961       0.096       0.028

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     942.186       0.000     942.186    1081.518       0.871      -0.490

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.550      11.033     485.163       0.000       0.060       0.281      -3.046

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.618      18.102       1.062     559.159      15.383     251.831       1.952

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  95798.875       0.432     642.538 1047619.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.212   EfDer =  0.885

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    118.688    2643.000      18.102     559.159       1.000       1.000       0.580
W Kg/sec =   53.94899

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.073    2545.586       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 91304.422   93130.320       1.108     322.834     291.446     248.585       0.853

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   756.89    -0.26   756.89     0.68   445.83
 MEAN    17.74     0.00    -0.02   756.89    -0.26   756.89     0.68
 HUB     15.05     0.00    -0.02   756.89    -0.26   756.89     0.68

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     31.46    46.36   -14.90   462.91   887.36    13.25   511.33     0.80
 MEAN    28.41    43.40   -14.99   409.13   860.52    13.25   511.33     0.78
 HUB     24.65    38.84   -14.19   347.12   832.80    13.25   511.33     0.75
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      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   423.57   123.50   405.17  1153.79     0.37
MEAN    17.51   433.01   152.44   405.29  1153.94     0.38
HUB     14.85   467.91   232.36   406.14  1154.22     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    456.91   524.71   333.41     0.45  2451.82
MEAN   403.78   476.90   251.34     0.41  2673.26     1.87
HUB    342.51   420.81   110.15     0.36  3454.45

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.95     1.05    17.26   568.24     1.02   553.26     0.92     0.81
MEAN    19.02     1.05    17.26   569.06     1.02   553.40     0.92     0.81
HUB     19.30     1.07    17.23   571.95     1.02   553.67     0.92     0.81

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     16.95    39.45    31.50     7.95     0.93     0.43     2.90
MEAN    20.61    31.81    23.50     8.31     0.81     0.47     3.28     0.81
HUB     29.77    15.17     6.50     8.67     0.81     0.53     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.885

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     438.118     153.437     410.371    1154.269       0.380       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.071      17.264     553.723      46.000      20.501      31.500      10.999

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     429.991     153.437     456.547    1154.883       0.372       0.024

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.033      17.294     554.312     471.992       0.030       0.163

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     418.104       0.000     418.104    1155.760       0.362       0.026

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.312     555.154       0.000       0.060       0.074       0.034

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.700      18.952       1.047     569.750      10.591     357.311       2.770

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  65969.289       0.316     442.466 2096866.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.212   EfDer =  0.966

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    118.688    2643.000      18.952     569.750       1.000       1.000       0.980
W Kg/sec =   53.94899

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.482    2521.815       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  91304.422   93130.320       1.827     513.330     280.994     401.059       1.427

     ROTOR LEADING EDGE CONDITIONS, STAGE            4
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```
       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   392.51    -0.14   392.51     0.34   423.84
MEAN    16.97     0.00    -0.02   392.51    -0.14   392.51     0.34
HUB     14.32     0.00    -0.02   392.51    -0.14   392.51     0.34

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     48.55    46.36     2.19   444.22   592.89    17.50   556.89     0.51
MEAN    44.93    43.80     1.13   391.42   554.42    17.50   556.89     0.48
HUB     40.09    37.84     2.25   330.28   513.07    17.50   556.89     0.44

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   437.18   140.75   413.90  1164.54     0.38
MEAN    16.57   446.64   166.01   414.64  1164.17     0.38
HUB     13.89   481.67   242.68   416.07  1163.74     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   508.10   294.71     0.44  2659.96
MEAN   382.27   467.65   216.26     0.40  2753.71     1.27
HUB    320.37   423.26    77.69     0.36  3372.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.98     1.05    18.13   579.60     1.02   563.64     0.92     0.88
MEAN    20.02     1.06    18.08   579.95     1.02   563.29     0.92     0.88
HUB     20.26     1.07    18.01   582.24     1.02   562.87     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     18.78    35.45    31.50     3.95     0.93     0.18     2.90
MEAN    21.82    27.54    23.50     4.04     0.91     0.20     3.29     0.88
HUB     30.25    10.58     6.50     4.08     0.91     0.23     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.966

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     439.217     166.943     406.253    1165.403       0.377       0.054

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.068      18.192     564.490      46.000      22.339      32.400      10.061

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     429.800     166.943     461.083    1166.108       0.369       0.081

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.033      18.236     565.173     456.573       0.028       0.197

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     408.927       0.000     408.927    1167.615       0.350       0.066

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.326     566.634       0.000       0.060       0.069       0.125

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.778      19.950       1.053     580.595      10.845     318.713       2.471

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  67559.906       0.356     453.135 1084317.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.212   EfDer =  0.936
```

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
118.688	2643.000	19.950	580.595	1.000	1.000	0.980

W Kg/sec = 53.94899

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
92.525	2498.152	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
91304.422	93130.320	1.891	509.668	269.475	390.276	1.448

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	381.06	-0.13	381.06	0.33	399.37
MEAN	15.91	0.00	-0.02	381.06	-0.13	381.06	0.33	
HUB	13.07	0.00	-0.02	381.06	-0.13	381.06	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.96	47.36	0.60	422.54	569.09	18.53	568.47	0.49
MEAN	43.94	44.80	-0.86	367.03	529.16	18.53	568.47	0.45
HUB	38.36	38.84	-0.48	301.45	485.96	18.53	568.47	0.42

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	421.72	124.14	403.04	1175.15	0.36
MEAN	15.50	429.11	145.08	403.84	1174.70	0.37
HUB	12.59	458.42	214.18	405.31	1174.17	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	496.31	289.64	0.42	2229.52	
MEAN	357.44	456.28	212.37	0.39	2250.42	1.25
HUB	290.38	412.41	76.20	0.35	2698.29	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.81	1.04	19.04	588.85	1.01	574.00	0.92	0.86
MEAN	20.82	1.04	18.98	588.93	1.01	573.56	0.92	0.86
HUB	20.99	1.05	18.90	590.58	1.02	573.04	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	17.12	35.70	31.50	4.20	0.93	0.17	2.90	
MEAN	19.76	27.74	23.50	4.24	0.90	0.18	3.34	0.86
HUB	27.85	10.65	6.50	4.15	0.90	0.20	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.936

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	433.296	147.736	407.332	1174.921	0.369	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.836	18.966	573.782	46.000	19.935	33.000	13.065

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	437.021	147.736	461.317	1174.644	0.372	-0.064

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.743	18.850	573.511	440.827	0.069	0.172

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	408.475	0.000	408.475	1176.706	0.347	0.044

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.050	575.526	0.000	0.060	0.088	0.041

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    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.704      20.708       1.038     589.453       8.858     364.135       2.823

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   55194.738       0.322     370.200 1139600.750

    OVERALL EXIT CONDITIONS; ALL          5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     415051.62   2783.8154    115.9461      1.3707      0.7424      8.2116      1.1275


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70%  Stat 2 40% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 8.638   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     116.916    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   53.14380

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     114.216    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   89941.703   91740.344       2.500     831.557     332.621     619.754       1.863

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   267.09    -0.09   267.09     0.24   473.93
  MEAN    17.06     0.00    -0.02   267.09    -0.09   267.09     0.24
  HUB     12.51     0.00    -0.02   267.09    -0.09   267.09     0.24

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.70    50.47    10.23   475.82   545.74    14.51   516.85     0.49
  MEAN    55.84    47.20     8.64   393.48   475.65    14.51   516.85     0.43
  HUB     47.22    38.62     8.60   288.54   393.25    14.51   516.85     0.35

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   457.73   281.30   361.08  1125.96     0.41
  MEAN    18.04   476.19   305.58   365.20  1123.26     0.42
  HUB     15.00   534.53   383.39   372.47  1118.93     0.48

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   410.15   194.52     0.36  5805.17
  MEAN   415.99   381.53   110.41     0.34  5513.09     1.40
  HUB    345.97   374.35    37.43     0.33  5752.06

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.18     1.14    15.33   544.32     1.04   526.82     0.92     0.91
  MEAN    17.07     1.13    15.08   543.24     1.04   524.30     0.92     0.91
  HUB     17.16     1.14    14.67   544.12     1.04   520.26     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     37.92    28.31    24.20     4.11     0.93     0.34     2.90
  MEAN    39.92    16.82    12.70     4.12     0.93     0.29     3.51     0.91
  HUB     45.83    -5.74    -9.30     3.56     0.93     0.16     4.78
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     482.767     304.990     374.226    1123.396       0.430      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.114      15.071     524.426      24.000      39.180      35.400      -3.780

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     399.143     304.990     502.329    1129.974       0.353       0.310

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.095      15.680     530.586     528.796       0.019       0.444

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     370.169       0.000     370.169    1131.955       0.327       0.360

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.829     532.448       0.000       0.060       0.041       0.380

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      17.048       1.128     543.893      21.083     203.344       1.576

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 131256.891       0.580     867.221 1123107.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.638   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    116.916    2643.000      17.048     543.893       1.000       1.000       0.980
W Kg/sec =   53.14380

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    103.236    2581.064       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  89941.703   91740.344       1.964     590.487     300.647     474.134       1.577

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   353.67    -0.12   353.67     0.31   462.86
 MEAN    18.08     0.00    -0.02   353.67    -0.12   353.67     0.31
 HUB     15.21     0.00    -0.02   353.67    -0.12   353.67     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.28    46.36     6.92   473.98   591.48    15.93   533.45     0.52
 MEAN    49.70    42.30     7.40   416.97   546.85    15.93   533.45     0.48
 HUB     44.78    37.84     6.94   350.81   498.24    15.93   533.45     0.44

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   425.94   210.34   370.38  1144.84     0.37
 MEAN    18.01   434.87   223.61   372.97  1143.12     0.38
 HUB     15.22   470.68   283.10   376.03  1141.37     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   452.90   260.64     0.40  4297.61
 MEAN   415.39   419.39   191.78     0.37  4029.44     1.41
 HUB    351.11   382.13    68.01     0.33  4311.44
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	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.69	1.10	16.99	559.81	1.03	544.66	0.92	0.91
MEAN	18.59	1.09	16.82	558.82	1.03	543.02	0.92	0.91
HUB	18.70	1.10	16.63	559.86	1.03	541.36	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	29.59	35.13	31.50	3.63	0.93	0.30	2.90	
MEAN	30.94	27.21	23.50	3.71	0.93	0.30	3.30	0.91
HUB	36.97	10.25	6.50	3.75	0.93	0.31	3.92	

blockage3	Cor/U1	Cor/Incid
0.550	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	862.094	224.239	832.419	1094.091	0.788	-2.408

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.641	12.369	497.432	46.000	15.077	30.600	15.523

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	888.641	224.239	916.496	1089.874	0.815	-2.635

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.550	18.497	11.944	493.557	289.961	0.088	0.060

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	885.232	0.000	885.232	1090.864	0.811	-0.302

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.550	11.812	494.108	0.000	0.060	0.237	-2.706

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.672	18.222	1.069	559.497	15.605	247.041	1.915

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
97179.508	0.438	642.070	1030075.688

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 8.638 EfDer = 0.835

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
116.916	2643.000	18.222	559.497	1.000	1.000	0.580

W Kg/sec = 53.14380

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
97.960	2544.816	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
89941.703	91740.344	1.132	322.834	285.291	248.585	0.871

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	728.48	-0.25	728.48	0.65	445.70
MEAN	17.74	0.00	-0.02	728.48	-0.25	728.48	0.65	
HUB	15.05	0.00	-0.02	728.48	-0.25	728.48	0.65	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	32.45	46.36	-13.91	462.91	863.25	13.66	515.19	0.78
MEAN	29.33	43.40	-14.07	409.13	835.63	13.66	515.19	0.75
HUB	25.49	38.84	-13.35	347.12	807.06	13.66	515.19	0.72

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	417.65	131.99	396.25	1155.23	0.36
MEAN	17.51	427.34	158.83	396.72	1155.15	0.37
HUB	14.85	462.62	235.56	398.16	1155.19	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	512.43	324.92	0.44	2619.77	
MEAN	403.78	466.25	244.95	0.40	2785.00	1.86
HUB	342.51	412.27	106.95	0.36	3501.85	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.08	1.05	17.43	569.20	1.02	554.63	0.92	0.76
MEAN	19.13	1.05	17.40	569.81	1.02	554.56	0.92	0.76
HUB	19.37	1.06	17.34	572.47	1.02	554.60	0.92	0.76

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	18.42	39.35	31.50	7.85	0.93	0.43	2.90	
MEAN	21.82	31.69	23.50	8.19	0.82	0.47	3.28	0.76
HUB	30.61	15.04	6.50	8.54	0.82	0.53	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.835

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	432.407	159.872	401.767	1155.478	0.374	0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.176	17.407	554.880	46.000	21.699	31.500	9.801

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	420.315	159.872	449.692	1156.374	0.363	0.045

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.145	17.473	555.741	471.992	0.027	0.179

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	408.556	0.000	408.556	1157.220	0.353	0.050

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.496	556.555	0.000	0.060	0.067	0.058

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.670	19.073	1.047	570.492	10.995	340.839	2.642

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
68484.312	0.328	452.479	2029379.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 8.638 EfDer = 0.974

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
116.916	2643.000	19.073	570.492	1.000	1.000	0.980

W Kg/sec = 53.14380

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
94.504	2520.174	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
89941.703	91740.344	1.865	513.330	275.232	401.059	1.457

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	383.70	-0.13	383.70	0.33	423.57

```
MEAN    16.97     0.00    -0.02   383.70    -0.13   383.70     0.33
HUB     14.32     0.00    -0.02   383.70    -0.13   383.70     0.33

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     49.19    46.36     2.83   444.22   587.09    17.68   558.20     0.51
MEAN    45.58    43.80     1.78   391.42   548.22    17.68   558.20     0.47
HUB     40.73    37.84     2.89   330.28   506.36    17.68   558.20     0.44

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   430.11   148.13   403.79  1166.36     0.37
MEAN    16.57   439.55   171.35   404.77  1165.82     0.38
HUB     13.89   474.33   244.67   406.36  1165.21     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   495.59   287.33     0.42  2799.21
MEAN   382.27   456.43   210.92     0.39  2842.12     1.29
HUB    320.37   413.35    75.70     0.35  3400.29

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.17     1.06    18.36   580.86     1.02   565.41     0.92     0.89
MEAN    20.19     1.06    18.30   581.02     1.02   564.89     0.92     0.89
HUB     20.41     1.07    18.21   583.08     1.02   564.30     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     20.15    35.43    31.50     3.93     0.93     0.20     2.90
MEAN    22.94    27.52    23.50     4.02     0.91     0.21     3.29     0.89
HUB     31.05    10.55     6.50     4.05     0.91     0.24     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     432.450     172.310     396.639    1167.002       0.371       0.054

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.238      18.405     566.039      46.000      23.481      32.400       8.919

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     418.979     172.310     453.028    1167.988       0.359       0.100

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.209      18.488     566.997     456.573       0.025       0.212

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     398.575       0.000     398.575    1169.422       0.341       0.088

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.578     568.389       0.000       0.060       0.062       0.146

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.801      20.135       1.056     581.652      11.160     308.422       2.391

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  69522.695       0.367     459.340 1064309.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 8.638   EfDer =  0.948

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    116.916    2643.000      20.135     581.652       1.000       1.000       0.980
W Kg/sec =   53.14380
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
90.387	2495.881	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
89941.703	91740.344	1.936	509.668	263.247	390.276	1.483

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	371.59	-0.13	371.59	0.32	399.01
MEAN	15.91	0.00	-0.02	371.59	-0.13	371.59	0.32	
HUB	13.07	0.00	-0.02	371.59	-0.13	371.59	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.68	47.36	1.32	422.54	562.79	18.78	570.13	0.48
MEAN	44.66	44.80	-0.14	367.03	522.38	18.78	570.13	0.45
HUB	39.06	38.84	0.22	301.45	478.57	18.78	570.13	0.41

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	413.83	132.15	392.17	1177.34	0.35
MEAN	15.50	421.16	150.88	393.20	1176.69	0.36
HUB	12.59	450.20	216.35	394.81	1175.99	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	482.81	281.63	0.41	2373.10	
MEAN	357.44	444.16	206.56	0.38	2340.37	1.27
HUB	290.38	401.69	74.03	0.34	2725.57	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.07	1.05	19.34	590.44	1.02	576.14	0.92	0.87
MEAN	21.06	1.05	19.27	590.32	1.01	575.51	0.92	0.87
HUB	21.21	1.05	19.17	591.74	1.02	574.82	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	18.62	35.68	31.50	4.18	0.93	0.18	2.90	
MEAN	20.99	27.71	23.50	4.21	0.90	0.19	3.34	0.87
HUB	28.72	10.62	6.50	4.12	0.90	0.22	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.948

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	425.282	153.650	396.556	1176.920	0.361	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.077	19.256	575.735	46.000	21.179	33.000	11.821

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	424.499	153.650	451.451	1176.976	0.361	-0.038

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.999	19.192	575.790	440.827	0.062	0.189

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	396.960	0.000	396.960	1178.905	0.337	0.068

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.382	577.678	0.000	0.060	0.080	0.065

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.738	20.966	1.041	590.832	9.180	350.084	2.714

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 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   57200.078       0.334     377.924 1118056.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     423643.50   2799.0337    114.2156      1.3878      0.7573      8.6379      1.1301


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 70%  Stat 2 40% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.996

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     115.614    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   52.55191

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     112.943    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   88939.984   90718.586       2.528     831.557     328.916     619.754       1.884

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   263.94    -0.09   263.94     0.24   473.93
  MEAN    17.06     0.00    -0.02   263.94    -0.09   263.94     0.24
  HUB     12.51     0.00    -0.02   263.94    -0.09   263.94     0.24

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.99    50.47    10.52   475.82   544.20    14.53   516.99     0.49
  MEAN    56.15    47.20     8.95   393.48   473.88    14.53   516.99     0.42
  HUB     47.56    38.62     8.94   288.54   391.12    14.53   516.99     0.35

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   455.69   283.74   356.57  1126.33     0.40
  MEAN    18.04   473.63   306.96   360.70  1123.58     0.42
  HUB     15.00   531.01   382.95   367.86  1119.24     0.47

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   405.02   192.08     0.36  5855.37
  MEAN   415.99   376.81   109.03     0.34  5537.91     1.42
  HUB    345.97   369.71    36.98     0.33  5745.39

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.19     1.14    15.36   544.50     1.04   527.16     0.92     0.91
  MEAN    17.08     1.13    15.11   543.33     1.04   524.59     0.92     0.91
  HUB     17.15     1.14    14.70   544.10     1.04   520.55     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     38.51    28.31    24.20     4.11     0.93     0.35     2.90
  MEAN    40.40    16.82    12.70     4.12     0.93     0.30     3.51     0.91
  HUB     46.15    -5.74    -9.30     3.56     0.93     0.17     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.996
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     480.056     306.365     369.587    1123.720       0.427      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.120      15.099     524.729      24.000      39.657      35.400      -4.257

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     393.992     306.365     499.089    1130.427       0.349       0.319

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.100      15.721     531.012     528.796       0.020       0.452

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     365.514       0.000     365.514    1132.348       0.323       0.366

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.863     532.818       0.000       0.060       0.043       0.387

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      17.052       1.129     543.977      21.167     201.536       1.562

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 131782.047       0.582     860.993 1109851.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.614    2643.000      17.052     543.977       1.000       1.000       0.980
W Kg/sec =   52.55191

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.067    2580.864       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88939.984   90718.586       1.987     590.487     297.243     474.134       1.595

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   349.27    -0.12   349.27     0.31   462.82
 MEAN    18.08     0.00    -0.02   349.27    -0.12   349.27     0.31
 HUB     15.21     0.00    -0.02   349.27    -0.12   349.27     0.31

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.62    46.36     7.26   473.98   588.86    15.96   533.79     0.52
 MEAN    50.06    42.30     7.76   416.97   544.01    15.96   533.79     0.48
 HUB     45.14    37.84     7.30   350.81   495.12    15.96   533.79     0.44

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   423.48   213.78   365.56  1145.38     0.37
 MEAN    18.01   432.10   226.12   368.20  1143.59     0.38
 HUB     15.22   467.49   284.03   371.31  1141.77     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   446.97   257.20     0.39  4367.89
 MEAN   415.39   414.00   189.27     0.36  4074.67     1.43
 HUB    351.11   377.33    67.08     0.33  4325.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.72     1.10    17.04   560.16     1.03   545.18     0.92     0.91
 MEAN    18.61     1.09    16.86   559.07     1.03   543.48     0.92     0.91
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 HUB     18.71     1.10    16.67   560.00     1.03   541.75     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.32    35.13    31.50     3.63     0.93     0.30     2.90
 MEAN    31.56    27.20    23.50     3.70     0.93     0.30     3.30     0.91
 HUB     37.41    10.24     6.50     3.74     0.93     0.31     3.92


   blockage3   Cor/U1    Cor/Incid
      0.550       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     841.935     226.759     810.823    1097.500       0.767      -2.313

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.662      12.637     500.544      46.000      15.624      30.600      14.976

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     858.466     226.759     887.910    1094.948       0.784      -2.470

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.550      18.529      12.343     498.199     289.961       0.083       0.077

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     852.731       0.000     852.731    1096.111       0.778      -0.208

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.550      12.257     499.045       0.000       0.060       0.213      -2.517

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.701      18.292       1.073     559.742      15.765     243.627       1.889

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98176.602       0.443     641.433 1017252.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.810

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.614    2643.000      18.292     559.742       1.000       1.000       0.580
W Kg/sec =   52.55191

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.518    2544.260       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88939.984   90718.586       1.149     322.834     281.091     248.585       0.884

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   710.35    -0.24   710.35     0.64   445.60
 MEAN    17.74     0.00    -0.02   710.35    -0.24   710.35     0.64
 HUB     15.05     0.00    -0.02   710.35    -0.24   710.35     0.64

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     33.10    46.36   -13.26   462.91   848.00    13.92   517.61     0.76
 MEAN    29.95    43.40   -13.45   409.13   819.87    13.92   517.61     0.73
 HUB     26.06    38.84   -12.78   347.12   790.73    13.92   517.61     0.71

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   413.68   137.77   390.06  1156.21     0.36
```

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MEAN    17.51   423.43   163.20   390.72  1155.99     0.37
HUB     14.85   458.81   237.69   392.44  1155.87     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    456.91   503.98   319.14     0.44  2734.13
MEAN   403.78   458.84   240.58     0.40  2861.47     1.86
HUB    342.51   406.19   104.82     0.35  3533.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.16     1.05    17.54   569.87     1.02   555.58     0.92     0.74
MEAN    19.20     1.05    17.50   570.34     1.02   555.37     0.92     0.74
HUB     19.42     1.06    17.42   572.83     1.02   555.25     0.92     0.74

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     19.45    39.29    31.50     7.79     0.93     0.43     2.90
MEAN    22.67    31.62    23.50     8.12     0.83     0.47     3.28     0.74
HUB     31.20    14.95     6.50     8.45     0.83     0.52     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.810

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     428.457     164.274     395.714    1156.315       0.371       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.244      17.501     555.683      46.000      22.545      31.500       8.955

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     413.543     164.274     444.976    1157.405       0.357       0.060

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.218      17.593     556.732     471.992       0.025       0.191

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     401.888       0.000     401.888    1158.230       0.347       0.066

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.619     557.525       0.000       0.060       0.063       0.075

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.658      19.151       1.047     571.011      11.269     330.402       2.561

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  70194.562       0.336     458.614 1984996.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 8.953   EfDer =  0.979

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    115.614    2643.000      19.151     571.011       1.000       1.000       0.980
W Kg/sec =   52.55191

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.112    2519.029       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  88939.984   90718.586       1.893     513.330     271.178     401.059       1.479

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   377.55    -0.13   377.55     0.33   423.37
 MEAN    16.97     0.00    -0.02   377.55    -0.13   377.55     0.33
 HUB     14.32     0.00    -0.02   377.55    -0.13   377.55     0.33
```

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.65	46.36	3.29	444.22	583.09	17.79	559.11	0.50
MEAN	46.04	43.80	2.24	391.42	543.92	17.79	559.11	0.47
HUB	41.19	37.84	3.35	330.28	501.71	17.79	559.11	0.43

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	425.34	153.23	396.78	1167.61	0.36
MEAN	16.57	434.71	175.05	397.91	1166.95	0.37
HUB	13.89	469.27	246.04	399.60	1166.23	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	486.91	282.23	0.42	2895.46	
MEAN	382.27	448.63	207.21	0.38	2903.52	1.30
HUB	320.37	406.45	74.33	0.35	3419.32	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.30	1.06	18.52	581.73	1.02	566.63	0.92	0.90
MEAN	20.30	1.06	18.44	581.76	1.02	565.99	0.92	0.90
HUB	20.51	1.07	18.34	583.67	1.02	565.29	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	21.12	35.42	31.50	3.92	0.93	0.21	2.90	
MEAN	23.75	27.51	23.50	4.01	0.91	0.22	3.29	0.90
HUB	31.62	10.54	6.50	4.04	0.91	0.25	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.979

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	427.846	176.038	389.952	1168.101	0.366	0.053

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.351	18.547	567.107	46.000	24.296	32.400	8.104

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	411.489	176.038	447.563	1169.281	0.352	0.114

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.326	18.656	568.253	456.573	0.023	0.224

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	391.418	0.000	391.418	1170.665	0.334	0.103

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.747	569.598	0.000	0.060	0.058	0.161

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.815	20.258	1.058	582.388	11.378	301.530	2.337

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
70880.977	0.374	463.098	1049861.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 8.953 EfDer = 0.955

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
115.614	2643.000	20.258	582.389	1.000	1.000	0.980

W Kg/sec = 52.55191

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
88.898	2494.301	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
88939.984	90718.586	1.969	509.668	258.910	390.276	1.507

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	365.03	-0.13	365.03	0.31	398.76
MEAN	15.91	0.00	-0.02	365.03	-0.13	365.03	0.31	
HUB	13.07	0.00	-0.02	365.03	-0.13	365.03	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.18	47.36	1.82	422.54	558.48	18.94	571.27	0.48
MEAN	45.17	44.80	0.37	367.03	517.73	18.94	571.27	0.44
HUB	39.56	38.84	0.72	301.45	473.50	18.94	571.27	0.40

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	408.58	137.67	384.69	1178.83	0.35
MEAN	15.50	415.79	154.88	385.87	1178.06	0.35
HUB	12.59	444.59	217.83	387.56	1177.24	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	473.52	276.11	0.40	2472.13	
MEAN	357.44	435.81	202.57	0.37	2402.24	1.29
HUB	290.38	394.30	72.55	0.33	2744.13	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.25	1.05	19.55	591.54	1.02	577.61	0.92	0.87
MEAN	21.22	1.05	19.46	591.28	1.02	576.85	0.92	0.87
HUB	21.36	1.05	19.35	592.55	1.02	576.05	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	19.69	35.67	31.50	4.17	0.93	0.19	2.90	
MEAN	21.87	27.70	23.50	4.20	0.90	0.20	3.34	0.87
HUB	29.34	10.60	6.50	4.10	0.90	0.22	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.955

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	419.881	157.718	389.134	1178.287	0.356	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.237	19.450	577.074	46.000	22.063	33.000	10.937

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	415.939	157.718	444.837	1178.568	0.353	-0.019

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.170	19.421	577.349	440.827	0.057	0.200

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	389.072	0.000	389.072	1180.409	0.330	0.085

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.605	579.154	0.000	0.060	0.074	0.082

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.760	21.138	1.043	591.790	9.401	340.832	2.642

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
58580.133	0.342	382.731	1102555.250

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   OVERALL EXIT CONDITIONS; ALL          5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    429614.31   2806.8696    112.9435      1.3992      0.7663      8.9532      1.1319


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

   Fan-Core + 4 Stage LPC 70%  Stat 2 40% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.632    2632.591       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85544.477   87255.180       2.629     831.557     316.359     619.754       1.959

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   253.30    -0.09   253.30     0.23   473.93
 MEAN    17.06     0.00    -0.02   253.30    -0.09   253.30     0.23
 HUB     12.51     0.00    -0.02   253.30    -0.09   253.30     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.98    50.47    11.51   475.82   539.12    14.57   517.45     0.48
 MEAN    57.23    47.20    10.03   393.48   468.04    14.57   517.45     0.42
 HUB     48.73    38.62    10.11   288.54   384.01    14.57   517.45     0.34

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   449.23   291.89   341.48  1127.51     0.40
 MEAN    18.04   465.30   311.56   345.60  1124.60     0.41
 HUB     15.00   519.31   381.42   352.41  1120.25     0.46

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    475.82   387.87   183.93     0.34  6023.48
 MEAN   415.99   361.03   104.44     0.32  5620.72     1.47
 HUB    345.97   354.19    35.46     0.32  5722.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.25     1.14    15.46   545.13     1.04   528.27     0.92     0.91
 MEAN    17.10     1.13    15.19   543.64     1.04   525.55     0.92     0.91
 HUB     17.14     1.13    14.79   544.01     1.04   521.49     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.52    28.31    24.20     4.11     0.93     0.37     2.90
 MEAN    42.03    16.81    12.70     4.11     0.94     0.33     3.51     0.91
 HUB     47.26    -5.75    -9.30     3.55     0.94     0.19     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     471.222     310.951     354.061    1124.772       0.419      -0.004
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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.140      15.188     525.712      24.000      41.291      35.400      -5.891

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     376.829     310.951     488.560    1131.902       0.333       0.350

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.116      15.850     532.398     528.796       0.022       0.477

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     349.994       0.000     349.994    1133.632       0.309       0.388

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.970     534.027       0.000       0.060       0.048       0.409

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      17.063       1.129     544.258      21.448     195.486       1.515

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 133535.359       0.590     839.141 1065123.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      17.063     544.258       1.000       1.000       0.980
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     98.134    2580.196       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85544.477   87255.180       2.066     590.487     285.789     474.134       1.659

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   334.58    -0.12   334.58     0.29   462.70
 MEAN    18.08     0.00    -0.02   334.58    -0.12   334.58     0.29
 HUB     15.21     0.00    -0.02   334.58    -0.12   334.58     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.79    46.36     8.43   473.98   580.27    16.06   534.91     0.51
 MEAN    51.26    42.30     8.96   416.97   534.70    16.06   534.91     0.47
 HUB     46.37    37.84     8.53   350.81   484.87    16.06   534.91     0.43

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   415.86   225.21   349.60  1147.14     0.36
 MEAN    18.01   423.25   234.43   352.40  1145.13     0.37
 HUB     15.22   457.01   287.03   355.64  1143.10     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   427.34   245.76     0.37  4601.21
 MEAN   415.39   396.14   180.96     0.35  4224.12     1.47
 HUB    351.11   361.36    64.09     0.32  4371.15

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.82     1.10    17.19   561.30     1.03   546.86     0.92     0.91
 MEAN    18.67     1.09    16.99   559.90     1.03   544.94     0.92     0.91
 HUB     18.73     1.10    16.78   560.45     1.03   543.01     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     32.79    35.11    31.50     3.61     0.93     0.33     2.90
 MEAN    33.63    27.18    23.50     3.68     0.93     0.33     3.30     0.91
 HUB     38.91    10.22     6.50     3.72     0.93     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
      0.550       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     785.060     235.086     749.035    1106.810       0.709      -2.052

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.724      13.382     509.082      46.000      17.425      30.600      13.175

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     780.041     235.086     814.696    1107.525       0.704      -2.055

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.550      18.624      13.370     509.738     289.961       0.067       0.119

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     770.464       0.000     770.464    1108.929       0.695      -0.005

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.550      13.373     510.983       0.000       0.060       0.154      -2.054

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.768       18.470       1.082     560.552      16.294     232.621       1.803

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 101469.648       0.457     637.639  974203.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.769

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    111.200     2643.000       18.470     560.552       1.000        1.000        0.580
W Kg/sec =   50.54562

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     92.002     2542.420        1.402       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  85544.477   87255.180        1.205     322.834     267.938     248.585       0.928

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   658.51    -0.23   658.51     0.59   445.28
 MEAN    17.74      0.00    -0.02   658.51    -0.23   658.51     0.59
 HUB     15.05      0.00    -0.02   658.51    -0.23   658.51     0.59

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     35.12     46.36   -11.24   462.91   805.07     14.63   524.34      0.72
 MEAN    31.87     43.40   -11.53   409.13   775.38     14.63   524.34      0.69
 HUB     27.81     38.84   -11.03   347.12   744.51     14.63   524.34      0.66

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   401.71    155.84    370.25  1159.28      0.35
 MEAN    17.51   411.27    176.89    371.29  1158.64      0.35
 HUB     14.85   446.30    244.31    373.49  1158.07      0.39
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   477.20   301.07     0.41  3091.78
 MEAN   403.78   435.13   226.89     0.38  3100.70     1.86
 HUB    342.51   386.18    98.19     0.33  3631.47

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.41     1.05    17.86   572.00     1.02   558.53     0.92     0.70
 MEAN    19.42     1.05    17.79   572.03     1.02   557.91     0.92     0.70
 HUB     19.58     1.06    17.67   574.00     1.02   557.37     0.92     0.70

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.83    39.12    31.50     7.62     0.93     0.44     2.90
 MEAN    25.47    31.43    23.50     7.93     0.84     0.47     3.28     0.70
 HUB     33.19    14.73     6.50     8.23     0.84     0.52     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.769

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     416.079     178.047     376.060    1158.958       0.359      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.454      17.794     558.224      46.000      25.335      31.500       6.165

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     391.747     178.047     430.310    1160.660       0.338       0.110

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.439      17.963     559.865     471.992       0.019       0.229

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     380.509       0.000     380.509    1161.411       0.328       0.120

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.997     560.589       0.000       0.060       0.049       0.129

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.646      19.387       1.050     572.679      12.127     301.088       2.334

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  75537.812       0.362     474.682 1853436.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      19.387     572.679       1.000       1.000       0.980
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.594    2515.358       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85544.477   87255.180       1.989     513.330     258.021     401.059       1.554

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   357.76    -0.12   357.76     0.31   422.76
 MEAN    16.97     0.00    -0.02   357.76    -0.12   357.76     0.31
 HUB     14.32     0.00    -0.02   357.76    -0.12   357.76     0.31

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.16    46.36     4.80   444.22   570.47    18.15   561.99     0.49
 MEAN    47.58    43.80     3.78   391.42   530.38    18.15   561.99     0.46
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HUB     42.72    37.84     4.88   330.28   486.99    18.15   561.99     0.42

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   411.07   169.50   374.50  1171.52     0.35
MEAN    16.57   419.91   186.83   376.06  1170.49     0.36
HUB     13.89   453.46   250.41   378.05  1169.43     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   459.33   265.96     0.39  3202.46
MEAN   382.27   423.81   195.44     0.36  3098.64     1.35
HUB    320.37   384.47    69.96     0.33  3479.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.69     1.07    19.00   584.54     1.02   570.43     0.92     0.91
MEAN    20.64     1.06    18.89   584.15     1.02   569.43     0.92     0.91
HUB     20.80     1.07    18.75   585.56     1.02   568.40     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     24.35    35.38    31.50     3.88     0.93     0.25     2.90
MEAN    26.42    27.46    23.50     3.96     0.92     0.25     3.29     0.91
HUB     33.52    10.48     6.50     3.98     0.92     0.28     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.991

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     413.771     187.884     368.655    1171.546       0.353       0.052

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.693      18.981     570.458      46.000      27.006      32.400       5.394

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     387.816     187.884     430.931    1173.328       0.331       0.160

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.679      19.171     572.195     456.573       0.018       0.261

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    16.096     368.853       0.000     368.853    1174.556       0.314       0.153

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      19.262     573.393       0.000       0.060       0.046       0.209

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.850      20.626       1.064     584.750      12.072     280.765       2.176

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  75208.133       0.397     472.610 1002030.562


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.034   EfDer =  0.977

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.200    2643.000      20.626     584.750       1.000       1.000       0.980
W Kg/sec =   50.54562

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     84.145    2489.259       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85544.477   87255.180       2.080     509.668     245.067     390.276       1.593
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ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	344.31	-0.12	344.31	0.29	397.95
MEAN	15.91	0.00	-0.02	344.31	-0.12	344.31	0.29	
HUB	13.07	0.00	-0.02	344.31	-0.12	344.31	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.83	47.36	3.47	422.54	545.15	19.43	574.86	0.46
MEAN	46.84	44.80	2.04	367.03	503.33	19.43	574.86	0.43
HUB	41.21	38.84	2.37	301.45	457.71	19.43	574.86	0.39

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	393.12	154.91	361.31	1183.45	0.33
MEAN	15.50	399.64	167.40	362.89	1182.32	0.34
HUB	12.59	427.32	222.46	364.85	1181.15	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	444.47	258.87	0.38	2781.30	
MEAN	357.44	409.64	190.05	0.35	2596.16	1.33
HUB	290.38	371.12	67.92	0.31	2802.29	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.78	1.06	20.18	595.05	1.02	582.15	0.92	0.89
MEAN	21.70	1.05	20.05	594.36	1.02	581.03	0.92	0.89
HUB	21.79	1.06	19.90	595.12	1.02	579.88	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	23.21	35.62	31.50	4.12	0.93	0.23	2.90	
MEAN	24.76	27.64	23.50	4.14	0.91	0.24	3.34	0.89
HUB	31.37	10.55	6.50	4.05	0.91	0.25	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.977

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	403.658	170.468	365.896	1182.534	0.341	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.724	20.039	581.243	46.000	24.980	33.000	8.020

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	389.455	170.468	425.129	1183.490	0.329	0.043

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.686	20.117	582.183	440.827	0.042	0.239

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	364.594	0.000	364.594	1185.080	0.308	0.141

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.282	583.748	0.000	0.060	0.058	0.139

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.817	21.659	1.050	594.844	10.093	313.833	2.433

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
62895.688	0.367	395.239	1051463.500

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
448646.62	2819.3103	108.6316	1.4337	0.7898	10.0345	1.1378

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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Fan-Core + 4 Stage LPC 70% Stat 2 40% Ice Block 8-2-2011

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1

RESET = 0.000BLEED = 0.000 DPInc =10.989 EfDer = 0.986

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
107.366	2643.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 48.80284

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
104.886	2632.591	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
82594.961	84246.680	2.722	831.557	305.451	619.754	2.029

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	244.12	-0.08	244.12	0.22	473.93
MEAN	17.06	0.00	-0.02	244.12	-0.08	244.12	0.22	
HUB	12.51	0.00	-0.02	244.12	-0.08	244.12	0.22	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.84	50.47	12.37	475.82	534.87	14.61	517.83	0.48
MEAN	58.19	47.20	10.99	393.48	463.13	14.61	517.83	0.41
HUB	49.77	38.62	11.15	288.54	378.02	14.61	517.83	0.34

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	444.15	298.79	328.62	1128.48	0.39
MEAN	18.04	458.46	315.43	332.70	1125.45	0.41
HUB	15.00	509.42	380.07	339.20	1121.08	0.45

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	475.82	373.27	177.03	0.33	6165.71	
MEAN	415.99	347.56	100.56	0.31	5690.62	1.51
HUB	345.97	340.91	34.10	0.30	5702.12	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.29	1.14	15.54	545.65	1.04	529.18	0.92	0.90
MEAN	17.11	1.13	15.26	543.89	1.04	526.34	0.92	0.90
HUB	17.12	1.13	14.85	543.94	1.04	522.26	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.28	28.31	24.20	4.11	0.93	0.40	2.90	
MEAN	43.47	16.82	12.70	4.12	0.94	0.35	3.51	0.90
HUB	48.25	-5.74	-9.30	3.56	0.94	0.21	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.986

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	463.961	314.822	340.803	1125.632	0.412	-0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.153	15.258	526.516	24.000	42.731	35.400	-7.331

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	362.256	314.822	479.940	1133.109	0.320	0.376

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.126	15.953	533.535	528.796	0.024	0.500

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	336.802	0.000	336.802	1134.687	0.297	0.407

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.053	535.021	0.000	0.060	0.054	0.427

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.858	17.067	1.130	544.495	21.685	190.336	1.475

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
135009.734	0.596	819.153	1026515.062

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =10.989 EfDer = 0.991

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
107.366	2643.000	17.067	544.495	1.000	1.000	0.980

W Kg/sec = 48.80284

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
94.749	2579.635	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
82594.961	84246.680	2.140	590.487	275.933	474.134	1.718

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	322.08	-0.11	322.08	0.28	462.60
MEAN	18.08	0.00	-0.02	322.08	-0.11	322.08	0.28	
HUB	15.21	0.00	-0.02	322.08	-0.11	322.08	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.81	46.36	9.45	473.98	573.14	16.14	535.83	0.50
MEAN	52.32	42.30	10.02	416.97	526.96	16.14	535.83	0.46
HUB	47.45	37.84	9.61	350.81	476.32	16.14	535.83	0.42

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	410.03	234.77	336.17	1148.57	0.36
MEAN	18.01	416.21	241.39	339.05	1146.39	0.36
HUB	15.22	448.37	289.52	342.36	1144.18	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	470.98	410.86	236.21	0.36	4796.18	
MEAN	415.39	381.09	174.00	0.33	4349.49	1.51
HUB	351.11	347.86	61.59	0.30	4409.12	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.89	1.11	17.30	562.26	1.03	548.22	0.92	0.91
MEAN	18.72	1.10	17.09	560.61	1.03	546.14	0.92	0.91
HUB	18.74	1.10	16.86	560.83	1.03	544.04	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.93	35.09	31.50	3.59	0.93	0.35	2.90	
MEAN	35.45	27.17	23.50	3.67	0.94	0.35	3.30	0.91
HUB	40.22	10.20	6.50	3.70	0.94	0.35	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.550       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      744.819     242.071     704.384     1113.118       0.669       -1.872

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     18.768      13.896      514.903      46.000      18.966       30.600       11.634

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     17.960      727.541     242.071     766.756     1115.412       0.652       -1.786

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.550       18.689      14.038      517.027      289.961       0.056       0.146

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4        cp 3-4
     17.823      716.895       0.000     716.895     1116.813       0.642       0.107

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.550       14.078      518.313       0.000       0.060       0.120       -1.762

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.802       18.581        1.089      561.231       16.736      223.694       1.734

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 104224.773       0.470     632.370  937301.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.767

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    107.366     2643.000       18.581      561.231       1.000        1.000        0.580
W Kg/sec =   48.80284

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     88.357     2540.881        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  82594.961    84246.680        1.255      322.834     257.323      248.585       0.966

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00     -0.02    620.74     -0.21    620.74      0.55    445.01
 MEAN    17.74      0.00     -0.02    620.74     -0.21    620.74      0.55
 HUB     15.05      0.00     -0.02    620.74     -0.21    620.74      0.55

       BetaFlo    BetaBlade Incid    U1        W1        Ps1       Ts1      Rel Mach
 TIP     36.73     46.36     -9.63    462.91    774.46     15.12    529.06      0.69
 MEAN    33.40     43.40    -10.00    409.13    743.56     15.12    529.06      0.66
 HUB     29.23     38.84     -9.61    347.12    711.31     15.12    529.06      0.63

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500        0.050        0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP      19.81    392.78    170.39    353.90   1161.70      0.34
 MEAN     17.51    401.78    187.89    355.14   1160.75      0.35
 HUB      14.85    435.95    249.53    357.47   1159.87      0.38

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP     456.91    455.35    286.52      0.39   3379.63
 MEAN    403.78    415.61    215.89      0.36   3293.14      1.87
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 HUB    342.51   369.36    92.97     0.32  3708.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.61     1.06    18.12   573.75     1.02   560.86     0.92     0.70
 MEAN    19.59     1.05    18.03   573.43     1.02   559.95     0.92     0.70
 HUB     19.72     1.06    17.88   574.97     1.02   559.10     0.92     0.70

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.71    38.99    31.50     7.49     0.93     0.45     2.90
 MEAN    27.88    31.30    23.50     7.80     0.85     0.48     3.28     0.70
 HUB     34.92    14.58     6.50     8.08     0.85     0.53     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.767

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     406.376     189.125     359.685    1161.068       0.350       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.624      18.028     560.257      46.000      27.736      31.500       3.764

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     373.779     189.125     418.902    1163.266       0.321       0.152

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.615      18.259     562.381     471.992       0.016       0.263

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     362.980       0.000     362.980    1163.953       0.312       0.164

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.295     563.045       0.000       0.060       0.041       0.174

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.658      19.573       1.053     574.046      12.815     280.467       2.174

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79825.641       0.382     484.331 1753811.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.366    2643.000      19.573     574.046       1.000       1.000       0.980
W Kg/sec =   48.80284

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     84.830    2512.360       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82594.961   84246.680       2.078     513.330     247.059     401.059       1.623

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   341.50    -0.12   341.50     0.29   422.25
 MEAN    16.97     0.00    -0.02   341.50    -0.12   341.50     0.29
 HUB     14.32     0.00    -0.02   341.50    -0.12   341.50     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.46    46.36     6.10   444.22   560.41    18.44   564.31     0.48
 MEAN    48.91    43.80     5.11   391.42   519.54    18.44   564.31     0.45
 HUB     44.05    37.84     6.21   330.28   475.17    18.44   564.31     0.41

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   400.54   182.61   356.50  1174.59     0.34
MEAN    16.57   408.59   196.35   358.32  1173.30     0.35
HUB     13.89   440.97   253.93   360.52  1171.98     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   437.06   252.85     0.37  3449.96
MEAN   382.27   403.68   185.92     0.34  3256.29     1.39
HUB    320.37   366.59    66.44     0.31  3528.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.99     1.07    19.37   586.82     1.02   573.43     0.92     0.91
MEAN    20.91     1.07    19.23   586.10     1.02   572.17     0.92     0.91
HUB     21.03     1.07    19.07   587.11     1.02   570.88     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     27.12    35.35    31.50     3.85     0.93     0.28     2.90
MEAN    28.72    27.42    23.50     3.92     0.92     0.28     3.29     0.91
HUB     35.16    10.44     6.50     3.94     0.92     0.30     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     403.043     197.455     351.362    1174.271       0.343       0.051

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.961      19.319     573.117      46.000      29.335      32.400       3.065

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     368.781     197.455     418.315    1176.531       0.313       0.199

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.953      19.572     575.324     456.573       0.015       0.295

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     350.777       0.000     350.777    1177.636       0.298       0.194

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      19.659     576.406       0.000       0.060       0.040       0.249

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.868      20.909       1.068     586.678      12.632     265.133       2.055

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  78698.461       0.415     477.492  961622.062


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.989   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.366    2643.000      20.909     586.678       1.000       1.000       0.980
W Kg/sec =   48.80284

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.278    2485.166       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82594.961   84246.680       2.180     509.668     233.807     390.276       1.669

    ROTOR LEADING EDGE CONDITIONS, STAGE            5
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	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	327.66	-0.11	327.66	0.28	397.30
MEAN	15.91	0.00	-0.02	327.66	-0.11	327.66	0.28	
HUB	13.07	0.00	-0.02	327.66	-0.11	327.66	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.22	47.36	4.86	422.54	534.79	19.82	577.72	0.45
MEAN	48.25	44.80	3.45	367.03	492.09	19.82	577.72	0.42
HUB	42.63	38.84	3.79	301.45	445.31	19.82	577.72	0.38

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	382.01	168.55	342.81	1187.06	0.32
MEAN	15.50	387.57	177.29	344.64	1185.66	0.33
HUB	12.59	413.99	226.13	346.77	1184.23	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	413.78	421.49	245.23	0.36	3025.84	
MEAN	357.44	388.89	180.15	0.33	2749.37	1.38
HUB	290.38	352.68	64.26	0.30	2848.40	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	22.20	1.06	20.66	597.88	1.02	585.70	0.92	0.90
MEAN	22.08	1.06	20.50	596.85	1.02	584.32	0.92	0.90
HUB	22.12	1.06	20.33	597.22	1.02	582.92	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	26.18	35.58	31.50	4.08	0.93	0.27	2.90	
MEAN	27.22	27.60	23.50	4.10	0.92	0.26	3.34	0.90
HUB	33.11	10.50	6.50	4.00	0.92	0.27	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.989

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	391.571	180.541	347.466	1185.860	0.330	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
22.098	20.490	584.520	46.000	27.456	33.000	5.544

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	368.764	180.541	410.588	1187.328	0.311	0.093

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	22.077	20.647	585.967	440.827	0.033	0.274

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	345.421	0.000	345.421	1188.736	0.291	0.188

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.797	587.359	0.000	0.060	0.047	0.185

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.849	22.054	1.055	597.318	10.640	294.256	2.281

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
66308.352	0.387	402.317	1008518.312

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
464066.94	2815.6631	104.8861	1.4599	0.8040	10.9895	1.1425

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 70%  Stat 2 40% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.981

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     103.556    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   47.07069

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     101.163    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79663.445   81256.547       2.823     831.557     294.610     619.754       2.104

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   235.05    -0.08   235.05     0.21   473.93
  MEAN    17.06     0.00    -0.02   235.05    -0.08   235.05     0.21
  HUB     12.51     0.00    -0.02   235.05    -0.08   235.05     0.21

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.72    50.47    13.25   475.82   530.78    14.65   518.20     0.48
  MEAN    59.15    47.20    11.95   393.48   458.41    14.65   518.20     0.41
  HUB     50.84    38.62    12.22   288.54   372.22    14.65   518.20     0.33

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   439.55   305.49   316.04  1129.38     0.39
  MEAN    18.04   452.02   319.21   320.05  1126.24     0.40
  HUB     15.00   499.87   378.72   326.25  1121.86     0.45

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   359.02   170.33     0.32  6303.87
  MEAN   415.99   334.36    96.78     0.30  5758.65     1.56
  HUB    345.97   327.89    32.75     0.29  5681.81

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.33     1.15    15.61   546.17     1.04   530.03     0.92     0.90
  MEAN    17.13     1.13    15.32   544.15     1.04   527.08     0.92     0.90
  HUB     17.10     1.13    14.92   543.86     1.04   522.99     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     44.03    28.32    24.20     4.12     0.93     0.42     2.90
  MEAN    44.92    16.83    12.70     4.13     0.94     0.37     3.51     0.90
  HUB     49.26    -5.73    -9.30     3.57     0.94     0.24     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.981

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     457.122     318.590     327.812    1126.439       0.406      -0.002

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      17.164      15.321     527.272      24.000      44.183      35.400      -8.783

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     348.042     318.590     471.839    1134.248       0.307       0.403

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.132      16.048     534.607     528.796       0.027       0.524

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     323.919       0.000     323.919    1135.683       0.285       0.424

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.128     535.961       0.000       0.060       0.062       0.445

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.849      17.066       1.130     544.725      21.915     185.296       1.436

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 136438.906       0.603     798.443  988356.188


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.986

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    103.556    2643.000      17.066     544.725       1.000       1.000       0.980
W Kg/sec =   47.07069

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.409    2579.091       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79663.445   81256.547       2.218     590.487     266.205     474.134       1.781

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   309.86    -0.11   309.86     0.27   462.50
 MEAN    18.08     0.00    -0.02   309.86    -0.11   309.86     0.27
 HUB     15.21     0.00    -0.02   309.86    -0.11   309.86     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.83    46.36    10.47   473.98   566.36    16.21   536.71     0.50
 MEAN    53.39    42.30    11.09   416.97   519.58    16.21   536.71     0.46
 HUB     48.56    37.84    10.72   350.81   468.14    16.21   536.71     0.41

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   404.92   243.96   323.17  1149.90     0.35
 MEAN    18.01   409.76   248.13   326.09  1147.56     0.36
 HUB     15.22   440.16   291.91   329.44  1145.20     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   394.94   227.02     0.34  4983.81
 MEAN   415.39   366.49   167.26     0.32  4470.74     1.55
 HUB    351.11   334.71    59.20     0.29  4445.34

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.96     1.11    17.40   563.19     1.03   549.49     0.92     0.90
 MEAN    18.75     1.10    17.17   561.28     1.03   547.26     0.92     0.90
 HUB     18.74     1.10    16.93   561.19     1.03   545.01     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.05    35.09    31.50     3.59     0.93     0.38     2.90
 MEAN    37.27    27.15    23.50     3.65     0.94     0.37     3.30     0.90
 HUB     41.54    10.19     6.50     3.69     0.94     0.36     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.550       1.000       0.986

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     710.188     248.826     665.171    1118.361       0.635      -1.719

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.802      14.327     519.767      46.000      20.510      30.600      10.090

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     683.103     248.826     727.010    1121.746       0.609      -1.560

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.550      18.741      14.585     522.918     289.961       0.047       0.171

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     672.251       0.000     672.251    1123.069       0.599       0.191

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.550      14.644     524.147       0.000       0.060       0.094      -1.524

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.825      18.663       1.094     561.887      17.162     215.309       1.669

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 106878.734       0.482     625.456  901036.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  0.782

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    103.556    2643.000      18.663     561.887       1.000       1.000       0.580
W Kg/sec =   47.07069

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     84.893    2539.398       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
  79663.445   81256.547       1.306     322.834     247.236     248.585       1.005

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   587.30    -0.20   587.30     0.52   444.75
 MEAN    17.74     0.00    -0.02   587.30    -0.20   587.30     0.52
 HUB     15.05     0.00    -0.02   587.30    -0.20   587.30     0.52

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     38.26    46.36    -8.10   462.91   747.92    15.53   533.09     0.66
 MEAN    34.88    43.40    -8.52   409.13   715.87    15.53   533.09     0.63
 HUB     30.60    38.84    -8.24   347.12   682.31    15.53   533.09     0.60

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   385.08   184.17   338.19  1163.94     0.33
 MEAN    17.51   393.26   198.31   339.59  1162.71     0.34
 HUB     14.85   426.19   254.39   341.94  1161.55     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    456.91   434.47   272.74     0.37  3652.37
 MEAN   403.78   396.91   205.47     0.34  3475.34     1.89
 HUB    342.51   353.11    88.12     0.30  3780.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
```

```
 TIP     19.81     1.06    18.36   575.41     1.02   563.03     0.92     0.72
 MEAN    19.75     1.06    18.25   574.76     1.02   561.84     0.92     0.72
 HUB     19.85     1.06    18.08   575.89     1.02   560.72     0.92     0.72

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.57    38.89    31.50     7.39     0.93     0.46     2.90
 MEAN    30.28    31.18    23.50     7.68     0.86     0.49     3.28     0.72
 HUB     36.65    14.45     6.50     7.95     0.86     0.53     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.782

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     397.630     199.613     343.896    1163.027       0.342       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.787      18.248     562.150      46.000      30.133      31.500       1.367

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     356.598     199.613     408.665    1165.697       0.306       0.195

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.781      18.537     564.734     471.992       0.014       0.298

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     346.294       0.000     346.294    1166.321       0.297       0.206

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.571     565.339       0.000       0.060       0.037       0.217

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.679      19.744       1.058     575.352      13.465     262.865       2.038

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  83876.508       0.402     490.847 1663316.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =11.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.556    2643.000      19.744     575.352       1.000       1.000       0.980
W Kg/sec =   47.07069

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     81.201    2509.507       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79663.445   81256.547       2.171     513.330     236.488     401.059       1.696

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   325.99    -0.11   325.99     0.28   421.77
 MEAN    16.97     0.00    -0.02   325.99    -0.11   325.99     0.28
 HUB     14.32     0.00    -0.02   325.99    -0.11   325.99     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.73    46.36     7.37   444.22   551.09    18.70   566.48     0.47
 MEAN    50.22    43.80     6.42   391.42   509.48    18.70   566.48     0.44
 HUB     45.38    37.84     7.54   330.28   464.14    18.70   566.48     0.40

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	391.53	194.90	339.57	1177.41	0.33
MEAN	16.57	398.55	205.33	341.59	1175.89	0.34
HUB	13.89	429.49	257.23	343.94	1174.34	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	435.46	416.14	240.56	0.35	3681.92	
MEAN	382.27	384.69	176.94	0.33	3404.98	1.44
HUB	320.37	349.69	63.13	0.30	3574.60	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.28	1.08	19.71	588.98	1.02	576.19	0.92	0.91
MEAN	21.16	1.07	19.54	587.96	1.02	574.70	0.92	0.91
HUB	21.23	1.08	19.36	588.59	1.02	573.19	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	29.85	35.31	31.50	3.81	0.93	0.31	2.90	
MEAN	31.01	27.38	23.50	3.88	0.93	0.31	3.29	0.91
HUB	36.79	10.40	6.50	3.90	0.93	0.32	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	393.554	206.482	335.037	1176.790	0.334	0.050

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.207	19.625	575.580	46.000	31.645	32.400	0.755

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	350.947	206.482	407.184	1179.494	0.298	0.238

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.201	19.937	578.228	456.573	0.013	0.328

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	333.898	0.000	333.898	1180.488	0.283	0.232

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.016	579.203	0.000	0.060	0.037	0.285

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	21.161	1.072	588.510	13.158	251.228	1.948

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
81978.188	0.432	479.738	922324.312

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =11.953 EfDer = 0.996

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
103.556	2643.000	21.161	588.510	1.000	1.000	0.980

W Kg/sec = 47.07069

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
76.624	2481.295	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
79663.445	81256.547	2.284	509.668	223.165	390.276	1.749

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	312.08	-0.11	312.08	0.26	396.68
MEAN	15.91	0.00	-0.02	312.08	-0.11	312.08	0.26	

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 HUB     13.07     0.00    -0.02   312.08    -0.11   312.08     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.56    47.36     6.20   422.54   525.38    20.16   580.38     0.44
 MEAN    49.63    44.80     4.83   367.03   481.85    20.16   580.38     0.41
 HUB     44.02    38.84     5.18   301.45   433.97    20.16   580.38     0.37

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   372.70   181.11   325.74  1190.34     0.31
 MEAN    15.50   377.06   186.46   327.74  1188.72     0.32
 HUB     12.59   401.98   229.54   330.00  1187.08     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   400.30   232.67     0.34  3251.13
 MEAN   357.44   369.66   170.99     0.31  2891.32     1.43
 HUB    290.38   335.56    60.84     0.28  2891.32

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.57     1.07    21.09   600.54     1.02   588.95     0.92     0.91
 MEAN    22.41     1.06    20.90   599.21     1.02   587.34     0.92     0.91
 HUB     22.41     1.06    20.70   599.21     1.02   585.72     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.07    35.54    31.50     4.04     0.93     0.30     2.90
 MEAN    29.64    27.55    23.50     4.05     0.92     0.29     3.34     0.91
 HUB     34.82    10.45     6.50     3.95     0.92     0.29     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     381.079     189.875     330.407    1188.911       0.321      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.433      20.890     587.534      46.000      29.885      33.000       3.115

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     349.830     189.875     398.037    1190.838       0.294       0.141

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.421      21.116     589.441     440.827       0.027       0.308

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     327.855       0.000     327.855    1192.093       0.275       0.232

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.254     590.684       0.000       0.060       0.040       0.228

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      22.402       1.059     599.656      11.146     277.339       2.150

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   69462.055       0.406     406.493  966897.688

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     478634.41   2800.9766    101.1634      1.4829      0.8136     11.9532      1.1470


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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
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*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 70%  Stat 2 40% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =12.353   EfDer =  0.978

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     101.992    2643.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   46.36004

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
      99.636    2632.591       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   78460.727   80029.773       2.866     831.557     290.162     619.754       2.136

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   231.34    -0.08   231.34     0.21   473.93
  MEAN    17.06     0.00    -0.02   231.34    -0.08   231.34     0.21
  HUB     12.51     0.00    -0.02   231.34    -0.08   231.34     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.08    50.47    13.61   475.82   529.15    14.66   518.34     0.47
  MEAN    59.55    47.20    12.35   393.48   456.52    14.66   518.34     0.41
  HUB     51.29    38.62    12.67   288.54   369.89    14.66   518.34     0.33

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   437.80   308.20   310.93  1129.74     0.39
  MEAN    18.04   449.47   320.72   314.90  1126.55     0.40
  HUB     15.00   496.00   378.15   320.98  1122.17     0.44

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    475.82   353.23   167.62     0.31  6359.89
  MEAN   415.99   329.00    95.27     0.29  5785.85     1.58
  HUB    345.97   322.58    32.18     0.29  5673.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     17.34     1.15    15.63   546.37     1.05   530.37     0.92     0.89
  MEAN    17.13     1.13    15.35   544.25     1.04   527.37     0.92     0.89
  HUB     17.09     1.13    14.94   543.83     1.04   523.28     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     44.75    28.33    24.20     4.13     0.93     0.43     2.90
  MEAN    45.52    16.83    12.70     4.13     0.94     0.38     3.51     0.89
  HUB     49.67    -5.72    -9.30     3.58     0.94     0.24     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.978

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     454.409     320.096     322.530    1126.758       0.403      -0.001

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      17.168      15.346     527.570      24.000      44.783      35.400      -9.383

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      18.071     342.280     320.096     468.633    1134.698       0.302       0.414

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      17.134      16.084     535.032     528.796       0.028       0.534

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     318.691       0.000     318.691    1136.078       0.281       0.431

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.156     536.334       0.000       0.060       0.065       0.452

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.845      17.065       1.130     544.817      22.007     183.250       1.421

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 137012.328       0.605     789.693  972759.562


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =12.353   EfDer =  0.983

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    101.992    2643.000      17.065     544.817       1.000       1.000       0.980
W Kg/sec =   46.36004

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     90.044    2578.873       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  78460.727   80029.773       2.252     590.487     262.230     474.134       1.808

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   304.89    -0.10   304.89     0.27   462.46
 MEAN    18.08     0.00    -0.02   304.89    -0.10   304.89     0.27
 HUB     15.21     0.00    -0.02   304.89    -0.10   304.89     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.25    46.36    10.89   473.98   563.66    16.23   537.05     0.50
 MEAN    53.83    42.30    11.53   416.97   516.63    16.23   537.05     0.45
 HUB     49.01    37.84    11.17   350.81   464.87    16.23   537.05     0.41

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   403.01   247.67   317.93  1150.42     0.35
 MEAN    18.01   407.26   250.82   320.85  1148.03     0.35
 HUB     15.22   436.90   292.87   324.20  1145.60     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    470.98   388.52   223.31     0.34  5059.51
 MEAN   415.39   360.60   164.57     0.31  4519.18     1.57
 HUB    351.11   329.39    58.24     0.29  4459.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.98     1.11    17.43   563.56     1.03   549.99     0.92     0.90
 MEAN    18.77     1.10    17.20   561.56     1.03   547.71     0.92     0.90
 HUB     18.74     1.10    16.95   561.34     1.03   545.40     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.92    35.08    31.50     3.58     0.93     0.39     2.90
 MEAN    38.02    27.15    23.50     3.65     0.94     0.38     3.30     0.90
 HUB     42.09    10.18     6.50     3.68     0.94     0.37     3.92


  blockage3   Cor/U1    Cor/Incid
     0.550       1.000       0.983

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	697.143	251.525	650.187	1120.292	0.622	-1.661

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.814	14.486	521.563	46.000	21.149	30.600	9.451

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	666.433	251.525	712.319	1124.041	0.593	-1.475

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.550	18.759	14.785	525.060	289.961	0.044	0.180

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	655.632	0.000	655.632	1125.320	0.583	0.221

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.550	14.848	526.253	0.000	0.060	0.085	-1.436

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.831	18.691	1.095	562.150	17.333	211.992	1.643

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
107945.328	0.487	622.161	886268.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =12.353 EfDer = 0.791

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
101.992	2643.000	18.691	562.150	1.000	1.000	0.580

W Kg/sec = 46.36004

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
83.507	2538.803	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
78460.727	80029.773	1.327	322.834	243.199	248.585	1.022

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	574.46	-0.20	574.46	0.51	444.64
MEAN	17.74	0.00	-0.02	574.46	-0.20	574.46	0.51	
HUB	15.05	0.00	-0.02	574.46	-0.20	574.46	0.51	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	38.87	46.36	-7.49	462.91	737.88	15.68	534.60	0.65
MEAN	35.47	43.40	-7.93	409.13	705.38	15.68	534.60	0.62
HUB	31.16	38.84	-7.68	347.12	671.30	15.68	534.60	0.59

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	382.25	189.66	331.88	1164.81	0.33
MEAN	17.51	390.02	202.48	333.34	1163.48	0.34
HUB	14.85	422.37	256.34	335.69	1162.21	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	456.91	426.10	267.25	0.37	3761.18	
MEAN	403.78	389.40	201.30	0.33	3548.30	1.90
HUB	342.51	346.57	86.17	0.30	3809.58	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.89	1.06	18.45	576.08	1.02	563.88	0.92	0.72
MEAN	19.82	1.06	18.33	575.29	1.02	562.59	0.92	0.72
HUB	19.90	1.06	18.16	576.26	1.03	561.36	0.92	0.72

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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.75    38.84    31.50     7.34     0.93     0.47     2.90
 MEAN    31.28    31.13    23.50     7.63     0.86     0.49     3.28     0.72
 HUB     37.37    14.40     6.50     7.90     0.86     0.53     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.791

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     394.307     203.812     337.548    1163.795       0.339       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.853      18.335     562.893      46.000      31.124      31.500       0.376

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     349.723     203.812     404.778    1166.655       0.300       0.212

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.847      18.646     565.663     471.992       0.013       0.312

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     339.638       0.000     339.638    1167.253       0.291       0.222

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.679     566.244       0.000       0.060       0.037       0.233

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.689      19.811       1.060     575.875      13.725     256.274       1.987

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  85496.531       0.410     492.773 1628058.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =12.353   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    101.992    2643.000      19.811     575.875       1.000       1.000       0.980
W Kg/sec =   46.36004

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     79.740    2508.366       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  78460.727   80029.773       2.210     513.330     232.235     401.059       1.727

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   319.79    -0.11   319.79     0.27   421.58
 MEAN    16.97     0.00    -0.02   319.79    -0.11   319.79     0.27
 HUB     14.32     0.00    -0.02   319.79    -0.11   319.79     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.26    46.36     7.90   444.22   547.45    18.81   567.34     0.47
 MEAN    50.76    43.80     6.96   391.42   505.53    18.81   567.34     0.43
 HUB     45.93    37.84     8.09   330.28   459.81    18.81   567.34     0.39

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   388.21   199.76   332.87  1178.51     0.33
 MEAN    16.57   394.74   208.87   334.95  1176.90     0.34
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HUB     13.89   425.02   258.54   337.35  1175.27     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    435.46   407.87   235.70     0.35  3773.52
MEAN   382.27   377.17   173.39     0.32  3463.74     1.46
HUB    320.37   342.97    61.83     0.29  3592.64

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.39     1.08    19.84   589.85     1.02   577.27     0.92     0.91
MEAN    21.26     1.07    19.66   588.70     1.02   575.69     0.92     0.91
HUB     21.31     1.08    19.47   589.18     1.02   574.10     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.97    35.30    31.50     3.80     0.93     0.32     2.90
MEAN    31.95    27.37    23.50     3.87     0.93     0.32     3.29     0.91
HUB     37.47    10.39     6.50     3.89     0.93     0.33     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     389.964     210.049     328.559    1177.776       0.331       0.049

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.302      19.743     576.546      46.000      32.591      32.400      -0.191

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     343.904     210.049     402.978    1180.655       0.291       0.254

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.297      20.077     579.367     456.573       0.013       0.342

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     327.247       0.000     327.247    1181.605       0.277       0.247

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.153     580.301       0.000       0.060       0.037       0.299

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.879      21.257       1.073     589.241      13.365     245.922       1.906

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  83272.773       0.439     479.956  906424.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =12.353   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    101.992    2643.000      21.257     589.241       1.000       1.000       0.980
W Kg/sec =   46.36004

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     75.173    2479.756       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  78460.727   80029.773       2.328     509.668     218.939     390.276       1.783

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   305.93    -0.11   305.93     0.26   396.43
 MEAN    15.91     0.00    -0.02   305.93    -0.11   305.93     0.26
 HUB     13.07     0.00    -0.02   305.93    -0.11   305.93     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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 TIP     54.10    47.36     6.74   422.54   521.75    20.29   581.43     0.44
 MEAN    50.20    44.80     5.40   367.03   477.89    20.29   581.43     0.40
 HUB     44.59    38.84     5.75   301.45   429.57    20.29   581.43     0.36

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   369.33   186.02   319.06  1191.62     0.31
 MEAN    15.50   373.13   190.04   321.11  1189.91     0.31
 HUB     12.59   397.34   230.83   323.41  1188.19     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    413.78   392.01   227.76     0.33  3339.12
 MEAN   357.44   362.13   167.40     0.30  2946.86     1.45
 HUB    290.38   328.85    59.55     0.28  2907.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     22.71     1.07    21.25   601.60     1.02   590.21     0.92     0.91
 MEAN    22.54     1.06    21.05   600.15     1.02   588.53     0.92     0.91
 HUB     22.52     1.06    20.84   600.00     1.02   586.82     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.24    35.52    31.50     4.02     0.93     0.31     2.90
 MEAN    30.62    27.53    23.50     4.03     0.92     0.30     3.34     0.91
 HUB     35.52    10.43     6.50     3.93     0.92     0.30     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     377.160     193.526     323.725    1190.098       0.317      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     22.560      21.041     588.710      46.000      30.871      33.000       2.129

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     342.465     193.526     393.363    1192.203       0.287       0.160

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      22.551      21.294     590.794     440.827       0.026       0.322

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     321.019       0.000     321.019    1193.401       0.269       0.249

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      21.425     591.982       0.000       0.060       0.038       0.245

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      22.532       1.060     600.584      11.343     271.008       2.101

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   70690.273       0.413     407.435  950089.438

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     484417.25   2792.0190     99.6361      1.4915      0.8164     12.3528      1.1488


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 60%  Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.020    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   50.46355

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.455    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 85405.578   87113.516       2.633     831.557     315.845     619.754       1.962

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   252.87    -0.09   252.87     0.23   406.33
 MEAN    17.06     0.00    -0.02   252.87    -0.09   252.87     0.23
 HUB     12.51     0.00    -0.02   252.87    -0.09   252.87     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.21    50.47     7.74   407.95   480.04    14.58   517.47     0.43
 MEAN    53.15    47.20     5.95   337.36   421.68    14.58   517.47     0.38
 HUB     44.38    38.62     5.76   247.38   353.81    14.58   517.47     0.32

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   411.69   220.75   347.51  1122.00     0.37
 MEAN    18.04   430.43   250.77   349.84  1120.48     0.38
 HUB     15.00   485.97   332.06   354.83  1117.48     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   394.72   187.20     0.35  4555.88
 MEAN   356.65   365.52   105.89     0.33  4524.33     1.29
 HUB    296.62   356.59    35.44     0.32  4982.04

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.48     1.09    15.02   537.28     1.03   523.13     0.92     0.91
 MEAN    16.47     1.09    14.88   537.18     1.03   521.71     0.92     0.91
 HUB     16.62     1.10    14.59   538.64     1.03   518.91     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.43    28.31    24.20     4.11     0.93     0.26     2.90
 MEAN    35.63    16.84    12.70     4.14     0.92     0.22     3.51     0.91
 HUB     43.10    -5.70    -9.30     3.60     0.92     0.10     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     437.269     250.280     358.559    1120.504       0.390      -0.010

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    16.507      14.859     521.730      24.000      34.916      35.400       0.484

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     387.069     250.280     460.937    1124.210       0.344       0.218

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.498      15.197     525.186     528.796       0.015       0.370

   VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	358.919	0.000	358.919	1126.085	0.319	0.284

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.341	526.940	0.000	0.060	0.037	0.303

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.875	16.462	1.090	537.700	14.890	220.181	1.707

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
92703.586	0.557	581.607	1063300.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 5.953 EfDer = 0.992

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
111.020	2266.000	16.462	537.700	1.000	1.000	0.980

W Kg/sec = 50.46355

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
100.937	2225.604	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85405.578	87113.516	2.009	590.487	293.951	474.134	1.613

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	343.01	-0.12	343.01	0.30	399.11
MEAN	18.08	0.00	-0.02	343.01	-0.12	343.01	0.30	
HUB	15.21	0.00	-0.02	343.01	-0.12	343.01	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.84	46.36	3.48	406.37	531.87	15.44	527.87	0.47
MEAN	46.19	42.30	3.89	357.49	495.52	15.44	527.87	0.44
HUB	41.26	37.84	3.42	300.77	456.28	15.44	527.87	0.40

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	394.14	145.72	366.21	1133.78	0.35
MEAN	18.01	403.27	166.92	367.11	1133.24	0.36
HUB	15.22	436.41	233.88	368.45	1132.64	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	448.02	258.08	0.40	2977.93	
MEAN	356.14	413.01	189.22	0.36	3008.30	1.29
HUB	301.03	374.52	67.15	0.33	3562.16	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.40	1.06	16.00	547.16	1.02	534.18	0.92	0.91
MEAN	17.41	1.06	15.95	547.25	1.02	533.67	0.92	0.91
HUB	17.58	1.07	15.87	549.01	1.02	533.11	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	21.70	35.17	31.50	3.67	0.93	0.20	2.90	
MEAN	24.45	27.27	23.50	3.77	0.92	0.22	3.30	0.91
HUB	32.41	10.33	6.50	3.83	0.92	0.24	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	457.570	167.385	425.855	1129.674	0.405	-0.239

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.447	15.581	530.323	46.000	21.458	30.600	9.142

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	440.228	167.385	470.976	1131.058	0.389	-0.163

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	17.421	15.690	531.623	455.853	0.028	0.172

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	434.747	0.000	434.747	1131.484	0.384	0.066

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	15.682	532.024	0.000	0.060	0.064	-0.168

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.821	17.366	1.055	547.809	10.109	288.894	2.239

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
62946.453	0.386	394.915	984160.938

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 5.953 EfDer = 0.903

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
111.020	2266.000	17.366	547.809	1.000	1.000	0.880

W Kg/sec = 50.46355

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
96.579	2204.975	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85405.578	87113.516	1.741	489.817	281.263	384.470	1.367

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	406.44	-0.14	406.44	0.36	386.18
MEAN	17.74	0.00	-0.02	406.44	-0.14	406.44	0.36	
HUB	15.05	0.00	-0.02	406.44	-0.14	406.44	0.36	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	44.33	46.36	-2.03	396.88	568.17	15.89	534.01	0.50
MEAN	40.81	43.40	-2.59	350.77	536.96	15.89	534.01	0.47
HUB	36.23	38.84	-2.61	297.61	503.83	15.89	534.01	0.44

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	402.83	110.81	387.29	1141.22	0.35
MEAN	17.51	411.60	139.34	387.30	1141.41	0.36
HUB	14.85	444.51	216.70	388.11	1141.54	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	478.45	280.93	0.42	2197.92	
MEAN	346.18	439.07	206.85	0.38	2441.79	1.30
HUB	293.65	395.67	76.96	0.35	3220.03	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.01	1.04	16.52	554.79	1.01	541.24	0.92	0.83
MEAN	18.08	1.04	16.53	555.56	1.01	541.42	0.92	0.83
HUB	18.32	1.05	16.50	558.03	1.02	541.53	0.92	0.83

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	15.97	35.96	31.50	4.46	0.93	0.19	2.90	

```
 MEAN    19.79    28.11    23.50     4.61     0.89     0.22     3.28     0.83
 HUB     29.18    11.22     6.50     4.72     0.89     0.27     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.903

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     416.536     140.251     392.214    1141.645       0.365       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.121      16.527     541.639      46.000      19.676      31.500      11.824

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     411.350     140.251     434.603    1142.022       0.360       0.011

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.087      16.534     541.998     471.992       0.031       0.152

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     400.125       0.000     400.125    1142.823       0.350       0.010

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.543     542.759       0.000       0.060       0.080       0.017

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.690      18.009       1.037     556.128       8.320     331.423       2.569

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  51814.488       0.338     325.075 1119496.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.914

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    111.020    2266.000      18.009     556.128       1.000       1.000       0.980
W Kg/sec =   50.46355

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     93.836    2188.419       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85405.578   87113.516       1.878     513.330     273.278     401.059       1.468

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   375.84    -0.13   375.84     0.33   367.81
 MEAN    16.97     0.00    -0.02   375.84    -0.13   375.84     0.33
 HUB     14.32     0.00    -0.02   375.84    -0.13   375.84     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.39    46.36    -0.97   380.86   535.17    16.71   544.33     0.47
 MEAN    41.77    43.80    -2.03   335.59   503.94    16.71   544.33     0.44
 HUB     37.01    37.84    -0.83   283.17   470.65    16.71   544.33     0.41

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   411.64    86.10   402.53  1147.42     0.36
 MEAN    16.57   418.80   117.45   401.99  1147.96     0.36
 HUB     13.89   448.76   198.93   402.27  1148.41     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
```

TIP	373.34	494.51	287.25	0.43	1628.01		
MEAN	327.74	453.67	210.29	0.40	1948.77	1.18	
HUB	274.67	409.33	75.74	0.36	2764.93		

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.50	1.03	16.93	561.30	1.01	547.15	0.92	0.84
MEAN	18.60	1.03	16.96	562.32	1.01	547.67	0.92	0.84
HUB	18.85	1.05	16.97	564.91	1.02	548.09	0.92	0.84

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	12.07	35.51	31.50	4.01	0.93	0.10	2.90	
MEAN	16.29	27.62	23.50	4.12	0.89	0.13	3.29	0.84
HUB	26.31	10.66	6.50	4.16	0.89	0.18	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.914

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	411.394	118.109	394.076	1149.047	0.358	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.634	17.052	548.708	46.000	16.684	32.400	15.716

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	419.682	118.109	435.985	1148.444	0.365	-0.005

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.582	16.943	548.133	456.573	0.040	0.124

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	400.180	0.000	400.180	1149.842	0.348	-0.039

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.986	549.468	0.000	0.060	0.105	0.020

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.606	18.472	1.026	562.841	6.712	383.240	2.971

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
41806.695	0.300	262.288	1029034.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 5.953 EfDer = 0.858

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
111.020	2266.000	18.472	562.841	1.000	1.000	0.980

W Kg/sec = 50.46355

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
92.032	2175.331	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85405.578	87113.516	1.902	509.668	268.028	390.276	1.456

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	372.95	-0.13	372.95	0.32	347.76
MEAN	15.91	0.00	-0.02	372.95	-0.13	372.95	0.32	
HUB	13.07	0.00	-0.02	372.95	-0.13	372.95	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	44.18	47.36	-3.18	362.27	520.02	17.18	551.23	0.45
MEAN	40.17	44.80	-4.63	314.67	488.05	17.18	551.23	0.42
HUB	34.74	38.84	-4.10	258.45	453.82	17.18	551.23	0.39

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      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   405.71    66.26   400.26  1153.39     0.35
 MEAN    15.50   410.96    95.38   399.74  1153.97     0.36
 HUB     12.59   435.86   172.97   400.07  1154.45     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   493.40   288.50     0.43  1191.02
 MEAN   306.46   452.04   211.08     0.39  1480.24     1.15
 HUB    248.96   407.22    75.99     0.35  2179.38

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.81     1.02    17.27   566.62     1.01   552.88     0.92     0.79
 MEAN    18.90     1.02    17.31   567.54     1.01   553.44     0.92     0.79
 HUB     19.10     1.03    17.31   569.76     1.01   553.90     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     9.40    35.78    31.50     4.28     0.93     0.07     2.90
 MEAN   13.42    27.84    23.50     4.34     0.88     0.10     3.34     0.79
 HUB    23.38    10.75     6.50     4.25     0.88     0.15     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.858

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     414.823      97.132     403.291    1154.140       0.359      -0.013

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.905      17.289     553.607      46.000      13.542      33.000      19.458

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     436.172      97.132     446.856    1152.558       0.378      -0.177

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.776      17.006     552.090     440.827       0.099       0.096

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     407.960       0.000     407.960    1154.632       0.353      -0.068

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      17.177     554.078       0.000       0.060       0.128      -0.073

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.432      18.727       1.014     567.974       5.134     465.098       3.605

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  31977.408       0.254     200.621 1090119.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    281248.62   1764.5061     108.4552      1.2396      0.7354      5.9532      1.0864


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 10% Ice Block 3-11-2011
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.993    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   49.54226

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.475    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 83846.383   85523.125        2.682     831.557     310.079     619.754       1.999

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   248.01    -0.09   248.01     0.22   406.33
MEAN    17.06     0.00    -0.02   248.01    -0.09   248.01     0.22
HUB     12.51     0.00    -0.02   248.01    -0.09   248.01     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.71    50.47     8.24   407.95   477.50    14.60   517.67     0.43
MEAN    53.69    47.20     6.49   337.36   418.78    14.60   517.67     0.38
HUB     44.94    38.62     6.32   247.38   350.36    14.60   517.67     0.31

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   407.83   224.69   340.35  1122.56     0.36
MEAN    18.04   425.99   252.99   342.74  1120.96     0.38
HUB     15.00   480.29   331.42   347.61  1117.94     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    407.95   386.55   183.26     0.34  4637.11
MEAN   356.65   358.07   103.67     0.32  4564.33     1.31
HUB    296.62   349.35    34.80     0.31  4972.38

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.51     1.09    15.07   537.54     1.03   523.65     0.92     0.91
MEAN    16.49     1.09    14.92   537.31     1.03   522.15     0.92     0.91
HUB     16.61     1.10    14.63   538.61     1.03   519.34     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.43    28.30     24.20     4.10     0.93     0.27     2.90
MEAN    36.43    16.83     12.70     4.13     0.93     0.23     3.51     0.91
HUB     43.63    -5.72     -9.30     3.58     0.93     0.11     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    18.071     432.581     252.495     351.244    1120.997       0.386       -0.009

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    16.520      14.905     522.189      24.000      35.711      35.400      -0.311

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     378.833     252.495     455.267    1124.900       0.337       0.234

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.511      15.263     525.831     528.796       0.015       0.382

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     351.409       0.000     351.409    1126.687       0.312       0.297
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.400	527.504	0.000	0.060	0.037	0.316

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	16.475	1.091	537.818	15.008	216.767	1.680

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
93438.875	0.561	575.517	1042869.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 6.485 EfDer = 0.995

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
108.993	2266.000	16.475	537.818	1.000	1.000	0.980

W Kg/sec = 49.54226

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
99.023	2225.360	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
83846.383	85523.125	2.048	590.487	288.378	474.134	1.644

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	335.90	-0.12	335.90	0.30	399.07
MEAN	18.08	0.00	-0.02	335.90	-0.12	335.90	0.30	
HUB	15.21	0.00	-0.02	335.90	-0.12	335.90	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.43	46.36	4.07	406.37	527.31	15.49	528.39	0.47
MEAN	46.79	42.30	4.49	357.49	490.63	15.49	528.39	0.44
HUB	41.85	37.84	4.01	300.77	450.96	15.49	528.39	0.40

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	388.86	151.54	358.12	1134.67	0.34
MEAN	18.01	397.84	171.13	359.16	1134.01	0.35
HUB	15.22	430.67	235.44	360.62	1133.29	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	438.04	252.25	0.39	3096.91	
MEAN	356.14	404.01	185.01	0.36	3084.10	1.31
HUB	301.03	366.53	65.59	0.32	3585.81	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.45	1.06	16.09	547.65	1.02	535.03	0.92	0.91
MEAN	17.45	1.06	16.02	547.61	1.02	534.39	0.92	0.91
HUB	17.61	1.07	15.94	549.21	1.02	533.72	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	22.94	35.16	31.50	3.66	0.93	0.22	2.90	
MEAN	25.48	27.25	23.50	3.75	0.92	0.23	3.30	0.91
HUB	33.14	10.31	6.50	3.81	0.92	0.25	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	450.239	171.608	416.252	1130.638	0.398	-0.233

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.489	15.676	531.228	46.000	22.405	30.600	8.195

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	429.786	171.608	462.780	1132.237	0.380	-0.138

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	17.466	15.811	532.731	455.853	0.025	0.185

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	424.337	0.000	424.337	1132.650	0.375	0.087

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	15.806	533.120	0.000	0.060	0.059	-0.141

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.835	17.416	1.057	548.158	10.340	281.075	2.179

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
64386.652	0.395	396.576	964193.438

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 6.485 EfDer = 0.916

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
108.993	2266.000	17.416	548.158	1.000	1.000	0.880

W Kg/sec = 49.54226

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
94.570	2204.272	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
83846.383	85523.125	1.778	489.817	275.412	384.470	1.396

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	396.91	-0.14	396.91	0.35	386.05
MEAN	17.74	0.00	-0.02	396.91	-0.14	396.91	0.35	
HUB	15.05	0.00	-0.02	396.91	-0.14	396.91	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.01	46.36	-1.35	396.88	561.39	16.00	535.00	0.49
MEAN	41.48	43.40	-1.92	350.77	529.79	16.00	535.00	0.47
HUB	36.88	38.84	-1.96	297.61	496.18	16.00	535.00	0.44

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	395.69	117.95	377.70	1142.57	0.35
MEAN	17.51	404.61	144.58	377.90	1142.59	0.35
HUB	14.85	437.43	218.73	378.82	1142.56	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	466.49	273.78	0.41	2339.42	
MEAN	346.18	428.32	201.61	0.37	2533.49	1.31
HUB	293.65	386.15	74.93	0.34	3250.13	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.12	1.04	16.67	555.59	1.01	542.51	0.92	0.84
MEAN	18.18	1.04	16.66	556.20	1.01	542.53	0.92	0.84
HUB	18.39	1.06	16.62	558.48	1.02	542.50	0.92	0.84

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	17.34	35.94	31.50	4.44	0.93	0.21	2.90	
MEAN	20.94	28.08	23.50	4.58	0.89	0.23	3.28	0.84
HUB	30.00	11.19	6.50	4.69	0.89	0.28	3.87	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.916

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      409.400     145.527     382.662     1142.825       0.358       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     18.213      16.665      542.760      46.000      20.822       31.500      10.678

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392      400.780     145.527     426.383     1143.439       0.351       0.031

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       18.185      16.702      543.343      471.992       0.028       0.167

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121      389.714       0.000     389.714     1144.207       0.341       0.032

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       16.715      544.073       0.000       0.060       0.072       0.040

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.722       18.114        1.040      556.756        8.598      319.523       2.477

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  53550.098       0.349     329.831 1095230.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  0.928

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    108.993     2266.000       18.114      556.756       1.000        1.000       0.980
W Kg/sec =   49.54226

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     91.636     2187.184        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  83846.383   85523.125        1.924      513.330     266.872      401.059       1.503

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00     -0.02   366.21     -0.13   366.21      0.32    367.60
 MEAN    16.97      0.00     -0.02   366.21     -0.13   366.21      0.32
 HUB     14.32      0.00     -0.02   366.21     -0.13   366.21      0.32

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     46.13     46.36    -0.23   380.86   528.45     16.87    545.56      0.46
 MEAN    42.51     43.80    -1.29   335.59   496.81     16.87    545.56      0.43
 HUB     37.73     37.84    -0.11   283.17   463.00     16.87    545.56      0.40

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   402.54     94.27   391.35   1149.24      0.35
 MEAN    16.57   410.06    123.34   391.07   1149.58      0.36
 HUB     13.89   440.13    201.13   391.49   1149.84      0.38

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    373.34    480.66    279.07      0.42  1782.24
 MEAN   327.74    441.26    204.40      0.38  2046.37      1.20
 HUB    274.67    398.34     73.54      0.35  2795.46
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.67     1.03    17.15   562.42     1.01   548.89     0.92     0.85
MEAN    18.75     1.04    17.17   563.25     1.01   549.21     0.92     0.85
HUB     18.98     1.05    17.16   565.63     1.02   549.46     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     13.54    35.49    31.50     3.99     0.93     0.12     2.90
MEAN    17.51    27.59    23.50     4.09     0.90     0.15     3.29     0.85
HUB     27.19    10.64     6.50     4.14     0.90     0.19     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.928

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     402.973     124.034     383.410    1150.616       0.350       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.783      17.254     550.208      46.000      17.927      32.400      14.473

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     407.654     124.034     426.106    1150.285       0.354       0.014

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.740      17.179     549.891     456.573       0.036       0.139

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     388.592       0.000     388.592    1151.609       0.337      -0.017

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.226     551.158       0.000       0.060       0.097       0.042

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.654      18.640       1.029     563.767       7.011     366.139       2.838

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  43668.586       0.313     268.968 1006596.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  0.876

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.993    2266.000      18.640     563.767       1.000       1.000       0.980
W Kg/sec =   49.54226

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.611    2173.542       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83846.383   85523.125       1.953     509.668     260.978     390.276       1.495

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   362.34    -0.12   362.34     0.31   347.48
 MEAN    15.91     0.00    -0.02   362.34    -0.12   362.34     0.31
 HUB     13.07     0.00    -0.02   362.34    -0.12   362.34     0.31

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.00    47.36    -2.36   362.27   512.47    17.41   552.81     0.44
 MEAN    40.98    44.80    -3.82   314.67   479.99    17.41   552.81     0.42
 HUB     35.51    38.84    -3.33   258.45   445.15    17.41   552.81     0.39

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
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      0.500       0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
  TIP     17.94   395.24    75.30   388.00  1155.62     0.34
  MEAN    15.50   400.90   101.92   387.73  1155.98     0.35
  HUB     12.59   425.99   175.40   388.20  1156.26     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    354.76   478.16   279.45     0.41  1353.22
  MEAN   306.46   438.37   204.54     0.38  1581.46     1.17
  HUB    248.96   395.11    73.56     0.34  2209.92

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.04     1.02    17.56   568.06     1.01   555.02     0.92     0.80
  MEAN    19.11     1.03    17.58   568.79     1.01   555.37     0.92     0.80
  HUB     19.30     1.04    17.57   570.78     1.01   555.63     0.92     0.80

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     10.98    35.76    31.50     4.26     0.93     0.09     2.90
  MEAN    14.73    27.81    23.50     4.31     0.88     0.12     3.34     0.80
  HUB     24.31    10.73     6.50     4.23     0.88     0.16     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.876

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     404.651     103.786     391.115    1156.156       0.350      -0.012

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      19.117      17.562     555.541      46.000      14.861      33.000      18.139

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     421.947     103.786     434.523    1154.913       0.365      -0.152

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      19.006      17.329     554.347     440.827       0.091       0.111

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     394.894       0.000     394.894    1156.833       0.341      -0.047

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      17.487     556.192       0.000       0.060       0.121      -0.052

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.503      18.958       1.017     569.212       5.445     438.646       3.400

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   33915.270       0.269     208.894 1065687.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     288959.50   1779.7856    106.4752      1.2549      0.7579      6.4851      1.0888


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  1.000
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
107.227	2266.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 48.73943

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
104.750	2257.076	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
82487.648	84137.219	2.726	831.557	305.054	619.754	2.032

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	243.79	-0.08	243.79	0.22	406.33
MEAN	17.06	0.00	-0.02	243.79	-0.08	243.79	0.22	
HUB	12.51	0.00	-0.02	243.79	-0.08	243.79	0.22	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.14	50.47	8.67	407.95	475.32	14.61	517.85	0.43
MEAN	54.15	47.20	6.95	337.36	416.29	14.61	517.85	0.37
HUB	45.43	38.62	6.81	247.38	347.38	14.61	517.85	0.31

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	404.59	228.08	334.17	1123.04	0.36
MEAN	18.04	422.23	254.90	336.60	1121.36	0.38
HUB	15.00	475.37	330.81	341.38	1118.33	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	407.95	379.51	179.87	0.34	4706.94	
MEAN	356.65	351.64	101.75	0.31	4598.84	1.33
HUB	296.62	343.09	34.19	0.31	4963.23	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.53	1.09	15.11	537.76	1.03	524.09	0.92	0.91
MEAN	16.50	1.09	14.96	537.42	1.03	522.53	0.92	0.91
HUB	16.61	1.10	14.67	538.58	1.03	519.70	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.31	28.29	24.20	4.09	0.93	0.28	2.90	
MEAN	37.14	16.82	12.70	4.12	0.93	0.25	3.51	0.91
HUB	44.10	-5.72	-9.30	3.58	0.93	0.12	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	428.601	254.406	344.929	1121.412	0.382	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
16.530	14.943	522.576	24.000	36.411	35.400	-1.011

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	371.745	254.406	450.463	1125.483	0.330	0.248

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.522	15.318	526.377	528.796	0.015	0.393

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	344.946	0.000	344.946	1127.197	0.306	0.309

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.448	527.981	0.000	0.060	0.037	0.328

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	16.486	1.091	537.919	15.109	213.838	1.658

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
94066.633	0.565	569.995	1025114.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 6.953 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
107.227	2266.000	16.486	537.919	1.000	1.000	0.980

W Kg/sec = 48.73943

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
97.366	2225.151	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
82487.648	84137.219	2.082	590.487	283.552	474.134	1.672

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	329.78	-0.11	329.78	0.29	399.03
MEAN	18.08	0.00	-0.02	329.78	-0.11	329.78	0.29	
HUB	15.21	0.00	-0.02	329.78	-0.11	329.78	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.95	46.36	4.59	406.37	523.43	15.54	528.84	0.46
MEAN	47.32	42.30	5.02	357.49	486.45	15.54	528.84	0.43
HUB	42.38	37.84	4.54	300.77	446.42	15.54	528.84	0.40

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	384.50	156.56	351.18	1135.42	0.34
MEAN	18.01	393.30	174.75	352.35	1134.65	0.35
HUB	15.22	425.79	236.76	353.90	1133.83	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	429.48	247.23	0.38	3199.37	
MEAN	356.14	396.30	181.39	0.35	3149.31	1.32
HUB	301.03	359.68	64.27	0.32	3605.94	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.50	1.06	16.16	548.08	1.02	535.73	0.92	0.91
MEAN	17.48	1.06	16.09	547.92	1.02	535.00	0.92	0.91
HUB	17.63	1.07	15.99	549.37	1.02	534.23	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	24.03	35.15	31.50	3.65	0.93	0.23	2.90	
MEAN	26.38	27.24	23.50	3.74	0.92	0.24	3.30	0.91
HUB	33.78	10.29	6.50	3.79	0.92	0.26	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	444.088	175.241	408.050	1131.445	0.392	-0.228

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.522	15.754	531.987	46.000	23.242	30.600	7.358

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	420.899	175.241	455.922	1133.225	0.371	-0.116

```
   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      17.503      15.911     533.662     455.853       0.023       0.196

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     415.488       0.000     415.488    1133.627       0.367       0.106

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      15.908     534.040       0.000       0.060       0.055      -0.118

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.845      17.457       1.059     548.458      10.539     274.553       2.128

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  65624.633       0.402     397.651  946910.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.927

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.227    2266.000      17.457     548.458       1.000       1.000       0.880
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.844    2203.670       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82487.648   84137.219       1.812     489.817     270.387     384.470       1.422

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   388.80    -0.13   388.80     0.34   385.95
 MEAN    17.74     0.00    -0.02   388.80    -0.13   388.80     0.34
 HUB     15.05     0.00    -0.02   388.80    -0.13   388.80     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.60    46.36    -0.76   396.88   555.68    16.10   535.83     0.49
 MEAN    42.07    43.40    -1.33   350.77   523.74    16.10   535.83     0.46
 HUB     37.44    38.84    -1.40   297.61   489.71    16.10   535.83     0.43

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   389.82   124.05   369.56  1143.69     0.34
 MEAN    17.51   398.80   149.00   369.92  1143.57     0.35
 HUB     14.85   431.47   220.45   370.91  1143.41     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   456.32   267.69     0.40  2460.10
 MEAN   346.18   419.19   197.19     0.37  2610.84     1.33
 HUB    293.65   378.06    73.21     0.33  3275.64

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.20     1.04    16.80   556.27     1.01   543.58     0.92     0.85
 MEAN    18.25     1.05    16.78   556.75     1.02   543.47     0.92     0.85
 HUB     18.46     1.06    16.73   558.86     1.02   543.31     0.92     0.85

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.56    35.92    31.50     4.42     0.93     0.22     2.90
 MEAN    21.94    28.06    23.50     4.56     0.90     0.24     3.28     0.85
 HUB     30.72    11.17     6.50     4.67     0.90     0.29     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.927
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     403.455     149.977     374.543    1143.813       0.353       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.289      16.779     543.699      46.000      21.822      31.500       9.678

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     391.837     149.977     419.558    1144.625       0.342       0.048

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.265      16.841     544.471     471.992       0.025       0.181

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     380.919       0.000     380.919    1145.365       0.333       0.051

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.858     545.175       0.000       0.060       0.067       0.059

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.748      18.202       1.043     557.293       8.835     309.867       2.402

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  55023.762       0.359     333.415 1074348.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.939

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.227    2266.000      18.202     557.293       1.000       1.000       0.980
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.762    2186.132       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82487.648   84137.219       1.964     513.330     261.413     401.059       1.534

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   358.07    -0.12   358.07     0.31   367.42
 MEAN    16.97     0.00    -0.02   358.07    -0.12   358.07     0.31
 HUB     14.32     0.00    -0.02   358.07    -0.12   358.07     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.78    46.36     0.42   380.86   522.84    17.01   546.59     0.46
 MEAN    43.15    43.80    -0.65   335.59   490.84    17.01   546.59     0.43
 HUB     38.35    37.84     0.51   283.17   456.59    17.01   546.59     0.40

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   395.10   101.15   381.94  1150.75      0.34
 MEAN    16.57   402.85   128.31   381.86  1150.93      0.35
 HUB     13.89   432.94   202.97   382.41  1151.03      0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   469.01   272.20     0.41  1911.99
 MEAN   327.74   430.80   199.43     0.37  2128.75     1.22
 HUB    274.67   389.08    71.70     0.34  2821.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.80     1.03    17.33   563.36     1.01   550.33     0.92     0.86
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 MEAN    18.87     1.04    17.34   564.05     1.01   550.50     0.92     0.86
 HUB     19.09     1.05    17.32   566.25     1.02   550.60     0.92     0.86

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     14.83    35.48    31.50     3.98     0.93     0.14     2.90
 MEAN    18.57    27.58    23.50     4.08     0.90     0.16     3.29     0.86
 HUB     27.96    10.62     6.50     4.12     0.90     0.20     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.939

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     396.037     129.035     374.426    1151.923       0.344       0.052

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.907      17.421     551.458      46.000      19.015      32.400      13.385

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     397.570     129.035     417.985    1151.817       0.345       0.030

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.870      17.376     551.357     456.573       0.033       0.153

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     378.883       0.000     378.883    1153.082       0.329       0.003

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.425     552.568       0.000       0.060       0.090       0.061

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.691      18.780       1.032     564.555       7.262     352.603       2.733

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  45235.031       0.325     274.101  987311.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.892

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.227    2266.000      18.780     564.555       1.000       1.000       0.980
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.563    2172.026       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82487.648   84137.219       1.999     509.668     255.014     390.276       1.530

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   353.44    -0.12   353.44     0.31   347.24
 MEAN    15.91     0.00    -0.02   353.44    -0.12   353.44     0.31
 HUB     13.07     0.00    -0.02   353.44    -0.12   353.44     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.72    47.36    -1.64   362.27   506.21    17.60   554.13     0.44
 MEAN    41.69    44.80    -3.11   314.67   473.30    17.60   554.13     0.41
 HUB     36.19    38.84    -2.65   258.45   437.93    17.60   554.13     0.38

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     17.94   386.73    82.87   377.74  1157.46     0.33
 MEAN    15.50   392.66   107.40   377.68  1157.65     0.34
 HUB     12.59   417.81   177.43   378.27  1157.76     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   465.42   271.89     0.40  1488.84
 MEAN   306.46   426.93   199.05     0.37  1666.44     1.19
 HUB    248.96   384.97    71.53     0.33  2235.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.23     1.02    17.80   569.28     1.01   556.79     0.92     0.82
 MEAN    19.29     1.03    17.81   569.85     1.01   556.97     0.92     0.82
 HUB     19.46     1.04    17.78   571.65     1.01   557.08     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     12.37    35.75    31.50     4.25     0.93     0.11     2.90
 MEAN    15.87    27.79    23.50     4.29     0.89     0.13     3.34     0.82
 HUB     25.13    10.71     6.50     4.21     0.89     0.17     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.892

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     396.324     109.373     380.934    1157.825       0.342      -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.295      17.791     557.145      46.000      16.020      33.000      16.980

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     410.134     109.373     424.467    1156.858       0.355      -0.130

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.198      17.599     556.215     440.827       0.083       0.124

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     384.004       0.000     384.004    1158.659       0.331      -0.028

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.748     557.948       0.000       0.060       0.114      -0.032

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.558      19.152       1.020     570.260       5.705     418.305       3.243

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  35537.512       0.282     215.339 1044757.062

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     295487.56   1790.5012    104.7498      1.2678      0.7756      6.9532      1.0908


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 60%  Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     105.235    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   47.83408
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
102.804	2257.076	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
80955.414	82574.344	2.778	831.557	299.388	619.754	2.070

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	239.04	-0.08	239.04	0.21	406.33
MEAN	17.06	0.00	-0.02	239.04	-0.08	239.04	0.21	
HUB	12.51	0.00	-0.02	239.04	-0.08	239.04	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.64	50.47	9.17	407.95	472.90	14.63	518.04	0.42
MEAN	54.69	47.20	7.49	337.36	413.53	14.63	518.04	0.37
HUB	45.99	38.62	7.37	247.38	344.06	14.63	518.04	0.31

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	401.07	231.85	327.27	1123.56	0.36
MEAN	18.04	418.09	257.04	329.73	1121.81	0.37
HUB	15.00	469.94	330.17	334.41	1118.76	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	407.95	371.64	176.10	0.33	4784.73	
MEAN	356.65	344.45	99.61	0.31	4637.42	1.35
HUB	296.62	336.09	33.55	0.30	4953.53	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.55	1.10	15.16	538.01	1.03	524.57	0.92	0.91
MEAN	16.51	1.09	15.00	537.54	1.03	522.94	0.92	0.91
HUB	16.61	1.10	14.71	538.55	1.03	520.10	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.31	28.28	24.20	4.08	0.93	0.30	2.90	
MEAN	37.94	16.81	12.70	4.11	0.93	0.26	3.51	0.91
HUB	44.63	-5.73	-9.30	3.57	0.93	0.13	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	424.227	256.543	337.868	1121.868	0.378	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
16.541	14.984	523.000	24.000	37.209	35.400	-1.809

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	363.843	256.543	445.192	1126.122	0.323	0.264

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.532	15.377	526.975	528.796	0.015	0.406

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	337.741	0.000	337.741	1127.755	0.299	0.321

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.500	528.505	0.000	0.060	0.038	0.341

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	16.496	1.092	538.032	15.222	210.565	1.632

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94770.008       0.569     563.590 1005147.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    105.235    2266.000      16.496     538.032       1.000       1.000       0.980
W Kg/sec =   47.83408

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     95.508    2224.918       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  80955.414   82574.344       2.123     590.487     278.141     474.134       1.705

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   322.95    -0.11   322.95     0.29   398.99
 MEAN    18.08     0.00    -0.02   322.95    -0.11   322.95     0.29
 HUB     15.21     0.00    -0.02   322.95    -0.11   322.95     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.53    46.36     5.17   406.37   519.16    15.58   529.32     0.46
 MEAN    47.91    42.30     5.61   357.49   481.85    15.58   529.32     0.43
 HUB     42.97    37.84     5.13   300.77   441.40    15.58   529.32     0.39

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   379.83   162.11   343.50  1136.24     0.33
 MEAN    18.01   388.38   178.78   344.78  1135.35     0.34
 HUB     15.22   420.45   238.26   346.43  1134.43     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   420.01   241.69     0.37  3312.55
 MEAN   356.14   387.73   177.36     0.34  3221.82     1.34
 HUB    301.03   352.07    62.77     0.31  3628.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.55     1.06    16.24   548.55     1.02   536.50     0.92     0.91
 MEAN    17.52     1.06    16.15   548.26     1.02   535.67     0.92     0.91
 HUB     17.65     1.07    16.05   549.56     1.02   534.79     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.26    35.13    31.50     3.63     0.93     0.24     2.90
 MEAN    27.41    27.22    23.50     3.72     0.92     0.25     3.30     0.91
 HUB     34.52    10.27     6.50     3.77     0.92     0.27     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     437.400     179.281     398.969    1132.323       0.386      -0.222

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.558      15.838     532.813      46.000      24.197      30.600       6.403

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     411.095     179.281     448.487    1134.302       0.362      -0.091

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      17.542      16.018     534.677     455.853       0.021       0.210
```

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	405.740	0.000	405.740	1134.690	0.358	0.126

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	16.018	535.042	0.000	0.060	0.050	-0.091

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.854	17.500	1.061	548.791	10.759	267.507	2.074

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
66998.305	0.411	398.434	927543.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 7.486 EfDer = 0.939

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
105.235	2266.000	17.500	548.791	1.000	1.000	0.880

W Kg/sec = 47.83408

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
90.925	2203.000	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
80955.414	82574.344	1.850	489.817	264.796	384.470	1.452

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	379.85	-0.13	379.85	0.33	385.83
MEAN	17.74	0.00	-0.02	379.85	-0.13	379.85	0.33	
HUB	15.05	0.00	-0.02	379.85	-0.13	379.85	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.27	46.36	-0.09	396.88	549.45	16.20	536.74	0.48
MEAN	42.73	43.40	-0.67	350.77	517.12	16.20	536.74	0.46
HUB	38.09	38.84	-0.75	297.61	482.63	16.20	536.74	0.42

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	383.57	130.73	360.60	1144.91	0.34
MEAN	17.51	392.54	153.89	361.12	1144.64	0.34
HUB	14.85	424.99	222.33	362.20	1144.34	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	445.15	261.00	0.39	2592.45	
MEAN	346.18	409.13	192.29	0.36	2696.41	1.35
HUB	293.65	369.15	71.32	0.32	3303.57	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.30	1.05	16.93	557.02	1.02	544.74	0.92	0.86
MEAN	18.33	1.05	16.90	557.35	1.02	544.49	0.92	0.86
HUB	18.52	1.06	16.84	559.28	1.02	544.20	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	19.93	35.90	31.50	4.40	0.93	0.23	2.90	
MEAN	23.08	28.03	23.50	4.53	0.90	0.25	3.28	0.86
HUB	31.54	11.14	6.50	4.64	0.90	0.29	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.939

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

```
     17.392     397.068     154.900     365.608    1144.887       0.347       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.370      16.902     544.720      46.000      22.961      31.500       8.539

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     382.031     154.900     412.240    1145.914       0.333       0.068

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.352      16.991     545.698     471.992       0.022       0.196

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     371.291       0.000     371.291    1146.624       0.324       0.073

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.011     546.374       0.000       0.060       0.060       0.082

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.773      18.295       1.045     557.886       9.095     299.683       2.323

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  56644.578       0.369     336.861 1051073.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.951

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    105.235    2266.000      18.295     557.886       1.000       1.000       0.980
W Kg/sec =   47.83408

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.693    2184.969       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  80955.414   82574.344       2.010     513.330     255.388     401.059       1.570

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   349.15    -0.12   349.15     0.30   367.23
 MEAN    16.97     0.00    -0.02   349.15    -0.12   349.15     0.30
 HUB     14.32     0.00    -0.02   349.15    -0.12   349.15     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.50    46.36     1.14   380.86   516.77    17.16   547.71     0.45
 MEAN    43.88    43.80     0.08   335.59   484.36    17.16   547.71     0.42
 HUB     39.05    37.84     1.21   283.17   449.62    17.16   547.71     0.39

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   387.23   108.64   371.68  1152.37     0.34
 MEAN    16.57   395.15   133.75   371.82  1152.38     0.34
 HUB     13.89   425.19   205.00   372.50  1152.32     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   456.31   264.70     0.40  2053.44
 MEAN   327.74   419.38   193.99     0.36  2218.85     1.24
 HUB    274.67   378.96    69.66     0.33  2849.23

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.95     1.04    17.53   564.41     1.01   551.89     0.92     0.87
 MEAN    19.01     1.04    17.52   564.93     1.01   551.89     0.92     0.87
 HUB     19.21     1.05    17.49   566.93     1.02   551.84     0.92     0.87
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     16.29    35.46    31.50     3.96     0.93     0.15     2.90
 MEAN    19.78    27.55    23.50     4.05     0.90     0.18     3.29     0.87
 HUB     28.83    10.59     6.50     4.09     0.90     0.21     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.951

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     388.640     134.506     364.622    1153.336       0.337       0.052

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.041      17.600     552.811      46.000      20.249      32.400      12.151

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     386.612     134.506     409.342    1153.473       0.335       0.050

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.011      17.587     552.943     456.573       0.029       0.169

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     368.342       0.000     368.342    1154.674       0.319       0.026

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.640     554.095       0.000       0.060       0.082       0.084

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.728       18.930       1.035     565.424       7.537     338.610       2.625

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  46947.922       0.337     279.196  965839.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.908

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    105.235    2266.000       18.930     565.424       1.000       1.000       0.980
W Kg/sec =   47.83408

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     85.320    2170.356        1.402       0.249      53.349       56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  80955.414   82574.344        2.051     509.668     248.482     390.276       1.571

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   343.76    -0.12   343.76     0.30   346.97
 MEAN    15.91      0.00    -0.02   343.76    -0.12   343.76     0.30
 HUB     13.07      0.00    -0.02   343.76    -0.12   343.76     0.30

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     46.51     47.36    -0.85   362.27   499.49     17.80   555.56      0.43
 MEAN    42.48     44.80    -2.32   314.67   466.11     17.80   555.56      0.40
 HUB     36.95     38.84    -1.89   258.45   430.15     17.80   555.56      0.37

     ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   377.78     91.06   366.65  1159.44      0.33
 MEAN    15.50   383.90    113.33   366.79  1159.44      0.33
 HUB     12.59   409.05    179.63   367.49  1159.38      0.35
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   451.63   263.70     0.39  1635.75
 MEAN   306.46   414.53   193.13     0.36  1758.20     1.21
 HUB    248.96   373.98    69.33     0.32  2263.09

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.44     1.03    18.06   570.62     1.01   558.70     0.92     0.83
 MEAN    19.48     1.03    18.05   571.01     1.01   558.70     0.92     0.83
 HUB     19.64     1.04    18.02   572.61     1.01   558.64     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     13.95    35.72    31.50     4.22     0.93     0.13     2.90
 MEAN    17.17    27.77    23.50     4.27     0.89     0.15     3.34     0.83
 HUB     26.05    10.68     6.50     4.18     0.89     0.18     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.908

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     387.491     115.406     369.906    1159.620       0.334      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.488      18.037     558.874      46.000      17.327      33.000      15.673

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     397.427     115.406     413.844    1158.944       0.343      -0.104

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.407      17.888     558.223     440.827       0.075       0.140

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     372.254       0.000     372.254    1160.623       0.321      -0.005

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.029     559.840       0.000       0.060       0.105      -0.009

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.614      19.363       1.023     571.410       5.987     397.881       3.084

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  37293.324       0.296     221.781 1021521.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    302654.12   1799.8610    102.8040      1.2817      0.7934      7.4864      1.0930


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.509    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   47.04952

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.118    2257.076       1.402       0.249      53.349      32.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
79627.609	81219.992	2.824	831.557	294.477	619.754	2.105

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	234.94	-0.08	234.94	0.21	406.33
MEAN	17.06	0.00	-0.02	234.94	-0.08	234.94	0.21	
HUB	12.51	0.00	-0.02	234.94	-0.08	234.94	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.07	50.47	9.60	407.95	470.83	14.65	518.20	0.42
MEAN	55.15	47.20	7.95	337.36	411.17	14.65	518.20	0.37
HUB	46.49	38.62	7.87	247.38	341.22	14.65	518.20	0.31

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	398.16	235.09	321.34	1123.99	0.35
MEAN	18.04	414.58	258.86	323.83	1122.18	0.37
HUB	15.00	465.31	329.62	328.42	1119.12	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	407.95	364.89	172.86	0.32	4851.52	
MEAN	356.65	338.28	97.79	0.30	4670.22	1.37
HUB	296.62	330.08	33.01	0.29	4945.38	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.57	1.10	15.20	538.22	1.03	524.98	0.92	0.91
MEAN	16.52	1.09	15.03	537.65	1.03	523.29	0.92	0.91
HUB	16.60	1.10	14.74	538.52	1.03	520.44	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.19	28.28	24.20	4.08	0.93	0.31	2.90	
MEAN	38.64	16.80	12.70	4.10	0.93	0.27	3.51	0.91
HUB	45.10	-5.74	-9.30	3.56	0.93	0.14	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	420.522	258.359	331.797	1122.252	0.375	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
16.549	15.018	523.359	24.000	37.907	35.400	-2.507

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	357.069	258.359	440.735	1126.662	0.317	0.278

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.540	15.427	527.480	528.796	0.016	0.417

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	331.565	0.000	331.565	1128.227	0.294	0.332

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.542	528.947	0.000	0.060	0.039	0.352

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	16.504	1.092	538.129	15.319	207.759	1.611

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
95373.062	0.573	557.874	987890.812

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.509    2266.000      16.504     538.129       1.000       1.000       0.980
W Kg/sec =   47.04952

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.906    2224.718       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 79627.609   81219.992       2.159     590.487     273.476     474.134       1.734

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   317.10    -0.11   317.10     0.28   398.95
MEAN    18.08     0.00    -0.02   317.10    -0.11   317.10     0.28
HUB     15.21     0.00    -0.02   317.10    -0.11   317.10     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     52.04    46.36     5.68   406.37   515.53    15.62   529.73     0.46
MEAN    48.44    42.30     6.14   357.49   477.94    15.62   529.73     0.42
HUB     43.50    37.84     5.66   300.77   437.13    15.62   529.73     0.39

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   375.98   166.81   336.95  1136.92     0.33
MEAN    18.01   384.27   182.20   338.32  1135.94     0.34
HUB     15.22   415.92   239.50   340.04  1134.93     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   411.94   236.98     0.36  3408.56
MEAN   356.14   380.42   173.94     0.33  3283.40     1.36
HUB    301.03   345.56    61.53     0.30  3647.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.59     1.07    16.30   548.95     1.02   537.15     0.92     0.91
MEAN    17.55     1.06    16.21   548.56     1.02   536.22     0.92     0.91
HUB     17.67     1.07    16.10   549.71     1.02   535.27     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     26.34    35.12    31.50     3.62     0.93     0.26     2.90
MEAN    28.30    27.21    23.50     3.71     0.93     0.26     3.30     0.91
HUB     35.16    10.26     6.50     3.76     0.93     0.28     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     431.801     182.712     391.239    1133.056       0.381      -0.216

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.586      15.907     533.503      46.000      25.033      30.600       5.567

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     402.778     182.712     442.282    1135.202       0.355      -0.069

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      17.573      16.106     535.526     455.853       0.019       0.221

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     17.823     397.481       0.000     397.481    1135.577       0.350       0.144

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      16.108     535.880       0.000       0.060       0.047      -0.068

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.861      17.534       1.062     549.075      10.946     261.668       2.028

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  68162.164       0.418     398.707  910860.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.949

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.509    2266.000      17.534     549.075       1.000       1.000       0.880
W Kg/sec =   47.04952

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.283    2202.431       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79627.609   81219.992       1.884     489.817     260.016     384.470       1.479

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   372.25    -0.13   372.25     0.33   385.73
 MEAN    17.74     0.00    -0.02   372.25    -0.13   372.25     0.33
 HUB     15.05     0.00    -0.02   372.25    -0.13   372.25     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.84    46.36     0.48   396.88   544.23    16.28   537.50     0.48
 MEAN    43.31    43.40    -0.09   350.77   511.57    16.28   537.50     0.45
 HUB     38.65    38.84    -0.19   297.61   476.68    16.28   537.50     0.42

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   378.46   136.40   353.03  1145.92     0.33
 MEAN    17.51   387.37   158.03   353.67  1145.54     0.34
 HUB     14.85   419.59   223.96   354.83  1145.12     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   435.69   255.34     0.38  2704.63
 MEAN   346.18   400.61   188.16     0.35  2768.75     1.36
 HUB    293.65   361.60    69.69     0.32  3327.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.38     1.05    17.04   557.66     1.02   545.70     0.92     0.87
 MEAN    18.40     1.05    17.00   557.87     1.02   545.34     0.92     0.87
 HUB     18.58     1.06    16.93   559.64     1.02   544.94     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.13    35.88    31.50     4.38     0.93     0.24     2.90
 MEAN    24.08    28.01    23.50     4.51     0.90     0.26     3.28     0.87
 HUB     32.26    11.11     6.50     4.61     0.90     0.30     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.949

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     391.788     159.062     358.046    1145.782       0.342       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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    18.437      17.002     545.572      46.000      23.953      31.500       7.547

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     373.762     159.062     406.201    1146.991       0.326       0.085

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.422      17.114     546.725     471.992       0.020       0.209

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.121     363.187       0.000     363.187    1147.674       0.316       0.092

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.137     547.376       0.000       0.060       0.055       0.101

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.793      18.370       1.048     558.391       9.316     291.381       2.259

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  58020.152       0.378     339.382 1031126.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.960

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.509    2266.000      18.370     558.391       1.000       1.000       0.980
W Kg/sec =   47.04952

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     85.938    2183.981       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79627.609   81219.992       2.051     513.330     250.278     401.059       1.602

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   341.63    -0.12   341.63     0.30   367.06
 MEAN    16.97     0.00    -0.02   341.63    -0.12   341.63     0.30
 HUB     14.32     0.00    -0.02   341.63    -0.12   341.63     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.12    46.36     1.76   380.86   511.72    17.28   548.65     0.45
 MEAN    44.50    43.80     0.70   335.59   478.97    17.28   548.65     0.42
 HUB     39.67    37.84     1.83   283.17   443.81    17.28   548.65     0.39

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   380.85   114.95   363.09  1153.72     0.33
 MEAN    16.57   388.83   138.31   363.40  1153.59     0.34
 HUB     13.89   418.77   206.72   364.19  1153.40     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   445.65   258.40     0.39  2172.43
 MEAN   327.74   409.81   189.43     0.36  2294.27     1.25
 HUB    274.67   370.47    67.95     0.32  2873.02

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.08     1.04    17.69   565.29     1.01   553.18     0.92     0.88
 MEAN    19.12     1.04    17.67   565.68     1.01   553.05     0.92     0.88
 HUB     19.31     1.05    17.62   567.51     1.02   552.87     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.57    35.44    31.50     3.94     0.93     0.17     2.90
 MEAN    20.84    27.53    23.50     4.03     0.90     0.19     3.29     0.88
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HUB     29.58    10.57     6.50     4.07     0.90     0.22     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.960

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     382.573     139.084     356.395    1154.510       0.331       0.052

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.151      17.747     553.938      46.000      21.318      32.400      11.082

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     377.456     139.084     402.266    1154.849       0.327       0.067

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.126      17.760     554.262     456.573       0.027       0.183

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     359.544       0.000     359.544    1155.996       0.311       0.046

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.816     555.365       0.000       0.060       0.075       0.103

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.756      19.053       1.037     566.159       7.768     327.449       2.538

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  48386.250       0.347     283.030  947453.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.922

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.509    2266.000      19.053     566.159       1.000       1.000       0.980
W Kg/sec =   47.04952

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.434    2168.947       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79627.609   81219.992       2.098     509.668     242.987     390.276       1.606

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   335.66    -0.12   335.66     0.29   346.74
 MEAN    15.91     0.00    -0.02   335.66    -0.12   335.66     0.29
 HUB     13.07     0.00    -0.02   335.66    -0.12   335.66     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.19    47.36    -0.17   362.27   493.96    17.97   556.75     0.43
 MEAN    43.16    44.80    -1.64   314.67   460.18    17.97   556.75     0.40
 HUB     37.61    38.84    -1.23   258.45   423.71    17.97   556.75     0.37

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   370.57    97.88   357.41  1161.08     0.32
 MEAN    15.50   376.77   118.28   357.72  1160.93     0.32
 HUB     12.59   401.84   181.48   358.52  1160.72     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   440.14   256.87     0.38  1758.17
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 MEAN   306.46   404.20   188.18     0.35  1834.84     1.23
 HUB    248.96   364.82    67.48     0.31  2286.37

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.61     1.03    18.27   571.74     1.01   560.27     0.92     0.84
 MEAN    19.64     1.03    18.25   571.98     1.01   560.13     0.92     0.84
 HUB     19.78     1.04    18.21   573.42     1.01   559.94     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.32    35.70    31.50     4.20     0.93     0.14     2.90
 MEAN    18.30    27.75    23.50     4.25     0.89     0.16     3.34     0.84
 HUB     26.85    10.66     6.50     4.16     0.89     0.19     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.922

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     380.303     120.445     360.726    1161.105       0.328      -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.648      18.239     560.305      46.000      18.464      33.000      14.536

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     386.916     120.445     405.229    1160.666       0.333      -0.082

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.578      18.127     559.882     440.827       0.068       0.154

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     362.509       0.000     362.509    1162.248       0.312       0.015

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.261     561.409       0.000       0.060       0.097       0.012

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.656      19.537       1.025     572.381       6.222     381.963       2.961

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   38759.348       0.308     226.718 1001680.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     308700.97   1805.7107    101.1179      1.2932      0.8069      7.9529      1.0948


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.995

    W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
      99.590    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   45.26799

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      97.289    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   76612.523   78144.609       2.935     831.557     283.327     619.754       2.187
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ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	225.65	-0.08	225.65	0.20	406.33
MEAN	17.06	0.00	-0.02	225.65	-0.08	225.65	0.20	
HUB	12.51	0.00	-0.02	225.65	-0.08	225.65	0.20	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.06	50.47	10.59	407.95	466.27	14.68	518.56	0.42
MEAN	56.23	47.20	9.03	337.36	405.93	14.68	518.56	0.36
HUB	47.64	38.62	9.02	247.38	334.90	14.68	518.56	0.30

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	391.93	242.30	308.05	1124.94	0.35
MEAN	18.04	406.94	262.95	310.57	1122.99	0.36
HUB	15.00	454.96	328.31	314.96	1119.90	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	407.95	349.77	165.65	0.31	5000.22	
MEAN	356.65	324.40	93.71	0.29	4743.87	1.41
HUB	296.62	316.55	31.69	0.28	4925.55	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.62	1.10	15.28	538.69	1.03	525.86	0.92	0.91
MEAN	16.54	1.09	15.10	537.88	1.03	524.05	0.92	0.91
HUB	16.59	1.10	14.81	538.46	1.03	521.17	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.19	28.27	24.20	4.07	0.93	0.34	2.90	
MEAN	40.25	16.79	12.70	4.09	0.93	0.30	3.51	0.91
HUB	46.19	-5.74	-9.30	3.56	0.93	0.17	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	412.441	262.437	318.173	1123.084	0.367	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
16.566	15.091	524.135	24.000	39.517	35.400	-4.117

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	341.927	262.437	431.031	1127.834	0.303	0.310

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.556	15.532	528.578	528.796	0.017	0.442

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	317.759	0.000	317.759	1129.254	0.281	0.356

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.632	529.910	0.000	0.060	0.042	0.376

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.872	16.517	1.093	538.343	15.533	201.502	1.562

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
96707.609	0.581	544.261	948857.062

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

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 RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    99.590    2266.000      16.517     538.343       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    90.297    2224.275       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 76612.523   78144.609       2.246     590.487     262.964     474.134       1.803

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   303.99    -0.10   303.99     0.27   398.87
MEAN    18.08     0.00    -0.02   303.99    -0.10   303.99     0.27
HUB     15.21     0.00    -0.02   303.99    -0.10   303.99     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.21    46.36     6.85   406.37   507.57    15.71   530.63     0.45
MEAN    49.63    42.30     7.33   357.49   469.35    15.71   530.63     0.42
HUB     44.70    37.84     6.86   300.77   427.71    15.71   530.63     0.38

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   367.93   177.26   322.42  1138.39     0.32
MEAN    18.01   375.47   189.80   323.97  1137.22     0.33
HUB     15.22   406.03   242.27   325.83  1136.02     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   394.05   226.54     0.35  3621.79
MEAN   356.14   364.17   166.34     0.32  3420.18     1.40
HUB    301.03   331.08    58.76     0.29  3689.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.67     1.07    16.44   549.85     1.02   538.54     0.92     0.91
MEAN    17.60     1.07    16.32   549.21     1.02   537.43     0.92     0.91
HUB     17.69     1.07    16.20   550.06     1.02   536.29     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     28.80    35.09    31.50     3.59     0.93     0.28     2.90
MEAN    30.36    27.18    23.50     3.68     0.93     0.29     3.30     0.91
HUB     36.63    10.22     6.50     3.72     0.93     0.30     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     419.753     190.332     374.120    1134.633       0.370      -0.205

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.642      16.049     534.990      46.000      26.965      30.600       3.635

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     384.445     190.332     428.981    1137.145       0.338      -0.020

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      17.634      16.291     537.361     455.853       0.016       0.248

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     379.314       0.000     379.314    1137.491       0.333       0.184

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.850      16.295     537.688       0.000       0.060       0.041      -0.017

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      17.601       1.066     549.704      11.361     249.151       1.931

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  70747.172       0.434     398.158  873308.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.967

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2266.000      17.601     549.704       1.000       1.000       0.880
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     85.626    2201.169       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       1.964     489.817     249.364     384.470       1.542

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   355.51    -0.12   355.51     0.31   385.51
 MEAN    17.74     0.00    -0.02   355.51    -0.12   355.51     0.31
 HUB     15.05     0.00    -0.02   355.51    -0.12   355.51     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.16    46.36     1.80   396.88   532.91    16.45   539.15     0.47
 MEAN    44.63    43.40     1.23   350.77   499.52    16.45   539.15     0.44
 HUB     39.94    38.84     1.10   297.61   463.72    16.45   539.15     0.41

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   367.87   148.83   336.41  1148.09     0.32
 MEAN    17.51   376.45   167.10   337.32  1147.46     0.33
 HUB     14.85   407.94   227.47   338.63  1146.80     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   414.94   242.90     0.36  2950.86
 MEAN   346.18   381.91   179.08     0.33  2927.58     1.40
 HUB    293.65   345.04    66.18     0.30  3379.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.54     1.05    17.27   559.07     1.02   547.77     0.92     0.88
 MEAN    18.54     1.05    17.20   559.00     1.02   547.17     0.92     0.88
 HUB     18.68     1.06    17.12   560.44     1.02   546.54     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.87    35.83    31.50     4.33     0.93     0.27     2.90
 MEAN    26.35    27.96    23.50     4.46     0.91     0.29     3.28     0.88
 HUB     33.89    11.06     6.50     4.56     0.91     0.32     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.967

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     380.633     168.200     341.453    1147.704       0.332       0.005

    Pt3        Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.575     17.211     547.405      46.000      26.225      31.500       5.275

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	355.712	168.200	393.475	1149.309	0.310	0.125

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.566	17.371	548.938	471.992	0.016	0.241

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	345.542	0.000	345.542	1149.932	0.300	0.135

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.398	549.533	0.000	0.060	0.046	0.145

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.829	18.525	1.052	559.504	9.800	274.142	2.125

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
61033.652	0.398	343.491	986530.312

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 9.028 EfDer = 0.977

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
99.590	2266.000	18.525	559.504	1.000	1.000	0.980

W Kg/sec = 45.26799

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
82.077	2181.807	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
76612.523	78144.609	2.148	513.330	239.034	401.059	1.678

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	325.23	-0.11	325.23	0.28	366.70
MEAN	16.97	0.00	-0.02	325.23	-0.11	325.23	0.28	
HUB	14.32	0.00	-0.02	325.23	-0.11	325.23	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.51	46.36	3.15	380.86	500.92	17.52	550.67	0.44
MEAN	45.91	43.80	2.11	335.59	467.41	17.52	550.67	0.41
HUB	41.06	37.84	3.22	283.17	431.31	17.52	550.67	0.37

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	367.71	128.51	344.52	1156.58	0.32
MEAN	16.57	375.62	148.16	345.16	1156.17	0.32
HUB	13.89	405.07	210.36	346.17	1155.71	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	422.66	244.83	0.37	2428.47	
MEAN	327.74	389.08	179.58	0.34	2457.55	1.29
HUB	274.67	352.09	64.31	0.30	2923.49	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.33	1.04	18.02	567.21	1.01	555.92	0.92	0.89
MEAN	19.34	1.04	17.98	567.31	1.01	555.53	0.92	0.89
HUB	19.50	1.05	17.91	568.79	1.02	555.09	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.46	35.40	31.50	3.90	0.93	0.20	2.90	
MEAN	23.23	27.49	23.50	3.99	0.91	0.22	3.29	0.89
HUB	31.29	10.52	6.50	4.02	0.91	0.25	3.90	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     369.912     148.997     338.578    1157.014       0.320       0.052

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.378      18.052     556.343      46.000      23.753      32.400       8.647

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     357.743     148.997     387.531    1157.783       0.309       0.106

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.363      18.121     557.083     456.573       0.021       0.215

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     340.637       0.000     340.637    1158.819       0.294       0.091

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.181     558.080       0.000       0.060       0.061       0.148

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.806      19.306       1.042     567.769       8.265     304.969       2.364

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  51483.191       0.369     289.742  906400.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.948

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     99.590    2266.000      19.306     567.769       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     79.336    2165.869       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.206     509.668     231.052     390.276       1.689

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   318.24    -0.11   318.24     0.27   346.25
 MEAN    15.91     0.00    -0.02   318.24    -0.11   318.24     0.27
 HUB     13.07     0.00    -0.02   318.24    -0.11   318.24     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.71    47.36     1.35   362.27   482.28    18.32   559.31     0.42
 MEAN    44.69    44.80    -0.11   314.67   447.62    18.32   559.31     0.39
 HUB     39.09    38.84     0.25   258.45   410.04    18.32   559.31     0.35

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   355.91   112.47   337.68  1164.52     0.31
 MEAN    15.50   362.03   128.91   338.30  1164.07     0.31
 HUB     12.59   386.66   185.44   339.30  1163.59     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   415.61   242.29     0.36  2019.67
 MEAN   306.46   382.06   177.55     0.33  1999.48     1.27
 HUB    248.96   345.19    63.52     0.30  2336.11
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    19.97     1.03    18.72   574.18     1.01   563.60     0.92     0.87
 MEAN   19.97     1.03    18.67   574.12     1.01   563.17     0.92     0.87
 HUB    20.08     1.04    18.60   575.19     1.01   562.70     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    18.42    35.66    31.50     4.16     0.93     0.18     2.90
 MEAN   20.86    27.69    23.50     4.19     0.90     0.19     3.34     0.87
 HUB    28.66    10.60     6.50     4.10     0.90     0.21     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.948

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     365.475     131.270     341.087    1164.247       0.314      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.980      18.659     563.342      46.000      21.050      33.000      11.950

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     364.626     131.270     387.536    1164.301       0.313      -0.030

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.934      18.623     563.394     440.827       0.054       0.186

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     341.791       0.000     341.791    1165.692       0.293       0.064

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.745     564.741       0.000       0.060       0.080       0.061

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.735      19.899       1.031     574.494       6.725     350.829       2.720

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  41896.555       0.333     235.790  957541.312

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    321868.19   1811.4414     97.2890      1.3172      0.8315      9.0280      1.0989


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 60%  Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     96.156    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.935    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73970.969   75450.234       3.040     831.557     273.558     619.754       2.266

     ROTOR LEADING EDGE CONDITIONS, STAGE            1
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   217.56    -0.07   217.56     0.19   406.33
MEAN    17.06     0.00    -0.02   217.56    -0.07   217.56     0.19
HUB     12.51     0.00    -0.02   217.56    -0.07   217.56     0.19

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.93    50.47    11.46   407.95   462.40    14.71   518.86     0.41
MEAN    57.19    47.20     9.99   337.36   401.49    14.71   518.86     0.36
HUB     48.68    38.62    10.06   247.38   329.49    14.71   518.86     0.29

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   386.93   248.50   296.59  1125.72     0.34
MEAN    18.04   400.57   266.43   299.11  1123.67     0.36
HUB     15.00   446.15   327.18   303.32  1120.56     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    407.95   336.73   159.45     0.30  5128.11
MEAN   356.65   312.42    90.22     0.28  4806.68     1.45
HUB    296.62   304.86    30.56     0.27  4908.61

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.65     1.10    15.34   539.10     1.03   526.60     0.92     0.91
MEAN    16.55     1.10    15.16   538.08     1.03   524.68     0.92     0.91
HUB     16.58     1.10    14.86   538.40     1.03   521.78     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.96    28.26    24.20     4.06     0.93     0.36     2.90
MEAN    41.69    16.78    12.70     4.08     0.94     0.32     3.51     0.91
HUB     47.17    -5.75    -9.30     3.55     0.94     0.19     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     405.700     265.916     306.400    1123.775       0.361      -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.579      15.149     524.780      24.000      40.954      35.400      -5.554

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     328.906     265.916     422.954    1128.808       0.291       0.338

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.567      15.617     529.492     528.796       0.018       0.465

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     305.882       0.000     305.882    1130.109       0.271       0.376

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.703     530.712       0.000       0.060       0.047       0.396

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.866      16.524       1.094     538.527      15.717     196.116       1.520

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  97853.297       0.588     531.720  914825.688


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
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    96.156    2266.000      16.524     538.527       1.000       1.000       0.980
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    87.161    2223.895       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 73970.969   75450.234       2.326     590.487     253.831     474.134       1.868

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   292.71    -0.10   292.71     0.26   398.80
MEAN    18.08     0.00    -0.02   292.71    -0.10   292.71     0.26
HUB     15.21     0.00    -0.02   292.71    -0.10   292.71     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.24    46.36     7.88   406.37   500.89    15.77   531.37     0.44
MEAN    50.70    42.30     8.40   357.49   462.11    15.77   531.37     0.41
HUB     45.79    37.84     7.95   300.77   419.77    15.77   531.37     0.37

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   361.61   186.12   310.04  1139.60     0.32
MEAN    18.01   368.34   196.25   311.70  1138.27     0.32
HUB     15.22   397.75   244.59   313.65  1136.92     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   378.83   217.68     0.33  3802.57
MEAN   356.14   350.31   159.88     0.31  3536.35     1.43
HUB    301.03   318.69    56.44     0.28  3724.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.73     1.07    16.54   550.60     1.02   539.68     0.92     0.91
MEAN    17.65     1.07    16.41   549.76     1.02   538.43     0.92     0.91
HUB     17.71     1.07    16.27   550.36     1.02   537.15     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.98    35.07    31.50     3.57     0.93     0.31     2.90
MEAN    32.20    27.16    23.50     3.66     0.93     0.31     3.30     0.91
HUB     37.95    10.20     6.50     3.70     0.93     0.32     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     409.899     196.805     359.562    1135.923       0.361      -0.194

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.684      16.160     536.208      46.000      28.694      30.600       1.906

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     368.944     196.805     418.153    1138.742       0.324       0.024

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      17.678      16.436     538.872     455.853       0.015       0.273

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     363.993       0.000     363.993    1139.062       0.320       0.217

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.850      16.441     539.175       0.000       0.060       0.038       0.027

   STAGE EXIT CONDITIONS, STAGE            2
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Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.876	17.648	1.068	550.240	11.713	238.957	1.852

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
72937.234	0.447	396.330	840755.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
RESET = 0.000BLEED = 0.000 DPInc = 9.988 EfDer = 0.980

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
96.156	2266.000	17.648	550.240	1.000	1.000	0.880

W Kg/sec = 43.70718

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
82.493	2200.097	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73970.969	75450.234	2.039	489.817	240.242	384.470	1.600

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	341.36	-0.12	341.36	0.30	385.32
MEAN	17.74	0.00	-0.02	341.36	-0.12	341.36	0.30	
HUB	15.05	0.00	-0.02	341.36	-0.12	341.36	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.31	46.36	2.95	396.88	523.57	16.58	540.51	0.46
MEAN	45.79	43.40	2.39	350.77	489.54	16.58	540.51	0.43
HUB	41.09	38.84	2.25	297.61	452.95	16.58	540.51	0.40

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	359.66	159.25	322.48	1149.86	0.31
MEAN	17.51	367.75	174.73	323.58	1149.03	0.32
HUB	14.85	398.40	230.42	325.01	1148.18	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	397.55	232.49	0.35	3157.04	
MEAN	346.18	366.20	171.45	0.32	3061.09	1.43
HUB	293.65	331.10	63.23	0.29	3423.50	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.67	1.06	17.45	560.27	1.02	549.46	0.92	0.90
MEAN	18.64	1.06	17.36	559.96	1.02	548.67	0.92	0.90
HUB	18.76	1.06	17.26	561.11	1.02	547.86	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	26.28	35.79	31.50	4.29	0.93	0.29	2.90	
MEAN	28.37	27.92	23.50	4.42	0.91	0.31	3.28	0.90
HUB	35.34	11.01	6.50	4.51	0.91	0.33	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.980

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	371.755	175.881	327.517	1149.273	0.323	0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.680	17.372	548.905	46.000	28.236	31.500	3.264

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	340.644	175.881	383.370	1151.209	0.296	0.161

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.675	17.572	550.755	471.992	0.014	0.269

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	330.865	0.000	330.865	1151.782	0.287	0.171

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.600	551.304	0.000	0.060	0.040	0.182

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.852	18.639	1.056	560.446	10.206	260.577	2.020

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
63561.258	0.414	345.382	948176.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 9.988 EfDer = 0.988

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
96.156	2266.000	18.639	560.446	1.000	1.000	0.980

W Kg/sec = 43.70718

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
78.826	2179.974	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73970.969	75450.234	2.236	513.330	229.564	401.059	1.747

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	311.57	-0.11	311.57	0.27	366.39
MEAN	16.97	0.00	-0.02	311.57	-0.11	311.57	0.27	
HUB	14.32	0.00	-0.02	311.57	-0.11	311.57	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.72	46.36	4.36	380.86	492.15	17.72	552.34	0.43
MEAN	47.13	43.80	3.33	335.59	458.00	17.72	552.34	0.40
HUB	42.28	37.84	4.44	283.17	421.10	17.72	552.34	0.37

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	357.64	139.69	329.23	1158.89	0.31
MEAN	16.57	365.22	156.29	330.09	1158.26	0.32
HUB	13.89	394.05	213.39	331.27	1157.59	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	403.72	233.66	0.35	2639.35	
MEAN	327.74	371.96	171.45	0.32	2592.20	1.33
HUB	274.67	336.89	61.28	0.29	2965.53	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.53	1.05	18.28	568.83	1.01	558.15	0.92	0.90
MEAN	19.52	1.05	18.22	568.68	1.01	557.54	0.92	0.90
HUB	19.65	1.05	18.13	569.86	1.02	556.90	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	22.99	35.36	31.50	3.86	0.93	0.23	2.90	
MEAN	25.34	27.45	23.50	3.95	0.92	0.24	3.29	0.90
HUB	32.79	10.48	6.50	3.98	0.92	0.26	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.988

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	359.982	157.172	323.858	1159.046	0.311	0.051

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.552	18.286	558.300	46.000	25.888	32.400	6.512

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	341.568	157.172	375.994	1160.165	0.294	0.140

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.543	18.400	559.379	456.573	0.017	0.244

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	325.172	0.000	325.172	1161.111	0.280	0.130

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.462	560.292	0.000	0.060	0.051	0.186

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.838	19.497	1.046	569.121	8.675	287.844	2.231

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
54038.227	0.388	293.636	871138.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 9.988 EfDer = 0.967

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
96.156	2266.000	19.497	569.121	1.000	1.000	0.980

W Kg/sec = 43.70718

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
75.941	2163.295	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73970.969	75450.234	2.304	509.668	221.166	390.276	1.765

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	303.96	-0.10	303.96	0.26	345.84
MEAN	15.91	0.00	-0.02	303.96	-0.10	303.96	0.26	
HUB	13.07	0.00	-0.02	303.96	-0.10	303.96	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.01	47.36	2.65	362.27	472.98	18.59	561.41	0.41
MEAN	46.00	44.80	1.20	314.67	437.58	18.59	561.41	0.38
HUB	40.39	38.84	1.55	258.45	399.05	18.59	561.41	0.34

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	344.84	124.30	321.65	1167.28	0.30
MEAN	15.50	350.60	137.51	322.50	1166.61	0.30
HUB	12.59	374.60	188.62	323.64	1165.91	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	395.69	230.45	0.34	2231.91	
MEAN	306.46	364.08	168.94	0.31	2132.80	1.30
HUB	248.96	329.22	60.34	0.28	2376.11	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.26	1.04	19.06	576.21	1.01	566.28	0.92	0.88
MEAN	20.22	1.04	18.99	575.89	1.01	565.63	0.92	0.88

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 HUB     20.31     1.04    18.90   576.66     1.01   564.95     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.13    35.62    31.50     4.12     0.93     0.21     2.90
 MEAN    23.09    27.65    23.50     4.15     0.91     0.21     3.34     0.88
 HUB     30.23    10.56     6.50     4.06     0.91     0.23     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     353.999     140.035     325.124    1166.774       0.303      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.236      18.983     565.791      46.000      23.302      33.000       9.698

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     346.704     140.035     373.916    1167.214       0.297       0.014

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.206      19.005     566.217     440.827       0.043       0.215

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     325.095       0.000     325.095    1168.462       0.278       0.107

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.119     567.430       0.000       0.060       0.067       0.104

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.788      20.176       1.035     576.254       7.133     328.052       2.543

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  44437.793       0.353     241.468  919780.188

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    332827.78   1808.5370     93.9346      1.3356      0.8462      9.9879      1.1022


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 60%  Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     92.762    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   42.16433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     90.619    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  71359.812   72786.852       3.151     831.557     263.901     619.754       2.348

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   209.60    -0.07   209.60     0.19   406.33
 MEAN    17.06     0.00    -0.02   209.60    -0.07   209.60     0.19
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HUB     12.51     0.00    -0.02   209.60    -0.07   209.60     0.19

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     62.81    50.47    12.34   407.95   458.71    14.74   519.14     0.41
MEAN    58.15    47.20    10.95   337.36   397.23    14.74   519.14     0.36
HUB     49.73    38.62    11.11   247.38   324.29    14.74   519.14     0.29

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   382.39   254.50   285.40  1126.45     0.34
MEAN    18.04   394.57   269.81   287.91  1124.30     0.35
HUB     15.00   437.62   326.01   291.94  1121.17     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    407.95   324.04   153.45     0.29  5251.84
MEAN   356.65   300.72    86.85     0.27  4867.47     1.50
HUB    296.62   293.42    29.39     0.26  4890.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.68     1.10    15.40   539.49     1.03   527.28     0.92     0.90
MEAN    16.56     1.10    15.21   538.27     1.03   525.27     0.92     0.90
HUB     16.57     1.10    14.91   538.35     1.03   522.35     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.72    28.27    24.20     4.07     0.93     0.39     2.90
MEAN    43.14    16.79    12.70     4.09     0.94     0.34     3.51     0.90
HUB     48.16    -5.75    -9.30     3.55     0.94     0.21     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.987

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     399.348     269.283     294.899    1124.421       0.355      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.589      15.202     525.384      24.000      42.400      35.400      -7.000

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     316.235     269.283     415.352    1129.724       0.280       0.365

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.574      15.695     530.351     528.796       0.020       0.488

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     294.320       0.000     294.320    1130.914       0.260       0.395

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.766     531.469       0.000       0.060       0.053       0.415

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      16.527       1.094     538.704      15.894     190.885       1.480

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98953.383       0.595     518.717  881331.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     92.762    2266.000      16.527     538.704       1.000       1.000       0.980
W Kg/sec =   42.16433
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
84.081	2223.530	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
71359.812	72786.852	2.411	590.487	244.863	474.134	1.936

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	281.72	-0.10	281.72	0.25	398.74
MEAN	18.08	0.00	-0.02	281.72	-0.10	281.72	0.25	
HUB	15.21	0.00	-0.02	281.72	-0.10	281.72	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.27	46.36	8.91	406.37	494.55	15.83	532.08	0.44
MEAN	51.77	42.30	9.47	357.49	455.23	15.83	532.08	0.40
HUB	46.88	37.84	9.04	300.77	412.17	15.83	532.08	0.36

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	356.00	194.64	298.08	1140.72	0.31
MEAN	18.01	361.79	202.49	299.82	1139.26	0.32
HUB	15.22	389.93	246.85	301.84	1137.76	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	364.14	209.16	0.32	3976.52	
MEAN	356.14	336.90	153.65	0.30	3648.55	1.47
HUB	301.03	306.67	54.18	0.27	3759.20	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.79	1.08	16.63	551.33	1.02	540.75	0.92	0.91
MEAN	17.68	1.07	16.49	550.29	1.02	539.36	0.92	0.91
HUB	17.72	1.07	16.33	550.64	1.02	537.95	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.14	35.06	31.50	3.56	0.93	0.33	2.90	
MEAN	34.03	27.13	23.50	3.63	0.94	0.33	3.30	0.91
HUB	39.28	10.18	6.50	3.68	0.94	0.33	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.994

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	400.769	203.056	345.520	1137.123	0.352	-0.184

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.718	16.258	537.342	46.000	30.442	30.600	0.158

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	354.063	203.056	408.157	1140.234	0.311	0.067

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	17.713	16.566	540.286	455.853	0.014	0.298

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	349.321	0.000	349.321	1140.528	0.306	0.250

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	16.569	540.565	0.000	0.060	0.037	0.069

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.876	17.684	1.070	550.756	12.052	229.460	1.779

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
75049.359	0.460	393.412	808871.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000 BLEED = 0.000 DPInc = 10.953 EfDer = 0.990

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
92.762	2266.000	17.684	550.756	1.000	1.000	0.880

W Kg/sec = 42.16433

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
79.454	2199.067	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
71359.812	72786.852	2.117	489.817	231.391	384.470	1.662

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	327.78	-0.11	327.78	0.29	385.14
MEAN	17.74	0.00	-0.02	327.78	-0.11	327.78	0.29	
HUB	15.05	0.00	-0.02	327.78	-0.11	327.78	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.45	46.36	4.09	396.88	514.82	16.70	541.78	0.45
MEAN	46.95	43.40	3.55	350.77	480.16	16.70	541.78	0.42
HUB	42.25	38.84	3.41	297.61	442.80	16.70	541.78	0.39

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	352.44	169.13	309.21	1151.49	0.31
MEAN	17.51	359.88	182.00	310.47	1150.49	0.31
HUB	14.85	389.55	233.24	312.00	1149.46	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	381.01	222.61	0.33	3352.69	
MEAN	346.18	351.21	164.18	0.31	3188.20	1.47
HUB	293.65	317.80	60.41	0.28	3465.31	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.79	1.06	17.60	561.40	1.02	551.03	0.92	0.91
MEAN	18.73	1.06	17.50	560.88	1.02	550.06	0.92	0.91
HUB	18.83	1.06	17.39	561.76	1.02	549.09	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.68	35.75	31.50	4.25	0.93	0.32	2.90	
MEAN	30.38	27.87	23.50	4.37	0.92	0.33	3.28	0.91
HUB	36.78	10.96	6.50	4.46	0.92	0.35	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.990

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	363.731	183.194	314.229	1150.731	0.316	0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.769	17.512	550.299	46.000	30.242	31.500	1.258

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	326.349	183.194	374.251	1152.981	0.283	0.196

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.766	17.749	552.453	471.992	0.013	0.298

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	316.984	0.000	316.984	1153.506	0.275	0.205

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.776	552.957	0.000	0.060	0.037	0.216

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.867	18.734	1.059	561.347	10.591	248.332	1.925

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
65964.492	0.430	345.788	910849.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =10.953 EfDer = 0.995

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
92.762	2266.000	18.734	561.347	1.000	1.000	0.980

W Kg/sec = 42.16433

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
75.719	2178.222	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
71359.812	72786.852	2.328	513.330	220.516	401.059	1.819

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	298.62	-0.10	298.62	0.26	366.09
MEAN	16.97	0.00	-0.02	298.62	-0.10	298.62	0.26	
HUB	14.32	0.00	-0.02	298.62	-0.10	298.62	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.91	46.36	5.55	380.86	484.05	17.88	553.90	0.42
MEAN	48.34	43.80	4.54	335.59	449.29	17.88	553.90	0.39
HUB	43.49	37.84	5.65	283.17	411.61	17.88	553.90	0.36

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	348.86	150.15	314.89	1161.01	0.30
MEAN	16.57	355.93	163.92	315.94	1160.19	0.31
HUB	13.89	383.94	216.24	317.25	1159.33	0.33

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	385.97	223.19	0.33	2836.91	
MEAN	327.74	355.89	163.82	0.31	2718.56	1.36
HUB	274.67	322.59	58.43	0.28	3005.00	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.71	1.05	18.51	570.35	1.02	560.19	0.92	0.91
MEAN	19.67	1.05	18.42	569.98	1.02	559.40	0.92	0.91
HUB	19.77	1.06	18.32	570.89	1.02	558.58	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.49	35.33	31.50	3.83	0.93	0.26	2.90	
MEAN	27.42	27.41	23.50	3.91	0.92	0.26	3.29	0.91
HUB	34.28	10.44	6.50	3.94	0.92	0.28	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	351.125	164.843	310.025	1160.923	0.302	0.051

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.700      18.487     560.112      46.000      28.000      32.400       4.400

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     326.454     164.843     365.712    1162.369       0.281       0.175

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.694      18.643     561.508     456.573       0.014       0.273

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     310.762       0.000     310.762    1163.233       0.267       0.168

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.704     562.343       0.000       0.060       0.043       0.222

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      19.657       1.049     570.407       9.060     272.782       2.115

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  56433.547       0.405     295.827  836850.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     92.762    2266.000      19.657     570.407       1.000       1.000       0.980
W Kg/sec =   42.16433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     72.746    2160.855       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  71359.812   72786.852       2.406     509.668     211.862     390.276       1.842

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   290.63    -0.10   290.63     0.25   345.45
 MEAN    15.91     0.00    -0.02   290.63    -0.10   290.63     0.25
 HUB     13.07     0.00    -0.02   290.63    -0.10   290.63     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.27    47.36     3.91   362.27   464.52    18.82   563.35     0.40
 MEAN    47.28    44.80     2.48   314.67   428.42    18.82   563.35     0.37
 HUB     41.66    38.84     2.82   258.45   388.99    18.82   563.35     0.33

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   335.32   135.25   306.84  1169.80     0.29
 MEAN    15.50   340.51   145.48   307.86  1168.93     0.29
 HUB     12.59   363.69   191.61   309.13  1168.04     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   377.27   219.51     0.32  2428.14
 MEAN   306.46   347.41   160.98     0.30  2256.23     1.34
 HUB    248.96   314.40    57.36     0.27  2413.63

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.50     1.04    19.36   578.11     1.01   568.73     0.92     0.90
 MEAN    20.44     1.04    19.27   577.57     1.01   567.89     0.92     0.90
 HUB     20.50     1.04    19.16   578.07     1.01   567.02     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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  TIP     23.79    35.58    31.50     4.08     0.93     0.24     2.90
  MEAN    25.29    27.60    23.50     4.10     0.91     0.24     3.34     0.90
  HUB     31.79    10.51     6.50     4.01     0.91     0.25     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.981

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
       R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
       15.219     343.890     148.151     310.341    1169.092       0.294       -0.007

       Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
       20.455      19.261     568.044      46.000      25.519      33.000       7.481

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
       RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
       15.219     330.252     148.151     361.960    1169.882       0.282       0.058

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      20.437      19.335     568.811     440.827       0.035       0.245

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     309.752       0.000     309.752    1171.008       0.265       0.149

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      19.442     569.907       0.000       0.060       0.055       0.146

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.826      20.412       1.038     577.917       7.511     308.592       2.392

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   46792.691       0.372     245.289  883170.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     343193.50   1799.0332     90.6187      1.3512      0.8551     10.9534      1.1054


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.980

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
      89.191     2266.000       15.107     522.810        1.000        1.000        0.980
 W Kg/sec =   40.54142

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
      87.131     2257.076        1.402        0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
   68613.172    69985.281        3.277     831.557     253.744     619.754        2.442

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00     -0.02   201.25     -0.07   201.25      0.18    406.33
  MEAN    17.06      0.00     -0.02   201.25     -0.07   201.25      0.18
  HUB     12.51      0.00     -0.02   201.25     -0.07   201.25      0.18

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
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TIP     63.75    50.47    13.28   407.95   454.95    14.77   519.43     0.41
MEAN    59.19    47.20    11.99   337.36   392.89    14.77   519.43     0.35
HUB     50.88    38.62    12.26   247.38   318.96    14.77   519.43     0.29

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   378.04   260.69   273.77  1127.18     0.34
MEAN    18.04   388.58   273.28   276.25  1124.93     0.35
HUB     15.00   428.89   324.80   280.09  1121.79     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    407.95   310.86   147.26     0.28  5379.48
MEAN   356.65   288.56    83.37     0.26  4930.11     1.55
HUB    296.62   281.50    28.18     0.25  4872.87

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.71     1.11    15.46   539.90     1.03   527.96     0.92     0.90
MEAN    16.57     1.10    15.26   538.47     1.03   525.86     0.92     0.90
HUB     16.55     1.10    14.96   538.29     1.03   522.93     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.60    28.28    24.20     4.08     0.93     0.42     2.90
MEAN    44.69    16.79    12.70     4.09     0.94     0.37     3.51     0.90
HUB     49.23    -5.75    -9.30     3.55     0.94     0.23     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.980

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    18.071     392.992     272.751     282.930    1125.066       0.349      -0.003

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    16.597      15.252     525.987      24.000      43.951      35.400      -8.551

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     303.095     272.751     407.750    1130.642       0.268       0.394

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.580      15.771     531.213     528.796       0.023       0.513

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     282.322       0.000     282.322    1131.722       0.249       0.414

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.826     532.229       0.000       0.060       0.060       0.434

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4         PR4       Texit        Del T       Ns        Ns nondim
     0.849      16.527       1.094     538.886      16.076     185.454       1.438

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 100088.438       0.601     504.473  846247.312


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.988

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    89.191    2266.000      16.527     538.886       1.000       1.000       0.980
W Kg/sec =   40.54142

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    80.859    2223.154       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
68613.172	69985.281	2.508	590.487	235.480	474.134	2.013

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	270.30	-0.09	270.30	0.24	398.67
MEAN	18.08	0.00	-0.02	270.30	-0.09	270.30	0.24	
HUB	15.21	0.00	-0.02	270.30	-0.09	270.30	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.38	46.36	10.02	406.37	488.13	15.88	532.78	0.43
MEAN	52.91	42.30	10.61	357.49	448.25	15.88	532.78	0.40
HUB	48.06	37.84	10.22	300.77	404.45	15.88	532.78	0.36

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	350.74	203.37	285.76	1141.84	0.31
MEAN	18.01	355.39	208.84	287.55	1140.24	0.31
HUB	15.22	382.02	249.12	289.62	1138.61	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	349.05	200.43	0.31	4154.65	
MEAN	356.14	323.08	147.29	0.28	3762.95	1.52
HUB	301.03	294.24	51.91	0.26	3793.70	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.84	1.08	16.71	552.08	1.02	541.81	0.92	0.90
MEAN	17.71	1.07	16.56	550.84	1.02	540.29	0.92	0.90
HUB	17.72	1.07	16.39	550.93	1.02	538.75	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.44	35.05	31.50	3.55	0.93	0.36	2.90	
MEAN	35.99	27.12	23.50	3.62	0.94	0.35	3.30	0.90
HUB	40.70	10.16	6.50	3.66	0.94	0.35	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.988

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	391.752	209.430	331.072	1138.312	0.344	-0.174

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.746	16.348	538.467	46.000	32.317	30.600	-1.717

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	338.821	209.430	398.322	1141.721	0.297	0.113

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	17.741	16.688	541.697	455.853	0.014	0.326

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	334.326	0.000	334.326	1141.987	0.293	0.282

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	16.689	541.950	0.000	0.060	0.038	0.113

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.872	17.713	1.072	551.284	12.398	220.039	1.706

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
77205.188	0.474	389.135	775624.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
RESET = 0.000BLEED = 0.000 DPInc =11.987 EfDer = 0.996

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
89.191	2266.000	17.713	551.284	1.000	1.000	0.880

W Kg/sec = 40.54142

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
76.310	2198.012	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
68613.172	69985.281	2.204	489.817	222.235	384.470	1.730

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	313.87	-0.11	313.87	0.27	384.96
MEAN	17.74	0.00	-0.02	313.87	-0.11	313.87	0.27	
HUB	15.05	0.00	-0.02	313.87	-0.11	313.87	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.67	46.36	5.31	396.88	506.08	16.81	543.06	0.44
MEAN	48.19	43.40	4.79	350.77	470.78	16.81	543.06	0.41
HUB	43.49	38.84	4.65	297.61	432.61	16.81	543.06	0.38

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	345.77	179.16	295.74	1153.11	0.30
MEAN	17.51	352.34	189.36	297.12	1151.93	0.31
HUB	14.85	380.77	236.08	298.75	1150.75	0.33

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	364.21	212.58	0.32	3551.29	
MEAN	346.18	335.97	156.82	0.29	3316.98	1.51
HUB	293.65	304.25	57.57	0.26	3507.40	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.89	1.07	17.75	562.56	1.02	552.58	0.92	0.91
MEAN	18.81	1.06	17.63	561.82	1.02	551.45	0.92	0.91
HUB	18.88	1.07	17.50	562.42	1.02	550.31	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.21	35.71	31.50	4.21	0.93	0.34	2.90	
MEAN	32.51	27.83	23.50	4.33	0.92	0.35	3.28	0.91
HUB	38.32	10.91	6.50	4.41	0.92	0.37	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.996

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	356.030	190.604	300.711	1152.173	0.309	0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.848	17.639	551.682	46.000	32.368	31.500	-0.868

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	311.875	190.604	365.508	1154.742	0.270	0.233

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.845	17.913	554.144	471.992	0.012	0.329

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	302.971	0.000	302.971	1155.218	0.262	0.240

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.935	554.602	0.000	0.060	0.037	0.251

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.876	18.815	1.062	562.267	10.982	236.487	1.833

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
68400.422	0.446	344.757	872148.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =11.987 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
89.191	2266.000	18.815	562.267	1.000	1.000	0.980

W Kg/sec = 40.54142

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
72.552	2176.441	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
68613.172	69985.281	2.429	513.330	211.295	401.059	1.898

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	285.54	-0.10	285.54	0.25	365.79
MEAN	16.97	0.00	-0.02	285.54	-0.10	285.54	0.25	
HUB	14.32	0.00	-0.02	285.54	-0.10	285.54	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.15	46.36	6.79	380.86	476.09	18.03	555.46	0.41
MEAN	49.62	43.80	5.82	335.59	440.70	18.03	555.46	0.38
HUB	44.77	37.84	6.93	283.17	402.21	18.03	555.46	0.35

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	340.77	160.60	300.55	1163.09	0.29
MEAN	16.57	347.09	171.52	301.74	1162.09	0.30
HUB	13.89	374.03	219.07	303.17	1161.06	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	368.22	212.74	0.32	3034.09	
MEAN	327.74	339.78	156.22	0.29	2844.50	1.41
HUB	274.67	308.22	55.60	0.27	3044.26	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.86	1.06	18.71	571.90	1.02	562.20	0.92	0.91
MEAN	19.80	1.05	18.61	571.30	1.02	561.24	0.92	0.91
HUB	19.87	1.06	18.49	571.93	1.02	560.25	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.12	35.29	31.50	3.79	0.93	0.28	2.90	
MEAN	29.62	27.37	23.50	3.87	0.92	0.29	3.29	0.91
HUB	35.85	10.39	6.50	3.89	0.92	0.30	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	342.716	172.489	296.145	1162.775	0.295	0.049

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.830	18.668	561.902	46.000	30.219	32.400	2.181

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	311.368	172.489	355.953	1164.545	0.267	0.212

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.827	18.865	563.615	456.573	0.012	0.304

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	296.420	0.000	296.420	1165.328	0.254	0.205

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.922	564.373	0.000	0.060	0.038	0.258

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.873	19.795	1.052	571.710	9.443	258.570	2.004

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
58822.773	0.422	296.483	801323.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =11.987 EfDer = 0.991

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
89.191	2266.000	19.795	571.710	1.000	1.000	0.980

W Kg/sec = 40.54142

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
69.538	2158.392	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
68613.172	69985.281	2.517	509.668	202.519	390.276	1.927

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	277.34	-0.10	277.34	0.24	345.06
MEAN	15.91	0.00	-0.02	277.34	-0.10	277.34	0.24	
HUB	13.07	0.00	-0.02	277.34	-0.10	277.34	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.57	47.36	5.21	362.27	456.32	19.03	565.29	0.39
MEAN	48.62	44.80	3.82	314.67	419.52	19.03	565.29	0.36
HUB	42.99	38.84	4.15	258.45	379.16	19.03	565.29	0.33

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	326.68	146.06	292.21	1172.25	0.28
MEAN	15.50	331.03	153.34	293.38	1171.21	0.28
HUB	12.59	353.15	194.53	294.74	1170.15	0.30

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	359.08	208.70	0.31	2622.05	
MEAN	306.46	330.93	153.12	0.28	2377.90	1.38
HUB	248.96	299.73	54.44	0.26	2450.33	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.72	1.05	19.63	580.03	1.01	571.12	0.92	0.91
MEAN	20.63	1.04	19.52	579.26	1.01	570.11	0.92	0.91
HUB	20.66	1.04	19.39	579.49	1.01	569.08	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	26.56	35.53	31.50	4.03	0.93	0.27	2.90	
MEAN	27.59	27.56	23.50	4.06	0.92	0.27	3.34	0.91
HUB	33.42	10.46	6.50	3.96	0.92	0.27	4.06	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      334.416     156.150     295.721     1171.363       0.285       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     20.649      19.511      570.256      46.000      27.835       33.000       5.165

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      314.107     156.150     350.780     1172.492       0.268       0.103

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       20.640      19.634      571.356      440.827       0.028       0.276

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4        cp 3-4
     14.701      294.691       0.000     294.691     1173.505       0.251       0.192

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       19.733      572.343       0.000       0.060       0.046       0.189

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4        Pt4           PR4        Texit        Del T        Ns         Ns nondim
      0.853       20.619        1.042      579.593       7.883      290.697       2.253

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  49115.305       0.390     247.554  845330.688

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    353632.12   1782.4020      87.1308       1.3649       0.8589      11.9868       1.1086


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 60%  Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.974

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     85.685     2266.000       15.107      522.810        1.000        1.000        0.980
 W Kg/sec =   38.94787

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     83.706     2257.076        1.402        0.249       53.349       32.000        0.050

   CFM         SCFM            A1/A*       Area1         A*      AthrRotor   ChokeMargin
  65916.203    67234.383        3.411      831.557      243.770      619.754        2.542

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00     -0.02    193.09     -0.07    193.09      0.17    406.33
  MEAN    17.06      0.00     -0.02    193.09     -0.07    193.09      0.17
  HUB     12.51      0.00     -0.02    193.09     -0.07    193.09      0.17

       BetaFlo    BetaBlade Incid    U1        W1        Ps1       Ts1      Rel Mach
  TIP     64.67     50.47     14.20    407.95    451.40     14.80    519.70      0.40
  MEAN    60.22     47.20     13.02    337.36    388.77     14.80    519.70      0.35
  HUB     52.03     38.62     13.41    247.38    313.87     14.80    519.70      0.28
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     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   374.15   266.63   262.48  1127.85     0.33
MEAN    18.04   382.99   276.60   264.91  1125.52     0.34
HUB     15.00   420.46   323.53   268.55  1122.36     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    407.95   298.11   141.32     0.26  5502.01
MEAN   356.65   276.74    80.05     0.25  4989.90     1.60
HUB    296.62   269.90    26.91     0.24  4853.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.73     1.11    15.51   540.29     1.03   528.60     0.92     0.89
MEAN    16.58     1.10    15.30   538.66     1.03   526.41     0.92     0.89
HUB     16.54     1.09    15.01   538.23     1.03   523.46     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     45.45    28.30    24.20     4.10     0.93     0.44     2.90
MEAN    46.24    16.81    12.70     4.11     0.94     0.39     3.51     0.89
HUB     50.30    -5.72    -9.30     3.58     0.94     0.26     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.974

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    18.071     387.055     276.063     271.295    1125.664       0.344       -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    16.603      15.297     526.546      24.000      45.499      35.400     -10.099

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     290.363     276.063     400.651    1131.497       0.257       0.422

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.582      15.839     532.017     528.796       0.025       0.539

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083     270.685       0.000     270.685    1132.477       0.239       0.432

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.879     532.939       0.000       0.060       0.069       0.452

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4        Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.838      16.524       1.094     539.059      16.249     180.205       1.397

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 101164.203       0.608     489.853  811938.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     85.685    2266.000      16.524     539.059       1.000       1.000       0.980
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.709    2222.797       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  65916.203   67234.383       2.609     590.487     226.308     474.134       2.095
```

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	259.21	-0.09	259.21	0.23	398.61
MEAN	18.08	0.00	-0.02	259.21	-0.09	259.21	0.23	
HUB	15.21	0.00	-0.02	259.21	-0.09	259.21	0.23	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.47	46.36	11.11	406.37	482.08	15.93	533.45	0.43
MEAN	54.06	42.30	11.76	357.49	441.65	15.93	533.45	0.39
HUB	49.25	37.84	11.41	300.77	397.13	15.93	533.45	0.35

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	346.19	211.73	273.89	1142.87	0.30
MEAN	18.01	349.60	214.95	275.71	1141.15	0.31
HUB	15.22	374.58	251.27	277.79	1139.40	0.33

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	334.52	192.06	0.29	4325.42	
MEAN	356.14	309.75	141.19	0.27	3872.92	1.56
HUB	301.03	282.21	49.75	0.25	3826.51	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.88	1.08	16.78	552.80	1.03	542.79	0.92	0.90
MEAN	17.74	1.07	16.62	551.36	1.02	541.15	0.92	0.90
HUB	17.72	1.07	16.44	551.21	1.02	539.49	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.71	35.04	31.50	3.54	0.93	0.38	2.90	
MEAN	37.94	27.12	23.50	3.62	0.94	0.37	3.30	0.90
HUB	42.13	10.15	6.50	3.65	0.94	0.37	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.982

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	383.480	215.557	317.163	1139.410	0.337	-0.163

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.768	16.426	539.508	46.000	34.202	30.600	-3.602

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	324.205	215.557	389.325	1143.103	0.284	0.158

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	17.762	16.796	543.011	455.853	0.015	0.354

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	319.978	0.000	319.978	1143.343	0.280	0.313

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	16.791	543.239	0.000	0.060	0.041	0.154

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.865	17.731	1.073	551.789	12.730	211.252	1.638

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
79272.414	0.486	383.849	743251.562

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =13.019 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
85.685	2266.000	17.731	551.789	1.000	1.000	0.880

W Kg/sec = 38.94787

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
73.267	2197.007	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
65916.203	67234.383	2.296	489.817	213.374	384.470	1.802

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	300.54	-0.10	300.54	0.26	384.78
MEAN	17.74	0.00	-0.02	300.54	-0.10	300.54	0.26	
HUB	15.05	0.00	-0.02	300.54	-0.10	300.54	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.87	46.36	6.51	396.88	497.91	16.90	544.25	0.44
MEAN	49.42	43.40	6.02	350.77	461.99	16.90	544.25	0.40
HUB	44.73	38.84	5.89	297.61	423.03	16.90	544.25	0.37

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	340.07	188.68	282.93	1154.60	0.29
MEAN	17.51	345.61	196.36	284.41	1153.27	0.30
HUB	14.85	372.65	238.78	286.10	1151.94	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	348.25	203.05	0.30	3739.92	
MEAN	346.18	321.46	149.82	0.28	3439.47	1.55
HUB	293.65	291.32	54.88	0.25	3547.40	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.98	1.07	17.87	563.66	1.02	554.01	0.92	0.91
MEAN	18.88	1.06	17.73	562.71	1.02	552.74	0.92	0.91
HUB	18.91	1.07	17.59	563.05	1.02	551.46	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.70	35.67	31.50	4.17	0.93	0.37	2.90	
MEAN	34.62	27.78	23.50	4.28	0.93	0.37	3.28	0.91
HUB	39.85	10.86	6.50	4.36	0.93	0.38	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	349.164	197.651	287.836	1153.508	0.303	0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.911	17.745	552.963	46.000	34.477	31.500	-2.977

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	298.146	197.651	357.711	1156.380	0.258	0.270

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.907	18.052	555.720	471.992	0.013	0.360

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	289.711	0.000	289.711	1156.811	0.250	0.272

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.069	556.134	0.000	0.060	0.040	0.284

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.879	18.875	1.065	563.143	11.354	225.706	1.750

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
70715.422	0.461	342.415	834653.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =13.019 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
85.685	2266.000	18.875	563.143	1.000	1.000	0.980

W Kg/sec = 38.94787

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
69.531	2174.746	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
65916.203	67234.383	2.535	513.330	202.496	401.059	1.981

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	273.14	-0.09	273.14	0.24	365.51
MEAN	16.97	0.00	-0.02	273.14	-0.09	273.14	0.24	
HUB	14.32	0.00	-0.02	273.14	-0.09	273.14	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.36	46.36	8.00	380.86	468.75	18.16	556.91	0.40
MEAN	50.87	43.80	7.07	335.59	432.77	18.16	556.91	0.37
HUB	46.04	37.84	8.20	283.17	393.50	18.16	556.91	0.34

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	333.83	170.36	287.09	1165.00	0.29
MEAN	16.57	339.24	178.64	288.39	1163.84	0.29
HUB	13.89	364.93	221.66	289.90	1162.67	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	351.60	202.98	0.30	3218.20	
MEAN	327.74	324.65	149.10	0.28	2962.42	1.45
HUB	274.67	294.71	53.01	0.25	3080.25	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.99	1.06	18.88	573.36	1.02	564.06	0.92	0.91
MEAN	19.90	1.05	18.76	572.55	1.02	562.94	0.92	0.91
HUB	19.94	1.06	18.62	572.92	1.02	561.80	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.68	35.26	31.50	3.76	0.93	0.31	2.90	
MEAN	31.78	27.34	23.50	3.84	0.93	0.31	3.29	0.91
HUB	37.40	10.36	6.50	3.86	0.93	0.32	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	335.280	179.649	283.088	1164.483	0.288	0.048

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.933	18.817	563.558	46.000	32.399	32.400	0.001

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th

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    16.481     297.242     179.649     347.313    1166.556       0.255       0.248

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.931      19.050     565.567     456.573       0.011       0.336

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     283.027       0.000     283.027    1167.266       0.242       0.240

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.102     566.255       0.000       0.060       0.037       0.292

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      19.901       1.054     572.944       9.801     245.939       1.907

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  61051.117       0.438     295.619  766915.312


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     85.685    2266.000      19.901     572.944       1.000       1.000       0.980
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     66.519    2156.066       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 65916.203   67234.383       2.631     509.668     193.726     390.276       2.015

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   264.91    -0.09   264.91     0.23   344.68
 MEAN    15.91     0.00    -0.02   264.91    -0.09   264.91     0.23
 HUB     13.07     0.00    -0.02   264.91    -0.09   264.91     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.83    47.36     6.47   362.27   448.87    19.20   567.08     0.38
 MEAN    49.92    44.80     5.12   314.67   411.40    19.20   567.08     0.35
 HUB     44.30    38.84     5.46   258.45   370.16    19.20   567.08     0.32

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   319.36   156.02   278.65  1174.50     0.27
 MEAN    15.50   322.74   160.64   279.93  1173.31     0.28
 HUB     12.59   343.61   197.23   281.37  1172.10     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   342.26   198.74     0.29  2800.66
 MEAN   306.46   315.63   145.82     0.27  2490.93     1.43
 HUB    248.96   286.08    51.73     0.24  2484.32

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.90     1.05    19.85   581.83     1.02   573.32     0.92     0.91
 MEAN    20.79     1.04    19.72   580.85     1.01   572.15     0.92     0.91
 HUB     20.79     1.04    19.58   580.83     1.01   570.97     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     29.24    35.50    31.50     4.00     0.93     0.30     2.90
 MEAN    29.85    27.52    23.50     4.02     0.92     0.29     3.34     0.91
 HUB     35.03    10.42     6.50     3.92     0.92     0.29     4.06


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.997

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     326.144     163.582     282.154    1173.447       0.278      -0.007

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      20.804      19.716     572.291      46.000      30.103      33.000       2.897

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     299.228     163.582     341.022    1174.887       0.255       0.146

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      20.800      19.881     573.696     440.827       0.024       0.308

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     280.811       0.000     280.811    1175.800       0.239       0.232

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      19.973     574.588       0.000       0.060       0.039       0.228

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.870      20.782       1.044     581.171       8.228     275.139       2.133

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   51261.789       0.407     248.218  808755.625

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     363464.94   1759.9534     83.7060      1.3757      0.8579     13.0194      1.1116


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 60%  Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  0.966

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
      82.317     2266.000       15.107     522.810       1.000        1.000        0.980
 W Kg/sec =   37.41694

    W cor       RPM cor         GAMMA       Cp          R            Blades       THK
      80.416     2257.076        1.402       0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
   63325.230    64591.602        3.551     831.557     234.188     619.754       2.646

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   185.28    -0.06   185.28      0.17    406.33
  MEAN    17.06      0.00    -0.02   185.28    -0.06   185.28      0.17
  HUB     12.51      0.00    -0.02   185.28    -0.06   185.28      0.17

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
  TIP     65.58     50.47    15.11   407.95    448.11     14.82    519.94      0.40
  MEAN    61.23     47.20    14.03   337.36    384.95     14.82    519.94      0.34
  HUB     53.17     38.62    14.55   247.38    309.13     14.82    519.94      0.28

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK         AeroBl     Blades2
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     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   370.79   272.24   251.74  1128.47     0.33
MEAN    18.04   377.90   279.72   254.10  1126.05     0.34
HUB     15.00   412.59   322.33   257.56  1122.89     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    407.95   285.99   135.71     0.25  5617.60
MEAN   356.65   265.49    76.94     0.24  5046.04     1.66
HUB    296.62   258.84    25.71     0.23  4835.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.76     1.11    15.55   540.65     1.03   529.17     0.92     0.88
MEAN    16.58     1.10    15.34   538.84     1.03   526.91     0.92     0.88
HUB     16.52     1.09    15.05   538.17     1.03   523.95     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     47.24    28.33    24.20     4.13     0.93     0.47     2.90
MEAN    47.75    16.85    12.70     4.15     0.95     0.42     3.51     0.88
HUB     51.37    -5.70    -9.30     3.60     0.95     0.28     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     381.639     279.172     260.213    1126.210       0.339      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.607      15.337     527.057      24.000      47.013      35.400     -11.613

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     278.271     279.172     394.172    1132.281       0.246       0.450

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.583      15.900     532.754     528.796       0.028       0.564

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     259.620       0.000     259.620    1133.171       0.229       0.449

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.924     533.592       0.000       0.060       0.078       0.468

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.826      16.518       1.093     539.222      16.412     175.209       1.358

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102177.656       0.614     475.312  779103.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  0.974

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     82.317    2266.000      16.518     539.222       1.000       1.000       0.980
W Kg/sec =   37.41694

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     74.693    2222.462       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63325.230   64591.602       2.715     590.487     217.522     474.134       2.180

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
```

TIP	20.55	0.00	-0.02	248.67	-0.09	248.67	0.22	398.55
MEAN	18.08	0.00	-0.02	248.67	-0.09	248.67	0.22	
HUB	15.21	0.00	-0.02	248.67	-0.09	248.67	0.22	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.54	46.36	12.18	406.37	476.49	15.97	534.06	0.42
MEAN	55.18	42.30	12.88	357.49	435.54	15.97	534.06	0.38
HUB	50.43	37.84	12.59	300.77	390.32	15.97	534.06	0.34

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	342.35	219.57	262.67	1143.81	0.30
MEAN	18.01	344.46	220.69	264.48	1141.98	0.30
HUB	15.22	367.71	253.29	266.56	1140.12	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	320.83	184.22	0.28	4485.43	
MEAN	356.14	297.15	135.45	0.26	3976.14	1.61
HUB	301.03	270.80	47.74	0.24	3857.12	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.92	1.08	16.83	553.47	1.03	543.68	0.92	0.89
MEAN	17.75	1.07	16.67	551.85	1.02	541.94	0.92	0.89
HUB	17.71	1.07	16.48	551.47	1.02	540.18	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.89	35.04	31.50	3.54	0.93	0.41	2.90	
MEAN	39.84	27.12	23.50	3.62	0.94	0.39	3.30	0.89
HUB	43.54	10.15	6.50	3.65	0.94	0.39	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.974

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	376.039	221.308	304.019	1140.407	0.330	-0.153

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.783	16.491	540.454	46.000	36.052	30.600	-5.452

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	310.443	221.308	381.251	1144.368	0.271	0.201

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	17.776	16.888	544.214	455.853	0.016	0.382

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	306.491	0.000	306.491	1144.582	0.268	0.341

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	16.878	544.418	0.000	0.060	0.047	0.192

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.856	17.741	1.074	552.263	13.041	203.197	1.575

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
81209.250	0.498	377.771	712383.812

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =14.028 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
82.317	2266.000	17.741	552.263	1.000	1.000	0.880

W Kg/sec = 37.41694

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
70.378	2196.064	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
63325.230	64591.602	2.390	489.817	204.960	384.470	1.876

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	287.99	-0.10	287.99	0.25	384.62
MEAN	17.74	0.00	-0.02	287.99	-0.10	287.99	0.25	
HUB	15.05	0.00	-0.02	287.99	-0.10	287.99	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.04	46.36	7.68	396.88	490.44	16.98	545.34	0.43
MEAN	50.62	43.40	7.22	350.77	453.93	16.98	545.34	0.40
HUB	45.95	38.84	7.11	297.61	414.21	16.98	545.34	0.36

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	335.31	197.51	270.96	1155.95	0.29
MEAN	17.51	339.72	202.87	272.50	1154.49	0.29
HUB	14.85	365.25	241.25	274.24	1153.03	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	333.38	194.22	0.29	3914.75	
MEAN	346.18	307.89	143.32	0.27	3553.29	1.60
HUB	293.65	279.20	52.40	0.24	3584.05	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.05	1.07	17.97	564.69	1.02	555.31	0.92	0.91
MEAN	18.92	1.07	17.82	563.55	1.02	553.91	0.92	0.91
HUB	18.94	1.07	17.66	563.64	1.02	552.50	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.09	35.63	31.50	4.13	0.93	0.39	2.90	
MEAN	36.67	27.74	23.50	4.24	0.93	0.39	3.28	0.91
HUB	41.34	10.82	6.50	4.32	0.93	0.40	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	343.154	204.200	275.784	1154.720	0.297	0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.958	17.830	554.128	46.000	36.518	31.500	-5.018

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	285.342	204.200	350.881	1157.877	0.246	0.305

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.953	18.168	557.162	471.992	0.014	0.391

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	277.371	0.000	277.371	1158.266	0.239	0.300

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.176	557.537	0.000	0.060	0.045	0.312

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.877      18.918       1.066     563.961      11.698     216.049       1.675

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  72859.297       0.475     338.929  799058.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     82.317    2266.000      18.919     563.961       1.000       1.000       0.980
W Kg/sec =   37.41694

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     66.698    2173.168       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63325.230   64591.602       2.643     513.330     194.245     401.059       2.065

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   261.59    -0.09   261.59     0.23   365.24
 MEAN    16.97     0.00    -0.02   261.59    -0.09   261.59     0.23
 HUB     14.32     0.00    -0.02   261.59    -0.09   261.59     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.52    46.36     9.16   380.86   462.11    18.26   558.25     0.40
 MEAN    52.07    43.80     8.27   335.59   425.57    18.26   558.25     0.37
 HUB     47.28    37.84     9.44   283.17   385.57    18.26   558.25     0.33

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   328.01   179.31   274.66  1166.72     0.28
 MEAN    16.57   332.41   185.22   276.03  1165.44     0.29
 HUB     13.89   356.75   224.08   277.59  1164.13     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   336.28   194.03     0.29  3387.13
 MEAN   327.74   310.65   142.52     0.27  3071.36     1.49
 HUB    274.67   282.16    50.59     0.24  3113.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.09      1.06    19.02   574.71     1.02   565.73     0.92     0.91
 MEAN    19.98      1.06    18.88   573.71     1.02   564.49     0.92     0.91
 HUB     19.99      1.06    18.73   573.85     1.02   563.22     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.14    35.24    31.50     3.74     0.93     0.34     2.90
 MEAN    33.86    27.31    23.50     3.81     0.93     0.34     3.29     0.91
 HUB     38.91    10.33     6.50     3.83     0.93     0.34     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     328.835     186.262     270.996    1166.033       0.282       0.046

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.011      18.934     565.063      46.000      34.502      32.400      -2.102

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     284.211     186.262     339.808    1168.387       0.243       0.283

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      20.009      19.201     567.347     456.573       0.012       0.367

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     270.699       0.000     270.699    1169.032       0.232       0.272

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.245     567.973       0.000       0.060       0.038       0.322

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      19.978       1.056     574.091      10.130     234.785       1.820

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  63104.098       0.453     293.549  734256.938


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     82.317    2266.000      19.978     574.091       1.000       1.000       0.980
W Kg/sec =   37.41694

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     63.720    2153.910       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63325.230   64591.602       2.746     509.668     185.577     390.276       2.103

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   253.45    -0.09   253.45     0.22   344.34
 MEAN    15.91     0.00    -0.02   253.45    -0.09   253.45     0.22
 HUB     13.07     0.00    -0.02   253.45    -0.09   253.45     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.03    47.36     7.67   362.27   442.20    19.33   568.73     0.38
 MEAN    51.16    44.80     6.36   314.67   404.12    19.33   568.73     0.35
 HUB     45.57    38.84     6.73   258.45   362.05    19.33   568.73     0.31

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   313.30   165.09   266.27  1176.53     0.27
 MEAN    15.50   315.57   167.25   267.61  1175.20     0.27
 HUB     12.59   335.08   199.66   269.10  1173.86     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   326.91   189.66     0.28  2963.35
 MEAN   306.46   301.65   139.21     0.26  2593.38     1.47
 HUB    248.96   273.58    49.31     0.23  2514.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.04     1.05    20.03   583.50     1.02   575.30     0.92     0.91
 MEAN    20.91     1.05    19.88   582.32     1.01   574.01     0.92     0.91
 HUB     20.88     1.05    19.73   582.07     1.01   572.70     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.80    35.46    31.50     3.96     0.93     0.32     2.90
 MEAN    32.00    27.48    23.50     3.98     0.93     0.31     3.34     0.91
 HUB     36.57    10.38     6.50     3.88     0.93     0.31     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     319.007     170.318     269.735    1175.332       0.271      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.922      19.877     574.135      46.000      32.269      33.000       0.731

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     285.687     170.318     332.604    1177.053       0.243       0.186

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.921      20.079     575.818     440.827       0.021       0.340

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     268.185       0.000     268.185    1177.879       0.228       0.269

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.162     576.627       0.000       0.060       0.037       0.264

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      20.904       1.046     582.632       8.540     261.698       2.029

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  53210.805       0.423     247.527  774092.812

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    372561.12   1733.0887     80.4157      1.3837      0.8530     14.0280      1.1144


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 60%  Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.958

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     79.082    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   35.94620

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.255    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  60836.117   62052.707       3.696     831.557     224.983     619.754       2.755

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   177.81    -0.06   177.81     0.16   406.33
 MEAN    17.06     0.00    -0.02   177.81    -0.06   177.81     0.16
 HUB     12.51     0.00    -0.02   177.81    -0.06   177.81     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     66.45    50.47    15.98   407.95   445.07    14.84   520.17     0.40
 MEAN    62.21    47.20    15.01   337.36   381.40    14.84   520.17     0.34
 HUB     54.30    38.62    15.68   247.38   304.70    14.84   520.17     0.27

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     20.63   367.91   277.54   241.51  1129.03     0.33
 MEAN    18.04   373.26   282.64   243.80  1126.54     0.33
 HUB     15.00   405.14   321.08   247.07  1123.37     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   274.47   130.41     0.24  5726.97
 MEAN   356.65   254.78    74.01     0.23  5098.82     1.72
 HUB    296.62   248.28    24.46     0.22  4816.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.78     1.11    15.59   541.00     1.03   529.70     0.92     0.88
 MEAN    16.59     1.10    15.37   539.01     1.03   527.37     0.92     0.88
 HUB     16.50     1.09    15.08   538.11     1.03   524.40     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    48.97    28.37    24.20     4.17     0.93     0.49     2.90
 MEAN   49.22    16.89    12.70     4.19     0.95     0.44     3.51     0.88
 HUB    52.42    -5.65    -9.30     3.65     0.95     0.31     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.958

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     376.701     282.095     249.651    1126.706       0.334       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.609      15.371     527.521      24.000      48.492      35.400     -13.092

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     266.773     282.095     388.260    1132.998       0.235       0.476

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.582      15.953     533.430     528.796       0.031       0.589

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     249.082       0.000     249.082    1133.807       0.220       0.464

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.963     534.192       0.000       0.060       0.088       0.484

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.814      16.510       1.093     539.374      16.564     170.456       1.321

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 103123.086       0.620     460.855  747667.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.966

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     79.082    2266.000      16.510     539.374       1.000       1.000       0.980
W Kg/sec =   35.94620

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     71.801    2222.149       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  60836.117   62052.707       2.824     590.487     209.101     474.134       2.267

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   238.62    -0.08   238.62     0.21   398.49
 MEAN    18.08     0.00    -0.02   238.62    -0.08   238.62     0.21
 HUB     15.21     0.00    -0.02   238.62    -0.08   238.62     0.21
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.58    46.36    13.22   406.37   471.32    16.01   534.62     0.42
MEAN    56.28    42.30    13.98   357.49   429.88    16.01   534.62     0.38
HUB     51.58    37.84    13.74   300.77   383.99    16.01   534.62     0.34

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   339.15   226.95   252.02  1144.66     0.30
MEAN    18.01   339.90   226.07   253.82  1142.73     0.30
HUB     15.22   361.35   255.15   255.88  1140.78     0.32

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   307.88   176.84     0.27  4636.07
MEAN   356.14   285.21   130.07     0.25  4072.95     1.66
HUB    301.03   259.96    45.88     0.23  3885.39

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.94     1.09    16.88   554.10     1.03   544.49     0.92     0.88
MEAN    17.76     1.08    16.70   552.31     1.02   542.66     0.92     0.88
HUB     17.70     1.07    16.51   551.71     1.02   540.81     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.00    35.06    31.50     3.56     0.93     0.43     2.90
MEAN    41.69    27.13    23.50     3.63     0.95     0.42     3.30     0.88
HUB     44.92    10.17     6.50     3.67     0.95     0.41     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     369.332     226.702     291.569    1141.314       0.324      -0.144

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.793      16.546     541.315      46.000      37.866      30.600      -7.266

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     297.448     226.702     373.991    1145.526       0.260       0.242

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      17.783      16.968     545.318     455.853       0.019       0.410

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     293.770       0.000     293.770    1145.717       0.256       0.366

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      16.950     545.500       0.000       0.060       0.054       0.227

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.845      17.744       1.075     552.707      13.333     195.771       1.518

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  83027.117       0.509     371.046  682932.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     79.082    2266.000      17.744     552.707       1.000       1.000       0.880
W Kg/sec =   35.94620

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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    67.628    2195.183       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
60836.117   62052.707       2.487     489.817     196.953     384.470       1.952

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   276.14    -0.10   276.14     0.24   384.46
MEAN    17.74     0.00    -0.02   276.14    -0.10   276.14     0.24
HUB     15.05     0.00    -0.02   276.14    -0.10   276.14     0.24

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.18    46.36     8.82   396.88   483.57    17.04   546.34     0.42
MEAN    51.80    43.40     8.40   350.77   446.50    17.04   546.34     0.39
HUB     47.15    38.84     8.31   297.61   406.06    17.04   546.34     0.35

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   331.36   205.76   259.73  1157.17     0.29
MEAN    17.51   334.57   208.93   261.31  1155.60     0.29
HUB     14.85   358.50   243.55   263.07  1154.02     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   319.44   185.97     0.28  4078.11
MEAN   346.18   295.16   137.25     0.26  3659.41     1.64
HUB    293.65   267.80    50.10     0.23  3618.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.10     1.08    18.04   565.66     1.02   556.49     0.92     0.91
MEAN    18.96     1.07    17.89   564.33     1.02   554.98     0.92     0.91
HUB     18.95     1.07    17.72   564.20     1.02   553.46     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.39    35.60    31.50     4.10     0.93     0.41     2.90
MEAN    38.65    27.71    23.50     4.21     0.93     0.41     3.28     0.91
HUB     42.79    10.78     6.50     4.28     0.93     0.42     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     337.884     210.305     264.456    1155.826       0.292       0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.992      17.897     555.193      46.000      38.493      31.500      -6.993

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     273.344     210.305     344.885    1159.250       0.236       0.339

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.985      18.263     558.487     471.992       0.017       0.422

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     265.824       0.000     265.824    1159.601       0.229       0.326

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.263     558.826       0.000       0.060       0.053       0.339

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.871      18.944       1.068     564.726      12.020     207.301       1.607

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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  74860.930       0.488     334.552  765224.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.994

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     79.082    2266.000      18.944     564.726       1.000       1.000       0.980
W Kg/sec =   35.94620

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     64.029    2171.696       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 60836.117   62052.707       2.753     513.330     186.475     401.059       2.151

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   250.77    -0.09   250.77     0.22   365.00
MEAN    16.97     0.00    -0.02   250.77    -0.09   250.77     0.22
HUB     14.32     0.00    -0.02   250.77    -0.09   250.77     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.64    46.36    10.28   380.86   456.07    18.34   559.48     0.39
MEAN    53.24    43.80     9.44   335.59   419.00    18.34   559.48     0.36
HUB     48.48    37.84    10.64   283.17   378.31    18.34   559.48     0.33

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   323.13   187.60   263.10  1168.29     0.28
MEAN    16.57   326.42   191.28   264.51  1166.89     0.28
HUB     13.89   349.30   226.27   266.11  1165.47     0.30

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    373.34   322.06   185.75     0.28  3543.51
MEAN   327.74   297.64   136.47     0.26  3171.64     1.54
HUB    274.67   270.47    48.40     0.23  3144.13

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.17     1.06    19.12   575.98     1.02   567.26     0.92     0.91
MEAN    20.04     1.06    18.98   574.80     1.02   565.90     0.92     0.91
HUB     20.03     1.06    18.82   574.71     1.02   564.52     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.49    35.22    31.50     3.72     0.93     0.36     2.90
MEAN    35.87    27.29    23.50     3.79     0.94     0.36     3.29     0.91
HUB     40.37    10.31     6.50     3.81     0.94     0.36     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.994

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     323.197     192.351     259.726    1167.447       0.277       0.044

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.067      19.025     566.438      46.000      36.523      32.400      -4.123

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     272.110     192.351     333.230    1170.061       0.233       0.316

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.064      19.322     568.978     456.573       0.013       0.398

   VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	259.270	0.000	259.270	1170.647	0.221	0.300

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.357	569.547	0.000	0.060	0.042	0.348

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.873	20.031	1.057	575.160	10.434	224.840	1.743

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
64996.172	0.466	290.466	703212.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =15.012 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
79.082	2266.000	20.031	575.160	1.000	1.000	0.980

W Kg/sec = 35.94620

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
61.111	2151.908	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
60836.117	62052.707	2.864	509.668	177.979	390.276	2.193

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	242.82	-0.08	242.82	0.21	344.02
MEAN	15.91	0.00	-0.02	242.82	-0.08	242.82	0.21	
HUB	13.07	0.00	-0.02	242.82	-0.08	242.82	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.17	47.36	8.81	362.27	436.19	19.44	570.24	0.37
MEAN	52.35	44.80	7.55	314.67	397.54	19.44	570.24	0.34
HUB	46.80	38.84	7.96	258.45	354.69	19.44	570.24	0.30

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	308.25	173.39	254.86	1178.36	0.26
MEAN	15.50	309.38	173.37	256.24	1176.93	0.26
HUB	12.59	327.41	201.88	257.76	1175.48	0.28

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	312.81	181.36	0.27	3112.19	
MEAN	306.46	288.74	133.09	0.25	2688.12	1.52
HUB	248.96	262.03	47.08	0.22	2542.77	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.15	1.06	20.17	585.04	1.02	577.11	0.92	0.91
MEAN	21.00	1.05	20.01	583.69	1.01	575.70	0.92	0.91
HUB	20.94	1.05	19.84	583.23	1.01	574.28	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.23	35.44	31.50	3.94	0.93	0.35	2.90	
MEAN	34.08	27.45	23.50	3.95	0.93	0.34	3.34	0.91
HUB	38.07	10.35	6.50	3.85	0.93	0.33	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	312.851	176.547	258.277	1177.046	0.266	-0.008

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.009      20.001     575.816      46.000      34.355      33.000      -1.355

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     273.254     176.547     325.325    1179.025       0.232       0.224

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.008      20.236     577.754     440.827       0.021       0.370

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     256.596       0.000     256.596    1179.776       0.217       0.302

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.310     578.491       0.000       0.060       0.037       0.297

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      20.991       1.048     583.988       8.828     249.874       1.937

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  55000.785       0.437     245.797  741182.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    381008.09   1702.7157     77.2548      1.3895      0.8452     15.0123      1.1170


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 60%  Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.950

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     75.973    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   34.53327

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     74.218    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  58444.840   59613.613       3.847     831.557     216.140     619.754       2.867

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   170.65    -0.06   170.65     0.15   406.33
  MEAN    17.06     0.00    -0.02   170.65    -0.06   170.65     0.15
  HUB     12.51     0.00    -0.02   170.65    -0.06   170.65     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     67.30    50.47    16.83   407.95   442.26    14.86   520.38     0.40
  MEAN    63.17    47.20    15.97   337.36   378.11    14.86   520.38     0.34
  HUB     55.41    38.62    16.79   247.38   300.58    14.86   520.38     0.27

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   365.41   282.51   231.77  1129.54     0.32
  MEAN    18.04   369.02   285.36   233.97  1126.99     0.33
  HUB     15.00   398.17   319.90   237.07  1123.81     0.35
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   263.54   125.44     0.23  5829.34
 MEAN   356.65   244.59    71.29     0.22  5147.82     1.78
 HUB    296.62   238.21    23.28     0.21  4799.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.79     1.11    15.62   541.33     1.04   530.17     0.92     0.87
 MEAN    16.59     1.10    15.40   539.16     1.03   527.79     0.92     0.87
 HUB     16.49     1.09    15.11   538.06     1.03   524.81     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     50.63    28.42    24.20     4.22     0.93     0.51     2.90
 MEAN    50.65    16.95    12.70     4.25     0.95     0.46     3.51     0.87
 HUB     53.46    -5.61    -9.30     3.69     0.95     0.33     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.950

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     372.173     284.809     239.576    1127.159       0.330       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.610      15.400     527.946      24.000      49.930      35.400     -14.530

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     255.829     284.809     382.837    1133.655       0.226       0.501

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.579      16.001     534.049     528.796       0.034       0.613

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     239.034       0.000     239.034    1134.392       0.211       0.479

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.997     534.743       0.000       0.060       0.097       0.498

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.802      16.501       1.092     539.515      16.705     165.927       1.286

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 104003.922       0.625     446.521  717563.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.958

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     75.973    2266.000      16.501     539.515       1.000       1.000       0.980
W Kg/sec =   34.53327

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     69.027    2221.858       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  58444.840   59613.613       2.937     590.487     201.025     474.134       2.359

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   229.03    -0.08   229.03     0.20   398.44
 MEAN    18.08     0.00    -0.02   229.03    -0.08   229.03     0.20
 HUB     15.21     0.00    -0.02   229.03    -0.08   229.03     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.60    46.36    14.24   406.37   466.53    16.04   535.13     0.41
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MEAN    57.36    42.30    15.06   357.49   424.63    16.04   535.13     0.37
HUB     52.72    37.84    14.88   300.77   378.11    16.04   535.13     0.33

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   336.50   233.89   241.92  1145.44     0.29
MEAN    18.01   335.86   231.14   243.68  1143.42     0.29
HUB     15.22   355.43   256.84   245.70  1141.39     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   295.62   169.91     0.26  4777.69
MEAN   356.14   273.87   125.00     0.24  4164.18     1.71
HUB    301.03   249.64    44.19     0.22  3911.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.96     1.09    16.92   554.69     1.03   545.23     0.92     0.88
MEAN    17.77     1.08    16.74   552.74     1.02   543.32     0.92     0.88
HUB     17.69     1.07    16.54   551.94     1.02   541.39     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.03    35.08    31.50     3.58     0.93     0.45     2.90
MEAN    43.49    27.16    23.50     3.66     0.95     0.44     3.30     0.88
HUB     46.27    10.20     6.50     3.70     0.95     0.43     3.92


  blockage3   Cor/U1    Cor/Incid
     0.850       1.000       0.958

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     363.300     231.785     279.755    1142.139       0.318      -0.135

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.798      16.591     542.099      46.000      39.643      30.600      -9.043

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     285.148     231.785     367.470    1146.589       0.249       0.282

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.850      17.785      17.035     546.332     455.853       0.021       0.438

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    17.823     281.741       0.000     281.741    1146.758       0.246       0.389

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.850      17.010     546.493       0.000       0.060       0.063       0.259

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.832      17.741       1.075     553.122      13.607     188.898       1.464

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  84730.938       0.520     363.776  654816.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.993

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     75.973    2266.000      17.741     553.122       1.000       1.000       0.880
W Kg/sec =   34.53327

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     65.007    2194.359       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 58444.840   59613.613       2.587     489.817     189.320     384.470       2.031

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   264.92    -0.09   264.92     0.23   384.32
MEAN    17.74     0.00    -0.02   264.92    -0.09   264.92     0.23
HUB     15.05     0.00    -0.02   264.92    -0.09   264.92     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.28    46.36     9.92   396.88   477.25    17.09   547.26     0.42
MEAN    52.94    43.40     9.54   350.77   439.65    17.09   547.26     0.38
HUB     48.33    38.84     9.49   297.61   398.51    17.09   547.26     0.35

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   328.11   213.48   249.16  1158.29     0.28
MEAN    17.51   330.06   214.63   250.75  1156.62     0.29
HUB     14.85   352.30   245.66   252.52  1154.94     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   306.35   178.25     0.26  4230.94
MEAN   346.18   283.16   131.55     0.24  3759.08     1.69
HUB    293.65   257.04    47.99     0.22  3649.48

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.14     1.08    18.11   566.56     1.02   557.57     0.92     0.91
MEAN    18.98     1.07    17.94   565.06     1.02   555.96     0.92     0.91
HUB     18.95     1.07    17.76   564.71     1.02   554.35     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.59    35.58    31.50     4.08     0.93     0.43     2.90
MEAN    40.56    27.68    23.50     4.18     0.94     0.43     3.28     0.91
HUB     44.21    10.76     6.50     4.26     0.94     0.43     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.993

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     333.278     216.040     253.773    1156.837       0.288       0.008

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.015      17.949     556.167      46.000      40.408      31.500      -8.908

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     262.059     216.040     339.630    1160.513       0.226       0.372

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.005      18.341     559.707     471.992       0.019       0.453

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     254.971       0.000     254.971    1160.830       0.220       0.350

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.330     560.013       0.000       0.060       0.062       0.362

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.862      18.958       1.069     565.442      12.320     199.321       1.545

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  76731.773       0.500     329.434  733028.688
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     75.973    2266.000      18.958     565.442       1.000       1.000       0.980
W Kg/sec =   34.53327

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     61.507    2170.321       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 58444.840   59613.613       2.866     513.330     179.130     401.059       2.239

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   240.59    -0.08   240.59     0.21   364.77
MEAN    16.97     0.00    -0.02   240.59    -0.08   240.59     0.21
HUB     14.32     0.00    -0.02   240.59    -0.08   240.59     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.73    46.36    11.37   380.86   450.55    18.40   560.61     0.39
MEAN    54.37    43.80    10.57   335.59   412.99    18.40   560.61     0.36
HUB     49.66    37.84    11.82   283.17   371.64    18.40   560.61     0.32

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   319.07   195.33   252.30  1169.72     0.27
MEAN    16.57   321.18   196.93   253.72  1168.22     0.27
HUB     13.89   342.52   228.31   255.33  1166.70     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    373.34   308.78   178.02     0.26  3689.38
MEAN   327.74   285.46   130.82     0.24  3265.23     1.58
HUB    274.67   259.50    46.36     0.22  3172.43

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.23     1.07    19.21   577.15     1.02   568.65     0.92     0.90
MEAN    20.08     1.06    19.05   575.81     1.02   567.20     0.92     0.90
HUB     20.04     1.06    18.88   575.51     1.02   565.72     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.75    35.21    31.50     3.71     0.93     0.39     2.90
MEAN    37.82    27.28    23.50     3.78     0.94     0.38     3.29     0.90
HUB     41.80    10.29     6.50     3.79     0.94     0.38     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     318.279     198.033     249.168    1168.743       0.272       0.042

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.106      19.094     567.701      46.000      38.477      32.400      -6.077

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     260.804     198.033     327.469    1171.600       0.223       0.348

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.101      19.418     570.480     456.573       0.014       0.428

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    16.096     248.606       0.000     248.606    1172.133       0.212       0.326
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.444	570.999	0.000	0.060	0.049	0.372

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.865	20.064	1.058	576.159	10.717	215.848	1.673

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
66761.555	0.479	286.628	673667.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =15.972 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
75.973	2266.000	20.064	576.159	1.000	1.000	0.980

W Kg/sec = 34.53327

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
58.665	2150.042	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
58444.840	59613.613	2.983	509.668	170.855	390.276	2.284

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	232.90	-0.08	232.90	0.20	343.72
MEAN	15.91	0.00	-0.02	232.90	-0.08	232.90	0.20	
HUB	13.07	0.00	-0.02	232.90	-0.08	232.90	0.20	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.27	47.36	9.91	362.27	430.74	19.52	571.63	0.37
MEAN	53.50	44.80	8.70	314.67	391.55	19.52	571.63	0.33
HUB	47.99	38.84	9.15	258.45	347.97	19.52	571.63	0.30

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	304.07	181.07	244.28	1180.04	0.26
MEAN	15.50	303.96	178.98	245.67	1178.51	0.26
HUB	12.59	320.45	203.91	247.20	1176.96	0.27

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	299.73	173.68	0.25	3249.94	
MEAN	306.46	276.78	127.48	0.23	2775.03	1.56
HUB	248.96	251.27	45.05	0.21	2568.33	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.23	1.06	20.27	586.47	1.02	578.76	0.92	0.91
MEAN	21.06	1.05	20.10	584.97	1.02	577.25	0.92	0.91
HUB	20.98	1.05	19.93	584.31	1.01	575.74	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.55	35.41	31.50	3.91	0.93	0.38	2.90	
MEAN	36.07	27.42	23.50	3.92	0.93	0.36	3.34	0.91
HUB	39.52	10.33	6.50	3.83	0.93	0.35	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	307.471	182.261	247.628	1178.615	0.261	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.070	20.095	577.359	46.000	36.354	33.000	-3.354

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     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     261.744     182.261     318.950    1180.831       0.222       0.260

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      21.067      20.357     579.531     440.827       0.023       0.400

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     245.872       0.000     245.872    1181.516       0.208       0.332

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      20.423     580.204       0.000       0.060       0.040       0.326

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.877      21.049       1.049     585.251       9.092     239.350       1.855

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   56649.984       0.450     243.216  709886.812

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     388878.19   1669.5760     74.2182      1.3933      0.8355     15.9719      1.1194


*********************************************************************
**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 10% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =17.022   EfDer =  0.940

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      72.622    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   33.00999

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      70.944    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   55866.812   56984.027       4.025     831.557     206.605     619.754       3.000

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   162.95    -0.06   162.95     0.15   406.33
  MEAN    17.06     0.00    -0.02   162.95    -0.06   162.95     0.15
  HUB     12.51     0.00    -0.02   162.95    -0.06   162.95     0.15

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.23    50.47    17.76   407.95   439.34    14.88   520.59     0.39
  MEAN    64.22    47.20    17.02   337.36   374.70    14.88   520.59     0.33
  HUB     56.63    38.62    18.01   247.38   296.27    14.88   520.59     0.26

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   363.05   287.76   221.35  1130.06     0.32
  MEAN    18.04   364.70   288.23   223.45  1127.45     0.32
  HUB     15.00   390.78   318.56   226.35  1124.26     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   251.87   120.19     0.22  5937.73
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 MEAN   356.65   233.69    68.42     0.21  5199.54     1.85
 HUB    296.62   227.41    21.94     0.20  4779.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.81     1.11    15.64   541.67     1.04   530.66     0.92     0.86
 MEAN    16.59     1.10    15.43   539.33     1.03   528.22     0.92     0.86
 HUB     16.46     1.09    15.14   537.99     1.03   525.24     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     52.43    28.50    24.20     4.30     0.93     0.54     2.90
 MEAN    52.22    17.03    12.70     4.33     0.95     0.49     3.51     0.86
 HUB     54.60    -5.54    -9.30     3.76     0.95     0.36     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.940

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     367.563     287.674     228.793    1127.622       0.326       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.607      15.427     528.379      24.000      51.504      35.400     -16.104

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     244.135     287.674     377.304    1134.331       0.215       0.528

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.573      16.046     534.685     528.796       0.038       0.640

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     228.278       0.000     228.278    1134.994       0.201       0.495

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.029     535.311       0.000       0.060       0.108       0.514

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.788      16.488       1.091     539.663      16.853     161.073       1.249

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 104926.555       0.630     430.612  685209.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =17.022   EfDer =  0.948

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     72.622    2266.000      16.488     539.663       1.000       1.000       0.980
W Kg/sec =   33.00999

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     66.041    2221.552       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  55866.812   56984.027       3.070     590.487     192.329     474.134       2.465

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   218.76    -0.08   218.76     0.19   398.38
 MEAN    18.08     0.00    -0.02   218.76    -0.08   218.76     0.19
 HUB     15.21     0.00    -0.02   218.76    -0.08   218.76     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.71    46.36    15.35   406.37   461.58    16.07   535.67     0.41
 MEAN    58.54    42.30    16.24   357.49   419.18    16.07   535.67     0.37
 HUB     53.98    37.84    16.14   300.77   371.97    16.07   535.67     0.33
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      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   334.07   241.21   231.14  1146.23     0.29
MEAN    18.01   331.88   236.48   232.85  1144.13     0.29
HUB     15.22   349.32   258.62   234.81  1142.01     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   282.60   162.59     0.25  4926.97
MEAN   356.14   261.80   119.66     0.23  4260.42     1.77
HUB    301.03   238.61    42.40     0.21  3938.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.98     1.09    16.95   555.31     1.03   545.99     0.92     0.87
MEAN    17.77     1.08    16.76   553.19     1.03   544.00     0.92     0.87
HUB     17.67     1.07    16.56   552.17     1.02   541.98     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.22    35.12    31.50     3.62     0.93     0.48     2.90
MEAN    45.44    27.20    23.50     3.70     0.95     0.46     3.30     0.87
HUB     47.76    10.24     6.50     3.74     0.95     0.45     3.92


   blockage3   Cor/U1    Cor/Incid
      0.850       1.000       0.948

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     357.233     237.147     267.164    1142.982       0.313      -0.125

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.798      16.631     542.901      46.000      41.594      30.600     -10.994

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     272.072     237.147     360.918    1147.684       0.237       0.325

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.850      17.782      17.099     547.377     455.853       0.025       0.469

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     268.956       0.000     268.956    1147.832       0.234       0.412

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.850      17.064     547.518       0.000       0.060       0.074       0.292

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.817      17.730       1.075     553.559      13.896     181.731       1.409

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  86528.609       0.531     355.108  624685.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =17.022   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     72.622    2266.000      17.730     553.559       1.000       1.000       0.880
W Kg/sec =   33.00999

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     62.200    2193.492       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  55866.812   56984.027       2.704     489.817     181.146     384.470       2.122

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   252.99    -0.09   252.99     0.22   384.17
MEAN    17.74     0.00    -0.02   252.99    -0.09   252.99     0.22
HUB     15.05     0.00    -0.02   252.99    -0.09   252.99     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.49    46.36    11.13   396.88   470.72    17.14   548.21     0.41
MEAN    54.21    43.40    10.81   350.77   432.55    17.14   548.21     0.38
HUB     49.64    38.84    10.80   297.61   390.67    17.14   548.21     0.34

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   325.16   221.58   237.96  1159.44     0.28
MEAN    17.51   325.64   220.59   239.55  1157.67     0.28
HUB     14.85   345.96   247.91   241.31  1155.89     0.30

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   292.54   170.15     0.25  4391.33
MEAN   346.18   270.48   125.60     0.23  3863.24     1.75
HUB    293.65   245.61    45.75     0.21  3682.71

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.18     1.08    18.16   567.50     1.03   558.67     0.92     0.90
MEAN    19.00     1.07    17.98   565.83     1.02   556.97     0.92     0.90
HUB     18.94     1.07    17.80   565.25     1.02   555.26     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.96    35.57    31.50     4.07     0.93     0.46     2.90
MEAN    42.64    27.67    23.50     4.17     0.94     0.45     3.28     0.90
HUB     45.77    10.73     6.50     4.23     0.94     0.45     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.987

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     328.751     222.033     242.443    1157.875       0.284       0.008

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.028      17.991     557.169      46.000      42.484      31.500     -10.984

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     250.120     222.033     334.453    1161.818       0.215       0.407

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.015      18.410     560.970     471.992       0.023       0.486

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.121     243.492       0.000     243.492    1162.101       0.210       0.374

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.388     561.243       0.000       0.060       0.074       0.386

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.850      18.960       1.069     566.194      12.635     191.123       1.482

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  78694.938       0.513     322.959  698630.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =17.022   EfDer =  0.982
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
72.622	2266.000	18.960	566.194	1.000	1.000	0.980

W Kg/sec = 33.00999

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
58.826	2168.880	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
55866.812	56984.027	2.996	513.330	171.320	401.059	2.341

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	229.81	-0.08	229.81	0.20	364.52
MEAN	16.97	0.00	-0.02	229.81	-0.08	229.81	0.20	
HUB	14.32	0.00	-0.02	229.81	-0.08	229.81	0.20	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.90	46.36	12.54	380.86	444.89	18.45	561.78	0.38
MEAN	55.60	43.80	11.80	335.59	406.80	18.45	561.78	0.35
HUB	50.95	37.84	13.11	283.17	364.75	18.45	561.78	0.31

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	315.28	203.36	240.92	1171.19	0.27
MEAN	16.57	316.00	202.80	242.34	1169.59	0.27
HUB	13.89	335.56	230.42	243.95	1167.97	0.29

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	294.85	169.98	0.25	3841.01	
MEAN	327.74	272.66	124.94	0.23	3362.51	1.64
HUB	274.67	247.93	44.25	0.21	3201.63	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.27	1.07	19.27	578.39	1.02	570.09	0.92	0.90
MEAN	20.10	1.06	19.11	576.87	1.02	568.53	0.92	0.90
HUB	20.05	1.06	18.93	576.36	1.02	566.96	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.17	35.20	31.50	3.70	0.93	0.42	2.90	
MEAN	39.92	27.27	23.50	3.77	0.94	0.40	3.29	0.90
HUB	43.37	10.28	6.50	3.78	0.94	0.40	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.982

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	313.446	203.939	238.028	1170.077	0.268	0.040

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.131	19.150	569.002	46.000	40.590	32.400	-8.190

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	248.909	203.939	321.787	1173.188	0.212	0.383

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.124	19.501	572.032	456.573	0.017	0.462

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	237.393	0.000	237.393	1173.668	0.202	0.352

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.515	572.500	0.000	0.060	0.059	0.396

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.853	20.080	1.059	577.205	11.011	206.717	1.602

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
68594.609	0.492	281.508	642094.688

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =17.022 EfDer = 0.992

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
72.622	2266.000	20.080	577.205	1.000	1.000	0.980

W Kg/sec = 33.00999

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
56.081	2148.093	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
55866.812	56984.027	3.120	509.668	163.331	390.276	2.389

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	222.45	-0.08	222.45	0.19	343.41
MEAN	15.91	0.00	-0.02	222.45	-0.08	222.45	0.19	
HUB	13.07	0.00	-0.02	222.45	-0.08	222.45	0.19	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.45	47.36	11.09	362.27	425.18	19.58	573.07	0.36
MEAN	54.75	44.80	9.95	314.67	385.42	19.58	573.07	0.33
HUB	49.29	38.84	10.45	258.45	341.06	19.58	573.07	0.29

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	300.22	189.06	233.21	1181.76	0.25
MEAN	15.50	298.65	184.81	234.60	1180.13	0.25
HUB	12.59	313.38	206.04	236.12	1178.49	0.27

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	286.08	165.69	0.24	3393.17	
MEAN	306.46	264.27	121.65	0.22	2865.26	1.61
HUB	248.96	239.99	42.92	0.20	2595.01	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.29	1.06	20.36	587.98	1.02	580.45	0.92	0.91
MEAN	21.10	1.05	20.18	586.30	1.02	578.85	0.92	0.91
HUB	21.00	1.05	19.99	585.44	1.01	577.24	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.03	35.39	31.50	3.89	0.93	0.40	2.90	
MEAN	38.23	27.41	23.50	3.91	0.94	0.39	3.34	0.91
HUB	41.11	10.30	6.50	3.80	0.94	0.37	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	302.215	188.194	236.468	1180.229	0.256	-0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.112	20.170	578.948	46.000	38.515	33.000	-5.515

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	249.726	188.194	312.698	1182.692	0.211	0.297

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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.107      20.460     581.366     440.827       0.026       0.434

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     234.677       0.000     234.677    1183.311       0.198       0.362

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.516     581.975       0.000       0.060       0.047       0.355

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      21.087       1.050     586.572       9.367     228.746       1.773

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  58364.945       0.464     239.526  676470.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    397109.62   1629.7119     70.9444      1.3958      0.8227     17.0217      1.1220


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 60%  Stat 2 10% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc =18.040   EfDer =  0.929

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     69.419    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   31.55391

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     67.815    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  53402.504   54470.438       4.211     831.557     197.492     619.754       3.138

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   155.62    -0.05   155.62     0.14   406.33
 MEAN    17.06     0.00    -0.02   155.62    -0.05   155.62     0.14
 HUB     12.51     0.00    -0.02   155.62    -0.05   155.62     0.14

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     69.12    50.47    18.65   407.95   436.67    14.90   520.79     0.39
 MEAN    65.24    47.20    18.04   337.36   371.57    14.90   520.79     0.33
 HUB     57.83    38.62    19.21   247.38   292.30    14.90   520.79     0.26

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   361.09   292.69   211.47  1130.53     0.32
 MEAN    18.04   360.83   290.92   213.46  1127.86     0.32
 HUB     15.00   383.89   317.23   216.17  1124.67     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   240.84   115.26     0.21  6039.33
 MEAN   356.65   223.35    65.73     0.20  5248.00     1.92
 HUB    296.62   217.15    20.62     0.19  4759.18
```

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.82	1.11	15.67	541.99	1.04	531.10	0.92	0.85
MEAN	16.58	1.10	15.45	539.48	1.03	528.61	0.92	0.85
HUB	16.44	1.09	15.17	537.93	1.03	525.62	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	54.15	28.59	24.20	4.39	0.93	0.56	2.90	
MEAN	53.73	17.12	12.70	4.42	0.95	0.51	3.51	0.85
HUB	55.73	-5.45	-9.30	3.85	0.95	0.38	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.929

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	363.425	290.358	218.564	1128.038	0.322	0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
16.602	15.448	528.770	24.000	53.030	35.400	-17.630

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	233.059	290.358	372.322	1134.945	0.205	0.555

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.565	16.085	535.265	528.796	0.041	0.667

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	218.066	0.000	218.066	1135.544	0.192	0.511

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.055	535.829	0.000	0.060	0.118	0.529

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.774	16.474	1.090	539.801	16.991	156.448	1.213

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
105784.961	0.636	414.985	654374.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =18.040 EfDer = 0.936

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
69.419	2266.000	16.474	539.801	1.000	1.000	0.980

W Kg/sec = 31.55391

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
63.191	2221.269	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
53402.504	54470.438	3.209	590.487	184.027	474.134	2.576

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	209.01	-0.07	209.01	0.18	398.33
MEAN	18.08	0.00	-0.02	209.01	-0.07	209.01	0.18	
HUB	15.21	0.00	-0.02	209.01	-0.07	209.01	0.18	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.79	46.36	16.43	406.37	457.03	16.09	536.15	0.40
MEAN	59.69	42.30	17.39	357.49	414.17	16.09	536.15	0.36
HUB	55.21	37.84	17.37	300.77	366.32	16.09	536.15	0.32

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	332.19	248.05	220.95	1146.95	0.29
MEAN	18.01	328.41	241.46	222.60	1144.78	0.29
HUB	15.22	343.68	260.23	224.49	1142.58	0.30

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	270.33	155.74	0.24	5066.73	
MEAN	356.14	250.40	114.68	0.22	4349.93	1.83
HUB	301.03	228.17	40.80	0.20	3962.60	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.99	1.09	16.97	555.89	1.03	546.68	0.92	0.86
MEAN	17.77	1.08	16.78	553.62	1.03	544.61	0.92	0.86
HUB	17.65	1.07	16.58	552.39	1.02	542.52	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	48.31	35.18	31.50	3.68	0.93	0.50	2.90	
MEAN	47.33	27.26	23.50	3.76	0.95	0.48	3.30	0.86
HUB	49.22	10.30	6.50	3.80	0.95	0.47	3.92	

blockage3	Cor/U1	Cor/Incid
0.850	1.000	0.936

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	351.839	242.135	255.267	1143.745	0.308	-0.117

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.792	16.661	543.627	46.000	43.488	30.600	-12.888

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	259.743	242.135	355.100	1148.682	0.226	0.366

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.850	17.773	17.151	548.331	455.853	0.029	0.500

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	256.900	0.000	256.900	1148.811	0.224	0.434

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.850	17.106	548.454	0.000	0.060	0.086	0.323

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.801	17.714	1.075	553.965	14.164	175.100	1.357

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
88201.211	0.541	346.005	596049.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =18.040 EfDer = 0.980

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
69.419	2266.000	17.714	553.965	1.000	1.000	0.880

W Kg/sec = 31.55391

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
59.535	2192.688	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
53402.504	54470.438	2.825	489.817	173.383	384.470	2.217

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	241.72	-0.08	241.72	0.21	384.02

```
MEAN    17.74     0.00    -0.02   241.72    -0.08   241.72     0.21
HUB     15.05     0.00    -0.02   241.72    -0.08   241.72     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.66    46.36    12.30   396.88   464.76    17.18   549.09     0.40
MEAN    55.44    43.40    12.04   350.77   426.06    17.18   549.09     0.37
HUB     50.92    38.84    12.08   297.61   383.47    17.18   549.09     0.33

     ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   322.86   229.15   227.44  1160.48     0.28
MEAN    17.51   321.84   226.15   229.00  1158.62     0.28
HUB     14.85   340.15   249.93   230.73  1156.75     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   279.58   162.59     0.24  4541.05
MEAN   346.18   258.55   120.03     0.22  3960.58     1.80
HUB    293.65   234.84    43.72     0.20  3712.72

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.20     1.08    18.19   568.38     1.03   559.68     0.92     0.90
MEAN    19.00     1.07    18.01   566.54     1.02   557.89     0.92     0.90
HUB     18.92     1.07    17.82   565.75     1.02   556.09     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     45.21    35.56    31.50     4.06     0.93     0.48     2.90
MEAN    44.64    27.66    23.50     4.16     0.94     0.47     3.28     0.90
HUB     47.29    10.73     6.50     4.23     0.94     0.47     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     324.864     227.634     231.774    1158.819       0.280       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.031      18.019     558.081      46.000      44.484      31.500     -12.984

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     238.902     227.634     329.987    1163.013       0.205       0.440

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.014      18.462     562.128     471.992       0.026       0.519

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     232.703       0.000     232.703    1163.265       0.200       0.397

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.429     562.372       0.000       0.060       0.087       0.408

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.838      18.951       1.070     566.894      12.928     183.631       1.423

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  80521.211       0.525     315.877  666031.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =18.040   EfDer =  0.974

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     69.419    2266.000      18.951     566.894       1.000       1.000       0.980
W Kg/sec =   31.55391
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
56.293	2167.541	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
53402.504	54470.438	3.131	513.330	163.944	401.059	2.446

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	219.68	-0.08	219.68	0.19	364.30
MEAN	16.97	0.00	-0.02	219.68	-0.08	219.68	0.19	
HUB	14.32	0.00	-0.02	219.68	-0.08	219.68	0.19	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.03	46.36	13.67	380.86	439.74	18.49	562.86	0.38
MEAN	56.80	43.80	13.00	335.59	401.16	18.49	562.86	0.34
HUB	52.20	37.84	14.36	283.17	358.45	18.49	562.86	0.31

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	312.21	210.84	230.27	1172.53	0.27
MEAN	16.57	311.52	208.26	231.68	1170.84	0.27
HUB	13.89	329.20	232.30	233.26	1169.14	0.28

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	281.84	162.50	0.24	3982.14	
MEAN	327.74	260.67	119.48	0.22	3452.92	1.69
HUB	274.67	237.07	42.37	0.20	3227.68	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.30	1.07	19.32	579.54	1.02	571.40	0.92	0.89
MEAN	20.11	1.06	19.15	577.86	1.02	569.75	0.92	0.89
HUB	20.04	1.06	18.96	577.14	1.02	568.09	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.48	35.21	31.50	3.71	0.93	0.44	2.90	
MEAN	41.95	27.28	23.50	3.78	0.94	0.43	3.29	0.89
HUB	44.88	10.30	6.50	3.80	0.94	0.42	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.974

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	309.278	209.429	227.580	1171.294	0.264	0.038

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.140	19.186	570.191	46.000	42.622	32.400	-10.222

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	237.779	209.429	316.858	1174.643	0.202	0.416

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.130	19.562	573.457	456.573	0.020	0.494

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	226.903	0.000	226.903	1175.075	0.193	0.375

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.564	573.879	0.000	0.060	0.070	0.417

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.840	20.080	1.060	578.177	11.284	198.434	1.538

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  70292.602       0.504     275.751  612165.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =18.040   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     69.419    2266.000      20.080     578.177       1.000       1.000       0.980
W Kg/sec =   31.55391

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     53.655    2146.286       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  53402.504   54470.438       3.262     509.668     156.264     390.276       2.498

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   212.67    -0.07   212.67     0.18   343.12
 MEAN    15.91     0.00    -0.02   212.67    -0.07   212.67     0.18
 HUB     13.07     0.00    -0.02   212.67    -0.07   212.67     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.59    47.36    12.23   362.27   420.14    19.63   574.40     0.36
 MEAN    55.95    44.80    11.15   314.67   379.86    19.63   574.40     0.32
 HUB     50.56    38.84    11.72   258.45   334.76    19.63   574.40     0.28

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   297.10   196.43   222.89  1183.33     0.25
 MEAN    15.50   294.08   190.22   224.27  1181.62     0.25
 HUB     12.59   306.95   207.96   225.77  1179.89     0.26

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   273.40   158.32     0.23  3525.36
 MEAN   306.46   252.60   116.24     0.21  2949.16     1.67
 HUB    248.96   229.46    41.00     0.19  2619.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.33     1.06    20.41   589.37     1.02   582.00     0.92     0.90
 MEAN    21.12     1.05    20.23   587.54     1.02   580.32     0.92     0.90
 HUB     21.00     1.05    20.04   586.49     1.01   578.63     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.39    35.39    31.50     3.89     0.93     0.43     2.90
 MEAN    40.30    27.40    23.50     3.90     0.94     0.41     3.34     0.90
 HUB     42.65    10.29     6.50     3.79     0.94     0.39     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     297.701     193.711     226.058    1181.702       0.252      -0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.133      20.219     580.400      46.000      40.593      33.000      -7.593

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     238.548     193.711     307.293    1184.395       0.201       0.332

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.123      20.534     583.048     440.827       0.030       0.466
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    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    14.701     224.265       0.000     224.265    1184.955       0.189       0.389

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.578     583.600       0.000       0.060       0.056       0.381

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      21.100       1.051     587.799       9.621     219.212       1.699

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   59949.395       0.476     235.176  644812.250

   OVERALL EXIT CONDITIONS; ALL          5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    404749.38   1587.7944     67.8150      1.3967      0.8088     18.0398      1.1243



**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

   Fan-Core + 4 Stage LPC 60%  Stat 2 20% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.999

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    111.020    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   50.46355

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.455    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85405.578   87113.516       2.633     831.557     315.845     619.754       1.962

     ROTOR LEADING EDGE CONDITIONS, STAGE           1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   252.87    -0.09   252.87     0.23   406.33
  MEAN    17.06     0.00    -0.02   252.87    -0.09   252.87     0.23
  HUB     12.51     0.00    -0.02   252.87    -0.09   252.87     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.21    50.47     7.74   407.95   480.04    14.58   517.47     0.43
  MEAN    53.15    47.20     5.95   337.36   421.68    14.58   517.47     0.38
  HUB     44.38    38.62     5.76   247.38   353.81    14.58   517.47     0.32

     ROTOR EXIT CONDITIONS, STAGE           1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   411.69   220.75   347.51  1122.00     0.37
  MEAN    18.04   430.43   250.77   349.84  1120.48     0.38
  HUB     15.00   485.97   332.06   354.83  1117.48     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   394.72   187.20     0.35  4555.88
  MEAN   356.65   365.52   105.89     0.33  4524.33     1.29
  HUB    296.62   356.59    35.44     0.32  4982.04

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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```
 TIP     16.48     1.09    15.02   537.28     1.03   523.13     0.92     0.91
 MEAN    16.47     1.09    14.88   537.18     1.03   521.71     0.92     0.91
 HUB     16.62     1.10    14.59   538.64     1.03   518.91     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.43    28.31    24.20     4.11     0.93     0.26     2.90
 MEAN    35.63    16.84    12.70     4.14     0.92     0.22     3.51     0.91
 HUB     43.10    -5.70    -9.30     3.60     0.92     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     437.269     250.280     358.559    1120.504       0.390      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.507      14.859     521.730      24.000      34.916      35.400       0.484

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     387.069     250.280     460.937    1124.210       0.344       0.218

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.498      15.197     525.186     528.796       0.015       0.370

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     358.919       0.000     358.919    1126.085       0.319       0.284

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.341     526.940       0.000       0.060       0.037       0.303

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      16.462       1.090     537.700      14.890     220.181       1.707

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  92703.586       0.557     581.607 1063300.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.992

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    111.020    2266.000      16.462     537.700       1.000       1.000       0.980
W Kg/sec =   50.46355

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.937    2225.604       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85405.578   87113.516       2.009     590.487     293.951     474.134       1.613

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   343.01    -0.12   343.01     0.30   399.11
 MEAN    18.08     0.00    -0.02   343.01    -0.12   343.01     0.30
 HUB     15.21     0.00    -0.02   343.01    -0.12   343.01     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.84    46.36     3.48   406.37   531.87    15.44   527.87     0.47
 MEAN    46.19    42.30     3.89   357.49   495.52    15.44   527.87     0.44
 HUB     41.26    37.84     3.42   300.77   456.28    15.44   527.87     0.40

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
```

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	394.14	145.72	366.21	1133.78	0.35
MEAN	18.01	403.27	166.92	367.11	1133.24	0.36
HUB	15.22	436.41	233.88	368.45	1132.64	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	448.02	258.08	0.40	2977.93	
MEAN	356.14	413.01	189.22	0.36	3008.30	1.29
HUB	301.03	374.52	67.15	0.33	3562.16	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.40	1.06	16.00	547.16	1.02	534.18	0.92	0.91
MEAN	17.41	1.06	15.95	547.25	1.02	533.67	0.92	0.91
HUB	17.58	1.07	15.87	549.01	1.02	533.11	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	21.70	35.17	31.50	3.67	0.93	0.20	2.90	
MEAN	24.45	27.27	23.50	3.77	0.92	0.22	3.30	0.91
HUB	32.41	10.33	6.50	3.83	0.92	0.24	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	524.740	167.385	497.328	1123.790	0.467	-0.605

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.447	15.023	524.812	46.000	18.602	30.600	11.998

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	516.068	167.385	542.535	1124.597	0.459	-0.578

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	17.401	15.059	525.566	400.556	0.040	0.136

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	509.342	0.000	509.342	1125.213	0.453	0.026

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	15.063	526.142	0.000	0.060	0.081	-0.575

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.798	17.340	1.053	547.809	10.109	288.894	2.239

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
62946.453	0.386	394.915	984160.938

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 5.953 EfDer = 0.815

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
111.020	2266.000	17.340	547.809	1.000	1.000	0.780

W Kg/sec = 50.46355

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
96.724	2204.975	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85405.578	87113.516	1.541	434.156	281.686	339.175	1.204

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	469.21	-0.16	469.21	0.42	386.18
MEAN	17.74	0.00	-0.02	469.21	-0.16	469.21	0.42	

```
HUB     15.05     0.00    -0.02   469.21    -0.16   469.21     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     40.24    46.36    -6.12   396.88   614.65    15.39   529.42     0.54
MEAN    36.79    43.40    -6.61   350.77   585.92    15.39   529.42     0.52
HUB     32.40    38.84    -6.44   297.61   555.72    15.39   529.42     0.49

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   402.80   100.88   389.96  1140.57     0.35
MEAN    17.51   411.28   130.88   389.90  1140.94     0.36
HUB     14.85   443.88   210.16   390.97  1141.26     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   486.49   290.86     0.43  2001.62
MEAN   346.18   445.40   215.30     0.39  2294.15     1.38
HUB    293.65   399.79    83.49     0.35  3123.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.87     1.03    16.39   554.16     1.01   540.62     0.92     0.75
MEAN    17.95     1.04    16.40   555.09     1.01   540.97     0.92     0.75
HUB     18.17     1.05    16.37   557.73     1.02   541.27     0.92     0.75

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     14.50    36.72    31.50     5.22     0.93     0.24     2.90
MEAN    18.56    28.91    23.50     5.41     0.87     0.27     3.28     0.75
HUB     28.26    12.05     6.50     5.55     0.87     0.33     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.815

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     416.373     131.740     394.982    1141.164       0.365      -0.004

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.979      16.398     541.184      46.000      18.445      31.500      13.055

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     414.850     131.740     435.265    1141.275       0.363      -0.009

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.940      16.373     541.290     471.992       0.034       0.137

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     403.701       0.000     403.701    1142.078       0.353      -0.014

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.375     542.052       0.000       0.060       0.088      -0.008

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.588      17.855       1.030     555.662       7.853     350.082       2.714

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  48909.102       0.319     306.847 1290443.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.909

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.020    2266.000      17.855     555.662       1.000       1.000       0.980
W Kg/sec =   50.46355
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
94.605	2189.337	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85405.578	87113.516	1.863	513.330	275.518	401.059	1.456

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	379.14	-0.13	379.14	0.33	367.96
MEAN	16.97	0.00	-0.02	379.14	-0.13	379.14	0.33	
HUB	14.32	0.00	-0.02	379.14	-0.13	379.14	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.14	46.36	-1.22	380.86	537.49	16.54	543.66	0.47
MEAN	41.52	43.80	-2.28	335.59	506.41	16.54	543.66	0.44
HUB	36.77	37.84	-1.07	283.17	473.29	16.54	543.66	0.41

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	414.83	83.29	406.39	1146.52	0.36
MEAN	16.57	421.85	115.42	405.75	1147.14	0.37
HUB	13.89	451.77	198.20	405.97	1147.65	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	499.28	290.06	0.44	1574.99	
MEAN	327.74	457.94	212.32	0.40	1915.20	1.18
HUB	274.67	413.11	76.47	0.36	2754.81	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.33	1.03	16.74	560.66	1.01	546.29	0.92	0.83
MEAN	18.43	1.03	16.78	561.74	1.01	546.88	0.92	0.83
HUB	18.68	1.05	16.79	564.41	1.02	547.37	0.92	0.83

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	11.58	35.52	31.50	4.02	0.93	0.10	2.90	
MEAN	15.88	27.62	23.50	4.12	0.89	0.13	3.29	0.83
HUB	26.02	10.67	6.50	4.17	0.89	0.18	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.909

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	414.330	116.070	397.740	1148.235	0.361	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.462	16.871	547.938	46.000	16.269	32.400	16.131

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	423.832	116.070	439.438	1147.538	0.369	-0.011

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.408	16.751	547.273	456.573	0.042	0.119

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	404.177	0.000	404.177	1148.962	0.352	-0.046

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.792	548.631	0.000	0.060	0.108	0.013

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.588	18.294	1.025	562.272	6.610	389.380	3.018

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
41169.184	0.295	258.288	1030706.062

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 5.953 EfDer = 0.852

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
111.020	2266.000	18.294	562.272	1.000	1.000	0.980

W Kg/sec = 50.46355

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
92.879	2176.431	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85405.578	87113.516	1.884	509.668	270.497	390.276	1.443

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	376.60	-0.13	376.60	0.33	347.94
MEAN	15.91	0.00	-0.02	376.60	-0.13	376.60	0.33	
HUB	13.07	0.00	-0.02	376.60	-0.13	376.60	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	43.90	47.36	-3.46	362.27	522.65	16.98	550.43	0.45
MEAN	39.89	44.80	-4.91	314.67	490.85	16.98	550.43	0.43
HUB	34.47	38.84	-4.37	258.45	456.83	16.98	550.43	0.40

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	409.40	63.15	404.50	1152.34	0.36
MEAN	15.50	414.48	93.15	403.88	1153.01	0.36
HUB	12.59	439.30	172.16	404.16	1153.56	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	498.65	291.61	0.43	1135.25	
MEAN	306.46	456.75	213.31	0.40	1445.71	1.15
HUB	248.96	411.40	76.80	0.36	2169.21	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.62	1.02	17.06	565.88	1.01	551.88	0.92	0.78
MEAN	18.70	1.02	17.10	566.86	1.01	552.52	0.92	0.78
HUB	18.91	1.03	17.11	569.16	1.01	553.05	0.92	0.78

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	8.87	35.79	31.50	4.29	0.93	0.07	2.90	
MEAN	12.99	27.84	23.50	4.34	0.88	0.10	3.34	0.78
HUB	23.07	10.76	6.50	4.26	0.88	0.14	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.852

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	418.390	94.861	407.495	1153.174	0.363	-0.013

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.710	17.082	552.684	46.000	13.105	33.000	19.895

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	441.111	94.861	451.195	1151.471	0.383	-0.185

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.575	16.784	551.054	440.827	0.102	0.091

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     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     412.479       0.000     412.479    1153.601       0.358      -0.075

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      16.958     553.094       0.000       0.060       0.131      -0.080

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.406      18.527       1.013     567.299       5.027     474.767       3.680

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   31314.828       0.249     196.464 1092127.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     277043.12   1738.1216    108.4552      1.2264      0.7081      5.9532      1.0851


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 20% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     108.993    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   49.54226

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     106.475    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   83846.383   85523.125       2.682     831.557     310.079     619.754       1.999

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   248.01    -0.09   248.01     0.22   406.33
  MEAN    17.06     0.00    -0.02   248.01    -0.09   248.01     0.22
  HUB     12.51     0.00    -0.02   248.01    -0.09   248.01     0.22

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.71    50.47     8.24   407.95   477.50    14.60   517.67     0.43
  MEAN    53.69    47.20     6.49   337.36   418.78    14.60   517.67     0.38
  HUB     44.94    38.62     6.32   247.38   350.36    14.60   517.67     0.31

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   407.83   224.69   340.35  1122.56     0.36
  MEAN    18.04   425.99   252.99   342.74  1120.96     0.38
  HUB     15.00   480.29   331.42   347.61  1117.94     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   386.55   183.26     0.34  4637.11
  MEAN   356.65   358.07   103.67     0.32  4564.33     1.31
  HUB    296.62   349.35    34.80     0.31  4972.38

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.51     1.09    15.07   537.54     1.03   523.65     0.92     0.91
  MEAN    16.49     1.09    14.92   537.31     1.03   522.15     0.92     0.91
  HUB     16.61     1.10    14.63   538.61     1.03   519.34     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.43    28.30    24.20     4.10     0.93     0.27     2.90
 MEAN    36.43    16.83    12.70     4.13     0.93     0.23     3.51     0.91
 HUB     43.63    -5.72    -9.30     3.58     0.93     0.11     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     432.581     252.495     351.244    1120.997       0.386      -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.520      14.905     522.189      24.000      35.711      35.400      -0.311

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     378.833     252.495     455.267    1124.900       0.337       0.234

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.511      15.263     525.831     528.796       0.015       0.382

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     351.409       0.000     351.409    1126.687       0.312       0.297

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.400     527.504       0.000       0.060       0.037       0.316

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      16.475       1.091     537.818      15.008     216.767       1.680

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93438.875       0.561     575.517 1042869.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.993    2266.000      16.475     537.818       1.000       1.000       0.980
W Kg/sec =   49.54226

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     99.023    2225.360       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 83846.383   85523.125       2.048     590.487     288.378     474.134       1.644

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   335.90    -0.12   335.90     0.30   399.07
 MEAN    18.08     0.00    -0.02   335.90    -0.12   335.90     0.30
 HUB     15.21     0.00    -0.02   335.90    -0.12   335.90     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.43    46.36     4.07   406.37   527.31    15.49   528.39     0.47
 MEAN    46.79    42.30     4.49   357.49   490.63    15.49   528.39     0.44
 HUB     41.85    37.84     4.01   300.77   450.96    15.49   528.39     0.40

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   388.86   151.54   358.12  1134.67     0.34
 MEAN    18.01   397.84   171.13   359.16  1134.01     0.35
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HUB     15.22   430.67   235.44   360.62  1133.29     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   438.04   252.25     0.39  3096.91
MEAN   356.14   404.01   185.01     0.36  3084.10     1.31
HUB    301.03   366.53    65.59     0.32  3585.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.45     1.06    16.09   547.65     1.02   535.03     0.92     0.91
MEAN    17.45     1.06    16.02   547.61     1.02   534.39     0.92     0.91
HUB     17.61     1.07    15.94   549.21     1.02   533.72     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     22.94    35.16    31.50     3.66     0.93     0.22     2.90
MEAN    25.48    27.25    23.50     3.75     0.92     0.23     3.30     0.91
HUB     33.14    10.31     6.50     3.81     0.92     0.25     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     514.836     171.608     485.393    1125.084       0.458      -0.589

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.489      15.147     526.021      46.000      19.471      30.600      11.129

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     502.879     171.608     531.354    1126.170       0.447      -0.539

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      17.449      15.214     527.038     400.556       0.037       0.148

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.823     496.252       0.000     496.252    1126.761       0.440       0.049

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.750      15.220     527.591       0.000       0.060       0.075      -0.535

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.813      17.392       1.056     548.158      10.340     281.075       2.179

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  64386.652       0.395     396.576  964193.438


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  0.830

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.993    2266.000      17.392     548.158       1.000       1.000       0.780
W Kg/sec =   49.54226

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     94.705    2204.272       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83846.383   85523.125       1.574     434.156     275.805     339.175       1.230

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   457.60    -0.16   457.60     0.40   386.05
 MEAN    17.74     0.00    -0.02   457.60    -0.16   457.60     0.40
 HUB     15.05     0.00    -0.02   457.60    -0.16   457.60     0.40

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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TIP     40.95    46.36    -5.41   396.88   605.83    15.53   530.67     0.54
MEAN    37.48    43.40    -5.92   350.77   576.67    15.53   530.67     0.51
HUB     33.05    38.84    -5.79   297.61   545.95    15.53   530.67     0.48

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   395.44   108.32   380.32  1141.95     0.35
MEAN    17.51   404.13   136.34   380.43  1142.14     0.35
HUB     14.85   436.68   212.39   381.55  1142.30     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   474.31   283.41     0.42  2149.02
MEAN   346.18   434.47   209.84     0.38  2389.67     1.40
HUB    293.65   390.11    81.26     0.34  3156.37

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.97     1.03    16.54   554.98     1.01   541.92     0.92     0.76
MEAN    18.04     1.04    16.54   555.75     1.01   542.11     0.92     0.76
HUB     18.25     1.05    16.50   558.18     1.02   542.26     0.92     0.76

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     15.90    36.69    31.50     5.19     0.93     0.25     2.90
MEAN    19.72    28.88    23.50     5.38     0.87     0.28     3.28     0.76
HUB     29.10    12.02     6.50     5.52     0.87     0.34     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.830

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     409.047     137.237     385.338    1142.372       0.358      -0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.070      16.536     542.331      46.000      19.603      31.500      11.897

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     404.147     137.237     426.812    1142.722       0.354       0.011

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.038      16.542     542.664     471.992       0.031       0.152

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     393.140       0.000     393.140    1143.494       0.344       0.008

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.549     543.396       0.000       0.060       0.080       0.015

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.625      17.961       1.033     556.303       8.145     336.381       2.608

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  50728.695       0.331     312.453 1260886.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  0.923

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.993    2266.000      17.961     556.303       1.000       1.000       0.980
W Kg/sec =   49.54226

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.380    2188.075       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
83846.383	85523.125	1.908	513.330	269.040	401.059	1.491

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	369.38	-0.13	369.38	0.32	367.75
MEAN	16.97	0.00	-0.02	369.38	-0.13	369.38	0.32	
HUB	14.32	0.00	-0.02	369.38	-0.13	369.38	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.89	46.36	-0.47	380.86	530.65	16.71	544.91	0.46
MEAN	42.27	43.80	-1.53	335.59	499.15	16.71	544.91	0.44
HUB	37.49	37.84	-0.35	283.17	465.51	16.71	544.91	0.41

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	405.50	91.60	395.02	1148.38	0.35
MEAN	16.57	412.90	121.39	394.65	1148.79	0.36
HUB	13.89	442.96	200.42	395.03	1149.11	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	485.20	281.74	0.42	1731.86	
MEAN	327.74	445.34	206.35	0.39	2014.10	1.19
HUB	274.67	401.95	74.25	0.35	2785.60	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.49	1.03	16.96	561.80	1.01	548.07	0.92	0.84
MEAN	18.58	1.03	16.99	562.70	1.01	548.46	0.92	0.84
HUB	18.82	1.05	16.98	565.15	1.02	548.76	0.92	0.84

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	13.06	35.50	31.50	4.00	0.93	0.12	2.90	
MEAN	17.10	27.60	23.50	4.10	0.89	0.14	3.29	0.84
HUB	26.90	10.65	6.50	4.15	0.89	0.19	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.923

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	405.712	122.075	386.911	1149.843	0.353	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.612	17.075	549.472	46.000	17.511	32.400	14.889

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	411.597	122.075	429.319	1149.422	0.358	0.007

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.566	16.989	549.071	456.573	0.038	0.134

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	392.391	0.000	392.391	1150.771	0.341	-0.024

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.034	550.360	0.000	0.060	0.100	0.035

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.639	18.463	1.028	563.217	6.913	371.620	2.881

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
43058.406	0.309	265.209	1008144.562

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5
RESET = 0.000BLEED = 0.000 DPInc = 6.485 EfDer = 0.870

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
108.993	2266.000	18.463	563.217	1.000	1.000	0.980

W Kg/sec = 49.54226

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
90.425	2174.605	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
83846.383	85523.125	1.935	509.668	263.348	390.276	1.482

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	365.82	-0.13	365.82	0.32	347.65
MEAN	15.91	0.00	-0.02	365.82	-0.13	365.82	0.32	
HUB	13.07	0.00	-0.02	365.82	-0.13	365.82	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	44.73	47.36	-2.63	362.27	514.93	17.22	552.04	0.45
MEAN	40.71	44.80	-4.09	314.67	482.62	17.22	552.04	0.42
HUB	35.25	38.84	-3.59	258.45	447.98	17.22	552.04	0.39

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	398.63	72.34	392.01	1154.63	0.35
MEAN	15.50	404.17	99.80	391.66	1155.07	0.35
HUB	12.59	429.20	174.59	392.09	1155.41	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	483.15	282.42	0.42	1300.02	
MEAN	306.46	442.84	206.66	0.38	1548.59	1.17
HUB	248.96	399.08	74.37	0.35	2199.74	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.84	1.02	17.35	567.34	1.01	554.08	0.92	0.80
MEAN	18.91	1.02	17.38	568.13	1.01	554.49	0.92	0.80
HUB	19.11	1.03	17.37	570.20	1.01	554.82	0.92	0.80

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	10.45	35.77	31.50	4.27	0.93	0.09	2.90	
MEAN	14.29	27.82	23.50	4.32	0.88	0.11	3.34	0.80
HUB	24.00	10.74	6.50	4.24	0.88	0.16	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.870

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	407.961	101.625	395.101	1155.238	0.353	-0.012

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.923	17.358	554.664	46.000	14.425	33.000	18.575

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	426.594	101.625	438.532	1153.886	0.370	-0.160

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.806	17.110	553.365	440.827	0.093	0.106

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	399.167	0.000	399.167	1155.855	0.345	-0.055

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   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.271     555.256       0.000       0.060       0.123      -0.059

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.480      18.758       1.016     568.559       5.343     447.033       3.465

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  33280.781       0.264     204.986 1067532.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    284893.41   1754.7416    106.4752      1.2417      0.7318      6.4851      1.0875


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 60%  Stat 2 20% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.227    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    104.750    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82487.648   84137.219       2.726     831.557     305.054     619.754       2.032

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   243.79    -0.08   243.79     0.22   406.33
 MEAN    17.06     0.00    -0.02   243.79    -0.08   243.79     0.22
 HUB     12.51     0.00    -0.02   243.79    -0.08   243.79     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.14    50.47     8.67   407.95   475.32    14.61   517.85     0.43
 MEAN    54.15    47.20     6.95   337.36   416.29    14.61   517.85     0.37
 HUB     45.43    38.62     6.81   247.38   347.38    14.61   517.85     0.31

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   404.59   228.08   334.17  1123.04     0.36
 MEAN    18.04   422.23   254.90   336.60  1121.36     0.38
 HUB     15.00   475.37   330.81   341.38  1118.33     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   379.51   179.87     0.34  4706.94
 MEAN   356.65   351.64   101.75     0.31  4598.84     1.33
 HUB    296.62   343.09    34.19     0.31  4963.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.53     1.09    15.11   537.76     1.03   524.09     0.92     0.91
 MEAN    16.50     1.09    14.96   537.42     1.03   522.53     0.92     0.91
 HUB     16.61     1.10    14.67   538.58     1.03   519.70     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.31    28.29    24.20     4.09     0.93     0.28     2.90
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 MEAN    37.14    16.82    12.70     4.12     0.93     0.25     3.51     0.91
 HUB     44.10    -5.72    -9.30     3.58     0.93     0.12     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     428.601     254.406     344.929    1121.412       0.382       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.530      14.943     522.576      24.000      36.411      35.400      -1.011

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     371.745     254.406     450.463    1125.483       0.330       0.248

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.522      15.318     526.377     528.796       0.015       0.393

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     344.946       0.000     344.946    1127.197       0.306       0.309

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.448     527.981       0.000       0.060       0.037       0.328

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.878      16.486       1.091     537.919      15.109     213.838       1.658

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94066.633       0.565     569.995 1025114.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.997

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    107.227    2266.000      16.486     537.919       1.000       1.000       0.980
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     97.366    2225.151       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82487.648   84137.219       2.082     590.487     283.552     474.134       1.672

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   329.78    -0.11   329.78     0.29   399.03
 MEAN    18.08     0.00    -0.02   329.78    -0.11   329.78     0.29
 HUB     15.21     0.00    -0.02   329.78    -0.11   329.78     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.95    46.36     4.59   406.37   523.43    15.54   528.84     0.46
 MEAN    47.32    42.30     5.02   357.49   486.45    15.54   528.84     0.43
 HUB     42.38    37.84     4.54   300.77   446.42    15.54   528.84     0.40

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   384.50   156.56   351.18  1135.42     0.34
 MEAN    18.01   393.30   174.75   352.35  1134.65     0.35
 HUB     15.22   425.79   236.76   353.90  1133.83     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
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 TIP    403.80   429.48   247.23     0.38  3199.37
 MEAN   356.14   396.30   181.39     0.35  3149.31     1.32
 HUB    301.03   359.68    64.27     0.32  3605.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.50     1.06    16.16   548.08     1.02   535.73     0.92     0.91
 MEAN    17.48     1.06    16.09   547.92     1.02   535.00     0.92     0.91
 HUB     17.63     1.07    15.99   549.37     1.02   534.23     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.03    35.15    31.50     3.65     0.93     0.23     2.90
 MEAN    26.38    27.24    23.50     3.74     0.92     0.24     3.30     0.91
 HUB     33.78    10.29     6.50     3.79     0.92     0.26     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     506.532     175.241     475.252    1126.161       0.450      -0.575

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.522      15.248     527.029      46.000      20.241      30.600      10.359

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     491.729     175.241     522.022    1127.479       0.436      -0.506

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      17.487      15.342     528.264     400.556       0.034       0.158

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     485.186       0.000     485.186    1128.048       0.430       0.070

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      15.350     528.797       0.000       0.060       0.071      -0.501

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.825      17.434       1.058     548.458      10.539     274.553       2.128

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  65624.633       0.402     397.651  946910.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.843

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.227    2266.000      17.434     548.458       1.000       1.000       0.780
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.969    2203.670       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82487.648   84137.219       1.604     434.156     270.749     339.175       1.253

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   447.75    -0.15   447.75     0.40   385.95
 MEAN    17.74     0.00    -0.02   447.75    -0.15   447.75     0.40
 HUB     15.05     0.00    -0.02   447.75    -0.15   447.75     0.40

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     41.56    46.36    -4.80   396.88   598.42    15.65   531.72     0.53
 MEAN    38.09    43.40    -5.31   350.77   568.88    15.65   531.72     0.50
 HUB     33.62    38.84    -5.22   297.61   537.72    15.65   531.72     0.48
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      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   389.36   114.64   372.10  1143.10     0.34
 MEAN    17.51   398.15   141.00   372.35  1143.15     0.35
 HUB     14.85   430.61   214.28   373.51  1143.17     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   463.94   277.10     0.41  2274.04
 MEAN   346.18   425.14   205.18     0.37  2471.22     1.41
 HUB    293.65   381.85    79.37     0.33  3184.45

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.06     1.04    16.66   555.68     1.01   543.02     0.92     0.77
 MEAN    18.11     1.04    16.65   556.31     1.01   543.07     0.92     0.77
 HUB     18.31     1.05    16.60   558.57     1.02   543.09     0.92     0.77

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     17.12    36.67    31.50     5.17     0.93     0.26     2.90
 MEAN    20.74    28.86    23.50     5.36     0.88     0.29     3.28     0.77
 HUB     29.84    12.00     6.50     5.50     0.88     0.34     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.843

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     402.938     141.929     377.114    1143.385       0.352       -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.148      16.652     543.293      46.000      20.624      31.500      10.876

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     395.058     141.929     419.779    1143.938       0.345       0.028

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.120      16.684     543.818     471.992       0.028       0.165

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     384.184       0.000     384.184    1144.681       0.336       0.028

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.695     544.526       0.000       0.060       0.074       0.035

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.654      18.051       1.035     556.851       8.394     325.329       2.522

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  52275.723       0.341     316.764 1235578.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.935

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.227    2266.000      18.051     556.851       1.000       1.000       0.980
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     90.477    2186.998       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82487.648   84137.219       1.948     513.330     263.496     401.059       1.522
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ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	361.10	-0.12	361.10	0.32	367.57
MEAN	16.97	0.00	-0.02	361.10	-0.12	361.10	0.32	
HUB	14.32	0.00	-0.02	361.10	-0.12	361.10	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.54	46.36	0.18	380.86	524.92	16.85	545.96	0.46
MEAN	42.91	43.80	-0.89	335.59	493.04	16.85	545.96	0.43
HUB	38.12	37.84	0.28	283.17	458.96	16.85	545.96	0.40

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	397.84	98.62	385.42	1149.93	0.35
MEAN	16.57	405.50	126.46	385.27	1150.17	0.35
HUB	13.89	435.60	202.31	385.78	1150.33	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	473.31	274.73	0.41	1864.27	
MEAN	327.74	434.68	201.28	0.38	2098.01	1.21
HUB	274.67	392.50	72.36	0.34	2811.82	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.63	1.03	17.15	562.77	1.01	549.56	0.92	0.86
MEAN	18.70	1.04	17.16	563.51	1.01	549.78	0.92	0.86
HUB	18.93	1.05	17.14	565.78	1.02	549.94	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	14.35	35.48	31.50	3.98	0.93	0.13	2.90	
MEAN	18.17	27.58	23.50	4.08	0.90	0.16	3.29	0.86
HUB	27.67	10.62	6.50	4.12	0.90	0.20	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.935

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	398.584	127.169	377.753	1151.185	0.346	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.738	17.245	550.756	46.000	18.606	32.400	13.794

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	401.300	127.169	420.968	1150.995	0.349	0.024

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.699	17.190	550.574	456.573	0.034	0.148

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	382.474	0.000	382.474	1152.282	0.332	-0.005

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.238	551.806	0.000	0.060	0.093	0.054

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.678	18.606	1.031	564.021	7.170	357.519	2.771

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
44657.141	0.320	270.599	988750.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 6.953 EfDer = 0.886

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
107.227	2266.000	18.606	564.021	1.000	1.000	0.980

W Kg/sec = 48.73943

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
88.339	2173.053	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
82487.648	84137.219	1.981	509.668	257.275	390.276	1.517

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	356.73	-0.12	356.73	0.31	347.40
MEAN	15.91	0.00	-0.02	356.73	-0.12	356.73	0.31	
HUB	13.07	0.00	-0.02	356.73	-0.12	356.73	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.45	47.36	-1.91	362.27	508.51	17.41	553.40	0.44
MEAN	41.43	44.80	-3.37	314.67	475.77	17.41	553.40	0.41
HUB	35.94	38.84	-2.90	258.45	440.59	17.41	553.40	0.38

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	389.84	80.07	381.53	1156.53	0.34
MEAN	15.50	395.69	105.39	381.39	1156.78	0.34
HUB	12.59	420.82	176.68	381.94	1156.95	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	470.12	274.68	0.41	1438.73	
MEAN	306.46	431.15	201.07	0.37	1635.28	1.18
HUB	248.96	388.72	72.28	0.34	2226.03	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.04	1.02	17.59	568.59	1.01	555.90	0.92	0.81
MEAN	19.10	1.03	17.61	569.21	1.01	556.14	0.92	0.81
HUB	19.27	1.04	17.59	571.09	1.01	556.30	0.92	0.81

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	11.85	35.75	31.50	4.25	0.93	0.10	2.90	
MEAN	15.45	27.80	23.50	4.30	0.89	0.13	3.34	0.81
HUB	24.82	10.72	6.50	4.22	0.89	0.17	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.886

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	399.385	107.325	384.694	1156.955	0.345	-0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.104	17.591	556.312	46.000	15.588	33.000	17.412

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	414.490	107.325	428.160	1155.887	0.359	-0.138

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.003	17.385	555.286	440.827	0.086	0.119

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	388.022	0.000	388.022	1157.732	0.335	-0.035

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.536	557.060	0.000	0.060	0.116	-0.040

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     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.538      18.956       1.019     569.630       5.609     425.629       3.299

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   34939.867       0.278     211.717 1046459.000

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     291564.00   1766.7262    104.7498      1.2548      0.7508      6.9532      1.0896


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 20% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     105.235    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   47.83408

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     102.804    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   80955.414   82574.344       2.778     831.557     299.388     619.754       2.070

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   239.04    -0.08   239.04     0.21   406.33
  MEAN    17.06     0.00    -0.02   239.04    -0.08   239.04     0.21
  HUB     12.51     0.00    -0.02   239.04    -0.08   239.04     0.21

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.64    50.47     9.17   407.95   472.90    14.63   518.04     0.42
  MEAN    54.69    47.20     7.49   337.36   413.53    14.63   518.04     0.37
  HUB     45.99    38.62     7.37   247.38   344.06    14.63   518.04     0.31

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   401.07   231.85   327.27  1123.56     0.36
  MEAN    18.04   418.09   257.04   329.73  1121.81     0.37
  HUB     15.00   469.94   330.17   334.41  1118.76     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   371.64   176.10     0.33  4784.73
  MEAN   356.65   344.45    99.61     0.31  4637.42     1.35
  HUB    296.62   336.09    33.55     0.30  4953.53

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.55     1.10    15.16   538.01     1.03   524.57     0.92     0.91
  MEAN    16.51     1.09    15.00   537.54     1.03   522.94     0.92     0.91
  HUB     16.61     1.10    14.71   538.55     1.03   520.10     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     35.31    28.28    24.20     4.08     0.93     0.30     2.90
  MEAN    37.94    16.81    12.70     4.11     0.93     0.26     3.51     0.91
  HUB     44.63    -5.73    -9.30     3.57     0.93     0.13     4.78
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071      424.227     256.543     337.868     1121.868       0.378       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     16.541      14.984      523.000      24.000      37.209       35.400       -1.809

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     18.071      363.843     256.543     445.192     1126.122       0.323       0.264

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       16.532      15.377      526.975     528.796       0.015       0.406

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083      337.741       0.000     337.741     1127.755       0.299       0.321

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       15.500      528.505       0.000       0.060       0.038       0.341

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.877       16.496        1.092      538.032       15.222      210.565       1.632

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94770.008       0.569     563.590 1005147.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.999

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    105.235     2266.000       16.496      538.032       1.000        1.000        0.980
W Kg/sec =   47.83408

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     95.508     2224.918        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  80955.414   82574.344        2.123      590.487     278.141      474.134       1.705

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.55      0.00     -0.02   322.95     -0.11   322.95      0.29    398.99
 MEAN    18.08      0.00     -0.02   322.95     -0.11   322.95      0.29
 HUB     15.21      0.00     -0.02   322.95     -0.11   322.95      0.29

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     51.53     46.36      5.17   406.37    519.16     15.58    529.32      0.46
 MEAN    47.91     42.30      5.61   357.49    481.85     15.58    529.32      0.43
 HUB     42.97     37.84      5.13   300.77    441.40     15.58    529.32      0.39

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500       0.050        0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     20.42    379.83    162.11    343.50   1136.24      0.33
 MEAN    18.01    388.38    178.78    344.78   1135.35      0.34
 HUB     15.22    420.45    238.26    346.43   1134.43      0.37

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    403.80    420.01    241.69      0.37   3312.55
 MEAN   356.14    387.73    177.36      0.34   3221.82       1.34
 HUB    301.03    352.07     62.77      0.31   3628.66
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    17.55     1.06    16.24   548.55     1.02   536.50     0.92     0.91
 MEAN   17.52     1.06    16.15   548.26     1.02   535.67     0.92     0.91
 HUB    17.65     1.07    16.05   549.56     1.02   534.79     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    25.26    35.13    31.50     3.63     0.93     0.24     2.90
 MEAN   27.41    27.22    23.50     3.72     0.92     0.25     3.30     0.91
 HUB    34.52    10.27     6.50     3.77     0.92     0.27     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     497.507     179.281     464.081    1127.325       0.441      -0.560

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.558      15.357     528.120      46.000      21.122      30.600       9.478

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     479.505     179.281     511.924    1128.892       0.425      -0.469

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      17.528      15.480     529.589     400.556       0.031       0.170

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     473.059       0.000     473.059    1129.438       0.419       0.093

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      15.489     530.102       0.000       0.060       0.065      -0.463

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.836      17.479       1.060     548.791      10.759     267.507       2.074

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  66998.305       0.411     398.434  927543.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.858

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    105.235    2266.000      17.479     548.791       1.000       1.000       0.780
W Kg/sec =   47.83408

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.037    2203.000       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  80955.414   82574.344       1.638     434.156     265.123     339.175       1.279

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP    20.07     0.00    -0.02   436.92    -0.15   436.92     0.39   385.83
 MEAN   17.74     0.00    -0.02   436.92    -0.15   436.92     0.39
 HUB    15.05     0.00    -0.02   436.92    -0.15   436.92     0.39

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP    42.26    46.36    -4.10   396.88   590.36    15.77   532.85     0.52
 MEAN   38.77    43.40    -4.63   350.77   560.40    15.77   532.85     0.49
 HUB    34.27    38.84    -4.57   297.61   528.73    15.77   532.85     0.47

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
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     0.500       0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   382.87   121.66   363.02  1144.35     0.33
 MEAN    17.51   391.71   146.18   363.42  1144.25     0.34
 HUB     14.85   423.99   216.37   364.62  1144.12     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   452.47   270.08     0.40  2413.05
 MEAN   346.18   414.82   200.01     0.36  2561.71     1.43
 HUB    293.65   372.72    77.28     0.33  3215.41

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.16     1.04    16.80   556.45     1.01   544.21     0.92     0.79
 MEAN    18.20     1.04    16.78   556.93     1.01   544.11     0.92     0.79
 HUB     18.39     1.05    16.72   559.00     1.02   543.99     0.92     0.79

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.53    36.65    31.50     5.15     0.93     0.27     2.90
 MEAN    21.91    28.83    23.50     5.33     0.88     0.30     3.28     0.79
 HUB     30.69    11.97     6.50     5.47     0.88     0.35     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.858

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     396.353     147.135     368.031    1144.488       0.346       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.232      16.779     544.342      46.000      21.791      31.500       9.709

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     385.057     147.135     412.211    1145.263       0.336       0.048

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.210      16.838     545.079     471.992       0.025       0.180

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     374.345       0.000     374.345    1145.976       0.327       0.051

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.854     545.758       0.000       0.060       0.067       0.059

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.686      18.148       1.038     557.461       8.669     313.676       2.432

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  53992.312       0.352     321.088 1207498.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.948

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    105.235    2266.000      18.148     557.461       1.000       1.000       0.980
W Kg/sec =   47.83408

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.368    2185.803       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  80955.414   82574.344       1.995     513.330     257.354     401.059       1.558

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     19.26     0.00    -0.02   351.98    -0.12   351.98     0.31   367.37
MEAN    16.97     0.00    -0.02   351.98    -0.12   351.98     0.31
HUB     14.32     0.00    -0.02   351.98    -0.12   351.98     0.31

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     47.27    46.36     0.91   380.86   518.69    17.00   547.12     0.45
MEAN    43.64    43.80    -0.16   335.59   486.41    17.00   547.12     0.42
HUB     38.83    37.84     0.99   283.17   451.83    17.00   547.12     0.39

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   389.70   106.30   374.92  1151.61     0.34
MEAN    16.57   397.56   132.01   375.00  1151.67     0.35
HUB     13.89   427.64   204.37   375.64  1151.66     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    373.34   460.31   267.05     0.40  2009.19
MEAN   327.74   423.01   195.74     0.37  2189.91     1.23
HUB    274.67   382.16    70.30     0.33  2840.40

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.78     1.04    17.35   563.84     1.01   551.16     0.92     0.87
MEAN    18.84     1.04    17.35   564.41     1.01   551.22     0.92     0.87
HUB     19.05     1.05    17.32   566.48     1.02   551.21     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     15.83    35.46    31.50     3.96     0.93     0.15     2.90
MEAN    19.39    27.56    23.50     4.06     0.90     0.17     3.29     0.87
HUB     28.55    10.60     6.50     4.10     0.90     0.21     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.948

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     390.951     132.748     367.723    1152.641       0.339       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.877      17.431     552.149      46.000      19.850      32.400      12.550

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     390.075     132.748     412.044    1152.700       0.338       0.043

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.845      17.407     552.206     456.573       0.031       0.164

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     16.096     371.672       0.000     371.672    1153.921       0.322       0.018

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.459     553.376       0.000       0.060       0.084       0.077

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.717      18.762       1.034     564.911       7.451     342.947       2.659

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  46407.273       0.333     275.980  967152.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.903

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    105.235    2266.000      18.762     564.911       1.000       1.000       0.980
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W Kg/sec = 47.83408

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
86.047	2171.341	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
80955.414	82574.344	2.034	509.668	250.599	390.276	1.557

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	346.82	-0.12	346.82	0.30	347.13
MEAN	15.91	0.00	-0.02	346.82	-0.12	346.82	0.30	
HUB	13.07	0.00	-0.02	346.82	-0.12	346.82	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.26	47.36	-1.10	362.27	501.60	17.62	554.87	0.43
MEAN	42.23	44.80	-2.57	314.67	468.38	17.62	554.87	0.41
HUB	36.71	38.84	-2.13	258.45	432.60	17.62	554.87	0.37

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	380.57	88.48	370.14	1158.57	0.33
MEAN	15.50	386.65	111.48	370.23	1158.63	0.33
HUB	12.59	411.81	178.96	370.89	1158.62	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	455.97	266.27	0.39	1589.54	
MEAN	306.46	418.43	194.97	0.36	1729.63	1.20
HUB	248.96	377.44	70.01	0.33	2254.60	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.25	1.03	17.86	569.96	1.01	557.86	0.92	0.83
MEAN	19.29	1.03	17.86	570.40	1.01	557.92	0.92	0.83
HUB	19.46	1.04	17.83	572.07	1.01	557.91	0.92	0.83

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	13.44	35.73	31.50	4.23	0.93	0.12	2.90	
MEAN	16.76	27.77	23.50	4.27	0.89	0.14	3.34	0.83
HUB	25.76	10.69	6.50	4.19	0.89	0.18	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.903

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	390.261	113.528	373.383	1158.807	0.337	-0.011

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.303	17.844	558.094	46.000	16.912	33.000	16.088

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	401.425	113.528	417.170	1158.040	0.347	-0.112

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.217	17.683	557.356	440.827	0.078	0.135

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	375.952	0.000	375.952	1159.756	0.324	-0.013

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.825	559.009	0.000	0.060	0.108	-0.016

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.597      19.173       1.022     570.810       5.899     404.117       3.133

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   36744.328       0.292     218.516 1023062.562

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     298912.25   1777.6082    102.8040      1.2691      0.7703      7.4864      1.0918


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 20% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     103.509    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   47.04952

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     101.118    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   79627.609   81219.992       2.824     831.557     294.477     619.754       2.105

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   234.94    -0.08   234.94     0.21   406.33
  MEAN    17.06     0.00    -0.02   234.94    -0.08   234.94     0.21
  HUB     12.51     0.00    -0.02   234.94    -0.08   234.94     0.21

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.07    50.47     9.60   407.95   470.83    14.65   518.20     0.42
  MEAN    55.15    47.20     7.95   337.36   411.17    14.65   518.20     0.37
  HUB     46.49    38.62     7.87   247.38   341.22    14.65   518.20     0.31

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   398.16   235.09   321.34  1123.99     0.35
  MEAN    18.04   414.58   258.86   323.83  1122.18     0.37
  HUB     15.00   465.31   329.62   328.42  1119.12     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   364.89   172.86     0.32  4851.52
  MEAN   356.65   338.28    97.79     0.30  4670.22     1.37
  HUB    296.62   330.08    33.01     0.29  4945.38

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.57     1.10    15.20   538.22     1.03   524.98     0.92     0.91
  MEAN    16.52     1.09    15.03   537.65     1.03   523.29     0.92     0.91
  HUB     16.60     1.10    14.74   538.52     1.03   520.44     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     36.19    28.28    24.20     4.08     0.93     0.31     2.90
  MEAN    38.64    16.80    12.70     4.10     0.93     0.27     3.51     0.91
  HUB     45.10    -5.74    -9.30     3.56     0.93     0.14     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.998
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     420.522     258.359     331.797    1122.252       0.375      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.549      15.018     523.359      24.000      37.907      35.400      -2.507

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     357.069     258.359     440.735    1126.662       0.317       0.278

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.540      15.427     527.480     528.796       0.016       0.417

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     331.565       0.000     331.565    1128.227       0.294       0.332

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.542     528.947       0.000       0.060       0.039       0.352

    STAGE EXIT CONDITIONS, STAGE             1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.877      16.504       1.092     538.129      15.319     207.759       1.611

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  95373.062       0.573     557.874  987890.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.509    2266.000      16.504     538.129       1.000       1.000       0.980
W Kg/sec =   47.04952

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.906    2224.718       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79627.609   81219.992       2.159     590.487     273.476     474.134       1.734

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   317.10    -0.11   317.10     0.28   398.95
 MEAN    18.08     0.00    -0.02   317.10    -0.11   317.10     0.28
 HUB     15.21     0.00    -0.02   317.10    -0.11   317.10     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.04    46.36     5.68   406.37   515.53    15.62   529.73     0.46
 MEAN    48.44    42.30     6.14   357.49   477.94    15.62   529.73     0.42
 HUB     43.50    37.84     5.66   300.77   437.13    15.62   529.73     0.39

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     20.42   375.98   166.81   336.95  1136.92      0.33
 MEAN    18.01   384.27   182.20   338.32  1135.94      0.34
 HUB     15.22   415.92   239.50   340.04  1134.93      0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   411.94   236.98     0.36  3408.56
 MEAN   356.14   380.42   173.94     0.33  3283.40     1.36
 HUB    301.03   345.56    61.53     0.30  3647.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.59     1.07    16.30   548.95     1.02   537.15     0.92     0.91
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 MEAN    17.55     1.06    16.21   548.56     1.02   536.22     0.92     0.91
 HUB     17.67     1.07    16.10   549.71     1.02   535.27     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.34    35.12    31.50     3.62     0.93     0.26     2.90
 MEAN    28.30    27.21    23.50     3.71     0.93     0.26     3.30     0.91
 HUB     35.16    10.26     6.50     3.76     0.93     0.28     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     489.957     182.712     454.614    1128.292       0.434      -0.546

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.586      15.446     529.026      46.000      21.895      30.600       8.705

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     469.192     182.712     503.512    1130.065       0.415      -0.437

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      17.560      15.593     530.690     400.556       0.028       0.180

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     462.834       0.000     462.834    1130.591       0.409       0.113

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      15.603     531.185       0.000       0.060       0.061      -0.430

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.845      17.514       1.061     549.075      10.946     261.668       2.028

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  68162.164       0.418     398.707  910860.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.872

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.509    2266.000      17.514     549.075       1.000       1.000       0.780
W Kg/sec =   47.04952

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.384    2202.431       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79627.609   81219.992       1.668     434.156     260.310     339.175       1.303

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   427.76    -0.15   427.76     0.38   385.73
 MEAN    17.74     0.00    -0.02   427.76    -0.15   427.76     0.38
 HUB     15.05     0.00    -0.02   427.76    -0.15   427.76     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.87    46.36    -3.49   396.88   583.61    15.87   533.79     0.51
 MEAN    39.36    43.40    -4.04   350.77   553.28    15.87   533.79     0.49
 HUB     34.84    38.84    -4.00   297.61   521.19    15.87   533.79     0.46

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     19.81   377.53   127.58   355.32  1145.40     0.33
 MEAN    17.51   386.37   150.53   355.84  1145.17     0.34
 HUB     14.85   418.44   218.14   357.08  1144.92     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   442.76   264.16     0.39  2530.29
 MEAN   346.18   406.08   195.66     0.35  2637.85     1.44
 HUB    293.65   364.97    75.51     0.32  3241.63

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.24     1.04    16.91   557.11     1.01   545.21     0.92     0.80
 MEAN    18.27     1.04    16.88   557.45     1.02   544.99     0.92     0.80
 HUB     18.44     1.05    16.82   559.37     1.02   544.75     0.92     0.80

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.75    36.63    31.50     5.13     0.93     0.28     2.90
 MEAN    22.93    28.80    23.50     5.30     0.88     0.31     3.28     0.80
 HUB     31.42    11.94     6.50     5.44     0.88     0.35     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.872

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     390.883     151.516     360.323    1145.408       0.341       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.303      16.884     545.217      46.000      22.807      31.500       8.693

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     376.605     151.516     405.941    1146.369       0.329       0.066

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.285      16.966     546.133     471.992       0.022       0.194

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     366.044       0.000     366.044    1147.056       0.319       0.070

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.985     546.788       0.000       0.060       0.061       0.079

    STAGE EXIT CONDITIONS, STAGE            3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.711      18.229       1.041     557.977       8.902     304.271       2.359

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  55440.488       0.361     324.293 1183535.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.957

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     103.509    2266.000      18.229     557.977       1.000       1.000       0.980
W Kg/sec =   47.04952

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      86.575    2184.792       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79627.609   81219.992       2.036     513.330     252.132     401.059       1.591

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   344.28    -0.12   344.28     0.30   367.20
 MEAN    16.97     0.00    -0.02   344.28    -0.12   344.28     0.30
 HUB     14.32     0.00    -0.02   344.28    -0.12   344.28     0.30
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     47.90    46.36     1.54   380.86   513.49    17.13   548.08     0.45
MEAN    44.28    43.80     0.48   335.59   480.86    17.13   548.08     0.42
HUB     39.45    37.84     1.61   283.17   445.85    17.13   548.08     0.39

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   383.07   112.74   366.11  1153.00     0.33
MEAN    16.57   391.03   136.69   366.36  1152.91     0.34
HUB     13.89   421.02   206.11   367.11  1152.77     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    373.34   449.39   260.61     0.39  2130.72
MEAN   327.74   413.19   191.05     0.36  2267.51     1.25
HUB    274.67   373.46    68.55     0.32  2864.63

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.91     1.04    17.52   564.74     1.01   552.49     0.92     0.88
MEAN    18.96     1.04    17.50   565.18     1.01   552.41     0.92     0.88
HUB     19.15     1.05    17.46   567.07     1.02   552.27     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     17.12    35.44    31.50     3.94     0.93     0.16     2.90
MEAN    20.46    27.54    23.50     4.04     0.90     0.18     3.29     0.88
HUB     29.31    10.58     6.50     4.08     0.90     0.22     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.957

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     384.686     137.460     359.288    1153.849       0.333       0.052

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.993      17.584     553.307      46.000      20.936      32.400      11.464

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     380.673     137.460     404.731    1154.117       0.330       0.061

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.966      17.588     553.564     456.573       0.028       0.178

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     362.633       0.000     362.633    1155.283       0.314       0.038

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.642     554.683       0.000       0.060       0.077       0.096

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.746      18.891       1.036     565.664       7.687     331.321       2.568

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  47879.820       0.344     280.067  948663.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.917

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.509    2266.000      18.891     565.664       1.000       1.000       0.980
W Kg/sec =   47.04952

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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    84.114    2169.896       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 79627.609   81219.992       2.081     509.668     244.968     390.276       1.593

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   338.51    -0.12   338.51     0.29   346.90
MEAN    15.91     0.00    -0.02   338.51    -0.12   338.51     0.29
HUB     13.07     0.00    -0.02   338.51    -0.12   338.51     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     46.95    47.36    -0.41   362.27   495.89    17.80   556.10     0.43
MEAN    42.92    44.80    -1.88   314.67   462.25    17.80   556.10     0.40
HUB     37.37    38.84    -1.47   258.45   425.96    17.80   556.10     0.37

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   373.08    95.49   360.65  1160.26     0.32
MEAN    15.50   379.26   116.57   360.90  1160.16     0.33
HUB     12.59   404.35   180.82   361.67  1160.00     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    354.76   444.17   259.26     0.38  1715.28
MEAN   306.46   407.81   189.89     0.35  1808.45     1.22
HUB    248.96   368.03    68.14     0.32  2278.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.43     1.03    18.08   571.11     1.01   559.49     0.92     0.84
MEAN    19.46     1.03    18.07   571.41     1.01   559.40     0.92     0.84
HUB     19.61     1.04    18.02   572.90     1.01   559.25     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     14.83    35.71    31.50     4.21     0.93     0.14     2.90
MEAN    17.90    27.75    23.50     4.25     0.89     0.16     3.34     0.84
HUB     26.56    10.67     6.50     4.17     0.89     0.19     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.917

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     382.816     118.710     363.945    1160.337       0.330      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.469      18.054     559.568      46.000      18.065      33.000      14.935

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     390.594     118.710     408.235    1159.816       0.337      -0.090

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.396      17.930     559.066     440.827       0.071       0.149

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     365.920       0.000     365.920    1161.431       0.315       0.008

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.065     560.624       0.000       0.060       0.100       0.005

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.642      19.354       1.025     571.803       6.140     387.419       3.003

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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   38247.594       0.304     223.725 1003089.688

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     305103.12   1784.6655    101.1179      1.2811      0.7855      7.9529      1.0937


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 20% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 8.472   EfDer =  0.997

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     101.607    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   46.18479

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      99.259    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   78164.125   79727.242       2.877     831.557     289.065     619.754       2.144

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   230.42    -0.08   230.42     0.21   406.33
  MEAN    17.06     0.00    -0.02   230.42    -0.08   230.42     0.21
  HUB     12.51     0.00    -0.02   230.42    -0.08   230.42     0.21

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.55    50.47    10.08   407.95   468.60    14.66   518.38     0.42
  MEAN    55.67    47.20     8.47   337.36   408.61    14.66   518.38     0.37
  HUB     47.04    38.62     8.42   247.38   338.13    14.66   518.38     0.30

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   395.06   238.61   314.87  1124.46     0.35
  MEAN    18.04   410.82   260.86   317.37  1122.58     0.37
  HUB     15.00   460.24   328.98   321.86  1119.50     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   357.52   169.34     0.32  4924.07
  MEAN   356.65   331.51    95.79     0.30  4706.30     1.39
  HUB    296.62   323.49    32.36     0.29  4935.70

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.59     1.10    15.24   538.45     1.03   525.42     0.92     0.91
  MEAN    16.53     1.09    15.06   537.76     1.03   523.66     0.92     0.91
  HUB     16.60     1.10    14.77   538.49     1.03   520.80     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     37.15    28.27    24.20     4.07     0.93     0.32     2.90
  MEAN    39.42    16.80    12.70     4.10     0.93     0.28     3.51     0.91
  HUB     45.63    -5.74    -9.30     3.56     0.93     0.15     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.997

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
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    18.071     416.550     260.357     325.158    1122.662       0.371      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    16.558      15.054     523.741      24.000      38.685      35.400      -3.285

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     349.680     260.357     435.961    1127.239       0.310       0.294

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.549      15.479     528.021     528.796       0.016       0.429

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    18.083     324.828       0.000     324.828    1128.733       0.288       0.344

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.587     529.421       0.000       0.060       0.040       0.363

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.875      16.511       1.093     538.234      15.424     204.706       1.587

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96025.133       0.577     551.365  968918.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.472   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    101.607    2266.000      16.511     538.234       1.000       1.000       0.980
W Kg/sec =   46.18479

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.150    2224.501       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  78164.125   79727.242       2.200     590.487     268.361     474.134       1.767

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   310.70    -0.11   310.70     0.28   398.91
 MEAN    18.08     0.00    -0.02   310.70    -0.11   310.70     0.28
 HUB     15.21     0.00    -0.02   310.70    -0.11   310.70     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.61    46.36     6.25   406.37   511.62    15.66   530.17     0.45
 MEAN    49.01    42.30     6.71   357.49   473.72    15.66   530.17     0.42
 HUB     44.08    37.84     6.24   300.77   432.51    15.66   530.17     0.38

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   371.96   171.92   329.84  1137.65     0.33
 MEAN    18.01   379.92   185.94   331.30  1136.57     0.33
 HUB     15.22   411.05   240.84   333.10  1135.46     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   403.19   231.88     0.35  3512.78
 MEAN   356.14   372.46   170.20     0.33  3350.72     1.38
 HUB    301.03   338.49    60.19     0.30  3667.95

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.63     1.07    16.37   549.39     1.02   537.84     0.92     0.91
 MEAN    17.58     1.06    16.27   548.88     1.02   536.82     0.92     0.91
 HUB     17.68     1.07    16.15   549.88     1.02   535.77     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.53    35.11    31.50     3.61     0.93     0.27     2.90
 MEAN    29.30    27.19    23.50     3.69     0.93     0.27     3.30     0.91
 HUB     35.87    10.24     6.50     3.74     0.93     0.29     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     481.927     186.463     444.393    1129.315       0.427      -0.532

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.615      15.539     529.986      46.000      22.762      30.600       7.838

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     458.101     186.463     494.595    1131.306       0.405      -0.402

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      17.593      15.712     531.856     400.556       0.026       0.192

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     451.842       0.000     451.842    1131.812       0.399       0.135

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      15.723     532.332       0.000       0.060       0.057      -0.393

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.853       17.551       1.063     549.383      11.149     255.470       1.980

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  69427.102       0.426     398.642  892577.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 8.472   EfDer =  0.886

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    101.607    2266.000       17.551     549.383       1.000        1.000        0.780
W Kg/sec =   46.18479

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     87.584    2201.813        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  78164.125   79727.242        1.702     434.156     255.068     339.175       1.330

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   417.89    -0.14   417.89      0.37   385.62
 MEAN    17.74      0.00    -0.02   417.89    -0.14   417.89      0.37
 HUB     15.05      0.00    -0.02   417.89    -0.14   417.89      0.37

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     43.53     46.36    -2.83   396.88   576.42     15.98   534.80      0.51
 MEAN    40.02     43.40    -3.38   350.77   545.69     15.98   534.80      0.48
 HUB     35.47     38.84    -3.37   297.61   513.12     15.98   534.80      0.45

     ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   371.98    134.01    347.00  1146.51      0.32
 MEAN    17.51   380.74    155.26    347.64  1146.14      0.33
 HUB     14.85   412.51    220.05    348.92  1145.77      0.36
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   432.24   257.72     0.38  2657.72
 MEAN   346.18   396.62   190.92     0.35  2720.69     1.46
 HUB    293.65   356.60    73.60     0.31  3269.88

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.32     1.04    17.03   557.82     1.02   546.27     0.92     0.81
 MEAN    18.34     1.05    16.99   558.02     1.02   545.92     0.92     0.81
 HUB     18.51     1.05    16.92   559.77     1.02   545.56     0.92     0.81

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.12    36.60    31.50     5.10     0.93     0.29     2.90
 MEAN    24.07    28.78    23.50     5.28     0.89     0.32     3.28     0.81
 HUB     32.24    11.91     6.50     5.41     0.89     0.36     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.886

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     385.128     156.283     351.994    1146.388       0.336       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.377      16.995     546.151      46.000      23.941      31.500       7.559

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     367.501     156.283     399.351    1147.550       0.320       0.085

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.363      17.102     547.259     471.992       0.020       0.209

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     357.118       0.000     357.118    1148.208       0.311       0.092

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.124     547.887       0.000       0.060       0.055       0.101

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.736      18.313       1.043     558.537       9.154     294.498       2.283

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  57012.613       0.372     327.359 1157490.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 8.472   EfDer =  0.967

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    101.607    2266.000      18.313     558.537       1.000       1.000       0.980
W Kg/sec =   46.18479

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     84.633    2183.695       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  78164.125   79727.242       2.083     513.330     246.476     401.059       1.627

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   336.00    -0.12   336.00     0.29   367.01
 MEAN    16.97     0.00    -0.02   336.00    -0.12   336.00     0.29
 HUB     14.32     0.00    -0.02   336.00    -0.12   336.00     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.59    46.36     2.23   380.86   507.97    17.26   549.11     0.44
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MEAN    44.98    43.80     1.18   335.59   474.96    17.26   549.11     0.41
HUB     40.14    37.84     2.30   283.17   439.48    17.26   549.11     0.38

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   376.21   119.63   356.68  1154.47     0.33
MEAN    16.57   384.19   141.69   357.11  1154.23     0.33
HUB     13.89   413.99   207.96   357.97  1153.95     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    373.34   437.71   253.71     0.38  2260.93
MEAN   327.74   402.67   186.05     0.35  2350.26     1.27
HUB    274.67   364.14    66.71     0.32  2890.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.05     1.04    17.70   565.72     1.01   553.90     0.92     0.88
MEAN    19.08     1.04    17.67   566.00     1.01   553.67     0.92     0.88
HUB     19.26     1.05    17.62   567.71     1.02   553.40     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     18.54    35.42    31.50     3.92     0.93     0.18     2.90
MEAN    21.64    27.52    23.50     4.02     0.91     0.20     3.29     0.88
HUB     30.15    10.56     6.50     4.06     0.91     0.23     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.967

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     378.121     142.483     350.248    1155.132       0.327       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.115      17.746     554.538      46.000      22.137      32.400      10.263

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     370.639     142.483     397.083    1155.619       0.321       0.080

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.093      17.778     555.005     456.573       0.025       0.193

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     352.999       0.000     352.999    1156.728       0.305       0.061

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.835     556.071       0.000       0.060       0.070       0.118

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.775      19.027       1.039     566.476       7.939     319.475       2.477

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  49451.660       0.355     283.945  928507.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.472   EfDer =  0.931

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    101.607    2266.000      19.027     566.476       1.000       1.000       0.980
W Kg/sec =   46.18479

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     82.037    2168.339       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 78164.125   79727.242       2.133     509.668     238.920     390.276       1.634

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   329.64    -0.11   329.64     0.28   346.65
MEAN    15.91     0.00    -0.02   329.64    -0.11   329.64     0.28
HUB     13.07     0.00    -0.02   329.64    -0.11   329.64     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     47.71    47.36     0.35   362.27   489.88    17.98   557.40     0.42
MEAN    43.68    44.80    -1.12   314.67   455.80    17.98   557.40     0.39
HUB     38.11    38.84    -0.73   258.45   418.95    17.98   557.40     0.36

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   365.36   102.93   350.56  1162.03     0.31
MEAN    15.50   371.58   121.98   350.99  1161.78     0.32
HUB     12.59   396.54   182.87   351.85  1161.47     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    354.76   431.64   251.82     0.37  1848.66
MEAN   306.46   396.51   184.48     0.34  1892.17     1.24
HUB    248.96   358.01    66.09     0.31  2303.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.62     1.03    18.32   572.35     1.01   561.20     0.92     0.85
MEAN    19.63     1.03    18.29   572.48     1.01   560.96     0.92     0.85
HUB     19.77     1.04    18.23   573.79     1.01   560.66     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     16.36    35.69    31.50     4.19     0.93     0.15     2.90
MEAN    19.16    27.73    23.50     4.23     0.90     0.17     3.34     0.85
HUB     27.46    10.64     6.50     4.14     0.90     0.20     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.931

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     375.076     124.215     353.911    1161.953       0.323      -0.009

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.645      18.275     561.127      46.000      19.340      33.000      13.660

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     379.151     124.215     398.979    1161.687       0.326      -0.064

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.585      18.190     560.870     440.827       0.063       0.165

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    14.701     355.298       0.000     355.298    1163.201       0.305       0.032

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.319     562.333       0.000       0.060       0.092       0.028

   STAGE EXIT CONDITIONS, STAGE            5
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.685      19.545       1.027     572.873       6.397     370.731       2.874

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  39848.684       0.317     228.806  981372.250

   OVERALL EXIT CONDITIONS; ALL          5   STAGES
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   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     311765.19   1790.1176     99.2594      1.2938      0.8005      8.4720      1.0958


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 20% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.995

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      99.590    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   45.26799

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
      97.289    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   76612.523   78144.609       2.935     831.557     283.327     619.754       2.187

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   225.65    -0.08   225.65     0.20   406.33
  MEAN    17.06     0.00    -0.02   225.65    -0.08   225.65     0.20
  HUB     12.51     0.00    -0.02   225.65    -0.08   225.65     0.20

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.06    50.47    10.59   407.95   466.27    14.68   518.56     0.42
  MEAN    56.23    47.20     9.03   337.36   405.93    14.68   518.56     0.36
  HUB     47.64    38.62     9.02   247.38   334.90    14.68   518.56     0.30

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   391.93   242.30   308.05  1124.94     0.35
  MEAN    18.04   406.94   262.95   310.57  1122.99     0.36
  HUB     15.00   454.96   328.31   314.96  1119.90     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   349.77   165.65     0.31  5000.22
  MEAN   356.65   324.40    93.71     0.29  4743.87     1.41
  HUB    296.62   316.55    31.69     0.28  4925.55

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.62     1.10    15.28   538.69     1.03   525.86     0.92     0.91
  MEAN    16.54     1.09    15.10   537.88     1.03   524.05     0.92     0.91
  HUB     16.59     1.10    14.81   538.46     1.03   521.17     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     38.19    28.27    24.20     4.07     0.93     0.34     2.90
  MEAN    40.25    16.79    12.70     4.09     0.93     0.30     3.51     0.91
  HUB     46.19    -5.74    -9.30     3.56     0.93     0.17     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.995

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     412.441     262.437     318.173    1123.084       0.367      -0.006

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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    16.566      15.091     524.135      24.000      39.517      35.400      -4.117

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     341.927     262.437     431.031    1127.834       0.303       0.310

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.556      15.532     528.578     528.796       0.017       0.442

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    18.083     317.759       0.000     317.759    1129.254       0.281       0.356

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.632     529.910       0.000       0.060       0.042       0.376

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.872      16.517       1.093     538.343      15.533     201.502       1.562

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96707.609       0.581     544.261  948857.062


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2266.000      16.517     538.343       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     90.297    2224.275       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.246     590.487     262.964     474.134       1.803

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   303.99    -0.10   303.99     0.27   398.87
 MEAN    18.08     0.00    -0.02   303.99    -0.10   303.99     0.27
 HUB     15.21     0.00    -0.02   303.99    -0.10   303.99     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.21    46.36     6.85   406.37   507.57    15.71   530.63     0.45
 MEAN    49.63    42.30     7.33   357.49   469.35    15.71   530.63     0.42
 HUB     44.70    37.84     6.86   300.77   427.71    15.71   530.63     0.38

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   367.93   177.26   322.42  1138.39     0.32
 MEAN    18.01   375.47   189.80   323.97  1137.22     0.33
 HUB     15.22   406.03   242.27   325.83  1136.02     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   394.05   226.54     0.35  3621.79
 MEAN   356.14   364.17   166.34     0.32  3420.18     1.40
 HUB    301.03   331.08    58.76     0.29  3689.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.67     1.07    16.44   549.85     1.02   538.54     0.92     0.91
 MEAN    17.60     1.07    16.32   549.21     1.02   537.43     0.92     0.91
 HUB     17.69     1.07    16.20   550.06     1.02   536.29     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.80    35.09    31.50     3.59     0.93     0.28     2.90
 MEAN    30.36    27.18    23.50     3.68     0.93     0.29     3.30     0.91
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HUB     36.63    10.22     6.50     3.72     0.93     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
      0.750       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     473.697     190.332     433.777    1130.356       0.419      -0.516

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.642      15.632     530.964      46.000      23.691      30.600       6.909

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     446.632     190.332     485.496    1132.568       0.394      -0.364

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      17.624      15.830     533.045     400.556       0.024       0.205

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.823     440.485       0.000     440.485    1133.052       0.389       0.158

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.750      15.843     533.500       0.000       0.060       0.052      -0.355

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns         Ns nondim
      0.859      17.586       1.065     549.704      11.361     249.151       1.931

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  70747.172       0.434     398.158  873308.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.901

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2266.000      17.586     549.704       1.000       1.000       0.780
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     85.700    2201.169       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       1.740     434.156     249.580     339.175       1.359

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   407.66    -0.14   407.66     0.36   385.51
 MEAN    17.74     0.00    -0.02   407.66    -0.14   407.66     0.36
 HUB     15.05     0.00    -0.02   407.66    -0.14   407.66     0.36

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.24    46.36    -2.12   396.88   569.04    16.08   535.83     0.50
 MEAN    40.72    43.40    -2.68   350.77   537.89    16.08   535.83     0.47
 HUB     36.14    38.84    -2.70   297.61   504.82    16.08   535.83     0.44

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   366.45   140.67   338.37  1147.65     0.32
 MEAN    17.51   375.06   160.20   339.13  1147.14     0.33
 HUB     14.85   406.47   222.06   340.45  1146.64     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   421.34   251.06     0.37  2789.51
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 MEAN   346.18   386.78   185.99     0.34  2807.00     1.48
 HUB    293.65   347.90    71.59     0.30  3299.69

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.41     1.05    17.16   558.56     1.02   547.35     0.92     0.82
 MEAN    18.42     1.05    17.10   558.62     1.02   546.87     0.92     0.82
 HUB     18.57     1.06    17.02   560.18     1.02   546.39     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.57    36.57    31.50     5.07     0.93     0.30     2.90
 MEAN    25.29    28.74    23.50     5.24     0.89     0.33     3.28     0.82
 HUB     33.11    11.88     6.50     5.38     0.89     0.37     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.901

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     379.327     161.249     343.347    1147.389       0.331       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.453      17.107     547.105      46.000      25.157      31.500       6.343

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     358.084     161.249     392.716    1148.759       0.312       0.106

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.443      17.240     548.413     471.992       0.018       0.226

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     347.903       0.000     347.903    1149.388       0.303       0.115

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.264     549.013       0.000       0.060       0.050       0.124

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.761      18.398       1.046     559.121       9.417     284.770       2.208

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  58647.465       0.382     330.062 1130266.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.975

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2266.000      18.398     559.121       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     82.613    2182.554       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.134     513.330     240.593     401.059       1.667

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   327.43    -0.11   327.43     0.28   366.82
 MEAN    16.97     0.00    -0.02   327.43    -0.11   327.43     0.28
 HUB     14.32     0.00    -0.02   327.43    -0.11   327.43     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.32    46.36     2.96   380.86   502.34    17.39   550.17     0.44
 MEAN    45.71    43.80     1.91   335.59   468.94    17.39   550.17     0.41
 HUB     40.87    37.84     3.03   283.17   432.97    17.39   550.17     0.38
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      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   369.40   126.71   346.99  1155.96     0.32
MEAN    16.57   377.33   146.84   347.59  1155.58     0.33
HUB     13.89   406.89   209.90   348.57  1155.16     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    373.34   425.71   246.63     0.37  2394.44
MEAN   327.74   391.84   180.90     0.34  2435.66     1.29
HUB    274.67   354.53    64.77     0.31  2917.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.19      1.04    17.88   566.72     1.01   555.33     0.92     0.89
MEAN    19.20      1.04    17.83   566.85     1.01   554.97     0.92     0.89
HUB     19.36      1.05    17.77   568.38     1.02   554.56     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     20.06    35.40    31.50     3.90     0.93     0.20     2.90
MEAN    22.90    27.49    23.50     3.99     0.91     0.21     3.29     0.89
HUB     31.06    10.53     6.50     4.03     0.91     0.24     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.975

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     371.554     147.668     340.949    1156.439       0.321       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.238      17.908     555.793      46.000      23.418      32.400       8.982

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     360.358     147.668     389.440    1157.150       0.311       0.100

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.221      17.970     556.477     456.573       0.022       0.210

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     343.142       0.000     343.142    1158.201       0.296       0.085

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.029     557.489       0.000       0.060       0.063       0.142

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.800      19.163       1.042     567.320       8.199     307.838       2.386

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  51072.973       0.366     287.433  907378.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.945

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2266.000      19.163     567.320       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     79.897    2166.725       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.190     509.668     232.686     390.276       1.677

     ROTOR LEADING EDGE CONDITIONS, STAGE            5
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	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	320.55	-0.11	320.55	0.28	346.39
MEAN	15.91	0.00	-0.02	320.55	-0.11	320.55	0.28	
HUB	13.07	0.00	-0.02	320.55	-0.11	320.55	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.51	47.36	1.15	362.27	483.81	18.17	558.74	0.42
MEAN	44.48	44.80	-0.32	314.67	449.27	18.17	558.74	0.39
HUB	38.89	38.84	0.05	258.45	411.84	18.17	558.74	0.36

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	357.78	110.54	340.28	1163.82	0.31
MEAN	15.50	363.93	127.50	340.87	1163.42	0.31
HUB	12.59	388.63	184.88	341.83	1162.97	0.33

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	418.84	244.21	0.36	1985.15	
MEAN	306.46	384.99	178.96	0.33	1977.63	1.26
HUB	248.96	347.79	64.08	0.30	2329.13	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.81	1.03	18.55	573.62	1.01	562.93	0.92	0.86
MEAN	19.81	1.03	18.51	573.60	1.01	562.54	0.92	0.86
HUB	19.93	1.04	18.44	574.71	1.01	562.10	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	18.00	35.67	31.50	4.17	0.93	0.17	2.90	
MEAN	20.51	27.70	23.50	4.20	0.90	0.19	3.34	0.86
HUB	28.41	10.62	6.50	4.12	0.90	0.21	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.945

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	367.385	129.833	343.679	1163.590	0.316	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.823	18.498	562.710	46.000	20.695	33.000	12.305

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	367.554	129.833	389.811	1163.579	0.316	-0.038

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.774	18.451	562.699	440.827	0.056	0.182

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	344.515	0.000	344.515	1164.995	0.296	0.057

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.575	564.069	0.000	0.060	0.083	0.054

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.726	19.738	1.030	573.979	6.658	354.757	2.750

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
41478.734	0.330	233.438	958660.500

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
318653.94	1793.3521	97.2890	1.3066	0.8142	9.0280	1.0979

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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 60%  Stat 2 20% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      96.156    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   43.70718

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      93.935    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73970.969   75450.234       3.040     831.557     273.558     619.754       2.266

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   217.56    -0.07   217.56     0.19   406.33
  MEAN    17.06     0.00    -0.02   217.56    -0.07   217.56     0.19
  HUB     12.51     0.00    -0.02   217.56    -0.07   217.56     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.93    50.47    11.46   407.95   462.40    14.71   518.86     0.41
  MEAN    57.19    47.20     9.99   337.36   401.49    14.71   518.86     0.36
  HUB     48.68    38.62    10.06   247.38   329.49    14.71   518.86     0.29

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   386.93   248.50   296.59  1125.72     0.34
  MEAN    18.04   400.57   266.43   299.11  1123.67     0.36
  HUB     15.00   446.15   327.18   303.32  1120.56     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   336.73   159.45     0.30  5128.11
  MEAN   356.65   312.42    90.22     0.28  4806.68     1.45
  HUB    296.62   304.86    30.56     0.27  4908.61

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.65     1.10    15.34   539.10     1.03   526.60     0.92     0.91
  MEAN    16.55     1.10    15.16   538.08     1.03   524.68     0.92     0.91
  HUB     16.58     1.10    14.86   538.40     1.03   521.78     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     39.96    28.26    24.20     4.06     0.93     0.36     2.90
  MEAN    41.69    16.78    12.70     4.08     0.94     0.32     3.51     0.91
  HUB     47.17    -5.75    -9.30     3.55     0.94     0.19     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     405.700     265.916     306.400    1123.775       0.361      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.579      15.149     524.780      24.000      40.954      35.400      -5.554

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	328.906	265.916	422.954	1128.808	0.291	0.338

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.567	15.617	529.492	528.796	0.018	0.465

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	305.882	0.000	305.882	1130.109	0.271	0.376

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.703	530.712	0.000	0.060	0.047	0.396

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.866	16.524	1.094	538.527	15.717	196.116	1.520

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
97853.297	0.588	531.720	914825.688

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 9.988 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
96.156	2266.000	16.524	538.527	1.000	1.000	0.980

W Kg/sec = 43.70718

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
87.161	2223.895	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73970.969	75450.234	2.326	590.487	253.831	474.134	1.868

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	292.71	-0.10	292.71	0.26	398.80
MEAN	18.08	0.00	-0.02	292.71	-0.10	292.71	0.26	
HUB	15.21	0.00	-0.02	292.71	-0.10	292.71	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.24	46.36	7.88	406.37	500.89	15.77	531.37	0.44
MEAN	50.70	42.30	8.40	357.49	462.11	15.77	531.37	0.41
HUB	45.79	37.84	7.95	300.77	419.77	15.77	531.37	0.37

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	361.61	186.12	310.04	1139.60	0.32
MEAN	18.01	368.34	196.25	311.70	1138.27	0.32
HUB	15.22	397.75	244.59	313.65	1136.92	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	378.83	217.68	0.33	3802.57	
MEAN	356.14	350.31	159.88	0.31	3536.35	1.43
HUB	301.03	318.69	56.44	0.28	3724.93	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.73	1.07	16.54	550.60	1.02	539.68	0.92	0.91
MEAN	17.65	1.07	16.41	549.76	1.02	538.43	0.92	0.91
HUB	17.71	1.07	16.27	550.36	1.02	537.15	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.98	35.07	31.50	3.57	0.93	0.31	2.90	
MEAN	32.20	27.16	23.50	3.66	0.93	0.31	3.30	0.91
HUB	37.95	10.20	6.50	3.70	0.93	0.32	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	460.372	196.805	416.185	1132.031	0.407	-0.490

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.684	15.778	532.540	46.000	25.308	30.600	5.292

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	427.726	196.805	470.831	1134.602	0.377	-0.301

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	17.671	16.018	534.961	400.556	0.020	0.227

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	421.783	0.000	421.783	1135.049	0.372	0.196

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	16.031	535.383	0.000	0.060	0.046	-0.290

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.867	17.637	1.067	550.240	11.713	238.957	1.852

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
72937.234	0.447	396.330	840755.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 9.988 EfDer = 0.925

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
96.156	2266.000	17.637	550.240	1.000	1.000	0.780

W Kg/sec = 43.70718

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
82.543	2200.097	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73970.969	75450.234	1.806	434.156	240.386	339.175	1.411

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	390.77	-0.13	390.77	0.34	385.32
MEAN	17.74	0.00	-0.02	390.77	-0.13	390.77	0.34	
HUB	15.05	0.00	-0.02	390.77	-0.13	390.77	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.45	46.36	-0.91	396.88	557.06	16.25	537.49	0.49
MEAN	41.92	43.40	-1.48	350.77	525.20	16.25	537.49	0.46
HUB	37.31	38.84	-1.53	297.61	491.27	16.25	537.49	0.43

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	357.83	151.69	324.09	1149.48	0.31
MEAN	17.51	366.04	168.33	325.04	1148.76	0.32
HUB	14.85	396.66	225.34	326.44	1148.05	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	403.31	240.04	0.35	3007.71	
MEAN	346.18	370.51	177.85	0.32	2949.28	1.51
HUB	293.65	333.51	68.31	0.29	3348.38	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.56	1.05	17.35	559.79	1.02	549.10	0.92	0.85
MEAN	18.54	1.05	17.28	559.61	1.02	548.42	0.92	0.85
HUB	18.66	1.06	17.18	560.87	1.02	547.73	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.08	36.53	31.50	5.03	0.93	0.32	2.90	
MEAN	27.38	28.69	23.50	5.19	0.90	0.34	3.28	0.85
HUB	34.62	11.82	6.50	5.32	0.90	0.38	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.925

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	370.103	169.435	329.041	1149.007	0.322	0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.574	17.284	548.651	46.000	27.246	31.500	4.254

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	342.576	169.435	382.187	1150.722	0.298	0.143

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.567	17.458	550.289	471.992	0.015	0.255

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	332.769	0.000	332.769	1151.300	0.289	0.153

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.485	550.842	0.000	0.060	0.043	0.163

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.797	18.530	1.051	560.090	9.850	269.562	2.090

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
61344.238	0.400	333.336	1084759.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 9.988 EfDer = 0.987

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
96.156	2266.000	18.530	560.090	1.000	1.000	0.980

W Kg/sec = 43.70718

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
79.265	2180.667	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73970.969	75450.234	2.224	513.330	230.842	401.059	1.737

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	313.34	-0.11	313.34	0.27	366.51
MEAN	16.97	0.00	-0.02	313.34	-0.11	313.34	0.27	
HUB	14.32	0.00	-0.02	313.34	-0.11	313.34	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.56	46.36	4.20	380.86	493.27	17.60	551.89	0.43
MEAN	46.97	43.80	3.17	335.59	459.21	17.60	551.89	0.40
HUB	42.12	37.84	4.28	283.17	422.41	17.60	551.89	0.37

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	358.89	138.24	331.20	1158.35	0.31
MEAN	16.57	366.53	155.24	332.04	1157.74	0.32
HUB	13.89	395.46	213.00	333.19	1157.10	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	406.16	235.10	0.35	2612.12	
MEAN	327.74	374.18	172.51	0.32	2574.69	1.32
HUB	274.67	338.85	61.66	0.29	2960.18	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.41	1.05	18.16	568.38	1.01	557.63	0.92	0.90
MEAN	19.40	1.05	18.09	568.26	1.01	557.05	0.92	0.90
HUB	19.53	1.05	18.01	569.49	1.02	556.43	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	22.66	35.37	31.50	3.87	0.93	0.22	2.90	
MEAN	25.06	27.45	23.50	3.95	0.91	0.24	3.29	0.90
HUB	32.59	10.49	6.50	3.99	0.91	0.26	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.987

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	361.231	156.109	325.758	1158.541	0.312	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.431	18.163	557.816	46.000	25.605	32.400	6.795

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	343.650	156.109	377.446	1159.615	0.296	0.136

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.421	18.272	558.851	456.573	0.017	0.240

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	327.159	0.000	327.159	1160.573	0.282	0.125

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.333	559.775	0.000	0.060	0.052	0.181

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.834	19.374	1.046	568.712	8.622	289.992	2.248

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
53707.902	0.385	291.841	871934.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 9.988 EfDer = 0.965

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
96.156	2266.000	19.374	568.712	1.000	1.000	0.980

W Kg/sec = 43.70718

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
76.394	2164.073	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73970.969	75450.234	2.291	509.668	222.485	390.276	1.754

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	305.79	-0.11	305.79	0.26	345.96

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 MEAN    15.91     0.00    -0.02   305.79    -0.11   305.79     0.26
 HUB     13.07     0.00    -0.02   305.79    -0.11   305.79     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.84    47.36     2.48   362.27   474.16    18.46   560.90     0.41
 MEAN    45.83    44.80     1.03   314.67   438.86    18.46   560.90     0.38
 HUB     40.22    38.84     1.38   258.45   400.45    18.46   560.90     0.34

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   346.21   122.79   323.70  1166.68     0.30
 MEAN    15.50   352.03   136.41   324.53  1166.04     0.30
 HUB     12.59   376.14   188.24   325.65  1165.37     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   398.24   231.97     0.34  2204.75
 MEAN   306.46   366.38   170.05     0.31  2115.70     1.30
 HUB    248.96   331.26    60.72     0.28  2371.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.12     1.04    18.92   575.71     1.01   565.70     0.92     0.88
 MEAN    20.09     1.04    18.86   575.43     1.01   565.08     0.92     0.88
 HUB     20.18     1.04    18.77   576.24     1.01   564.43     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.77    35.63    31.50     4.13     0.93     0.20     2.90
 MEAN    22.80    27.65    23.50     4.15     0.91     0.21     3.34     0.88
 HUB     30.03    10.56     6.50     4.06     0.91     0.23     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.965

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     355.435     138.911     327.167    1166.208       0.305      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.102      18.846     565.245      46.000      23.005      33.000       9.995

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     348.989     138.911     375.619    1166.599       0.299       0.008

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.070      18.861     565.624     440.827       0.045       0.211

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     327.224       0.000     327.224    1167.866       0.280       0.101

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.975     566.853       0.000       0.060       0.068       0.098

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.781      20.040       1.034     575.793       7.081     330.848       2.565

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   44114.699       0.351     239.713  920677.250

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     329957.34   1792.9396     93.9346      1.3265      0.8327      9.9879      1.1013

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**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 20% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.987

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      92.762    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   42.16433

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      90.619    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   71359.812   72786.852       3.151     831.557     263.901     619.754       2.348

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   209.60    -0.07   209.60     0.19   406.33
  MEAN    17.06     0.00    -0.02   209.60    -0.07   209.60     0.19
  HUB     12.51     0.00    -0.02   209.60    -0.07   209.60     0.19

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.81    50.47    12.34   407.95   458.71    14.74   519.14     0.41
  MEAN    58.15    47.20    10.95   337.36   397.23    14.74   519.14     0.36
  HUB     49.73    38.62    11.11   247.38   324.29    14.74   519.14     0.29

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   382.39   254.50   285.40  1126.45     0.34
  MEAN    18.04   394.57   269.81   287.91  1124.30     0.35
  HUB     15.00   437.62   326.01   291.94  1121.17     0.39

        U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   324.04   153.45     0.29  5251.84
  MEAN   356.65   300.72    86.85     0.27  4867.47     1.50
  HUB    296.62   293.42    29.39     0.26  4890.99

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.68     1.10    15.40   539.49     1.03   527.28     0.92     0.90
  MEAN    16.56     1.10    15.21   538.27     1.03   525.27     0.92     0.90
  HUB     16.57     1.10    14.91   538.35     1.03   522.35     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     41.72    28.27    24.20     4.07     0.93     0.39     2.90
  MEAN    43.14    16.79    12.70     4.09     0.94     0.34     3.51     0.90
  HUB     48.16    -5.75    -9.30     3.55     0.94     0.21     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.987

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     399.348     269.283     294.899    1124.421       0.355      -0.004

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      16.589      15.202     525.384      24.000      42.400      35.400      -7.000

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      18.071     316.235     269.283     415.352    1129.724       0.280       0.365
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BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.574	15.695	530.351	528.796	0.020	0.488

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	294.320	0.000	294.320	1130.914	0.260	0.395

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.766	531.469	0.000	0.060	0.053	0.415

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.859	16.527	1.094	538.704	15.894	190.885	1.480

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
98953.383	0.595	518.717	881331.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =10.953 EfDer = 0.994

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
92.762	2266.000	16.527	538.704	1.000	1.000	0.980

W Kg/sec = 42.16433

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
84.081	2223.530	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
71359.812	72786.852	2.411	590.487	244.863	474.134	1.936

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	281.72	-0.10	281.72	0.25	398.74
MEAN	18.08	0.00	-0.02	281.72	-0.10	281.72	0.25	
HUB	15.21	0.00	-0.02	281.72	-0.10	281.72	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.27	46.36	8.91	406.37	494.55	15.83	532.08	0.44
MEAN	51.77	42.30	9.47	357.49	455.23	15.83	532.08	0.40
HUB	46.88	37.84	9.04	300.77	412.17	15.83	532.08	0.36

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	356.00	194.64	298.08	1140.72	0.31
MEAN	18.01	361.79	202.49	299.82	1139.26	0.32
HUB	15.22	389.93	246.85	301.84	1137.76	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	364.14	209.16	0.32	3976.52	
MEAN	356.14	336.90	153.65	0.30	3648.55	1.47
HUB	301.03	306.67	54.18	0.27	3759.20	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.79	1.08	16.63	551.33	1.02	540.75	0.92	0.91
MEAN	17.68	1.07	16.49	550.29	1.02	539.36	0.92	0.91
HUB	17.72	1.07	16.33	550.64	1.02	537.95	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.14	35.06	31.50	3.56	0.93	0.33	2.90	
MEAN	34.03	27.13	23.50	3.63	0.94	0.33	3.30	0.91
HUB	39.28	10.18	6.50	3.68	0.94	0.33	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.994

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	447.981	203.056	399.318	1133.577	0.395	-0.465

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.718	15.907	533.996	46.000	26.954	30.600	3.646

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	409.708	203.056	457.266	1136.483	0.361	-0.238

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	17.708	16.185	536.737	400.556	0.017	0.250

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	403.988	0.000	403.988	1136.894	0.355	0.234

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	16.199	537.126	0.000	0.060	0.041	-0.227

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.871	17.679	1.070	550.756	12.052	229.460	1.779

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
75049.359	0.460	393.412	808871.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =10.953 EfDer = 0.946

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
92.762	2266.000	17.679	550.756	1.000	1.000	0.780

W Kg/sec = 42.16433

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
79.479	2199.067	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
71359.812	72786.852	1.876	434.156	231.465	339.175	1.465

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	374.63	-0.13	374.63	0.33	385.14
MEAN	17.74	0.00	-0.02	374.63	-0.13	374.63	0.33	
HUB	15.05	0.00	-0.02	374.63	-0.13	374.63	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.66	46.36	0.30	396.88	545.86	16.40	539.04	0.48
MEAN	43.13	43.40	-0.27	350.77	513.30	16.40	539.04	0.45
HUB	38.48	38.84	-0.36	297.61	478.53	16.40	539.04	0.42

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	350.29	162.24	310.46	1151.17	0.30
MEAN	17.51	357.88	176.08	311.57	1150.27	0.31
HUB	14.85	387.58	228.53	313.04	1149.37	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	386.07	229.49	0.34	3216.65	
MEAN	346.18	354.98	170.10	0.31	3084.90	1.54
HUB	293.65	319.74	65.12	0.28	3395.65	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.69	1.06	17.52	560.97	1.02	550.72	0.92	0.87
MEAN	18.65	1.05	17.43	560.55	1.02	549.86	0.92	0.87

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 HUB     18.75     1.06    17.32   561.54     1.02   548.99     0.92     0.87

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.59    36.47    31.50     4.97     0.93     0.34     2.90
 MEAN    29.47    28.63    23.50     5.13     0.90     0.36     3.28     0.87
 HUB     36.13    11.75     6.50     5.25     0.90     0.39     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.946

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     361.766     177.239     315.375    1150.513       0.314       0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.681      17.442     550.091      46.000      29.336      31.500       2.164

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     327.840     177.239     372.683    1152.554       0.284       0.180

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.677      17.655     552.045     471.992       0.013       0.284

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     318.437       0.000     318.437    1153.084       0.276       0.190

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.682     552.552       0.000       0.060       0.038       0.201

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.825      18.645       1.055     561.020      10.264     255.897       1.984

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  63927.688       0.417     335.111 1040711.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     92.762    2266.000      18.645     561.020       1.000       1.000       0.980
W Kg/sec =   42.16433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     76.060    2178.857       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  71359.812   72786.852       2.317     513.330     221.509     401.059       1.811

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   299.98    -0.10   299.98     0.26   366.20
 MEAN    16.97     0.00    -0.02   299.98    -0.10   299.98     0.26
 HUB     14.32     0.00    -0.02   299.98    -0.10   299.98     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.78    46.36     5.42   380.86   484.89    17.79   553.51     0.42
 MEAN    48.22    43.80     4.42   335.59   450.20    17.79   553.51     0.39
 HUB     43.36    37.84     5.52   283.17   412.59    17.79   553.51     0.36

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   349.74   149.07   316.38  1160.55     0.30
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 MEAN    16.57   356.87   163.11   317.41  1159.74     0.31
 HUB     13.89   384.97   215.92   318.71  1158.91     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   387.81   224.27     0.33  2816.48
 MEAN   327.74   357.57   164.64     0.31  2705.05     1.36
 HUB    274.67   324.08    58.75     0.28  3000.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.61     1.05    18.41   569.96     1.02   559.75     0.92     0.91
 MEAN    19.57     1.05    18.32   569.61     1.02   558.97     0.92     0.91
 HUB     19.67     1.05    18.22   570.55     1.02   558.17     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.23    35.33    31.50     3.83     0.93     0.25     2.90
 MEAN    27.20    27.41    23.50     3.91     0.92     0.26     3.29     0.91
 HUB     34.12    10.44     6.50     3.94     0.92     0.28     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     352.014     164.023     311.464    1160.487       0.303       0.051

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.601      18.388     559.693      46.000      27.772      32.400       4.628

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     328.023     164.023     366.746    1161.898       0.282       0.171

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.596      18.539     561.055     456.573       0.014       0.270

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     312.256       0.000     312.256    1162.771       0.269       0.164

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.600     561.898       0.000       0.060       0.044       0.218

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      19.557       1.049     570.039       9.019     274.320       2.127

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  56181.242       0.403     294.504  837485.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     92.762    2266.000      19.557     570.039       1.000       1.000       0.980
W Kg/sec =   42.16433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     73.093    2161.552       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  71359.812   72786.852       2.394     509.668     212.871     390.276       1.833

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   292.01    -0.10   292.01     0.25   345.56
 MEAN    15.91     0.00    -0.02   292.01    -0.10   292.01     0.25
 HUB     13.07     0.00    -0.02   292.01    -0.10   292.01     0.25
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.14    47.36     3.78   362.27   465.38    18.72   562.92     0.40
MEAN    47.15    44.80     2.35   314.67   429.36    18.72   562.92     0.37
HUB     41.52    38.84     2.68   258.45   390.02    18.72   562.92     0.34

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   336.27   134.12   308.37  1169.30     0.29
MEAN    15.50   341.52   144.64   309.38  1168.45     0.29
HUB     12.59   364.80   191.29   310.63  1167.58     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    354.76   379.17   220.63     0.32  2407.98
MEAN   306.46   349.14   161.82     0.30  2243.17     1.34
HUB    248.96   315.93    57.67     0.27  2409.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.39     1.04    19.25   577.68     1.01   568.24     0.92     0.90
MEAN    20.33     1.04    19.16   577.16     1.01   567.42     0.92     0.90
HUB     20.39     1.04    19.05   577.69     1.01   566.58     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     23.51    35.58    31.50     4.08     0.93     0.23     2.90
MEAN    25.06    27.61    23.50     4.11     0.91     0.24     3.34     0.90
HUB     31.63    10.52     6.50     4.02     0.91     0.25     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     344.900     147.292     311.867    1168.612       0.295      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.346      19.151     567.579      46.000      25.281      33.000       7.719

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     331.944     147.292     363.155    1169.366       0.284       0.053

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.327      19.220     568.311     440.827       0.036       0.242

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     311.330       0.000     311.330    1170.504       0.266       0.144

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.327     569.418       0.000       0.060       0.056       0.141

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.822      20.302       1.038     577.511       7.471     310.547       2.407

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   46547.250       0.370     244.002  883874.812

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     340658.94   1785.7471     90.6187      1.3439      0.8453     10.9534      1.1046


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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 60%  Stat 2 20% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     89.191    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   40.54142

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.131    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 68613.172   69985.281       3.277     831.557     253.744     619.754       2.442

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   201.25    -0.07   201.25     0.18   406.33
MEAN    17.06     0.00    -0.02   201.25    -0.07   201.25     0.18
HUB     12.51     0.00    -0.02   201.25    -0.07   201.25     0.18

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     63.75    50.47    13.28   407.95   454.95    14.77   519.43     0.41
MEAN    59.19    47.20    11.99   337.36   392.89    14.77   519.43     0.35
HUB     50.88    38.62    12.26   247.38   318.96    14.77   519.43     0.29

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   378.04   260.69   273.77  1127.18     0.34
MEAN    18.04   388.58   273.28   276.25  1124.93     0.35
HUB     15.00   428.89   324.80   280.09  1121.79     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    407.95   310.86   147.26     0.28  5379.48
MEAN   356.65   288.56    83.37     0.26  4930.11     1.55
HUB    296.62   281.50    28.18     0.25  4872.87

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.71     1.11    15.46   539.90     1.03   527.96     0.92     0.90
MEAN    16.57     1.10    15.26   538.47     1.03   525.86     0.92     0.90
HUB     16.55     1.10    14.96   538.29     1.03   522.93     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.60    28.28    24.20     4.08     0.93     0.42     2.90
MEAN    44.69    16.79    12.70     4.09     0.94     0.37     3.51     0.90
HUB     49.23    -5.75    -9.30     3.55     0.94     0.23     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     392.992     272.751     282.930    1125.066       0.349      -0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.597      15.252     525.987      24.000      43.951      35.400      -8.551

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     303.095     272.751     407.750    1130.642       0.268       0.394

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.580      15.771     531.213     528.796       0.023       0.513
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	282.322	0.000	282.322	1131.722	0.249	0.414

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.826	532.229	0.000	0.060	0.060	0.434

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.849	16.527	1.094	538.886	16.076	185.454	1.438

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
100088.438	0.601	504.473	846247.312

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =11.987 EfDer = 0.988

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
89.191	2266.000	16.527	538.886	1.000	1.000	0.980

W Kg/sec = 40.54142

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
80.859	2223.154	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
68613.172	69985.281	2.508	590.487	235.480	474.134	2.013

ROTOR LEADING EDGE CONDITIONS, STAGE 2

R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP 20.55	0.00	-0.02	270.30	-0.09	270.30	0.24	398.67
MEAN 18.08	0.00	-0.02	270.30	-0.09	270.30	0.24	
HUB 15.21	0.00	-0.02	270.30	-0.09	270.30	0.24	

BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP 56.38	46.36	10.02	406.37	488.13	15.88	532.78	0.43
MEAN 52.91	42.30	10.61	357.49	448.25	15.88	532.78	0.40
HUB 48.06	37.84	10.22	300.77	404.45	15.88	532.78	0.36

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

R2	C2	Cu2	Cm2	Ao2	Mach2
TIP 20.42	350.74	203.37	285.76	1141.84	0.31
MEAN 18.01	355.39	208.84	287.55	1140.24	0.31
HUB 15.22	382.02	249.12	289.62	1138.61	0.34

U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP 403.80	349.05	200.43	0.31	4154.65	
MEAN 356.14	323.08	147.29	0.28	3762.95	1.52
HUB 301.03	294.24	51.91	0.26	3793.70	

Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP 17.84	1.08	16.71	552.08	1.02	541.81	0.92	0.90
MEAN 17.71	1.07	16.56	550.84	1.02	540.29	0.92	0.90
HUB 17.72	1.07	16.39	550.93	1.02	538.75	0.92	0.90

Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP 35.44	35.05	31.50	3.55	0.93	0.36	2.90	
MEAN 35.99	27.12	23.50	3.62	0.94	0.35	3.30	0.90
HUB 40.70	10.16	6.50	3.66	0.94	0.35	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.988

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	435.693	209.430	382.057	1135.098	0.384	-0.438

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.746      16.029     535.431      46.000      28.730      30.600       1.870

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     391.375     209.430     443.887    1138.338       0.344      -0.172

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      17.739      16.345     538.492     400.556       0.016       0.275

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     385.912       0.000     385.912    1138.713       0.339       0.273

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      16.357     538.847       0.000       0.060       0.038      -0.162

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      17.713       1.072     551.284      12.398     220.039       1.706

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  77205.188       0.474     389.135  775624.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.964

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     89.191    2266.000      17.713     551.284       1.000       1.000       0.780
W Kg/sec =   40.54142

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     76.311    2198.012       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  68613.172   69985.281       1.954     434.156     222.238     339.175       1.526

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   358.18    -0.12   358.18     0.31   384.96
 MEAN    17.74     0.00    -0.02   358.18    -0.12   358.18     0.31
 HUB     15.05     0.00    -0.02   358.18    -0.12   358.18     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.94    46.36     1.58   396.88   534.70    16.54   540.57     0.47
 MEAN    44.41    43.40     1.01   350.77   501.42    16.54   540.57     0.44
 HUB     39.73    38.84     0.89   297.61   465.77    16.54   540.57     0.41

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   343.33   172.94   296.60  1152.85     0.30
 MEAN    17.51   350.11   184.01   297.85  1151.76     0.30
 HUB     14.85   378.60   231.73   299.40  1150.68     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   368.57   218.80     0.32  3428.39
 MEAN   346.18   339.14   162.17     0.29  3223.62     1.58
 HUB    293.65   305.74    61.93     0.27  3442.97

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.81     1.06    17.69   562.17     1.02   552.33     0.92     0.88
 MEAN    18.75     1.06    17.58   561.52     1.02   551.28     0.92     0.88
 HUB     18.82     1.06    17.46   562.22     1.02   550.25     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     30.25    36.42    31.50     4.92     0.93     0.37     2.90
 MEAN    31.71    28.57    23.50     5.07     0.91     0.38     3.28     0.88
 HUB     37.74    11.69     6.50     5.19     0.91     0.41     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.964

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     353.825     185.221     301.472    1152.000       0.307       0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.780      17.589     551.515      46.000      31.566      31.500      -0.066

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     312.920     185.221     363.628    1154.376       0.271       0.219

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.777      17.842     553.793     471.992       0.012       0.317

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     303.972       0.000     303.972    1154.856       0.263       0.227

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.865     554.254       0.000       0.060       0.037       0.238

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.847       18.748       1.058     561.970      10.685     242.786       1.882

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  66549.906       0.434     335.430  995264.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.999

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     89.191     2266.000       18.748     561.970       1.000        1.000        0.980
W Kg/sec =   40.54142

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     72.793     2177.016        1.402       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  68613.172   69985.281        2.421     513.330     211.997     401.059       1.892

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   286.47    -0.10   286.47     0.25   365.89
 MEAN    16.97      0.00    -0.02   286.47    -0.10   286.47     0.25
 HUB     14.32      0.00    -0.02   286.47    -0.10   286.47     0.25

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     53.06     46.36     6.70   380.86   476.65     17.96   555.12      0.41
 MEAN    49.52     43.80     5.72   335.59   441.31     17.96   555.12      0.38
 HUB     44.68     37.84     6.84   283.17   402.88     17.96   555.12      0.35

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88   341.32    159.86    301.56   1162.70      0.29
 MEAN    16.57   347.69    170.97    302.75   1161.71      0.30
 HUB     13.89   374.73    218.87    304.17   1160.70      0.32
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	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	369.48	213.48	0.32	3020.13	
MEAN	327.74	340.93	156.77	0.29	2835.38	1.40
HUB	274.67	309.24	55.80	0.27	3041.52	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.79	1.06	18.64	571.56	1.02	561.83	0.92	0.91
MEAN	19.72	1.05	18.53	570.97	1.02	560.88	0.92	0.91
HUB	19.79	1.06	18.41	571.63	1.02	559.90	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.93	35.29	31.50	3.79	0.93	0.28	2.90	
MEAN	29.46	27.38	23.50	3.88	0.92	0.29	3.29	0.91
HUB	35.74	10.40	6.50	3.90	0.92	0.30	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	343.290	171.936	297.130	1162.404	0.295	0.050

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.756	18.594	561.545	46.000	30.056	32.400	2.344

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	312.435	171.936	356.620	1164.151	0.268	0.209

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.753	18.788	563.235	456.573	0.012	0.302

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	297.433	0.000	297.433	1164.941	0.255	0.203

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.845	563.999	0.000	0.060	0.038	0.256

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.872	19.721	1.052	571.385	9.416	259.556	2.012

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
58652.715	0.421	295.626	801812.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =11.987 EfDer = 0.991

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
89.191	2266.000	19.721	571.385	1.000	1.000	0.980

W Kg/sec = 40.54142

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
69.779	2159.004	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
68613.172	69985.281	2.508	509.668	203.220	390.276	1.920

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	278.27	-0.10	278.27	0.24	345.15
MEAN	15.91	0.00	-0.02	278.27	-0.10	278.27	0.24	
HUB	13.07	0.00	-0.02	278.27	-0.10	278.27	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.48	47.36	5.12	362.27	456.89	18.95	564.92	0.39
MEAN	48.52	44.80	3.72	314.67	420.14	18.95	564.92	0.36

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 HUB     42.90    38.84     4.06   258.45   379.85    18.95   564.92     0.33

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   327.26   145.29   293.23  1171.84     0.28
 MEAN    15.50   331.69   152.81   294.39  1170.81     0.28
 HUB     12.59   353.88   194.31   295.75  1169.76     0.30

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   360.36   209.46     0.31  2608.32
 MEAN   306.46   332.08   153.65     0.28  2369.67     1.38
 HUB    248.96   300.76    54.65     0.26  2447.63

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.64     1.05    19.55   579.67     1.01   570.72     0.92     0.91
 MEAN    20.55     1.04    19.44   578.91     1.01   569.72     0.92     0.91
 HUB     20.58     1.04    19.31   579.16     1.01   568.70     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.36    35.54    31.50     4.04     0.93     0.27     2.90
 MEAN    27.43    27.56    23.50     4.06     0.92     0.26     3.34     0.91
 HUB     33.31    10.47     6.50     3.97     0.92     0.27     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     335.073     155.609     296.749    1170.965       0.286       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.569      19.430     569.869      46.000      27.672      33.000       5.328

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219     315.237     155.609     351.552    1172.071       0.269        0.100

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.559      19.550     570.946     440.827       0.028       0.274

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     295.744       0.000     295.744    1173.091       0.252        0.189

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      19.649     571.940       0.000       0.060       0.046        0.186

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.852      20.538       1.041     579.243       7.857     291.915        2.263

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   48952.469       0.389     246.734  845863.375

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     351448.72   1771.3970     87.1308      1.3595      0.8528     11.9868      1.1079


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 20% Ice Block 3-11-2011
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.974

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    85.685    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    83.706    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 65916.203   67234.383       3.411     831.557     243.770     619.754       2.542

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   193.09    -0.07   193.09     0.17   406.33
MEAN    17.06     0.00    -0.02   193.09    -0.07   193.09     0.17
HUB     12.51     0.00    -0.02   193.09    -0.07   193.09     0.17

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     64.67    50.47    14.20   407.95   451.40    14.80   519.70     0.40
MEAN    60.22    47.20    13.02   337.36   388.77    14.80   519.70     0.35
HUB     52.03    38.62    13.41   247.38   313.87    14.80   519.70     0.28

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

        R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   374.15   266.63   262.48  1127.85     0.33
MEAN    18.04   382.99   276.60   264.91  1125.52     0.34
HUB     15.00   420.46   323.53   268.55  1122.36     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    407.95   298.11   141.32     0.26  5502.01
MEAN   356.65   276.74    80.05     0.25  4989.90     1.60
HUB    296.62   269.90    26.91     0.24  4853.73

       Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.73     1.11    15.51   540.29     1.03   528.60     0.92     0.89
MEAN    16.58     1.10    15.30   538.66     1.03   526.41     0.92     0.89
HUB     16.54     1.09    15.01   538.23     1.03   523.46     0.92     0.89

       Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     45.45    28.30    24.20     4.10     0.93     0.44     2.90
MEAN    46.24    16.81    12.70     4.11     0.94     0.39     3.51     0.89
HUB     50.30    -5.72    -9.30     3.58     0.94     0.26     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.974

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     387.055     276.063     271.295    1125.664       0.344      -0.002

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    16.603      15.297     526.546      24.000      45.499      35.400     -10.099

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     290.363     276.063     400.651    1131.497       0.257       0.422

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.582      15.839     532.017     528.796       0.025       0.539

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     270.685       0.000     270.685    1132.477       0.239       0.432
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.879	532.939	0.000	0.060	0.069	0.452

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.838	16.524	1.094	539.059	16.249	180.205	1.397

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
101164.203	0.608	489.853	811938.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =13.019 EfDer = 0.982

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
85.685	2266.000	16.524	539.059	1.000	1.000	0.980

W Kg/sec = 38.94787

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
77.709	2222.797	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
65916.203	67234.383	2.609	590.487	226.308	474.134	2.095

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	259.21	-0.09	259.21	0.23	398.61
MEAN	18.08	0.00	-0.02	259.21	-0.09	259.21	0.23	
HUB	15.21	0.00	-0.02	259.21	-0.09	259.21	0.23	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.47	46.36	11.11	406.37	482.08	15.93	533.45	0.43
MEAN	54.06	42.30	11.76	357.49	441.65	15.93	533.45	0.39
HUB	49.25	37.84	11.41	300.77	397.13	15.93	533.45	0.35

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	346.19	211.73	273.89	1142.87	0.30
MEAN	18.01	349.60	214.95	275.71	1141.15	0.31
HUB	15.22	374.58	251.27	277.79	1139.40	0.33

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	334.52	192.06	0.29	4325.42	
MEAN	356.14	309.75	141.19	0.27	3872.92	1.56
HUB	301.03	282.21	49.75	0.25	3826.51	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.88	1.08	16.78	552.80	1.03	542.79	0.92	0.90
MEAN	17.74	1.07	16.62	551.36	1.02	541.15	0.92	0.90
HUB	17.72	1.07	16.44	551.21	1.02	539.49	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.71	35.04	31.50	3.54	0.93	0.38	2.90	
MEAN	37.94	27.12	23.50	3.62	0.94	0.37	3.30	0.90
HUB	42.13	10.15	6.50	3.65	0.94	0.37	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.982

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	424.348	215.557	365.522	1136.495	0.373	-0.412

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.768	16.135	536.751	46.000	30.529	30.600	0.071

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	373.902	215.557	431.588	1140.050	0.328	-0.108

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	17.762	16.485	540.114	400.556	0.015	0.301

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	368.716	0.000	368.716	1140.389	0.323	0.309

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	16.496	540.435	0.000	0.060	0.037	-0.099

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.869	17.737	1.073	551.789	12.730	211.252	1.638

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
79272.414	0.486	383.849	743251.562

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =13.019 EfDer = 0.979

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
85.685	2266.000	17.737	551.789	1.000	1.000	0.780

W Kg/sec = 38.94787

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
73.246	2197.007	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
65916.203	67234.383	2.035	434.156	213.312	339.175	1.590

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	342.49	-0.12	342.49	0.30	384.78
MEAN	17.74	0.00	-0.02	342.49	-0.12	342.49	0.30	
HUB	15.05	0.00	-0.02	342.49	-0.12	342.49	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.22	46.36	2.86	396.88	524.31	16.66	541.99	0.46
MEAN	45.69	43.40	2.29	350.77	490.33	16.66	541.99	0.43
HUB	41.00	38.84	2.16	297.61	453.81	16.66	541.99	0.40

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	337.41	183.07	283.42	1154.39	0.29
MEAN	17.51	343.20	191.51	284.80	1153.14	0.30
HUB	14.85	370.33	234.77	286.41	1151.89	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	351.95	208.66	0.30	3629.07	
MEAN	346.18	324.09	154.67	0.28	3354.78	1.62
HUB	293.65	292.40	58.89	0.25	3488.05	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.92	1.07	17.83	563.31	1.02	553.81	0.92	0.90
MEAN	18.83	1.06	17.71	562.44	1.02	552.61	0.92	0.90
HUB	18.87	1.06	17.57	562.87	1.02	551.41	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.86	36.36	31.50	4.86	0.93	0.39	2.90	
MEAN	33.92	28.51	23.50	5.01	0.91	0.40	3.28	0.90
HUB	39.34	11.62	6.50	5.12	0.91	0.42	3.87	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.979

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      346.762     192.767     288.244     1153.372       0.301       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     18.864      17.715      552.832      46.000      33.773      31.500      -2.273

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392      298.787     192.767     355.574     1156.067       0.258       0.257

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.861      18.004      555.418      471.992       0.012       0.349

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121      290.310       0.000     290.310     1156.500       0.251       0.261

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.022      555.835       0.000       0.060       0.038       0.273

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.861      18.830       1.062     562.873      11.084     230.970       1.790

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  69034.453       0.450     334.275  951428.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     85.685    2266.000      18.830     562.873       1.000       1.000       0.980
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     69.681    2175.268       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  65916.203   67234.383       2.530     513.330     202.934     401.059       1.976

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   273.70    -0.09   273.70     0.24   365.60
 MEAN    16.97     0.00    -0.02   273.70    -0.09   273.70     0.24
 HUB     14.32     0.00    -0.02   273.70    -0.09   273.70     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.30    46.36     7.94   380.86   469.08    18.11   556.62     0.41
 MEAN    50.81    43.80     7.01   335.59   433.12    18.11   556.62     0.37
 HUB     45.98    37.84     8.14   283.17   393.89    18.11   556.62     0.34

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   334.12   169.90   287.69  1164.67     0.29
 MEAN    16.57   339.58   178.32   288.99  1163.53     0.29
 HUB     13.89   365.34   221.55   290.49  1162.36     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   352.36   203.44     0.30  3209.57
 MEAN   327.74   325.33   149.42     0.28  2957.11     1.45
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 HUB    274.67   295.31    53.12     0.25  3078.65

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.94     1.06    18.83   573.06     1.02   563.74     0.92     0.91
 MEAN    19.85     1.05    18.71   572.26     1.02   562.63     0.92     0.91
 HUB     19.89     1.06    18.58   572.65     1.02   561.50     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.56    35.27    31.50     3.77     0.93     0.31     2.90
 MEAN    31.68    27.34    23.50     3.84     0.93     0.31     3.29     0.91
 HUB     37.33    10.36     6.50     3.86     0.93     0.32     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     335.602     179.326     283.673    1164.168       0.288       0.048

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.884      18.768     563.253      46.000      32.299      32.400       0.101

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     297.873     179.326     347.687    1166.229       0.255       0.246

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.882      18.999     565.249     456.573       0.011       0.335

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     283.624       0.000     283.624    1166.942       0.243       0.239

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.052     565.941       0.000       0.060       0.037       0.290

    STAGE EXIT CONDITIONS, STAGE             4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878       19.852       1.054     572.658       9.784     246.501       1.911

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  60948.836       0.437     295.124  767286.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     85.685    2266.000      19.852     572.657       1.000       1.000       0.980
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     66.666    2156.605       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  65916.203   67234.383       2.625     509.668     194.156     390.276       2.010

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   265.46    -0.09   265.46     0.23   344.77
 MEAN    15.91     0.00    -0.02   265.46    -0.09   265.46     0.23
 HUB     13.07     0.00    -0.02   265.46    -0.09   265.46     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.77    47.36     6.41   362.27   449.19    19.15   566.77     0.38
 MEAN    49.86    44.80     5.06   314.67   411.76    19.15   566.77     0.35
 HUB     44.24    38.84     5.40   258.45   370.56    19.15   566.77     0.32

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   319.66   155.57   279.25  1174.16     0.27
MEAN    15.50   323.09   160.30   280.52  1172.98     0.28
HUB     12.59   344.01   197.08   281.96  1171.77     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    354.76   343.01   199.18     0.29  2792.66
MEAN   306.46   316.31   146.16     0.27  2485.72     1.42
HUB    248.96   286.69    51.88     0.24  2482.43

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.85     1.05    19.80   581.52     1.02   572.99     0.92     0.91
MEAN    20.74     1.04    19.67   580.55     1.01   571.83     0.92     0.91
HUB     20.74     1.04    19.53   580.54     1.01   570.66     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     29.12    35.50    31.50     4.00     0.93     0.30     2.90
MEAN    29.75    27.52    23.50     4.02     0.92     0.29     3.34     0.91
HUB     34.95    10.43     6.50     3.93     0.92     0.29     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     326.493     163.239     282.755    1173.118       0.278      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.751      19.663     571.969      46.000      29.999      33.000       3.001

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     299.884     163.239     341.435    1174.544       0.255       0.144

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.747      19.826     573.361     440.827       0.024       0.307

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     281.423       0.000     281.423    1175.461       0.239       0.230

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.918     574.257       0.000       0.060       0.040       0.227

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.870      20.729       1.044     580.869       8.212     275.829       2.138

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   51162.180       0.407     247.735  809153.688

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     361582.09   1750.8362     83.7060      1.3722      0.8551     13.0194      1.1111


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 20% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  0.966
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   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     82.317    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   37.41694

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     80.416    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63325.230   64591.602       3.551     831.557     234.188     619.754       2.646

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   185.28    -0.06   185.28     0.17   406.33
 MEAN    17.06     0.00    -0.02   185.28    -0.06   185.28     0.17
 HUB     12.51     0.00    -0.02   185.28    -0.06   185.28     0.17

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     65.58    50.47    15.11   407.95   448.11    14.82   519.94     0.40
 MEAN    61.23    47.20    14.03   337.36   384.95    14.82   519.94     0.34
 HUB     53.17    38.62    14.55   247.38   309.13    14.82   519.94     0.28

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   370.79   272.24   251.74  1128.47     0.33
 MEAN    18.04   377.90   279.72   254.10  1126.05     0.34
 HUB     15.00   412.59   322.33   257.56  1122.89     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   285.99   135.71     0.25  5617.60
 MEAN   356.65   265.49    76.94     0.24  5046.04     1.66
 HUB    296.62   258.84    25.71     0.23  4835.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.76     1.11    15.55   540.65     1.03   529.17     0.92     0.88
 MEAN    16.58     1.10    15.34   538.84     1.03   526.91     0.92     0.88
 HUB     16.52     1.09    15.05   538.17     1.03   523.95     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.24    28.33    24.20     4.13     0.93     0.47     2.90
 MEAN    47.75    16.85    12.70     4.15     0.95     0.42     3.51     0.88
 HUB     51.37    -5.70    -9.30     3.60     0.95     0.28     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     381.639     279.172     260.213    1126.210       0.339      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.607      15.337     527.057      24.000      47.013      35.400     -11.613

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     278.271     279.172     394.172    1132.281       0.246       0.450

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.583      15.900     532.754     528.796       0.028       0.564

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     259.620       0.000     259.620    1133.171       0.229       0.449

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.924     533.592       0.000       0.060       0.078       0.468
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STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.826	16.518	1.093	539.222	16.412	175.209	1.358

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
102177.656	0.614	475.312	779103.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =14.028 EfDer = 0.974

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
82.317	2266.000	16.518	539.222	1.000	1.000	0.980

W Kg/sec = 37.41694

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
74.693	2222.462	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
63325.230	64591.602	2.715	590.487	217.522	474.134	2.180

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	248.67	-0.09	248.67	0.22	398.55
MEAN	18.08	0.00	-0.02	248.67	-0.09	248.67	0.22	
HUB	15.21	0.00	-0.02	248.67	-0.09	248.67	0.22	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.54	46.36	12.18	406.37	476.49	15.97	534.06	0.42
MEAN	55.18	42.30	12.88	357.49	435.54	15.97	534.06	0.38
HUB	50.43	37.84	12.59	300.77	390.32	15.97	534.06	0.34

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	342.35	219.57	262.67	1143.81	0.30
MEAN	18.01	344.46	220.69	264.48	1141.98	0.30
HUB	15.22	367.71	253.29	266.56	1140.12	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	320.83	184.22	0.28	4485.43	
MEAN	356.14	297.15	135.45	0.26	3976.14	1.61
HUB	301.03	270.80	47.74	0.24	3857.12	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.92	1.08	16.83	553.47	1.03	543.68	0.92	0.89
MEAN	17.75	1.07	16.67	551.85	1.02	541.94	0.92	0.89
HUB	17.71	1.07	16.48	551.47	1.02	540.18	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.89	35.04	31.50	3.54	0.93	0.41	2.90	
MEAN	39.84	27.12	23.50	3.62	0.94	0.39	3.30	0.89
HUB	43.54	10.15	6.50	3.65	0.94	0.39	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.974

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	414.069	221.308	349.965	1137.757	0.364	-0.388

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.783	16.226	537.944	46.000	32.308	30.600	-1.708

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th

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     17.960     357.539     221.308     420.489    1141.602       0.313      -0.047

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.750      17.778      16.607     541.587     400.556       0.015       0.327

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     352.638       0.000     352.638    1141.909       0.309       0.342

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      16.614     541.878       0.000       0.060       0.038      -0.041

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.863      17.752       1.075     552.263      13.041     203.197       1.575

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  81209.250       0.498     377.771  712383.812


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     82.317    2266.000      17.752     552.263       1.000       1.000       0.780
W Kg/sec =   37.41694

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     70.337    2196.064       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63325.230   64591.602       2.119     434.156     204.842     339.175       1.656

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   327.78    -0.11   327.78     0.29   384.62
 MEAN    17.74     0.00    -0.02   327.78    -0.11   327.78     0.29
 HUB     15.05     0.00    -0.02   327.78    -0.11   327.78     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.45    46.36     4.09   396.88   514.82    16.77   543.29     0.45
 MEAN    46.95    43.40     3.55   350.77   480.17    16.77   543.29     0.42
 HUB     42.25    38.84     3.41   297.61   442.81    16.77   543.29     0.39

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   332.54   192.53   271.14  1155.78     0.29
 MEAN    17.51   337.21   198.49   272.60  1154.39     0.29
 HUB     14.85   362.85   237.57   274.27  1153.00     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   336.45   199.21     0.29  3816.21
 MEAN   346.18   310.04   147.70     0.27  3476.84     1.67
 HUB    293.65   279.94    56.08     0.24  3529.58

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.01     1.07    17.95   564.38     1.02   555.15     0.92     0.91
 MEAN    18.90     1.06    17.81   563.30     1.02   553.81     0.92     0.91
 HUB     18.92     1.07    17.66   563.47     1.02   552.48     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.38    36.31    31.50     4.81     0.93     0.41     2.90
 MEAN    36.06    28.45    23.50     4.95     0.92     0.42     3.28     0.91
 HUB     40.90    11.56     6.50     5.06     0.92     0.44     3.87


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.990

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     340.633     199.790     275.889    1154.617       0.295       0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.931      17.820     554.029      46.000      35.911      31.500      -4.411

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     285.638     199.790     348.576    1157.610       0.247       0.294

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.927      18.141     556.905     471.992       0.014       0.382

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     277.629       0.000     277.629    1158.002       0.240       0.292

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.151     557.282       0.000       0.060       0.043       0.304

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      18.893       1.064     563.718      11.455     220.441       1.709

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  71346.781       0.465     331.893  909973.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  0.998

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     82.317    2266.000      18.893     563.718       1.000       1.000       0.980
W Kg/sec =   37.41694

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     66.770    2173.636       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
  63325.230   64591.602       2.640     513.330     194.455     401.059       2.062

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   261.83    -0.09   261.83     0.23   365.32
 MEAN    16.97     0.00    -0.02   261.83    -0.09   261.83     0.23
 HUB     14.32     0.00    -0.02   261.83    -0.09   261.83     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.50    46.36     9.14   380.86   462.25    18.23   557.99     0.40
 MEAN    52.05    43.80     8.25   335.59   425.72    18.23   557.99     0.37
 HUB     47.25    37.84     9.41   283.17   385.73    18.23   557.99     0.33

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   328.13   179.14   274.92  1166.46     0.28
 MEAN    16.57   332.54   185.06   276.28  1165.17     0.29
 HUB     13.89   356.93   224.05   277.85  1163.87     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   336.59   194.21     0.29  3383.82
 MEAN   327.74   310.95   142.68     0.27  3068.77     1.49
 HUB    274.67   282.42    50.62     0.24  3113.33

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     20.06     1.06    18.99   574.46     1.02   565.47     0.92     0.91
 MEAN    19.95     1.06    18.86   573.46     1.02   564.23     0.92     0.91
 HUB     19.97     1.06    18.71   573.60     1.02   562.97     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.09    35.24    31.50     3.74     0.93     0.34     2.90
 MEAN    33.82    27.31    23.50     3.81     0.93     0.33     3.29     0.91
 HUB     38.88    10.33     6.50     3.83     0.93     0.34     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     328.951     186.105     271.244    1165.769       0.282       0.046

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.985      18.908     564.807      46.000      34.455      32.400      -2.055

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     284.478     186.105     339.945    1168.118       0.244       0.282

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.983      19.174     567.085     456.573       0.012       0.367

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     270.951       0.000     270.951    1168.764       0.232       0.271

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.219     567.712       0.000       0.060       0.038       0.321

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      19.952       1.056     573.842      10.123     235.010       1.822

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  63062.402       0.452     293.355  734534.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     82.317    2266.000      19.952     573.842       1.000       1.000       0.980
W Kg/sec =   37.41694

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     63.790    2154.378       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63325.230   64591.602       2.743     509.668     185.779     390.276       2.101

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   253.69    -0.09   253.69     0.22   344.41
 MEAN    15.91     0.00    -0.02   253.69    -0.09   253.69     0.22
 HUB     13.07     0.00    -0.02   253.69    -0.09   253.69     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.00    47.36     7.64   362.27   442.34    19.31   568.47     0.38
 MEAN    51.13    44.80     6.33   314.67   404.27    19.31   568.47     0.35
 HUB     45.54    38.84     6.70   258.45   362.22    19.31   568.47     0.31

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
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```
         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   313.41   164.90   266.52  1176.25     0.27
 MEAN    15.50   315.73   167.15   267.86  1174.93     0.27
 HUB     12.59   335.25   199.61   269.35  1173.60     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   327.23   189.85     0.28  2959.94
 MEAN   306.46   301.92   139.31     0.26  2591.76     1.47
 HUB    248.96   273.83    49.35     0.23  2514.28

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.01     1.05    20.00   583.24     1.02   575.04     0.92     0.91
 MEAN    20.88     1.05    19.86   582.07     1.01   573.75     0.92     0.91
 HUB     20.85     1.05    19.70   581.82     1.01   572.44     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     31.75    35.46    31.50     3.96     0.93     0.32     2.90
 MEAN    31.96    27.48    23.50     3.98     0.93     0.31     3.34     0.91
 HUB     36.54    10.38     6.50     3.88     0.93     0.31     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     319.162     170.211     269.986    1175.063       0.272      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.894      19.849     573.872      46.000      32.229      33.000       0.771

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     285.959     170.211     332.783    1176.779       0.243       0.186

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.893      20.051     575.549     440.827       0.021       0.339

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     268.438       0.000     268.438    1177.608       0.228       0.268

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.134     576.360       0.000       0.060       0.037       0.264

    STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.878      20.877       1.046     582.376       8.534     261.955       2.031

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   53174.066       0.423     247.356  774383.812

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     370970.16   1725.6877     80.4157      1.3819      0.8530     14.0280      1.1139


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 20% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.958

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      79.082    2266.000      15.107     522.810       1.000       1.000       0.980
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W Kg/sec = 35.94620

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
77.255	2257.076	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
60836.117	62052.707	3.696	831.557	224.983	619.754	2.755

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	177.81	-0.06	177.81	0.16	406.33
MEAN	17.06	0.00	-0.02	177.81	-0.06	177.81	0.16	
HUB	12.51	0.00	-0.02	177.81	-0.06	177.81	0.16	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	66.45	50.47	15.98	407.95	445.07	14.84	520.17	0.40
MEAN	62.21	47.20	15.01	337.36	381.40	14.84	520.17	0.34
HUB	54.30	38.62	15.68	247.38	304.70	14.84	520.17	0.27

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	367.91	277.54	241.51	1129.03	0.33
MEAN	18.04	373.26	282.64	243.80	1126.54	0.33
HUB	15.00	405.14	321.08	247.07	1123.37	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	407.95	274.47	130.41	0.24	5726.97	
MEAN	356.65	254.78	74.01	0.23	5098.82	1.72
HUB	296.62	248.28	24.46	0.22	4816.99	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.78	1.11	15.59	541.00	1.03	529.70	0.92	0.88
MEAN	16.59	1.10	15.37	539.01	1.03	527.37	0.92	0.88
HUB	16.50	1.09	15.08	538.11	1.03	524.40	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	48.97	28.37	24.20	4.17	0.93	0.49	2.90	
MEAN	49.22	16.89	12.70	4.19	0.95	0.44	3.51	0.88
HUB	52.42	-5.65	-9.30	3.65	0.95	0.31	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.958

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	376.701	282.095	249.651	1126.706	0.334	0.000

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
16.609	15.371	527.521	24.000	48.492	35.400	-13.092

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	266.773	282.095	388.260	1132.998	0.235	0.476

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.582	15.953	533.430	528.796	0.031	0.589

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	249.082	0.000	249.082	1133.807	0.220	0.464

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.963	534.192	0.000	0.060	0.088	0.484

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.814      16.510       1.093     539.374      16.564     170.456       1.321

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 103123.086       0.620     460.855  747667.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.966

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     79.082    2266.000      16.510     539.374       1.000       1.000       0.980
W Kg/sec =   35.94620

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     71.801    2222.149       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  60836.117   62052.707       2.824     590.487     209.101     474.134       2.267

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   238.62    -0.08   238.62     0.21   398.49
 MEAN    18.08     0.00    -0.02   238.62    -0.08   238.62     0.21
 HUB     15.21     0.00    -0.02   238.62    -0.08   238.62     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.58    46.36    13.22   406.37   471.32    16.01   534.62     0.42
 MEAN    56.28    42.30    13.98   357.49   429.88    16.01   534.62     0.38
 HUB     51.58    37.84    13.74   300.77   383.99    16.01   534.62     0.34

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   339.15   226.95   252.02  1144.66     0.30
 MEAN    18.01   339.90   226.07   253.82  1142.73     0.30
 HUB     15.22   361.35   255.15   255.88  1140.78     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   307.88   176.84     0.27  4636.07
 MEAN   356.14   285.21   130.07     0.25  4072.95     1.66
 HUB    301.03   259.96    45.88     0.23  3885.39

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.94      1.09    16.88   554.10     1.03   544.49     0.92     0.88
 MEAN    17.76      1.08    16.70   552.31     1.02   542.66     0.92     0.88
 HUB     17.70      1.07    16.51   551.71     1.02   540.81     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.00    35.06    31.50     3.56     0.93     0.43     2.90
 MEAN    41.69    27.13    23.50     3.63     0.95     0.42     3.30     0.88
 HUB     44.92    10.17     6.50     3.67     0.95     0.41     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.966

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     404.735     226.702     335.285    1138.899       0.355      -0.364

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.793      16.303     539.026      46.000      34.064      30.600      -3.464

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     342.159     226.702     410.447    1143.015       0.299       0.012

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.750      17.787      16.713     542.930     400.556       0.015       0.354

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     337.549       0.000     337.549    1143.291       0.295       0.373

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.750      16.715     543.191       0.000       0.060       0.041       0.014

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.855      17.759       1.076     552.707      13.333     195.771       1.518

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  83027.117       0.509     371.046  682932.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     79.082    2266.000      17.759     552.707       1.000       1.000       0.780
W Kg/sec =   35.94620

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     67.572    2195.183       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  60836.117   62052.707       2.206     434.156     196.789     339.175       1.724

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   313.94    -0.11   313.94     0.27   384.46
 MEAN    17.74     0.00    -0.02   313.94    -0.11   313.94     0.27
 HUB     15.05     0.00    -0.02   313.94    -0.11   313.94     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.66    46.36     5.30   396.88   506.12    16.85   544.48     0.44
 MEAN    48.18    43.40     4.78   350.77   470.83    16.85   544.48     0.41
 HUB     43.48    38.84     4.64   297.61   432.66    16.85   544.48     0.38

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   328.54   201.31   259.64  1157.04     0.28
 MEAN    17.51   332.04   205.03   261.17  1155.53     0.29
 HUB     14.85   356.10   240.22   262.87  1154.01     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   321.99   190.42     0.28  3990.15
 MEAN   346.18   296.87   141.15     0.26  3591.35     1.71
 HUB    293.65   268.24    53.44     0.23  3568.84

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.09     1.07    18.05   565.38     1.02   556.36     0.92     0.91
 MEAN    18.95     1.07    17.89   564.11     1.02   554.90     0.92     0.91
 HUB     18.94     1.07    17.73   564.04     1.02   553.45     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.79    36.26    31.50     4.76     0.93     0.43     2.90
 MEAN    38.13    28.39    23.50     4.89     0.92     0.44     3.28     0.91
 HUB     42.42    11.49     6.50     4.99     0.92     0.45     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.996

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	335.342	206.379	264.314	1155.750	0.290	0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.983	17.904	555.119	46.000	37.983	31.500	-6.483

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	273.358	206.379	342.515	1159.025	0.236	0.330

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.977	18.255	558.269	471.992	0.016	0.414

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	265.805	0.000	265.805	1159.377	0.229	0.320

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.257	558.609	0.000	0.060	0.051	0.332

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.871	18.938	1.066	564.509	11.802	210.965	1.635

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
73506.969	0.479	328.501	870697.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =15.012 EfDer = 0.994

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
79.082	2266.000	18.938	564.509	1.000	1.000	0.980

W Kg/sec = 35.94620

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
64.037	2172.114	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
60836.117	62052.707	2.753	513.330	186.496	401.059	2.150

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	250.75	-0.09	250.75	0.22	365.07
MEAN	16.97	0.00	-0.02	250.75	-0.09	250.75	0.22	
HUB	14.32	0.00	-0.02	250.75	-0.09	250.75	0.22	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.65	46.36	10.29	380.86	456.06	18.33	559.26	0.39
MEAN	53.24	43.80	9.44	335.59	418.99	18.33	559.26	0.36
HUB	48.48	37.84	10.64	283.17	378.30	18.33	559.26	0.33

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	323.14	187.64	263.08	1168.07	0.28
MEAN	16.57	326.42	191.30	264.49	1166.67	0.28
HUB	13.89	349.30	226.30	266.09	1165.25	0.30

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	322.02	185.70	0.28	3544.31	
MEAN	327.74	297.61	136.44	0.26	3172.07	1.54
HUB	274.67	270.45	48.37	0.23	3144.56	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.16	1.06	19.12	575.76	1.02	567.04	0.92	0.91
MEAN	20.03	1.06	18.97	574.58	1.02	565.68	0.92	0.91
HUB	20.02	1.06	18.81	574.49	1.02	564.30	0.92	0.91

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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.50    35.22    31.50     3.72     0.93     0.36     2.90
 MEAN    35.88    27.29    23.50     3.79     0.94     0.36     3.29     0.91
 HUB     40.38    10.30     6.50     3.80     0.94     0.36     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     323.196     192.377     259.704    1167.226       0.277       0.044

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.061      19.020     566.223      46.000      36.529      32.400      -4.129

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     272.084     192.377     333.225    1169.842       0.233       0.316

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.059      19.316     568.763     456.573       0.013       0.398

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     259.246       0.000     259.246    1170.427       0.221       0.300

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.352     569.333       0.000       0.060       0.042       0.349

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.873      20.026       1.057     574.944      10.435     224.804       1.743

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  65007.055       0.466     290.515  703417.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.999

   W act       RPM act         Pt          Tt           POTS        POTH       AeroBl
     79.082    2266.000       20.026     574.944       1.000       1.000       0.980
W Kg/sec =   35.94620

   W cor       RPM cor         GAMMA       Cp          R           Blades       THK
     61.117    2152.312        1.402       0.249      53.349      56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  60836.117   62052.707        2.863     509.668     177.995     390.276       2.193

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   242.80    -0.08   242.80      0.21   344.08
 MEAN    15.91      0.00    -0.02   242.80    -0.08   242.80      0.21
 HUB     13.07      0.00    -0.02   242.80    -0.08   242.80      0.21

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     56.18    47.36     8.82   362.27   436.18     19.43    570.02      0.37
 MEAN    52.35    44.80     7.55   314.67   397.52     19.43    570.02      0.34
 HUB     46.80    38.84     7.96   258.45   354.67     19.43    570.02      0.30

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   308.25   173.42   254.84  1178.15      0.26
 MEAN    15.50   309.36   173.37   256.21  1176.71      0.26
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 HUB     12.59   327.40   201.90   257.74  1175.26     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   312.77   181.34     0.27  3112.68
 MEAN   306.46   288.72   133.08     0.25  2688.23     1.52
 HUB    248.96   262.00    47.07     0.22  2542.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.15     1.06    20.16   584.82     1.02   576.89     0.92     0.91
 MEAN    20.99     1.05    20.00   583.48     1.01   575.49     0.92     0.91
 HUB     20.94     1.05    19.84   583.02     1.01   574.07     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.24    35.43    31.50     3.93     0.93     0.35     2.90
 MEAN    34.09    27.45    23.50     3.95     0.93     0.34     3.34     0.91
 HUB     38.07    10.35     6.50     3.85     0.93     0.33     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     312.834     176.554     258.251    1176.828       0.266      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.003      19.996     575.602      46.000      34.359      33.000      -1.359

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     273.224     176.554     325.304    1178.808       0.232       0.224

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.002      20.230     577.540     440.827       0.021       0.370

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     256.568       0.000     256.568    1179.559       0.218       0.302

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.305     578.277       0.000       0.060       0.037       0.297

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      20.986       1.048     583.773       8.828     249.846       1.937

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  55005.613       0.437     245.819  741390.938

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    379669.84   1696.7351     77.2548      1.3891      0.8475     15.0123      1.1166


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 20% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.950

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      75.973    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   34.53327

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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    74.218    2257.076       1.402       0.249      53.349      32.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
58444.840   59613.613       3.847     831.557     216.140     619.754       2.867

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   170.65    -0.06   170.65     0.15   406.33
MEAN    17.06     0.00    -0.02   170.65    -0.06   170.65     0.15
HUB     12.51     0.00    -0.02   170.65    -0.06   170.65     0.15

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     67.30    50.47    16.83   407.95   442.26    14.86   520.38     0.40
MEAN    63.17    47.20    15.97   337.36   378.11    14.86   520.38     0.34
HUB     55.41    38.62    16.79   247.38   300.58    14.86   520.38     0.27

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

        R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   365.41   282.51   231.77  1129.54     0.32
MEAN    18.04   369.02   285.36   233.97  1126.99     0.33
HUB     15.00   398.17   319.90   237.07  1123.81     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    407.95   263.54   125.44     0.23  5829.34
MEAN   356.65   244.59    71.29     0.22  5147.82     1.78
HUB    296.62   238.21    23.28     0.21  4799.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.79     1.11    15.62   541.33     1.04   530.17     0.92     0.87
MEAN    16.59     1.10    15.40   539.16     1.03   527.79     0.92     0.87
HUB     16.49     1.09    15.11   538.06     1.03   524.81     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     50.63    28.42    24.20     4.22     0.93     0.51     2.90
MEAN    50.65    16.95    12.70     4.25     0.95     0.46     3.51     0.87
HUB     53.46    -5.61    -9.30     3.69     0.95     0.33     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.950

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     372.173     284.809     239.576    1127.159       0.330       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.610      15.400     527.946      24.000      49.930      35.400     -14.530

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     255.829     284.809     382.837    1133.655       0.226       0.501

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.579      16.001     534.049     528.796       0.034       0.613

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     239.034       0.000     239.034    1134.392       0.211       0.479

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.997     534.743       0.000       0.060       0.097       0.498

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.802      16.501       1.092     539.515      16.705     165.927       1.286

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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 104003.922       0.625     446.521  717563.875


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.958

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     75.973    2266.000      16.501     539.515       1.000       1.000       0.980
W Kg/sec =   34.53327

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     69.027    2221.858       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 58444.840   59613.613       2.937     590.487     201.025     474.134       2.359

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   229.03    -0.08   229.03     0.20   398.44
MEAN    18.08     0.00    -0.02   229.03    -0.08   229.03     0.20
HUB     15.21     0.00    -0.02   229.03    -0.08   229.03     0.20

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.60    46.36    14.24   406.37   466.53    16.04   535.13     0.41
MEAN    57.36    42.30    15.06   357.49   424.63    16.04   535.13     0.37
HUB     52.72    37.84    14.88   300.77   378.11    16.04   535.13     0.33

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   336.50   233.89   241.92  1145.44     0.29
MEAN    18.01   335.86   231.14   243.68  1143.42     0.29
HUB     15.22   355.43   256.84   245.70  1141.39     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   295.62   169.91     0.26  4777.69
MEAN   356.14   273.87   125.00     0.24  4164.18     1.71
HUB    301.03   249.64    44.19     0.22  3911.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.96     1.09    16.92   554.69     1.03   545.23     0.92     0.88
MEAN    17.77     1.08    16.74   552.74     1.02   543.32     0.92     0.88
HUB     17.69     1.07    16.54   551.94     1.02   541.39     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     44.03    35.08    31.50     3.58     0.93     0.45     2.90
MEAN    43.49    27.16    23.50     3.66     0.95     0.44     3.30     0.88
HUB     46.27    10.20     6.50     3.70     0.95     0.43     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.958

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     396.262     231.785     321.402    1139.935       0.348      -0.341

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.798      16.369     540.008      46.000      35.798      30.600      -5.198

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     327.663     231.785     401.357    1144.304       0.286       0.068

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      17.790      16.804     544.156     400.556       0.017       0.380

   VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	323.345	0.000	323.345	1144.550	0.283	0.401

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	16.800	544.390	0.000	0.060	0.046	0.064

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.844	17.759	1.076	553.122	13.607	188.898	1.464

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
84730.938	0.520	363.776	654816.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =15.972 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
75.973	2266.000	17.759	553.122	1.000	1.000	0.780

W Kg/sec = 34.53327

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
64.939	2194.359	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
58444.840	59613.613	2.296	434.156	189.121	339.175	1.793

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	300.89	-0.10	300.89	0.26	384.32
MEAN	17.74	0.00	-0.02	300.89	-0.10	300.89	0.26	
HUB	15.05	0.00	-0.02	300.89	-0.10	300.89	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.84	46.36	6.48	396.88	498.13	16.93	545.56	0.43
MEAN	49.39	43.40	5.99	350.77	462.22	16.93	545.56	0.40
HUB	44.70	38.84	5.86	297.61	423.28	16.93	545.56	0.37

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	325.34	209.55	248.86	1158.19	0.28
MEAN	17.51	327.54	211.13	250.42	1156.57	0.28
HUB	14.85	349.92	242.63	252.14	1154.94	0.30

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	308.42	182.18	0.27	4153.30	
MEAN	346.18	284.52	135.06	0.25	3697.96	1.76
HUB	293.65	257.25	51.02	0.22	3604.60	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.15	1.08	18.12	566.31	1.02	557.47	0.92	0.91
MEAN	18.99	1.07	17.96	564.86	1.02	555.91	0.92	0.91
HUB	18.96	1.07	17.79	564.57	1.02	554.34	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.10	36.21	31.50	4.71	0.93	0.45	2.90	
MEAN	40.13	28.34	23.50	4.84	0.92	0.45	3.28	0.91
HUB	43.90	11.44	6.50	4.94	0.92	0.47	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	330.745	212.513	253.437	1156.781	0.286	0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.022	17.971	556.113	46.000	39.981	31.500	-8.481

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	261.850	212.513	337.235	1160.322	0.226	0.364

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.013	18.349	559.522	471.992	0.018	0.446

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	254.737	0.000	254.737	1160.640	0.219	0.345

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.341	559.829	0.000	0.060	0.060	0.357

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.869	18.968	1.068	565.247	12.125	202.389	1.569

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
75521.148	0.492	324.236	833432.062

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =15.972 EfDer = 0.989

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
75.973	2266.000	18.968	565.247	1.000	1.000	0.980

W Kg/sec = 34.53327

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
61.464	2170.695	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
58444.840	59613.613	2.868	513.330	179.003	401.059	2.241

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	240.37	-0.08	240.37	0.21	364.83
MEAN	16.97	0.00	-0.02	240.37	-0.08	240.37	0.21	
HUB	14.32	0.00	-0.02	240.37	-0.08	240.37	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.75	46.36	11.39	380.86	450.44	18.41	560.42	0.39
MEAN	54.39	43.80	10.59	335.59	412.86	18.41	560.42	0.36
HUB	49.68	37.84	11.84	283.17	371.50	18.41	560.42	0.32

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	318.98	195.49	252.06	1169.54	0.27
MEAN	16.57	321.07	197.05	253.49	1168.04	0.27
HUB	13.89	342.37	228.34	255.10	1166.51	0.29

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	308.49	177.86	0.26	3692.41	
MEAN	327.74	285.19	130.69	0.24	3267.27	1.58
HUB	274.67	259.27	46.33	0.22	3172.85	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.24	1.07	19.22	576.97	1.02	568.47	0.92	0.90
MEAN	20.09	1.06	19.06	575.62	1.02	567.01	0.92	0.90
HUB	20.06	1.06	18.89	575.32	1.02	565.53	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	37.80	35.21	31.50	3.71	0.93	0.39	2.90	

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 MEAN    37.86    27.27    23.50     3.77     0.94     0.38     3.29     0.90
 HUB     41.83    10.29     6.50     3.79     0.94     0.38     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     318.176     198.157     248.938    1168.556       0.272        0.042

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.117      19.106     567.518      46.000      38.520      32.400      -6.120

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     260.557     198.157     327.347    1171.419       0.222        0.349

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.113      19.430     570.302     456.573       0.014        0.429

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096     248.373       0.000     248.373    1171.951       0.212        0.327

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      19.456     570.820       0.000       0.060       0.049        0.373

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.864       20.075       1.058     575.970      10.723     215.662        1.672

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  66797.664       0.479     286.783  673817.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.996

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     75.973     2266.000       20.075     575.970       1.000        1.000        0.980
W Kg/sec =   34.53327

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     58.622     2150.394        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  58444.840   59613.613        2.985     509.668     170.728     390.276        2.286

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   232.68     -0.08   232.68      0.20   343.78
 MEAN    15.91      0.00    -0.02   232.68     -0.08   232.68      0.20
 HUB     13.07      0.00    -0.02   232.68     -0.08   232.68      0.20

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     57.29     47.36     9.93   362.27   430.62     19.53   571.45      0.37
 MEAN    53.53     44.80     8.73   314.67   391.42     19.53   571.45      0.33
 HUB     48.01     38.84     9.17   258.45   347.82     19.53   571.45      0.30

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   303.99    181.25    244.05   1179.86      0.26
 MEAN    15.50   303.83    179.08    245.44   1178.33      0.26
 HUB     12.59   320.30    203.95    246.97   1176.78      0.27

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
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 TIP    354.76   299.44   173.51     0.25  3253.01
 MEAN   306.46   276.53   127.38     0.23  2776.56     1.56
 HUB    248.96   251.04    45.01     0.21  2568.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.24     1.06    20.28   586.30     1.02   578.58     0.92     0.91
 MEAN    21.07     1.05    20.12   584.78     1.02   577.08     0.92     0.91
 HUB     20.99     1.05    19.94   584.12     1.01   575.56     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.60    35.41    31.50     3.91     0.93     0.38     2.90
 MEAN    36.12    27.43    23.50     3.93     0.93     0.36     3.34     0.91
 HUB     39.55    10.33     6.50     3.83     0.93     0.35     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     307.342     182.362     247.393    1178.437       0.261      -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.083      20.108     577.182      46.000      36.395      33.000      -3.395

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     261.491     182.362     318.800    1180.658       0.221       0.261

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.080      20.371     579.359     440.827       0.023       0.401

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     245.636       0.000     245.636    1181.341       0.208       0.332

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.436     580.031       0.000       0.060       0.041       0.327

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      21.062       1.049     585.068       9.098     239.131       1.854

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   56683.789       0.450     243.361  710037.250

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     387737.44   1664.6786     74.2182      1.3942      0.8395     15.9719      1.1191


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 20% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =17.022   EfDer =  0.940

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      72.622    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   33.00999

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      70.944    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 55866.812   56984.027       4.025     831.557     206.605     619.754       3.000

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   162.95    -0.06   162.95     0.15   406.33
MEAN    17.06     0.00    -0.02   162.95    -0.06   162.95     0.15
HUB     12.51     0.00    -0.02   162.95    -0.06   162.95     0.15

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     68.23    50.47    17.76   407.95   439.34    14.88   520.59     0.39
MEAN    64.22    47.20    17.02   337.36   374.70    14.88   520.59     0.33
HUB     56.63    38.62    18.01   247.38   296.27    14.88   520.59     0.26

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   363.05   287.76   221.35  1130.06     0.32
MEAN    18.04   364.70   288.23   223.45  1127.45     0.32
HUB     15.00   390.78   318.56   226.35  1124.26     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    407.95   251.87   120.19     0.22  5937.73
MEAN   356.65   233.69    68.42     0.21  5199.54     1.85
HUB    296.62   227.41    21.94     0.20  4779.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.81     1.11    15.64   541.67     1.04   530.66     0.92     0.86
MEAN    16.59     1.10    15.43   539.33     1.03   528.22     0.92     0.86
HUB     16.46     1.09    15.14   537.99     1.03   525.24     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     52.43    28.50    24.20     4.30     0.93     0.54     2.90
MEAN    52.22    17.03    12.70     4.33     0.95     0.49     3.51     0.86
HUB     54.60    -5.54    -9.30     3.76     0.95     0.36     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.940

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     367.563     287.674     228.793    1127.622       0.326       0.001

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    16.607      15.427     528.379      24.000      51.504      35.400     -16.104

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     244.135     287.674     377.304    1134.331       0.215       0.528

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.573      16.046     534.685     528.796       0.038       0.640

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     228.278       0.000     228.278    1134.994       0.201       0.495

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.029     535.311       0.000       0.060       0.108       0.514

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.788      16.488       1.091     539.663      16.853     161.073       1.249

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 104926.555       0.630     430.612  685209.375
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =17.022   EfDer =  0.948

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    72.622    2266.000      16.488     539.663       1.000       1.000       0.980
W Kg/sec =   33.00999

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    66.041    2221.552       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 55866.812   56984.027       3.070     590.487     192.329     474.134       2.465

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   218.76    -0.08   218.76     0.19   398.38
MEAN    18.08     0.00    -0.02   218.76    -0.08   218.76     0.19
HUB     15.21     0.00    -0.02   218.76    -0.08   218.76     0.19

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     61.71    46.36    15.35   406.37   461.58    16.07   535.67     0.41
MEAN    58.54    42.30    16.24   357.49   419.18    16.07   535.67     0.37
HUB     53.98    37.84    16.14   300.77   371.97    16.07   535.67     0.33

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   334.07   241.21   231.14  1146.23     0.29
MEAN    18.01   331.88   236.48   232.85  1144.13     0.29
HUB     15.22   349.32   258.62   234.81  1142.01     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   282.60   162.59     0.25  4926.97
MEAN   356.14   261.80   119.66     0.23  4260.42     1.77
HUB    301.03   238.61    42.40     0.21  3938.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.98     1.09    16.95   555.31     1.03   545.99     0.92     0.87
MEAN    17.77     1.08    16.76   553.19     1.03   544.00     0.92     0.87
HUB     17.67     1.07    16.56   552.17     1.02   541.98     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.22    35.12    31.50     3.62     0.93     0.48     2.90
MEAN    45.44    27.20    23.50     3.70     0.95     0.46     3.30     0.87
HUB     47.76    10.24     6.50     3.74     0.95     0.45     3.92


  blockage3   Cor/U1    Cor/Incid
     0.750       1.000       0.948

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     387.653     237.147     306.652    1140.989       0.340       -0.317

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.798      16.430     541.009      46.000      37.716      30.600      -7.116

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
    17.960     312.312     237.147     392.145    1145.623       0.273       0.127

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.750      17.788      16.892     545.413     400.556       0.019       0.409

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
    17.823     308.320       0.000     308.320    1145.841       0.269       0.429
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	16.880	545.620	0.000	0.060	0.053	0.116

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.831	17.752	1.077	553.559	13.896	181.731	1.409

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
86528.609	0.531	355.108	624685.562

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =17.022 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
72.622	2266.000	17.752	553.559	1.000	1.000	0.780

W Kg/sec = 33.00999

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
62.123	2193.492	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
55866.812	56984.027	2.400	434.156	180.921	339.175	1.875

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	287.06	-0.10	287.06	0.25	384.17
MEAN	17.74	0.00	-0.02	287.06	-0.10	287.06	0.25	
HUB	15.05	0.00	-0.02	287.06	-0.10	287.06	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.13	46.36	7.77	396.88	489.89	16.99	546.68	0.43
MEAN	50.71	43.40	7.31	350.77	453.34	16.99	546.68	0.40
HUB	46.04	38.84	7.20	297.61	413.56	16.99	546.68	0.36

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	322.50	218.18	237.49	1159.37	0.28
MEAN	17.51	323.21	217.51	239.07	1157.63	0.28
HUB	14.85	343.64	245.17	240.79	1155.89	0.30

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	294.15	173.55	0.25	4324.16	
MEAN	346.18	271.49	128.67	0.23	3809.68	1.81
HUB	293.65	245.63	48.48	0.21	3642.28	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.20	1.08	18.19	567.29	1.02	558.60	0.92	0.91
MEAN	19.02	1.07	18.02	565.66	1.02	556.93	0.92	0.91
HUB	18.96	1.07	17.83	565.12	1.02	555.26	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.57	36.16	31.50	4.66	0.93	0.48	2.90	
MEAN	42.30	28.29	23.50	4.79	0.93	0.47	3.28	0.91
HUB	45.52	11.38	6.50	4.88	0.93	0.48	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	326.304	218.942	241.949	1157.838	0.282	0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.050	18.027	557.132	46.000	42.142	31.500	-10.642

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	249.727	218.942	332.113	1161.659	0.215	0.401

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.038	18.434	560.816	471.992	0.022	0.480

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	243.082	0.000	243.082	1161.942	0.209	0.370

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.414	561.089	0.000	0.060	0.072	0.382

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.863	18.985	1.069	566.023	12.464	193.637	1.501

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
77632.234	0.506	318.598	793723.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =17.022 EfDer = 0.981

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
72.622	2266.000	18.985	566.023	1.000	1.000	0.980

W Kg/sec = 33.00999

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
58.739	2169.207	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
55866.812	56984.027	3.001	513.330	171.069	401.059	2.344

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	229.43	-0.08	229.43	0.20	364.58
MEAN	16.97	0.00	-0.02	229.43	-0.08	229.43	0.20	
HUB	14.32	0.00	-0.02	229.43	-0.08	229.43	0.20	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.94	46.36	12.58	380.86	444.69	18.48	561.63	0.38
MEAN	55.65	43.80	11.85	335.59	406.58	18.48	561.63	0.35
HUB	50.99	37.84	13.15	283.17	364.51	18.48	561.63	0.31

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	315.15	203.65	240.51	1171.05	0.27
MEAN	16.57	315.84	203.03	241.94	1169.44	0.27
HUB	13.89	335.29	230.46	243.54	1167.82	0.29

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	294.35	169.70	0.25	3846.41	
MEAN	327.74	272.19	124.71	0.23	3366.32	1.64
HUB	274.67	247.52	44.21	0.21	3202.17	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.30	1.07	19.30	578.23	1.02	569.94	0.92	0.90
MEAN	20.13	1.06	19.14	576.71	1.02	568.38	0.92	0.90
HUB	20.07	1.06	18.96	576.19	1.02	566.80	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	40.26	35.21	31.50	3.71	0.93	0.42	2.90	
MEAN	40.00	27.27	23.50	3.77	0.94	0.41	3.29	0.90
HUB	43.42	10.29	6.50	3.79	0.94	0.40	3.90	

```
   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481      313.294     204.171     237.629     1169.922       0.268       0.040

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     20.158      19.177      568.850      46.000      40.669      32.400      -8.269

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481      248.482     204.171     321.603     1173.044       0.212       0.384

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       20.151      19.530      571.890     456.573       0.017       0.463

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096      236.991       0.000     236.991     1173.522       0.202       0.353

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       19.543      572.355       0.000       0.060       0.059       0.397

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4           PR4        Texit        Del T        Ns        Ns nondim
      0.853       20.108        1.059      577.045      11.021     206.398       1.600

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  68658.953       0.493     281.772  642199.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =17.022   EfDer =  0.991

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     72.622     2266.000       20.108      577.045       1.000        1.000        0.980
W Kg/sec =   33.00999

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     55.998     2148.391        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  55866.812   56984.027        3.125      509.668     163.087      390.276       2.393

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00     -0.02   222.07     -0.08   222.07      0.19    343.46
 MEAN    15.91      0.00     -0.02   222.07     -0.08   222.07      0.19
 HUB     13.07      0.00     -0.02   222.07     -0.08   222.07      0.19

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     58.50     47.36    11.14   362.27   424.99     19.61   572.93      0.36
 MEAN    54.79     44.80     9.99   314.67   385.21     19.61   572.93      0.33
 HUB     49.34     38.84    10.50   258.45   340.82     19.61   572.93      0.29

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   300.08    189.33    232.81   1181.62      0.25
 MEAN    15.50   298.46    185.01    234.20   1179.99      0.25
 HUB     12.59   313.13    206.12    235.72   1178.35      0.27

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    354.76    285.60    165.43      0.24   3397.94
 MEAN   306.46    263.82    121.45      0.22   2868.45      1.62
 HUB    248.96    239.59     42.85      0.20   2596.00
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    21.32     1.06    20.39   587.83     1.02   580.31     0.92     0.91
 MEAN   21.13     1.05    20.21   586.15     1.02   578.71     0.92     0.91
 HUB    21.03     1.05    20.02   585.28     1.01   577.10     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    39.12    35.40    31.50     3.90     0.93     0.40     2.90
 MEAN   38.31    27.41    23.50     3.91     0.94     0.39     3.34     0.91
 HUB    41.17    10.30     6.50     3.80     0.94     0.37     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.991

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     302.032     188.404     236.067    1180.087       0.256      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.142      20.200     578.806      46.000      38.593      33.000      -5.593

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     249.293     188.404     312.479    1182.559       0.211       0.299

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.137      20.491     581.233     440.827       0.026       0.435

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     234.274       0.000     234.274    1183.176       0.198       0.363

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.546     581.840       0.000       0.060       0.047       0.356

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      21.116       1.050     586.422       9.377     228.379       1.770

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  58424.344       0.464     239.770  676571.188

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    396170.66   1625.8583     70.9444      1.3978      0.8283     17.0217      1.1217


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 60%  Stat 2 20% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =18.040   EfDer =  0.929

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     69.419    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   31.55391

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     67.815    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  53402.504   54470.438       4.211     831.557     197.492     619.754       3.138

     ROTOR LEADING EDGE CONDITIONS, STAGE            1
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   155.62    -0.05   155.62     0.14   406.33
MEAN    17.06     0.00    -0.02   155.62    -0.05   155.62     0.14
HUB     12.51     0.00    -0.02   155.62    -0.05   155.62     0.14

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     69.12    50.47    18.65   407.95   436.67    14.90   520.79     0.39
MEAN    65.24    47.20    18.04   337.36   371.57    14.90   520.79     0.33
HUB     57.83    38.62    19.21   247.38   292.30    14.90   520.79     0.26

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   361.09   292.69   211.47  1130.53     0.32
MEAN    18.04   360.83   290.92   213.46  1127.86     0.32
HUB     15.00   383.89   317.23   216.17  1124.67     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    407.95   240.84   115.26     0.21  6039.33
MEAN   356.65   223.35    65.73     0.20  5248.00     1.92
HUB    296.62   217.15    20.62     0.19  4759.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.82     1.11    15.67   541.99     1.04   531.10     0.92     0.85
MEAN    16.58     1.10    15.45   539.48     1.03   528.61     0.92     0.85
HUB     16.44     1.09    15.17   537.93     1.03   525.62     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     54.15    28.59    24.20     4.39     0.93     0.56     2.90
MEAN    53.73    17.12    12.70     4.42     0.95     0.51     3.51     0.85
HUB     55.73    -5.45    -9.30     3.85     0.95     0.38     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.929

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    18.071     363.425     290.358     218.564    1128.038       0.322       0.001

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    16.602      15.448     528.770      24.000      53.030      35.400     -17.630

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     233.059     290.358     372.322    1134.945       0.205       0.555

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.565      16.085     535.265     528.796       0.041       0.667

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     218.066       0.000     218.066    1135.544       0.192       0.511

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.055     535.829       0.000       0.060       0.118       0.529

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.774      16.474       1.090     539.801      16.991     156.448       1.213

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 105784.961       0.636     414.985  654374.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =18.040   EfDer =  0.936
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
69.419	2266.000	16.474	539.801	1.000	1.000	0.980

W Kg/sec = 31.55391

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
63.191	2221.269	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
53402.504	54470.438	3.209	590.487	184.027	474.134	2.576

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	209.01	-0.07	209.01	0.18	398.33
MEAN	18.08	0.00	-0.02	209.01	-0.07	209.01	0.18	
HUB	15.21	0.00	-0.02	209.01	-0.07	209.01	0.18	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.79	46.36	16.43	406.37	457.03	16.09	536.15	0.40
MEAN	59.69	42.30	17.39	357.49	414.17	16.09	536.15	0.36
HUB	55.21	37.84	17.37	300.77	366.32	16.09	536.15	0.32

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	332.19	248.05	220.95	1146.95	0.29
MEAN	18.01	328.41	241.46	222.60	1144.78	0.29
HUB	15.22	343.68	260.23	224.49	1142.58	0.30

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	270.33	155.74	0.24	5066.73	
MEAN	356.14	250.40	114.68	0.22	4349.93	1.83
HUB	301.03	228.17	40.80	0.20	3962.60	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.99	1.09	16.97	555.89	1.03	546.68	0.92	0.86
MEAN	17.77	1.08	16.78	553.62	1.03	544.61	0.92	0.86
HUB	17.65	1.07	16.58	552.39	1.02	542.52	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	48.31	35.18	31.50	3.68	0.93	0.50	2.90	
MEAN	47.33	27.26	23.50	3.76	0.95	0.48	3.30	0.86
HUB	49.22	10.30	6.50	3.80	0.95	0.47	3.92	

blockage3	Cor/U1	Cor/Incid
0.750	1.000	0.936

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	379.915	242.135	292.756	1141.939	0.333	-0.294

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.792	16.478	541.912	46.000	39.594	30.600	-8.994

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	297.892	242.135	383.887	1146.820	0.260	0.183

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.750	17.779	16.964	546.555	400.556	0.022	0.439

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	294.215	0.000	294.215	1147.011	0.257	0.453

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.750	16.944	546.736	0.000	0.060	0.063	0.164

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.816	17.738	1.077	553.965	14.164	175.100	1.357

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
88201.211	0.541	346.005	596049.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =18.040 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
69.419	2266.000	17.738	553.965	1.000	1.000	0.780

W Kg/sec = 31.55391

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
59.453	2192.688	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
53402.504	54470.438	2.507	434.156	173.144	339.175	1.959

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	274.06	-0.09	274.06	0.24	384.02
MEAN	17.74	0.00	-0.02	274.06	-0.09	274.06	0.24	
HUB	15.05	0.00	-0.02	274.06	-0.09	274.06	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.38	46.36	9.02	396.88	482.38	17.05	547.69	0.42
MEAN	52.01	43.40	8.61	350.77	445.21	17.05	547.69	0.39
HUB	47.37	38.84	8.53	297.61	404.64	17.05	547.69	0.35

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	320.34	226.18	226.85	1160.43	0.28
MEAN	17.51	319.56	223.48	228.42	1158.60	0.28
HUB	14.85	337.96	247.49	230.14	1156.76	0.29

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	280.84	165.55	0.24	4482.53	
MEAN	346.18	259.29	122.71	0.22	3914.00	1.87
HUB	293.65	234.72	46.16	0.20	3676.65	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.23	1.08	18.24	568.20	1.03	559.63	0.92	0.91
MEAN	19.04	1.07	18.06	566.39	1.02	557.87	0.92	0.91
HUB	18.96	1.07	17.86	565.64	1.02	556.10	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.92	36.12	31.50	4.62	0.93	0.50	2.90	
MEAN	44.37	28.24	23.50	4.74	0.93	0.49	3.28	0.91
HUB	47.08	11.34	6.50	4.84	0.93	0.50	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	322.558	224.944	231.179	1158.795	0.278	0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.064	18.064	558.056	46.000	44.217	31.500	-12.717

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	238.387	224.944	327.762	1162.881	0.205	0.436

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.049	18.498	561.999	471.992	0.025	0.514

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	232.177	0.000	232.177	1163.133	0.200	0.394

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.466	562.243	0.000	0.060	0.085	0.405

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.854	18.987	1.070	566.744	12.779	185.697	1.440

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
79590.805	0.519	312.227	756183.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =18.040 EfDer = 0.973

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
69.419	2266.000	18.987	566.744	1.000	1.000	0.980

W Kg/sec = 31.55391

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
56.178	2167.826	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
53402.504	54470.438	3.138	513.330	163.609	401.059	2.451

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	219.18	-0.08	219.18	0.19	364.35
MEAN	16.97	0.00	-0.02	219.18	-0.08	219.18	0.19	
HUB	14.32	0.00	-0.02	219.18	-0.08	219.18	0.19	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.08	46.36	13.72	380.86	439.49	18.52	562.73	0.38
MEAN	56.86	43.80	13.06	335.59	400.89	18.52	562.73	0.34
HUB	52.27	37.84	14.43	283.17	358.15	18.52	562.73	0.31

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	312.07	211.20	229.75	1172.41	0.27
MEAN	16.57	311.31	208.53	231.15	1170.72	0.27
HUB	13.89	328.91	232.42	232.73	1169.01	0.28

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	281.21	162.15	0.24	3988.86	
MEAN	327.74	260.08	119.21	0.22	3457.41	1.70
HUB	274.67	236.54	42.25	0.20	3229.36	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.34	1.07	19.36	579.41	1.02	571.28	0.92	0.89
MEAN	20.15	1.06	19.19	577.72	1.02	569.63	0.92	0.89
HUB	20.08	1.06	19.00	577.00	1.02	567.96	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.59	35.21	31.50	3.71	0.93	0.44	2.90	
MEAN	42.05	27.28	23.50	3.78	0.94	0.43	3.29	0.89
HUB	44.96	10.29	6.50	3.79	0.94	0.42	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.973

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     309.087     209.701     227.069    1171.167       0.264       0.038

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.180      19.225     570.065      46.000      42.723      32.400     -10.323

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     237.234     209.701     316.630    1174.529       0.202       0.418

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.170      19.603     573.343     456.573       0.020       0.496

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     226.390       0.000     226.390    1174.958       0.193       0.377

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.604     573.762       0.000       0.060       0.070       0.418

    STAGE EXIT CONDITIONS, STAGE             4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.839      20.119       1.060     578.042      11.297     198.032       1.535

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  70377.555       0.505     276.085  612238.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =18.040   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     69.419    2266.000      20.119     578.042       1.000       1.000       0.980
W Kg/sec =   31.55391

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     53.544    2146.538       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  53402.504   54470.438       3.268     509.668     155.941     390.276       2.503

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   212.19    -0.07   212.19     0.18   343.16
 MEAN    15.91     0.00    -0.02   212.19    -0.07   212.19     0.18
 HUB     13.07     0.00    -0.02   212.19    -0.07   212.19     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.65    47.36    12.29   362.27   419.90    19.67   574.28     0.36
 MEAN    56.01    44.80    11.21   314.67   379.59    19.67   574.28     0.32
 HUB     50.62    38.84    11.78   258.45   334.46    19.67   574.28     0.28

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   296.96   196.80   222.39  1183.22     0.25
 MEAN    15.50   293.85   190.46   223.76  1181.51     0.25
 HUB     12.59   306.62   208.03   225.26  1179.78     0.26

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   272.78   157.96     0.23  3531.91
 MEAN   306.46   252.04   115.99     0.21  2952.90     1.67
 HUB    248.96   228.95    40.93     0.19  2620.04

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.37     1.06    20.46   589.25     1.02   581.89     0.92     0.90
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 MEAN    21.16     1.05    20.27   587.41     1.02   580.21     0.92     0.90
 HUB     21.04     1.05    20.08   586.36     1.01   578.51     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.51    35.39    31.50     3.89     0.93     0.43     2.90
 MEAN    40.40    27.40    23.50     3.90     0.94     0.41     3.34     0.90
 HUB     42.72    10.30     6.50     3.80     0.94     0.39     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     297.474     193.956     225.548    1181.590       0.252       -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.175      20.261     580.287      46.000      40.693      33.000      -7.693

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     238.000     193.956     307.023    1184.293       0.201       0.334

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.166      20.577     582.946     440.827       0.030       0.468

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     223.755       0.000     223.755    1184.851       0.189       0.390

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.622     583.495       0.000       0.060       0.056       0.382

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      21.142       1.051     587.675       9.633     218.765       1.696

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  60022.555       0.477     235.463  644878.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     403977.09   1584.7649     67.8150      1.3995      0.8154     18.0398      1.1241

*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

    Fan-Core + 4 Stage LPC 60% Stat 2 27% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.353   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     113.333    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   51.51516

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     110.715    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   87185.352   88928.875       2.579     831.557     322.427     619.754       1.922

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   258.44    -0.09   258.44     0.23   406.33
  MEAN    17.06     0.00    -0.02   258.44    -0.09   258.44     0.23
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HUB     12.51     0.00    -0.02   258.44    -0.09   258.44     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.65    50.47     7.18   407.95   483.00    14.55   517.23     0.43
MEAN    52.55    47.20     5.35   337.36   425.04    14.55   517.23     0.38
HUB     43.76    38.62     5.14   247.38   357.81    14.55   517.23     0.32

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   416.32   216.21   355.77  1121.34     0.37
MEAN    18.04   435.66   248.21   358.03  1119.92     0.39
HUB     15.00   492.59   332.83   363.15  1116.94     0.44

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    407.95   404.15   191.74     0.36  4462.23
MEAN   356.65   374.10   108.44     0.33  4478.31     1.27
HUB    296.62   364.95    36.21     0.33  4993.49

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.45     1.09    14.96   536.98     1.03   522.51     0.92     0.91
MEAN    16.46     1.09    14.82   537.04     1.03   521.18     0.92     0.91
HUB     16.62     1.10    14.54   538.67     1.03   518.41     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.29    28.32    24.20     4.12     0.93     0.24     2.90
MEAN    34.73    16.85    12.70     4.15     0.92     0.21     3.51     0.91
HUB     42.51    -5.69    -9.30     3.61     0.92     0.09     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     442.785     247.732     366.998    1119.923       0.395      -0.011

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    16.492      14.805     521.189      24.000      34.020      35.400       1.380

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     396.608     247.732     467.621    1123.396       0.353       0.199

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.482      15.119     524.426     528.796       0.016       0.356

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     367.617       0.000     367.617    1125.376       0.327       0.269

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.271     526.277       0.000       0.060       0.037       0.287

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.872      16.444       1.089     537.564      14.754     224.125       1.737

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  91858.469       0.552     588.314 1086699.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.353   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    113.333    2266.000      16.444     537.564       1.000       1.000       0.980
W Kg/sec =   51.51516
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
103.137	2225.885	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
87185.352	88928.875	1.966	590.487	300.359	474.134	1.579

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	351.24	-0.12	351.24	0.31	399.16
MEAN	18.08	0.00	-0.02	351.24	-0.12	351.24	0.31	
HUB	15.21	0.00	-0.02	351.24	-0.12	351.24	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.17	46.36	2.81	406.37	537.22	15.37	527.26	0.48
MEAN	45.52	42.30	3.22	357.49	501.25	15.37	527.26	0.45
HUB	40.59	37.84	2.75	300.77	462.50	15.37	527.26	0.41

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	400.51	138.87	375.66	1132.72	0.35
MEAN	18.01	409.73	161.96	376.36	1132.33	0.36
HUB	15.22	443.18	232.07	377.56	1131.88	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	459.68	264.92	0.41	2838.31	
MEAN	356.14	423.50	194.18	0.37	2919.10	1.27
HUB	301.03	383.80	68.96	0.34	3534.68	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.33	1.05	15.89	546.58	1.02	533.18	0.92	0.90
MEAN	17.36	1.06	15.85	546.84	1.02	532.81	0.92	0.90
HUB	17.55	1.07	15.79	548.79	1.02	532.39	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.29	35.19	31.50	3.69	0.93	0.19	2.90	
MEAN	23.28	27.29	23.50	3.79	0.92	0.20	3.30	0.90
HUB	31.58	10.35	6.50	3.85	0.92	0.23	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.987

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	606.529	162.416	584.379	1115.047	0.544	-1.040

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.397	14.222	516.678	46.000	15.532	30.600	15.068

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	611.086	162.416	632.301	1114.547	0.548	-1.103

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	17.320	14.115	516.214	361.848	0.059	0.095

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	603.465	0.000	603.465	1115.382	0.541	-0.068

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	14.115	516.988	0.000	0.060	0.116	-1.103

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.736	17.230	1.048	547.402	9.837	298.365	2.313

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
61256.906	0.376	392.324	1007133.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 5.353 EfDer = 0.765

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
113.333	2266.000	17.230	547.402	1.000	1.000	0.710

W Kg/sec = 51.51516

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
99.332	2205.794	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
87185.352	88928.875	1.366	395.194	289.281	307.469	1.063

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	545.68	-0.19	545.68	0.49	386.32
MEAN	17.74	0.00	-0.02	545.68	-0.19	545.68	0.49	
HUB	15.05	0.00	-0.02	545.68	-0.19	545.68	0.49	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	36.04	46.36	-10.32	396.88	674.86	14.65	522.54	0.60
MEAN	32.75	43.40	-10.65	350.77	648.80	14.65	522.54	0.58
HUB	28.62	38.84	-10.22	297.61	621.65	14.65	522.54	0.55

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	411.92	83.05	403.46	1138.30	0.36
MEAN	17.51	419.61	116.70	403.06	1139.07	0.37
HUB	14.85	451.48	201.49	404.03	1139.80	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	508.00	308.69	0.45	1648.97	
MEAN	346.18	463.81	229.49	0.41	2046.34	1.46
HUB	293.65	414.41	92.17	0.36	2994.92	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.64	1.02	16.11	552.64	1.01	538.47	0.92	0.70
MEAN	17.73	1.03	16.15	553.90	1.01	539.20	0.92	0.70
HUB	17.97	1.04	16.13	556.91	1.02	539.89	0.92	0.70

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	11.63	37.42	31.50	5.92	0.93	0.27	2.90	
MEAN	16.15	29.66	23.50	6.16	0.84	0.31	3.28	0.70
HUB	26.51	12.85	6.50	6.35	0.84	0.38	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.765

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	424.979	117.465	408.422	1139.280	0.373	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.764	16.135	539.401	46.000	16.046	31.500	15.454

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	430.247	117.465	445.994	1138.882	0.378	-0.047

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.712	16.049	539.025	471.992	0.041	0.107

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	419.048	0.000	419.048	1139.721	0.368	-0.059

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.038	539.819	0.000	0.060	0.104	-0.054

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.485	17.610	1.022	554.483	7.082	389.245	3.017

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
44104.199	0.287	282.468	1493217.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 5.353 EfDer = 0.887

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
113.333	2266.000	17.610	554.483	1.000	1.000	0.980

W Kg/sec = 51.51516

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
97.816	2191.663	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
87185.352	88928.875	1.802	513.330	284.872	401.059	1.408

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	393.28	-0.14	393.28	0.34	368.35
MEAN	16.97	0.00	-0.02	393.28	-0.14	393.28	0.34	
HUB	14.32	0.00	-0.02	393.28	-0.14	393.28	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	44.09	46.36	-2.27	380.86	547.56	16.22	541.57	0.48
MEAN	40.49	43.80	-3.31	335.59	517.09	16.22	541.57	0.45
HUB	35.77	37.84	-2.07	283.17	484.70	16.22	541.57	0.42

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	428.94	71.19	422.99	1143.47	0.38
MEAN	16.57	435.20	106.69	421.92	1144.41	0.38
HUB	13.89	464.77	194.94	421.91	1145.21	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	519.83	302.16	0.45	1346.65	
MEAN	327.74	476.33	221.06	0.42	1770.49	1.15
HUB	274.67	429.38	79.73	0.37	2709.67	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.00	1.02	16.33	558.76	1.01	543.40	0.92	0.81
MEAN	18.12	1.03	16.40	560.11	1.01	544.29	0.92	0.81
HUB	18.40	1.04	16.42	563.09	1.02	545.05	0.92	0.81

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	9.55	35.54	31.50	4.04	0.93	0.07	2.90	
MEAN	14.19	27.65	23.50	4.15	0.89	0.11	3.29	0.81
HUB	24.80	10.70	6.50	4.20	0.89	0.16	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.887

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	427.213	107.286	413.522	1145.582	0.373	0.051

```
     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.153      16.489     545.412      46.000      14.544      32.400      17.856

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     441.783     107.286     454.624    1144.471       0.386      -0.036

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.086      16.317     544.354     456.573       0.048       0.098

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     421.469       0.000     421.469    1146.009       0.368      -0.075

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.354     545.819       0.000       0.060       0.119      -0.016

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.506      17.958       1.020     560.651       6.167     417.738       3.238

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  38412.242       0.276     246.014 1058395.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.353   EfDer =  0.827

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    113.333    2266.000      17.958     560.651       1.000       1.000       0.980
W Kg/sec =   51.51516

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.450    2179.575       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  87185.352   88928.875       1.814     509.668     280.898     390.276       1.389

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   392.38    -0.14   392.38     0.34   348.44
 MEAN    15.91     0.00    -0.02   392.38    -0.14   392.38     0.34
 HUB     13.07     0.00    -0.02   392.38    -0.14   392.38     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.73    47.36    -4.63   362.27   534.13    16.56   547.80     0.47
 MEAN    38.74    44.80    -6.06   314.67   503.06    16.56   547.80     0.44
 HUB     33.39    38.84    -5.45   258.45   469.93    16.56   547.80     0.41

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   425.79    49.63   422.89  1148.65     0.37
 MEAN    15.50   429.99    83.41   421.82  1149.67     0.37
 HUB     12.59   454.29   168.53   421.88  1150.55     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   521.47   305.12     0.45   892.86
 MEAN   306.46   477.17   223.05     0.42  1294.75     1.12
 HUB    248.96   429.48    80.44     0.37  2123.51

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.20     1.01    16.55   563.49     1.01   548.35     0.92     0.76
 MEAN    18.31     1.02    16.62   564.76     1.01   549.33     0.92     0.76
 HUB     18.53     1.03    16.64   567.39     1.01   550.16     0.92     0.76

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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  TIP      6.69    35.81    31.50     4.31     0.93     0.04     2.90
  MEAN    11.18    27.87    23.50     4.37     0.87     0.08     3.34     0.76
  HUB     21.78    10.79     6.50     4.29     0.87     0.13     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.827

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
       R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     434.106      84.936     425.716    1149.822       0.378       -0.015

       Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      18.312      16.595     549.480      46.000      11.283      33.000      21.717

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
       RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     462.659      84.936     470.390    1147.583       0.403       -0.217

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      18.151      16.226     547.343     440.827       0.113       0.071

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     432.111       0.000     432.111    1149.973       0.376       -0.099

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      16.422     549.625       0.000       0.060       0.139       -0.105

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.287      18.105       1.008     565.214       4.563     521.173       4.040

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   28420.367       0.226     182.020 1122605.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     264052.19   1691.1409     110.7153      1.1984      0.6568      5.3531      1.0811


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 60% Stat 2 27% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.999

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     111.020     2266.000       15.107     522.810       1.000        1.000        0.980
 W Kg/sec =   50.46355

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     108.455     2257.076        1.402        0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
   85405.578   87113.516        2.633     831.557     315.845     619.754       1.962

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa     C1       CU1       Cm1     Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   252.87    -0.09   252.87     0.23   406.33
  MEAN    17.06      0.00    -0.02   252.87    -0.09   252.87     0.23
  HUB     12.51      0.00    -0.02   252.87    -0.09   252.87     0.23

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
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TIP     58.21    50.47     7.74   407.95   480.04    14.58   517.47     0.43
MEAN    53.15    47.20     5.95   337.36   421.68    14.58   517.47     0.38
HUB     44.38    38.62     5.76   247.38   353.81    14.58   517.47     0.32

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   411.69   220.75   347.51  1122.00     0.37
MEAN    18.04   430.43   250.77   349.84  1120.48     0.38
HUB     15.00   485.97   332.06   354.83  1117.48     0.43

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    407.95   394.72   187.20     0.35  4555.88
MEAN   356.65   365.52   105.89     0.33  4524.33     1.29
HUB    296.62   356.59    35.44     0.32  4982.04

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.48     1.09    15.02   537.28     1.03   523.13     0.92     0.91
MEAN    16.47     1.09    14.88   537.18     1.03   521.71     0.92     0.91
HUB     16.62     1.10    14.59   538.64     1.03   518.91     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.43    28.31    24.20     4.11     0.93     0.26     2.90
MEAN    35.63    16.84    12.70     4.14     0.92     0.22     3.51     0.91
HUB     43.10    -5.70    -9.30     3.60     0.92     0.10     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    18.071     437.269     250.280     358.559    1120.504       0.390      -0.010

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    16.507      14.859     521.730      24.000      34.916      35.400       0.484

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     387.069     250.280     460.937    1124.210       0.344       0.218

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.498      15.197     525.186     528.796       0.015       0.370

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    18.083     358.919       0.000     358.919    1126.085       0.319       0.284

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.341     526.940       0.000       0.060       0.037       0.303

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.875      16.462       1.090     537.700      14.890     220.181       1.707

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  92703.586       0.557     581.607 1063300.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.020    2266.000      16.462     537.700       1.000       1.000       0.980
W Kg/sec =   50.46355

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.937    2225.604       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85405.578	87113.516	2.009	590.487	293.951	474.134	1.613

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	343.01	-0.12	343.01	0.30	399.11
MEAN	18.08	0.00	-0.02	343.01	-0.12	343.01	0.30	
HUB	15.21	0.00	-0.02	343.01	-0.12	343.01	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.84	46.36	3.48	406.37	531.87	15.44	527.87	0.47
MEAN	46.19	42.30	3.89	357.49	495.52	15.44	527.87	0.44
HUB	41.26	37.84	3.42	300.77	456.28	15.44	527.87	0.40

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	394.14	145.72	366.21	1133.78	0.35
MEAN	18.01	403.27	166.92	367.11	1133.24	0.36
HUB	15.22	436.41	233.88	368.45	1132.64	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	448.02	258.08	0.40	2977.93	
MEAN	356.14	413.01	189.22	0.36	3008.30	1.29
HUB	301.03	374.52	67.15	0.33	3562.16	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.40	1.06	16.00	547.16	1.02	534.18	0.92	0.91
MEAN	17.41	1.06	15.95	547.25	1.02	533.67	0.92	0.91
HUB	17.58	1.07	15.87	549.01	1.02	533.11	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	21.70	35.17	31.50	3.67	0.93	0.20	2.90	
MEAN	24.45	27.27	23.50	3.77	0.92	0.22	3.30	0.91
HUB	32.41	10.33	6.50	3.83	0.92	0.24	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	591.130	167.385	566.937	1117.146	0.529	-1.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.447	14.415	518.625	46.000	16.449	30.600	14.151

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	591.199	167.385	614.438	1117.139	0.529	-1.037

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	17.381	14.359	518.618	361.848	0.054	0.108

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	583.346	0.000	583.346	1117.969	0.522	-0.029

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	14.370	519.389	0.000	0.060	0.103	-1.029

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.767	17.305	1.051	547.809	10.109	288.894	2.239

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
62946.453	0.386	394.915	984160.938

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.768

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    111.020    2266.000      17.305     547.809      1.000       1.000       0.710
W Kg/sec =   50.46355

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.918    2204.975       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 85405.578   87113.516       1.400     395.194     282.251     307.469       1.089

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   528.74    -0.18   528.74     0.47   386.18
MEAN    17.74     0.00    -0.02   528.74    -0.18   528.74     0.47
HUB     15.05     0.00    -0.02   528.74    -0.18   528.74     0.47

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     36.90    46.36    -9.46   396.88   661.23    14.87   524.46     0.59
MEAN    33.57    43.40    -9.83   350.77   634.61    14.87   524.46     0.56
HUB     29.39    38.84    -9.45   297.61   606.83    14.87   524.46     0.54

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   402.68    92.10   392.00  1139.99     0.35
MEAN    17.51   410.83   123.42   391.85  1140.54     0.36
HUB     14.85   442.91   204.29   392.99  1141.05     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   493.40   299.63     0.43  1828.25
MEAN   346.18   450.75   222.76     0.40  2163.91     1.47
HUB    293.65   403.02    89.36     0.35  3036.46

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.76     1.03    16.29   553.61     1.01   540.07     0.92     0.70
MEAN    17.84     1.03    16.31   554.68     1.01   540.59     0.92     0.70
HUB     18.06     1.04    16.28   557.45     1.02   541.07     0.92     0.70

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     13.22    37.39    31.50     5.89     0.93     0.28     2.90
MEAN    17.48    29.62    23.50     6.12     0.85     0.32     3.28     0.70
HUB     27.47    12.81     6.50     6.31     0.85     0.38     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.768

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     416.012     124.231     397.029    1140.753       0.365      -0.006

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.872      16.301     540.796      46.000      17.375      31.500      14.125

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     417.504     124.231     435.595    1140.643       0.366      -0.026

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.829      16.251     540.692     471.992       0.037       0.123

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     406.441       0.000     406.441    1141.446       0.356      -0.034
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.247	541.454	0.000	0.060	0.095	-0.029

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.522	17.737	1.025	555.249	7.440	369.231	2.862

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
46335.531	0.302	290.701	1451278.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 5.953 EfDer = 0.905

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
111.020	2266.000	17.737	555.249	1.000	1.000	0.980

W Kg/sec = 50.46355

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
95.197	2190.152	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85405.578	87113.516	1.852	513.330	277.243	401.059	1.447

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	381.66	-0.13	381.66	0.33	368.10
MEAN	16.97	0.00	-0.02	381.66	-0.13	381.66	0.33	
HUB	14.32	0.00	-0.02	381.66	-0.13	381.66	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	44.95	46.36	-1.41	380.86	539.28	16.42	543.09	0.47
MEAN	41.34	43.80	-2.46	335.59	508.30	16.42	543.09	0.44
HUB	36.59	37.84	-1.25	283.17	475.32	16.42	543.09	0.42

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	417.30	81.15	409.34	1145.77	0.36
MEAN	16.57	424.19	113.85	408.63	1146.44	0.37
HUB	13.89	454.07	197.61	408.81	1147.00	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	502.93	292.19	0.44	1534.64	
MEAN	327.74	461.22	213.89	0.40	1889.24	1.17
HUB	274.67	416.01	77.05	0.36	2746.75	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.19	1.03	16.60	560.12	1.01	545.58	0.92	0.83
MEAN	18.30	1.03	16.64	561.25	1.01	546.22	0.92	0.83
HUB	18.56	1.05	16.65	563.97	1.02	546.76	0.92	0.83

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	11.21	35.52	31.50	4.02	0.93	0.09	2.90	
MEAN	15.57	27.63	23.50	4.13	0.89	0.13	3.29	0.83
HUB	25.80	10.67	6.50	4.17	0.89	0.18	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.905

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	416.592	114.495	400.549	1147.552	0.363	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.331	16.733	547.289	46.000	15.952	32.400	16.448

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    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     427.019     114.495     442.102    1146.782       0.372      -0.016

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.274      16.604     546.555     456.573       0.043       0.115

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     407.248       0.000     407.248    1148.226       0.355      -0.052

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.644     547.932       0.000       0.060       0.110       0.008

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.574      18.159       1.024     561.780       6.531     394.201       3.056

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  40678.965       0.292     255.213 1032078.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.847

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.020    2266.000      18.159     561.780       1.000       1.000       0.980
W Kg/sec =   50.46355

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.532    2177.384       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85405.578   87113.516       1.871     509.668     272.400     390.276       1.433

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   379.41    -0.13   379.41     0.33   348.09
 MEAN    15.91     0.00    -0.02   379.41    -0.13   379.41     0.33
 HUB     13.07     0.00    -0.02   379.41    -0.13   379.41     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.69    47.36    -3.67   362.27   524.68    16.84   549.76     0.46
 MEAN    39.68    44.80    -5.12   314.67   493.00    16.84   549.76     0.43
 HUB     34.28    38.84    -4.56   258.45   459.15    16.84   549.76     0.40

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   412.26    60.73   407.76  1151.48     0.36
 MEAN    15.50   417.20    91.41   407.06  1152.20     0.36
 HUB     12.59   441.95   171.53   407.31  1152.81     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   502.71   294.03     0.44  1091.90
 MEAN   306.46   460.37   215.05     0.40  1418.77     1.14
 HUB    248.96   414.60    77.44     0.36  2161.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.46     1.02    16.90   565.25     1.01   551.06     0.92     0.78
 MEAN    18.56     1.02    16.95   566.28     1.01   551.75     0.92     0.78
 HUB     18.77     1.03    16.95   568.64     1.01   552.33     0.92     0.78

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     8.47    35.79    31.50     4.29     0.93     0.06     2.90
 MEAN    12.66   27.85    23.50     4.35     0.88     0.09     3.34     0.78
 HUB     22.84   10.76     6.50     4.26     0.88     0.14     4.06
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.847

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      421.142      93.090      410.725    1152.370       0.365       -0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     18.562      16.924      551.917      46.000      12.770       33.000      20.230

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      444.918      93.090      454.553    1150.574       0.387       -0.191

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       18.422      16.615      550.198     440.827       0.104       0.087

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4        cp 3-4
     14.701      415.957       0.000      415.957    1152.748       0.361       -0.079

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       16.792      552.279       0.000       0.060       0.133       -0.085

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4        Pt4           PR4        Texit        Del T        Ns         Ns nondim
      0.386       18.375        1.012      566.725       4.945      482.502       3.740

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  30799.168       0.245     193.229 1093767.000

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    273463.69   1715.6648     108.4552      1.2163       0.6875       5.9532       1.0840


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 60% Stat 2 27% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  1.000

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    108.993     2266.000       15.107      522.810       1.000        1.000        0.980
 W Kg/sec =   49.54226

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
    106.475     2257.076        1.402        0.249       53.349       32.000       0.050

   CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
  83846.383   85523.125        2.682      831.557      310.079      619.754       1.999

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   248.01    -0.09   248.01      0.22   406.33
  MEAN    17.06      0.00    -0.02   248.01    -0.09   248.01      0.22
  HUB     12.51      0.00    -0.02   248.01    -0.09   248.01      0.22

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
  TIP     58.71     50.47     8.24   407.95   477.50     14.60   517.67      0.43
  MEAN    53.69     47.20     6.49   337.36   418.78     14.60   517.67      0.38
  HUB     44.94     38.62     6.32   247.38   350.36     14.60   517.67      0.31
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      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   407.83   224.69   340.35  1122.56     0.36
 MEAN    18.04   425.99   252.99   342.74  1120.96     0.38
 HUB     15.00   480.29   331.42   347.61  1117.94     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   386.55   183.26     0.34  4637.11
 MEAN   356.65   358.07   103.67     0.32  4564.33     1.31
 HUB    296.62   349.35    34.80     0.31  4972.38

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.51     1.09    15.07   537.54     1.03   523.65     0.92     0.91
 MEAN    16.49     1.09    14.92   537.31     1.03   522.15     0.92     0.91
 HUB     16.61     1.10    14.63   538.61     1.03   519.34     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.43    28.30    24.20     4.10     0.93     0.27     2.90
 MEAN    36.43    16.83    12.70     4.13     0.93     0.23     3.51     0.91
 HUB     43.63    -5.72    -9.30     3.58     0.93     0.11     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     432.581     252.495     351.244    1120.997       0.386       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.520      14.905     522.189      24.000      35.711      35.400      -0.311

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     378.833     252.495     455.267    1124.900       0.337       0.234

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.511      15.263     525.831     528.796       0.015       0.382

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083     351.409       0.000     351.409    1126.687       0.312       0.297

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.400     527.504       0.000       0.060       0.037       0.316

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      16.475       1.091     537.818      15.008     216.767       1.680

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93438.875       0.561     575.517 1042869.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.993    2266.000      16.475     537.818       1.000       1.000       0.980
W Kg/sec =   49.54226

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     99.023    2225.360       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83846.383   85523.125       2.048     590.487     288.378     474.134       1.644
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    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   335.90    -0.12   335.90     0.30   399.07
MEAN    18.08     0.00    -0.02   335.90    -0.12   335.90     0.30
HUB     15.21     0.00    -0.02   335.90    -0.12   335.90     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.43    46.36     4.07   406.37   527.31    15.49   528.39     0.47
MEAN    46.79    42.30     4.49   357.49   490.63    15.49   528.39     0.44
HUB     41.85    37.84     4.01   300.77   450.96    15.49   528.39     0.40

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   388.86   151.54   358.12  1134.67     0.34
MEAN    18.01   397.84   171.13   359.16  1134.01     0.35
HUB     15.22   430.67   235.44   360.62  1133.29     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   438.04   252.25     0.39  3096.91
MEAN   356.14   404.01   185.01     0.36  3084.10     1.31
HUB    301.03   366.53    65.59     0.32  3585.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.45     1.06    16.09   547.65     1.02   535.03     0.92     0.91
MEAN    17.45     1.06    16.02   547.61     1.02   534.39     0.92     0.91
HUB     17.61     1.07    15.94   549.21     1.02   533.72     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     22.94    35.16    31.50     3.66     0.93     0.22     2.90
MEAN    25.48    27.25    23.50     3.75     0.92     0.23     3.30     0.91
HUB     33.14    10.31     6.50     3.81     0.92     0.25     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     578.304     171.608     552.255    1118.870       0.517      -0.975

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.489      14.573     520.227      46.000      17.262      30.600      13.338

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     574.631     171.608     599.709    1119.250       0.513      -0.980

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      17.430      14.558     520.581     361.848       0.050       0.119

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.823     566.678       0.000     566.678    1120.065       0.506       0.003

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.680      14.578     521.339       0.000       0.060       0.093      -0.967

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.790      17.365       1.054     548.158      10.340     281.075       2.179

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  64386.652       0.395     396.576  964193.438


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  0.774
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
108.993	2266.000	17.365	548.158	1.000	1.000	0.710

W Kg/sec = 49.54226

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
94.850	2204.272	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
83846.383	85523.125	1.431	395.194	276.228	307.469	1.113

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	514.57	-0.18	514.57	0.46	386.05
MEAN	17.74	0.00	-0.02	514.57	-0.18	514.57	0.46	
HUB	15.05	0.00	-0.02	514.57	-0.18	514.57	0.46	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	37.65	46.36	-8.71	396.88	649.95	15.04	526.05	0.58
MEAN	34.29	43.40	-9.11	350.77	622.85	15.04	526.05	0.55
HUB	30.06	38.84	-8.78	297.61	594.52	15.04	526.05	0.53

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	395.08	99.84	382.26	1141.41	0.35
MEAN	17.51	403.51	129.11	382.30	1141.76	0.35
HUB	14.85	435.67	206.70	383.52	1142.09	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	480.96	291.90	0.42	1981.35	
MEAN	346.18	439.63	217.08	0.39	2263.39	1.48
HUB	293.65	393.25	86.95	0.34	3072.16	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.86	1.03	16.44	554.45	1.01	541.42	0.92	0.71
MEAN	17.93	1.03	16.45	555.35	1.01	541.75	0.92	0.71
HUB	18.14	1.04	16.41	557.91	1.02	542.06	0.92	0.71

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	14.64	37.37	31.50	5.87	0.93	0.29	2.90	
MEAN	18.66	29.59	23.50	6.09	0.85	0.33	3.28	0.71
HUB	28.32	12.77	6.50	6.27	0.85	0.38	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.774

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	408.527	129.956	387.306	1141.986	0.358	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.964	16.441	541.966	46.000	18.549	31.500	12.951

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	406.686	129.956	426.945	1142.119	0.356	-0.007

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.928	16.421	542.091	471.992	0.033	0.138

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	395.751	0.000	395.751	1142.890	0.346	-0.012

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.422	542.824	0.000	0.060	0.087	-0.006

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.555	17.845	1.028	555.903	7.745	353.436	2.740

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
48235.348	0.314	297.096	1415703.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 6.485 EfDer = 0.920

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
108.993	2266.000	17.845	555.903	1.000	1.000	0.980

W Kg/sec = 49.54226

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
92.950	2188.863	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
83846.383	85523.125	1.896	513.330	270.700	401.059	1.482

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	371.79	-0.13	371.79	0.32	367.88
MEAN	16.97	0.00	-0.02	371.79	-0.13	371.79	0.32	
HUB	14.32	0.00	-0.02	371.79	-0.13	371.79	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.70	46.36	-0.66	380.86	532.33	16.59	544.36	0.47
MEAN	42.08	43.80	-1.72	335.59	500.93	16.59	544.36	0.44
HUB	37.31	37.84	-0.53	283.17	467.43	16.59	544.36	0.41

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	407.77	89.56	397.82	1147.67	0.36
MEAN	16.57	415.09	119.90	397.39	1148.13	0.36
HUB	13.89	445.12	199.87	397.73	1148.49	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	488.67	283.79	0.43	1693.32	
MEAN	327.74	448.46	207.84	0.39	1989.41	1.19
HUB	274.67	404.70	74.80	0.35	2778.03	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.36	1.03	16.82	561.28	1.01	547.40	0.92	0.84
MEAN	18.45	1.03	16.85	562.22	1.01	547.83	0.92	0.84
HUB	18.69	1.05	16.85	564.72	1.02	548.18	0.92	0.84

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	12.69	35.50	31.50	4.00	0.93	0.11	2.90	
MEAN	16.79	27.61	23.50	4.11	0.89	0.14	3.29	0.84
HUB	26.68	10.65	6.50	4.15	0.89	0.19	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.920

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	407.813	120.576	389.580	1149.193	0.355	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.481	16.939	548.855	46.000	17.197	32.400	15.203

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th

```
     16.481     414.610     120.576     431.787    1148.705       0.361       0.003

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.434      16.845     548.388     456.573       0.039       0.130

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     395.292       0.000     395.292    1150.072       0.344      -0.030

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.889     549.694       0.000       0.060       0.102       0.029

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.626      18.329       1.027     562.741       6.838     375.891       2.914

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  42591.734       0.306     262.335 1009411.938


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  0.866

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.993    2266.000      18.329     562.741       1.000       1.000       0.980
W Kg/sec =   49.54226

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.049    2175.523       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83846.383   85523.125       1.922     509.668     265.166     390.276       1.472

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   368.48    -0.13   368.48     0.32   347.80
 MEAN    15.91     0.00    -0.02   368.48    -0.13   368.48     0.32
 HUB     13.07     0.00    -0.02   368.48    -0.13   368.48     0.32

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.52    47.36    -2.84   362.27   516.82    17.07   551.41     0.45
 MEAN    40.51    44.80    -4.29   314.67   484.64    17.07   551.41     0.42
 HUB     35.06    38.84    -3.78   258.45   450.15    17.07   551.41     0.39

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   401.25    70.08   395.08  1153.82     0.35
 MEAN    15.50   406.69    98.15   394.66  1154.31     0.35
 HUB     12.59   431.68   174.01   395.06  1154.70     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   486.96   284.68     0.42  1259.50
 MEAN   306.46   446.26   208.31     0.39  1523.15     1.16
 HUB    248.96   402.11    74.95     0.35  2192.44

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.69     1.02    17.19   566.74     1.01   553.30     0.92     0.79
 MEAN    18.77     1.02    17.22   567.58     1.01   553.77     0.92     0.79
 HUB     18.96     1.03    17.22   569.70     1.01   554.14     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     10.06    35.78    31.50     4.28     0.93     0.08     2.90
 MEAN    13.97    27.83    23.50     4.33     0.88     0.11     3.34     0.79
 HUB     23.77    10.74     6.50     4.24     0.88     0.15     4.06


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.866

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     410.502      99.952     398.147    1154.479       0.356      -0.013

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      18.776      17.203     553.938      46.000      14.093      33.000      18.907

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     430.156      99.952     441.616    1153.041       0.373      -0.166

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      18.655      16.944     552.558     440.827       0.096       0.102

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
      14.701     402.436       0.000     402.436    1155.050       0.348      -0.060

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      17.107     554.485       0.000       0.060       0.125      -0.064

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.463      18.607       1.015     568.007       5.265     453.603       3.516

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   32797.395       0.261     202.009 1069033.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     281450.00   1733.5326    106.4752      1.2317      0.7122      6.4851      1.0864


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 60% Stat 2 27% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     107.227    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   48.73943

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     104.750    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   82487.648   84137.219       2.726     831.557     305.054     619.754       2.032

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   243.79    -0.08   243.79     0.22   406.33
  MEAN    17.06     0.00    -0.02   243.79    -0.08   243.79     0.22
  HUB     12.51     0.00    -0.02   243.79    -0.08   243.79     0.22

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.14    50.47     8.67   407.95   475.32    14.61   517.85     0.43
  MEAN    54.15    47.20     6.95   337.36   416.29    14.61   517.85     0.37
  HUB     45.43    38.62     6.81   247.38   347.38    14.61   517.85     0.31

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
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     0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   404.59   228.08   334.17  1123.04     0.36
 MEAN    18.04   422.23   254.90   336.60  1121.36     0.38
 HUB     15.00   475.37   330.81   341.38  1118.33     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   379.51   179.87     0.34  4706.94
 MEAN   356.65   351.64   101.75     0.31  4598.84     1.33
 HUB    296.62   343.09    34.19     0.31  4963.23

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.53     1.09    15.11   537.76     1.03   524.09     0.92     0.91
 MEAN    16.50     1.09    14.96   537.42     1.03   522.53     0.92     0.91
 HUB     16.61     1.10    14.67   538.58     1.03   519.70     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.31    28.29    24.20     4.09     0.93     0.28     2.90
 MEAN    37.14    16.82    12.70     4.12     0.93     0.25     3.51     0.91
 HUB     44.10    -5.72    -9.30     3.58     0.93     0.12     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     428.601     254.406     344.929    1121.412       0.382      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.530      14.943     522.576      24.000      36.411      35.400      -1.011

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     371.745     254.406     450.463    1125.483       0.330       0.248

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.522      15.318     526.377     528.796       0.015       0.393

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     344.946       0.000     344.946    1127.197       0.306       0.309

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.448     527.981       0.000       0.060       0.037       0.328

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      16.486       1.091     537.919      15.109     213.838       1.658

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94066.633       0.565     569.995 1025114.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.227    2266.000      16.486     537.919       1.000       1.000       0.980
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.366    2225.151       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82487.648   84137.219       2.082     590.487     283.552     474.134       1.672

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     20.55     0.00    -0.02   329.78    -0.11   329.78     0.29   399.03
MEAN    18.08     0.00    -0.02   329.78    -0.11   329.78     0.29
HUB     15.21     0.00    -0.02   329.78    -0.11   329.78     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.95    46.36     4.59   406.37   523.43    15.54   528.84     0.46
MEAN    47.32    42.30     5.02   357.49   486.45    15.54   528.84     0.43
HUB     42.38    37.84     4.54   300.77   446.42    15.54   528.84     0.40

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   384.50   156.56   351.18  1135.42     0.34
MEAN    18.01   393.30   174.75   352.35  1134.65     0.35
HUB     15.22   425.79   236.76   353.90  1133.83     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   429.48   247.23     0.38  3199.37
MEAN   356.14   396.30   181.39     0.35  3149.31     1.32
HUB    301.03   359.68    64.27     0.32  3605.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.50     1.06    16.16   548.08     1.02   535.73     0.92     0.91
MEAN    17.48     1.06    16.09   547.92     1.02   535.00     0.92     0.91
HUB     17.63     1.07    15.99   549.37     1.02   534.23     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     24.03    35.15    31.50     3.65     0.93     0.23     2.90
MEAN    26.38    27.24    23.50     3.74     0.92     0.24     3.30     0.91
HUB     33.78    10.29     6.50     3.79     0.92     0.26     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     567.605     175.241     539.875    1120.292       0.507      -0.950

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.522      14.702     521.551      46.000      17.983      30.600      12.617

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     560.765     175.241     587.509    1120.984       0.500      -0.932

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      17.470      14.722     522.195     361.848       0.046       0.129

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     552.784       0.000     552.784    1121.781       0.493       0.031

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.680      14.747     522.938       0.000       0.060       0.085      -0.915

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.807      17.413       1.056     548.458      10.539     274.553       2.128

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  65624.633       0.402     397.651  946910.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.782

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.227    2266.000      17.413     548.458       1.000       1.000       0.710
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W Kg/sec = 48.73943

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
93.080	2203.670	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
82487.648	84137.219	1.458	395.194	271.072	307.469	1.134

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	502.67	-0.17	502.67	0.45	385.95
MEAN	17.74	0.00	-0.02	502.67	-0.17	502.67	0.45	
HUB	15.05	0.00	-0.02	502.67	-0.17	502.67	0.45	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	38.30	46.36	-8.06	396.88	640.57	15.19	527.36	0.57
MEAN	34.92	43.40	-8.48	350.77	613.06	15.19	527.36	0.54
HUB	30.64	38.84	-8.20	297.61	584.25	15.19	527.36	0.52

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	388.82	106.42	373.97	1142.59	0.34
MEAN	17.51	397.41	133.98	374.15	1142.79	0.35
HUB	14.85	429.56	208.74	375.43	1142.98	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	470.38	285.32	0.41	2111.64	
MEAN	346.18	430.14	212.20	0.38	2348.61	1.49
HUB	293.65	384.91	84.91	0.34	3102.47	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.95	1.03	16.57	555.16	1.01	542.54	0.92	0.72
MEAN	18.01	1.03	16.56	555.92	1.01	542.73	0.92	0.72
HUB	18.21	1.05	16.51	558.31	1.02	542.90	0.92	0.72

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	15.88	37.34	31.50	5.84	0.93	0.29	2.90	
MEAN	19.70	29.56	23.50	6.06	0.86	0.33	3.28	0.72
HUB	29.08	12.74	6.50	6.24	0.86	0.39	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.782

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	402.294	134.860	379.016	1143.021	0.352	-0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.041	16.558	542.948	46.000	19.586	31.500	11.914

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	397.501	134.860	419.754	1143.358	0.348	0.011

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.011	16.564	543.268	471.992	0.030	0.151

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	386.685	0.000	386.685	1144.103	0.338	0.008

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.570	543.976	0.000	0.060	0.080	0.015

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.583      17.935       1.030     556.463       8.005     340.772       2.642

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  49856.125       0.325     302.102 1385485.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.932

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.227    2266.000      17.935     556.463       1.000       1.000       0.980
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.027    2187.761       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82487.648   84137.219       1.936     513.330     265.099     401.059       1.513

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   363.41    -0.13   363.41     0.32   367.70
 MEAN    16.97     0.00    -0.02   363.41    -0.13   363.41     0.32
 HUB     14.32     0.00    -0.02   363.41    -0.13   363.41     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.35    46.36    -0.01   380.86   526.51    16.73   545.44     0.46
 MEAN    42.73    43.80    -1.07   335.59   494.74    16.73   545.44     0.43
 HUB     37.94    37.84     0.10   283.17   460.79    16.73   545.44     0.40

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   399.95    96.66   388.09  1149.25     0.35
 MEAN    16.57   407.55   125.07   387.89  1149.54     0.35
 HUB     13.89   437.63   201.75   388.35  1149.74     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   476.63   276.69     0.41  1827.28
 MEAN   327.74   437.64   202.67     0.38  2075.01     1.21
 HUB    274.67   395.14    72.92     0.34  2804.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.50     1.03    17.01   562.27     1.01   548.91     0.92     0.85
 MEAN    18.58     1.04    17.03   563.05     1.01   549.18     0.92     0.85
 HUB     18.80     1.05    17.01   565.37     1.02   549.38     0.92     0.85

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     13.99    35.49    31.50     3.99     0.93     0.13     2.90
 MEAN    17.87    27.59    23.50     4.09     0.90     0.15     3.29     0.85
 HUB     27.45    10.63     6.50     4.13     0.90     0.20     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.932

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     400.563     125.773     380.305    1150.564       0.348       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.609      17.111     550.164      46.000      18.300      32.400      14.100

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     404.165     125.773     423.283    1150.311       0.351       0.019

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      18.569      17.048     549.922     456.573       0.035       0.144

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     385.231       0.000     385.231    1151.615       0.335      -0.010

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.095     551.170       0.000       0.060       0.095       0.049

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.667      18.473       1.030     563.561       7.098     361.371       2.801

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  44211.355       0.317     267.898  989931.062


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.882

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.227    2266.000      18.473     563.561       1.000       1.000       0.980
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.938    2173.940       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82487.648   84137.219       1.968     509.668     259.017     390.276       1.507

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   359.26    -0.12   359.26     0.31   347.54
 MEAN    15.91     0.00    -0.02   359.26    -0.12   359.26     0.31
 HUB     13.07     0.00    -0.02   359.26    -0.12   359.26     0.31

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.25    47.36    -2.11   362.27   510.29    17.27   552.79     0.44
 MEAN    41.23    44.80    -3.57   314.67   477.67    17.27   552.79     0.41
 HUB     35.74    38.84    -3.10   258.45   442.64    17.27   552.79     0.38

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   392.25    77.91   384.44  1155.76     0.34
 MEAN    15.50   398.02   103.82   384.24  1156.06     0.34
 HUB     12.59   423.13   176.08   384.76  1156.27     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   473.75   276.85     0.41  1399.90
 MEAN   306.46   434.40   202.63     0.38  1611.00     1.18
 HUB    248.96   391.60    72.88     0.34  2218.49

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.89     1.02    17.44   568.01     1.01   555.16     0.92     0.81
 MEAN    18.95     1.03    17.46   568.68     1.01   555.45     0.92     0.81
 HUB     19.13     1.04    17.44   570.60     1.01   555.66     0.92     0.81

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     11.46    35.76    31.50     4.26     0.93     0.10     2.90
 MEAN    15.12    27.81    23.50     4.31     0.88     0.12     3.34     0.81
 HUB     24.59    10.73     6.50     4.23     0.88     0.16     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.882

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219      401.746     105.728      387.584     1156.232       0.347       -0.012

      Pt3          Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
      18.958       17.438      555.620      46.000      15.258       33.000      17.742

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
      15.219      417.847     105.728      431.016     1155.085       0.362       -0.144

    BlockageThr  PtTh        PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
       0.950       18.853      17.221      554.518      440.827       0.088        0.115

     VANED DIFFUSER EXIT:
    R4           C4          Cu4         Cm4          Ao4           Mach4        cp 3-4
      14.701      391.115       0.000      391.115     1156.964       0.338       -0.041

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4     w2-4OD       cp 2-4
       0.950       17.374      556.324       0.000        0.060        0.118       -0.045

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
       0.523       18.806        1.018      569.096        5.534      431.453        3.345

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   34474.324       0.274     208.896 1047848.562

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
     288233.06   1746.5426     104.7498       1.2449       0.7321       6.9532       1.0885


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60% Stat 2 27% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.999

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     105.235     2266.000       15.107      522.810        1.000        1.000        0.980
 W Kg/sec =   47.83408

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     102.804     2257.076        1.402        0.249       53.349       32.000        0.050

    CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
   80955.414   82574.344         2.778      831.557      299.388      619.754        2.070

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   239.04    -0.08   239.04      0.21   406.33
  MEAN    17.06      0.00    -0.02   239.04    -0.08   239.04      0.21
  HUB     12.51      0.00    -0.02   239.04    -0.08   239.04      0.21

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
  TIP     59.64     50.47     9.17   407.95   472.90     14.63   518.04      0.42
  MEAN    54.69     47.20     7.49   337.36   413.53     14.63   518.04      0.37
  HUB     45.99     38.62     7.37   247.38   344.06     14.63   518.04      0.31

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK         AeroBl     Blades2
       0.700       0.050       0.950      32.000

           R2      C2       Cu2       Cm2      Ao2          Mach2
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 TIP     20.63   401.07   231.85   327.27  1123.56     0.36
 MEAN    18.04   418.09   257.04   329.73  1121.81     0.37
 HUB     15.00   469.94   330.17   334.41  1118.76     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   371.64   176.10     0.33  4784.73
 MEAN   356.65   344.45    99.61     0.31  4637.42     1.35
 HUB    296.62   336.09    33.55     0.30  4953.53

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.55     1.10    15.16   538.01     1.03   524.57     0.92     0.91
 MEAN    16.51     1.09    15.00   537.54     1.03   522.94     0.92     0.91
 HUB     16.61     1.10    14.71   538.55     1.03   520.10     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.31    28.28    24.20     4.08     0.93     0.30     2.90
 MEAN    37.94    16.81    12.70     4.11     0.93     0.26     3.51     0.91
 HUB     44.63    -5.73    -9.30     3.57     0.93     0.13     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     424.227     256.543     337.868    1121.868       0.378       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.541      14.984     523.000      24.000      37.209      35.400      -1.809

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     363.843     256.543     445.192    1126.122       0.323       0.264

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.532      15.377     526.975     528.796       0.015       0.406

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     337.741       0.000     337.741    1127.755       0.299       0.321

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.500     528.505       0.000       0.060       0.038       0.341

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.877      16.496       1.092     538.032      15.222     210.565       1.632

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94770.008       0.569     563.590 1005147.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    105.235    2266.000      16.496     538.032       1.000       1.000       0.980
W Kg/sec =   47.83408

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.508    2224.918       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  80955.414   82574.344       2.123     590.487     278.141     474.134       1.705

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   322.95    -0.11   322.95     0.29   398.99
 MEAN    18.08     0.00    -0.02   322.95    -0.11   322.95     0.29
 HUB     15.21     0.00    -0.02   322.95    -0.11   322.95     0.29
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.53    46.36     5.17   406.37   519.16    15.58   529.32     0.46
MEAN    47.91    42.30     5.61   357.49   481.85    15.58   529.32     0.43
HUB     42.97    37.84     5.13   300.77   441.40    15.58   529.32     0.39

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   379.83   162.11   343.50  1136.24     0.33
MEAN    18.01   388.38   178.78   344.78  1135.35     0.34
HUB     15.22   420.45   238.26   346.43  1134.43     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   420.01   241.69     0.37  3312.55
MEAN   356.14   387.73   177.36     0.34  3221.82     1.34
HUB    301.03   352.07    62.77     0.31  3628.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.55     1.06    16.24   548.55     1.02   536.50     0.92     0.91
MEAN    17.52     1.06    16.15   548.26     1.02   535.67     0.92     0.91
HUB     17.65     1.07    16.05   549.56     1.02   534.79     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.26    35.13    31.50     3.63     0.93     0.24     2.90
MEAN    27.41    27.22    23.50     3.72     0.92     0.25     3.30     0.91
HUB     34.52    10.27     6.50     3.77     0.92     0.27     3.92


  blockage3   Cor/U1    Cor/Incid
     0.680       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     556.026     179.281     526.330    1121.816       0.496      -0.922

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.558      14.841     522.971      46.000      18.810      30.600      11.790

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     545.696     179.281     574.392    1122.835       0.486      -0.879

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.680      17.512      14.896     523.921     361.848       0.042       0.140

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     537.922       0.000     537.922    1123.589       0.479       0.056

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.680      14.921     524.625       0.000       0.060       0.079      -0.862

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.820      17.459       1.058     548.791      10.759     267.507       2.074

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  66998.305       0.411     398.434  927543.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.793

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    105.235    2266.000      17.459     548.791       1.000       1.000       0.710
W Kg/sec =   47.83408

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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    91.140    2203.000       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
80955.414   82574.344       1.489     395.194     265.424     307.469       1.158

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   489.86    -0.17   489.86     0.43   385.83
MEAN    17.74     0.00    -0.02   489.86    -0.17   489.86     0.43
HUB     15.05     0.00    -0.02   489.86    -0.17   489.86     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     39.03    46.36    -7.33   396.88   630.56    15.33   528.75     0.56
MEAN    35.62    43.40    -7.78   350.77   602.60    15.33   528.75     0.53
HUB     31.29    38.84    -7.55   297.61   573.27    15.33   528.75     0.51

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   382.21   113.58   364.94  1143.86     0.33
MEAN    17.51   390.91   139.29   365.25  1143.90     0.34
HUB     14.85   422.95   210.98   366.58  1143.93     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   458.86   278.15     0.40  2253.42
MEAN   346.18   419.78   206.89     0.37  2441.55     1.51
HUB    293.65   375.78    82.68     0.33  3135.53

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.04     1.03    16.70   555.95     1.01   543.75     0.92     0.73
MEAN    18.09     1.04    16.68   556.54     1.01   543.78     0.92     0.73
HUB     18.27     1.05    16.63   558.75     1.02   543.81     0.92     0.73

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     17.29    37.31    31.50     5.81     0.93     0.30     2.90
MEAN    20.87    29.53    23.50     6.03     0.86     0.34     3.28     0.73
HUB     29.92    12.71     6.50     6.21     0.86     0.39     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.793

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     395.649     140.208     369.973    1144.136       0.346      -0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.121      16.680     544.008      46.000      20.755      31.500      10.745

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     387.520     140.208     412.105    1144.695       0.339       0.031

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.096      16.714     544.539     471.992       0.027       0.166

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     376.850       0.000     376.850    1145.410       0.329       0.030

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.725     545.220       0.000       0.060       0.073       0.038

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.613      18.029       1.033     557.080       8.289     327.736       2.541

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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  51621.742       0.336     306.991 1352273.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.944

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     105.235    2266.000      18.029     557.080       1.000       1.000       0.980
W Kg/sec =   47.83408

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      88.923    2186.549       1.402       0.249      53.349      56.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  80955.414   82574.344       1.982     513.330     258.970     401.059       1.549

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   354.30    -0.12   354.30     0.31   367.49
 MEAN    16.97     0.00    -0.02   354.30    -0.12   354.30     0.31
 HUB     14.32     0.00    -0.02   354.30    -0.12   354.30     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.08    46.36     0.72   380.86   520.27    16.87   546.60     0.45
 MEAN    43.46    43.80    -0.34   335.59   488.09    16.87   546.60     0.43
 HUB     38.65    37.84     0.81   283.17   453.64    16.87   546.60     0.40

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   391.74   104.33   377.59  1150.95     0.34
 MEAN    16.57   399.56   130.62   377.61  1151.05     0.35
 HUB     13.89   429.64   203.82   378.21  1151.09     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   463.62   269.01     0.40  1972.09
 MEAN   327.74   425.96   197.12     0.37  2166.98     1.22
 HUB    274.67   384.79    70.84     0.33  2832.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.65     1.03    17.21   563.34     1.01   550.53     0.92     0.86
 MEAN    18.71     1.04    17.21   563.96     1.01   550.63     0.92     0.86
 HUB     18.92     1.05    17.18   566.07     1.02   550.66     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.45    35.47    31.50     3.97     0.93     0.14     2.90
 MEAN    19.08    27.57    23.50     4.07     0.90     0.17     3.29     0.86
 HUB     28.32    10.61     6.50     4.11     0.90     0.21     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.944

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     392.880     131.356     370.270    1152.034       0.341       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.744      17.293     551.571      46.000      19.533      32.400      12.867

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     392.920     131.356     414.295    1152.031       0.341       0.038

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.710      17.261     551.568     456.573       0.032       0.160

    VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	374.408	0.000	374.408	1153.269	0.325	0.012

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.312	552.754	0.000	0.060	0.086	0.071

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.707	18.625	1.033	564.459	7.379	346.573	2.687

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
45961.836	0.330	273.332	968279.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 7.486 EfDer = 0.899

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
105.235	2266.000	18.625	564.459	1.000	1.000	0.980

W Kg/sec = 47.83408

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
86.645	2172.210	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
80955.414	82574.344	2.020	509.668	252.341	390.276	1.547

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	349.33	-0.12	349.33	0.30	347.27
MEAN	15.91	0.00	-0.02	349.33	-0.12	349.33	0.30	
HUB	13.07	0.00	-0.02	349.33	-0.12	349.33	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.05	47.36	-1.31	362.27	503.35	17.48	554.27	0.44
MEAN	42.02	44.80	-2.78	314.67	470.24	17.48	554.27	0.41
HUB	36.51	38.84	-2.33	258.45	434.62	17.48	554.27	0.38

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	382.89	86.35	373.02	1157.82	0.33
MEAN	15.50	388.91	109.92	373.05	1157.93	0.34
HUB	12.59	414.07	178.36	373.69	1157.96	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	459.55	268.41	0.40	1551.28	
MEAN	306.46	421.66	196.54	0.36	1705.38	1.20
HUB	248.96	380.30	70.60	0.33	2247.11	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.10	1.03	17.70	569.38	1.01	557.14	0.92	0.82
MEAN	19.14	1.03	17.70	569.87	1.01	557.25	0.92	0.82
HUB	19.31	1.04	17.67	571.59	1.01	557.28	0.92	0.82

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	13.03	35.74	31.50	4.24	0.93	0.12	2.90	
MEAN	16.42	27.78	23.50	4.28	0.89	0.14	3.34	0.82
HUB	25.51	10.70	6.50	4.20	0.89	0.17	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.899

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	392.540	111.934	376.243	1158.103	0.339	-0.011

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.152      17.687     557.419      46.000      16.568      33.000      16.432

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     404.723     111.934     419.917    1157.260       0.350      -0.119

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.063      17.515     556.608     440.827       0.080       0.131

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     379.001       0.000     379.001    1159.008       0.327      -0.019

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.659     558.291       0.000       0.060       0.110      -0.023

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.582      19.018       1.021     570.284       5.825     409.441       3.174

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  36282.914       0.288     215.772 1024381.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    295634.81   1758.1176    102.8040      1.2589      0.7515      7.4864      1.0908


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 60% Stat 2 27% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.509    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   47.04952

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    101.118    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79627.609   81219.992       2.824     831.557     294.477     619.754       2.105

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   234.94    -0.08   234.94     0.21   406.33
  MEAN    17.06     0.00    -0.02   234.94    -0.08   234.94     0.21
  HUB     12.51     0.00    -0.02   234.94    -0.08   234.94     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.07    50.47     9.60   407.95   470.83    14.65   518.20     0.42
  MEAN    55.15    47.20     7.95   337.36   411.17    14.65   518.20     0.37
  HUB     46.49    38.62     7.87   247.38   341.22    14.65   518.20     0.31

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   398.16   235.09   321.34  1123.99     0.35
  MEAN    18.04   414.58   258.86   323.83  1122.18     0.37
  HUB     15.00   465.31   329.62   328.42  1119.12     0.42
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   364.89   172.86     0.32  4851.52
 MEAN   356.65   338.28    97.79     0.30  4670.22     1.37
 HUB    296.62   330.08    33.01     0.29  4945.38

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.57     1.10    15.20   538.22     1.03   524.98     0.92     0.91
 MEAN    16.52     1.09    15.03   537.65     1.03   523.29     0.92     0.91
 HUB     16.60     1.10    14.74   538.52     1.03   520.44     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.19    28.28    24.20     4.08     0.93     0.31     2.90
 MEAN    38.64    16.80    12.70     4.10     0.93     0.27     3.51     0.91
 HUB     45.10    -5.74    -9.30     3.56     0.93     0.14     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     420.522     258.359     331.797    1122.252       0.375      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.549      15.018     523.359      24.000      37.907      35.400      -2.507

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     357.069     258.359     440.735    1126.662       0.317       0.278

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.540      15.427     527.480     528.796       0.016       0.417

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     331.565       0.000     331.565    1128.227       0.294       0.332

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.542     528.947       0.000       0.060       0.039       0.352

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      16.504       1.092     538.129      15.319     207.759       1.611

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  95373.062       0.573     557.874  987890.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.509    2266.000      16.504     538.129       1.000       1.000       0.980
W Kg/sec =   47.04952

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.906    2224.718       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79627.609   81219.992       2.159     590.487     273.476     474.134       1.734

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   317.10    -0.11   317.10     0.28   398.95
 MEAN    18.08     0.00    -0.02   317.10    -0.11   317.10     0.28
 HUB     15.21     0.00    -0.02   317.10    -0.11   317.10     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.04    46.36     5.68   406.37   515.53    15.62   529.73     0.46
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 MEAN    48.44    42.30     6.14   357.49   477.94    15.62   529.73     0.42
 HUB     43.50    37.84     5.66   300.77   437.13    15.62   529.73     0.39

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   375.98   166.81   336.95  1136.92     0.33
 MEAN    18.01   384.27   182.20   338.32  1135.94     0.34
 HUB     15.22   415.92   239.50   340.04  1134.93     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   411.94   236.98     0.36  3408.56
 MEAN   356.14   380.42   173.94     0.33  3283.40     1.36
 HUB    301.03   345.56    61.53     0.30  3647.59

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.59     1.07    16.30   548.95     1.02   537.15     0.92     0.91
 MEAN    17.55     1.06    16.21   548.56     1.02   536.22     0.92     0.91
 HUB     17.67     1.07    16.10   549.71     1.02   535.27     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.34    35.12    31.50     3.62     0.93     0.26     2.90
 MEAN    28.30    27.21    23.50     3.71     0.93     0.26     3.30     0.91
 HUB     35.16    10.26     6.50     3.76     0.93     0.28     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     546.377     182.712     514.922    1123.073       0.487      -0.898

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.586      14.954     524.143      46.000      19.536      30.600      11.064

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     533.083     182.712     563.526    1124.356       0.474      -0.834

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      17.545      15.039     525.342     361.848       0.039       0.150

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     525.479       0.000     525.479    1125.075       0.467       0.078

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      15.063     526.014       0.000       0.060       0.075      -0.816

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.829      17.495       1.060     549.075      10.946     261.668       2.028

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  68162.164       0.418     398.707  910860.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.804

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    103.509    2266.000      17.495     549.075       1.000       1.000       0.710
W Kg/sec =   47.04952

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     89.481    2202.431       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 79627.609   81219.992       1.517     395.194     260.593     307.469       1.180

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   479.07    -0.16   479.07     0.42   385.73
MEAN    17.74     0.00    -0.02   479.07    -0.16   479.07     0.42
HUB     15.05     0.00    -0.02   479.07    -0.16   479.07     0.42

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     39.65    46.36    -6.71   396.88   622.22    15.46   529.91     0.55
MEAN    36.22    43.40    -7.18   350.77   593.86    15.46   529.91     0.53
HUB     31.86    38.84    -6.98   297.61   564.08    15.46   529.91     0.50

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   376.78   119.70   357.26  1144.93     0.33
MEAN    17.51   385.51   143.81   357.68  1144.83     0.34
HUB     14.85   417.39   212.86   359.03  1144.73     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   449.04   272.04     0.39  2374.54
MEAN   346.18   410.96   202.38     0.36  2520.49     1.52
HUB    293.65   368.01    80.79     0.32  3163.45

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.12     1.04    16.81   556.62     1.01   544.76     0.92     0.74
MEAN    18.16     1.04    16.79   557.08     1.01   544.67     0.92     0.74
HUB     18.33     1.05    16.72   559.12     1.02   544.57     0.92     0.74

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     18.52    37.29    31.50     5.79     0.93     0.31     2.90
MEAN    21.90    29.50    23.50     6.00     0.87     0.34     3.28     0.74
HUB     30.66    12.68     6.50     6.18     0.87     0.40     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.804

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     390.118     144.750     362.270    1145.069       0.341      -0.002

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.189      16.783     544.896      46.000      21.780      31.500       9.720

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     379.050     144.750     405.749    1145.816       0.331       0.048

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.168      16.841     545.607     471.992       0.024       0.180

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     368.517       0.000     368.517    1146.506       0.321       0.050

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.855     546.264       0.000       0.060       0.067       0.058

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.638      18.107       1.035     557.605       8.530     317.206       2.459

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  53124.648       0.346     310.746 1324077.375
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COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4
RESET = 0.000BLEED = 0.000 DPInc = 7.953 EfDer = 0.954

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
103.509	2266.000	18.107	557.605	1.000	1.000	0.980

W Kg/sec = 47.04952

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
87.126	2185.520	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
79627.609	81219.992	2.023	513.330	253.736	401.059	1.581

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	346.58	-0.12	346.58	0.30	367.32
MEAN	16.97	0.00	-0.02	346.58	-0.12	346.58	0.30	
HUB	14.32	0.00	-0.02	346.58	-0.12	346.58	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.71	46.36	1.35	380.86	515.03	17.00	547.58	0.45
MEAN	44.09	43.80	0.29	335.59	482.51	17.00	547.58	0.42
HUB	39.26	37.84	1.42	283.17	447.63	17.00	547.58	0.39

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	385.02	110.81	368.73	1152.36	0.33
MEAN	16.57	392.96	135.30	368.93	1152.32	0.34
HUB	13.89	422.96	205.57	369.65	1152.21	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	452.64	262.53	0.39	2094.38	
MEAN	327.74	416.11	192.44	0.36	2244.45	1.24
HUB	274.67	376.05	69.10	0.33	2857.06	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.77	1.04	17.38	564.25	1.01	551.88	0.92	0.87
MEAN	18.82	1.04	17.37	564.73	1.01	551.84	0.92	0.87
HUB	19.02	1.05	17.33	566.68	1.02	551.74	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	16.73	35.45	31.50	3.95	0.93	0.16	2.90	
MEAN	20.14	27.55	23.50	4.05	0.90	0.18	3.29	0.87
HUB	29.08	10.59	6.50	4.09	0.90	0.22	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.954

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	386.533	136.060	361.795	1153.260	0.335	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.857	17.445	552.746	46.000	20.610	32.400	11.790

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	383.464	136.060	406.887	1153.466	0.332	0.055

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.829	17.440	552.943	456.573	0.029	0.173

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	365.315	0.000	365.315	1154.649	0.316	0.032

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.493	554.078	0.000	0.060	0.079	0.090

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.738	18.752	1.036	565.221	7.616	334.744	2.595

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
47437.762	0.340	277.482	949733.938

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 7.953 EfDer = 0.913

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
103.509	2266.000	18.752	565.221	1.000	1.000	0.980

W Kg/sec = 47.04952

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
84.703	2170.745	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
79627.609	81219.992	2.066	509.668	246.686	390.276	1.582

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	340.97	-0.12	340.97	0.29	347.03
MEAN	15.91	0.00	-0.02	340.97	-0.12	340.97	0.29	
HUB	13.07	0.00	-0.02	340.97	-0.12	340.97	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.74	47.36	-0.62	362.27	497.58	17.65	555.51	0.43
MEAN	42.71	44.80	-2.09	314.67	464.06	17.65	555.51	0.40
HUB	37.17	38.84	-1.67	258.45	427.93	17.65	555.51	0.37

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	375.27	93.40	363.46	1159.53	0.32
MEAN	15.50	381.43	115.06	363.66	1159.48	0.33
HUB	12.59	406.54	180.25	364.40	1159.36	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	447.67	261.35	0.39	1677.77	
MEAN	306.46	410.95	191.39	0.35	1785.10	1.21
HUB	248.96	370.82	68.71	0.32	2270.89	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.27	1.03	17.92	570.55	1.01	558.79	0.92	0.84
MEAN	19.31	1.03	17.91	570.89	1.01	558.74	0.92	0.84
HUB	19.46	1.04	17.87	572.43	1.01	558.63	0.92	0.84

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	14.41	35.72	31.50	4.22	0.93	0.13	2.90	
MEAN	17.56	27.76	23.50	4.26	0.89	0.15	3.34	0.84
HUB	26.32	10.68	6.50	4.18	0.89	0.18	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.913

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	385.005	117.175	366.741	1159.655	0.332	-0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.316	17.895	558.913	46.000	17.719	33.000	15.281

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     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     393.798     117.175     410.861    1159.061       0.340      -0.097

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      19.240      17.761     558.341     440.827       0.073       0.145

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     368.888       0.000     368.888    1160.707       0.318       0.002

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      17.898     559.928       0.000       0.060       0.102      -0.002

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.629      19.197       1.024     571.289       6.068     392.283       3.041

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   37799.078       0.300     221.101 1004337.812

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     301896.69   1765.9099    101.1179      1.2707      0.7669      7.9529      1.0927


*********************************************************************
**************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60% Stat 2 27% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.995

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      99.590    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   45.26799

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      97.289    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   76612.523   78144.609       2.935     831.557     283.327     619.754       2.187

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   225.65    -0.08   225.65     0.20   406.33
  MEAN    17.06     0.00    -0.02   225.65    -0.08   225.65     0.20
  HUB     12.51     0.00    -0.02   225.65    -0.08   225.65     0.20

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.06    50.47    10.59   407.95   466.27    14.68   518.56     0.42
  MEAN    56.23    47.20     9.03   337.36   405.93    14.68   518.56     0.36
  HUB     47.64    38.62     9.02   247.38   334.90    14.68   518.56     0.30

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   391.93   242.30   308.05  1124.94     0.35
  MEAN    18.04   406.94   262.95   310.57  1122.99     0.36
  HUB     15.00   454.96   328.31   314.96  1119.90     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   349.77   165.65     0.31  5000.22
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 MEAN   356.65   324.40    93.71     0.29  4743.87     1.41
 HUB    296.62   316.55    31.69     0.28  4925.55

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.62     1.10    15.28   538.69     1.03   525.86     0.92     0.91
 MEAN    16.54     1.09    15.10   537.88     1.03   524.05     0.92     0.91
 HUB     16.59     1.10    14.81   538.46     1.03   521.17     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     38.19    28.27    24.20     4.07     0.93     0.34     2.90
 MEAN    40.25    16.79    12.70     4.09     0.93     0.30     3.51     0.91
 HUB     46.19    -5.74    -9.30     3.56     0.93     0.17     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     412.441     262.437     318.173    1123.084       0.367      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.566      15.091     524.135      24.000      39.517      35.400      -4.117

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     341.927     262.437     431.031    1127.834       0.303       0.310

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.556      15.532     528.578     528.796       0.017       0.442

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     317.759       0.000     317.759    1129.254       0.281       0.356

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.632     529.910       0.000       0.060       0.042       0.376

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      16.517       1.093     538.343      15.533     201.502       1.562

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96707.609       0.581     544.261  948857.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     99.590    2266.000      16.517     538.343       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     90.297    2224.275       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.246     590.487     262.964     474.134       1.803

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   303.99    -0.10   303.99     0.27   398.87
 MEAN    18.08     0.00    -0.02   303.99    -0.10   303.99     0.27
 HUB     15.21     0.00    -0.02   303.99    -0.10   303.99     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.21    46.36     6.85   406.37   507.57    15.71   530.63     0.45
 MEAN    49.63    42.30     7.33   357.49   469.35    15.71   530.63     0.42
 HUB     44.70    37.84     6.86   300.77   427.71    15.71   530.63     0.38
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      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   367.93   177.26   322.42  1138.39     0.32
MEAN    18.01   375.47   189.80   323.97  1137.22     0.33
HUB     15.22   406.03   242.27   325.83  1136.02     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   394.05   226.54     0.35  3621.79
MEAN   356.14   364.17   166.34     0.32  3420.18     1.40
HUB    301.03   331.08    58.76     0.29  3689.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.67     1.07    16.44   549.85     1.02   538.54     0.92     0.91
MEAN    17.60     1.07    16.32   549.21     1.02   537.43     0.92     0.91
HUB     17.69     1.07    16.20   550.06     1.02   536.29     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     28.80    35.09    31.50     3.59     0.93     0.28     2.90
MEAN    30.36    27.18    23.50     3.68     0.93     0.29     3.30     0.91
HUB     36.63    10.22     6.50     3.72     0.93     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     525.683     190.332     490.016    1125.728       0.467      -0.846

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.642      15.191     526.625      46.000      21.227      30.600       9.373

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     505.777     190.332     540.404    1127.560       0.449      -0.732

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      17.612      15.338     528.340     361.848       0.032       0.173

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     498.527       0.000     498.527    1128.208       0.442       0.128

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      15.362     528.948       0.000       0.060       0.065      -0.714

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.846      17.569       1.064     549.704      11.361     249.151       1.931

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  70747.172       0.434     398.158  873308.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.833

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2266.000      17.569     549.704       1.000       1.000       0.710
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     85.781    2201.169       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       1.582     395.194     249.815     307.469       1.231

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   455.54    -0.16   455.54     0.40   385.51
MEAN    17.74     0.00    -0.02   455.54    -0.16   455.54     0.40
HUB     15.05     0.00    -0.02   455.54    -0.16   455.54     0.40

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     41.07    46.36    -5.29   396.88   604.28    15.71   532.37     0.53
MEAN    37.61    43.40    -5.79   350.77   575.04    15.71   532.37     0.51
HUB     33.17    38.84    -5.67   297.61   544.23    15.71   532.37     0.48

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   365.39   133.17   340.26  1147.22     0.32
MEAN    17.51   374.00   153.83   340.90  1146.84     0.33
HUB     14.85   405.34   217.10   342.29  1146.47     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   427.35   258.56     0.37  2641.30
MEAN   346.18   391.42   192.36     0.34  2695.77     1.55
HUB    293.65   350.75    76.55     0.31  3226.32

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.29     1.04    17.05   558.09     1.02   546.94     0.92     0.76
MEAN    18.31     1.04    17.01   558.26     1.02   546.58     0.92     0.76
HUB     18.45     1.05    16.92   559.95     1.02   546.23     0.92     0.76

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     21.37    37.23    31.50     5.73     0.93     0.33     2.90
MEAN    24.29    29.43    23.50     5.93     0.87     0.36     3.28     0.76
HUB     32.39    12.61     6.50     6.11     0.87     0.41     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.833

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     378.346     154.837     345.212    1147.083       0.330       0.000

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.338      17.005     546.815      46.000      24.157      31.500       7.343

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     360.395     154.837     392.248    1148.244       0.314       0.089

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.325      17.114     547.922     471.992       0.019       0.212

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.121     350.211       0.000     350.211    1148.877       0.305       0.096

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.135     548.527       0.000       0.060       0.054       0.105

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.691      18.277       1.040     558.769       9.064     295.536       2.291

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  56453.262       0.368     317.713 1261829.125


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.973
```

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
99.590	2266.000	18.277	558.769	1.000	1.000	0.980

W Kg/sec = 45.26799

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
83.134	2183.243	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
76612.523	78144.609	2.120	513.330	242.112	401.059	1.657

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	329.58	-0.11	329.58	0.29	366.94
MEAN	16.97	0.00	-0.02	329.58	-0.11	329.58	0.29	
HUB	14.32	0.00	-0.02	329.58	-0.11	329.58	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.14	46.36	2.78	380.86	503.75	17.26	549.70	0.44
MEAN	45.53	43.80	1.73	335.59	470.44	17.26	549.70	0.41
HUB	40.68	37.84	2.84	283.17	434.59	17.26	549.70	0.38

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	371.08	124.94	349.41	1155.37	0.32
MEAN	16.57	379.03	145.56	349.96	1155.03	0.33
HUB	13.89	408.66	209.42	350.92	1154.64	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	428.71	248.40	0.37	2361.06	
MEAN	327.74	394.54	182.18	0.34	2414.48	1.28
HUB	274.67	356.93	65.25	0.31	2910.49	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.05	1.04	17.73	566.27	1.01	554.77	0.92	0.89
MEAN	19.07	1.04	17.70	566.43	1.01	554.44	0.92	0.89
HUB	19.23	1.05	17.64	568.01	1.02	554.07	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	19.68	35.41	31.50	3.91	0.93	0.19	2.90	
MEAN	22.58	27.50	23.50	4.00	0.91	0.21	3.29	0.89
HUB	30.83	10.53	6.50	4.03	0.91	0.24	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.973

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	373.179	146.382	343.271	1155.896	0.323	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.103	17.771	555.275	46.000	23.095	32.400	9.305

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	362.921	146.382	391.330	1156.552	0.314	0.095

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.086	17.825	555.906	456.573	0.022	0.206

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	345.597	0.000	345.597	1157.618	0.299	0.079

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.883	556.930	0.000	0.060	0.064	0.136

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.794	19.025	1.041	566.903	8.135	310.688	2.408

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
50669.270	0.364	285.161	908311.812

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 9.028 EfDer = 0.942

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
99.590	2266.000	19.025	566.903	1.000	1.000	0.980

W Kg/sec = 45.26799

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
80.445	2167.522	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
76612.523	78144.609	2.175	509.668	234.282	390.276	1.666

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	322.81	-0.11	322.81	0.28	346.52
MEAN	15.91	0.00	-0.02	322.81	-0.11	322.81	0.28	
HUB	13.07	0.00	-0.02	322.81	-0.11	322.81	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.30	47.36	0.94	362.27	485.31	18.03	558.20	0.42
MEAN	44.28	44.80	-0.52	314.67	450.89	18.03	558.20	0.39
HUB	38.69	38.84	-0.15	258.45	413.60	18.03	558.20	0.36

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	359.64	108.65	342.83	1163.16	0.31
MEAN	15.50	365.81	126.12	343.38	1162.79	0.31
HUB	12.59	390.59	184.39	344.33	1162.38	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	422.02	246.11	0.36	1951.14	
MEAN	306.46	387.86	180.34	0.33	1956.37	1.25
HUB	248.96	350.33	64.58	0.30	2322.87	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.66	1.03	18.40	573.10	1.01	562.30	0.92	0.86
MEAN	19.66	1.03	18.35	573.11	1.01	561.94	0.92	0.86
HUB	19.78	1.04	18.29	574.28	1.01	561.54	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	17.58	35.67	31.50	4.17	0.93	0.17	2.90	
MEAN	20.17	27.71	23.50	4.21	0.90	0.18	3.34	0.86
HUB	28.17	10.62	6.50	4.12	0.90	0.21	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.942

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	369.276	128.436	346.222	1162.968	0.318	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.672	18.342	562.111	46.000	20.353	33.000	12.647

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	370.430	128.436	392.064	1162.895	0.319	-0.044

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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.621      18.287     562.040     440.827       0.058       0.177

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     347.190       0.000     347.190    1164.334       0.298       0.051

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.411     563.432       0.000       0.060       0.085       0.047

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.716      19.584       1.029     573.497       6.593     358.640       2.780

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  41073.129       0.326     231.155  959733.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    315650.44   1776.4486     97.2890      1.2963      0.7969      9.0280      1.0970


********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
********************************************************************

   Fan-Core + 4 Stage LPC 60% Stat 2 27% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.992

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     96.156    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.935    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73970.969   75450.234       3.040     831.557     273.558     619.754       2.266

     ROTOR LEADING EDGE CONDITIONS, STAGE           1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   217.56    -0.07   217.56     0.19   406.33
 MEAN    17.06     0.00    -0.02   217.56    -0.07   217.56     0.19
 HUB     12.51     0.00    -0.02   217.56    -0.07   217.56     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     61.93    50.47    11.46   407.95   462.40    14.71   518.86     0.41
 MEAN    57.19    47.20     9.99   337.36   401.49    14.71   518.86     0.36
 HUB     48.68    38.62    10.06   247.38   329.49    14.71   518.86     0.29

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   386.93   248.50   296.59  1125.72     0.34
 MEAN    18.04   400.57   266.43   299.11  1123.67     0.36
 HUB     15.00   446.15   327.18   303.32  1120.56     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   336.73   159.45     0.30  5128.11
 MEAN   356.65   312.42    90.22     0.28  4806.68     1.45
 HUB    296.62   304.86    30.56     0.27  4908.61
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	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.65	1.10	15.34	539.10	1.03	526.60	0.92	0.91
MEAN	16.55	1.10	15.16	538.08	1.03	524.68	0.92	0.91
HUB	16.58	1.10	14.86	538.40	1.03	521.78	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.96	28.26	24.20	4.06	0.93	0.36	2.90	
MEAN	41.69	16.78	12.70	4.08	0.94	0.32	3.51	0.91
HUB	47.17	-5.75	-9.30	3.55	0.94	0.19	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	405.700	265.916	306.400	1123.775	0.361	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
16.579	15.149	524.780	24.000	40.954	35.400	-5.554

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	328.906	265.916	422.954	1128.808	0.291	0.338

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.567	15.617	529.492	528.796	0.018	0.465

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	305.882	0.000	305.882	1130.109	0.271	0.376

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.703	530.712	0.000	0.060	0.047	0.396

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.866	16.524	1.094	538.527	15.717	196.116	1.520

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
97853.297	0.588	531.720	914825.688

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 9.988 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
96.156	2266.000	16.524	538.527	1.000	1.000	0.980

W Kg/sec = 43.70718

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
87.161	2223.895	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73970.969	75450.234	2.326	590.487	253.831	474.134	1.868

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	292.71	-0.10	292.71	0.26	398.80
MEAN	18.08	0.00	-0.02	292.71	-0.10	292.71	0.26	
HUB	15.21	0.00	-0.02	292.71	-0.10	292.71	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.24	46.36	7.88	406.37	500.89	15.77	531.37	0.44
MEAN	50.70	42.30	8.40	357.49	462.11	15.77	531.37	0.41
HUB	45.79	37.84	7.95	300.77	419.77	15.77	531.37	0.37

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   361.61   186.12   310.04  1139.60     0.32
MEAN    18.01   368.34   196.25   311.70  1138.27     0.32
HUB     15.22   397.75   244.59   313.65  1136.92     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   378.83   217.68     0.33  3802.57
MEAN   356.14   350.31   159.88     0.31  3536.35     1.43
HUB    301.03   318.69    56.44     0.28  3724.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.73     1.07    16.54   550.60     1.02   539.68     0.92     0.91
MEAN    17.65     1.07    16.41   549.76     1.02   538.43     0.92     0.91
HUB     17.71     1.07    16.27   550.36     1.02   537.15     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.98    35.07    31.50     3.57     0.93     0.31     2.90
MEAN    32.20    27.16    23.50     3.66     0.93     0.31     3.30     0.91
HUB     37.95    10.20     6.50     3.70     0.93     0.32     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     508.791     196.805     469.186    1127.858       0.451      -0.801

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.684      15.377     528.621      46.000      22.756      30.600       7.844

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     483.157     196.805     521.702    1130.121       0.428      -0.645

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      17.661      15.573     530.744     361.848       0.027       0.194

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     476.200       0.000     476.200    1130.714       0.421       0.171

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      15.597     531.302       0.000       0.060       0.057      -0.627

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      17.623       1.067     550.240      11.713     238.957       1.852

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  72937.234       0.447     396.330  840755.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.860

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     96.156    2266.000      17.623     550.240       1.000       1.000       0.710
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     82.608    2200.097       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73970.969   75450.234       1.643     395.194     240.576     307.469       1.278

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   435.89    -0.15   435.89     0.38   385.32
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MEAN    17.74     0.00    -0.02   435.89    -0.15   435.89     0.38
HUB     15.05     0.00    -0.02   435.89    -0.15   435.89     0.38

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     42.33    46.36    -4.03   396.88   589.60    15.91   534.37     0.52
MEAN    38.84    43.40    -4.56   350.77   559.59    15.91   534.37     0.49
HUB     34.34    38.84    -4.50   297.61   527.88    15.91   534.37     0.47

     ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   356.49   144.61   325.84  1149.09     0.31
MEAN    17.51   364.75   162.29   326.66  1148.49     0.32
HUB     14.85   395.38   220.64   328.09  1147.90     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   408.96   247.13     0.36  2867.70
MEAN   346.18   374.87   183.89     0.33  2843.81     1.58
HUB    293.65   336.11    73.01     0.29  3278.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.44     1.05    17.25   559.35     1.02   548.73     0.92     0.79
MEAN    18.43     1.05    17.18   559.27     1.02   548.16     0.92     0.79
HUB     18.56     1.05    17.09   560.65     1.02   547.60     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     23.93    37.18    31.50     5.68     0.93     0.35     2.90
MEAN    26.42    29.38    23.50     5.88     0.88     0.37     3.28     0.79
HUB     33.92    12.55     6.50     6.05     0.88     0.42     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.860

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     368.887     163.355     330.746    1148.736       0.321       0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.461      17.186     548.393      46.000      26.285      31.500       5.215

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     344.678     163.355     381.429    1150.246       0.300       0.126

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.454      17.338     549.835     471.992       0.016       0.241

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     334.846       0.000     334.846    1150.830       0.291       0.135

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.362     550.393       0.000       0.060       0.046       0.145

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.733      18.415       1.045     559.756       9.516     278.732       2.161

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  59267.863       0.386     322.053 1209068.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     96.156    2266.000      18.415     559.756       1.000       1.000       0.980
W Kg/sec =   43.70718
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
79.739	2181.316	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73970.969	75450.234	2.210	513.330	232.226	401.059	1.727

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	315.28	-0.11	315.28	0.27	366.61
MEAN	16.97	0.00	-0.02	315.28	-0.11	315.28	0.27	
HUB	14.32	0.00	-0.02	315.28	-0.11	315.28	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.39	46.36	4.03	380.86	494.51	17.48	551.46	0.43
MEAN	46.80	43.80	3.00	335.59	460.53	17.48	551.46	0.40
HUB	41.94	37.84	4.10	283.17	423.85	17.48	551.46	0.37

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	360.29	136.68	333.35	1157.81	0.31
MEAN	16.57	367.97	154.08	334.16	1157.24	0.32
HUB	13.89	397.01	212.59	335.30	1156.63	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	408.82	236.66	0.35	2582.69	
MEAN	327.74	376.60	173.66	0.33	2555.51	1.32
HUB	274.67	340.99	62.08	0.29	2954.42	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.28	1.05	18.02	567.96	1.01	557.12	0.92	0.90
MEAN	19.27	1.05	17.96	567.87	1.01	556.56	0.92	0.90
HUB	19.40	1.05	17.88	569.14	1.02	555.98	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	22.29	35.37	31.50	3.87	0.93	0.22	2.90	
MEAN	24.75	27.46	23.50	3.96	0.91	0.23	3.29	0.90
HUB	32.38	10.49	6.50	3.99	0.91	0.26	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.986

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	362.605	154.944	327.833	1158.046	0.313	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.303	18.033	557.342	46.000	25.297	32.400	7.103

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	345.926	154.944	379.042	1159.070	0.298	0.131

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.292	18.134	558.329	456.573	0.018	0.236

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	329.334	0.000	329.334	1160.041	0.284	0.119

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.195	559.265	0.000	0.060	0.053	0.175

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.830	19.244	1.045	568.321	8.565	292.351	2.266

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  53349.430       0.383     289.893  872741.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.962

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     96.156    2266.000      19.244     568.321       1.000       1.000       0.980
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     76.885    2164.817       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73970.969   75450.234       2.276     509.668     223.916     390.276       1.743

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   307.80    -0.11   307.80     0.27   346.08
 MEAN    15.91     0.00    -0.02   307.80    -0.11   307.80     0.27
 HUB     13.07     0.00    -0.02   307.80    -0.11   307.80     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.66    47.36     2.30   362.27   475.46    18.33   560.41     0.41
 MEAN    45.64    44.80     0.84   314.67   440.26    18.33   560.41     0.38
 HUB     40.03    38.84     1.19   258.45   401.99    18.33   560.41     0.35

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   347.73   121.15   325.95  1166.09     0.30
 MEAN    15.50   353.61   135.19   326.74  1165.48     0.30
 HUB     12.59   377.81   187.78   327.84  1164.83     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   401.02   233.61     0.34  2175.36
 MEAN   306.46   368.91   171.26     0.32  2096.88     1.29
 HUB    248.96   333.50    61.18     0.29  2365.55

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.97     1.04    18.78   575.23     1.01   565.13     0.92     0.88
 MEAN    19.95     1.04    18.71   574.98     1.01   564.54     0.92     0.88
 HUB     20.04     1.04    18.63   575.83     1.01   563.91     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.39    35.63    31.50     4.13     0.93     0.20     2.90
 MEAN    22.48    27.66    23.50     4.16     0.91     0.21     3.34     0.88
 HUB     29.80    10.57     6.50     4.07     0.91     0.23     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.962

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     357.017     137.674     329.404    1165.646       0.306      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.959      18.700     564.703      46.000      22.682      33.000      10.318

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     351.494     137.674     377.495    1165.983       0.301       0.002

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.925      18.706     565.030     440.827       0.046       0.207
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     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     329.558       0.000     329.558    1167.270       0.282       0.095

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      18.822     566.277       0.000       0.060       0.070       0.092

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.775      19.894       1.034     575.345       7.024     333.957       2.589

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   43758.508       0.348     237.777  921592.562

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     327166.31   1777.7733     93.9346      1.3169      0.8173      9.9879      1.1005


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60% Stat 2 27% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.987

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      92.762    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   42.16433

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      90.619    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   71359.812   72786.852       3.151     831.557     263.901     619.754       2.348

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   209.60    -0.07   209.60     0.19   406.33
  MEAN    17.06     0.00    -0.02   209.60    -0.07   209.60     0.19
  HUB     12.51     0.00    -0.02   209.60    -0.07   209.60     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     62.81    50.47    12.34   407.95   458.71    14.74   519.14     0.41
  MEAN    58.15    47.20    10.95   337.36   397.23    14.74   519.14     0.36
  HUB     49.73    38.62    11.11   247.38   324.29    14.74   519.14     0.29

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   382.39   254.50   285.40  1126.45     0.34
  MEAN    18.04   394.57   269.81   287.91  1124.30     0.35
  HUB     15.00   437.62   326.01   291.94  1121.17     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   324.04   153.45     0.29  5251.84
  MEAN   356.65   300.72    86.85     0.27  4867.47     1.50
  HUB    296.62   293.42    29.39     0.26  4890.99

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.68     1.10    15.40   539.49     1.03   527.28     0.92     0.90
  MEAN    16.56     1.10    15.21   538.27     1.03   525.27     0.92     0.90
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 HUB     16.57     1.10    14.91   538.35     1.03   522.35     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.72    28.27    24.20     4.07     0.93     0.39     2.90
 MEAN    43.14    16.79    12.70     4.09     0.94     0.34     3.51     0.90
 HUB     48.16    -5.75    -9.30     3.55     0.94     0.21     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     399.348     269.283     294.899    1124.421       0.355      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.589      15.202     525.384      24.000      42.400      35.400      -7.000

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     316.235     269.283     415.352    1129.724       0.280       0.365

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.574      15.695     530.351     528.796       0.020       0.488

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     294.320       0.000     294.320    1130.914       0.260       0.395

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.766     531.469       0.000       0.060       0.053       0.415

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      16.527       1.094     538.704      15.894     190.885       1.480

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98953.383       0.595     518.717  881331.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     92.762    2266.000      16.527     538.704       1.000       1.000       0.980
W Kg/sec =   42.16433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     84.081    2223.530       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  71359.812   72786.852       2.411     590.487     244.863     474.134       1.936

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   281.72    -0.10   281.72     0.25   398.74
 MEAN    18.08     0.00    -0.02   281.72    -0.10   281.72     0.25
 HUB     15.21     0.00    -0.02   281.72    -0.10   281.72     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.27    46.36     8.91   406.37   494.55    15.83   532.08     0.44
 MEAN    51.77    42.30     9.47   357.49   455.23    15.83   532.08     0.40
 HUB     46.88    37.84     9.04   300.77   412.17    15.83   532.08     0.36

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   356.00   194.64   298.08  1140.72     0.31
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 MEAN    18.01   361.79   202.49   299.82  1139.26     0.32
 HUB     15.22   389.93   246.85   301.84  1137.76     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   364.14   209.16     0.32  3976.52
 MEAN   356.14   336.90   153.65     0.30  3648.55     1.47
 HUB    301.03   306.67    54.18     0.27  3759.20

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.79     1.08    16.63   551.33     1.02   540.75     0.92     0.91
 MEAN    17.68     1.07    16.49   550.29     1.02   539.36     0.92     0.91
 HUB     17.72     1.07    16.33   550.64     1.02   537.95     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.14    35.06    31.50     3.56     0.93     0.33     2.90
 MEAN    34.03    27.13    23.50     3.63     0.94     0.33     3.30     0.91
 HUB     39.28    10.18     6.50     3.68     0.94     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     493.113     203.056     449.365    1129.805       0.436      -0.758

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.718      15.542     530.448      46.000      24.317      30.600       6.283

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     461.797     203.056     504.468    1132.462       0.408      -0.560

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      17.701      15.784     532.946     361.848       0.023       0.215

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     455.125       0.000     455.125    1133.005       0.402       0.213

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      15.807     533.457       0.000       0.060       0.050      -0.542

    STAGE EXIT CONDITIONS, STAGE            2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.863      17.668       1.069     550.756      12.052     229.460       1.779

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  75049.359       0.460     393.412  808871.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.887

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     92.762    2266.000      17.668     550.756       1.000       1.000       0.710
W Kg/sec =   42.16433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     79.528    2199.067       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  71359.812   72786.852       1.706     395.194     231.607     307.469       1.328

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   417.22    -0.14   417.22     0.37   385.14
 MEAN    17.74     0.00    -0.02   417.22    -0.14   417.22     0.37
 HUB     15.05     0.00    -0.02   417.22    -0.14   417.22     0.37
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	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	43.58	46.36	-2.78	396.88	575.93	16.09	536.22	0.51
MEAN	40.07	43.40	-3.33	350.77	545.17	16.09	536.22	0.48
HUB	35.51	38.84	-3.33	297.61	512.57	16.09	536.22	0.45

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	348.66	155.60	312.02	1150.84	0.30
MEAN	17.51	356.39	170.44	312.99	1150.03	0.31
HUB	14.85	386.14	224.10	314.45	1149.25	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	391.30	236.14	0.34	3085.25	
MEAN	346.18	358.96	175.75	0.31	2986.30	1.61
HUB	293.65	322.06	69.56	0.28	3329.99	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.57	1.05	17.43	560.55	1.02	550.40	0.92	0.81
MEAN	18.54	1.05	17.35	560.24	1.02	549.63	0.92	0.81
HUB	18.65	1.06	17.24	561.33	1.02	548.88	0.92	0.81

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	26.50	37.12	31.50	5.62	0.93	0.37	2.90	
MEAN	28.57	29.31	23.50	5.81	0.89	0.39	3.28	0.81
HUB	35.48	12.47	6.50	5.97	0.89	0.43	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.887

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	360.324	171.554	316.863	1150.276	0.313	0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.576	17.353	549.865	46.000	28.432	31.500	3.068

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	329.676	171.554	371.641	1152.122	0.286	0.164

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.572	17.544	551.631	471.992	0.013	0.271

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	320.232	0.000	320.232	1152.657	0.278	0.174

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.569	552.144	0.000	0.060	0.040	0.184

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.768	18.538	1.049	560.707	9.951	263.704	2.044

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
61978.273	0.404	324.892	1158316.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =10.953 EfDer = 0.994

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
92.762	2266.000	18.538	560.707	1.000	1.000	0.980

W Kg/sec = 42.16433

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
76.475	2179.465	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
71359.812	72786.852	2.305	513.330	222.720	401.059	1.801

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	301.65	-0.10	301.65	0.26	366.30
MEAN	16.97	0.00	-0.02	301.65	-0.10	301.65	0.26	
HUB	14.32	0.00	-0.02	301.65	-0.10	301.65	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.63	46.36	5.27	380.86	485.93	17.68	553.11	0.42
MEAN	48.06	43.80	4.26	335.59	451.31	17.68	553.11	0.39
HUB	43.20	37.84	5.36	283.17	413.81	17.68	553.11	0.36

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	350.85	147.73	318.23	1160.07	0.30
MEAN	16.57	358.05	162.13	319.24	1159.29	0.31
HUB	13.89	386.27	215.58	320.52	1158.48	0.33

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	390.09	225.61	0.34	2791.20	
MEAN	327.74	359.64	165.61	0.31	2688.93	1.36
HUB	274.67	325.92	59.09	0.28	2995.92	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.48	1.05	18.29	569.57	1.02	559.29	0.92	0.91
MEAN	19.45	1.05	18.20	569.24	1.02	558.54	0.92	0.91
HUB	19.56	1.05	18.10	570.22	1.02	557.76	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	24.90	35.34	31.50	3.84	0.93	0.25	2.90	
MEAN	26.92	27.42	23.50	3.92	0.92	0.26	3.29	0.91
HUB	33.92	10.45	6.50	3.95	0.92	0.28	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.994

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	353.138	163.044	313.246	1160.040	0.304	0.051

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.484	18.269	559.265	46.000	27.497	32.400	4.903

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	329.965	163.044	368.050	1161.411	0.284	0.167

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.478	18.415	560.587	456.573	0.015	0.266

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	314.105	0.000	314.105	1162.294	0.270	0.159

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.475	561.440	0.000	0.060	0.045	0.214

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.855	19.438	1.049	569.678	8.970	276.206	2.141

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
55877.527	0.401	292.912	838167.125

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.978

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     92.762    2266.000      19.438     569.678       1.000       1.000       0.980
W Kg/sec =   42.16433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     73.516    2162.238       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 71359.812   72786.852       2.380     509.668     214.104     390.276       1.823

    ROTOR LEADING EDGE CONDITIONS, STAGE           5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   293.72    -0.10   293.72     0.25   345.67
MEAN    15.91     0.00    -0.02   293.72    -0.10   293.72     0.25
HUB     13.07     0.00    -0.02   293.72    -0.10   293.72     0.25

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.97    47.36     3.61   362.27   466.46    18.59   562.47     0.40
MEAN    46.98    44.80     2.18   314.67   430.53    18.59   562.47     0.37
HUB     41.36    38.84     2.52   258.45   391.31    18.59   562.47     0.34

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   337.46   132.73   310.26  1168.77     0.29
MEAN    15.50   342.79   143.63   311.25  1167.95     0.29
HUB     12.59   366.19   190.91   312.48  1167.10     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    354.76   381.52   222.02     0.33  2383.09
MEAN   306.46   351.27   162.83     0.30  2227.58     1.33
HUB    248.96   317.83    58.05     0.27  2404.89

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.26     1.04    19.12   577.24     1.01   567.74     0.92     0.89
MEAN    20.20     1.04    19.03   576.75     1.01   566.94     0.92     0.89
HUB     20.26     1.04    18.93   577.31     1.01   566.12     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     23.16    35.59    31.50     4.09     0.93     0.23     2.90
MEAN    24.77    27.62    23.50     4.12     0.91     0.23     3.34     0.89
HUB     31.42    10.52     6.50     4.02     0.91     0.25     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.978

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     346.176     146.267     313.757    1168.112       0.296      -0.007

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.217      19.020     567.096      46.000      24.994      33.000       8.006

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     334.042     146.267     364.662    1168.822       0.286       0.048

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.196      19.081     567.785     440.827       0.037       0.238

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     14.701     313.286       0.000     313.286    1169.976       0.268       0.139

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.189     568.907       0.000       0.060       0.058       0.136

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.818      20.171       1.038     577.101       7.424     312.960       2.426

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  46249.246       0.367     242.440  884638.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    338107.81   1772.3739     90.6187      1.3352      0.8322     10.9534      1.1038


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 60% Stat 2 27% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     89.191    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   40.54142

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.131    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  68613.172   69985.281       3.277     831.557     253.744     619.754       2.442

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   201.25    -0.07   201.25     0.18   406.33
 MEAN    17.06     0.00    -0.02   201.25    -0.07   201.25     0.18
 HUB     12.51     0.00    -0.02   201.25    -0.07   201.25     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     63.75    50.47    13.28   407.95   454.95    14.77   519.43     0.41
 MEAN    59.19    47.20    11.99   337.36   392.89    14.77   519.43     0.35
 HUB     50.88    38.62    12.26   247.38   318.96    14.77   519.43     0.29

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   378.04   260.69   273.77  1127.18     0.34
 MEAN    18.04   388.58   273.28   276.25  1124.93     0.35
 HUB     15.00   428.89   324.80   280.09  1121.79     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   310.86   147.26     0.28  5379.48
 MEAN   356.65   288.56    83.37     0.26  4930.11     1.55
 HUB    296.62   281.50    28.18     0.25  4872.87

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.71     1.11    15.46   539.90     1.03   527.96     0.92     0.90
 MEAN    16.57     1.10    15.26   538.47     1.03   525.86     0.92     0.90
 HUB     16.55     1.10    14.96   538.29     1.03   522.93     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     43.60    28.28    24.20     4.08     0.93     0.42     2.90
 MEAN    44.69    16.79    12.70     4.09     0.94     0.37     3.51     0.90
 HUB     49.23    -5.75    -9.30     3.55     0.94     0.23     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     392.992     272.751     282.930    1125.066       0.349       -0.003

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.597      15.252     525.987      24.000      43.951      35.400      -8.551

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     18.071     303.095     272.751     407.750    1130.642       0.268       0.394

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.580      15.771     531.213     528.796       0.023       0.513

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     282.322       0.000     282.322    1131.722       0.249       0.414

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.826     532.229       0.000       0.060       0.060       0.434

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.849      16.527       1.094     538.886      16.076     185.454       1.438

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 100088.438       0.601     504.473  846247.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.988

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     89.191    2266.000      16.527     538.886       1.000       1.000       0.980
W Kg/sec =   40.54142

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     80.859    2223.154       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
  68613.172   69985.281       2.508     590.487     235.480     474.134       2.013

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   270.30    -0.09   270.30     0.24   398.67
 MEAN    18.08     0.00    -0.02   270.30    -0.09   270.30     0.24
 HUB     15.21     0.00    -0.02   270.30    -0.09   270.30     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.38    46.36    10.02   406.37   488.13    15.88   532.78     0.43
 MEAN    52.91    42.30    10.61   357.49   448.25    15.88   532.78     0.40
 HUB     48.06    37.84    10.22   300.77   404.45    15.88   532.78     0.36

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   350.74   203.37   285.76  1141.84     0.31
 MEAN    18.01   355.39   208.84   287.55  1140.24     0.31
 HUB     15.22   382.02   249.12   289.62  1138.61     0.34
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	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	349.05	200.43	0.31	4154.65	
MEAN	356.14	323.08	147.29	0.28	3762.95	1.52
HUB	301.03	294.24	51.91	0.26	3793.70	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.84	1.08	16.71	552.08	1.02	541.81	0.92	0.90
MEAN	17.71	1.07	16.56	550.84	1.02	540.29	0.92	0.90
HUB	17.72	1.07	16.39	550.93	1.02	538.75	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.44	35.05	31.50	3.55	0.93	0.36	2.90	
MEAN	35.99	27.12	23.50	3.62	0.94	0.35	3.30	0.90
HUB	40.70	10.16	6.50	3.66	0.94	0.35	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.988

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	477.582	209.430	429.213	1131.706	0.422	-0.713

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.746	15.698	532.236	46.000	26.010	30.600	4.590

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	440.237	209.430	487.514	1134.746	0.388	-0.472

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	17.734	15.984	535.099	361.848	0.020	0.238

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	433.869	0.000	433.869	1135.238	0.382	0.256

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	16.006	535.563	0.000	0.060	0.044	-0.453

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.867	17.705	1.071	551.284	12.398	220.039	1.706

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
77205.188	0.474	389.135	775624.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =11.987 EfDer = 0.914

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
89.191	2266.000	17.705	551.284	1.000	1.000	0.710

W Kg/sec = 40.54142

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
76.342	2198.012	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
68613.172	69985.281	1.778	395.194	222.328	307.469	1.383

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	398.29	-0.14	398.29	0.35	384.96
MEAN	17.74	0.00	-0.02	398.29	-0.14	398.29	0.35	
HUB	15.05	0.00	-0.02	398.29	-0.14	398.29	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	44.91	46.36	-1.45	396.88	562.36	16.27	538.04	0.49
MEAN	41.38	43.40	-2.02	350.77	530.82	16.27	538.04	0.47

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HUB     36.78    38.84    -2.06   297.61   497.28    16.27   538.04     0.44

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   341.41   166.78   297.90  1152.56     0.30
MEAN    17.51   348.39   178.78   299.02  1151.56     0.30
HUB     14.85   376.97   227.58   300.53  1150.58     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   373.30   224.96     0.32  3306.58
MEAN   346.18   342.69   167.41     0.30  3132.22     1.65
HUB    293.65   307.71    66.08     0.27  3381.58

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.71     1.06    17.60   561.78     1.02   552.05     0.92     0.84
MEAN    18.66     1.05    17.51   561.23     1.02   551.09     0.92     0.84
HUB     18.73     1.06    17.39   562.02     1.02   550.16     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     29.24    37.06    31.50     5.56     0.93     0.39     2.90
MEAN    30.87    29.24    23.50     5.74     0.89     0.41     3.28     0.84
HUB     37.13    12.40     6.50     5.90     0.89     0.44     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.914

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     352.142     179.951     302.691    1151.799       0.306       0.005

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.687      17.512     551.324      46.000      30.732      31.500       0.768

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     314.436     179.951     362.288    1153.989       0.272       0.204

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.684      17.744     553.423     471.992       0.012       0.304

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.121     305.437       0.000     305.437    1154.475       0.265       0.213

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.767     553.888       0.000       0.060       0.037       0.224

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.800      18.655       1.054     561.679      10.395     249.364       1.933

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  64739.246       0.422     326.303 1106243.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     89.191    2266.000      18.655     561.679       1.000       1.000       0.980
W Kg/sec =   40.54142

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     73.137    2177.579       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  68613.172   69985.281       2.410     513.330     212.999     401.059       1.883
```

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	287.84	-0.10	287.84	0.25	365.99
MEAN	16.97	0.00	-0.02	287.84	-0.10	287.84	0.25	
HUB	14.32	0.00	-0.02	287.84	-0.10	287.84	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.93	46.36	6.57	380.86	477.47	17.87	554.76	0.41
MEAN	49.39	43.80	5.59	335.59	442.20	17.87	554.76	0.38
HUB	44.54	37.84	6.70	283.17	403.85	17.87	554.76	0.35

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	342.13	158.77	303.06	1162.28	0.29
MEAN	16.57	348.59	170.18	304.23	1161.31	0.30
HUB	13.89	375.75	218.58	305.64	1160.32	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	371.33	214.57	0.32	2999.54	
MEAN	327.74	342.61	157.56	0.30	2822.30	1.40
HUB	274.67	310.74	56.09	0.27	3037.51	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.68	1.06	18.53	571.20	1.02	561.43	0.92	0.91
MEAN	19.62	1.05	18.43	570.64	1.02	560.49	0.92	0.91
HUB	19.70	1.06	18.31	571.32	1.02	559.53	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.65	35.30	31.50	3.80	0.93	0.28	2.90	
MEAN	29.22	27.38	23.50	3.88	0.92	0.28	3.29	0.91
HUB	35.57	10.40	6.50	3.90	0.92	0.30	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	344.145	171.141	298.574	1162.009	0.296	0.050

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.654	18.492	561.166	46.000	29.821	32.400	2.579

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	314.002	171.141	357.612	1163.723	0.270	0.205

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.651	18.680	562.822	456.573	0.012	0.299

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	298.920	0.000	298.920	1164.521	0.257	0.199

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.738	563.594	0.000	0.060	0.039	0.252

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.871	19.618	1.052	571.055	9.376	261.005	2.023

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
58404.176	0.419	294.373	802370.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

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 RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.990

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    89.191    2266.000      19.618     571.055       1.000       1.000       0.980
W Kg/sec =   40.54142

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    70.124    2159.629       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 68613.172   69985.281       2.496     509.668     204.225     390.276       1.911

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   279.65    -0.10   279.65     0.24   345.25
MEAN    15.91     0.00    -0.02   279.65    -0.10   279.65     0.24
HUB     13.07     0.00    -0.02   279.65    -0.10   279.65     0.24

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     52.34    47.36     4.98   362.27   457.73    18.85   564.53     0.39
MEAN    48.38    44.80     3.58   314.67   421.05    18.85   564.53     0.36
HUB     42.75    38.84     3.91   258.45   380.86    18.85   564.53     0.33

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   328.11   144.17   294.74  1171.39     0.28
MEAN    15.50   332.65   152.00   295.89  1170.38     0.28
HUB     12.59   354.96   194.02   297.24  1169.34     0.30

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    354.76   362.24   210.58     0.31  2588.19
MEAN   306.46   333.78   154.46     0.29  2357.16     1.38
HUB    248.96   302.28    54.94     0.26  2444.01

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.52     1.05    19.43   579.27     1.01   570.28     0.92     0.91
MEAN    20.44     1.04    19.33   578.54     1.01   569.30     0.92     0.91
HUB     20.47     1.04    19.20   578.81     1.01   568.29     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     26.07    35.54    31.50     4.04     0.93     0.26     2.90
MEAN    27.19    27.57    23.50     4.07     0.92     0.26     3.34     0.91
HUB     33.13    10.47     6.50     3.97     0.92     0.27     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.990

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     336.032     154.787     298.259    1170.529       0.287      -0.007

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.457      19.318     569.447      46.000      27.428      33.000       5.572

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     316.899     154.787     352.681    1171.600       0.270       0.095

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.446      19.432     570.490     440.827       0.029       0.271

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     297.294       0.000     297.294    1172.632       0.254       0.184

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      19.531     571.495       0.000       0.060       0.047       0.181

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.849      20.425       1.041     578.874       7.819     293.712       2.277

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   48713.832       0.387     245.531  846481.688

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     349150.91   1759.8153     87.1308      1.3520      0.8424     11.9868      1.1072


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60% Stat 2 27% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.974

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      85.685    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   38.94787

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      83.706    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  65916.203   67234.383       3.411     831.557     243.770     619.754       2.542

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   193.09    -0.07   193.09     0.17   406.33
  MEAN    17.06     0.00    -0.02   193.09    -0.07   193.09     0.17
  HUB     12.51     0.00    -0.02   193.09    -0.07   193.09     0.17

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.67    50.47    14.20   407.95   451.40    14.80   519.70     0.40
  MEAN    60.22    47.20    13.02   337.36   388.77    14.80   519.70     0.35
  HUB     52.03    38.62    13.41   247.38   313.87    14.80   519.70     0.28

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   374.15   266.63   262.48  1127.85     0.33
  MEAN    18.04   382.99   276.60   264.91  1125.52     0.34
  HUB     15.00   420.46   323.53   268.55  1122.36     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   298.11   141.32     0.26  5502.01
  MEAN   356.65   276.74    80.05     0.25  4989.90     1.60
  HUB    296.62   269.90    26.91     0.24  4853.73

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.73     1.11    15.51   540.29     1.03   528.60     0.92     0.89
  MEAN    16.58     1.10    15.30   538.66     1.03   526.41     0.92     0.89
  HUB     16.54     1.09    15.01   538.23     1.03   523.46     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     45.45    28.30    24.20     4.10     0.93     0.44     2.90
  MEAN    46.24    16.81    12.70     4.11     0.94     0.39     3.51     0.89
  HUB     50.30    -5.72    -9.30     3.58     0.94     0.26     4.78
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     387.055     276.063     271.295    1125.664       0.344      -0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.603      15.297     526.546      24.000      45.499      35.400     -10.099

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     290.363     276.063     400.651    1131.497       0.257       0.422

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.582      15.839     532.017     528.796       0.025       0.539

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     270.685       0.000     270.685    1132.477       0.239       0.432

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.879     532.939       0.000       0.060       0.069       0.452

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.838      16.524       1.094     539.059      16.249     180.205       1.397

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 101164.203       0.608     489.853  811938.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     85.685    2266.000      16.524     539.059       1.000       1.000       0.980
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.709    2222.797       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  65916.203   67234.383       2.609     590.487     226.308     474.134       2.095

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   259.21    -0.09   259.21     0.23   398.61
 MEAN    18.08     0.00    -0.02   259.21    -0.09   259.21     0.23
 HUB     15.21     0.00    -0.02   259.21    -0.09   259.21     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.47    46.36    11.11   406.37   482.08    15.93   533.45     0.43
 MEAN    54.06    42.30    11.76   357.49   441.65    15.93   533.45     0.39
 HUB     49.25    37.84    11.41   300.77   397.13    15.93   533.45     0.35

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   346.19   211.73   273.89  1142.87     0.30
 MEAN    18.01   349.60   214.95   275.71  1141.15     0.31
 HUB     15.22   374.58   251.27   277.79  1139.40     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   334.52   192.06     0.29  4325.42
 MEAN   356.14   309.75   141.19     0.27  3872.92     1.56
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 HUB    301.03   282.21    49.75     0.25  3826.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.88     1.08    16.78   552.80     1.03   542.79     0.92     0.90
 MEAN    17.74     1.07    16.62   551.36     1.02   541.15     0.92     0.90
 HUB     17.72     1.07    16.44   551.21     1.02   539.49     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.71    35.04    31.50     3.54     0.93     0.38     2.90
 MEAN    37.94    27.12    23.50     3.62     0.94     0.37     3.30     0.90
 HUB     42.13    10.15     6.50     3.65     0.94     0.37     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     463.233     215.557     410.024    1133.439       0.409      -0.670

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.768      15.835     533.868      46.000      27.732      30.600       2.868

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     419.836     215.557     471.939    1136.832       0.369      -0.386

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      17.759      16.161     537.069     361.848       0.017       0.263

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     413.777       0.000     413.777    1137.278       0.364       0.297

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      16.181     537.491       0.000       0.060       0.039      -0.368

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      17.733       1.073     551.789      12.730     211.252       1.638

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79272.414       0.486     383.849  743251.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.938

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     85.685    2266.000      17.733     551.789       1.000       1.000       0.710
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     73.259    2197.007       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 65916.203   67234.383       1.852     395.194     213.352     307.469       1.441

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   380.30    -0.13   380.30     0.33   384.78
 MEAN    17.74     0.00    -0.02   380.30    -0.13   380.30     0.33
 HUB     15.05     0.00    -0.02   380.30    -0.13   380.30     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.23    46.36    -0.13   396.88   549.77    16.42   539.71     0.48
 MEAN    42.70    43.40    -0.70   350.77   517.46    16.42   539.71     0.45
 HUB     38.06    38.84    -0.78   297.61   482.99    16.42   539.71     0.42

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   335.26   177.46   284.44  1154.15     0.29
MEAN    17.51   341.28   186.69   285.69  1152.97     0.30
HUB     14.85   368.57   230.93   287.25  1151.82     0.32

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   356.12   214.27     0.31  3518.13
MEAN   346.18   327.20   159.49     0.28  3270.67     1.69
HUB    293.65   294.02    62.72     0.26  3431.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.83     1.06    17.76   562.96     1.02   553.57     0.92     0.86
MEAN    18.75     1.06    17.65   562.17     1.02   552.45     0.92     0.86
HUB     18.80     1.06    17.51   562.68     1.02   551.34     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.96    36.99    31.50     5.49     0.93     0.41     2.90
MEAN    33.16    29.17    23.50     5.67     0.90     0.42     3.28     0.86
HUB     38.80    12.32     6.50     5.82     0.90     0.45     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.938

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     344.870     187.918     289.174    1153.208       0.299       0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.785      17.653     552.675      46.000      33.018      31.500      -1.518

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     299.970     187.918     353.970    1155.727       0.260       0.244

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.783      17.922     555.093     471.992       0.012       0.338

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     291.438       0.000     291.438    1156.166       0.252       0.249

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.942     555.514       0.000       0.060       0.037       0.261

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.824      18.753       1.058     562.607      10.818     236.485       1.833

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  67374.742       0.439     326.239 1056263.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     85.685    2266.000      18.753     562.607       1.000       1.000       0.980
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     69.950    2175.783       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  65916.203   67234.383       2.520     513.330     203.717     401.059       1.969

     ROTOR LEADING EDGE CONDITIONS, STAGE            4
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   274.75    -0.09   274.75     0.24   365.68
MEAN    16.97     0.00    -0.02   274.75    -0.09   274.75     0.24
HUB     14.32     0.00    -0.02   274.75    -0.09   274.75     0.24

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.20    46.36     7.84   380.86   469.70    18.03   556.30     0.41
MEAN    50.70    43.80     6.90   335.59   433.79    18.03   556.30     0.37
HUB     45.87    37.84     8.03   283.17   394.63    18.03   556.30     0.34

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   334.68   169.08   288.83  1164.31     0.29
MEAN    16.57   340.24   177.74   290.12  1163.18     0.29
HUB     13.89   366.11   221.35   291.62  1162.02     0.32

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    373.34   353.76   204.27     0.30  3193.97
MEAN   327.74   326.60   150.00     0.28  2947.49     1.44
HUB    274.67   296.45    53.32     0.26  3075.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.85     1.06    18.75   572.75     1.02   563.39     0.92     0.91
MEAN    19.77     1.05    18.63   571.96     1.02   562.30     0.92     0.91
HUB     19.81     1.06    18.49   572.37     1.02   561.18     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.34    35.27    31.50     3.77     0.93     0.31     2.90
MEAN    31.49    27.34    23.50     3.84     0.93     0.31     3.29     0.91
HUB     37.20    10.36     6.50     3.86     0.93     0.32     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     336.225     178.742     284.778    1163.824       0.289       0.048

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.800      18.684     562.922      46.000      32.115      32.400       0.285

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     299.064     178.742     348.408    1165.860       0.257       0.243

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.798      18.912     564.894     456.573       0.011       0.332

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    16.096     284.752       0.000     284.752    1166.580       0.244       0.236

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.964     565.591       0.000       0.060       0.037       0.288

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      19.768       1.054     572.362       9.755     247.537       1.919

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  60764.258       0.436     294.230  767732.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
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    85.685    2266.000      19.768     572.362       1.000       1.000       0.980
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    66.932    2157.162       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 65916.203   67234.383       2.615     509.668     194.930     390.276       2.002

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   266.51    -0.09   266.51     0.23   344.86
MEAN    15.91     0.00    -0.02   266.51    -0.09   266.51     0.23
HUB     13.07     0.00    -0.02   266.51    -0.09   266.51     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.67    47.36     6.31   362.27   449.81    19.06   566.43     0.39
MEAN    49.75    44.80     4.95   314.67   412.44    19.06   566.43     0.35
HUB     44.13    38.84     5.29   258.45   371.31    19.06   566.43     0.32

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   320.25   154.72   280.39  1173.78     0.27
MEAN    15.50   323.78   159.71   281.65  1172.60     0.28
HUB     12.59   344.81   196.87   283.08  1171.41     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    354.76   344.43   200.03     0.29  2777.44
MEAN   306.46   317.59   146.75     0.27  2476.56     1.42
HUB    248.96   287.84    52.09     0.25  2479.85

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.75     1.05    19.71   581.18     1.02   572.62     0.92     0.91
MEAN    20.65     1.04    19.58   580.22     1.01   571.47     0.92     0.91
HUB     20.65     1.04    19.44   580.23     1.01   570.31     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     28.89    35.50    31.50     4.00     0.93     0.29     2.90
MEAN    29.56    27.52    23.50     4.02     0.92     0.29     3.34     0.91
HUB     34.82    10.43     6.50     3.93     0.92     0.29     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     327.179     162.637     283.893    1172.745       0.279      -0.007

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.660      19.572     571.608      46.000      29.808      33.000       3.192

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     301.128     162.637     342.241    1174.146       0.256       0.141

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.656      19.731     572.974     440.827       0.024       0.304

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    14.701     282.582       0.000     282.582    1175.072       0.240       0.227

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      19.823     573.878       0.000       0.060       0.040       0.223

   STAGE EXIT CONDITIONS, STAGE            5
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      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      20.638       1.044     580.545       8.183     277.096       2.148

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   50984.078       0.405     246.873  809641.438

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     359559.69   1741.0437     83.7060      1.3661      0.8473     13.0194      1.1104


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 60% Stat 2 27% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  0.966

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      82.317    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   37.41694

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      80.416    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   63325.230   64591.602       3.551     831.557     234.188     619.754       2.646

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   185.28    -0.06   185.28     0.17   406.33
  MEAN    17.06     0.00    -0.02   185.28    -0.06   185.28     0.17
  HUB     12.51     0.00    -0.02   185.28    -0.06   185.28     0.17

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     65.58    50.47    15.11   407.95   448.11    14.82   519.94     0.40
  MEAN    61.23    47.20    14.03   337.36   384.95    14.82   519.94     0.34
  HUB     53.17    38.62    14.55   247.38   309.13    14.82   519.94     0.28

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   370.79   272.24   251.74  1128.47     0.33
  MEAN    18.04   377.90   279.72   254.10  1126.05     0.34
  HUB     15.00   412.59   322.33   257.56  1122.89     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   285.99   135.71     0.25  5617.60
  MEAN   356.65   265.49    76.94     0.24  5046.04     1.66
  HUB    296.62   258.84    25.71     0.23  4835.73

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.76     1.11    15.55   540.65     1.03   529.17     0.92     0.88
  MEAN    16.58     1.10    15.34   538.84     1.03   526.91     0.92     0.88
  HUB     16.52     1.09    15.05   538.17     1.03   523.95     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     47.24    28.33    24.20     4.13     0.93     0.47     2.90
  MEAN    47.75    16.85    12.70     4.15     0.95     0.42     3.51     0.88
  HUB     51.37    -5.70    -9.30     3.60     0.95     0.28     4.78


    blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     381.639     279.172     260.213    1126.210       0.339      -0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.607      15.337     527.057      24.000      47.013      35.400     -11.613

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     278.271     279.172     394.172    1132.281       0.246       0.450

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.583      15.900     532.754     528.796       0.028       0.564

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     259.620       0.000     259.620    1133.171       0.229       0.449

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.924     533.592       0.000       0.060       0.078       0.468

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.826      16.518       1.093     539.222      16.412     175.209       1.358

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102177.656       0.614     475.312  779103.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  0.974

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     82.317    2266.000      16.518     539.222       1.000       1.000       0.980
W Kg/sec =   37.41694

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     74.693    2222.462       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  63325.230   64591.602       2.715     590.487     217.522     474.134       2.180

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   248.67    -0.09   248.67     0.22   398.55
 MEAN    18.08     0.00    -0.02   248.67    -0.09   248.67     0.22
 HUB     15.21     0.00    -0.02   248.67    -0.09   248.67     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.54    46.36    12.18   406.37   476.49    15.97   534.06     0.42
 MEAN    55.18    42.30    12.88   357.49   435.54    15.97   534.06     0.38
 HUB     50.43    37.84    12.59   300.77   390.32    15.97   534.06     0.34

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   342.35   219.57   262.67  1143.81     0.30
 MEAN    18.01   344.46   220.69   264.48  1141.98     0.30
 HUB     15.22   367.71   253.29   266.56  1140.12     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   320.83   184.22     0.28  4485.43
 MEAN   356.14   297.15   135.45     0.26  3976.14     1.61
 HUB    301.03   270.80    47.74     0.24  3857.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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TIP	17.92	1.08	16.83	553.47	1.03	543.68	0.92	0.89
MEAN	17.75	1.07	16.67	551.85	1.02	541.94	0.92	0.89
HUB	17.71	1.07	16.48	551.47	1.02	540.18	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.89	35.04	31.50	3.54	0.93	0.41	2.90	
MEAN	39.84	27.12	23.50	3.62	0.94	0.39	3.30	0.89
HUB	43.54	10.15	6.50	3.65	0.94	0.39	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.974

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	450.212	221.308	392.063	1134.994	0.397	-0.628

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.783	15.953	535.336	46.000	29.443	30.600	1.157

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	400.846	221.308	457.880	1138.708	0.352	-0.305

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.680	17.776	16.315	538.844	361.848	0.016	0.287

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	395.097	0.000	395.097	1139.111	0.347	0.335

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.680	16.333	539.226	0.000	0.060	0.037	-0.289

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.863	17.752	1.075	552.263	13.041	203.197	1.575

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
81209.250	0.498	377.771	712383.812

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =14.028 EfDer = 0.959

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
82.317	2266.000	17.752	552.263	1.000	1.000	0.710

W Kg/sec = 37.41694

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
70.335	2196.064	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
63325.230	64591.602	1.929	395.194	204.835	307.469	1.501

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	363.51	-0.13	363.51	0.32	384.62
MEAN	17.74	0.00	-0.02	363.51	-0.13	363.51	0.32	
HUB	15.05	0.00	-0.02	363.51	-0.13	363.51	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.52	46.36	1.16	396.88	538.28	16.55	541.23	0.47
MEAN	43.99	43.40	0.59	350.77	505.24	16.55	541.23	0.44
HUB	39.32	38.84	0.48	297.61	469.88	16.55	541.23	0.41

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	330.20	187.39	271.87	1155.58	0.29
MEAN	17.51	335.16	194.11	273.23	1154.25	0.29
HUB	14.85	360.95	234.00	274.83	1152.94	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	340.11	204.35	0.29	3714.68	
MEAN	346.18	312.70	152.07	0.27	3400.49	1.73
HUB	293.65	281.23	59.65	0.24	3476.84	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.94	1.07	17.89	564.06	1.02	554.95	0.92	0.88
MEAN	18.84	1.06	17.76	563.06	1.02	553.68	0.92	0.88
HUB	18.86	1.06	17.62	563.30	1.02	552.42	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.58	36.93	31.50	5.43	0.93	0.43	2.90	
MEAN	35.39	29.10	23.50	5.60	0.90	0.44	3.28	0.88
HUB	40.41	12.25	6.50	5.75	0.90	0.47	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.959

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	338.604	195.388	276.543	1154.483	0.293	0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.868	17.774	553.900	46.000	35.243	31.500	-3.743

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	286.503	195.388	346.785	1157.314	0.248	0.283

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.865	18.077	556.620	471.992	0.013	0.371

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	278.439	0.000	278.439	1157.709	0.241	0.282

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.089	557.000	0.000	0.060	0.041	0.294

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.842	18.833	1.061	563.474	11.211	225.089	1.745

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
69826.586	0.455	324.821	1009195.188

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =14.028 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
82.317	2266.000	18.833	563.474	1.000	1.000	0.980

W Kg/sec = 37.41694

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
66.967	2174.107	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
63325.230	64591.602	2.632	513.330	195.029	401.059	2.056

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	262.59	-0.09	262.59	0.23	365.40
MEAN	16.97	0.00	-0.02	262.59	-0.09	262.59	0.23	

```
HUB     14.32     0.00    -0.02   262.59    -0.09   262.59     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.42    46.36     9.06   380.86   462.68    18.17   557.72     0.40
MEAN    51.97    43.80     8.17   335.59   426.18    18.17   557.72     0.37
HUB     47.17    37.84     9.33   283.17   386.25    18.17   557.72     0.33

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   328.48   178.54   275.73  1166.15     0.28
MEAN    16.57   332.98   184.65   277.09  1164.87     0.29
HUB     13.89   357.44   223.87   278.65  1163.57     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    373.34   337.60   194.80     0.29  3372.57
MEAN   327.74   311.85   143.09     0.27  3061.96     1.49
HUB    274.67   283.24    50.80     0.24  3110.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.00     1.06    18.92   574.18     1.02   565.17     0.92     0.91
MEAN    19.89     1.06    18.79   573.20     1.02   563.94     0.92     0.91
HUB     19.91     1.06    18.64   573.35     1.02   562.68     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.92    35.24    31.50     3.74     0.93     0.34     2.90
MEAN    33.68    27.31    23.50     3.81     0.93     0.33     3.29     0.91
HUB     38.78    10.33     6.50     3.83     0.93     0.34     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     329.370     185.692     272.035    1165.470       0.283       0.046

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.920      18.844     564.518      46.000      34.318      32.400      -1.918

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     285.327     185.692     340.430    1167.801       0.244       0.280

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.918      19.107     566.778     456.573       0.011       0.365

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     271.753       0.000     271.753    1168.452       0.233       0.269

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.152     567.410       0.000       0.060       0.038       0.319

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      19.888       1.056     573.576      10.102     235.732       1.827

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  62926.203       0.451     292.722  734888.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     82.317    2266.000      19.888     573.576       1.000       1.000       0.980
W Kg/sec =   37.41694
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
63.982	2154.877	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
63325.230	64591.602	2.735	509.668	186.340	390.276	2.094

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	254.43	-0.09	254.43	0.22	344.49
MEAN	15.91	0.00	-0.02	254.43	-0.09	254.43	0.22	
HUB	13.07	0.00	-0.02	254.43	-0.09	254.43	0.22	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.93	47.36	7.57	362.27	442.76	19.24	568.17	0.38
MEAN	51.05	44.80	6.25	314.67	404.73	19.24	568.17	0.35
HUB	45.46	38.84	6.62	258.45	362.74	19.24	568.17	0.31

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	313.78	164.31	267.32	1175.93	0.27
MEAN	15.50	316.16	166.69	268.66	1174.61	0.27
HUB	12.59	335.79	199.44	270.14	1173.28	0.29

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	328.22	190.44	0.28	2949.42	
MEAN	306.46	302.84	139.77	0.26	2584.64	1.47
HUB	248.96	274.64	49.52	0.23	2512.15	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.94	1.05	19.93	582.94	1.02	574.72	0.92	0.91
MEAN	20.81	1.05	19.79	581.78	1.01	573.43	0.92	0.91
HUB	20.78	1.05	19.63	581.55	1.01	572.14	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.58	35.47	31.50	3.97	0.93	0.32	2.90	
MEAN	31.82	27.49	23.50	3.99	0.93	0.31	3.34	0.91
HUB	36.44	10.39	6.50	3.89	0.93	0.31	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	319.593	169.743	270.790	1174.745	0.272	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.825	19.779	573.562	46.000	32.081	33.000	0.919

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	286.833	169.743	333.296	1176.442	0.244	0.183

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.823	19.978	575.221	440.827	0.022	0.337

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	269.253	0.000	269.253	1177.276	0.229	0.266

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.062	576.037	0.000	0.060	0.037	0.261

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	20.807	1.046	582.089	8.514	262.823	2.037

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 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   53043.586       0.421     246.749  774766.688

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     369183.28   1717.3756     80.4157      1.3773      0.8478     14.0280      1.1134


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60% Stat 2 27% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.958

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      79.082    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   35.94620

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      77.255    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   60836.117   62052.707       3.696     831.557     224.983     619.754       2.755

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   177.81    -0.06   177.81     0.16   406.33
  MEAN    17.06     0.00    -0.02   177.81    -0.06   177.81     0.16
  HUB     12.51     0.00    -0.02   177.81    -0.06   177.81     0.16

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     66.45    50.47    15.98   407.95   445.07    14.84   520.17     0.40
  MEAN    62.21    47.20    15.01   337.36   381.40    14.84   520.17     0.34
  HUB     54.30    38.62    15.68   247.38   304.70    14.84   520.17     0.27

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   367.91   277.54   241.51  1129.03     0.33
  MEAN    18.04   373.26   282.64   243.80  1126.54     0.33
  HUB     15.00   405.14   321.08   247.07  1123.37     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   274.47   130.41     0.24  5726.97
  MEAN   356.65   254.78    74.01     0.23  5098.82     1.72
  HUB    296.62   248.28    24.46     0.22  4816.99

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.78     1.11    15.59   541.00     1.03   529.70     0.92     0.88
  MEAN    16.59     1.10    15.37   539.01     1.03   527.37     0.92     0.88
  HUB     16.50     1.09    15.08   538.11     1.03   524.40     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     48.97    28.37    24.20     4.17     0.93     0.49     2.90
  MEAN    49.22    16.89    12.70     4.19     0.95     0.44     3.51     0.88
  HUB     52.42    -5.65    -9.30     3.65     0.95     0.31     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.958

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	376.701	282.095	249.651	1126.706	0.334	0.000

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
16.609	15.371	527.521	24.000	48.492	35.400	-13.092

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	266.773	282.095	388.260	1132.998	0.235	0.476

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.582	15.953	533.430	528.796	0.031	0.589

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	249.082	0.000	249.082	1133.807	0.220	0.464

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.963	534.192	0.000	0.060	0.088	0.484

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.814	16.510	1.093	539.374	16.564	170.456	1.321

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
103123.086	0.620	460.855	747667.688

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =15.012 EfDer = 0.966

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
79.082	2266.000	16.510	539.374	1.000	1.000	0.980

W Kg/sec = 35.94620

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
71.801	2222.149	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
60836.117	62052.707	2.824	590.487	209.101	474.134	2.267

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	238.62	-0.08	238.62	0.21	398.49
MEAN	18.08	0.00	-0.02	238.62	-0.08	238.62	0.21	
HUB	15.21	0.00	-0.02	238.62	-0.08	238.62	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.58	46.36	13.22	406.37	471.32	16.01	534.62	0.42
MEAN	56.28	42.30	13.98	357.49	429.88	16.01	534.62	0.38
HUB	51.58	37.84	13.74	300.77	383.99	16.01	534.62	0.34

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	339.15	226.95	252.02	1144.66	0.30
MEAN	18.01	339.90	226.07	253.82	1142.73	0.30
HUB	15.22	361.35	255.15	255.88	1140.78	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	307.88	176.84	0.27	4636.07	
MEAN	356.14	285.21	130.07	0.25	4072.95	1.66
HUB	301.03	259.96	45.88	0.23	3885.39	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.94	1.09	16.88	554.10	1.03	544.49	0.92	0.88
MEAN	17.76	1.08	16.70	552.31	1.02	542.66	0.92	0.88
HUB	17.70	1.07	16.51	551.71	1.02	540.81	0.92	0.88

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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.00    35.06    31.50     3.56     0.93     0.43     2.90
 MEAN    41.69    27.13    23.50     3.63     0.95     0.42     3.30     0.88
 HUB     44.92    10.17     6.50     3.67     0.95     0.41     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     438.361     226.702     375.188    1136.395       0.386      -0.589

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.793      16.055     536.659      46.000      31.142      30.600      -0.542

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     383.091     226.702     445.143    1140.402       0.336      -0.227

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      17.787      16.449     540.451     361.848       0.015       0.312

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     377.654       0.000     377.654    1140.767       0.331       0.370

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      16.463     540.796       0.000       0.060       0.037      -0.214

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      17.763       1.076     552.707      13.333     195.771       1.518

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  83027.117       0.509     371.046  682932.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.975

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     79.082    2266.000      17.763     552.707       1.000       1.000       0.710
W Kg/sec =   35.94620

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     67.555    2195.183       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  60836.117   62052.707       2.009     395.194     196.740     307.469       1.563

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   347.77    -0.12   347.77     0.30   384.46
 MEAN    17.74     0.00    -0.02   347.77    -0.12   347.77     0.30
 HUB     15.05     0.00    -0.02   347.77    -0.12   347.77     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.78    46.36     2.42   396.88   527.78    16.66   542.61     0.46
 MEAN    45.26    43.40     1.86   350.77   494.04    16.66   542.61     0.43
 HUB     40.57    38.84     1.73   297.61   457.81    16.66   542.61     0.40

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   326.11   196.69   260.11  1156.88      0.28
 MEAN    17.51   329.88   201.03   261.55  1155.42      0.29
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 HUB     14.85   354.10   236.90   263.19  1153.97     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   325.12   195.04     0.28  3898.89
 MEAN   346.18   299.13   145.16     0.26  3521.44     1.77
 HUB    293.65   269.23    56.75     0.23  3519.83

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.03     1.07    18.01   565.09     1.02   556.21     0.92     0.89
 MEAN    18.91     1.06    17.86   563.89     1.02   554.80     0.92     0.89
 HUB     18.91     1.06    17.71   563.88     1.02   553.41     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.10    36.86    31.50     5.36     0.93     0.45     2.90
 MEAN    37.55    29.03    23.50     5.53     0.91     0.46     3.28     0.89
 HUB     41.99    12.17     6.50     5.67     0.91     0.48     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.975

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     333.191     202.348     264.711    1155.643       0.288       0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.937      17.874     555.016      46.000      37.395      31.500      -5.895

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     273.932     202.348     340.563    1158.767       0.236       0.320

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.932      18.209     558.020     471.992       0.015       0.405

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     266.329       0.000     266.329    1159.123       0.230       0.312

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.213     558.363       0.000       0.060       0.048       0.324

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.853      18.896       1.064     564.287      11.580     214.888       1.666

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  72121.766       0.470     322.310  964762.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     79.082    2266.000      18.896     564.287       1.000       1.000       0.980
W Kg/sec =   35.94620

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     64.168    2172.542       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  60836.117   62052.707       2.747     513.330     186.879     401.059       2.146

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   251.24    -0.09   251.24     0.22   365.14
 MEAN    16.97     0.00    -0.02   251.24    -0.09   251.24     0.22
 HUB     14.32     0.00    -0.02   251.24    -0.09   251.24     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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TIP     56.59    46.36    10.23   380.86   456.33    18.29   559.02     0.39
MEAN    53.19    43.80     9.39   335.59   419.28    18.29   559.02     0.36
HUB     48.43    37.84    10.59   283.17   378.62    18.29   559.02     0.33

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   323.35   187.27   263.60  1167.81     0.28
MEAN    16.57   326.68   191.02   265.01  1166.41     0.28
HUB     13.89   349.63   226.20   266.60  1164.99     0.30

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    373.34   322.66   186.08     0.28  3537.29
MEAN   327.74   298.20   136.72     0.26  3167.44     1.54
HUB    274.67   270.97    48.47     0.23  3143.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.12     1.06    19.07   575.52     1.02   566.79     0.92     0.91
MEAN    19.99     1.06    18.92   574.34     1.02   565.43     0.92     0.91
HUB     19.98     1.06    18.77   574.27     1.02   564.06     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.39    35.22    31.50     3.72     0.93     0.36     2.90
MEAN    35.78    27.29    23.50     3.79     0.94     0.36     3.29     0.91
HUB     40.31    10.30     6.50     3.80     0.94     0.36     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.994

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     323.437     192.096     260.212    1166.969       0.277       0.044

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.016      18.974     565.974      46.000      36.436      32.400      -4.036

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     272.629     192.096     333.508    1169.573       0.233       0.315

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.013      19.269     568.502     456.573       0.013       0.397

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    16.096     259.760       0.000     259.760    1170.161       0.222       0.299

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      19.305     569.074       0.000       0.060       0.042       0.347

   STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.873      19.980       1.057     574.708      10.422     225.249       1.746

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  64920.762       0.466     290.129  703694.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     79.082    2266.000      19.980     574.708       1.000       1.000       0.980
W Kg/sec =   35.94620

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     61.244    2152.754       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
60836.117	62052.707	2.857	509.668	178.365	390.276	2.188

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	243.28	-0.08	243.28	0.21	344.16
MEAN	15.91	0.00	-0.02	243.28	-0.08	243.28	0.21	
HUB	13.07	0.00	-0.02	243.28	-0.08	243.28	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.12	47.36	8.76	362.27	436.45	19.39	569.77	0.37
MEAN	52.30	44.80	7.50	314.67	397.81	19.39	569.77	0.34
HUB	46.74	38.84	7.90	258.45	355.00	19.39	569.77	0.30

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	308.47	173.06	255.35	1177.87	0.26
MEAN	15.50	309.64	173.11	256.72	1176.44	0.26
HUB	12.59	327.73	201.79	258.24	1174.99	0.28

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	313.39	181.70	0.27	3106.20	
MEAN	306.46	289.29	133.35	0.25	2684.15	1.51
HUB	248.96	262.51	47.17	0.22	2541.67	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.10	1.06	20.11	584.57	1.02	576.62	0.92	0.91
MEAN	20.94	1.05	19.96	583.23	1.01	575.22	0.92	0.91
HUB	20.89	1.05	19.79	582.78	1.01	573.81	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.13	35.43	31.50	3.93	0.93	0.35	2.90	
MEAN	33.99	27.45	23.50	3.95	0.93	0.34	3.34	0.91
HUB	38.00	10.35	6.50	3.85	0.93	0.33	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	313.105	176.286	258.762	1176.560	0.266	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.955	19.947	575.340	46.000	34.265	33.000	-1.265

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	273.777	176.286	325.624	1178.528	0.232	0.223

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.953	20.180	577.266	440.827	0.021	0.369

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	257.083	0.000	257.083	1179.283	0.218	0.301

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.254	578.006	0.000	0.060	0.037	0.296

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.880	20.937	1.048	583.524	8.816	250.356	1.941

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
54928.070	0.436	245.472	741686.625

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    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     378120.78   1689.8124     77.2548      1.3859      0.8447     15.0123      1.1161


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 60% Stat 2 27% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.950

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      75.973    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   34.53327

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      74.218    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   58444.840   59613.613       3.847     831.557     216.140     619.754       2.867

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   170.65    -0.06   170.65     0.15   406.33
  MEAN    17.06     0.00    -0.02   170.65    -0.06   170.65     0.15
  HUB     12.51     0.00    -0.02   170.65    -0.06   170.65     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     67.30    50.47    16.83   407.95   442.26    14.86   520.38     0.40
  MEAN    63.17    47.20    15.97   337.36   378.11    14.86   520.38     0.34
  HUB     55.41    38.62    16.79   247.38   300.58    14.86   520.38     0.27

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   365.41   282.51   231.77  1129.54     0.32
  MEAN    18.04   369.02   285.36   233.97  1126.99     0.33
  HUB     15.00   398.17   319.90   237.07  1123.81     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   263.54   125.44     0.23  5829.34
  MEAN   356.65   244.59    71.29     0.22  5147.82     1.78
  HUB    296.62   238.21    23.28     0.21  4799.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.79     1.11    15.62   541.33     1.04   530.17     0.92     0.87
  MEAN    16.59     1.10    15.40   539.16     1.03   527.79     0.92     0.87
  HUB     16.49     1.09    15.11   538.06     1.03   524.81     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     50.63    28.42    24.20     4.22     0.93     0.51     2.90
  MEAN    50.65    16.95    12.70     4.25     0.95     0.46     3.51     0.87
  HUB     53.46    -5.61    -9.30     3.69     0.95     0.33     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.950

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
       R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
       18.071     372.173     284.809     239.576    1127.159       0.330       0.000
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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.610      15.400     527.946      24.000      49.930      35.400     -14.530

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     255.829     284.809     382.837    1133.655       0.226       0.501

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.579      16.001     534.049     528.796       0.034       0.613

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     239.034       0.000     239.034    1134.392       0.211       0.479

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.997     534.743       0.000       0.060       0.097       0.498

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.802      16.501       1.092     539.515      16.705     165.927       1.286

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 104003.922       0.625     446.521  717563.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.958

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     75.973    2266.000      16.501     539.515       1.000       1.000       0.980
W Kg/sec =   34.53327

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     69.027    2221.858       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  58444.840   59613.613       2.937     590.487     201.025     474.134       2.359

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   229.03    -0.08   229.03     0.20   398.44
 MEAN    18.08     0.00    -0.02   229.03    -0.08   229.03     0.20
 HUB     15.21     0.00    -0.02   229.03    -0.08   229.03     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     60.60    46.36    14.24   406.37   466.53    16.04   535.13     0.41
 MEAN    57.36    42.30    15.06   357.49   424.63    16.04   535.13     0.37
 HUB     52.72    37.84    14.88   300.77   378.11    16.04   535.13     0.33

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   336.50   233.89   241.92  1145.44     0.29
 MEAN    18.01   335.86   231.14   243.68  1143.42     0.29
 HUB     15.22   355.43   256.84   245.70  1141.39     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   295.62   169.91     0.26  4777.69
 MEAN   356.14   273.87   125.00     0.24  4164.18     1.71
 HUB    301.03   249.64    44.19     0.22  3911.00

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.96     1.09    16.92   554.69     1.03   545.23     0.92     0.88
 MEAN    17.77     1.08    16.74   552.74     1.02   543.32     0.92     0.88
 HUB     17.69     1.07    16.54   551.94     1.02   541.39     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     44.03    35.08    31.50     3.58     0.93     0.45     2.90
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 MEAN    43.49    27.16    23.50     3.66     0.95     0.44     3.30     0.88
 HUB     46.27    10.20     6.50     3.70     0.95     0.43     3.92


   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.958

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     427.567     231.785     359.290    1137.659       0.376       -0.552

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.798      16.142     537.855      46.000      32.827      30.600      -2.227

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     366.433     231.785     433.587    1141.938       0.321       -0.154

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      17.792      16.565     541.908     361.848       0.015       0.336

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     361.308       0.000     361.308    1142.266       0.316       0.402

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      16.575     542.220       0.000       0.060       0.038      -0.145

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.850      17.767       1.077     553.122      13.607     188.898       1.464

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  84730.938       0.520     363.776  654816.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.986

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     75.973    2266.000      17.767     553.122       1.000       1.000       0.710
W Kg/sec =   34.53327

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     64.910    2194.359       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  58444.840   59613.613       2.091     395.194     189.036     307.469       1.627

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   332.99    -0.11   332.99     0.29   384.32
 MEAN    17.74     0.00    -0.02   332.99    -0.11   332.99     0.29
 HUB     15.05     0.00    -0.02   332.99    -0.11   332.99     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.01    46.36     3.65   396.88   518.15    16.75   543.86     0.45
 MEAN    46.50    43.40     3.10   350.77   483.74    16.75   543.86     0.42
 HUB     41.80    38.84     2.96   297.61   446.67    16.75   543.86     0.39

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   322.84   205.38   249.09  1158.06     0.28
 MEAN    17.51   325.35   207.50   250.59  1156.48     0.28
 HUB     14.85   347.92   239.62   252.25  1154.91     0.30

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
```

TIP	391.73	311.09	186.36	0.27	4070.86			
MEAN	346.18	286.40	138.68	0.25	3634.65	1.82		
HUB	293.65	257.97	54.03	0.22	3560.07			

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.11	1.08	18.10	566.05	1.02	557.35	0.92	0.90
MEAN	18.96	1.07	17.95	564.66	1.02	555.82	0.92	0.90
HUB	18.94	1.07	17.78	564.43	1.02	554.32	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.51	36.80	31.50	5.30	0.93	0.47	2.90	
MEAN	39.63	28.96	23.50	5.46	0.91	0.47	3.28	0.90
HUB	43.53	12.09	6.50	5.59	0.91	0.49	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.986

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	328.543	208.862	253.608	1156.698	0.284	0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.992	17.956	556.033	46.000	39.474	31.500	-7.974

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	262.170	208.862	335.196	1160.099	0.226	0.355

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.984	18.320	559.307	471.992	0.017	0.437

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	255.013	0.000	255.013	1160.419	0.220	0.338

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.314	559.616	0.000	0.060	0.057	0.350

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.859	18.942	1.066	565.046	11.924	205.697	1.595

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
74267.109	0.484	318.852	922733.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =15.972 EfDer = 0.989

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
75.973	2266.000	18.942	565.046	1.000	1.000	0.980

W Kg/sec = 34.53327

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
61.538	2171.081	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
58444.840	59613.613	2.864	513.330	179.218	401.059	2.238

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	240.63	-0.08	240.63	0.21	364.89
MEAN	16.97	0.00	-0.02	240.63	-0.08	240.63	0.21	
HUB	14.32	0.00	-0.02	240.63	-0.08	240.63	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.72	46.36	11.36	380.86	450.57	18.38	560.21	0.39
MEAN	54.37	43.80	10.57	335.59	413.01	18.38	560.21	0.36
HUB	49.65	37.84	11.81	283.17	371.66	18.38	560.21	0.32

```
      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   319.08   195.30   252.33  1169.32     0.27
 MEAN    16.57   321.18   196.88   253.76  1167.81     0.28
 HUB     13.89   342.54   228.30   255.37  1166.29     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   308.82   178.04     0.26  3688.88
 MEAN   327.74   285.51   130.86     0.24  3264.52     1.58
 HUB    274.67   259.54    46.37     0.22  3172.30

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.21     1.07    19.19   576.76     1.02   568.26     0.92     0.90
 MEAN    20.06     1.06    19.03   575.41     1.02   566.80     0.92     0.90
 HUB     20.03     1.06    18.86   575.12     1.02   565.32     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.74    35.21    31.50     3.71     0.93     0.39     2.90
 MEAN    37.81    27.28    23.50     3.78     0.94     0.38     3.29     0.90
 HUB     41.80    10.29     6.50     3.79     0.94     0.38     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481      318.280     197.990     249.203    1168.336       0.272        0.042

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.089      19.078      567.304      46.000      38.467      32.400      -6.067

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481      260.840     197.990     327.472    1171.193       0.223        0.348

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       20.085      19.402     570.081     456.573       0.014        0.428

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096      248.640       0.000     248.640    1171.726       0.212        0.326

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       19.427     570.600       0.000       0.060       0.049        0.372

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4          PR4        Texit         Del T       Ns         Ns nondim
      0.865       20.048       1.058      575.762       10.716     215.887       1.674

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  66752.531       0.479     286.590  674032.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.997

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     75.973     2266.000       20.048     575.762       1.000        1.000        0.980
W Kg/sec =   34.53327

   W cor       RPM cor         GAMMA        Cp          R           Blades       THK
     58.692     2150.783        1.402        0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  58444.840   59613.613        2.982      509.668     170.933     390.276       2.283
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ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	232.93	-0.08	232.93	0.20	343.84
MEAN	15.91	0.00	-0.02	232.93	-0.08	232.93	0.20	
HUB	13.07	0.00	-0.02	232.93	-0.08	232.93	0.20	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	57.27	47.36	9.91	362.27	430.76	19.50	571.23	0.37
MEAN	53.50	44.80	8.70	314.67	391.57	19.50	571.23	0.33
HUB	47.98	38.84	9.14	258.45	347.99	19.50	571.23	0.30

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	304.09	181.07	244.31	1179.64	0.26
MEAN	15.50	303.97	178.96	245.70	1178.10	0.26
HUB	12.59	320.47	203.90	247.23	1176.55	0.27

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	299.76	173.68	0.25	3249.88	
MEAN	306.46	276.81	127.50	0.23	2774.74	1.56
HUB	248.96	251.31	45.06	0.21	2568.21	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.21	1.06	20.25	586.08	1.02	578.36	0.92	0.91
MEAN	21.04	1.05	20.09	584.57	1.02	576.86	0.92	0.91
HUB	20.97	1.05	19.91	583.91	1.01	575.34	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.54	35.41	31.50	3.91	0.93	0.38	2.90	
MEAN	36.07	27.43	23.50	3.93	0.93	0.36	3.34	0.91
HUB	39.51	10.33	6.50	3.83	0.93	0.35	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	307.484	182.242	247.658	1178.211	0.261	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
21.053	20.078	576.960	46.000	36.348	33.000	-3.348

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	261.775	182.242	318.964	1180.427	0.222	0.260

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	21.051	20.341	579.132	440.827	0.023	0.400

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	245.900	0.000	245.900	1181.112	0.208	0.332

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	20.406	579.805	0.000	0.060	0.040	0.326

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	21.033	1.049	584.853	9.092	239.375	1.856

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
56647.039	0.450	243.204	710263.125

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR

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    386401.53   1658.9430     74.2182      1.3923      0.8387     15.9719      1.1187


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 60% Stat 2 27% Ice Block 8-2-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =17.022   EfDer =  0.940

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     72.622    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   33.00999

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     70.944    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  55866.812   56984.027       4.025     831.557     206.605     619.754       3.000

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   162.95    -0.06   162.95     0.15   406.33
 MEAN    17.06     0.00    -0.02   162.95    -0.06   162.95     0.15
 HUB     12.51     0.00    -0.02   162.95    -0.06   162.95     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     68.23    50.47    17.76   407.95   439.34    14.88   520.59     0.39
 MEAN    64.22    47.20    17.02   337.36   374.70    14.88   520.59     0.33
 HUB     56.63    38.62    18.01   247.38   296.27    14.88   520.59     0.26

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   363.05   287.76   221.35  1130.06     0.32
 MEAN    18.04   364.70   288.23   223.45  1127.45     0.32
 HUB     15.00   390.78   318.56   226.35  1124.26     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   251.87   120.19     0.22  5937.73
 MEAN   356.65   233.69    68.42     0.21  5199.54     1.85
 HUB    296.62   227.41    21.94     0.20  4779.07

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.81     1.11    15.64   541.67     1.04   530.66     0.92     0.86
 MEAN    16.59     1.10    15.43   539.33     1.03   528.22     0.92     0.86
 HUB     16.46     1.09    15.14   537.99     1.03   525.24     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     52.43    28.50    24.20     4.30     0.93     0.54     2.90
 MEAN    52.22    17.03    12.70     4.33     0.95     0.49     3.51     0.86
 HUB     54.60    -5.54    -9.30     3.76     0.95     0.36     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.940

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     367.563     287.674     228.793    1127.622       0.326       0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.607      15.427     528.379      24.000      51.504      35.400     -16.104
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STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	244.135	287.674	377.304	1134.331	0.215	0.528

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.573	16.046	534.685	528.796	0.038	0.640

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	228.278	0.000	228.278	1134.994	0.201	0.495

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.029	535.311	0.000	0.060	0.108	0.514

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.788	16.488	1.091	539.663	16.853	161.073	1.249

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
104926.555	0.630	430.612	685209.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =17.022 EfDer = 0.948

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
72.622	2266.000	16.488	539.663	1.000	1.000	0.980

W Kg/sec = 33.00999

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
66.041	2221.552	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
55866.812	56984.027	3.070	590.487	192.329	474.134	2.465

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	218.76	-0.08	218.76	0.19	398.38
MEAN	18.08	0.00	-0.02	218.76	-0.08	218.76	0.19	
HUB	15.21	0.00	-0.02	218.76	-0.08	218.76	0.19	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.71	46.36	15.35	406.37	461.58	16.07	535.67	0.41
MEAN	58.54	42.30	16.24	357.49	419.18	16.07	535.67	0.37
HUB	53.98	37.84	16.14	300.77	371.97	16.07	535.67	0.33

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	334.07	241.21	231.14	1146.23	0.29
MEAN	18.01	331.88	236.48	232.85	1144.13	0.29
HUB	15.22	349.32	258.62	234.81	1142.01	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	282.60	162.59	0.25	4926.97	
MEAN	356.14	261.80	119.66	0.23	4260.42	1.77
HUB	301.03	238.61	42.40	0.21	3938.18	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.98	1.09	16.95	555.31	1.03	545.99	0.92	0.87
MEAN	17.77	1.08	16.76	553.19	1.03	544.00	0.92	0.87
HUB	17.67	1.07	16.56	552.17	1.02	541.98	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	46.22	35.12	31.50	3.62	0.93	0.48	2.90	
MEAN	45.44	27.20	23.50	3.70	0.95	0.46	3.30	0.87
HUB	47.76	10.24	6.50	3.74	0.95	0.45	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.680       1.000       0.948

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      416.553     237.147     342.459     1138.940       0.366       -0.512

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     17.798      16.225      539.068      46.000      34.702       30.600      -4.102

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960      348.867     237.147     421.838     1143.502       0.305      -0.076

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.680       17.791      16.677      543.395      361.848       0.017       0.365

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823      344.091       0.000     344.091     1143.792       0.301       0.434

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680       16.682      543.671       0.000       0.060       0.042      -0.072

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4           PR4        Texit        Del T        Ns         Ns nondim
      0.839       17.764        1.077      553.559      13.896      181.731       1.409

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  86528.609       0.531     355.108  624685.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =17.022   EfDer =  0.995

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     72.622     2266.000       17.764      553.559       1.000        1.000        0.710
W Kg/sec =   33.00999

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     62.082     2193.492        1.402        0.249       53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  55866.812   56984.027        2.186      395.194     180.802      307.469       1.701

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00     -0.02   317.36     -0.11   317.36      0.28    384.17
 MEAN    17.74      0.00     -0.02   317.36     -0.11   317.36      0.28
 HUB     15.05      0.00     -0.02   317.36     -0.11   317.36      0.28

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     51.36     46.36      5.00   396.88    508.25     16.84    545.15      0.44
 MEAN    47.87     43.40      4.47   350.77    473.11     16.84    545.15      0.41
 HUB     43.17     38.84      4.33   297.61    435.15     16.84    545.15      0.38

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500       0.050        0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81    320.01    214.49    237.49   1159.27      0.28
 MEAN    17.51    321.03    214.30    239.03   1157.57      0.28
 HUB     14.85    341.62    242.42    240.71   1155.88      0.30

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    391.73    296.34    177.25      0.26   4251.22
 MEAN   346.18    273.00    131.88      0.24   3753.64      1.87
 HUB    293.65    246.10     51.23      0.21   3601.57
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.18     1.08    18.19   567.06     1.02   558.51     0.92     0.91
 MEAN    19.01     1.07    18.02   565.48     1.02   556.87     0.92     0.91
 HUB     18.96     1.07    17.84   565.00     1.02   555.25     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     42.09    36.73    31.50     5.23     0.93     0.49     2.90
 MEAN    41.88    28.89    23.50     5.39     0.92     0.49     3.28     0.91
 HUB     45.20    12.02     6.50     5.52     0.92     0.51     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     324.115     215.709     241.910    1157.776       0.280        0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.037      18.028     557.072      46.000      41.723      31.500     -10.223

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     17.392     249.808     215.709     330.052    1161.470       0.215        0.394

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.026      18.422     560.633     471.992       0.021        0.473

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     243.129       0.000     243.129    1161.755       0.209        0.365

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      18.405     560.908       0.000       0.060       0.070        0.377

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.861       18.976        1.068     565.844      12.285     196.375        1.522

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  76513.938       0.499     314.008  878076.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =17.022   EfDer =  0.981

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     72.622     2266.000       18.976     565.844       1.000        1.000        0.980
W Kg/sec =   33.00999

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     58.759     2169.551        1.402        0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  55866.812   56984.027        3.000     513.330     171.126     401.059        2.344

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   229.47    -0.08   229.47     0.20    364.64
 MEAN    16.97      0.00    -0.02   229.47    -0.08   229.47     0.20
 HUB     14.32      0.00    -0.02   229.47    -0.08   229.47     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.94     46.36    12.58   380.86   444.71    18.47   561.45     0.38
 MEAN    55.64     43.80    11.84   335.59   406.61    18.47   561.45     0.35
 HUB     50.99     37.84    13.15   283.17   364.54    18.47   561.45     0.31

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
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     0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   315.15   203.61   240.56  1170.86     0.27
 MEAN    16.57   315.85   202.99   241.98  1169.25     0.27
 HUB     13.89   335.33   230.46   243.58  1167.63     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   294.41   169.74     0.25  3845.60
 MEAN   327.74   272.24   124.75     0.23  3365.68     1.64
 HUB    274.67   247.56    44.21     0.21  3202.17

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.29     1.07    19.29   578.05     1.02   569.76     0.92     0.90
 MEAN    20.12     1.06    19.13   576.53     1.02   568.20     0.92     0.90
 HUB     20.07     1.06    18.95   576.01     1.02   566.62     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.24    35.21    31.50     3.71     0.93     0.42     2.90
 MEAN    39.99    27.27    23.50     3.77     0.94     0.41     3.29     0.90
 HUB     43.41    10.29     6.50     3.79     0.94     0.40     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.981

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     313.302     204.132     237.672    1169.737       0.268       0.040

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.149      19.168     568.668      46.000      40.659      32.400      -8.259

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     248.527     204.132     321.614    1172.858       0.212       0.384

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.142      19.520     571.707     456.573       0.017       0.463

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     237.034       0.000     237.034    1173.335       0.202       0.353

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.534     572.173       0.000       0.060       0.059       0.397

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.853      20.098       1.059     576.864      11.020     206.439       1.600

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  68649.680       0.493     281.734  642359.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =17.022   EfDer =  0.991

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     72.622    2266.000      20.098     576.864       1.000       1.000       0.980
W Kg/sec =   33.00999

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     56.016    2148.728       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  55866.812   56984.027       3.124     509.668     163.140     390.276       2.392

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     18.32     0.00    -0.02   222.11    -0.08   222.11     0.19   343.51
MEAN    15.91     0.00    -0.02   222.11    -0.08   222.11     0.19
HUB     13.07     0.00    -0.02   222.11    -0.08   222.11     0.19

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.49    47.36    11.13   362.27   425.01    19.60   572.75     0.36
MEAN    54.79    44.80     9.99   314.67   385.23    19.60   572.75     0.33
HUB     49.33    38.84    10.49   258.45   340.84    19.60   572.75     0.29

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   300.11   189.33   232.85  1181.44     0.25
MEAN    15.50   298.48   184.99   234.24  1179.81     0.25
HUB     12.59   313.14   206.09   235.76  1178.16     0.27

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    354.76   285.63   165.43     0.24  3397.92
MEAN   306.46   263.87   121.47     0.22  2868.04     1.62
HUB    248.96   239.63    42.87     0.20  2595.68

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     21.31     1.06    20.38   587.65     1.02   580.13     0.92     0.91
MEAN    21.12     1.05    20.20   585.97     1.02   578.53     0.92     0.91
HUB     21.02     1.05    20.01   585.10     1.01   576.92     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.11    35.39    31.50     3.89     0.93     0.40     2.90
MEAN    38.30    27.41    23.50     3.91     0.94     0.39     3.34     0.91
HUB     41.16    10.31     6.50     3.81     0.94     0.37     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.991

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     302.047     188.377     236.107    1179.902       0.256      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     21.132      20.190     578.623      46.000      38.584      33.000      -5.584

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     249.336     188.377     312.497    1182.373       0.211       0.298

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      21.127      20.481     581.050     440.827       0.026       0.435

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     234.314       0.000     234.314    1182.990       0.198       0.363

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.536     581.656       0.000       0.060       0.047       0.356

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      21.106       1.050     586.240       9.376     228.414       1.771

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  58419.250       0.464     239.749  676736.750

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    395038.03   1621.2101     70.9444      1.3971      0.8295     17.0217      1.1213
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*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 60% Stat 2 27% Ice Block 8-2-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =17.478   EfDer =  0.935

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      71.180    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   32.35472

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
      69.536    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  54757.828   55852.867        4.106     831.557     202.504     619.754       3.060

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   159.65    -0.05   159.65     0.14   406.33
  MEAN    17.06     0.00    -0.02   159.65    -0.05   159.65     0.14
  HUB     12.51     0.00    -0.02   159.65    -0.05   159.65     0.14

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.63    50.47    18.16   407.95   438.13    14.89   520.68     0.39
  MEAN    64.68    47.20    17.48   337.36   373.28    14.89   520.68     0.33
  HUB     57.17    38.62    18.55   247.38   294.47    14.89   520.68     0.26

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   362.13   289.99   216.89  1130.27     0.32
  MEAN    18.04   362.94   289.47   218.94  1127.64     0.32
  HUB     15.00   387.68   317.99   221.76  1124.45     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   246.89   117.96     0.22  5983.69
  MEAN   356.65   229.02    67.19     0.20  5221.77     1.88
  HUB    296.62   222.79    21.37     0.20  4770.55

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.81     1.11    15.65   541.82     1.04   530.86     0.92     0.86
  MEAN    16.59     1.10    15.44   539.40     1.03   528.40     0.92     0.86
  HUB     16.45     1.09    15.15   537.96     1.03   525.41     0.92     0.86

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     53.21    28.54    24.20     4.34     0.93     0.55     2.90
  MEAN    52.90    17.06    12.70     4.36     0.95     0.50     3.51     0.86
  HUB     55.11    -5.50    -9.30     3.80     0.95     0.37     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.935

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     365.681     288.905     224.180    1127.812       0.324       0.001

      Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      16.605      15.437     528.558      24.000      52.190      35.400     -16.790

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG          Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      18.071     239.138     288.905     375.037    1134.612       0.211       0.540
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BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.570	16.064	534.950	528.796	0.039	0.652

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	223.674	0.000	223.674	1135.245	0.197	0.502

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.041	535.548	0.000	0.060	0.112	0.521

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.782	16.482	1.091	539.727	16.917	158.986	1.232

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
105319.852	0.633	423.646	671322.188

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =17.478 EfDer = 0.943

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
71.180	2266.000	16.482	539.727	1.000	1.000	0.980

W Kg/sec = 32.35472

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
64.758	2221.423	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
54757.828	55852.867	3.131	590.487	188.591	474.134	2.514

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	214.36	-0.07	214.36	0.19	398.36
MEAN	18.08	0.00	-0.02	214.36	-0.07	214.36	0.19	
HUB	15.21	0.00	-0.02	214.36	-0.07	214.36	0.19	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	62.19	46.36	15.83	406.37	459.51	16.08	535.89	0.40
MEAN	59.06	42.30	16.76	357.49	416.90	16.08	535.89	0.37
HUB	54.53	37.84	16.69	300.77	369.40	16.08	535.89	0.33

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	333.18	244.31	226.54	1146.56	0.29
MEAN	18.01	330.27	238.72	228.23	1144.43	0.29
HUB	15.22	346.76	259.36	230.16	1142.27	0.30

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	277.05	159.49	0.24	4990.36	
MEAN	356.14	256.66	117.41	0.22	4300.75	1.80
HUB	301.03	233.90	41.66	0.20	3949.44	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.98	1.09	16.96	555.58	1.03	546.31	0.92	0.86
MEAN	17.77	1.08	16.77	553.39	1.03	544.28	0.92	0.86
HUB	17.66	1.07	16.57	552.27	1.02	542.23	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	47.16	35.15	31.50	3.65	0.93	0.49	2.90	
MEAN	46.29	27.22	23.50	3.72	0.95	0.47	3.30	0.86
HUB	48.41	10.26	6.50	3.76	0.95	0.46	3.92	

blockage3	Cor/U1	Cor/Incid
0.680	1.000	0.943

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     411.999     239.395     335.311    1139.468       0.362      -0.495

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.796      16.257     539.568      46.000      35.525      30.600      -4.925

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     341.428     239.395     416.992    1144.147       0.298      -0.044

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.680      17.789      16.721     544.008     361.848       0.017       0.377

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     336.805       0.000     336.805    1144.422       0.294       0.448

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.680      16.723     544.270       0.000       0.060       0.045      -0.042

    STAGE EXIT CONDITIONS, STAGE            2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.833      17.760       1.078     553.744      14.017     178.721       1.385

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  87286.812       0.535     351.108  611778.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =17.478   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     71.180    2266.000      17.760     553.744       1.000       1.000       0.710
W Kg/sec =   32.35472

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     60.874    2193.126       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  54757.828   55852.867       2.229     395.194     177.283     307.469       1.734

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   310.74    -0.11   310.74     0.27   384.10
 MEAN    17.74     0.00    -0.02   310.74    -0.11   310.74     0.27
 HUB     15.05     0.00    -0.02   310.74    -0.11   310.74     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.95    46.36     5.59   396.88   504.14    16.87   545.68     0.44
 MEAN    48.47    43.40     5.07   350.77   468.70    16.87   545.68     0.41
 HUB     43.77    38.84     4.93   297.61   430.34    16.87   545.68     0.38

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   319.01   218.33   232.59  1159.76     0.28
 MEAN    17.51   319.33   217.15   234.14  1158.02     0.28
 HUB     14.85   339.06   243.62   235.82  1156.28     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   290.12   173.41     0.25  4327.17
 MEAN   346.18   267.34   129.03     0.23  3803.44     1.89
 HUB    293.65   241.07    50.03     0.21  3619.37

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.20     1.08    18.22   567.48     1.02   558.99     0.92     0.91
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 MEAN    19.02     1.07    18.04   565.82     1.02   557.31     0.92     0.91
 HUB     18.96     1.07    17.86   565.24     1.02   555.64     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.19    36.71    31.50     5.21     0.93     0.50     2.90
 MEAN    42.84    28.86    23.50     5.36     0.92     0.50     3.28     0.91
 HUB     45.93    11.98     6.50     5.48     0.92     0.51     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     322.373     218.575     236.959    1158.222       0.278       0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.052      18.053     557.503      46.000      42.689      31.500     -11.189

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     244.586     218.575     328.020    1162.041       0.210       0.410

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.040      18.460     561.185     471.992       0.023       0.489

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     238.109       0.000     238.109    1162.311       0.205       0.376

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.437     561.446       0.000       0.060       0.076       0.388

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.860      18.985       1.069     566.181      12.437     192.531       1.492

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  77460.531       0.505     311.583  859060.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =17.478   EfDer =  0.978

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     71.180    2266.000      18.985     566.181       1.000       1.000       0.980
W Kg/sec =   32.35472

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     57.581    2168.905       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  54757.828   55852.867       3.061     513.330     167.695     401.059       2.392

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   224.76    -0.08   224.76     0.19   364.53
 MEAN    16.97     0.00    -0.02   224.76    -0.08   224.76     0.19
 HUB     14.32     0.00    -0.02   224.76    -0.08   224.76     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.46    46.36    13.10   380.86   442.30    18.50   561.96     0.38
 MEAN    56.19    43.80    12.39   335.59   403.96    18.50   561.96     0.35
 HUB     51.57    37.84    13.73   283.17   361.59    18.50   561.96     0.31

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
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 TIP     18.88   313.68   207.10   235.60  1171.50     0.27
 MEAN    16.57   313.72   205.54   237.01  1169.85     0.27
 HUB     13.89   332.35   231.35   238.61  1168.19     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   288.35   166.25     0.25  3911.46
 MEAN   327.74   266.66   122.20     0.23  3407.89     1.66
 HUB    274.67   242.51    43.32     0.21  3214.58

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.32     1.07    19.33   578.60     1.02   570.38     0.92     0.89
 MEAN    20.14     1.06    19.16   577.00     1.02   568.78     0.92     0.89
 HUB     20.08     1.06    18.98   576.39     1.02   567.16     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.32    35.21    31.50     3.71     0.93     0.43     2.90
 MEAN    40.93    27.28    23.50     3.78     0.94     0.42     3.29     0.89
 HUB     44.12    10.29     6.50     3.79     0.94     0.41     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.978

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     311.324     206.695     232.809    1170.318       0.266       0.039

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.168      19.199     569.236      46.000      41.600      32.400      -9.200

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     243.344     206.695     319.279    1173.550       0.207       0.400

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.159      19.564     572.384     456.573       0.018       0.478

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    16.096     232.149       0.000     232.149    1174.006       0.198       0.364

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      19.571     572.828       0.000       0.060       0.064       0.407

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.847      20.113       1.059     577.328      11.147     202.552       1.570

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  69443.797       0.498     279.336  628824.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =17.478   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     71.180    2266.000      20.113     577.328       1.000       1.000       0.980
W Kg/sec =   32.35472

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     54.886    2147.864       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  54757.828   55852.867       3.188     509.668     159.849     390.276       2.442

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   217.56    -0.07   217.56     0.19   343.37
 MEAN    15.91     0.00    -0.02   217.56    -0.07   217.56     0.19
 HUB     13.07     0.00    -0.02   217.56    -0.07   217.56     0.19
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       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.02    47.36    11.66   362.27   422.64    19.64   573.38     0.36
 MEAN    55.35    44.80    10.55   314.67   382.62    19.64   573.38     0.33
 HUB     49.92    38.84    11.08   258.45   337.89    19.64   573.38     0.29

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   298.59   192.75   228.04  1182.18     0.25
 MEAN    15.50   296.31   187.52   229.43  1180.51     0.25
 HUB     12.59   310.14   207.01   230.94  1178.83     0.26

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   279.73   162.01     0.24  3459.28
 MEAN   306.46   258.43   118.94     0.22  2907.23     1.64
 HUB    248.96   234.72    41.96     0.20  2607.20

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.35     1.06    20.42   588.31     1.02   580.87     0.92     0.90
 MEAN    21.15     1.05    20.24   586.56     1.02   579.23     0.92     0.90
 HUB     21.04     1.05    20.05   585.60     1.01   577.57     0.92     0.90

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     40.21    35.39    31.50     3.89     0.93     0.42     2.90
 MEAN    39.26    27.40    23.50     3.90     0.94     0.40     3.34     0.90
 HUB     41.87    10.30     6.50     3.80     0.94     0.38     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.989

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     299.905     190.954     231.257    1180.603       0.254      -0.011

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      21.158      20.228     579.314      46.000      39.547      33.000      -6.547

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     244.125     190.954     309.936    1183.182       0.206       0.315

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      21.151      20.531     581.847     440.827       0.028       0.450

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     229.460       0.000     229.460    1183.771       0.194       0.375

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      20.582     582.427       0.000       0.060       0.051       0.368

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.865      21.129       1.051     586.823       9.494     223.940       1.736

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   59157.727       0.470     237.960  662417.250

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     398668.72   1603.6324     69.5361      1.3986      0.8246     17.4781      1.1224


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
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****************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 60%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     111.020    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   50.46355

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     108.455    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   85405.578   87113.516       2.633     831.557     315.845     619.754       1.962

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   252.87    -0.09   252.87     0.23   406.33
  MEAN    17.06     0.00    -0.02   252.87    -0.09   252.87     0.23
  HUB     12.51     0.00    -0.02   252.87    -0.09   252.87     0.23

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     58.21    50.47     7.74   407.95   480.04    14.58   517.47     0.43
  MEAN    53.15    47.20     5.95   337.36   421.68    14.58   517.47     0.38
  HUB     44.38    38.62     5.76   247.38   353.81    14.58   517.47     0.32

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   411.69   220.75   347.51  1122.00     0.37
  MEAN    18.04   430.43   250.77   349.84  1120.48     0.38
  HUB     15.00   485.97   332.06   354.83  1117.48     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   394.72   187.20     0.35  4555.88
  MEAN   356.65   365.52   105.89     0.33  4524.33     1.29
  HUB    296.62   356.59    35.44     0.32  4982.04

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.48     1.09    15.02   537.28     1.03   523.13     0.92     0.91
  MEAN    16.47     1.09    14.88   537.18     1.03   521.71     0.92     0.91
  HUB     16.62     1.10    14.59   538.64     1.03   518.91     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     32.43    28.31    24.20     4.11     0.93     0.26     2.90
  MEAN    35.63    16.84    12.70     4.14     0.92     0.22     3.51     0.91
  HUB     43.10    -5.70    -9.30     3.60     0.92     0.10     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.999

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     437.269     250.280     358.559    1120.504       0.390      -0.010

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      16.507      14.859     521.730      24.000      34.916      35.400       0.484

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      18.071     387.069     250.280     460.937    1124.210       0.344       0.218

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      16.498      15.197     525.186     528.796       0.015       0.370
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	358.919	0.000	358.919	1126.085	0.319	0.284

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.341	526.940	0.000	0.060	0.037	0.303

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.875	16.462	1.090	537.700	14.890	220.181	1.707

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
92703.586	0.557	581.607	1063300.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 5.953 EfDer = 0.992

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
111.020	2266.000	16.462	537.700	1.000	1.000	0.980

W Kg/sec = 50.46355

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
100.937	2225.604	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85405.578	87113.516	2.009	590.487	293.951	474.134	1.613

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	343.01	-0.12	343.01	0.30	399.11
MEAN	18.08	0.00	-0.02	343.01	-0.12	343.01	0.30	
HUB	15.21	0.00	-0.02	343.01	-0.12	343.01	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.84	46.36	3.48	406.37	531.87	15.44	527.87	0.47
MEAN	46.19	42.30	3.89	357.49	495.52	15.44	527.87	0.44
HUB	41.26	37.84	3.42	300.77	456.28	15.44	527.87	0.40

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	394.14	145.72	366.21	1133.78	0.35
MEAN	18.01	403.27	166.92	367.11	1133.24	0.36
HUB	15.22	436.41	233.88	368.45	1132.64	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	448.02	258.08	0.40	2977.93	
MEAN	356.14	413.01	189.22	0.36	3008.30	1.29
HUB	301.03	374.52	67.15	0.33	3562.16	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.40	1.06	16.00	547.16	1.02	534.18	0.92	0.91
MEAN	17.41	1.06	15.95	547.25	1.02	533.67	0.92	0.91
HUB	17.58	1.07	15.87	549.01	1.02	533.11	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	21.70	35.17	31.50	3.67	0.93	0.20	2.90	
MEAN	24.45	27.27	23.50	3.77	0.92	0.22	3.30	0.91
HUB	32.41	10.33	6.50	3.83	0.92	0.24	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

```
    17.960     627.577     167.385     604.843    1113.143       0.564      -1.239

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.447      14.058     514.916      46.000      15.469      30.600      15.131

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     632.866     167.385     654.627    1112.542       0.569      -1.310

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      17.369      13.943     514.359     345.258       0.061       0.094

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     624.925       0.000     624.925    1113.445       0.561      -0.075

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      13.945     515.193       0.000       0.060       0.124      -1.309

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.739      17.274       1.049     547.809      10.109     288.894       2.239

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  62946.453       0.386     394.915  984160.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.768

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.020    2266.000      17.274     547.809       1.000       1.000       0.680
W Kg/sec =   50.46355

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.093    2204.975       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85405.578   87113.516       1.339     378.495     282.760     293.880       1.039

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   560.79    -0.19   560.79     0.50   386.18
 MEAN    17.74     0.00    -0.02   560.79    -0.19   560.79     0.50
 HUB     15.05     0.00    -0.02   560.79    -0.19   560.79     0.50

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     35.30    46.36   -11.06   396.88   687.13    14.55   521.55     0.61
 MEAN    32.04    43.40   -11.36   350.77   661.56    14.55   521.55     0.59
 HUB     27.97    38.84   -10.87   297.61   634.96    14.55   521.55     0.57

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   402.66    87.65   393.01  1139.70     0.35
 MEAN    17.51   410.57   119.62   392.75  1140.33     0.36
 HUB     14.85   442.23   201.31   393.75  1140.95     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   496.92   304.09     0.44  1740.16
 MEAN   346.18   453.42   226.57     0.40  2097.48     1.52
 HUB    293.65   404.44    92.34     0.35  2992.38

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.70     1.02    16.24   553.33     1.01   539.79     0.92     0.70
 MEAN    17.79     1.03    16.27   554.47     1.01   540.39     0.92     0.70
 HUB     18.02     1.04    16.24   557.31     1.02   540.98     0.92     0.70
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     12.57    37.73    31.50     6.23     0.93     0.30     2.90
 MEAN    16.94    29.98    23.50     6.48     0.84     0.34     3.28     0.70
 HUB     27.08    13.20     6.50     6.70     0.84     0.40     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.768

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     415.756     120.400     397.941    1140.548       0.365      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.824      16.258     540.604      46.000      16.834      31.500      14.666

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     418.710     120.400     435.677    1140.331       0.367      -0.034

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.778      16.196     540.398     471.992       0.038       0.117

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     407.696       0.000     407.696    1141.133       0.357      -0.044

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.188     541.158       0.000       0.060       0.098      -0.039

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.510      17.683       1.024     555.039       7.230     380.223       2.947

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  45026.258       0.293     282.487 1536474.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.903

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    111.020    2266.000      17.683     555.039       1.000       1.000       0.980
W Kg/sec =   50.46355

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     95.469    2190.567       1.402       0.249      53.349       56.000       0.050

   CFM        SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  85405.578   87113.516       1.846     513.330     278.036     401.059       1.442

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   382.82    -0.13   382.82     0.33   368.17
 MEAN    16.97      0.00    -0.02   382.82    -0.13   382.82     0.33
 HUB     14.32      0.00    -0.02   382.82    -0.13   382.82     0.33

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
 TIP     44.86     46.36    -1.50   380.86   540.10     16.36   542.80      0.47
 MEAN    41.25     43.80    -2.55   335.59   509.17     16.36   542.80      0.45
 HUB     36.50     37.84    -1.34   283.17   476.25     16.36   542.80      0.42

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   418.44    80.14   410.69  1145.40      0.37
 MEAN    16.57   425.27   113.14   409.95  1146.10      0.37
 HUB     13.89   455.11   197.33   410.11  1146.68      0.40
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   504.62   293.20     0.44  1515.58
 MEAN   327.74   462.72   214.60     0.40  1877.35     1.17
 HUB    274.67   417.34    77.34     0.36  2742.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.13     1.03    16.53   559.85     1.01   545.23     0.92     0.83
 MEAN    18.24     1.03    16.58   561.00     1.01   545.90     0.92     0.83
 HUB     18.50     1.05    16.59   563.75     1.02   546.45     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     11.04    35.52    31.50     4.02     0.93     0.09     2.90
 MEAN    15.43    27.63    23.50     4.13     0.89     0.12     3.29     0.83
 HUB     25.70    10.68     6.50     4.18     0.89     0.18     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.903

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     417.634     113.773     401.838    1147.216       0.364       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.270      16.670     546.969      46.000      15.808      32.400      16.592

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     428.482     113.773     443.330    1146.412       0.374      -0.018

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.213      16.536     546.203     456.573       0.043       0.113

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     408.657       0.000     408.657    1147.865       0.356      -0.054

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.576     547.589       0.000       0.060       0.111       0.005

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.568      18.096       1.023     561.533       6.494     396.479       3.073

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  40449.094       0.290     253.771 1032741.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.845

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.020    2266.000      18.096     561.533       1.000       1.000       0.980
W Kg/sec =   50.46355

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.833    2177.862       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85405.578   87113.516       1.865     509.668     273.276     390.276       1.428

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   380.69    -0.13   380.69     0.33   348.17
 MEAN    15.91     0.00    -0.02   380.69    -0.13   380.69     0.33
 HUB     13.07     0.00    -0.02   380.69    -0.13   380.69     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.59    47.36    -3.77   362.27   525.61    16.77   549.43     0.46
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MEAN    39.59    44.80    -5.21   314.67   493.99    16.77   549.43     0.43
HUB     34.19    38.84    -4.65   258.45   460.21    16.77   549.43     0.40

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   413.58    59.63   409.26  1151.06     0.36
MEAN    15.50   418.46    90.64   408.52  1151.81     0.36
HUB     12.59   443.16   171.22   408.75  1152.45     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    354.76   504.57   295.13     0.44  1072.09
MEAN   306.46   462.03   215.82     0.40  1406.82     1.14
HUB    248.96   416.08    77.75     0.36  2157.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.39     1.02    16.82   564.94     1.01   550.66     0.92     0.77
MEAN    18.49     1.02    16.87   566.00     1.01   551.38     0.92     0.77
HUB     18.70     1.03    16.88   568.38     1.01   551.99     0.92     0.77

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP      8.29    35.80    31.50     4.30     0.93     0.06     2.90
MEAN    12.51    27.85    23.50     4.35     0.88     0.09     3.34     0.77
HUB     22.73    10.77     6.50     4.27     0.88     0.14     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.845

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     422.418      92.304     412.209    1151.978       0.367      -0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.494      16.851     551.542      46.000      12.622      33.000      20.378

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     446.669      92.304     456.107    1150.139       0.388      -0.194

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.352      16.537     549.783     440.827       0.105       0.085

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     417.555       0.000     417.555    1152.334       0.362      -0.082

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.715     551.883       0.000       0.060       0.133      -0.087

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.377      18.305       1.012     566.440       4.907     486.106       3.768

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  30563.988       0.243     191.753 1094556.000

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     271689.38   1704.5330     108.4552      1.2117      0.6782      5.9532      1.0835


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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Fan-Core + 4 Stage LPC 60% Stat 2 30% Ice Block 9-1-2011

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1
RESET = 0.000BLEED = 0.000 DPInc = 6.485 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
108.993	2266.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 49.54226

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
106.475	2257.076	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
83846.383	85523.125	2.682	831.557	310.079	619.754	1.999

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	248.01	-0.09	248.01	0.22	406.33
MEAN	17.06	0.00	-0.02	248.01	-0.09	248.01	0.22	
HUB	12.51	0.00	-0.02	248.01	-0.09	248.01	0.22	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.71	50.47	8.24	407.95	477.50	14.60	517.67	0.43
MEAN	53.69	47.20	6.49	337.36	418.78	14.60	517.67	0.38
HUB	44.94	38.62	6.32	247.38	350.36	14.60	517.67	0.31

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	407.83	224.69	340.35	1122.56	0.36
MEAN	18.04	425.99	252.99	342.74	1120.96	0.38
HUB	15.00	480.29	331.42	347.61	1117.94	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	407.95	386.55	183.26	0.34	4637.11	
MEAN	356.65	358.07	103.67	0.32	4564.33	1.31
HUB	296.62	349.35	34.80	0.31	4972.38	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.51	1.09	15.07	537.54	1.03	523.65	0.92	0.91
MEAN	16.49	1.09	14.92	537.31	1.03	522.15	0.92	0.91
HUB	16.61	1.10	14.63	538.61	1.03	519.34	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.43	28.30	24.20	4.10	0.93	0.27	2.90	
MEAN	36.43	16.83	12.70	4.13	0.93	0.23	3.51	0.91
HUB	43.63	-5.72	-9.30	3.58	0.93	0.11	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	432.581	252.495	351.244	1120.997	0.386	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
16.520	14.905	522.189	24.000	35.711	35.400	-0.311

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	378.833	252.495	455.267	1124.900	0.337	0.234

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.511	15.263	525.831	528.796	0.015	0.382

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4

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    18.083     351.409       0.000     351.409    1126.687       0.312       0.297

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950     15.400     527.504       0.000       0.060       0.037       0.316

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877     16.475       1.091     537.818      15.008     216.767       1.680

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93438.875       0.561     575.517 1042869.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.993    2266.000      16.475     537.818       1.000       1.000       0.980
W Kg/sec =   49.54226

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     99.023    2225.360       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83846.383   85523.125       2.048     590.487     288.378     474.134       1.644

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   335.90    -0.12   335.90     0.30   399.07
 MEAN    18.08     0.00    -0.02   335.90    -0.12   335.90     0.30
 HUB     15.21     0.00    -0.02   335.90    -0.12   335.90     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.43    46.36     4.07   406.37   527.31    15.49   528.39     0.47
 MEAN    46.79    42.30     4.49   357.49   490.63    15.49   528.39     0.44
 HUB     41.85    37.84     4.01   300.77   450.96    15.49   528.39     0.40

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   388.86   151.54   358.12  1134.67     0.34
 MEAN    18.01   397.84   171.13   359.16  1134.01     0.35
 HUB     15.22   430.67   235.44   360.62  1133.29     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   438.04   252.25     0.39  3096.91
 MEAN   356.14   404.01   185.01     0.36  3084.10     1.31
 HUB    301.03   366.53    65.59     0.32  3585.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.45     1.06    16.09   547.65     1.02   535.03     0.92     0.91
 MEAN    17.45     1.06    16.02   547.61     1.02   534.39     0.92     0.91
 HUB     17.61     1.07    15.94   549.21     1.02   533.72     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.94    35.16    31.50     3.66     0.93     0.22     2.90
 MEAN    25.48    27.25    23.50     3.75     0.92     0.23     3.30     0.91
 HUB     33.14    10.31     6.50     3.81     0.92     0.25     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.995

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     612.904     171.608     588.390    1115.162       0.550      -1.199

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     17.489      14.239     516.785      46.000      16.260      30.600      14.340

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     614.014     171.608     637.544    1115.040       0.551      -1.240

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      17.419      14.172     516.671     345.258       0.057       0.105

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     605.836       0.000     605.836    1115.939       0.543      -0.037

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      14.185     517.504       0.000       0.060       0.112      -1.231

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.766      17.338       1.052     548.158      10.340     281.075       2.179

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  64386.652       0.395     396.576  964193.438


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  0.765

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.993    2266.000      17.338     548.158       1.000       1.000       0.680
W Kg/sec =   49.54226

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.000    2204.272       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83846.383   85523.125       1.368     378.495     276.664     293.880       1.062

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   545.05    -0.19   545.05     0.49   386.05
 MEAN    17.74     0.00    -0.02   545.05    -0.19   545.05     0.49
 HUB     15.05     0.00    -0.02   545.05    -0.19   545.05     0.49

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     36.07    46.36   -10.29   396.88   674.34    14.75   523.35     0.60
 MEAN    32.78    43.40   -10.62   350.77   648.26    14.75   523.35     0.58
 HUB     28.65    38.84   -10.19   297.61   621.09    14.75   523.35     0.55

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   394.98    95.51   383.26  1141.13     0.35
 MEAN    17.51   403.22   125.41   383.22  1141.56     0.35
 HUB     14.85   435.07   203.80   384.38  1142.00     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   484.39   296.22     0.42  1895.91
 MEAN   346.18   442.27   220.77     0.39  2198.82     1.53
 HUB    293.65   394.74    89.85     0.35  3029.33

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.81     1.03    16.39   554.18     1.01   541.15     0.92     0.70
 MEAN    17.88     1.03    16.40   555.14     1.01   541.56     0.92     0.70
 HUB     18.09     1.04    16.37   557.78     1.02   541.97     0.92     0.70

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     13.99    37.70    31.50     6.20     0.93     0.31     2.90
 MEAN    18.12    29.95    23.50     6.45     0.84     0.35     3.28     0.70
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HUB     27.93    13.16     6.50     6.66     0.84     0.41     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.765

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     408.259     126.233     388.254    1141.790       0.358      -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.912      16.395     541.780      46.000      18.011      31.500      13.489

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     407.919     126.233     427.004    1141.814       0.357      -0.015

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.874      16.363     541.804     471.992       0.035       0.131

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     397.025       0.000     397.025    1142.585       0.347      -0.022

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.361     542.536       0.000       0.060       0.090      -0.016

    STAGE EXIT CONDITIONS, STAGE            3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.537      17.788       1.026     555.699       7.541     363.184       2.815

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  46964.480       0.306     289.268 1497187.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  0.918

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.993    2266.000      17.788     555.699       1.000       1.000       0.980
W Kg/sec =   49.54226

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.228    2189.264       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83846.383   85523.125       1.891     513.330     271.510     401.059       1.477

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   372.97    -0.13   372.97     0.33   367.95
 MEAN    16.97     0.00    -0.02   372.97    -0.13   372.97     0.33
 HUB     14.32     0.00    -0.02   372.97    -0.13   372.97     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.61    46.36    -0.75   380.86   533.16    16.52   544.08     0.47
 MEAN    41.99    43.80    -1.81   335.59   501.81    16.52   544.08     0.44
 HUB     37.22    37.84    -0.62   283.17   468.36    16.52   544.08     0.41

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   408.89    88.54   399.19  1147.31     0.36
 MEAN    16.57   416.16   119.20   398.73  1147.80     0.36
 HUB     13.89   446.18   199.59   399.04  1148.18     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   490.37   284.80     0.43  1674.20
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 MEAN   327.74   449.97   208.54     0.39  1977.83     1.19
 HUB    274.67   406.05    75.08     0.35  2774.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.29     1.03    16.75   561.02     1.01   547.06     0.92     0.84
 MEAN    18.38     1.03    16.79   561.98     1.01   547.52     0.92     0.84
 HUB     18.63     1.05    16.78   564.51     1.02   547.89     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     12.51    35.51    31.50     4.01     0.93     0.11     2.90
 MEAN    16.64    27.61    23.50     4.11     0.89     0.14     3.29     0.84
 HUB     26.57    10.66     6.50     4.16     0.89     0.19     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.918

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     408.852     119.873     390.885    1148.866       0.356       0.052

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.418      16.872     548.543      46.000      17.049      32.400      15.351

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     416.081     119.873     433.005    1148.344       0.362       0.000

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.370      16.775     548.045     456.573       0.039       0.128

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     396.709       0.000     396.709    1149.721       0.345      -0.033

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.818     549.360       0.000       0.060       0.103       0.026

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.621      18.264       1.027     562.501       6.802     378.004       2.930

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  42363.734       0.304     260.931 1010045.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  0.864

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    108.993    2266.000      18.264     562.501       1.000       1.000       0.980
W Kg/sec =   49.54226

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     91.354    2175.988       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83846.383   85523.125       1.916     509.668     266.054     390.276       1.467

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   369.77    -0.13   369.77     0.32   347.87
 MEAN    15.91     0.00    -0.02   369.77    -0.13   369.77     0.32
 HUB     13.07     0.00    -0.02   369.77    -0.13   369.77     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.42    47.36    -2.94   362.27   517.75    17.00   551.09     0.45
 MEAN    40.41    44.80    -4.39   314.67   485.62    17.00   551.09     0.42
 HUB     34.97    38.84    -3.87   258.45   451.22    17.00   551.09     0.39
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      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   402.53    68.95   396.58  1153.41     0.35
MEAN    15.50   407.92    97.38   396.13  1153.93     0.35
HUB     12.59   432.90   173.73   396.51  1154.34     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    354.76   488.84   285.80     0.42  1239.32
MEAN   306.46   447.92   209.08     0.39  1511.18     1.16
HUB    248.96   403.58    75.23     0.35  2188.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.62      1.02    17.11   566.44     1.01   552.91     0.92     0.79
MEAN    18.70      1.02    17.15   567.30     1.01   553.41     0.92     0.79
HUB     18.89      1.03    17.14   569.45     1.01   553.80     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP      9.86    35.78    31.50     4.28     0.93     0.08     2.90
MEAN    13.81    27.83    23.50     4.33     0.88     0.11     3.34     0.79
HUB     23.66    10.74     6.50     4.24     0.88     0.15     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.864

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     411.756      99.165     399.636    1154.098       0.357      -0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.704      17.127     553.573      46.000      13.936      33.000      19.064

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     431.897      99.165     443.136    1152.618       0.375      -0.169

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.582      16.863     552.155     440.827       0.097       0.100

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     404.034       0.000     404.034    1154.646       0.350      -0.062

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.028     554.099       0.000       0.060       0.126      -0.067

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.454      18.534       1.015     567.728       5.228     456.856       3.542

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  32562.561       0.259     200.562 1069783.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    279716.31   1722.8542    106.4752      1.2268      0.7027      6.4851      1.0859


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
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 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.227    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    104.750    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82487.648   84137.219       2.726     831.557     305.054     619.754       2.032

     ROTOR LEADING EDGE CONDITIONS, STAGE             1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   243.79    -0.08   243.79     0.22   406.33
 MEAN    17.06     0.00    -0.02   243.79    -0.08   243.79     0.22
 HUB     12.51     0.00    -0.02   243.79    -0.08   243.79     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     59.14    50.47     8.67   407.95   475.32    14.61   517.85     0.43
 MEAN    54.15    47.20     6.95   337.36   416.29    14.61   517.85     0.37
 HUB     45.43    38.62     6.81   247.38   347.38    14.61   517.85     0.31

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.63   404.59   228.08   334.17  1123.04     0.36
 MEAN    18.04   422.23   254.90   336.60  1121.36     0.38
 HUB     15.00   475.37   330.81   341.38  1118.33     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   379.51   179.87     0.34  4706.94
 MEAN   356.65   351.64   101.75     0.31  4598.84     1.33
 HUB    296.62   343.09    34.19     0.31  4963.23

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.53     1.09    15.11   537.76     1.03   524.09     0.92     0.91
 MEAN    16.50     1.09    14.96   537.42     1.03   522.53     0.92     0.91
 HUB     16.61     1.10    14.67   538.58     1.03   519.70     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.31    28.29    24.20     4.09     0.93     0.28     2.90
 MEAN    37.14    16.82    12.70     4.12     0.93     0.25     3.51     0.91
 HUB     44.10    -5.72    -9.30     3.58     0.93     0.12     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     428.601     254.406     344.929    1121.412       0.382      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.530      14.943     522.576      24.000      36.411      35.400      -1.011

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     371.745     254.406     450.463    1125.483       0.330       0.248

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.522      15.318     526.377     528.796       0.015       0.393

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     344.946       0.000     344.946    1127.197       0.306       0.309

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      15.448     527.981       0.000       0.060       0.037       0.328

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      16.486       1.091     537.919      15.109     213.838       1.658

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94066.633       0.565     569.995 1025114.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.227    2266.000      16.486     537.919       1.000       1.000       0.980
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.366    2225.151       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82487.648   84137.219       2.082     590.487     283.552     474.134       1.672

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   329.78    -0.11   329.78     0.29   399.03
 MEAN    18.08     0.00    -0.02   329.78    -0.11   329.78     0.29
 HUB     15.21     0.00    -0.02   329.78    -0.11   329.78     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.95    46.36     4.59   406.37   523.43    15.54   528.84     0.46
 MEAN    47.32    42.30     5.02   357.49   486.45    15.54   528.84     0.43
 HUB     42.38    37.84     4.54   300.77   446.42    15.54   528.84     0.40

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   384.50   156.56   351.18  1135.42     0.34
 MEAN    18.01   393.30   174.75   352.35  1134.65     0.35
 HUB     15.22   425.79   236.76   353.90  1133.83     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   429.48   247.23     0.38  3199.37
 MEAN   356.14   396.30   181.39     0.35  3149.31     1.32
 HUB    301.03   359.68    64.27     0.32  3605.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.50     1.06    16.16   548.08     1.02   535.73     0.92     0.91
 MEAN    17.48     1.06    16.09   547.92     1.02   535.00     0.92     0.91
 HUB     17.63     1.07    15.99   549.37     1.02   534.23     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.03    35.15    31.50     3.65     0.93     0.23     2.90
 MEAN    26.38    27.24    23.50     3.74     0.92     0.24     3.30     0.91
 HUB     33.78    10.29     6.50     3.79     0.92     0.26     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     600.723     175.241     574.594    1116.816       0.538      -1.166

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.522      14.387     518.319      46.000      16.961      30.600      13.639

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	598.361	175.241	623.494	1117.071	0.536	-1.181

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	17.460	14.359	518.556	345.258	0.053	0.115

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	590.069	0.000	590.069	1117.958	0.528	-0.005

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	14.380	519.379	0.000	0.060	0.102	-1.167

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.786	17.389	1.055	548.458	10.539	274.553	2.128

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
65624.633	0.402	397.651	946910.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 6.953 EfDer = 0.767

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
107.227	2266.000	17.389	548.458	1.000	1.000	0.680

W Kg/sec = 48.73943

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
93.211	2203.670	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
82487.648	84137.219	1.394	378.495	271.454	293.880	1.083

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	531.90	-0.18	531.90	0.47	385.95
MEAN	17.74	0.00	-0.02	531.90	-0.18	531.90	0.47	
HUB	15.05	0.00	-0.02	531.90	-0.18	531.90	0.47	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	36.74	46.36	-9.62	396.88	663.76	14.91	524.83	0.59
MEAN	33.42	43.40	-9.98	350.77	637.25	14.91	524.83	0.57
HUB	29.24	38.84	-9.60	297.61	609.59	14.91	524.83	0.54

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	388.64	102.18	374.97	1142.32	0.34
MEAN	17.51	397.10	130.38	375.09	1142.60	0.35
HUB	14.85	429.00	205.93	376.34	1142.88	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	473.75	289.55	0.41	2027.93	
MEAN	346.18	432.74	215.80	0.38	2285.79	1.54
HUB	293.65	386.43	87.73	0.34	3060.77	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.89	1.03	16.51	554.90	1.01	542.28	0.92	0.70
MEAN	17.96	1.03	16.52	555.72	1.01	542.55	0.92	0.70
HUB	18.15	1.04	16.47	558.18	1.02	542.81	0.92	0.70

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	15.24	37.68	31.50	6.18	0.93	0.31	2.90	
MEAN	19.17	29.91	23.50	6.41	0.85	0.35	3.28	0.70
HUB	28.69	13.12	6.50	6.62	0.85	0.41	3.87	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.767

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     402.012     131.238     379.988    1142.830       0.352      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.987      16.511     542.768      46.000      19.054      31.500      12.446

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     398.747     131.238     419.789    1143.060       0.349       0.002

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.955      16.504     542.986     471.992       0.032       0.145

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     387.966       0.000     387.966    1143.805       0.339      -0.002

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.507     543.694       0.000       0.060       0.084       0.004

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.560      17.877       1.028     556.264       7.806     349.602       2.710

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  48615.277       0.317     294.583 1463995.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.930

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.227    2266.000      17.877     556.264       1.000       1.000       0.980
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.308    2188.153       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82487.648   84137.219       1.930     513.330     265.918     401.059       1.508

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   364.59    -0.13   364.59     0.32   367.76
 MEAN    16.97     0.00    -0.02   364.59    -0.13   364.59     0.32
 HUB     14.32     0.00    -0.02   364.59    -0.13   364.59     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.26    46.36    -0.10   380.86   527.33    16.66   545.16     0.46
 MEAN    42.64    43.80    -1.16   335.59   495.61    16.66   545.16     0.43
 HUB     37.85    37.84     0.01   283.17   461.72    16.66   545.16     0.40

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   401.04    95.66   389.46  1148.91     0.35
 MEAN    16.57   408.60   124.34   389.22  1149.22     0.36
 HUB     13.89   438.69   201.51   389.68  1149.44     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   478.32   277.68     0.42  1808.50
 MEAN   327.74   439.17   203.40     0.38  2063.00     1.20
 HUB    274.67   396.48    73.16     0.34  2800.73
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	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.43	1.03	16.94	562.01	1.01	548.58	0.92	0.85
MEAN	18.51	1.04	16.96	562.81	1.01	548.87	0.92	0.85
HUB	18.74	1.05	16.95	565.16	1.02	549.09	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	13.80	35.49	31.50	3.99	0.93	0.12	2.90	
MEAN	17.72	27.59	23.50	4.09	0.90	0.15	3.29	0.85
HUB	27.34	10.63	6.50	4.13	0.90	0.20	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.930

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	401.575	125.044	381.611	1150.245	0.349	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.544	17.043	549.861	46.000	18.143	32.400	14.257

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	405.633	125.044	424.469	1149.959	0.353	0.017

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.503	16.976	549.587	456.573	0.036	0.142

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	386.645	0.000	386.645	1151.272	0.336	-0.013

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.022	550.843	0.000	0.060	0.096	0.046

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.662	18.406	1.030	563.326	7.062	363.349	2.817

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
43985.996	0.316	266.532	990538.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 6.953 EfDer = 0.879

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
107.227	2266.000	18.406	563.326	1.000	1.000	0.980

W Kg/sec = 48.73943

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
89.244	2174.394	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
82487.648	84137.219	1.961	509.668	259.909	390.276	1.502

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	360.55	-0.12	360.55	0.31	347.61
MEAN	15.91	0.00	-0.02	360.55	-0.12	360.55	0.31	
HUB	13.07	0.00	-0.02	360.55	-0.12	360.55	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.15	47.36	-2.21	362.27	511.20	17.20	552.47	0.44
MEAN	41.12	44.80	-3.68	314.67	478.64	17.20	552.47	0.42
HUB	35.65	38.84	-3.19	258.45	443.69	17.20	552.47	0.38

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

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         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   393.50    76.82   385.93  1155.36     0.34
 MEAN    15.50   399.23   103.04   385.71  1155.69     0.35
 HUB     12.59   424.34   175.82   386.20  1155.93     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   475.60   277.94     0.41  1380.39
 MEAN   306.46   436.06   203.42     0.38  1598.81     1.18
 HUB    248.96   393.07    73.15     0.34  2215.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.81     1.02    17.36   567.71     1.01   554.78     0.92     0.80
 MEAN    18.88     1.03    17.38   568.40     1.01   555.09     0.92     0.80
 HUB     19.06     1.04    17.36   570.36     1.01   555.33     0.92     0.80

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     11.26    35.76    31.50     4.26     0.93     0.10     2.90
 MEAN    14.96    27.81    23.50     4.31     0.88     0.12     3.34     0.80
 HUB     24.48    10.72     6.50     4.22     0.88     0.16     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.879

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     402.965     104.927     389.065    1155.862       0.349      -0.012

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.885      17.360     555.266      46.000      15.093      33.000      17.907

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     419.568     104.927     432.490    1154.675       0.363      -0.148

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.777      17.138     554.126     440.827       0.089       0.113

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     392.699       0.000     392.699    1156.572       0.340      -0.044

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.293     555.948       0.000       0.060       0.119      -0.048

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.514      18.731       1.018     568.823       5.497     434.419       3.368

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   34242.887       0.272     207.494 1048563.562

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     286535.44   1736.2559    104.7498      1.2399      0.7225      6.9532      1.0880


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
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    105.235    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   47.83408

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    102.804    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 80955.414   82574.344       2.778     831.557     299.388     619.754       2.070

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   239.04    -0.08   239.04     0.21   406.33
MEAN    17.06     0.00    -0.02   239.04    -0.08   239.04     0.21
HUB     12.51     0.00    -0.02   239.04    -0.08   239.04     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.64    50.47     9.17   407.95   472.90    14.63   518.04     0.42
MEAN    54.69    47.20     7.49   337.36   413.53    14.63   518.04     0.37
HUB     45.99    38.62     7.37   247.38   344.06    14.63   518.04     0.31

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   401.07   231.85   327.27  1123.56     0.36
MEAN    18.04   418.09   257.04   329.73  1121.81     0.37
HUB     15.00   469.94   330.17   334.41  1118.76     0.42

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    407.95   371.64   176.10     0.33  4784.73
MEAN   356.65   344.45    99.61     0.31  4637.42     1.35
HUB    296.62   336.09    33.55     0.30  4953.53

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.55     1.10    15.16   538.01     1.03   524.57     0.92     0.91
MEAN    16.51     1.09    15.00   537.54     1.03   522.94     0.92     0.91
HUB     16.61     1.10    14.71   538.55     1.03   520.10     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.31    28.28    24.20     4.08     0.93     0.30     2.90
MEAN    37.94    16.81    12.70     4.11     0.93     0.26     3.51     0.91
HUB     44.63    -5.73    -9.30     3.57     0.93     0.13     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     424.227     256.543     337.868    1121.868       0.378      -0.008

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    16.541      14.984     523.000      24.000      37.209      35.400      -1.809

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     363.843     256.543     445.192    1126.122       0.323       0.264

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.532      15.377     526.975     528.796       0.015       0.406

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     337.741       0.000     337.741    1127.755       0.299       0.321

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.500     528.505       0.000       0.060       0.038       0.341

   STAGE EXIT CONDITIONS, STAGE            1
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Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	16.496	1.092	538.032	15.222	210.565	1.632

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
94770.008	0.569	563.590	1005147.938

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2
RESET = 0.000BLEED = 0.000 DPInc = 7.486 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
105.235	2266.000	16.496	538.032	1.000	1.000	0.980

W Kg/sec = 47.83408

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
95.508	2224.918	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
80955.414	82574.344	2.123	590.487	278.141	474.134	1.705

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	322.95	-0.11	322.95	0.29	398.99
MEAN	18.08	0.00	-0.02	322.95	-0.11	322.95	0.29	
HUB	15.21	0.00	-0.02	322.95	-0.11	322.95	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.53	46.36	5.17	406.37	519.16	15.58	529.32	0.46
MEAN	47.91	42.30	5.61	357.49	481.85	15.58	529.32	0.43
HUB	42.97	37.84	5.13	300.77	441.40	15.58	529.32	0.39

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	379.83	162.11	343.50	1136.24	0.33
MEAN	18.01	388.38	178.78	344.78	1135.35	0.34
HUB	15.22	420.45	238.26	346.43	1134.43	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	420.01	241.69	0.37	3312.55	
MEAN	356.14	387.73	177.36	0.34	3221.82	1.34
HUB	301.03	352.07	62.77	0.31	3628.66	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.55	1.06	16.24	548.55	1.02	536.50	0.92	0.91
MEAN	17.52	1.06	16.15	548.26	1.02	535.67	0.92	0.91
HUB	17.65	1.07	16.05	549.56	1.02	534.79	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.26	35.13	31.50	3.63	0.93	0.24	2.90	
MEAN	27.41	27.22	23.50	3.72	0.92	0.25	3.30	0.91
HUB	34.52	10.27	6.50	3.77	0.92	0.27	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	587.592	179.281	559.574	1118.578	0.525	-1.130

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.558	14.545	519.956	46.000	17.765	30.600	12.835

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	581.463	179.281	608.475	1119.222	0.520	-1.117

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	17.503	14.558	520.554	345.258	0.048	0.127

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	573.122	0.000	573.122	1120.086	0.512	0.028

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	14.585	521.359	0.000	0.060	0.091	-1.098

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.806	17.442	1.057	548.791	10.759	267.507	2.074

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
66998.305	0.411	398.434	927543.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 7.486 EfDer = 0.773

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
105.235	2266.000	17.442	548.791	1.000	1.000	0.680

W Kg/sec = 47.83408

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
91.229	2203.000	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
80955.414	82574.344	1.425	378.495	265.682	293.880	1.106

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	517.64	-0.18	517.64	0.46	385.83
MEAN	17.74	0.00	-0.02	517.64	-0.18	517.64	0.46	
HUB	15.05	0.00	-0.02	517.64	-0.18	517.64	0.46	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	37.49	46.36	-8.87	396.88	652.39	15.08	526.41	0.58
MEAN	34.14	43.40	-9.26	350.77	625.40	15.08	526.41	0.56
HUB	29.91	38.84	-8.93	297.61	597.19	15.08	526.41	0.53

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	381.88	109.57	365.83	1143.62	0.33
MEAN	17.51	390.48	135.84	366.09	1143.73	0.34
HUB	14.85	422.34	208.26	367.42	1143.84	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	462.00	282.16	0.40	2174.16	
MEAN	346.18	422.22	210.34	0.37	2381.25	1.55
HUB	293.65	377.22	85.39	0.33	3095.31	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.99	1.03	16.65	555.70	1.01	543.52	0.92	0.71
MEAN	18.04	1.03	16.64	556.35	1.01	543.62	0.92	0.71
HUB	18.22	1.04	16.58	558.62	1.02	543.73	0.92	0.71

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	16.67	37.64	31.50	6.14	0.93	0.32	2.90	
MEAN	20.36	29.88	23.50	6.38	0.85	0.36	3.28	0.71
HUB	29.54	13.08	6.50	6.58	0.85	0.41	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.773

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	395.249	136.731	370.845	1143.963	0.346	-0.004

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.070	16.636	543.844	46.000	20.239	31.500	11.261

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	388.645	136.731	411.996	1144.417	0.340	0.022

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.044	16.658	544.276	471.992	0.028	0.160

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	378.003	0.000	378.003	1145.133	0.330	0.020

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.666	544.957	0.000	0.060	0.076	0.028

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.586	17.974	1.031	556.890	8.098	335.502	2.601

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
50436.422	0.329	299.942	1427585.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 7.486 EfDer = 0.943

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
105.235	2266.000	17.974	556.890	1.000	1.000	0.980

W Kg/sec = 47.83408

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
89.179	2186.923	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
80955.414	82574.344	1.977	513.330	259.716	401.059	1.544

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	355.37	-0.12	355.37	0.31	367.56
MEAN	16.97	0.00	-0.02	355.37	-0.12	355.37	0.31	
HUB	14.32	0.00	-0.02	355.37	-0.12	355.37	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.99	46.36	0.63	380.86	520.99	16.81	546.34	0.45
MEAN	43.37	43.80	-0.43	335.59	488.87	16.81	546.34	0.43
HUB	38.56	37.84	0.72	283.17	454.47	16.81	546.34	0.40

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	392.68	103.42	378.82	1150.63	0.34
MEAN	16.57	400.48	129.95	378.81	1150.75	0.35
HUB	13.89	430.58	203.61	379.40	1150.81	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	465.14	269.92	0.40	1955.00	
MEAN	327.74	427.34	197.79	0.37	2155.84	1.22
HUB	274.67	386.00	71.06	0.34	2829.91	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.58	1.03	17.14	563.10	1.01	550.22	0.92	0.86
MEAN	18.65	1.04	17.15	563.73	1.01	550.34	0.92	0.86

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 HUB     18.86     1.05    17.12   565.88     1.02   550.39     0.92     0.86

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     15.27    35.47    31.50     3.97     0.93     0.14     2.90
 MEAN    18.93    27.57    23.50     4.07     0.90     0.17     3.29     0.86
 HUB     28.22    10.61     6.50     4.11     0.90     0.21     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.943

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     393.759     130.680     371.442    1151.739       0.342       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.683      17.229     551.290      46.000      19.383      32.400      13.017

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     394.232     130.680     415.326    1151.707       0.342       0.036

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.648      17.194     551.259     456.573       0.032       0.158

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     375.670       0.000     375.670    1152.953       0.326       0.010

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.244     552.452       0.000       0.060       0.087       0.068

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.703      18.562       1.033     564.236       7.346     348.264       2.700

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  45756.242       0.328     272.109  968820.188


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.897

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    105.235    2266.000      18.562     564.236       1.000       1.000       0.980
W Kg/sec =   47.83408

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     86.922    2172.640       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  80955.414   82574.344       2.013     509.668     253.147     390.276       1.542

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   350.49    -0.12   350.49     0.30   347.33
 MEAN    15.91     0.00    -0.02   350.49    -0.12   350.49     0.30
 HUB     13.07     0.00    -0.02   350.49    -0.12   350.49     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.96    47.36    -1.40   362.27   504.15    17.41   553.98     0.44
 MEAN    41.93    44.80    -2.87   314.67   471.10    17.41   553.98     0.41
 HUB     36.42    38.84    -2.42   258.45   435.55    17.41   553.98     0.38

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   383.96    85.35   374.35  1157.46     0.33
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 MEAN    15.50   389.96   109.21   374.35  1157.59     0.34
 HUB     12.59   415.12   178.10   374.98  1157.64     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   461.22   269.41     0.40  1533.31
 MEAN   306.46   423.14   197.25     0.37  1694.41     1.19
 HUB    248.96   381.61    70.86     0.33  2243.86

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.02     1.02    17.63   569.10     1.01   556.80     0.92     0.82
 MEAN    19.07     1.03    17.63   569.62     1.01   556.92     0.92     0.82
 HUB     19.24     1.04    17.60   571.36     1.01   556.97     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     12.84    35.74    31.50     4.24     0.93     0.11     2.90
 MEAN    16.26    27.78    23.50     4.28     0.89     0.14     3.34     0.82
 HUB     25.41    10.70     6.50     4.20     0.89     0.17     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.897

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     393.602     111.212     377.563    1157.762       0.340       -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.083      17.615     557.092      46.000      16.412      33.000      16.588

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     406.247     111.212     421.195    1156.884       0.351       -0.122

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.992      17.438     556.247     440.827       0.081       0.129

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     380.409       0.000     380.409    1158.647       0.328       -0.021

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.583     557.944       0.000       0.060       0.111       -0.025

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.576      18.947       1.021     570.026       5.791     411.929       3.193

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  36070.492       0.287     214.508 1025013.312

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    294031.47   1748.5826    102.8040      1.2542      0.7429      7.4864      1.0903


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     103.509    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   47.04952
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
101.118	2257.076	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
79627.609	81219.992	2.824	831.557	294.477	619.754	2.105

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	234.94	-0.08	234.94	0.21	406.33
MEAN	17.06	0.00	-0.02	234.94	-0.08	234.94	0.21	
HUB	12.51	0.00	-0.02	234.94	-0.08	234.94	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.07	50.47	9.60	407.95	470.83	14.65	518.20	0.42
MEAN	55.15	47.20	7.95	337.36	411.17	14.65	518.20	0.37
HUB	46.49	38.62	7.87	247.38	341.22	14.65	518.20	0.31

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	398.16	235.09	321.34	1123.99	0.35
MEAN	18.04	414.58	258.86	323.83	1122.18	0.37
HUB	15.00	465.31	329.62	328.42	1119.12	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	407.95	364.89	172.86	0.32	4851.52	
MEAN	356.65	338.28	97.79	0.30	4670.22	1.37
HUB	296.62	330.08	33.01	0.29	4945.38	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.57	1.10	15.20	538.22	1.03	524.98	0.92	0.91
MEAN	16.52	1.09	15.03	537.65	1.03	523.29	0.92	0.91
HUB	16.60	1.10	14.74	538.52	1.03	520.44	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.19	28.28	24.20	4.08	0.93	0.31	2.90	
MEAN	38.64	16.80	12.70	4.10	0.93	0.27	3.51	0.91
HUB	45.10	-5.74	-9.30	3.56	0.93	0.14	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	420.522	258.359	331.797	1122.252	0.375	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
16.549	15.018	523.359	24.000	37.907	35.400	-2.507

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	357.069	258.359	440.735	1126.662	0.317	0.278

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.540	15.427	527.480	528.796	0.016	0.417

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	331.565	0.000	331.565	1128.227	0.294	0.332

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.542	528.947	0.000	0.060	0.039	0.352

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	16.504	1.092	538.129	15.319	207.759	1.611

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
95373.062	0.573	557.874	987890.812

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.953 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
103.509	2266.000	16.504	538.129	1.000	1.000	0.980

W Kg/sec = 47.04952

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
93.906	2224.718	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
79627.609	81219.992	2.159	590.487	273.476	474.134	1.734

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	317.10	-0.11	317.10	0.28	398.95
MEAN	18.08	0.00	-0.02	317.10	-0.11	317.10	0.28	
HUB	15.21	0.00	-0.02	317.10	-0.11	317.10	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.04	46.36	5.68	406.37	515.53	15.62	529.73	0.46
MEAN	48.44	42.30	6.14	357.49	477.94	15.62	529.73	0.42
HUB	43.50	37.84	5.66	300.77	437.13	15.62	529.73	0.39

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	375.98	166.81	336.95	1136.92	0.33
MEAN	18.01	384.27	182.20	338.32	1135.94	0.34
HUB	15.22	415.92	239.50	340.04	1134.93	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	411.94	236.98	0.36	3408.56	
MEAN	356.14	380.42	173.94	0.33	3283.40	1.36
HUB	301.03	345.56	61.53	0.30	3647.59	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.59	1.07	16.30	548.95	1.02	537.15	0.92	0.91
MEAN	17.55	1.06	16.21	548.56	1.02	536.22	0.92	0.91
HUB	17.67	1.07	16.10	549.71	1.02	535.27	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	26.34	35.12	31.50	3.62	0.93	0.26	2.90	
MEAN	28.30	27.21	23.50	3.71	0.93	0.26	3.30	0.91
HUB	35.16	10.26	6.50	3.76	0.93	0.28	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	576.687	182.712	546.978	1120.023	0.515	-1.100

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.586	14.673	521.300	46.000	18.471	30.600	12.129

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	567.401	182.712	596.094	1120.976	0.506	-1.062

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	17.537	14.720	522.187	345.258	0.045	0.137

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	559.071	0.000	559.071	1121.817	0.498	0.056

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	14.752	522.971	0.000	0.060	0.083	-1.039

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.820	17.484	1.059	549.075	10.946	261.668	2.028

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
68162.164	0.418	398.707	910860.688

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 7.953 EfDer = 0.780

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
103.509	2266.000	17.484	549.075	1.000	1.000	0.680

W Kg/sec = 47.04952

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
89.540	2202.431	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
79627.609	81219.992	1.451	378.495	260.764	293.880	1.127

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	505.73	-0.17	505.73	0.45	385.73
MEAN	17.74	0.00	-0.02	505.73	-0.17	505.73	0.45	
HUB	15.05	0.00	-0.02	505.73	-0.17	505.73	0.45	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	38.14	46.36	-8.22	396.88	642.97	15.22	527.72	0.57
MEAN	34.76	43.40	-8.64	350.77	615.57	15.22	527.72	0.55
HUB	30.49	38.84	-8.35	297.61	586.89	15.22	527.72	0.52

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	376.33	115.81	358.07	1144.70	0.33
MEAN	17.51	384.99	140.49	358.44	1144.67	0.34
HUB	14.85	416.75	210.27	359.82	1144.65	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	452.05	275.93	0.39	2297.62	
MEAN	346.18	413.27	205.69	0.36	2462.59	1.56
HUB	293.65	369.35	83.38	0.32	3125.10	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.07	1.03	16.76	556.37	1.01	544.54	0.92	0.71
MEAN	18.11	1.04	16.75	556.89	1.01	544.52	0.92	0.71
HUB	18.28	1.05	16.68	559.00	1.02	544.49	0.92	0.71

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	17.92	37.62	31.50	6.12	0.93	0.33	2.90	
MEAN	21.40	29.85	23.50	6.35	0.86	0.36	3.28	0.71
HUB	30.30	13.05	6.50	6.55	0.86	0.42	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.780

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	389.640	141.412	363.073	1144.909	0.340	-0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.140	16.741	544.743	46.000	21.280	31.500	10.220

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	380.089	141.412	405.543	1145.554	0.332	0.040

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.118	16.787	545.357	471.992	0.025	0.173

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	369.577	0.000	369.577	1146.245	0.322	0.040

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.799	546.016	0.000	0.060	0.070	0.048

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.609	18.055	1.033	557.422	8.347	324.190	2.513

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
51983.062	0.339	304.069	1396825.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 7.953 EfDer = 0.953

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
103.509	2266.000	18.055	557.422	1.000	1.000	0.980

W Kg/sec = 47.04952

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
87.363	2185.879	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
79627.609	81219.992	2.018	513.330	254.428	401.059	1.576

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	347.56	-0.12	347.56	0.30	367.38
MEAN	16.97	0.00	-0.02	347.56	-0.12	347.56	0.30	
HUB	14.32	0.00	-0.02	347.56	-0.12	347.56	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.63	46.36	1.27	380.86	515.70	16.94	547.34	0.45
MEAN	44.01	43.80	0.21	335.59	483.22	16.94	547.34	0.42
HUB	39.18	37.84	1.34	283.17	448.39	16.94	547.34	0.39

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	385.86	109.99	369.85	1152.06	0.33
MEAN	16.57	393.79	134.71	370.03	1152.03	0.34
HUB	13.89	423.81	205.36	370.73	1151.95	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	454.03	263.36	0.39	2078.88	
MEAN	327.74	417.35	193.03	0.36	2234.75	1.24
HUB	274.67	377.16	69.31	0.33	2854.14	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.71	1.04	17.31	564.02	1.01	551.59	0.92	0.87
MEAN	18.76	1.04	17.31	564.52	1.01	551.57	0.92	0.87
HUB	18.96	1.05	17.27	566.48	1.02	551.49	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff

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 TIP     16.56    35.45    31.50     3.95     0.93     0.16     2.90
 MEAN    20.00    27.55    23.50     4.05     0.90     0.18     3.29     0.87
 HUB     28.98    10.59     6.50     4.09     0.90     0.22     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.953

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     387.332     135.471     362.869    1152.983       0.336       0.052

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.799      17.385     552.481      46.000      20.472      32.400      11.928

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     384.660     135.471     407.819    1153.163       0.334       0.053

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.770      17.377     552.653     456.573       0.029       0.172

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     366.465       0.000     366.465    1154.353       0.317       0.030

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.430     553.794       0.000       0.060       0.080       0.088

    STAGE EXIT CONDITIONS, STAGE             4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.734      18.692       1.035     565.008       7.586     336.202       2.606

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  47252.707       0.339     276.399  950226.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.911

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    103.509    2266.000      18.692     565.008       1.000       1.000       0.980
W Kg/sec =   47.04952

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     84.958    2171.155       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79627.609   81219.992       2.060     509.668     247.426     390.276       1.577

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   342.03    -0.12   342.03     0.30   347.10
 MEAN    15.91     0.00    -0.02   342.03    -0.12   342.03     0.30
 HUB     13.07     0.00    -0.02   342.03    -0.12   342.03     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.66    47.36    -0.70   362.27   498.31    17.59   555.24     0.43
 MEAN    42.63    44.80    -2.17   314.67   464.84    17.59   555.24     0.40
 HUB     37.09    38.84    -1.75   258.45   428.77    17.59   555.24     0.37

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     17.94   376.22    92.51   364.67  1159.19     0.32
 MEAN    15.50   382.36   114.39   364.85  1159.16     0.33
 HUB     12.59   407.51   180.06   365.57  1159.07     0.35
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   449.17   262.25     0.39  1661.72
 MEAN   306.46   412.32   192.07     0.36  1774.65     1.21
 HUB    248.96   372.01    68.91     0.32  2268.43

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.20     1.03    17.85   570.28     1.01   558.47     0.92     0.83
 MEAN    19.24     1.03    17.84   570.64     1.01   558.44     0.92     0.83
 HUB     19.39     1.04    17.80   572.21     1.01   558.35     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     14.23    35.72    31.50     4.22     0.93     0.13     2.90
 MEAN    17.41    27.76    23.50     4.26     0.89     0.15     3.34     0.83
 HUB     26.22    10.67     6.50     4.17     0.89     0.18     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.911

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     385.938     116.488     367.939    1159.338       0.333      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.251      17.827     558.609      46.000      17.568      33.000      15.432

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     395.173     116.488     411.985    1158.713       0.341      -0.099

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.173      17.689     558.007     440.827       0.074       0.143

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     370.163       0.000     370.163    1160.371       0.319      -0.001

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.826     559.605       0.000       0.060       0.103      -0.005

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.623      19.130       1.023     571.045       6.037     394.387       3.057

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   37607.949       0.299     219.983 1004907.812

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    300378.94   1757.0320    101.1179      1.2663      0.7591      7.9529      1.0923


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 60%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.289    2257.076       1.402       0.249      53.349      32.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
76612.523	78144.609	2.935	831.557	283.327	619.754	2.187

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	225.65	-0.08	225.65	0.20	406.33
MEAN	17.06	0.00	-0.02	225.65	-0.08	225.65	0.20	
HUB	12.51	0.00	-0.02	225.65	-0.08	225.65	0.20	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.06	50.47	10.59	407.95	466.27	14.68	518.56	0.42
MEAN	56.23	47.20	9.03	337.36	405.93	14.68	518.56	0.36
HUB	47.64	38.62	9.02	247.38	334.90	14.68	518.56	0.30

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	391.93	242.30	308.05	1124.94	0.35
MEAN	18.04	406.94	262.95	310.57	1122.99	0.36
HUB	15.00	454.96	328.31	314.96	1119.90	0.41

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	407.95	349.77	165.65	0.31	5000.22	
MEAN	356.65	324.40	93.71	0.29	4743.87	1.41
HUB	296.62	316.55	31.69	0.28	4925.55	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.62	1.10	15.28	538.69	1.03	525.86	0.92	0.91
MEAN	16.54	1.09	15.10	537.88	1.03	524.05	0.92	0.91
HUB	16.59	1.10	14.81	538.46	1.03	521.17	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.19	28.27	24.20	4.07	0.93	0.34	2.90	
MEAN	40.25	16.79	12.70	4.09	0.93	0.30	3.51	0.91
HUB	46.19	-5.74	-9.30	3.56	0.93	0.17	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	412.441	262.437	318.173	1123.084	0.367	-0.006

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
16.566	15.091	524.135	24.000	39.517	35.400	-4.117

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	341.927	262.437	431.031	1127.834	0.303	0.310

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.556	15.532	528.578	528.796	0.017	0.442

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	317.759	0.000	317.759	1129.254	0.281	0.356

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.632	529.910	0.000	0.060	0.042	0.376

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.872	16.517	1.093	538.343	15.533	201.502	1.562

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
96707.609	0.581	544.261	948857.062

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.999

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    99.590    2266.000      16.517     538.343      1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    90.297    2224.275       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 76612.523   78144.609       2.246     590.487     262.964     474.134       1.803

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   303.99    -0.10   303.99     0.27   398.87
MEAN    18.08     0.00    -0.02   303.99    -0.10   303.99     0.27
HUB     15.21     0.00    -0.02   303.99    -0.10   303.99     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.21    46.36     6.85   406.37   507.57    15.71   530.63     0.45
MEAN    49.63    42.30     7.33   357.49   469.35    15.71   530.63     0.42
HUB     44.70    37.84     6.86   300.77   427.71    15.71   530.63     0.38

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   367.93   177.26   322.42  1138.39     0.32
MEAN    18.01   375.47   189.80   323.97  1137.22     0.33
HUB     15.22   406.03   242.27   325.83  1136.02     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   394.05   226.54     0.35  3621.79
MEAN   356.14   364.17   166.34     0.32  3420.18     1.40
HUB    301.03   331.08    58.76     0.29  3689.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.67     1.07    16.44   549.85     1.02   538.54     0.92     0.91
MEAN    17.60     1.07    16.32   549.21     1.02   537.43     0.92     0.91
HUB     17.69     1.07    16.20   550.06     1.02   536.29     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     28.80    35.09    31.50     3.59     0.93     0.28     2.90
MEAN    30.36    27.18    23.50     3.68     0.93     0.29     3.30     0.91
HUB     36.63    10.22     6.50     3.72     0.93     0.30     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     553.397     190.332     519.636    1123.056       0.493      -1.033

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.642      14.941     524.128      46.000      20.117      30.600      10.483

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     537.180     190.332     569.902    1124.637       0.478      -0.942

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.650      17.605      15.057     525.605     345.258       0.038       0.159

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     529.248       0.000     529.248    1125.393       0.470       0.110
```

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	15.089	526.311	0.000	0.060	0.071	-0.918

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.840	17.560	1.063	549.704	11.361	249.151	1.931

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
70747.172	0.434	398.158	873308.312

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 9.028 EfDer = 0.803

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
99.590	2266.000	17.560	549.704	1.000	1.000	0.680

W Kg/sec = 45.26799

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
85.823	2201.169	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
76612.523	78144.609	1.514	378.495	249.938	293.880	1.176

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	480.18	-0.17	480.18	0.43	385.51
MEAN	17.74	0.00	-0.02	480.18	-0.17	480.18	0.43	
HUB	15.05	0.00	-0.02	480.18	-0.17	480.18	0.43	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	39.59	46.36	-6.77	396.88	623.07	15.51	530.45	0.55
MEAN	36.16	43.40	-7.24	350.77	594.75	15.51	530.45	0.53
HUB	31.80	38.84	-7.04	297.61	565.02	15.51	530.45	0.50

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	364.83	129.46	341.09	1147.01	0.32
MEAN	17.51	373.42	150.66	341.68	1146.70	0.33
HUB	14.85	404.70	214.61	343.11	1146.39	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	430.26	262.27	0.38	2567.99	
MEAN	346.18	393.67	195.53	0.34	2640.41	1.59
HUB	293.65	352.10	79.04	0.31	3189.47	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.24	1.04	17.00	557.86	1.01	546.74	0.92	0.73
MEAN	18.26	1.04	16.96	558.09	1.02	546.44	0.92	0.73
HUB	18.40	1.05	16.88	559.83	1.02	546.16	0.92	0.73

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.78	37.56	31.50	6.06	0.93	0.35	2.90	
MEAN	23.79	29.78	23.50	6.28	0.87	0.38	3.28	0.73
HUB	32.03	12.97	6.50	6.47	0.87	0.43	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.803

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	377.807	151.645	346.037	1146.935	0.329	-0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.286	16.960	546.674	46.000	23.665	31.500	7.835

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	361.436	151.645	391.959	1147.995	0.315	0.081

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.272	17.057	547.684	471.992	0.020	0.205

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	351.258	0.000	351.258	1148.629	0.306	0.086

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.077	548.290	0.000	0.060	0.057	0.095

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.659	18.222	1.038	558.594	8.889	301.324	2.336

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
55361.855	0.361	311.571	1329429.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 9.028 EfDer = 0.972

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
99.590	2266.000	18.222	558.594	1.000	1.000	0.980

W Kg/sec = 45.26799

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
83.371	2183.585	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
76612.523	78144.609	2.114	513.330	242.802	401.059	1.652

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	330.55	-0.11	330.55	0.29	367.00
MEAN	16.97	0.00	-0.02	330.55	-0.11	330.55	0.29	
HUB	14.32	0.00	-0.02	330.55	-0.11	330.55	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.05	46.36	2.69	380.86	504.38	17.21	549.47	0.44
MEAN	45.44	43.80	1.64	335.59	471.12	17.21	549.47	0.41
HUB	40.60	37.84	2.76	283.17	435.33	17.21	549.47	0.38

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	371.84	124.15	350.51	1155.09	0.32
MEAN	16.57	379.80	144.96	351.04	1154.76	0.33
HUB	13.89	409.46	209.21	351.98	1154.39	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	430.06	249.20	0.37	2346.09	
MEAN	327.74	395.78	182.78	0.34	2404.50	1.28
HUB	274.67	358.02	65.46	0.31	2907.49	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.99	1.04	17.67	566.04	1.01	554.50	0.92	0.89
MEAN	19.01	1.04	17.63	566.23	1.01	554.18	0.92	0.89
HUB	19.17	1.05	17.58	567.83	1.02	553.83	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	19.50	35.41	31.50	3.91	0.93	0.19	2.90	
MEAN	22.44	27.50	23.50	4.00	0.91	0.21	3.29	0.89
HUB	30.73	10.54	6.50	4.04	0.91	0.24	3.90	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.972

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     373.912     145.777     344.324    1155.634       0.324       0.052

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.042      17.708     555.025      46.000      22.946      32.400       9.454

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     364.085     145.777     392.184    1156.265       0.315       0.093

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.024      17.759     555.630     456.573       0.023       0.204

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     346.713       0.000     346.713    1157.337       0.300       0.076

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.817     556.661       0.000       0.060       0.065       0.133

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.791      18.963       1.041     566.699       8.105     311.998       2.419

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  50484.934       0.362     284.124  908757.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.940

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2266.000      18.963     566.699       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.694    2167.914       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       2.169     509.668     235.010     390.276       1.661

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   323.84    -0.11   323.84     0.28   346.58
 MEAN    15.91     0.00    -0.02   323.84    -0.11   323.84     0.28
 HUB     13.07     0.00    -0.02   323.84    -0.11   323.84     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.21    47.36     0.85   362.27   486.00    17.96   557.94     0.42
 MEAN    44.19    44.80    -0.61   314.67   451.62    17.96   557.94     0.39
 HUB     38.60    38.84    -0.24   258.45   414.40    17.96   557.94     0.36

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   360.49   107.81   343.99  1162.85     0.31
 MEAN    15.50   366.67   125.49   344.52  1162.49     0.32
 HUB     12.59   391.48   184.16   345.46  1162.10     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   423.46   246.95     0.36  1936.13
 MEAN   306.46   389.16   180.97     0.33  1946.59     1.25
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  HUB    248.96   351.48    64.81     0.30  2319.99

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     19.59     1.03    18.32   572.85     1.01   562.00     0.92     0.86
  MEAN    19.59     1.03    18.28   572.88     1.01   561.65     0.92     0.86
  HUB     19.71     1.04    18.22   574.06     1.01   561.27     0.92     0.86

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     17.40    35.67    31.50     4.17     0.93     0.17     2.90
  MEAN    20.01    27.71    23.50     4.21     0.90     0.18     3.34     0.86
  HUB     28.06    10.62     6.50     4.12     0.90     0.21     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.940

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     370.137     127.792     347.377    1162.670       0.318      -0.009

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      19.603      18.272     561.824      46.000      20.197      33.000      12.803

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     371.738     127.792     393.091    1162.567       0.320      -0.047

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      19.551      18.212     561.725     440.827       0.059       0.175

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     348.406       0.000     348.406    1164.018       0.299       0.048

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      18.337     563.128       0.000       0.060       0.086       0.044

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.712      19.514       1.029     573.263       6.564     360.415       2.794

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   40890.312       0.325     230.127  960242.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     314191.88   1768.2397     97.2890      1.2917      0.7891      9.0280      1.0965


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      96.156    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   43.70718

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      93.935    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   73970.969   75450.234       3.040     831.557     273.558     619.754       2.266
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ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	217.56	-0.07	217.56	0.19	406.33
MEAN	17.06	0.00	-0.02	217.56	-0.07	217.56	0.19	
HUB	12.51	0.00	-0.02	217.56	-0.07	217.56	0.19	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.93	50.47	11.46	407.95	462.40	14.71	518.86	0.41
MEAN	57.19	47.20	9.99	337.36	401.49	14.71	518.86	0.36
HUB	48.68	38.62	10.06	247.38	329.49	14.71	518.86	0.29

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	386.93	248.50	296.59	1125.72	0.34
MEAN	18.04	400.57	266.43	299.11	1123.67	0.36
HUB	15.00	446.15	327.18	303.32	1120.56	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	407.95	336.73	159.45	0.30	5128.11	
MEAN	356.65	312.42	90.22	0.28	4806.68	1.45
HUB	296.62	304.86	30.56	0.27	4908.61	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.65	1.10	15.34	539.10	1.03	526.60	0.92	0.91
MEAN	16.55	1.10	15.16	538.08	1.03	524.68	0.92	0.91
HUB	16.58	1.10	14.86	538.40	1.03	521.78	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.96	28.26	24.20	4.06	0.93	0.36	2.90	
MEAN	41.69	16.78	12.70	4.08	0.94	0.32	3.51	0.91
HUB	47.17	-5.75	-9.30	3.55	0.94	0.19	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.992

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	405.700	265.916	306.400	1123.775	0.361	-0.005

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
16.579	15.149	524.780	24.000	40.954	35.400	-5.554

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	328.906	265.916	422.954	1128.808	0.291	0.338

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.567	15.617	529.492	528.796	0.018	0.465

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	305.882	0.000	305.882	1130.109	0.271	0.376

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.703	530.712	0.000	0.060	0.047	0.396

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.866	16.524	1.094	538.527	15.717	196.116	1.520

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
97853.297	0.588	531.720	914825.688

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 9.988 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
96.156	2266.000	16.524	538.527	1.000	1.000	0.980

W Kg/sec = 43.70718

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
87.161	2223.895	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73970.969	75450.234	2.326	590.487	253.831	474.134	1.868

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	292.71	-0.10	292.71	0.26	398.80
MEAN	18.08	0.00	-0.02	292.71	-0.10	292.71	0.26	
HUB	15.21	0.00	-0.02	292.71	-0.10	292.71	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.24	46.36	7.88	406.37	500.89	15.77	531.37	0.44
MEAN	50.70	42.30	8.40	357.49	462.11	15.77	531.37	0.41
HUB	45.79	37.84	7.95	300.77	419.77	15.77	531.37	0.37

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	361.61	186.12	310.04	1139.60	0.32
MEAN	18.01	368.34	196.25	311.70	1138.27	0.32
HUB	15.22	397.75	244.59	313.65	1136.92	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	378.83	217.68	0.33	3802.57	
MEAN	356.14	350.31	159.88	0.31	3536.35	1.43
HUB	301.03	318.69	56.44	0.28	3724.93	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.73	1.07	16.54	550.60	1.02	539.68	0.92	0.91
MEAN	17.65	1.07	16.41	549.76	1.02	538.43	0.92	0.91
HUB	17.71	1.07	16.27	550.36	1.02	537.15	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	30.98	35.07	31.50	3.57	0.93	0.31	2.90	
MEAN	32.20	27.16	23.50	3.66	0.93	0.31	3.30	0.91
HUB	37.95	10.20	6.50	3.70	0.93	0.32	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.997

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	534.466	196.805	496.912	1125.469	0.475	-0.976

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.684	15.151	526.384	46.000	21.606	30.600	8.994

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	512.346	196.805	548.845	1127.534	0.454	-0.840

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	17.656	15.321	528.317	345.258	0.032	0.179

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	504.789	0.000	504.789	1128.219	0.447	0.156

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	15.352	528.959	0.000	0.060	0.063	-0.817

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    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.851      17.616       1.066     550.240      11.713     238.957       1.852

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  72937.234       0.447     396.330  840755.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.828

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     96.156    2266.000      17.616     550.240       1.000       1.000       0.680
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     82.644    2200.097       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 73970.969   75450.234       1.573     378.495     240.681     293.880       1.221

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   459.00    -0.16   459.00     0.41   385.32
 MEAN    17.74     0.00    -0.02   459.00    -0.16   459.00     0.41
 HUB     15.05     0.00    -0.02   459.00    -0.16   459.00     0.41

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     40.86    46.36    -5.50   396.88   606.89    15.73   532.65     0.54
 MEAN    37.40    43.40    -6.00   350.77   577.78    15.73   532.65     0.51
 HUB     32.97    38.84    -5.87   297.61   547.13    15.73   532.65     0.48

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   355.84   141.04   326.69  1148.90     0.31
 MEAN    17.51   364.12   159.26   327.45  1148.36     0.32
 HUB     14.85   394.74   218.28   328.90  1147.83     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   411.79   250.69     0.36  2797.24
 MEAN   346.18   377.05   186.93     0.33  2790.85     1.62
 HUB    293.65   337.42    75.37     0.29  3243.89

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.38     1.04    17.19   559.12     1.02   548.55     0.92     0.76
 MEAN    18.38     1.04    17.14   559.10     1.02   548.03     0.92     0.76
 HUB     18.50     1.05    17.05   560.54     1.02   547.53     0.92     0.76

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     23.35    37.50    31.50     6.00     0.93     0.36     2.90
 MEAN    25.94    29.72    23.50     6.22     0.87     0.39     3.28     0.76
 HUB     33.57    12.91     6.50     6.41     0.87     0.43     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.828

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     368.291     160.303     331.574    1148.599       0.321       0.001

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.407      17.139      548.262      46.000      25.802      31.500       5.698

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     17.392     345.704     160.303     381.062    1150.008       0.301       0.118

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.398      17.279     549.608     471.992       0.016       0.234

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     335.865       0.000     335.865    1150.594       0.292       0.126

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.303     550.169       0.000       0.060       0.048       0.136

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.701      18.358       1.042     559.589       9.349     283.675       2.199

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  58223.590       0.379     316.378 1272619.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.985

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     96.156    2266.000      18.358     559.589       1.000       1.000       0.980
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     79.972    2181.643       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73970.969   75450.234       2.204     513.330     232.905     401.059       1.722

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   316.23    -0.11   316.23     0.27   366.67
 MEAN    16.97     0.00    -0.02   316.23    -0.11   316.23     0.27
 HUB     14.32     0.00    -0.02   316.23    -0.11   316.23     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.31    46.36     3.95   380.86   495.11    17.42   551.24     0.43
 MEAN    46.71    43.80     2.91   335.59   461.18    17.42   551.24     0.40
 HUB     41.85    37.84     4.01   283.17   424.55    17.42   551.24     0.37

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   360.97   135.90   334.41  1157.55     0.31
 MEAN    16.57   368.69   153.52   335.21  1156.99     0.32
 HUB     13.89   397.76   212.36   336.33  1156.39     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   410.13   237.44     0.35  2567.97
 MEAN   327.74   377.78   174.22     0.33  2546.23     1.31
 HUB    274.67   342.05    62.31     0.30  2951.28

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.21     1.05    17.96   567.74     1.01   556.86     0.92     0.90
 MEAN    19.21     1.05    17.90   567.67     1.01   556.32     0.92     0.90
 HUB     19.34     1.05    17.82   568.96     1.02   555.75     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.12    35.38    31.50     3.88     0.93     0.22     2.90
 MEAN    24.61    27.46    23.50     3.96     0.91     0.23     3.29     0.90
 HUB     32.27    10.50     6.50     4.00     0.91     0.26     3.90


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.985

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     363.286     154.381     328.852    1157.797       0.314       0.052

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.240      17.969     557.105      46.000      25.148      32.400       7.252

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     347.044     154.381     379.833    1158.798       0.299       0.128

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.229      18.067     558.068     456.573       0.018       0.234

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     330.402       0.000     330.402    1159.775       0.285       0.117

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.128     559.010       0.000       0.060       0.054       0.173

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.828      19.180       1.045     568.125       8.536     293.530       2.275

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  53170.395       0.381     288.920  873143.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.961

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     96.156    2266.000      19.180     568.125       1.000       1.000       0.980
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     77.126    2165.191       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*     AthrRotor  ChokeMargin
  73970.969   75450.234       2.269     509.668     224.619     390.276       1.738

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   308.79    -0.11   308.79     0.27   346.14
 MEAN    15.91     0.00    -0.02   308.79    -0.11   308.79     0.27
 HUB     13.07     0.00    -0.02   308.79    -0.11   308.79     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.56    47.36     2.20   362.27   476.10    18.26   560.16     0.41
 MEAN    45.55    44.80     0.75   314.67   440.95    18.26   560.16     0.38
 HUB     39.94    38.84     1.10   258.45   402.75    18.26   560.16     0.35

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   348.48   120.31   327.05  1165.79     0.30
 MEAN    15.50   354.38   134.59   327.83  1165.19     0.30
 HUB     12.59   378.64   187.55   328.92  1164.56     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   402.40   234.44     0.35  2160.33
 MEAN   306.46   370.15   171.87     0.32  2087.46     1.29
 HUB    248.96   334.61    61.41     0.29  2362.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     19.90     1.04    18.70   574.98     1.01   564.84     0.92     0.88
 MEAN    19.88     1.04    18.64   574.75     1.01   564.27     0.92     0.88
 HUB     19.97     1.04    18.56   575.63     1.01   563.66     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.20    35.63    31.50     4.13     0.93     0.20     2.90
 MEAN    22.32    27.67    23.50     4.17     0.91     0.21     3.34     0.88
 HUB     29.69    10.58     6.50     4.08     0.91     0.23     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.961

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     357.795     137.054     330.504    1165.365       0.307      -0.008

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.889      18.629     564.432      46.000      22.523      33.000      10.477

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     352.729     137.054     378.420    1165.675       0.303      -0.001

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.854      18.631     564.732     440.827       0.047       0.205

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     330.708       0.000     330.708    1166.971       0.283       0.092

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.747     565.989       0.000       0.060       0.071       0.089

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.771      19.823       1.034     575.120       6.995     335.526       2.601

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  43578.711       0.346     236.800  922049.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    325763.25   1770.1490     93.9346      1.3122      0.8097      9.9879      1.1001


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 60%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.987

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     92.762    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   42.16433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     90.619    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  71359.812   72786.852       3.151     831.557     263.901     619.754       2.348

     ROTOR LEADING EDGE CONDITIONS, STAGE           1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     20.63     0.00    -0.02   209.60    -0.07   209.60     0.19   406.33
MEAN    17.06     0.00    -0.02   209.60    -0.07   209.60     0.19
HUB     12.51     0.00    -0.02   209.60    -0.07   209.60     0.19

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     62.81    50.47    12.34   407.95   458.71    14.74   519.14     0.41
MEAN    58.15    47.20    10.95   337.36   397.23    14.74   519.14     0.36
HUB     49.73    38.62    11.11   247.38   324.29    14.74   519.14     0.29

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   382.39   254.50   285.40  1126.45     0.34
MEAN    18.04   394.57   269.81   287.91  1124.30     0.35
HUB     15.00   437.62   326.01   291.94  1121.17     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    407.95   324.04   153.45     0.29  5251.84
MEAN   356.65   300.72    86.85     0.27  4867.47     1.50
HUB    296.62   293.42    29.39     0.26  4890.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.68     1.10    15.40   539.49     1.03   527.28     0.92     0.90
MEAN    16.56     1.10    15.21   538.27     1.03   525.27     0.92     0.90
HUB     16.57     1.10    14.91   538.35     1.03   522.35     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     41.72    28.27    24.20     4.07     0.93     0.39     2.90
MEAN    43.14    16.79    12.70     4.09     0.94     0.34     3.51     0.90
HUB     48.16    -5.75    -9.30     3.55     0.94     0.21     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.987

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     399.348     269.283     294.899    1124.421       0.355      -0.004

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.589      15.202     525.384      24.000      42.400      35.400      -7.000

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     316.235     269.283     415.352    1129.724       0.280       0.365

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.574      15.695     530.351     528.796       0.020       0.488

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     294.320       0.000     294.320    1130.914       0.260       0.395

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.766     531.469       0.000       0.060       0.053       0.415

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      16.527       1.094     538.704      15.894     190.885       1.480

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98953.383       0.595     518.717  881331.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     92.762    2266.000      16.527     538.704       1.000       1.000       0.980
```

W Kg/sec = 42.16433

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
84.081	2223.530	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
71359.812	72786.852	2.411	590.487	244.863	474.134	1.936

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	281.72	-0.10	281.72	0.25	398.74
MEAN	18.08	0.00	-0.02	281.72	-0.10	281.72	0.25	
HUB	15.21	0.00	-0.02	281.72	-0.10	281.72	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.27	46.36	8.91	406.37	494.55	15.83	532.08	0.44
MEAN	51.77	42.30	9.47	357.49	455.23	15.83	532.08	0.40
HUB	46.88	37.84	9.04	300.77	412.17	15.83	532.08	0.36

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	356.00	194.64	298.08	1140.72	0.31
MEAN	18.01	361.79	202.49	299.82	1139.26	0.32
HUB	15.22	389.93	246.85	301.84	1137.76	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	364.14	209.16	0.32	3976.52	
MEAN	356.14	336.90	153.65	0.30	3648.55	1.47
HUB	301.03	306.67	54.18	0.27	3759.20	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.79	1.08	16.63	551.33	1.02	540.75	0.92	0.91
MEAN	17.68	1.07	16.49	550.29	1.02	539.36	0.92	0.91
HUB	17.72	1.07	16.33	550.64	1.02	537.95	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.14	35.06	31.50	3.56	0.93	0.33	2.90	
MEAN	34.03	27.13	23.50	3.63	0.94	0.33	3.30	0.91
HUB	39.28	10.18	6.50	3.68	0.94	0.33	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.994

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	516.944	203.056	475.394	1127.662	0.458	-0.922

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.718	15.337	528.438	46.000	23.129	30.600	7.471

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	489.036	203.056	529.517	1130.161	0.433	-0.742

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	17.696	15.557	530.783	345.258	0.027	0.199

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	481.824	0.000	481.824	1130.784	0.426	0.200

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	15.586	531.368	0.000	0.060	0.055	-0.718

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

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      0.859      17.661       1.069     550.756      12.052     229.460       1.779

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  75049.359       0.460     393.412  808871.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.855

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     92.762    2266.000      17.661     550.756       1.000       1.000       0.680
W Kg/sec =   42.16433

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     79.557    2199.067       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  71359.812   72786.852       1.634     378.495     231.693     293.880       1.268

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   438.95    -0.15   438.95     0.39   385.14
 MEAN    17.74     0.00    -0.02   438.95    -0.15   438.95     0.39
 HUB     15.05     0.00    -0.02   438.95    -0.15   438.95     0.39

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.13    46.36    -4.23   396.88   591.86    15.93   534.67     0.52
 MEAN    38.64    43.40    -4.76   350.77   561.98    15.93   534.67     0.50
 HUB     34.15    38.84    -4.69   297.61   530.41    15.93   534.67     0.47

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   347.89   152.19   312.83  1150.66     0.30
 MEAN    17.51   355.68   167.56   313.74  1149.91     0.31
 HUB     14.85   385.45   221.85   315.21  1149.18     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   394.01   239.54     0.34  3017.93
 MEAN   346.18   361.02   178.62     0.31  2936.09     1.65
 HUB    293.65   323.29    71.80     0.28  3296.71

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.51      1.05    17.38   560.34     1.02   550.23     0.92     0.78
 MEAN    18.49      1.05    17.30   560.08     1.02   549.52     0.92     0.78
 HUB     18.60      1.05    17.20   561.22     1.02   548.82     0.92     0.78

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     25.94    37.44    31.50     5.94     0.93     0.38     2.90
 MEAN    28.11    29.65    23.50     6.15     0.88     0.40     3.28     0.78
 HUB     35.14    12.83     6.50     6.33     0.88     0.44     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.855

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     359.649     168.660     317.650    1150.151       0.313       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.521      17.306     549.746      46.000      27.967      31.500       3.533

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     330.640     168.660     371.173    1151.899       0.287       0.156

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      18.517      17.486     551.418     471.992       0.014       0.264

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     321.179       0.000     321.179    1152.437       0.279       0.165

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.511     551.933       0.000       0.060       0.041       0.176

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.738      18.483       1.047     560.548       9.792     267.935       2.077

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  60984.172       0.397     319.681 1218180.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     92.762    2266.000      18.483     560.548       1.000       1.000       0.980
W Kg/sec =   42.16433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     76.694    2179.775       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  71359.812   72786.852       2.298     513.330     223.356     401.059       1.796

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   302.54    -0.10   302.54     0.26   366.36
 MEAN    16.97     0.00    -0.02   302.54    -0.10   302.54     0.26
 HUB     14.32     0.00    -0.02   302.54    -0.10   302.54     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.55    46.36     5.19   380.86   486.48    17.62   552.91     0.42
 MEAN    47.97    43.80     4.17   335.59   451.90    17.62   552.91     0.39
 HUB     43.12    37.84     5.28   283.17   414.46    17.62   552.91     0.36

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   351.43   147.01   319.20  1159.82     0.30
 MEAN    16.57   358.67   161.60   320.20  1159.06     0.31
 HUB     13.89   386.95   215.38   321.47  1158.26     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   391.30   226.33     0.34  2777.61
 MEAN   327.74   360.73   166.14     0.31  2680.15     1.35
 HUB    274.67   326.89    59.29     0.28  2993.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.42     1.05    18.22   569.37     1.02   559.05     0.92     0.91
 MEAN    19.39     1.05    18.14   569.06     1.02   558.32     0.92     0.91
 HUB     19.50     1.05    18.04   570.05     1.02   557.55     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.73    35.34    31.50     3.84     0.93     0.25     2.90
 MEAN    26.78    27.42    23.50     3.92     0.92     0.26     3.29     0.91
 HUB     33.82    10.45     6.50     3.95     0.92     0.28     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.993

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     353.727     162.511     314.186    1159.810       0.305       0.051

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.422      18.207     559.044      46.000      27.350      32.400       5.050

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     330.992     162.511     368.735    1161.157       0.285       0.164

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.416      18.350     560.344     456.573       0.015       0.264

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     16.096     315.083       0.000     315.083    1162.047       0.271       0.156

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      18.410     561.202       0.000       0.060       0.045       0.211

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.854      19.376       1.048     569.492       8.944     277.228       2.149

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  55711.406       0.400     292.041  838521.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.977

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     92.762    2266.000      19.376     569.492       1.000       1.000       0.980
W Kg/sec =   42.16433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     73.739    2162.591       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  71359.812   72786.852       2.373     509.668     214.754     390.276       1.817

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   294.62    -0.10   294.62     0.25   345.73
 MEAN    15.91     0.00    -0.02   294.62    -0.10   294.62     0.25
 HUB     13.07     0.00    -0.02   294.62    -0.10   294.62     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.89    47.36     3.53   362.27   467.03    18.53   562.24     0.40
 MEAN    46.89    44.80     2.09   314.67   431.15    18.53   562.24     0.37
 HUB     41.27    38.84     2.43   258.45   391.99    18.53   562.24     0.34

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   338.09   132.00   311.26  1168.50     0.29
 MEAN    15.50   343.47   143.10   312.24  1167.69     0.29
 HUB     12.59   366.92   190.71   313.47  1166.86     0.31

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   382.76   222.76     0.33  2369.94
 MEAN   306.46   352.39   163.36     0.30  2219.36     1.33
 HUB    248.96   318.83    58.25     0.27  2402.36

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.19     1.04    19.05   577.01     1.01   567.47     0.92     0.89
 MEAN    20.13     1.04    18.96   576.54     1.01   566.69     0.92     0.89
 HUB     20.20     1.04    18.86   577.12     1.01   565.88     0.92     0.89
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.98    35.59    31.50     4.09     0.93     0.23     2.90
 MEAN    24.62    27.62    23.50     4.12     0.91     0.23     3.34     0.89
 HUB     31.32    10.53     6.50     4.03     0.91     0.25     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.977

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     346.855     145.726     314.758    1167.853       0.297      -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.149      18.951     566.845      46.000      24.843      33.000       8.157

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     335.153     145.726     365.464    1168.539       0.287       0.045

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.128      19.009     567.512     440.827       0.037       0.236

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     314.322       0.000     314.322    1169.701       0.269       0.136

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.117     568.641       0.000       0.060       0.058       0.133

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.815      20.102       1.037     576.890       7.398     314.246       2.436

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   46091.492       0.366     241.613  885037.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    336789.81   1765.4648     90.6187      1.3306      0.8251     10.9534      1.1034


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 60%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     89.191    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   40.54142

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.131    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  68613.172   69985.281       3.277     831.557     253.744     619.754       2.442

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   201.25    -0.07   201.25     0.18   406.33
  MEAN    17.06     0.00    -0.02   201.25    -0.07   201.25     0.18
  HUB     12.51     0.00    -0.02   201.25    -0.07   201.25     0.18
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     63.75    50.47    13.28   407.95   454.95    14.77   519.43     0.41
MEAN    59.19    47.20    11.99   337.36   392.89    14.77   519.43     0.35
HUB     50.88    38.62    12.26   247.38   318.96    14.77   519.43     0.29

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   378.04   260.69   273.77  1127.18     0.34
MEAN    18.04   388.58   273.28   276.25  1124.93     0.35
HUB     15.00   428.89   324.80   280.09  1121.79     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    407.95   310.86   147.26     0.28  5379.48
MEAN   356.65   288.56    83.37     0.26  4930.11     1.55
HUB    296.62   281.50    28.18     0.25  4872.87

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.71     1.11    15.46   539.90     1.03   527.96     0.92     0.90
MEAN    16.57     1.10    15.26   538.47     1.03   525.86     0.92     0.90
HUB     16.55     1.10    14.96   538.29     1.03   522.93     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     43.60    28.28    24.20     4.08     0.93     0.42     2.90
MEAN    44.69    16.79    12.70     4.09     0.94     0.37     3.51     0.90
HUB     49.23    -5.75    -9.30     3.55     0.94     0.23     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.980

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     392.992     272.751     282.930    1125.066       0.349      -0.003

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    16.597      15.252     525.987      24.000      43.951      35.400      -8.551

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     303.095     272.751     407.750    1130.642       0.268       0.394

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.580      15.771     531.213     528.796       0.023       0.513

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     282.322       0.000     282.322    1131.722       0.249       0.414

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.826     532.229       0.000       0.060       0.060       0.434

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.849      16.527       1.094     538.886      16.076     185.454       1.438

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 100088.438       0.601     504.473  846247.312


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     89.191    2266.000      16.527     538.886       1.000       1.000       0.980
W Kg/sec =   40.54142

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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    80.859    2223.154       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 68613.172   69985.281       2.508     590.487     235.480     474.134       2.013

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   270.30    -0.09   270.30     0.24   398.67
MEAN    18.08     0.00    -0.02   270.30    -0.09   270.30     0.24
HUB     15.21     0.00    -0.02   270.30    -0.09   270.30     0.24

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     56.38    46.36    10.02   406.37   488.13    15.88   532.78     0.43
MEAN    52.91    42.30    10.61   357.49   448.25    15.88   532.78     0.40
HUB     48.06    37.84    10.22   300.77   404.45    15.88   532.78     0.36

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   350.74   203.37   285.76  1141.84     0.31
MEAN    18.01   355.39   208.84   287.55  1140.24     0.31
HUB     15.22   382.02   249.12   289.62  1138.61     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   349.05   200.43     0.31  4154.65
MEAN   356.14   323.08   147.29     0.28  3762.95     1.52
HUB    301.03   294.24    51.91     0.26  3793.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.84     1.08    16.71   552.08     1.02   541.81     0.92     0.90
MEAN    17.71     1.07    16.56   550.84     1.02   540.29     0.92     0.90
HUB     17.72     1.07    16.39   550.93     1.02   538.75     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.44    35.05    31.50     3.55     0.93     0.36     2.90
MEAN    35.99    27.12    23.50     3.62     0.94     0.35     3.30     0.90
HUB     40.70    10.16     6.50     3.66     0.94     0.35     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.988

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     499.624     209.430     453.611    1129.792       0.442      -0.866

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.746      15.513     530.437      46.000      24.783      30.600       5.817

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     465.630     209.430     510.561    1132.707       0.411      -0.640

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.650      17.731      15.781     533.178     345.258       0.023       0.222

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     458.768       0.000     458.768    1133.270       0.405       0.245

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.650      15.809     533.707       0.000       0.060       0.048      -0.617

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.863      17.700       1.071     551.284      12.398     220.039       1.706

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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  77205.188       0.474     389.135  775624.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.885

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     89.191    2266.000      17.700     551.284       1.000       1.000       0.680
W Kg/sec =   40.54142

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     76.364    2198.012       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 68613.172   69985.281       1.702     378.495     222.392     293.880       1.321

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   418.66    -0.14   418.66     0.37   384.96
 MEAN    17.74     0.00    -0.02   418.66    -0.14   418.66     0.37
 HUB     15.05     0.00    -0.02   418.66    -0.14   418.66     0.37

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.48    46.36    -2.88   396.88   576.98    16.11   536.65     0.51
 MEAN    39.97    43.40    -3.43   350.77   546.28    16.11   536.65     0.48
 HUB     35.42    38.84    -3.42   297.61   513.75    16.11   536.65     0.45

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   340.52   163.61   298.64  1152.40     0.30
 MEAN    17.51   347.58   176.06   299.69  1151.45     0.30
 HUB     14.85   376.25   225.48   301.19  1150.52     0.33

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   375.80   228.13     0.33  3243.92
 MEAN   346.18   344.61   170.12     0.30  3084.82     1.68
 HUB    293.65   308.81    68.17     0.27  3350.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.65     1.05    17.55   561.59     1.02   551.90     0.92     0.81
 MEAN    18.60     1.05    17.46   561.08     1.02   550.99     0.92     0.81
 HUB     18.68     1.06    17.35   561.92     1.02   550.10     0.92     0.81

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.72    37.38    31.50     5.88     0.93     0.40     2.90
 MEAN    30.43    29.58    23.50     6.08     0.89     0.42     3.28     0.81
 HUB     36.82    12.75     6.50     6.25     0.89     0.46     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.885

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     351.360     177.219     303.393    1151.691       0.305       0.004

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.635      17.468     551.221      46.000      30.290      31.500       1.210

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     315.296     177.219     361.687    1153.786       0.273       0.196

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.632      17.689     553.228     471.992       0.012       0.298

   VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	306.271	0.000	306.271	1154.275	0.265	0.205

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.713	553.697	0.000	0.060	0.037	0.216

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.772	18.603	1.051	561.530	10.245	252.933	1.961

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
63809.777	0.416	321.619	1162508.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =11.987 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
89.191	2266.000	18.603	561.530	1.000	1.000	0.980

W Kg/sec = 40.54142

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
73.332	2177.868	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
68613.172	69985.281	2.404	513.330	213.566	401.059	1.878

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	288.62	-0.10	288.62	0.25	366.03
MEAN	16.97	0.00	-0.02	288.62	-0.10	288.62	0.25	
HUB	14.32	0.00	-0.02	288.62	-0.10	288.62	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.85	46.36	6.49	380.86	477.94	17.81	554.57	0.41
MEAN	49.31	43.80	5.51	335.59	442.70	17.81	554.57	0.38
HUB	44.46	37.84	6.62	283.17	404.41	17.81	554.57	0.35

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	342.60	158.16	303.91	1162.06	0.29
MEAN	16.57	349.11	169.75	305.07	1161.10	0.30
HUB	13.89	376.33	218.40	306.47	1160.12	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	372.37	215.18	0.32	2987.99	
MEAN	327.74	343.55	157.99	0.30	2815.05	1.40
HUB	274.67	311.59	56.27	0.27	3035.05	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.62	1.05	18.47	571.02	1.02	561.22	0.92	0.91
MEAN	19.56	1.05	18.37	570.47	1.02	560.29	0.92	0.91
HUB	19.64	1.06	18.26	571.17	1.02	559.34	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.49	35.30	31.50	3.80	0.93	0.28	2.90	
MEAN	29.09	27.38	23.50	3.88	0.92	0.28	3.29	0.91
HUB	35.48	10.40	6.50	3.90	0.92	0.30	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	344.641	170.702	299.397	1161.800	0.297	0.050

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.597	18.434	560.966	46.000	29.690	32.400	2.710

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	314.894	170.702	358.186	1163.495	0.271	0.203

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.594	18.620	562.604	456.573	0.012	0.297

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	299.767	0.000	299.767	1164.298	0.257	0.196

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.678	563.380	0.000	0.060	0.039	0.250

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.870	19.560	1.051	570.883	9.353	261.830	2.030

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
58263.902	0.418	293.666	802671.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =11.987 EfDer = 0.989

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
89.191	2266.000	19.560	570.883	1.000	1.000	0.980

W Kg/sec = 40.54142

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
70.319	2159.953	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
68613.172	69985.281	2.489	509.668	204.795	390.276	1.906

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	280.44	-0.10	280.44	0.24	345.31
MEAN	15.91	0.00	-0.02	280.44	-0.10	280.44	0.24	
HUB	13.07	0.00	-0.02	280.44	-0.10	280.44	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.26	47.36	4.90	362.27	458.21	18.79	564.32	0.39
MEAN	48.30	44.80	3.50	314.67	421.57	18.79	564.32	0.36
HUB	42.67	38.84	3.83	258.45	381.44	18.79	564.32	0.33

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	328.61	143.53	295.60	1171.15	0.28
MEAN	15.50	333.20	151.53	296.74	1170.15	0.28
HUB	12.59	355.58	193.85	298.09	1169.12	0.30

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	363.32	211.23	0.31	2576.68	
MEAN	306.46	334.75	154.92	0.29	2349.95	1.37
HUB	248.96	303.14	55.11	0.26	2441.82	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.46	1.05	19.37	579.06	1.01	570.05	0.92	0.91
MEAN	20.38	1.04	19.26	578.34	1.01	569.07	0.92	0.91
HUB	20.41	1.04	19.14	578.63	1.01	568.08	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.90	35.55	31.50	4.05	0.93	0.26	2.90	

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 MEAN    27.05    27.57    23.50     4.07     0.92     0.26     3.34     0.91
 HUB     33.04    10.48     6.50     3.98     0.92     0.27     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     336.578     154.313     299.120    1170.297       0.288       -0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.394      19.255     569.222      46.000      27.289      33.000       5.711

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     317.848     154.313     353.326    1171.348       0.271       0.092

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.383      19.365     570.245     440.827       0.029       0.269

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     298.179       0.000     298.179    1172.387       0.254       0.182

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.465     571.257       0.000       0.060       0.048       0.179

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.848      20.362       1.041     578.680       7.797     294.752       2.285

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  48575.469       0.386     244.834  846816.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    347942.78   1753.7261     87.1308      1.3479      0.8362     11.9868      1.1069


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*******************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 60%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.974

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     85.685    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.706    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  65916.203   67234.383       3.411     831.557     243.770     619.754       2.542

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   193.09    -0.07   193.09     0.17   406.33
 MEAN    17.06     0.00    -0.02   193.09    -0.07   193.09     0.17
 HUB     12.51     0.00    -0.02   193.09    -0.07   193.09     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     64.67    50.47    14.20   407.95   451.40    14.80   519.70     0.40
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 MEAN    60.22    47.20    13.02   337.36   388.77    14.80   519.70     0.35
 HUB     52.03    38.62    13.41   247.38   313.87    14.80   519.70     0.28

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   374.15   266.63   262.48  1127.85     0.33
 MEAN    18.04   382.99   276.60   264.91  1125.52     0.34
 HUB     15.00   420.46   323.53   268.55  1122.36     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   298.11   141.32     0.26  5502.01
 MEAN   356.65   276.74    80.05     0.25  4989.90     1.60
 HUB    296.62   269.90    26.91     0.24  4853.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.73     1.11    15.51   540.29     1.03   528.60     0.92     0.89
 MEAN    16.58     1.10    15.30   538.66     1.03   526.41     0.92     0.89
 HUB     16.54     1.09    15.01   538.23     1.03   523.46     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.45    28.30    24.20     4.10     0.93     0.44     2.90
 MEAN    46.24    16.81    12.70     4.11     0.94     0.39     3.51     0.89
 HUB     50.30    -5.72    -9.30     3.58     0.94     0.26     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     387.055     276.063     271.295    1125.664       0.344      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.603      15.297     526.546      24.000      45.499      35.400     -10.099

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     290.363     276.063     400.651    1131.497       0.257       0.422

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.582      15.839     532.017     528.796       0.025       0.539

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     270.685       0.000     270.685    1132.477       0.239       0.432

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.879     532.939       0.000       0.060       0.069       0.452

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.838      16.524       1.094     539.059      16.249     180.205       1.397

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 101164.203       0.608     489.853  811938.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.982

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     85.685    2266.000      16.524     539.059       1.000       1.000       0.980
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     77.709    2222.797       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 65916.203   67234.383       2.609     590.487     226.308     474.134       2.095

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   259.21    -0.09   259.21     0.23   398.61
MEAN    18.08     0.00    -0.02   259.21    -0.09   259.21     0.23
HUB     15.21     0.00    -0.02   259.21    -0.09   259.21     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.47    46.36    11.11   406.37   482.08    15.93   533.45     0.43
MEAN    54.06    42.30    11.76   357.49   441.65    15.93   533.45     0.39
HUB     49.25    37.84    11.41   300.77   397.13    15.93   533.45     0.35

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   346.19   211.73   273.89  1142.87     0.30
MEAN    18.01   349.60   214.95   275.71  1141.15     0.31
HUB     15.22   374.58   251.27   277.79  1139.40     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   334.52   192.06     0.29  4325.42
MEAN   356.14   309.75   141.19     0.27  3872.92     1.56
HUB    301.03   282.21    49.75     0.25  3826.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.88     1.08    16.78   552.80     1.03   542.79     0.92     0.90
MEAN    17.74     1.07    16.62   551.36     1.02   541.15     0.92     0.90
HUB     17.72     1.07    16.44   551.21     1.02   539.49     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.71    35.04    31.50     3.54     0.93     0.38     2.90
MEAN    37.94    27.12    23.50     3.62     0.94     0.37     3.30     0.90
HUB     42.13    10.15     6.50     3.65     0.94     0.37     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.982

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     483.638     215.557     432.945    1131.725       0.427      -0.812

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.768      15.669     532.255      46.000      26.468      30.600       4.132

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     443.581     215.557     493.182    1135.018       0.391      -0.541

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.650      17.757      15.979     535.357     345.258       0.019       0.246

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     437.060       0.000     437.060    1135.526       0.385       0.288

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.650      16.005     535.836       0.000       0.060       0.042      -0.519

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.864      17.730       1.073     551.789      12.730     211.252       1.638

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79272.414       0.486     383.849  743251.562
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.912

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    85.685    2266.000      17.730     551.789       1.000       1.000       0.680
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    73.274    2197.007       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 65916.203   67234.383       1.774     378.495     213.394     293.880       1.377

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   399.45    -0.14   399.45     0.35   384.78
MEAN    17.74     0.00    -0.02   399.45    -0.14   399.45     0.35
HUB     15.05     0.00    -0.02   399.45    -0.14   399.45     0.35

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     44.82    46.36    -1.54   396.88   563.19    16.28   538.46     0.49
MEAN    41.30    43.40    -2.10   350.77   531.69    16.28   538.47     0.47
HUB     36.70    38.84    -2.14   297.61   498.21    16.28   538.46     0.44

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   334.25   174.50   285.08  1154.01     0.29
MEAN    17.51   340.40   184.19   286.26  1152.88     0.30
HUB     14.85   367.74   228.93   287.80  1151.77     0.32

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   358.42   217.23     0.31  3459.60
MEAN   346.18   328.92   161.99     0.29  3227.02     1.72
HUB    293.65   294.99    64.72     0.26  3401.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.78     1.06    17.72   562.77     1.02   553.45     0.92     0.83
MEAN    18.71     1.06    17.61   562.04     1.02   552.36     0.92     0.83
HUB     18.76     1.06    17.48   562.59     1.02   551.30     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.47    37.31    31.50     5.81     0.93     0.42     2.90
MEAN    32.76    29.50    23.50     6.00     0.89     0.43     3.28     0.83
HUB     38.50    12.67     6.50     6.17     0.89     0.47     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.912

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     344.006     185.401     289.770    1153.114       0.298       0.006

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.738      17.614     552.585      46.000      32.612      31.500      -1.112

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     300.701     185.401     353.263    1155.544       0.260       0.237

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.736      17.873     554.917     471.992       0.012       0.332

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.121     292.138       0.000     292.138    1155.985       0.253       0.243
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   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.893     555.341       0.000       0.060       0.037       0.254

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.801      18.707       1.055     562.467      10.678     239.510       1.857

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  66505.719       0.433     322.031 1109228.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     85.685    2266.000      18.707     562.467       1.000       1.000       0.980
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     70.116    2176.053       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  65916.203   67234.383       2.514     513.330     204.199     401.059       1.964

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   275.41    -0.09   275.41     0.24   365.73
 MEAN    16.97     0.00    -0.02   275.41    -0.09   275.41     0.24
 HUB     14.32     0.00    -0.02   275.41    -0.09   275.41     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.14    46.36     7.78   380.86   470.08    17.98   556.13     0.41
 MEAN    50.63    43.80     6.83   335.59   434.20    17.98   556.13     0.38
 HUB     45.81    37.84     7.97   283.17   395.08    17.98   556.13     0.34

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   335.04   168.58   289.54  1164.12     0.29
 MEAN    16.57   340.64   177.37   290.82  1162.99     0.29
 HUB     13.89   366.58   221.21   292.32  1161.84     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   354.63   204.77     0.30  3184.57
 MEAN   327.74   327.39   150.37     0.28  2941.32     1.44
 HUB    274.67   297.17    53.46     0.26  3073.97

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.80     1.06    18.69   572.58     1.02   563.21     0.92     0.91
 MEAN    19.72     1.05    18.58   571.81     1.02   562.12     0.92     0.91
 HUB     19.76     1.06    18.44   572.23     1.02   561.01     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.21    35.27    31.50     3.77     0.93     0.31     2.90
 MEAN    31.38    27.34    23.50     3.84     0.93     0.31     3.29     0.91
 HUB     37.12    10.36     6.50     3.86     0.93     0.32     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      16.481     336.608     178.368     285.465    1163.638       0.289       0.048

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      19.749      18.633     562.743      46.000      31.999      32.400       0.401
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STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	299.805	178.368	348.853	1165.658	0.257	0.241

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.747	18.858	564.699	456.573	0.011	0.330

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	285.454	0.000	285.454	1166.381	0.245	0.234

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.911	565.400	0.000	0.060	0.037	0.286

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	19.717	1.054	572.204	9.736	248.185	1.924

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
60649.102	0.435	293.672	767984.062

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =13.019 EfDer = 0.997

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
85.685	2266.000	19.717	572.204	1.000	1.000	0.980

W Kg/sec = 38.94787

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
67.096	2157.460	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
65916.203	67234.383	2.608	509.668	195.407	390.276	1.997

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	267.16	-0.09	267.16	0.23	344.91
MEAN	15.91	0.00	-0.02	267.16	-0.09	267.16	0.23	
HUB	13.07	0.00	-0.02	267.16	-0.09	267.16	0.23	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.60	47.36	6.24	362.27	450.20	19.01	566.24	0.39
MEAN	49.68	44.80	4.88	314.67	412.86	19.01	566.24	0.35
HUB	44.06	38.84	5.22	258.45	371.78	19.01	566.24	0.32

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	320.63	154.23	281.10	1173.57	0.27
MEAN	15.50	324.20	159.31	282.35	1172.40	0.28
HUB	12.59	345.31	196.74	283.78	1171.21	0.29

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	345.29	200.53	0.29	2768.56	
MEAN	306.46	318.39	147.15	0.27	2470.42	1.42
HUB	248.96	288.55	52.22	0.25	2478.13	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.70	1.05	19.65	580.99	1.02	572.41	0.92	0.91
MEAN	20.59	1.04	19.52	580.05	1.01	571.27	0.92	0.91
HUB	20.59	1.04	19.39	580.07	1.01	570.11	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.75	35.50	31.50	4.00	0.93	0.29	2.90	
MEAN	29.43	27.53	23.50	4.03	0.92	0.29	3.34	0.91
HUB	34.73	10.43	6.50	3.93	0.92	0.29	4.06	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     327.593     162.233     284.600    1172.541       0.279      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.605      19.516     571.409      46.000      29.685      33.000       3.315

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     301.903     162.233     342.732    1173.925       0.257       0.138

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.600      19.673     572.760     440.827       0.024       0.302

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     283.305       0.000     283.305    1174.856       0.241       0.225

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.765     573.668       0.000       0.060       0.040       0.221

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.868      20.582       1.044     580.369       8.166     277.885       2.154

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   50873.875       0.404     246.339  809917.375

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    358465.31   1735.7444     83.7060      1.3624      0.8422     13.0194      1.1101


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

   Fan-Core + 4 Stage LPC 60%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  0.966

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     82.317    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   37.41694

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.416    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63325.230   64591.602       3.551     831.557     234.188     619.754       2.646

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   185.28    -0.06   185.28     0.17   406.33
  MEAN    17.06     0.00    -0.02   185.28    -0.06   185.28     0.17
  HUB     12.51     0.00    -0.02   185.28    -0.06   185.28     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     65.58    50.47    15.11   407.95   448.11    14.82   519.94     0.40
  MEAN    61.23    47.20    14.03   337.36   384.95    14.82   519.94     0.34
  HUB     53.17    38.62    14.55   247.38   309.13    14.82   519.94     0.28
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      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   370.79   272.24   251.74  1128.47     0.33
 MEAN    18.04   377.90   279.72   254.10  1126.05     0.34
 HUB     15.00   412.59   322.33   257.56  1122.89     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   285.99   135.71     0.25  5617.60
 MEAN   356.65   265.49    76.94     0.24  5046.04     1.66
 HUB    296.62   258.84    25.71     0.23  4835.73

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.76     1.11    15.55   540.65     1.03   529.17     0.92     0.88
 MEAN    16.58     1.10    15.34   538.84     1.03   526.91     0.92     0.88
 HUB     16.52     1.09    15.05   538.17     1.03   523.95     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     47.24    28.33    24.20     4.13     0.93     0.47     2.90
 MEAN    47.75    16.85    12.70     4.15     0.95     0.42     3.51     0.88
 HUB     51.37    -5.70    -9.30     3.60     0.95     0.28     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     381.639     279.172     260.213    1126.210       0.339      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.607      15.337     527.057      24.000      47.013      35.400     -11.613

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     278.271     279.172     394.172    1132.281       0.246       0.450

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.583      15.900     532.754     528.796       0.028       0.564

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     259.620       0.000     259.620    1133.171       0.229       0.449

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.924     533.592       0.000       0.060       0.078       0.468

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.826      16.518       1.093     539.222      16.412     175.209       1.358

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102177.656       0.614     475.312  779103.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  0.974

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     82.317    2266.000      16.518     539.222       1.000       1.000       0.980
W Kg/sec =   37.41694

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     74.693    2222.462       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63325.230   64591.602       2.715     590.487     217.522     474.134       2.180

     ROTOR LEADING EDGE CONDITIONS, STAGE            2
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   248.67    -0.09   248.67     0.22   398.55
MEAN    18.08     0.00    -0.02   248.67    -0.09   248.67     0.22
HUB     15.21     0.00    -0.02   248.67    -0.09   248.67     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.54    46.36    12.18   406.37   476.49    15.97   534.06     0.42
MEAN    55.18    42.30    12.88   357.49   435.54    15.97   534.06     0.38
HUB     50.43    37.84    12.59   300.77   390.32    15.97   534.06     0.34

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   342.35   219.57   262.67  1143.81     0.30
MEAN    18.01   344.46   220.69   264.48  1141.98     0.30
HUB     15.22   367.71   253.29   266.56  1140.12     0.32

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   320.83   184.22     0.28  4485.43
MEAN   356.14   297.15   135.45     0.26  3976.14     1.61
HUB    301.03   270.80    47.74     0.24  3857.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.92     1.08    16.83   553.47     1.03   543.68     0.92     0.89
MEAN    17.75     1.07    16.67   551.85     1.02   541.94     0.92     0.89
HUB     17.71     1.07    16.48   551.47     1.02   540.18     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     39.89    35.04    31.50     3.54     0.93     0.41     2.90
MEAN    39.84    27.12    23.50     3.62     0.94     0.39     3.30     0.89
HUB     43.54    10.15     6.50     3.65     0.94     0.39     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.974

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     469.141     221.308     413.662    1133.453       0.414      -0.761

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.783      15.803     533.882      46.000      28.147      30.600       2.453

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     423.133     221.308     477.513    1137.086       0.372      -0.448

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.650      17.775      16.152     537.311     345.258       0.017       0.269

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.823     416.946       0.000     416.946    1137.545       0.367       0.329

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.650      16.175     537.745       0.000       0.060       0.039      -0.428

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.862      17.750       1.075     552.263      13.041     203.197       1.575

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  81209.250       0.498     377.771  712383.812


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  0.937
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
82.317	2266.000	17.750	552.263	1.000	1.000	0.680

W Kg/sec = 37.41694

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
70.342	2196.064	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
63325.230	64591.602	1.848	378.495	204.856	293.880	1.435

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	381.55	-0.13	381.55	0.33	384.62
MEAN	17.74	0.00	-0.02	381.55	-0.13	381.55	0.33	
HUB	15.05	0.00	-0.02	381.55	-0.13	381.55	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.14	46.36	-0.22	396.88	550.63	16.42	540.11	0.48
MEAN	42.60	43.40	-0.80	350.77	518.38	16.42	540.11	0.45
HUB	37.97	38.84	-0.87	297.61	483.97	16.42	540.11	0.42

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	329.09	184.67	272.39	1155.47	0.28
MEAN	17.51	334.19	191.78	273.69	1154.18	0.29
HUB	14.85	360.09	232.16	275.26	1152.91	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	342.16	207.06	0.30	3661.01	
MEAN	346.18	314.24	154.41	0.27	3359.66	1.76
HUB	293.65	282.04	61.49	0.24	3449.60	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.89	1.06	17.86	563.89	1.02	554.84	0.92	0.86
MEAN	18.80	1.06	17.73	562.93	1.02	553.61	0.92	0.86
HUB	18.83	1.06	17.59	563.22	1.02	552.39	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.14	37.24	31.50	5.74	0.93	0.44	2.90	
MEAN	35.02	29.43	23.50	5.93	0.90	0.45	3.28	0.86
HUB	40.15	12.59	6.50	6.09	0.90	0.48	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.937

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	337.640	193.034	277.017	1154.405	0.292	0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.827	17.741	553.826	46.000	34.870	31.500	-3.370

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	287.094	193.034	345.955	1157.150	0.248	0.276

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.824	18.034	556.463	471.992	0.013	0.366

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	278.999	0.000	278.999	1157.548	0.241	0.277

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.048	556.845	0.000	0.060	0.040	0.288

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.823	18.794	1.059	563.345	11.082	227.648	1.765

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
69024.086	0.450	321.088	1059176.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc =14.028 EfDer = 0.998

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
82.317	2266.000	18.794	563.345	1.000	1.000	0.980

W Kg/sec = 37.41694

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
67.101	2174.356	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
63325.230	64591.602	2.627	513.330	195.420	401.059	2.052

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	263.11	-0.09	263.11	0.23	365.44
MEAN	16.97	0.00	-0.02	263.11	-0.09	263.11	0.23	
HUB	14.32	0.00	-0.02	263.11	-0.09	263.11	0.23	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.37	46.36	9.01	380.86	462.98	18.13	557.57	0.40
MEAN	51.91	43.80	8.11	335.59	426.51	18.13	557.57	0.37
HUB	47.11	37.84	9.27	283.17	386.61	18.13	557.57	0.33

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	328.73	178.13	276.29	1165.97	0.28
MEAN	16.57	333.28	184.36	277.65	1164.70	0.29
HUB	13.89	357.82	223.78	279.21	1163.41	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	338.29	195.21	0.29	3364.93	
MEAN	327.74	312.48	143.38	0.27	3057.08	1.49
HUB	274.67	283.81	50.89	0.24	3109.62	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.95	1.06	18.88	574.03	1.02	565.01	0.92	0.91
MEAN	19.85	1.06	18.75	573.05	1.02	563.78	0.92	0.91
HUB	19.86	1.06	18.60	573.22	1.02	562.53	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.81	35.24	31.50	3.74	0.93	0.34	2.90	
MEAN	33.58	27.31	23.50	3.81	0.93	0.33	3.29	0.91
HUB	38.71	10.33	6.50	3.83	0.93	0.34	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	329.654	185.396	272.580	1165.305	0.283	0.046

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.876	18.801	564.359	46.000	34.222	32.400	-1.822

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	285.913	185.396	340.761	1167.624	0.245	0.278

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.875	19.062	566.607	456.573	0.011	0.363

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	272.308	0.000	272.308	1168.277	0.233	0.268

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.107	567.241	0.000	0.060	0.038	0.318

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	19.845	1.056	573.433	10.087	236.220	1.831

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
62836.176	0.451	292.303	735092.938

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =14.028 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
82.317	2266.000	19.845	573.433	1.000	1.000	0.980

W Kg/sec = 37.41694

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
64.113	2155.147	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
63325.230	64591.602	2.730	509.668	186.721	390.276	2.090

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	254.95	-0.09	254.95	0.22	344.54
MEAN	15.91	0.00	-0.02	254.95	-0.09	254.95	0.22	
HUB	13.07	0.00	-0.02	254.95	-0.09	254.95	0.22	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	54.87	47.36	7.51	362.27	443.06	19.20	568.01	0.38
MEAN	50.99	44.80	6.19	314.67	405.06	19.20	568.01	0.35
HUB	45.40	38.84	6.56	258.45	363.10	19.20	568.01	0.31

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	314.05	163.92	267.87	1175.74	0.27
MEAN	15.50	316.49	166.41	269.21	1174.44	0.27
HUB	12.59	336.18	199.36	270.69	1173.11	0.29

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	328.90	190.84	0.28	2942.25	
MEAN	306.46	303.46	140.05	0.26	2580.28	1.46
HUB	248.96	275.20	49.60	0.23	2511.10	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.90	1.05	19.88	582.77	1.02	574.54	0.92	0.91
MEAN	20.76	1.05	19.74	581.62	1.01	573.26	0.92	0.91
HUB	20.74	1.05	19.59	581.40	1.01	571.97	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	31.46	35.47	31.50	3.97	0.93	0.32	2.90	
MEAN	31.72	27.49	23.50	3.99	0.93	0.31	3.34	0.91
HUB	36.37	10.38	6.50	3.88	0.93	0.31	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

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     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     319.913     169.457     271.346    1174.566       0.272      -0.007

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      20.778      19.733     573.388      46.000      31.985      33.000       1.015

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     287.438     169.457     333.670    1176.252       0.244       0.181

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      20.776      19.930     575.035     440.827       0.022       0.335

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     269.816       0.000     269.816    1177.090       0.229       0.264

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      20.013     575.855       0.000       0.060       0.037       0.260

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.878      20.760       1.046     581.933       8.500     263.399       2.042

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   52960.410       0.421     246.362  774989.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     368207.59   1712.8367     80.4157      1.3742      0.8438     14.0280      1.1131


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 30% Ice Block 9-1-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.958

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      79.082    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   35.94620

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      77.255    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   60836.117   62052.707       3.696     831.557     224.983     619.754       2.755

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   177.81    -0.06   177.81     0.16   406.33
  MEAN    17.06     0.00    -0.02   177.81    -0.06   177.81     0.16
  HUB     12.51     0.00    -0.02   177.81    -0.06   177.81     0.16

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     66.45    50.47    15.98   407.95   445.07    14.84   520.17     0.40
  MEAN    62.21    47.20    15.01   337.36   381.40    14.84   520.17     0.34
  HUB     54.30    38.62    15.68   247.38   304.70    14.84   520.17     0.27

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000
```

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	367.91	277.54	241.51	1129.03	0.33
MEAN	18.04	373.26	282.64	243.80	1126.54	0.33
HUB	15.00	405.14	321.08	247.07	1123.37	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	407.95	274.47	130.41	0.24	5726.97	
MEAN	356.65	254.78	74.01	0.23	5098.82	1.72
HUB	296.62	248.28	24.46	0.22	4816.99	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.78	1.11	15.59	541.00	1.03	529.70	0.92	0.88
MEAN	16.59	1.10	15.37	539.01	1.03	527.37	0.92	0.88
HUB	16.50	1.09	15.08	538.11	1.03	524.40	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	48.97	28.37	24.20	4.17	0.93	0.49	2.90	
MEAN	49.22	16.89	12.70	4.19	0.95	0.44	3.51	0.88
HUB	52.42	-5.65	-9.30	3.65	0.95	0.31	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.958

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	376.701	282.095	249.651	1126.706	0.334	0.000

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
16.609	15.371	527.521	24.000	48.492	35.400	-13.092

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	266.773	282.095	388.260	1132.998	0.235	0.476

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.582	15.953	533.430	528.796	0.031	0.589

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	249.082	0.000	249.082	1133.807	0.220	0.464

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.963	534.192	0.000	0.060	0.088	0.484

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.814	16.510	1.093	539.374	16.564	170.456	1.321

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
103123.086	0.620	460.855	747667.688

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =15.012 EfDer = 0.966

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
79.082	2266.000	16.510	539.374	1.000	1.000	0.980

W Kg/sec = 35.94620

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
71.801	2222.149	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
60836.117	62052.707	2.824	590.487	209.101	474.134	2.267

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	238.62	-0.08	238.62	0.21	398.49

```
MEAN    18.08     0.00    -0.02   238.62    -0.08   238.62     0.21
HUB     15.21     0.00    -0.02   238.62    -0.08   238.62     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     59.58    46.36    13.22   406.37   471.32    16.01   534.62     0.42
MEAN    56.28    42.30    13.98   357.49   429.88    16.01   534.62     0.38
HUB     51.58    37.84    13.74   300.77   383.99    16.01   534.62     0.34

     ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   339.15   226.95   252.02  1144.66     0.30
MEAN    18.01   339.90   226.07   253.82  1142.73     0.30
HUB     15.22   361.35   255.15   255.88  1140.78     0.32

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   307.88   176.84     0.27  4636.07
MEAN   356.14   285.21   130.07     0.25  4072.95     1.66
HUB    301.03   259.96    45.88     0.23  3885.39

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.94     1.09    16.88   554.10     1.03   544.49     0.92     0.88
MEAN    17.76     1.08    16.70   552.31     1.02   542.66     0.92     0.88
HUB     17.70     1.07    16.51   551.71     1.02   540.81     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     42.00    35.06    31.50     3.56     0.93     0.43     2.90
MEAN    41.69    27.13    23.50     3.63     0.95     0.42     3.30     0.88
HUB     44.92    10.17     6.50     3.67     0.95     0.41     3.92


   blockage3   Cor/U1    Cor/Incid
      0.650       1.000       0.966

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     455.948     226.702     395.594    1135.004       0.402      -0.713

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.793      15.918     535.345      46.000      29.816      30.600       0.784

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     404.076     226.702     463.326    1138.946       0.355      -0.360

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.650      17.786      16.302     539.071     345.258       0.016       0.293

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     398.218       0.000     398.218    1139.361       0.350       0.366

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.650      16.322     539.464       0.000       0.060       0.037      -0.342

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.857      17.763       1.076     552.707      13.333     195.771       1.518

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  83027.117       0.509     371.046  682932.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.957

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     79.082    2266.000      17.763     552.707       1.000       1.000       0.680
W Kg/sec =   35.94620
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
67.556	2195.183	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
60836.117	62052.707	1.924	378.495	196.741	293.880	1.494

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	364.81	-0.13	364.81	0.32	384.46
MEAN	17.74	0.00	-0.02	364.81	-0.13	364.81	0.32	
HUB	15.05	0.00	-0.02	364.81	-0.13	364.81	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.42	46.36	1.06	396.88	539.17	16.55	541.59	0.47
MEAN	43.89	43.40	0.49	350.77	506.18	16.55	541.59	0.44
HUB	39.22	38.84	0.38	297.61	470.89	16.55	541.59	0.41

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	324.93	194.20	260.51	1156.79	0.28
MEAN	17.51	328.84	198.88	261.89	1155.36	0.28
HUB	14.85	353.18	235.17	263.49	1153.95	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	326.93	197.54	0.28	3849.61	
MEAN	346.18	300.48	147.31	0.26	3483.84	1.80
HUB	293.65	269.90	58.48	0.23	3494.22	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.99	1.07	17.98	564.93	1.02	556.11	0.92	0.88
MEAN	18.87	1.06	17.84	563.77	1.02	554.74	0.92	0.88
HUB	18.88	1.06	17.69	563.80	1.02	553.39	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.70	37.17	31.50	5.67	0.93	0.46	2.90	
MEAN	37.21	29.36	23.50	5.86	0.90	0.47	3.28	0.88
HUB	41.75	12.51	6.50	6.01	0.90	0.49	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.957

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	332.161	200.180	265.064	1155.579	0.287	0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.903	17.848	554.954	46.000	37.061	31.500	-5.561

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	274.385	200.180	339.645	1158.621	0.237	0.314

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.899	18.174	557.881	471.992	0.014	0.399

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	266.752	0.000	266.752	1158.979	0.230	0.307

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.179	558.226	0.000	0.060	0.047	0.319

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.838	18.863	1.062	564.167	11.461	217.066	1.683

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  71380.094       0.465     318.996 1012024.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     79.082    2266.000      18.863     564.167       1.000       1.000       0.980
W Kg/sec =   35.94620

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     64.271    2172.771       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  60836.117   62052.707       2.742     513.330     187.179     401.059       2.143

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   251.64    -0.09   251.64     0.22   365.18
 MEAN    16.97     0.00    -0.02   251.64    -0.09   251.64     0.22
 HUB     14.32     0.00    -0.02   251.64    -0.09   251.64     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.55    46.36    10.19   380.86   456.55    18.25   558.88     0.39
 MEAN    53.14    43.80     9.34   335.59   419.52    18.25   558.88     0.36
 HUB     48.38    37.84    10.54   283.17   378.89    18.25   558.88     0.33

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   323.50   186.94   264.02  1167.66     0.28
 MEAN    16.57   326.88   190.78   265.43  1166.26     0.28
 HUB     13.89   349.90   226.11   267.02  1164.85     0.30

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   323.19   186.40     0.28  3531.09
 MEAN   327.74   298.68   136.96     0.26  3163.51     1.53
 HUB    274.67   271.40    48.56     0.23  3141.96

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.08     1.06    19.04   575.38     1.02   566.64     0.92     0.91
 MEAN    19.95     1.06    18.89   574.21     1.02   565.29     0.92     0.91
 HUB     19.94     1.06    18.73   574.14     1.02   563.92     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.30    35.22    31.50     3.72     0.93     0.36     2.90
 MEAN    35.71    27.29    23.50     3.79     0.93     0.36     3.29     0.91
 HUB     40.26    10.31     6.50     3.81     0.93     0.36     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     323.626     191.857     260.623    1166.823       0.277       0.045

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.980      18.940     565.832      46.000      36.359      32.400      -3.959

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     273.069     191.857     333.730    1169.417       0.234       0.313

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.978      19.233     568.351     456.573       0.012       0.396
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	260.176	0.000	260.176	1170.008	0.222	0.298

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.269	568.925	0.000	0.060	0.042	0.346

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.873	19.945	1.057	574.577	10.410	225.621	1.749

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
64845.996	0.465	289.795	703860.562

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =15.012 EfDer = 0.999

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
79.082	2266.000	19.945	574.577	1.000	1.000	0.980

W Kg/sec = 35.94620

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
61.344	2152.999	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
60836.117	62052.707	2.853	509.668	178.656	390.276	2.185

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	243.67	-0.08	243.67	0.21	344.19
MEAN	15.91	0.00	-0.02	243.67	-0.08	243.67	0.21	
HUB	13.07	0.00	-0.02	243.67	-0.08	243.67	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.08	47.36	8.72	362.27	436.66	19.35	569.62	0.37
MEAN	52.26	44.80	7.46	314.67	398.05	19.35	569.62	0.34
HUB	46.70	38.84	7.86	258.45	355.27	19.35	569.62	0.30

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	308.64	172.76	255.76	1177.71	0.26
MEAN	15.50	309.85	172.88	257.13	1176.28	0.26
HUB	12.59	328.00	201.69	258.65	1174.84	0.28

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	313.90	181.99	0.27	3100.94	
MEAN	306.46	289.76	133.57	0.25	2680.62	1.51
HUB	248.96	262.94	47.27	0.22	2540.39	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	21.06	1.06	20.07	584.42	1.02	576.47	0.92	0.91
MEAN	20.90	1.05	19.92	583.09	1.01	575.07	0.92	0.91
HUB	20.85	1.05	19.75	582.64	1.01	573.66	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.04	35.43	31.50	3.93	0.93	0.35	2.90	
MEAN	33.91	27.45	23.50	3.95	0.93	0.34	3.34	0.91
HUB	37.95	10.36	6.50	3.86	0.93	0.33	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

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     15.219     313.318     176.054     259.178    1176.403       0.266      -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.917      19.910      575.187      46.000      34.187      33.000      -1.187

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     274.227     176.054     325.876    1178.362       0.233       0.221

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.916      20.141     577.104     440.827       0.021       0.368

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     257.502       0.000     257.502    1179.120       0.218       0.299

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.216     577.847       0.000       0.060       0.037       0.294

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.880      20.900       1.048     583.382       8.805     250.784       1.944

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  54861.285       0.436     245.174  741867.312

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    377237.56   1685.8654     77.2548      1.3834      0.8418     15.0123      1.1159


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 60%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.950

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     75.973    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   34.53327

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     74.218    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  58444.840   59613.613       3.847     831.557     216.140     619.754       2.867

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   170.65    -0.06   170.65     0.15   406.33
 MEAN    17.06     0.00    -0.02   170.65    -0.06   170.65     0.15
 HUB     12.51     0.00    -0.02   170.65    -0.06   170.65     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     67.30    50.47    16.83   407.95   442.26    14.86   520.38     0.40
 MEAN    63.17    47.20    15.97   337.36   378.11    14.86   520.38     0.34
 HUB     55.41    38.62    16.79   247.38   300.58    14.86   520.38     0.27

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   365.41   282.51   231.77  1129.54     0.32
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 MEAN    18.04   369.02   285.36   233.97  1126.99     0.33
 HUB     15.00   398.17   319.90   237.07  1123.81     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   263.54   125.44     0.23  5829.34
 MEAN   356.65   244.59    71.29     0.22  5147.82     1.78
 HUB    296.62   238.21    23.28     0.21  4799.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.79     1.11    15.62   541.33     1.04   530.17     0.92     0.87
 MEAN    16.59     1.10    15.40   539.16     1.03   527.79     0.92     0.87
 HUB     16.49     1.09    15.11   538.06     1.03   524.81     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     50.63    28.42    24.20     4.22     0.93     0.51     2.90
 MEAN    50.65    16.95    12.70     4.25     0.95     0.46     3.51     0.87
 HUB     53.46    -5.61    -9.30     3.69     0.95     0.33     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.950

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    18.071     372.173     284.809     239.576    1127.159       0.330        0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    16.610      15.400     527.946      24.000      49.930      35.400     -14.530

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     255.829     284.809     382.837    1133.655       0.226        0.501

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.579      16.001     534.049     528.796       0.034        0.613

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
    18.083     239.034       0.000     239.034    1134.392       0.211        0.479

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.997     534.743       0.000       0.060       0.097        0.498

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.802      16.501       1.092     539.515      16.705     165.927       1.286

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 104003.922       0.625     446.521  717563.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.958

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     75.973    2266.000      16.501     539.515       1.000       1.000       0.980
W Kg/sec =   34.53327

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     69.027    2221.858       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  58444.840   59613.613       2.937     590.487     201.025     474.134       2.359

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   229.03    -0.08   229.03     0.20   398.44
 MEAN    18.08     0.00    -0.02   229.03    -0.08   229.03     0.20
 HUB     15.21     0.00    -0.02   229.03    -0.08   229.03     0.20
```

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.60	46.36	14.24	406.37	466.53	16.04	535.13	0.41
MEAN	57.36	42.30	15.06	357.49	424.63	16.04	535.13	0.37
HUB	52.72	37.84	14.88	300.77	378.11	16.04	535.13	0.33

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	336.50	233.89	241.92	1145.44	0.29
MEAN	18.01	335.86	231.14	243.68	1143.42	0.29
HUB	15.22	355.43	256.84	245.70	1141.39	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	295.62	169.91	0.26	4777.69	
MEAN	356.14	273.87	125.00	0.24	4164.18	1.71
HUB	301.03	249.64	44.19	0.22	3911.00	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.96	1.09	16.92	554.69	1.03	545.23	0.92	0.88
MEAN	17.77	1.08	16.74	552.74	1.02	543.32	0.92	0.88
HUB	17.69	1.07	16.54	551.94	1.02	541.39	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.03	35.08	31.50	3.58	0.93	0.45	2.90	
MEAN	43.49	27.16	23.50	3.66	0.95	0.44	3.30	0.88
HUB	46.27	10.20	6.50	3.70	0.95	0.43	3.92	

blockage3	Cor/U1	Cor/Incid
0.650	1.000	0.958

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	443.925	231.785	378.609	1136.399	0.391	-0.667

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.798	16.018	536.664	46.000	31.475	30.600	-0.875

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	386.244	231.785	450.454	1140.625	0.339	-0.277

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.650	17.792	16.433	540.663	345.258	0.015	0.317

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	380.712	0.000	380.712	1140.999	0.334	0.400

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.650	16.449	541.017	0.000	0.060	0.037	-0.262

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.851	17.769	1.077	553.122	13.607	188.898	1.464

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
84730.938	0.520	363.776	654816.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =15.972 EfDer = 0.973

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
75.973	2266.000	17.769	553.122	1.000	1.000	0.680

W Kg/sec = 34.53327

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
64.904	2194.359	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
58444.840	59613.613	2.002	378.495	189.019	293.880	1.555

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	349.11	-0.12	349.11	0.31	384.32
MEAN	17.74	0.00	-0.02	349.11	-0.12	349.11	0.31	
HUB	15.05	0.00	-0.02	349.11	-0.12	349.11	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.67	46.36	2.31	396.88	528.66	16.65	542.94	0.46
MEAN	45.15	43.40	1.75	350.77	494.98	16.65	542.94	0.43
HUB	40.46	38.84	1.62	297.61	458.82	16.65	542.94	0.40

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	321.63	203.13	249.37	1157.98	0.28
MEAN	17.51	324.27	205.54	250.81	1156.43	0.28
HUB	14.85	346.97	238.03	252.44	1154.89	0.30

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	312.66	188.61	0.27	4026.32	
MEAN	346.18	287.56	140.65	0.25	3600.39	1.85
HUB	293.65	258.50	55.62	0.22	3536.52	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.08	1.07	18.08	565.91	1.02	557.27	0.92	0.89
MEAN	18.94	1.07	17.93	564.55	1.02	555.77	0.92	0.89
HUB	18.92	1.06	17.77	564.35	1.02	554.30	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.17	37.10	31.50	5.60	0.93	0.47	2.90	
MEAN	39.33	29.28	23.50	5.78	0.91	0.48	3.28	0.89
HUB	43.32	12.43	6.50	5.93	0.91	0.50	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.973

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	327.474	206.887	253.845	1156.647	0.283	0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.966	17.938	555.983	46.000	39.180	31.500	-7.680

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	262.491	206.887	334.221	1159.972	0.226	0.350

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.959	18.293	559.184	471.992	0.017	0.432

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	255.307	0.000	255.307	1160.294	0.220	0.334

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.289	559.495	0.000	0.060	0.056	0.346

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.848	18.917	1.065	564.938	11.816	207.537	1.609

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
73592.359	0.480	315.955	967503.250

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.989

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     75.973    2266.000      18.917     564.938       1.000       1.000       0.980
W Kg/sec =   34.53327

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     61.611    2171.289       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 58444.840   59613.613       2.861     513.330     179.431     401.059       2.235

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   240.90    -0.08   240.90     0.21   364.93
MEAN    16.97     0.00    -0.02   240.90    -0.08   240.90     0.21
HUB     14.32     0.00    -0.02   240.90    -0.08   240.90     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     57.69    46.36    11.33   380.86   450.72    18.36   560.09     0.39
MEAN    54.33    43.80    10.53   335.59   413.17    18.36   560.09     0.36
HUB     49.62    37.84    11.78   283.17   371.84    18.36   560.09     0.32

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   319.18   195.09   252.62  1169.19     0.27
MEAN    16.57   321.32   196.75   254.05  1167.69     0.28
HUB     13.89   342.73   228.26   255.66  1166.17     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    373.34   309.18   178.26     0.26  3684.87
MEAN   327.74   285.83   131.00     0.24  3262.24     1.58
HUB    274.67   259.84    46.41     0.22  3171.69

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.18     1.07    19.16   576.64     1.02   568.13     0.92     0.90
MEAN    20.04     1.06    19.01   575.29     1.02   566.67     0.92     0.90
HUB     20.00     1.06    18.84   575.01     1.02   565.20     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.68    35.21    31.50     3.71     0.93     0.39     2.90
MEAN    37.76    27.28    23.50     3.78     0.94     0.38     3.29     0.90
HUB     41.76    10.29     6.50     3.79     0.94     0.38     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.989

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     318.417     197.852     249.488    1168.209       0.273       0.042

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.063      19.052     567.181      46.000      38.416      32.400      -6.016

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     261.144     197.852     327.630    1171.060       0.223       0.347

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.059      19.375     569.952     456.573       0.014       0.427

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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    16.096     248.926       0.000     248.926    1171.594       0.212       0.325

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.401     570.472       0.000       0.060       0.049       0.372

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      20.022       1.058     575.646      10.708     216.122       1.675

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  66706.703       0.479     286.393  674164.562


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     75.973    2266.000      20.022     575.646       1.000       1.000       0.980
W Kg/sec =   34.53327

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     58.762    2150.999       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  58444.840   59613.613       2.978     509.668     171.138     390.276       2.280

    ROTOR LEADING EDGE CONDITIONS, STAGE             5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   233.19    -0.08   233.19     0.20   343.87
 MEAN    15.91     0.00    -0.02   233.19    -0.08   233.19     0.20
 HUB     13.07     0.00    -0.02   233.19    -0.08   233.19     0.20

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.24    47.36     9.88   362.27   430.90    19.48   571.11     0.37
 MEAN    53.47    44.80     8.67   314.67   391.73    19.48   571.11     0.33
 HUB     47.95    38.84     9.11   258.45   348.17    19.48   571.11     0.30

     ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   304.20   180.86   244.59  1179.50     0.26
 MEAN    15.50   304.10   178.80   245.99  1177.97     0.26
 HUB     12.59   320.65   203.84   247.52  1176.42     0.27

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   300.11   173.89     0.25  3246.14
 MEAN   306.46   277.14   127.66     0.24  2772.25     1.56
 HUB    248.96   251.60    45.12     0.21  2567.43

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.19     1.06    20.23   585.95     1.02   578.22     0.92     0.91
 MEAN    21.01     1.05    20.06   584.45     1.02   576.73     0.92     0.91
 HUB     20.94     1.05    19.88   583.80     1.01   575.21     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     36.48    35.41    31.50     3.91     0.93     0.38     2.90
 MEAN    36.01    27.43    23.50     3.93     0.93     0.36     3.34     0.91
 HUB     39.47    10.33     6.50     3.83     0.93     0.35     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     307.616     182.079     247.942    1178.078       0.261      -0.009

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     21.026      20.051     576.830      46.000      36.292      33.000      -3.292

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     262.082     182.079     319.123    1180.287       0.222       0.259

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.023      20.312     578.996     440.827       0.023       0.400

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     246.186       0.000     246.186    1180.975       0.208       0.331

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.378     579.671       0.000       0.060       0.040       0.325

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      21.005       1.049     584.730       9.084     239.658       1.858

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   56601.219       0.450     243.007  710404.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    385635.16   1655.6527     74.2182      1.3904      0.8369     15.9719      1.1184


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 60%  Stat 2 30% Ice Block 9-1-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =17.022   EfDer =  0.940

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     72.622    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   33.00999

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     70.944    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  55866.812   56984.027       4.025     831.557     206.605     619.754       3.000

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   162.95    -0.06   162.95     0.15   406.33
  MEAN    17.06     0.00    -0.02   162.95    -0.06   162.95     0.15
  HUB     12.51     0.00    -0.02   162.95    -0.06   162.95     0.15

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     68.23    50.47    17.76   407.95   439.34    14.88   520.59     0.39
  MEAN    64.22    47.20    17.02   337.36   374.70    14.88   520.59     0.33
  HUB     56.63    38.62    18.01   247.38   296.27    14.88   520.59     0.26

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   363.05   287.76   221.35  1130.06     0.32
  MEAN    18.04   364.70   288.23   223.45  1127.45     0.32
  HUB     15.00   390.78   318.56   226.35  1124.26     0.35
```

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	407.95	251.87	120.19	0.22	5937.73	
MEAN	356.65	233.69	68.42	0.21	5199.54	1.85
HUB	296.62	227.41	21.94	0.20	4779.07	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.81	1.11	15.64	541.67	1.04	530.66	0.92	0.86
MEAN	16.59	1.10	15.43	539.33	1.03	528.22	0.92	0.86
HUB	16.46	1.09	15.14	537.99	1.03	525.24	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	52.43	28.50	24.20	4.30	0.93	0.54	2.90	
MEAN	52.22	17.03	12.70	4.33	0.95	0.49	3.51	0.86
HUB	54.60	-5.54	-9.30	3.76	0.95	0.36	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.940

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	367.563	287.674	228.793	1127.622	0.326	0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
16.607	15.427	528.379	24.000	51.504	35.400	-16.104

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	244.135	287.674	377.304	1134.331	0.215	0.528

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.573	16.046	534.685	528.796	0.038	0.640

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	228.278	0.000	228.278	1134.994	0.201	0.495

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.029	535.311	0.000	0.060	0.108	0.514

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.788	16.488	1.091	539.663	16.853	161.073	1.249

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
104926.555	0.630	430.612	685209.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =17.022 EfDer = 0.948

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
72.622	2266.000	16.488	539.663	1.000	1.000	0.980

W Kg/sec = 33.00999

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
66.041	2221.552	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
55866.812	56984.027	3.070	590.487	192.329	474.134	2.465

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	218.76	-0.08	218.76	0.19	398.38
MEAN	18.08	0.00	-0.02	218.76	-0.08	218.76	0.19	
HUB	15.21	0.00	-0.02	218.76	-0.08	218.76	0.19	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	61.71	46.36	15.35	406.37	461.58	16.07	535.67	0.41
MEAN	58.54	42.30	16.24	357.49	419.18	16.07	535.67	0.37

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HUB     53.98    37.84    16.14   300.77   371.97    16.07   535.67     0.33

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   334.07   241.21   231.14  1146.23     0.29
MEAN    18.01   331.88   236.48   232.85  1144.13     0.29
HUB     15.22   349.32   258.62   234.81  1142.01     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   282.60   162.59     0.25  4926.97
MEAN   356.14   261.80   119.66     0.23  4260.42     1.77
HUB    301.03   238.61    42.40     0.21  3938.18

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.98     1.09    16.95   555.31     1.03   545.99     0.92     0.87
MEAN    17.77     1.08    16.76   553.19     1.03   544.00     0.92     0.87
HUB     17.67     1.07    16.56   552.17     1.02   541.98     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     46.22    35.12    31.50     3.62     0.93     0.48     2.90
MEAN    45.44    27.20    23.50     3.70     0.95     0.46     3.30     0.87
HUB     47.76    10.24     6.50     3.74     0.95     0.45     3.92


  blockage3   Cor/U1    Cor/Incid
     0.650       1.000       0.948

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     431.647     237.147     360.667    1137.810       0.379       -0.618

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.798      16.113     537.999      46.000      33.326      30.600      -2.726

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     367.486     237.147     437.361    1142.329       0.322       -0.189

  BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
     0.650      17.792      16.559     542.281     345.258       0.016       0.345

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.823     362.317       0.000     362.317    1142.661       0.317       0.435

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.650      16.570     542.596       0.000       0.060       0.039       -0.179

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.841      17.767       1.078     553.559      13.896     181.731       1.409

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  86528.609       0.531     355.108  624685.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =17.022   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     72.622    2266.000      17.767     553.559       1.000       1.000       0.680
W Kg/sec =   33.00999

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     62.071    2193.492       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  55866.812   56984.027       2.094     378.495     180.768     293.880       1.626
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ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	332.55	-0.11	332.55	0.29	384.17
MEAN	17.74	0.00	-0.02	332.55	-0.11	332.55	0.29	
HUB	15.05	0.00	-0.02	332.55	-0.11	332.55	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.05	46.36	3.69	396.88	517.87	16.75	544.32	0.45
MEAN	46.54	43.40	3.14	350.77	483.44	16.75	544.32	0.42
HUB	41.84	38.84	3.00	297.61	446.35	16.75	544.32	0.39

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	318.77	212.46	237.65	1159.20	0.27
MEAN	17.51	319.93	212.53	239.14	1157.53	0.28
HUB	14.85	340.67	240.98	240.79	1155.87	0.29

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	297.68	179.27	0.26	4211.13	
MEAN	346.18	273.96	133.66	0.24	3722.63	1.90
HUB	293.65	246.49	52.67	0.21	3580.32	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.16	1.08	18.17	566.93	1.02	558.45	0.92	0.90
MEAN	18.99	1.07	18.01	565.38	1.02	556.83	0.92	0.90
HUB	18.94	1.07	17.83	564.93	1.02	555.24	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	41.80	37.03	31.50	5.53	0.93	0.50	2.90	
MEAN	41.63	29.20	23.50	5.70	0.91	0.50	3.28	0.90
HUB	45.02	12.34	6.50	5.84	0.91	0.52	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.987

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	323.018	213.921	242.030	1157.736	0.279	0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.020	18.017	557.033	46.000	41.472	31.500	-9.972

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	249.998	213.921	329.031	1161.361	0.215	0.389

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.009	18.404	560.527	471.992	0.020	0.469

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	243.296	0.000	243.296	1161.647	0.209	0.362

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.389	560.803	0.000	0.060	0.068	0.374

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.854	18.960	1.067	565.746	12.187	197.909	1.534

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
75904.961	0.495	311.509	920274.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

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 RESET =  0.000BLEED =  0.000 DPInc =17.022   EfDer =  0.981

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    72.622    2266.000      18.960     565.746       1.000       1.000       0.980
W Kg/sec =   33.00999

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    58.803    2169.738       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 55866.812   56984.027       2.997     513.330     171.253     401.059       2.342

    ROTOR LEADING EDGE CONDITIONS, STAGE             4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   229.63    -0.08   229.63     0.20   364.67
MEAN    16.97     0.00    -0.02   229.63    -0.08   229.63     0.20
HUB     14.32     0.00    -0.02   229.63    -0.08   229.63     0.20

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     58.92    46.36    12.56   380.86   444.79    18.45   561.34     0.38
MEAN    55.62    43.80    11.82   335.59   406.70    18.45   561.34     0.35
HUB     50.97    37.84    13.13   283.17   364.64    18.45   561.34     0.31

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
TIP     18.88   315.22   203.52   240.72  1170.75     0.27
MEAN    16.57   315.91   202.90   242.14  1169.15     0.27
HUB     13.89   335.43   230.43   243.75  1167.52     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    373.34   294.60   169.83     0.25  3843.94
MEAN   327.74   272.43   124.84     0.23  3364.15     1.64
HUB    274.67   247.73    44.24     0.21  3201.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.27     1.07    19.28   577.95     1.02   569.65     0.92     0.90
MEAN    20.11     1.06    19.11   576.43     1.02   568.09     0.92     0.90
HUB     20.05     1.06    18.93   575.91     1.02   566.52     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     40.21    35.20    31.50     3.70     0.93     0.42     2.90
MEAN    39.96    27.27    23.50     3.77     0.94     0.41     3.29     0.90
HUB     43.39    10.29     6.50     3.79     0.94     0.40     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.981

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     313.363     204.039     237.833    1169.629       0.268       0.040

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    20.132      19.151     568.563      46.000      40.627      32.400      -8.227

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     248.698     204.039     321.687    1172.746       0.212       0.384

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      20.125      19.503     571.598     456.573       0.017       0.462

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     237.194       0.000     237.194    1173.225       0.202       0.352

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      19.517     572.065       0.000       0.060       0.059       0.397

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.853      20.081       1.059     576.762      11.016     206.563       1.601

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  68625.945       0.492     281.636  642461.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =17.022   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     72.622    2266.000      20.081     576.762       1.000       1.000       0.980
W Kg/sec =   33.00999

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     56.057    2148.917       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 55866.812   56984.027       3.122     509.668     163.260     390.276       2.391

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   222.26    -0.08   222.26     0.19   343.54
 MEAN    15.91     0.00    -0.02   222.26    -0.08   222.26     0.19
 HUB     13.07     0.00    -0.02   222.26    -0.08   222.26     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.47    47.36    11.11   362.27   425.08    19.58   572.64     0.36
 MEAN    54.77    44.80     9.97   314.67   385.32    19.58   572.64     0.33
 HUB     49.31    38.84    10.47   258.45   340.94    19.58   572.64     0.29

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   300.14   189.18   233.01  1181.32     0.25
 MEAN    15.50   298.57   184.94   234.40  1179.70     0.25
 HUB     12.59   313.23   206.04   235.92  1178.05     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   285.84   165.57     0.24  3395.37
 MEAN   306.46   264.03   121.52     0.22  2867.29     1.61
 HUB    248.96   239.80    42.93     0.20  2595.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     21.29     1.06    20.36   587.54     1.02   580.02     0.92     0.91
 MEAN    21.10     1.05    20.18   585.86     1.02   578.42     0.92     0.91
 HUB     21.00     1.05    20.00   585.00     1.01   576.81     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.07    35.40    31.50     3.90     0.93     0.40     2.90
 MEAN    38.27    27.40    23.50     3.90     0.94     0.39     3.34     0.91
 HUB     41.13    10.31     6.50     3.81     0.94     0.37     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     302.142     188.327     236.268    1179.789       0.256      -0.010

    Pt3        Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    21.115      20.172     578.513      46.000      38.558      33.000      -5.558

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     249.507     188.327     312.604    1182.258       0.211       0.298

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      21.109      20.463     580.937     440.827       0.026       0.434

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     234.473       0.000     234.473    1182.876       0.198       0.362

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      20.518     581.544       0.000       0.060       0.047       0.355

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.869      21.089       1.050     586.134       9.372     228.567       1.772

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  58393.250       0.464     239.642  676843.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    394379.31   1618.5067     70.9444      1.3960      0.8287     17.0217      1.1211



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*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 60%  Stat 2 35% Ice Block 8-31-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.020    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   50.46355

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    108.455    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85405.578   87113.516       2.633     831.557     315.845     619.754       1.962

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   252.87    -0.09   252.87     0.23   406.33
 MEAN    17.06     0.00    -0.02   252.87    -0.09   252.87     0.23
 HUB     12.51     0.00    -0.02   252.87    -0.09   252.87     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.21    50.47     7.74   407.95   480.04    14.58   517.47     0.43
 MEAN    53.15    47.20     5.95   337.36   421.68    14.58   517.47     0.38
 HUB     44.38    38.62     5.76   247.38   353.81    14.58   517.47     0.32

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   411.69   220.75   347.51  1122.00     0.37
 MEAN    18.04   430.43   250.77   349.84  1120.48     0.38
 HUB     15.00   485.97   332.06   354.83  1117.48     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   394.72   187.20     0.35  4555.88
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 MEAN   356.65   365.52   105.89     0.33  4524.33     1.29
 HUB    296.62   356.59    35.44     0.32  4982.04

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.48     1.09    15.02   537.28     1.03   523.13     0.92     0.91
 MEAN    16.47     1.09    14.88   537.18     1.03   521.71     0.92     0.91
 HUB     16.62     1.10    14.59   538.64     1.03   518.91     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     32.43    28.31    24.20     4.11     0.93     0.26     2.90
 MEAN    35.63    16.84    12.70     4.14     0.92     0.22     3.51     0.91
 HUB     43.10    -5.70    -9.30     3.60     0.92     0.10     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     437.269     250.280     358.559    1120.504       0.390      -0.010

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.507      14.859     521.730      24.000      34.916      35.400       0.484

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     387.069     250.280     460.937    1124.210       0.344       0.218

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.498      15.197     525.186     528.796       0.015       0.370

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     358.919       0.000     358.919    1126.085       0.319       0.284

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.341     526.940       0.000       0.060       0.037       0.303

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.875      16.462       1.090     537.700      14.890     220.181       1.707

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  92703.586       0.557     581.607 1063300.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.020    2266.000      16.462     537.700       1.000       1.000       0.980
W Kg/sec =   50.46355

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.937    2225.604       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85405.578   87113.516       2.009     590.487     293.951     474.134       1.613

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   343.01    -0.12   343.01     0.30   399.11
 MEAN    18.08     0.00    -0.02   343.01    -0.12   343.01     0.30
 HUB     15.21     0.00    -0.02   343.01    -0.12   343.01     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.84    46.36     3.48   406.37   531.87    15.44   527.87     0.47
 MEAN    46.19    42.30     3.89   357.49   495.52    15.44   527.87     0.44
 HUB     41.26    37.84     3.42   300.77   456.28    15.44   527.87     0.40
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      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   394.14   145.72   366.21  1133.78     0.35
MEAN    18.01   403.27   166.92   367.11  1133.24     0.36
HUB     15.22   436.41   233.88   368.45  1132.64     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   448.02   258.08     0.40  2977.93
MEAN   356.14   413.01   189.22     0.36  3008.30     1.29
HUB    301.03   374.52    67.15     0.33  3562.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.40     1.06    16.00   547.16     1.02   534.18     0.92     0.91
MEAN    17.41     1.06    15.95   547.25     1.02   533.67     0.92     0.91
HUB     17.58     1.07    15.87   549.01     1.02   533.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     21.70    35.17    31.50     3.67     0.93     0.20     2.90
MEAN    24.45    27.27    23.50     3.77     0.92     0.22     3.30     0.91
HUB     32.41    10.33     6.50     3.83     0.92     0.24     3.92


   blockage3   Cor/U1    Cor/Incid
      0.600       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     706.201     167.385     686.077    1103.636       0.640      -1.774

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.447      13.242     506.157      46.000      13.711      30.600      16.889

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     725.046     167.385     744.117    1101.178       0.658      -1.955

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.600      17.344      12.960     503.905     317.610       0.078       0.063

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     717.938       0.000     717.938    1102.135       0.651      -0.208

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600      12.925     504.763       0.000       0.060       0.176      -1.978

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.668      17.195       1.045     547.809      10.109     288.894       2.239

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  62946.453       0.386     394.915  984160.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.841

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.020    2266.000      17.195     547.809       1.000       1.000       0.630
W Kg/sec =   50.46355

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.539    2204.975       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85405.578   87113.516       1.234     350.665     284.060     271.233       0.955

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   627.82    -0.22   627.82     0.56   386.18
MEAN    17.74     0.00    -0.02   627.82    -0.22   627.82     0.56
HUB     15.05     0.00    -0.02   627.82    -0.22   627.82     0.56

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     32.31    46.36   -14.05   396.88   742.86    13.85   514.89     0.67
MEAN    29.21    43.40   -14.19   350.77   719.27    13.85   514.89     0.65
HUB     25.38    38.84   -13.46   297.61   694.88    13.85   514.89     0.62

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   402.40    79.18   394.53  1139.15     0.35
MEAN    17.51   409.57   112.46   393.83  1139.98     0.36
HUB     14.85   439.91   195.63   394.02  1140.85     0.39

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   503.33   312.55     0.44  1572.91
MEAN   346.18   457.96   233.73     0.40  1972.59     1.63
HUB    293.65   406.03    98.03     0.36  2908.31

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.62     1.02    16.16   552.80     1.01   539.28     0.92     0.77
MEAN    17.73     1.03    16.21   554.07     1.01   540.06     0.92     0.77
HUB     17.99     1.05    16.23   557.04     1.02   540.88     0.92     0.77

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     11.35    38.39    31.50     6.89     0.93     0.34     2.90
MEAN    15.94    30.69    23.50     7.19     0.82     0.39     3.28     0.77
HUB     26.40    13.97     6.50     7.47     0.82     0.45     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.841

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     414.671     113.196     398.922    1140.204       0.364      -0.003

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.762      16.209     540.281      46.000      15.842      31.500      15.658

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     420.175     113.196     435.156    1139.799       0.369      -0.049

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.713      16.124     539.898     471.992       0.041       0.105

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.121     409.271       0.000     409.271    1140.596       0.359      -0.062

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.111     540.653       0.000       0.060       0.105      -0.058

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.553      17.612       1.024     554.640       6.832     404.042       3.132

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  42546.035       0.277     266.927 1712255.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.901
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
111.020	2266.000	17.612	554.640	1.000	1.000	0.980

W Kg/sec = 50.46355

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
95.820	2191.353	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85405.578	87113.516	1.840	513.330	279.059	401.059	1.437

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	384.27	-0.13	384.27	0.34	368.30
MEAN	16.97	0.00	-0.02	384.27	-0.13	384.27	0.34	
HUB	14.32	0.00	-0.02	384.27	-0.13	384.27	0.34	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	44.75	46.36	-1.61	380.86	541.13	16.28	542.31	0.47
MEAN	41.14	43.80	-2.66	335.59	510.27	16.28	542.31	0.45
HUB	36.40	37.84	-1.44	283.17	477.41	16.28	542.31	0.42

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	419.87	78.92	412.39	1144.80	0.37
MEAN	16.57	426.64	112.25	411.60	1145.53	0.37
HUB	13.89	456.44	196.99	411.74	1146.14	0.40

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	506.71	294.43	0.44	1492.50	
MEAN	327.74	464.60	215.49	0.41	1862.74	1.17
HUB	274.67	419.00	77.68	0.37	2738.12	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.05	1.02	16.45	559.38	1.01	544.66	0.92	0.82
MEAN	18.16	1.03	16.50	560.56	1.01	545.36	0.92	0.82
HUB	18.42	1.05	16.51	563.33	1.02	545.94	0.92	0.82

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	10.83	35.52	31.50	4.02	0.93	0.09	2.90	
MEAN	15.26	27.63	23.50	4.13	0.89	0.12	3.29	0.82
HUB	25.57	10.68	6.50	4.18	0.89	0.17	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.901

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	418.947	112.886	403.452	1146.655	0.365	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.191	16.587	546.435	46.000	15.632	32.400	16.768

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	430.317	112.886	444.877	1145.808	0.376	-0.021

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.133	16.449	545.628	456.573	0.044	0.111

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	410.424	0.000	410.424	1147.274	0.358	-0.057

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.488	547.025	0.000	0.060	0.112	0.002

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.560	18.015	1.023	561.090	6.450	399.300	3.095

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
40169.680	0.288	252.018	1033774.938

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 5.953 EfDer = 0.843

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
111.020	2266.000	18.015	561.090	1.000	1.000	0.980

W Kg/sec = 50.46355

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
94.220	2178.722	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85405.578	87113.516	1.857	509.668	274.401	390.276	1.422

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	382.30	-0.13	382.30	0.33	348.31
MEAN	15.91	0.00	-0.02	382.30	-0.13	382.30	0.33	
HUB	13.07	0.00	-0.02	382.30	-0.13	382.30	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	43.47	47.36	-3.89	362.27	526.77	16.68	548.89	0.46
MEAN	39.47	44.80	-5.33	314.67	495.24	16.68	548.89	0.43
HUB	34.07	38.84	-4.77	258.45	461.54	16.68	548.89	0.40

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	415.24	58.28	411.13	1150.39	0.36
MEAN	15.50	420.03	89.64	410.35	1151.18	0.36
HUB	12.59	444.69	170.84	410.56	1151.85	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	506.88	296.48	0.44	1047.90	
MEAN	306.46	464.11	216.82	0.40	1391.28	1.14
HUB	248.96	417.92	78.12	0.36	2152.64	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.30	1.02	16.73	564.42	1.01	550.02	0.92	0.77
MEAN	18.40	1.02	16.78	565.51	1.01	550.78	0.92	0.77
HUB	18.61	1.03	16.79	567.92	1.01	551.42	0.92	0.77

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	8.07	35.80	31.50	4.30	0.93	0.06	2.90	
MEAN	12.32	27.85	23.50	4.35	0.88	0.09	3.34	0.77
HUB	22.59	10.77	6.50	4.27	0.88	0.14	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.843

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	424.009	91.282	414.067	1151.348	0.368	-0.014

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.405	16.758	550.940	46.000	12.432	33.000	20.568

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	448.867	91.282	458.055	1149.453	0.391	-0.197

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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.262      16.437     549.128     440.827       0.106       0.083

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     419.558       0.000     419.558    1151.675       0.364      -0.084

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.617     551.253       0.000       0.060       0.134      -0.090

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.365      18.214       1.011     565.950       4.860     490.667       3.804

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  30270.916       0.241     189.915 1095755.125

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    268636.66   1685.3807    108.4552      1.2057      0.6677      5.9532      1.0825


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 60%  Stat 2 35% Ice Block 8-31-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.993    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   49.54226

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    106.475    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83846.383   85523.125       2.682     831.557     310.079     619.754       1.999

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   248.01    -0.09   248.01     0.22   406.33
 MEAN    17.06     0.00    -0.02   248.01    -0.09   248.01     0.22
 HUB     12.51     0.00    -0.02   248.01    -0.09   248.01     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.71    50.47     8.24   407.95   477.50    14.60   517.67     0.43
 MEAN    53.69    47.20     6.49   337.36   418.78    14.60   517.67     0.38
 HUB     44.94    38.62     6.32   247.38   350.36    14.60   517.67     0.31

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   407.83   224.69   340.35  1122.56     0.36
 MEAN    18.04   425.99   252.99   342.74  1120.96     0.38
 HUB     15.00   480.29   331.42   347.61  1117.94     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   386.55   183.26     0.34  4637.11
 MEAN   356.65   358.07   103.67     0.32  4564.33     1.31
 HUB    296.62   349.35    34.80     0.31  4972.38
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.51     1.09    15.07   537.54     1.03   523.65     0.92     0.91
MEAN    16.49     1.09    14.92   537.31     1.03   522.15     0.92     0.91
HUB     16.61     1.10    14.63   538.61     1.03   519.34     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.43    28.30    24.20     4.10     0.93     0.27     2.90
MEAN    36.43    16.83    12.70     4.13     0.93     0.23     3.51     0.91
HUB     43.63    -5.72    -9.30     3.58     0.93     0.11     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     432.581     252.495     351.244    1120.997       0.386       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.520      14.905     522.189      24.000      35.711      35.400      -0.311

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     378.833     252.495     455.267    1124.900       0.337       0.234

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.511      15.263     525.831     528.796       0.015       0.382

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083     351.409       0.000     351.409    1126.687       0.312       0.297

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.400     527.504       0.000       0.060       0.037       0.316

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.877      16.475       1.091     537.818      15.008     216.767       1.680

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93438.875       0.561     575.517 1042869.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.993    2266.000      16.475     537.818       1.000       1.000       0.980
W Kg/sec =   49.54226

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     99.023    2225.360       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83846.383   85523.125       2.048     590.487     288.378     474.134       1.644

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   335.90    -0.12   335.90     0.30   399.07
 MEAN    18.08     0.00    -0.02   335.90    -0.12   335.90     0.30
 HUB     15.21     0.00    -0.02   335.90    -0.12   335.90     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.43    46.36     4.07   406.37   527.31    15.49   528.39     0.47
 MEAN    46.79    42.30     4.49   357.49   490.63    15.49   528.39     0.44
 HUB     41.85    37.84     4.01   300.77   450.96    15.49   528.39     0.40

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000
```

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	388.86	151.54	358.12	1134.67	0.34
MEAN	18.01	397.84	171.13	359.16	1134.01	0.35
HUB	15.22	430.67	235.44	360.62	1133.29	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	438.04	252.25	0.39	3096.91	
MEAN	356.14	404.01	185.01	0.36	3084.10	1.31
HUB	301.03	366.53	65.59	0.32	3585.81	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.45	1.06	16.09	547.65	1.02	535.03	0.92	0.91
MEAN	17.45	1.06	16.02	547.61	1.02	534.39	0.92	0.91
HUB	17.61	1.07	15.94	549.21	1.02	533.72	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	22.94	35.16	31.50	3.66	0.93	0.22	2.90	
MEAN	25.48	27.25	23.50	3.75	0.92	0.23	3.30	0.91
HUB	33.14	10.31	6.50	3.81	0.92	0.25	3.92	

blockage3	Cor/U1	Cor/Incid
0.600	1.000	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	686.638	171.608	664.848	1106.494	0.621	-1.707

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.489	13.485	508.782	46.000	14.473	30.600	16.127

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	699.493	171.608	720.236	1104.875	0.633	-1.842

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.600	17.397	13.277	507.294	317.610	0.072	0.077

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	691.524	0.000	691.524	1105.894	0.625	-0.148

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.600	13.265	508.221	0.000	0.060	0.157	-1.850

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.707	17.270	1.048	548.158	10.340	281.075	2.179

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
64386.652	0.395	396.576	964193.438

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 6.485 EfDer = 0.808

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
108.993	2266.000	17.270	548.158	1.000	1.000	0.630

W Kg/sec = 49.54226

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
95.374	2204.272	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
83846.383	85523.125	1.263	350.665	277.754	271.233	0.977

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	607.99	-0.21	607.99	0.54	386.05

```
MEAN    17.74     0.00    -0.02   607.99    -0.21   607.99     0.54
HUB     15.05     0.00    -0.02   607.99    -0.21   607.99     0.54

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     33.15    46.36   -13.21   396.88   726.17    14.11   517.29     0.65
MEAN    30.00    43.40   -13.40   350.77   702.02    14.11   517.29     0.63
HUB     26.10    38.84   -12.74   297.61   677.01    14.11   517.29     0.61

     ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   394.52    87.35   384.72  1140.62     0.35
MEAN    17.51   402.23   118.49   384.38  1141.23     0.35
HUB     14.85   433.07   198.27   385.02  1141.87     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   490.57   304.38     0.43  1734.64
MEAN   346.18   446.76   227.70     0.39  2077.99     1.63
HUB    293.65   396.66    95.38     0.35  2947.50

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.72     1.03    16.31   553.67     1.01   540.67     0.92     0.74
MEAN    17.81     1.03    16.34   554.76     1.01   541.25     0.92     0.74
HUB     18.04     1.04    16.34   557.52     1.02   541.86     0.92     0.74

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     12.79    38.35    31.50     6.85     0.93     0.35     2.90
MEAN    17.13    30.64    23.50     7.14     0.83     0.39     3.28     0.74
HUB     27.25    13.91     6.50     7.41     0.83     0.45     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.808

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     407.227     119.263     389.372    1141.455       0.357      -0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.843      16.339     541.466      46.000      17.030      31.500      14.470

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     409.512     119.263     426.525    1141.290       0.359      -0.030

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.802      16.284     541.310     471.992       0.037       0.119

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4        cp 3-4
     17.121     398.713       0.000     398.713    1142.058       0.349      -0.040

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.277     542.039        0.000       0.060       0.097      -0.035

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4           PR4       Texit        Del T       Ns         Ns nondim
      0.555      17.710        1.026     555.314       7.156     384.020       2.977

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  44565.230       0.290     274.490 1663537.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  0.916

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    108.993    2266.000       17.710     555.314       1.000       1.000       0.980
W Kg/sec =   49.54226
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
93.605	2190.024	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
83846.383	85523.125	1.883	513.330	272.607	401.059	1.471

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	374.53	-0.13	374.53	0.33	368.08
MEAN	16.97	0.00	-0.02	374.53	-0.13	374.53	0.33	
HUB	14.32	0.00	-0.02	374.53	-0.13	374.53	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.49	46.36	-0.87	380.86	534.25	16.44	543.60	0.47
MEAN	41.87	43.80	-1.93	335.59	502.97	16.44	543.60	0.44
HUB	37.10	37.84	-0.74	283.17	469.61	16.44	543.60	0.41

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	410.38	87.21	401.00	1146.72	0.36
MEAN	16.57	417.59	118.25	400.49	1147.24	0.36
HUB	13.89	447.58	199.24	400.79	1147.65	0.39

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	492.62	286.13	0.43	1649.04	
MEAN	327.74	451.97	209.49	0.39	1962.10	1.19
HUB	274.67	407.83	75.43	0.36	2769.31	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.20	1.03	16.66	560.55	1.01	546.49	0.92	0.84
MEAN	18.30	1.03	16.70	561.54	1.01	546.98	0.92	0.84
HUB	18.54	1.05	16.70	564.11	1.02	547.38	0.92	0.84

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	12.27	35.51	31.50	4.01	0.93	0.11	2.90	
MEAN	16.45	27.61	23.50	4.11	0.89	0.14	3.29	0.84
HUB	26.43	10.66	6.50	4.16	0.89	0.19	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.916

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	410.225	118.918	392.611	1148.313	0.357	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.332	16.782	548.016	46.000	16.851	32.400	15.549

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	418.033	118.918	434.618	1147.747	0.364	-0.003

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.282	16.679	547.476	456.573	0.040	0.126

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	398.589	0.000	398.589	1149.136	0.347	-0.036

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.722	548.802	0.000	0.060	0.104	0.023

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.613	18.175	1.026	562.067	6.753	380.827	2.952

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  42062.234       0.302     259.074 1011053.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  0.861

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.993    2266.000      18.175     562.067       1.000       1.000       0.980
W Kg/sec =   49.54226

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     91.766    2176.827       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83846.383   85523.125       1.907     509.668     267.254     390.276       1.460

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   371.49    -0.13   371.49     0.32   348.00
 MEAN    15.91     0.00    -0.02   371.49    -0.13   371.49     0.32
 HUB     13.07     0.00    -0.02   371.49    -0.13   371.49     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.29    47.36    -3.07   362.27   518.98    16.91   550.55     0.45
 MEAN    40.28    44.80    -4.52   314.67   486.93    16.91   550.55     0.42
 HUB     34.84    38.84    -4.00   258.45   452.62    16.91   550.55     0.39

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   404.24    67.50   398.57  1152.75     0.35
 MEAN    15.50   409.56    96.32   398.08  1153.30     0.36
 HUB     12.59   434.50   173.33   398.43  1153.75     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   491.30   287.26     0.43  1213.26
 MEAN   306.46   450.14   210.14     0.39  1494.80     1.16
 HUB    248.96   405.55    75.63     0.35  2183.88

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.52     1.02    17.01   565.92     1.01   552.28     0.92     0.79
 MEAN    18.60     1.02    17.05   566.81     1.01   552.81     0.92     0.79
 HUB     18.80     1.03    17.04   569.00     1.01   553.24     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP      9.61    35.78    31.50     4.28     0.93     0.08     2.90
 MEAN    13.60    27.83    23.50     4.33     0.88     0.10     3.34     0.79
 HUB     23.51    10.75     6.50     4.25     0.88     0.15     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.861

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     413.414      98.089     401.609    1153.474       0.358      -0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.607      17.025     552.975      46.000      13.725      33.000      19.275

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     434.212      98.089     445.154    1151.938       0.377      -0.173

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.482      16.754     551.504     440.827       0.098       0.098
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     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
      14.701     406.155       0.000     406.155    1153.992       0.352      -0.065

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      16.919     553.472       0.000       0.060       0.127      -0.070

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.442      18.434       1.014     567.245       5.177     461.244       3.576

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   32249.670       0.256     198.635 1070954.875

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     276702.66   1704.2925    106.4752      1.2203      0.6911      6.4851      1.0850


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 35% Ice Block 8-31-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     107.227    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   48.73943

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     104.750    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   82487.648   84137.219       2.726     831.557     305.054     619.754       2.032

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   243.79    -0.08   243.79     0.22   406.33
  MEAN    17.06     0.00    -0.02   243.79    -0.08   243.79     0.22
  HUB     12.51     0.00    -0.02   243.79    -0.08   243.79     0.22

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.14    50.47     8.67   407.95   475.32    14.61   517.85     0.43
  MEAN    54.15    47.20     6.95   337.36   416.29    14.61   517.85     0.37
  HUB     45.43    38.62     6.81   247.38   347.38    14.61   517.85     0.31

      ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   404.59   228.08   334.17  1123.04     0.36
  MEAN    18.04   422.23   254.90   336.60  1121.36     0.38
  HUB     15.00   475.37   330.81   341.38  1118.33     0.43

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   379.51   179.87     0.34  4706.94
  MEAN   356.65   351.64   101.75     0.31  4598.84     1.33
  HUB    296.62   343.09    34.19     0.31  4963.23

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.53     1.09    15.11   537.76     1.03   524.09     0.92     0.91
  MEAN    16.50     1.09    14.96   537.42     1.03   522.53     0.92     0.91
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 HUB     16.61     1.10    14.67   538.58     1.03   519.70     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     34.31    28.29    24.20     4.09     0.93     0.28     2.90
 MEAN    37.14    16.82    12.70     4.12     0.93     0.25     3.51     0.91
 HUB     44.10    -5.72    -9.30     3.58     0.93     0.12     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     428.601     254.406     344.929    1121.412       0.382      -0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.530      14.943     522.576      24.000      36.411      35.400      -1.011

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     371.745     254.406     450.463    1125.483       0.330       0.248

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.522      15.318     526.377     528.796       0.015       0.393

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     344.946       0.000     344.946    1127.197       0.306       0.309

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.448     527.981       0.000       0.060       0.037       0.328

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      16.486       1.091     537.919      15.109     213.838       1.658

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94066.633       0.565     569.995 1025114.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.227    2266.000      16.486     537.919       1.000       1.000       0.980
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.366    2225.151       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82487.648   84137.219       2.082     590.487     283.552     474.134       1.672

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   329.78    -0.11   329.78     0.29   399.03
 MEAN    18.08     0.00    -0.02   329.78    -0.11   329.78     0.29
 HUB     15.21     0.00    -0.02   329.78    -0.11   329.78     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.95    46.36     4.59   406.37   523.43    15.54   528.84     0.46
 MEAN    47.32    42.30     5.02   357.49   486.45    15.54   528.84     0.43
 HUB     42.38    37.84     4.54   300.77   446.42    15.54   528.84     0.40

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   384.50   156.56   351.18  1135.42     0.34
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 MEAN    18.01   393.30   174.75   352.35  1134.65     0.35
 HUB     15.22   425.79   236.76   353.90  1133.83     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   429.48   247.23     0.38  3199.37
 MEAN   356.14   396.30   181.39     0.35  3149.31     1.32
 HUB    301.03   359.68    64.27     0.32  3605.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.50     1.06    16.16   548.08     1.02   535.73     0.92     0.91
 MEAN    17.48     1.06    16.09   547.92     1.02   535.00     0.92     0.91
 HUB     17.63     1.07    15.99   549.37     1.02   534.23     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.03    35.15    31.50     3.65     0.93     0.23     2.90
 MEAN    26.38    27.24    23.50     3.74     0.92     0.24     3.30     0.91
 HUB     33.78    10.29     6.50     3.79     0.92     0.26     3.92


  blockage3   Cor/U1    Cor/Incid
     0.600       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     670.664     175.241     647.364    1108.787       0.605      -1.651

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.522      13.681     510.893      46.000      15.147      30.600      15.453

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     678.855     175.241     701.109    1107.784       0.613      -1.750

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.600      17.439      13.530     509.970     317.610       0.067       0.088

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     670.402       0.000     670.402    1108.825       0.605      -0.102

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.600      13.533     510.923       0.000       0.060       0.143      -1.749

   STAGE EXIT CONDITIONS, STAGE            2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.735      17.329       1.051     548.458      10.539     274.553       2.128

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  65624.633       0.402     397.651  946910.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.789

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.227    2266.000      17.329     548.458       1.000       1.000       0.630
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.533    2203.670       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82487.648   84137.219       1.287     350.665     272.395     271.233       0.996

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   591.73    -0.20   591.73     0.53   385.95
 MEAN    17.74     0.00    -0.02   591.73    -0.20   591.73     0.53
 HUB     15.05     0.00    -0.02   591.73    -0.20   591.73     0.53
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     33.86    46.36   -12.50   396.88   712.61    14.31   519.22     0.64
MEAN    30.67    43.40   -12.73   350.77   687.98    14.31   519.22     0.62
HUB     26.72    38.84   -12.12   297.61   662.44    14.31   519.22     0.59

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   388.06    94.28   376.43  1141.84     0.34
MEAN    17.51   396.11   123.62   376.33  1142.27     0.35
HUB     14.85   427.23   200.54   377.24  1142.74     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   479.77   297.46     0.42  1871.72
MEAN   346.18   437.22   222.57     0.38  2167.71     1.64
HUB    293.65   388.57    93.11     0.34  2981.06

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.81     1.03    16.44   554.40     1.01   541.83     0.92     0.72
MEAN    17.88     1.03    16.45   555.34     1.01   542.24     0.92     0.72
HUB     18.09     1.04    16.43   557.92     1.02   542.68     0.92     0.72

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     14.06    38.32    31.50     6.82     0.93     0.35     2.90
MEAN    18.18    30.60    23.50     7.10     0.83     0.39     3.28     0.72
HUB     27.99    13.87     6.50     7.37     0.83     0.45     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.789

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     401.011     124.427     381.219    1142.503       0.351      -0.004

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.913      16.448     542.460      46.000      18.076      31.500      13.424

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     400.445     124.427     419.331    1142.543       0.350      -0.013

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.877      16.419     542.498     471.992       0.034       0.132

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     389.746       0.000     389.746    1143.286       0.341      -0.021

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.417     543.204       0.000       0.060       0.090      -0.015

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.562      17.793       1.027     555.889       7.431     368.264       2.855

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  46281.426       0.302     280.441 1623039.750


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.928

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.227    2266.000      17.793     555.889       1.000       1.000       0.980
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.706    2188.890       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
82487.648	84137.219	1.922	513.330	267.077	401.059	1.502

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	366.24	-0.13	366.24	0.32	367.89
MEAN	16.97	0.00	-0.02	366.24	-0.13	366.24	0.32	
HUB	14.32	0.00	-0.02	366.24	-0.13	366.24	0.32	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.13	46.36	-0.23	380.86	528.47	16.57	544.69	0.46
MEAN	42.51	43.80	-1.29	335.59	496.82	16.57	544.69	0.43
HUB	37.72	37.84	-0.12	283.17	463.02	16.57	544.69	0.40

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	402.56	94.27	391.37	1148.32	0.35
MEAN	16.57	410.07	123.32	391.09	1148.66	0.36
HUB	13.89	440.15	201.13	391.51	1148.92	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	480.67	279.07	0.42	1782.29	
MEAN	327.74	441.29	204.42	0.38	2045.99	1.20
HUB	274.67	398.36	73.54	0.35	2795.55	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.34	1.03	16.84	561.55	1.01	548.02	0.92	0.85
MEAN	18.42	1.04	16.86	562.39	1.01	548.35	0.92	0.85
HUB	18.65	1.05	16.85	564.77	1.02	548.59	0.92	0.85

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	13.54	35.49	31.50	3.99	0.93	0.12	2.90	
MEAN	17.50	27.60	23.50	4.10	0.90	0.15	3.29	0.85
HUB	27.19	10.64	6.50	4.14	0.90	0.19	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.928

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	402.982	124.011	383.426	1149.699	0.351	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.451	16.947	549.340	46.000	17.923	32.400	14.477

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	407.677	124.011	426.121	1149.367	0.355	0.014

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.408	16.873	549.023	456.573	0.036	0.139

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	388.613	0.000	388.613	1150.693	0.338	-0.017

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.919	550.290	0.000	0.060	0.097	0.042

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.654	18.310	1.029	562.900	7.011	366.162	2.838

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
43666.961	0.313	264.599	991523.625

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.876

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.227    2266.000      18.310     562.900       1.000       1.000       0.980
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.676    2175.216       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 82487.648   84137.219       1.951     509.668     261.169     390.276       1.494

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   362.36    -0.12   362.36     0.31   347.75
MEAN    15.91     0.00    -0.02   362.36    -0.12   362.36     0.31
HUB     13.07     0.00    -0.02   362.36    -0.12   362.36     0.31

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     45.00    47.36    -2.36   362.27   512.48    17.10   551.94     0.44
MEAN    40.98    44.80    -3.82   314.67   480.00    17.10   551.94     0.42
HUB     35.51    38.84    -3.33   258.45   445.16    17.10   551.94     0.39

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   395.25    75.29   388.01  1154.71     0.34
MEAN    15.50   400.91   101.91   387.74  1155.07     0.35
HUB     12.59   426.01   175.42   388.21  1155.34     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    354.76   478.18   279.47     0.41  1352.96
MEAN   306.46   438.39   204.54     0.38  1581.42     1.17
HUB    248.96   395.12    73.55     0.34  2210.11

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.70     1.02    17.25   567.20     1.01   554.15     0.92     0.80
MEAN    18.77     1.03    17.27   567.92     1.01   554.50     0.92     0.80
HUB     18.96     1.04    17.26   569.92     1.01   554.77     0.92     0.80

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     10.98    35.76    31.50     4.26     0.93     0.09     2.90
MEAN    14.73    27.81    23.50     4.31     0.88     0.12     3.34     0.80
HUB     24.32    10.73     6.50     4.23     0.88     0.16     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.876

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     404.662     103.783     391.127    1155.243       0.350      -0.012

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.780      17.250     554.673      46.000      14.861      33.000      18.139

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     421.972     103.783     434.547    1153.999       0.366      -0.152

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.670      17.021     553.478     440.827       0.091       0.111

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     14.701     394.910       0.000     394.910    1155.921       0.342      -0.048

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      17.177     555.324       0.000       0.060       0.121      -0.052

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.503      18.623       1.017     568.344       5.445     438.663       3.400

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   33914.367       0.269     205.503 1049707.250

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     283554.03   1718.1899    104.7498      1.2327      0.7099      6.9532      1.0871


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 35% Ice Block 8-31-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     105.235    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   47.83408

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     102.804    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   80955.414   82574.344       2.778     831.557     299.388     619.754       2.070

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   239.04    -0.08   239.04     0.21   406.33
  MEAN    17.06     0.00    -0.02   239.04    -0.08   239.04     0.21
  HUB     12.51     0.00    -0.02   239.04    -0.08   239.04     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     59.64    50.47     9.17   407.95   472.90    14.63   518.04     0.42
  MEAN    54.69    47.20     7.49   337.36   413.53    14.63   518.04     0.37
  HUB     45.99    38.62     7.37   247.38   344.06    14.63   518.04     0.31

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   401.07   231.85   327.27  1123.56     0.36
  MEAN    18.04   418.09   257.04   329.73  1121.81     0.37
  HUB     15.00   469.94   330.17   334.41  1118.76     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   371.64   176.10     0.33  4784.73
  MEAN   356.65   344.45    99.61     0.31  4637.42     1.35
  HUB    296.62   336.09    33.55     0.30  4953.53

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.55     1.10    15.16   538.01     1.03   524.57     0.92     0.91
  MEAN    16.51     1.09    15.00   537.54     1.03   522.94     0.92     0.91
  HUB     16.61     1.10    14.71   538.55     1.03   520.10     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     35.31    28.28    24.20     4.08     0.93     0.30     2.90
 MEAN    37.94    16.81    12.70     4.11     0.93     0.26     3.51     0.91
 HUB     44.63    -5.73    -9.30     3.57     0.93     0.13     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     424.227     256.543     337.868    1121.868       0.378       -0.008

     Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.541      14.984     523.000      24.000      37.209      35.400      -1.809

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG          Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     18.071     363.843     256.543     445.192    1126.122       0.323       0.264

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.532      15.377     526.975     528.796       0.015       0.406

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     337.741       0.000     337.741    1127.755       0.299       0.321

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.500     528.505       0.000       0.060       0.038       0.341

    STAGE EXIT CONDITIONS, STAGE            1
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.877      16.496       1.092     538.032      15.222     210.565       1.632

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  94770.008       0.569     563.590 1005147.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    105.235    2266.000      16.496     538.032       1.000       1.000       0.980
W Kg/sec =   47.83408

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     95.508    2224.918       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  80955.414   82574.344       2.123     590.487     278.141     474.134       1.705

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   322.95    -0.11   322.95     0.29   398.99
 MEAN    18.08     0.00    -0.02   322.95    -0.11   322.95     0.29
 HUB     15.21     0.00    -0.02   322.95    -0.11   322.95     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.53    46.36     5.17   406.37   519.16    15.58   529.32     0.46
 MEAN    47.91    42.30     5.61   357.49   481.85    15.58   529.32     0.43
 HUB     42.97    37.84     5.13   300.77   441.40    15.58   529.32     0.39

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   379.83   162.11   343.50  1136.24     0.33
 MEAN    18.01   388.38   178.78   344.78  1135.35     0.34
 HUB     15.22   420.45   238.26   346.43  1134.43     0.37
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	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	420.01	241.69	0.37	3312.55	
MEAN	356.14	387.73	177.36	0.34	3221.82	1.34
HUB	301.03	352.07	62.77	0.31	3628.66	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.55	1.06	16.24	548.55	1.02	536.50	0.92	0.91
MEAN	17.52	1.06	16.15	548.26	1.02	535.67	0.92	0.91
HUB	17.65	1.07	16.05	549.56	1.02	534.79	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.26	35.13	31.50	3.63	0.93	0.24	2.90	
MEAN	27.41	27.22	23.50	3.72	0.92	0.25	3.30	0.91
HUB	34.52	10.27	6.50	3.77	0.92	0.27	3.92	

blockage3	Cor/U1	Cor/Incid
0.600	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	653.678	179.281	628.613	1111.184	0.588	-1.592

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.558	13.887	513.105	46.000	15.918	30.600	14.682

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	657.062	179.281	681.082	1110.783	0.592	-1.653

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.600	17.483	13.794	512.735	317.610	0.062	0.100

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	648.270	0.000	648.270	1111.825	0.583	-0.055

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.600	13.809	513.693	0.000	0.060	0.128	-1.642

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.762	17.389	1.054	548.791	10.759	267.507	2.074

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
66998.305	0.411	398.434	927543.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 7.486 EfDer = 0.775

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
105.235	2266.000	17.389	548.791	1.000	1.000	0.630

W Kg/sec = 47.83408

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
91.503	2203.000	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
80955.414	82574.344	1.316	350.665	266.482	271.233	1.018

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	574.34	-0.20	574.34	0.51	385.83
MEAN	17.74	0.00	-0.02	574.34	-0.20	574.34	0.51	
HUB	15.05	0.00	-0.02	574.34	-0.20	574.34	0.51	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	34.66	46.36	-11.70	396.88	698.24	14.53	521.24	0.62
MEAN	31.43	43.40	-11.97	350.77	673.09	14.53	521.24	0.60

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HUB     27.41    38.84   -11.43   297.61   646.96    14.53   521.24     0.58

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   381.18   101.87   367.31  1143.16     0.33
MEAN    17.51   389.50   129.27   367.43  1143.41     0.34
HUB     14.85   420.78   203.05   368.55  1143.70     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   467.91   289.87     0.41  2021.98
MEAN   346.18   426.68   216.92     0.37  2266.52     1.64
HUB    293.65   379.53    90.61     0.33  3018.20

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.90     1.03    16.57   555.21     1.01   543.08     0.92     0.71
MEAN    17.96     1.03    16.57   555.99     1.01   543.32     0.92     0.71
HUB     18.15     1.04    16.53   558.38     1.02   543.59     0.92     0.71

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     15.50    38.28    31.50     6.78     0.93     0.35     2.90
MEAN    19.38    30.56    23.50     7.06     0.84     0.40     3.28     0.71
HUB     28.85    13.81     6.50     7.31     0.84     0.45     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.775

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.392     394.280     130.115     372.192    1143.645       0.345      -0.004

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.989      16.567     543.544      46.000      19.269      31.500      12.231

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     390.446     130.115     411.555    1143.909       0.341       0.006

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      17.959      16.566     543.795     471.992       0.030       0.147

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    17.121     379.869       0.000     379.869    1144.624       0.332       0.002

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.569     544.475       0.000       0.060       0.082       0.008

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.573      17.884       1.028     556.525       7.734     352.101       2.729

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  48168.340       0.314     286.453 1579201.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.941

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    105.235    2266.000      17.884     556.525       1.000       1.000       0.980
W Kg/sec =   47.83408

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.597    2187.638       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  80955.414   82574.344       1.967     513.330     260.934     401.059       1.537
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ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	357.10	-0.12	357.10	0.31	367.68
MEAN	16.97	0.00	-0.02	357.10	-0.12	357.10	0.31	
HUB	14.32	0.00	-0.02	357.10	-0.12	357.10	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.85	46.36	0.49	380.86	522.17	16.72	545.88	0.46
MEAN	43.23	43.80	-0.57	335.59	490.12	16.72	545.88	0.43
HUB	38.43	37.84	0.59	283.17	455.82	16.72	545.88	0.40

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	394.22	101.98	380.80	1150.05	0.34
MEAN	16.57	401.98	128.91	380.75	1150.21	0.35
HUB	13.89	432.08	203.20	381.32	1150.29	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	467.60	271.37	0.41	1927.67	
MEAN	327.74	429.54	198.83	0.37	2138.63	1.22
HUB	274.67	387.96	71.47	0.34	2824.22	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.48	1.03	17.04	562.65	1.01	549.67	0.92	0.86
MEAN	18.55	1.04	17.04	563.32	1.01	549.82	0.92	0.86
HUB	18.76	1.05	17.02	565.49	1.02	549.90	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	14.99	35.47	31.50	3.97	0.93	0.14	2.90	
MEAN	18.70	27.57	23.50	4.07	0.90	0.16	3.29	0.86
HUB	28.05	10.62	6.50	4.12	0.90	0.21	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.941

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	395.207	129.635	373.341	1151.202	0.343	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.583	17.126	550.777	46.000	19.149	32.400	13.251

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	396.356	129.635	417.018	1151.123	0.344	0.032

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.547	17.085	550.701	456.573	0.033	0.155

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	377.714	0.000	377.714	1152.381	0.328	0.005

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.134	551.906	0.000	0.060	0.089	0.064

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.695	18.459	1.032	563.819	7.293	351.017	2.721

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
45424.996	0.326	270.139	969776.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

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 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.894

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    105.235    2266.000      18.459     563.819       1.000       1.000       0.980
W Kg/sec =   47.83408

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.373    2173.443       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  80955.414   82574.344       2.003     509.668     254.461     390.276       1.534

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   352.36    -0.12   352.36     0.31   347.46
 MEAN    15.91     0.00    -0.02   352.36    -0.12   352.36     0.31
 HUB     13.07     0.00    -0.02   352.36    -0.12   352.36     0.31

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.80    47.36    -1.56   362.27   505.46    17.30   553.45     0.44
 MEAN    41.78    44.80    -3.02   314.67   472.50    17.30   553.45     0.41
 HUB     36.27    38.84    -2.57   258.45   437.06    17.30   553.45     0.38

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   385.71    83.78   376.50  1156.81     0.33
 MEAN    15.50   391.67   108.06   376.46  1156.98     0.34
 HUB     12.59   416.83   177.69   377.06  1157.07     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   463.88   270.98     0.40  1505.17
 MEAN   306.46   425.54   198.40     0.37  1676.59     1.19
 HUB    248.96   383.74    71.27     0.33  2238.68

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.91     1.02    17.51   568.60     1.01   556.18     0.92     0.82
 MEAN    18.96     1.03    17.51   569.14     1.01   556.33     0.92     0.82
 HUB     19.13     1.04    17.49   570.93     1.01   556.42     0.92     0.82

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     12.54    35.74    31.50     4.24     0.93     0.11     2.90
 MEAN    16.02    27.79    23.50     4.29     0.89     0.13     3.34     0.82
 HUB     25.23    10.70     6.50     4.20     0.89     0.17     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.894

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     395.324     110.041     379.700    1157.152       0.342      -0.011

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.971      17.497     556.507      46.000      16.162      33.000      16.838

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     408.717     110.041     423.271    1156.217       0.353      -0.127

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.877      17.313     555.608     440.827       0.083       0.126

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     14.701     382.690       0.000     382.690    1158.005       0.330      -0.026

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.950      17.459     557.328       0.000       0.060       0.113      -0.030

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.565      18.832       1.020     569.555       5.737     415.944       3.224

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   35733.938       0.284     212.507 1026120.312

    OVERALL EXIT CONDITIONS; ALL          5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     291095.59   1731.1232    102.8040      1.2466      0.7295      7.4864      1.0894


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 35% Ice Block 8-31-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     103.509    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   47.04952

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     101.118    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   79627.609   81219.992       2.824     831.557     294.477     619.754       2.105

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   234.94    -0.08   234.94     0.21   406.33
  MEAN    17.06     0.00    -0.02   234.94    -0.08   234.94     0.21
  HUB     12.51     0.00    -0.02   234.94    -0.08   234.94     0.21

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     60.07    50.47     9.60   407.95   470.83    14.65   518.20     0.42
  MEAN    55.15    47.20     7.95   337.36   411.17    14.65   518.20     0.37
  HUB     46.49    38.62     7.87   247.38   341.22    14.65   518.20     0.31

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   398.16   235.09   321.34  1123.99     0.35
  MEAN    18.04   414.58   258.86   323.83  1122.18     0.37
  HUB     15.00   465.31   329.62   328.42  1119.12     0.42

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   364.89   172.86     0.32  4851.52
  MEAN   356.65   338.28    97.79     0.30  4670.22     1.37
  HUB    296.62   330.08    33.01     0.29  4945.38

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.57     1.10    15.20   538.22     1.03   524.98     0.92     0.91
  MEAN    16.52     1.09    15.03   537.65     1.03   523.29     0.92     0.91
  HUB     16.60     1.10    14.74   538.52     1.03   520.44     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     36.19    28.28    24.20     4.08     0.93     0.31     2.90
  MEAN    38.64    16.80    12.70     4.10     0.93     0.27     3.51     0.91
  HUB     45.10    -5.74    -9.30     3.56     0.93     0.14     4.78
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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.998

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     420.522     258.359     331.797    1122.252       0.375      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.549      15.018     523.359      24.000      37.907      35.400      -2.507

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     357.069     258.359     440.735    1126.662       0.317       0.278

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.540      15.427     527.480     528.796       0.016       0.417

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     331.565       0.000     331.565    1128.227       0.294       0.332

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.542     528.947       0.000       0.060       0.039       0.352

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      16.504       1.092     538.129      15.319     207.759       1.611

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  95373.062       0.573     557.874  987890.812


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.509    2266.000      16.504     538.129       1.000       1.000       0.980
W Kg/sec =   47.04952

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.906    2224.718       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79627.609   81219.992       2.159     590.487     273.476     474.134       1.734

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   317.10    -0.11   317.10     0.28   398.95
 MEAN    18.08     0.00    -0.02   317.10    -0.11   317.10     0.28
 HUB     15.21     0.00    -0.02   317.10    -0.11   317.10     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.04    46.36     5.68   406.37   515.53    15.62   529.73     0.46
 MEAN    48.44    42.30     6.14   357.49   477.94    15.62   529.73     0.42
 HUB     43.50    37.84     5.66   300.77   437.13    15.62   529.73     0.39

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   375.98   166.81   336.95  1136.92     0.33
 MEAN    18.01   384.27   182.20   338.32  1135.94     0.34
 HUB     15.22   415.92   239.50   340.04  1134.93     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   411.94   236.98     0.36  3408.56
 MEAN   356.14   380.42   173.94     0.33  3283.40     1.36
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 HUB    301.03   345.56    61.53     0.30  3647.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.59     1.07    16.30   548.95     1.02   537.15     0.92     0.91
 MEAN    17.55     1.06    16.21   548.56     1.02   536.22     0.92     0.91
 HUB     17.67     1.07    16.10   549.71     1.02   535.27     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.34    35.12    31.50     3.62     0.93     0.26     2.90
 MEAN    28.30    27.21    23.50     3.71     0.93     0.26     3.30     0.91
 HUB     35.16    10.26     6.50     3.76     0.93     0.28     3.92


   blockage3   Cor/U1    Cor/Incid
      0.600       1.000       1.000

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     639.734     182.712     613.087    1113.121       0.575      -1.543

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.586      14.054     514.895      46.000      16.595      30.600      14.005

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     639.253     182.712     664.852    1113.176       0.574      -1.574

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.600      17.519      14.006     514.947     317.610       0.058       0.110

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     630.297       0.000     630.297    1114.204       0.566      -0.017

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600      14.030     515.896       0.000       0.060       0.116      -1.556

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.782      17.437       1.057     549.075      10.946     261.668       2.028

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  68162.164       0.418     398.707  910860.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.768

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.509    2266.000      17.437     549.075       1.000       1.000       0.630
W Kg/sec =   47.04952

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     89.779    2202.431       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79627.609   81219.992       1.341     350.665     261.461     271.233       1.037

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   559.99    -0.19   559.99     0.50   385.73
 MEAN    17.74     0.00    -0.02   559.99    -0.19   559.99     0.50
 HUB     15.05     0.00    -0.02   559.99    -0.19   559.99     0.50

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     35.34    46.36   -11.02   396.88   686.48    14.70   522.89     0.61
 MEAN    32.08    43.40   -11.32   350.77   660.88    14.70   522.89     0.59
 HUB     28.00    38.84   -10.84   297.61   634.25    14.70   522.89     0.57

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
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   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   375.53   108.27   359.59  1144.25     0.33
MEAN    17.51   383.99   134.02   359.84  1144.36     0.34
HUB     14.85   415.32   205.17   361.10  1144.50     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   457.88   283.46     0.40  2148.75
MEAN   346.18   417.73   212.16     0.37  2349.72     1.65
HUB    293.65   371.78    88.48     0.32  3049.74

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.97     1.03    16.68   555.90     1.01   544.12     0.92     0.70
MEAN    18.02     1.03    16.67   556.54     1.01   544.22     0.92     0.70
HUB     18.20     1.04    16.62   558.76     1.02   544.36     0.92     0.70

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     16.76    38.25    31.50     6.75     0.93     0.36     2.90
MEAN    20.43    30.52    23.50     7.02     0.84     0.40     3.28     0.70
HUB     29.60    13.77     6.50     7.27     0.84     0.46     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.768

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     388.665     134.903     364.502    1144.598       0.340      -0.003

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.053      16.667     544.450      46.000      20.310      31.500      11.190

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     381.962     134.903     405.085    1145.052       0.334       0.024

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.028      16.690     544.882     471.992       0.028       0.161

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
    17.121     371.503       0.000     371.503    1145.743       0.324       0.022

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      16.697     545.540       0.000       0.060       0.076       0.029

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.585      17.960       1.030     557.065       7.990     339.294       2.630

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  49760.984       0.324     291.071 1542570.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.951

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.509    2266.000      17.960     557.065       1.000       1.000       0.980
W Kg/sec =   47.04952

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.796    2186.579       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79627.609   81219.992       2.008     513.330     255.688     401.059       1.569

    ROTOR LEADING EDGE CONDITIONS, STAGE            4
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   349.34    -0.12   349.34     0.30   367.50
MEAN    16.97     0.00    -0.02   349.34    -0.12   349.34     0.30
HUB     14.32     0.00    -0.02   349.34    -0.12   349.34     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     47.48    46.36     1.12   380.86   516.90    16.84   546.87     0.45
MEAN    43.86    43.80     0.06   335.59   484.50    16.84   546.87     0.42
HUB     39.04    37.84     1.20   283.17   449.77    16.84   546.87     0.39

     ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   387.40   108.50   371.89  1151.49     0.34
MEAN    16.57   395.30   133.62   372.03  1151.50     0.34
HUB     13.89   425.36   204.98   372.71  1151.44     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    373.34   456.56   264.84     0.40  2050.79
MEAN   327.74   419.63   194.13     0.36  2216.56     1.24
HUB    274.67   379.17    69.69     0.33  2848.88

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.61     1.04    17.20   563.58     1.01   551.05     0.92     0.87
MEAN    18.66     1.04    17.20   564.10     1.01   551.06     0.92     0.87
HUB     18.86     1.05    17.16   566.11     1.02   551.00     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     16.26    35.46    31.50     3.96     0.93     0.15     2.90
MEAN    19.76    27.56    23.50     4.06     0.90     0.18     3.29     0.87
HUB     28.81    10.59     6.50     4.09     0.90     0.21     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.951

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     388.779     134.366     364.821    1152.454       0.337       0.052

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.693      17.276     551.976      46.000      20.219      32.400      12.181

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     386.838     134.366     409.509    1152.586       0.336       0.049

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.664      17.262     552.102     456.573       0.030       0.168

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    16.096     368.558       0.000     368.558    1153.789       0.319       0.025

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.314     553.255       0.000       0.060       0.082       0.083

   STAGE EXIT CONDITIONS, STAGE             4
     Eff4        Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.727       18.584       1.035     564.597       7.532     338.895       2.627

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  46912.676       0.337     274.410  951157.438


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.908

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
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    103.509    2266.000      18.584     564.597       1.000       1.000       0.980
W Kg/sec =   47.04952

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     85.421    2171.945       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 79627.609   81219.992       2.049     509.668     248.777     390.276       1.569

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   343.95    -0.12   343.95     0.30   347.22
 MEAN    15.91     0.00    -0.02   343.95    -0.12   343.95     0.30
 HUB     13.07     0.00    -0.02   343.95    -0.12   343.95     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.50    47.36    -0.86   362.27   499.63    17.47   554.72     0.43
 MEAN    42.47    44.80    -2.33   314.67   466.26    17.47   554.72     0.40
 HUB     36.93    38.84    -1.91   258.45   430.30    17.47   554.72     0.37

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   377.95    90.88   366.86  1158.55     0.33
 MEAN    15.50   384.08   113.23   367.01  1158.56     0.33
 HUB     12.59   409.23   179.61   367.71  1158.50     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   451.90   263.87     0.39  1632.61
 MEAN   306.46   414.76   193.23     0.36  1756.73     1.21
 HUB    248.96   374.19    69.36     0.32  2262.79

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.08     1.03    17.73   569.78     1.01   557.85     0.92     0.83
 MEAN    19.12     1.03    17.72   570.17     1.01   557.86     0.92     0.83
 HUB     19.28     1.04    17.68   571.78     1.01   557.80     0.92     0.83

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     13.91    35.73    31.50     4.23     0.93     0.13     2.90
 MEAN    17.15    27.77    23.50     4.27     0.89     0.15     3.34     0.83
 HUB     26.03    10.68     6.50     4.18     0.89     0.18     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.908

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    15.219     387.669     115.309     370.123    1158.736       0.335      -0.010

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.132      17.704     558.031      46.000      17.304      33.000      15.696

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    15.219     397.681     115.309     414.061    1158.054       0.343      -0.105

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.051      17.557     557.374     440.827       0.075       0.140

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    14.701     372.483       0.000     372.483    1159.736       0.321      -0.006

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.695     558.995       0.000       0.060       0.105      -0.009

   STAGE EXIT CONDITIONS, STAGE            5
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      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.613      19.008       1.023     570.578       5.982     398.252       3.087

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   37261.078       0.296     217.954 1005981.562

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     297469.94   1740.0162    101.1179      1.2582      0.7451      7.9529      1.0914


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 35% Ice Block 8-31-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.995

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      99.590    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   45.26799

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      97.289    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
   76612.523   78144.609       2.935     831.557     283.327     619.754       2.187

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   225.65    -0.08   225.65     0.20   406.33
  MEAN    17.06     0.00    -0.02   225.65    -0.08   225.65     0.20
  HUB     12.51     0.00    -0.02   225.65    -0.08   225.65     0.20

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.06    50.47    10.59   407.95   466.27    14.68   518.56     0.42
  MEAN    56.23    47.20     9.03   337.36   405.93    14.68   518.56     0.36
  HUB     47.64    38.62     9.02   247.38   334.90    14.68   518.56     0.30

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   391.93   242.30   308.05  1124.94     0.35
  MEAN    18.04   406.94   262.95   310.57  1122.99     0.36
  HUB     15.00   454.96   328.31   314.96  1119.90     0.41

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   349.77   165.65     0.31  5000.22
  MEAN   356.65   324.40    93.71     0.29  4743.87     1.41
  HUB    296.62   316.55    31.69     0.28  4925.55

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.62     1.10    15.28   538.69     1.03   525.86     0.92     0.91
  MEAN    16.54     1.09    15.10   537.88     1.03   524.05     0.92     0.91
  HUB     16.59     1.10    14.81   538.46     1.03   521.17     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     38.19    28.27    24.20     4.07     0.93     0.34     2.90
  MEAN    40.25    16.79    12.70     4.09     0.93     0.30     3.51     0.91
  HUB     46.19    -5.74    -9.30     3.56     0.93     0.17     4.78


    blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     412.441     262.437     318.173    1123.084       0.367      -0.006

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.566      15.091     524.135      24.000      39.517      35.400      -4.117

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     341.927     262.437     431.031    1127.834       0.303       0.310

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.556      15.532     528.578     528.796       0.017       0.442

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     317.759       0.000     317.759    1129.254       0.281       0.356

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.632     529.910       0.000       0.060       0.042       0.376

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      16.517       1.093     538.343      15.533     201.502       1.562

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96707.609       0.581     544.261  948857.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.999

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     99.590    2266.000      16.517     538.343       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     90.297    2224.275       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  76612.523   78144.609       2.246     590.487     262.964     474.134       1.803

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   303.99    -0.10   303.99     0.27   398.87
 MEAN    18.08     0.00    -0.02   303.99    -0.10   303.99     0.27
 HUB     15.21     0.00    -0.02   303.99    -0.10   303.99     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.21    46.36     6.85   406.37   507.57    15.71   530.63     0.45
 MEAN    49.63    42.30     7.33   357.49   469.35    15.71   530.63     0.42
 HUB     44.70    37.84     6.86   300.77   427.71    15.71   530.63     0.38

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   367.93   177.26   322.42  1138.39     0.32
 MEAN    18.01   375.47   189.80   323.97  1137.22     0.33
 HUB     15.22   406.03   242.27   325.83  1136.02     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   394.05   226.54     0.35  3621.79
 MEAN   356.14   364.17   166.34     0.32  3420.18     1.40
 HUB    301.03   331.08    58.76     0.29  3689.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     17.67     1.07    16.44   549.85     1.02   538.54     0.92     0.91
 MEAN    17.60     1.07    16.32   549.21     1.02   537.43     0.92     0.91
 HUB     17.69     1.07    16.20   550.06     1.02   536.29     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.80    35.09    31.50     3.59     0.93     0.28     2.90
 MEAN    30.36    27.18    23.50     3.68     0.93     0.29     3.30     0.91
 HUB     36.63    10.22     6.50     3.72     0.93     0.30     3.92


   blockage3   Cor/U1    Cor/Incid
      0.600       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     610.354     190.332     579.918    1117.109       0.546      -1.439

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.642      14.398     518.592      46.000      18.170      30.600      12.430

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     601.800     190.332     631.181    1118.041       0.538      -1.404

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.600      17.590      14.439     519.458     317.610       0.049       0.133

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823     592.773       0.000     592.773    1119.011       0.530       0.059

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600      14.478     520.359       0.000       0.060       0.093      -1.375

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.816      17.531       1.061     549.704      11.361     249.151       1.931

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  70747.172       0.434     398.158  873308.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.768

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     99.590    2266.000      17.531     549.704       1.000       1.000       0.630
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     85.968    2201.169       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  76612.523   78144.609       1.401     350.665     250.361     271.233       1.083

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   529.42    -0.18   529.42     0.47   385.51
 MEAN    17.74     0.00    -0.02   529.42    -0.18   529.42     0.47
 HUB     15.05     0.00    -0.02   529.42    -0.18   529.42     0.47

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     36.87    46.36    -9.49   396.88   661.77    15.06   526.30     0.59
 MEAN    33.54    43.40    -9.86   350.77   635.18    15.06   526.30     0.56
 HUB     29.36    38.84    -9.48   297.61   607.42    15.06   526.30     0.54

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000
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	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	363.75	122.40	342.54	1146.61	0.32
MEAN	17.51	372.27	144.60	343.04	1146.42	0.32
HUB	14.85	403.33	209.82	344.46	1146.25	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	435.74	269.33	0.38	2428.47	
MEAN	346.18	397.88	201.58	0.35	2534.76	1.67
HUB	293.65	354.51	83.84	0.31	3118.51	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.14	1.03	16.92	557.42	1.01	546.37	0.92	0.70
MEAN	18.17	1.04	16.89	557.75	1.01	546.18	0.92	0.70
HUB	18.32	1.04	16.81	559.61	1.02	546.02	0.92	0.70

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	19.66	38.18	31.50	6.68	0.93	0.37	2.90	
MEAN	22.86	30.44	23.50	6.94	0.85	0.41	3.28	0.70
HUB	31.35	13.68	6.50	7.18	0.85	0.46	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.768

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	376.705	145.554	347.449	1146.655	0.329	-0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.195	16.883	546.409	46.000	22.730	31.500	8.770

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	363.248	145.554	391.324	1147.527	0.317	0.065

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.180	16.958	547.240	471.992	0.022	0.192

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	353.092	0.000	353.092	1148.164	0.308	0.068

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.974	547.848	0.000	0.060	0.062	0.076

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.618	18.126	1.034	558.259	8.555	313.431	2.430

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
53278.188	0.347	299.844	1463267.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 9.028 EfDer = 0.970

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
99.590	2266.000	18.126	558.259	1.000	1.000	0.980

W Kg/sec = 45.26799

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
83.788	2184.239	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
76612.523	78144.609	2.104	513.330	244.017	401.059	1.644

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	332.25	-0.11	332.25	0.29	367.11
MEAN	16.97	0.00	-0.02	332.25	-0.11	332.25	0.29	

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HUB     14.32     0.00    -0.02   332.25    -0.11   332.25     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     48.91    46.36     2.55   380.86   505.50    17.10   549.04     0.44
MEAN    45.30    43.80     1.50   335.59   472.32    17.10   549.04     0.41
HUB     40.45    37.84     2.61   283.17   436.63    17.10   549.04     0.38

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   373.19   122.74   352.43  1154.56     0.32
MEAN    16.57   381.17   143.96   352.93  1154.26     0.33
HUB     13.89   410.87   208.81   353.85  1153.92     0.36

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    373.34   432.45   250.60     0.37  2319.55
MEAN   327.74   397.91   183.78     0.34  2387.98     1.27
HUB    274.67   359.93    65.85     0.31  2902.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.88     1.04    17.56   565.62     1.01   554.00     0.92     0.89
MEAN    18.90     1.04    17.52   565.84     1.01   553.71     0.92     0.89
HUB     19.07     1.05    17.47   567.47     1.02   553.38     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     19.20    35.42    31.50     3.92     0.93     0.19     2.90
MEAN    22.19    27.51    23.50     4.01     0.91     0.20     3.29     0.89
HUB     30.55    10.54     6.50     4.04     0.91     0.24     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.970

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     375.225     144.774     346.171    1155.145       0.325       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.935      17.599     554.557      46.000      22.695      32.400       9.705

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     366.125     144.774     393.709    1155.732       0.317       0.089

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.916      17.644     555.120     456.573       0.023       0.201

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     348.668       0.000     348.668    1156.816       0.301       0.071

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.701     556.162       0.000       0.060       0.067       0.129

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.786      18.854       1.040     566.313       8.054     314.295       2.436

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  50165.387       0.360     282.326  909573.812


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.937

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2266.000      18.854     566.313       1.000       1.000       0.980
W Kg/sec =   45.26799
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
81.133	2168.652	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
76612.523	78144.609	2.157	509.668	236.289	390.276	1.652

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	325.64	-0.11	325.64	0.28	346.70
MEAN	15.91	0.00	-0.02	325.64	-0.11	325.64	0.28	
HUB	13.07	0.00	-0.02	325.64	-0.11	325.64	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.06	47.36	0.70	362.27	487.20	17.85	557.46	0.42
MEAN	44.03	44.80	-0.77	314.67	452.92	17.85	557.46	0.39
HUB	38.45	38.84	-0.39	258.45	415.81	17.85	557.46	0.36

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	361.99	106.29	346.03	1162.26	0.31
MEAN	15.50	368.19	124.41	346.53	1161.94	0.32
HUB	12.59	393.03	183.73	347.44	1161.57	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	426.00	248.47	0.37	1908.88	
MEAN	306.46	391.44	182.05	0.34	1929.90	1.25
HUB	248.96	353.51	65.23	0.30	2314.63	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.46	1.03	18.20	572.37	1.01	561.43	0.92	0.86
MEAN	19.47	1.03	18.16	572.44	1.01	561.12	0.92	0.86
HUB	19.60	1.04	18.10	573.66	1.01	560.76	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	17.08	35.68	31.50	4.18	0.93	0.16	2.90	
MEAN	19.75	27.71	23.50	4.21	0.90	0.18	3.34	0.86
HUB	27.87	10.63	6.50	4.13	0.90	0.20	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.937

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	371.666	126.695	349.405	1162.117	0.320	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.484	18.149	561.292	46.000	19.931	33.000	13.069

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	374.037	126.695	394.911	1161.964	0.322	-0.053

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.429	18.082	561.144	440.827	0.060	0.172

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	350.542	0.000	350.542	1163.435	0.301	0.043

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.207	562.566	0.000	0.060	0.088	0.039

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.704	19.392	1.029	572.825	6.512	363.585	2.818

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 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   40565.453       0.322     228.298  961174.938

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     311463.81   1752.8866     97.2890      1.2836      0.7758      9.0280      1.0957


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 35% Ice Block 8-31-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.992

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      96.156    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   43.70718

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      93.935    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   73970.969   75450.234       3.040     831.557     273.558     619.754       2.266

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   217.56    -0.07   217.56     0.19   406.33
  MEAN    17.06     0.00    -0.02   217.56    -0.07   217.56     0.19
  HUB     12.51     0.00    -0.02   217.56    -0.07   217.56     0.19

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     61.93    50.47    11.46   407.95   462.40    14.71   518.86     0.41
  MEAN    57.19    47.20     9.99   337.36   401.49    14.71   518.86     0.36
  HUB     48.68    38.62    10.06   247.38   329.49    14.71   518.86     0.29

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   386.93   248.50   296.59  1125.72     0.34
  MEAN    18.04   400.57   266.43   299.11  1123.67     0.36
  HUB     15.00   446.15   327.18   303.32  1120.56     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   336.73   159.45     0.30  5128.11
  MEAN   356.65   312.42    90.22     0.28  4806.68     1.45
  HUB    296.62   304.86    30.56     0.27  4908.61

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.65     1.10    15.34   539.10     1.03   526.60     0.92     0.91
  MEAN    16.55     1.10    15.16   538.08     1.03   524.68     0.92     0.91
  HUB     16.58     1.10    14.86   538.40     1.03   521.78     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     39.96    28.26    24.20     4.06     0.93     0.36     2.90
  MEAN    41.69    16.78    12.70     4.08     0.94     0.32     3.51     0.91
  HUB     47.17    -5.75    -9.30     3.55     0.94     0.19     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.992

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     405.700     265.916     306.400    1123.775       0.361      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.579      15.149     524.780      24.000      40.954      35.400      -5.554

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     328.906     265.916     422.954    1128.808       0.291       0.338

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.567      15.617     529.492     528.796       0.018       0.465

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
     18.083     305.882       0.000     305.882    1130.109       0.271       0.376

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.703     530.712       0.000       0.060       0.047       0.396

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      16.524       1.094     538.527      15.717     196.116       1.520

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  97853.297       0.588     531.720  914825.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     96.156    2266.000      16.524     538.527       1.000       1.000       0.980
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.161    2223.895       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73970.969   75450.234       2.326     590.487     253.831     474.134       1.868

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   292.71    -0.10   292.71     0.26   398.80
 MEAN    18.08     0.00    -0.02   292.71    -0.10   292.71     0.26
 HUB     15.21     0.00    -0.02   292.71    -0.10   292.71     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.24    46.36     7.88   406.37   500.89    15.77   531.37     0.44
 MEAN    50.70    42.30     8.40   357.49   462.11    15.77   531.37     0.41
 HUB     45.79    37.84     7.95   300.77   419.77    15.77   531.37     0.37

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     20.42   361.61   186.12   310.04  1139.60     0.32
 MEAN    18.01   368.34   196.25   311.70  1138.27     0.32
 HUB     15.22   397.75   244.59   313.65  1136.92     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   378.83   217.68     0.33  3802.57
 MEAN   356.14   350.31   159.88     0.31  3536.35     1.43
 HUB    301.03   318.69    56.44     0.28  3724.93

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.73     1.07    16.54   550.60     1.02   539.68     0.92     0.91
 MEAN    17.65     1.07    16.41   549.76     1.02   538.43     0.92     0.91
 HUB     17.71     1.07    16.27   550.36     1.02   537.15     0.92     0.91
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.98    35.07    31.50     3.57     0.93     0.31     2.90
 MEAN    32.20    27.16    23.50     3.66     0.93     0.31     3.30     0.91
 HUB     37.95    10.20     6.50     3.70     0.93     0.32     3.92


   blockage3   Cor/U1    Cor/Incid
      0.600       1.000       0.997

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     586.805     196.805     552.818    1120.217       0.524      -1.353

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.684      14.664     521.482      46.000      19.596      30.600      11.004

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     571.709     196.805     604.635    1121.785       0.510      -1.264

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.600      17.643      14.774     522.943     317.610       0.042       0.153

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     562.835       0.000     562.835    1122.686       0.501       0.120

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600      14.819     523.784       0.000       0.060       0.077      -1.229

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.837      17.598       1.065     550.240      11.713     238.957       1.852

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  72937.234       0.447     396.330  840755.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.781

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     96.156    2266.000      17.598     550.240       1.000       1.000       0.630
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     82.728    2200.097       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  73970.969   75450.234       1.455     350.665     240.926     271.233       1.126

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   504.52    -0.17   504.52     0.45   385.32
 MEAN    17.74     0.00    -0.02   504.52    -0.17   504.52     0.45
 HUB     15.05     0.00    -0.02   504.52    -0.17   504.52     0.45

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     38.20    46.36    -8.16   396.88   642.02    15.34   528.98     0.57
 MEAN    34.82    43.40    -8.58   350.77   614.58    15.34   528.98     0.54
 HUB     30.55    38.84    -8.29   297.61   585.85    15.34   528.98     0.52

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2       Cu2      Cm2     Ao2          Mach2
 TIP     19.81   354.52   134.36   328.08  1148.54      0.31
 MEAN    17.51   362.85   153.57   328.74  1148.11      0.32
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 HUB     14.85   393.36   213.75   330.21  1147.70     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   416.98   257.37     0.36  2665.18
 MEAN   346.18   381.01   192.61     0.33  2691.61     1.69
 HUB    293.65   339.74    79.90     0.30  3176.80

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.28     1.04    17.11   558.70     1.02   548.21     0.92     0.71
 MEAN    18.29     1.04    17.06   558.79     1.02   547.79     0.92     0.71
 HUB     18.41     1.05    16.98   560.33     1.02   547.41     0.92     0.71

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.27    38.11    31.50     6.61     0.93     0.39     2.90
 MEAN    25.04    30.37    23.50     6.87     0.86     0.42     3.28     0.71
 HUB     32.92    13.60     6.50     7.10     0.86     0.47     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.781

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     367.067     154.580     332.931    1148.346       0.320      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.316      17.062     548.021      46.000      24.906      31.500       6.594

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     347.420     154.580     380.258    1149.573       0.302       0.102

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.306      17.181     549.193     471.992       0.018       0.222

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     337.579       0.000     337.579    1150.162       0.294       0.109

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.202     549.756       0.000       0.060       0.051       0.119

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.651      18.263       1.038     559.273       9.033     293.739       2.277

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  56257.051       0.367     305.692 1397409.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.984

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     96.156    2266.000      18.263     559.273       1.000       1.000       0.980
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.366    2182.258       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73970.969   75450.234       2.193     513.330     234.052     401.059       1.714

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   317.82    -0.11   317.82     0.28   366.77
 MEAN    16.97     0.00    -0.02   317.82    -0.11   317.82     0.28
 HUB     14.32     0.00    -0.02   317.82    -0.11   317.82     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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TIP     50.16    46.36     3.80   380.86   496.13    17.32   550.84     0.43
MEAN    46.57    43.80     2.77   335.59   462.28    17.32   550.84     0.40
HUB     41.71    37.84     3.87   283.17   425.74    17.32   550.84     0.37

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   362.14   134.61   336.19  1157.06     0.31
MEAN    16.57   369.89   152.57   336.96  1156.53     0.32
HUB     13.89   399.06   212.03   338.06  1155.95     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    373.34   412.33   238.73     0.36  2543.56
MEAN   327.74   379.77   175.17     0.33  2530.49     1.31
HUB    274.67   343.82    62.63     0.30  2946.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.10     1.05    17.85   567.35     1.01   556.40     0.92     0.90
MEAN    19.10     1.05    17.79   567.31     1.01   555.88     0.92     0.90
HUB     19.24     1.05    17.72   568.63     1.02   555.33     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     21.82    35.38    31.50     3.88     0.93     0.22     2.90
MEAN    24.36    27.47    23.50     3.97     0.91     0.23     3.29     0.90
HUB     32.10    10.50     6.50     4.00     0.91     0.26     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.984

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     364.435     153.426     330.566    1157.346       0.315       0.052

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.135      17.862     556.672      46.000      24.897      32.400       7.503

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     348.926     153.426     381.168    1158.306       0.301       0.124

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.123      17.955     557.596     456.573       0.019       0.230

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    16.096     332.201       0.000     332.201    1159.293       0.287       0.112

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.015     558.547       0.000       0.060       0.055       0.168

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.825      19.073       1.044     567.762       8.489     295.498       2.291

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  52875.918       0.379     287.320  873862.562


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.959

  W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    96.156    2266.000      19.073     567.762       1.000       1.000       0.980
W Kg/sec =   43.70718

  W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    77.535    2165.883       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73970.969	75450.234	2.257	509.668	225.808	390.276	1.728

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	310.45	-0.11	310.45	0.27	346.25
MEAN	15.91	0.00	-0.02	310.45	-0.11	310.45	0.27	
HUB	13.07	0.00	-0.02	310.45	-0.11	310.45	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	49.41	47.36	2.05	362.27	477.18	18.15	559.72	0.41
MEAN	45.40	44.80	0.60	314.67	442.12	18.15	559.72	0.38
HUB	39.79	38.84	0.95	258.45	404.02	18.15	559.72	0.35

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	349.76	118.94	328.91	1165.26	0.30
MEAN	15.50	355.70	133.58	329.66	1164.69	0.31
HUB	12.59	380.03	187.17	330.74	1164.08	0.33

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	404.71	235.81	0.35	2135.79	
MEAN	306.46	372.24	172.88	0.32	2071.92	1.29
HUB	248.96	336.46	61.80	0.29	2357.83	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.78	1.04	18.58	574.54	1.01	564.33	0.92	0.88
MEAN	19.76	1.04	18.52	574.34	1.01	563.78	0.92	0.88
HUB	19.85	1.04	18.44	575.25	1.01	563.19	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	19.88	35.64	31.50	4.14	0.93	0.19	2.90	
MEAN	22.06	27.67	23.50	4.17	0.90	0.20	3.34	0.88
HUB	29.51	10.58	6.50	4.08	0.90	0.22	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.959

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	359.119	136.033	332.357	1164.857	0.308	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.771	18.509	563.942	46.000	22.259	33.000	10.741

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	354.807	136.033	379.991	1165.122	0.305	-0.006

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.735	18.504	564.199	440.827	0.048	0.202

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	332.644	0.000	332.644	1166.435	0.285	0.087

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.620	565.471	0.000	0.060	0.073	0.084

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.765	19.704	1.033	574.710	6.948	338.154	2.621

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
43282.332	0.344	235.190	922861.062

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   OVERALL EXIT CONDITIONS; ALL          5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    323205.84   1756.2526     93.9346      1.3043      0.7972      9.9879      1.0993



*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

   Fan-Core + 4 Stage LPC 60%  Stat 2 35% Ice Block 8-31-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.987

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     92.762    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   42.16433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     90.619    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  71359.812   72786.852       3.151     831.557     263.901     619.754       2.348

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   209.60    -0.07   209.60     0.19   406.33
 MEAN    17.06     0.00    -0.02   209.60    -0.07   209.60     0.19
 HUB     12.51     0.00    -0.02   209.60    -0.07   209.60     0.19

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     62.81    50.47    12.34   407.95   458.71    14.74   519.14     0.41
 MEAN    58.15    47.20    10.95   337.36   397.23    14.74   519.14     0.36
 HUB     49.73    38.62    11.11   247.38   324.29    14.74   519.14     0.29

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   382.39   254.50   285.40  1126.45     0.34
 MEAN    18.04   394.57   269.81   287.91  1124.30     0.35
 HUB     15.00   437.62   326.01   291.94  1121.17     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   324.04   153.45     0.29  5251.84
 MEAN   356.65   300.72    86.85     0.27  4867.47     1.50
 HUB    296.62   293.42    29.39     0.26  4890.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.68     1.10    15.40   539.49     1.03   527.28     0.92     0.90
 MEAN    16.56     1.10    15.21   538.27     1.03   525.27     0.92     0.90
 HUB     16.57     1.10    14.91   538.35     1.03   522.35     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     41.72    28.27    24.20     4.07     0.93     0.39     2.90
 MEAN    43.14    16.79    12.70     4.09     0.94     0.34     3.51     0.90
 HUB     48.16    -5.75    -9.30     3.55     0.94     0.21     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.987

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     399.348     269.283     294.899    1124.421       0.355      -0.004
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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.589      15.202     525.384      24.000      42.400      35.400      -7.000

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     316.235     269.283     415.352    1129.724       0.280       0.365

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.574      15.695     530.351     528.796       0.020       0.488

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     294.320       0.000     294.320    1130.914       0.260       0.395

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.766     531.469       0.000       0.060       0.053       0.415

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      16.527       1.094     538.704      15.894     190.885       1.480

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98953.383       0.595     518.717  881331.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.994

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     92.762    2266.000      16.527     538.704       1.000       1.000       0.980
W Kg/sec =   42.16433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     84.081    2223.530       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  71359.812   72786.852       2.411     590.487     244.863     474.134       1.936

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   281.72    -0.10   281.72     0.25   398.74
 MEAN    18.08     0.00    -0.02   281.72    -0.10   281.72     0.25
 HUB     15.21     0.00    -0.02   281.72    -0.10   281.72     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.27    46.36     8.91   406.37   494.55    15.83   532.08     0.44
 MEAN    51.77    42.30     9.47   357.49   455.23    15.83   532.08     0.40
 HUB     46.88    37.84     9.04   300.77   412.17    15.83   532.08     0.36

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   356.00   194.64   298.08  1140.72     0.31
 MEAN    18.01   361.79   202.49   299.82  1139.26     0.32
 HUB     15.22   389.93   246.85   301.84  1137.76     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   364.14   209.16     0.32  3976.52
 MEAN   356.14   336.90   153.65     0.30  3648.55     1.47
 HUB    301.03   306.67    54.18     0.27  3759.20

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.79     1.08    16.63   551.33     1.02   540.75     0.92     0.91
 MEAN    17.68     1.07    16.49   550.29     1.02   539.36     0.92     0.91
 HUB     17.72     1.07    16.33   550.64     1.02   537.95     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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 TIP     33.14    35.06    31.50     3.56     0.93     0.33     2.90
 MEAN    34.03    27.13    23.50     3.63     0.94     0.33     3.30     0.91
 HUB     39.28    10.18     6.50     3.68     0.94     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
      0.600       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     565.213     203.056     527.479    1122.998       0.503      -1.272

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.718      14.900     524.076      46.000      21.054      30.600       9.546

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     543.916     203.056     580.583    1125.110       0.483      -1.133

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.600      17.686      15.069     526.048     317.610       0.035       0.173

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     535.467       0.000     535.467    1125.924       0.476       0.171

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600      15.113     526.810       0.000       0.060       0.066      -1.097

    STAGE EXIT CONDITIONS, STAGE             2
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.849      17.648       1.068     550.756      12.052     229.460       1.779

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  75049.359       0.460     393.412  808871.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.802

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     92.762     2266.000       17.648     550.756       1.000        1.000        0.630
W Kg/sec =   42.16433

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     79.618     2199.067        1.402       0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  71359.812   72786.852        1.512     350.665     231.869     271.233       1.170

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa     C1       CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07      0.00    -0.02   481.43    -0.17   481.43     0.43    385.14
 MEAN    17.74      0.00    -0.02   481.43    -0.17   481.43     0.43
 HUB     15.05      0.00    -0.02   481.43    -0.17   481.43     0.43

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     39.51     46.36    -6.85   396.88   624.03     15.58   531.40      0.55
 MEAN    36.09     43.40    -7.31   350.77   595.76     15.58   531.40      0.53
 HUB     31.74     38.84    -7.10   297.61   566.07     15.58   531.40      0.50

      ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     19.81   346.42    145.81    314.23   1150.33      0.30
 MEAN    17.51   354.30    162.12    315.04   1149.68      0.31
 HUB     14.85   384.08    217.54    316.53   1149.06      0.33
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   399.03   245.92     0.35  2891.84
MEAN   346.18   364.87   184.07     0.32  2841.09     1.72
HUB    293.65   325.55    76.11     0.28  3233.03

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.41     1.04    17.29   559.94     1.02   549.92     0.92     0.73
MEAN    18.40     1.04    17.22   559.78     1.02   549.29     0.92     0.73
HUB     18.50     1.05    17.13   561.02     1.02   548.70     0.92     0.73

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     24.89    38.05    31.50     6.55     0.93     0.40     2.90
MEAN    27.23    30.30    23.50     6.80     0.86     0.43     3.28     0.73
HUB     34.50    13.52     6.50     7.02     0.86     0.47     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.802

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     358.327     163.183     319.013    1149.918       0.312       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.426      17.225     549.524      46.000      27.091      31.500       4.409

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     332.334     163.183     370.236    1151.486       0.289       0.140

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.421      17.384     551.023     471.992       0.014       0.252

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     322.848       0.000     322.848    1152.028       0.280       0.149

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.408     551.542       0.000       0.060       0.043       0.160

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.685      18.385       1.042     560.246       9.490     276.496       2.143

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  59106.984       0.385     309.841 1335055.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.993

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     92.762    2266.000      18.385     560.246       1.000       1.000       0.980
W Kg/sec =   42.16433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.080    2180.362       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  71359.812   72786.852       2.287     513.330     224.482     401.059       1.787

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   304.09    -0.10   304.09     0.26   366.45
MEAN    16.97     0.00    -0.02   304.09    -0.10   304.09     0.26
HUB     14.32     0.00    -0.02   304.09    -0.10   304.09     0.26

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.40    46.36     5.04   380.86   487.45    17.52   552.53     0.42
MEAN    47.83    43.80     4.03   335.59   452.95    17.52   552.53     0.39
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HUB     42.97    37.84     5.13   283.17   415.59    17.52   552.53     0.36

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   352.47   145.77   320.92  1159.37     0.30
MEAN    16.57   359.78   160.70   321.90  1158.62     0.31
HUB     13.89   388.17   215.05   323.15  1157.85     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    373.34   393.42   227.58     0.34  2754.07
MEAN   327.74   362.66   167.04     0.31  2665.14     1.35
HUB    274.67   328.61    59.62     0.28  2988.48

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.31     1.05    18.11   568.99     1.02   558.62     0.92     0.91
MEAN    19.28     1.05    18.03   568.71     1.02   557.90     0.92     0.91
HUB     19.39     1.05    17.94   569.73     1.02   557.15     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     24.43    35.34    31.50     3.84     0.93     0.24     2.90
MEAN    26.53    27.43    23.50     3.93     0.92     0.25     3.29     0.91
HUB     33.64    10.45     6.50     3.95     0.92     0.27     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.993

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     354.785     161.600     315.845    1159.383       0.306       0.051

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.314      18.098     558.635      46.000      27.096      32.400       5.304

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     332.801     161.600     369.961    1160.692       0.287       0.160

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.308      18.235     559.897     456.573       0.015       0.260

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    16.096     316.807       0.000     316.807    1161.591       0.273       0.152

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.296     560.764       0.000       0.060       0.046       0.207

   STAGE EXIT CONDITIONS, STAGE            4
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.851      19.267       1.048     569.145       8.898     279.010       2.163

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  55426.770       0.398     290.549  839171.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.976

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     92.762    2266.000      19.267     569.145       1.000       1.000       0.980
W Kg/sec =   42.16433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     74.134    2163.250       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  71359.812   72786.852       2.361     509.668     215.903     390.276       1.808
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ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	296.22	-0.10	296.22	0.25	345.83
MEAN	15.91	0.00	-0.02	296.22	-0.10	296.22	0.25	
HUB	13.07	0.00	-0.02	296.22	-0.10	296.22	0.25	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.74	47.36	3.38	362.27	468.04	18.42	561.82	0.40
MEAN	46.74	44.80	1.94	314.67	432.24	18.42	561.82	0.37
HUB	41.12	38.84	2.28	258.45	393.19	18.42	561.82	0.34

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	339.22	130.70	313.03	1168.00	0.29
MEAN	15.50	344.66	142.13	313.99	1167.21	0.30
HUB	12.59	368.23	190.37	315.20	1166.40	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	384.95	224.05	0.33	2346.65	
MEAN	306.46	354.39	164.33	0.30	2204.28	1.32
HUB	248.96	320.60	58.59	0.27	2398.15	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.06	1.04	18.92	576.59	1.01	566.99	0.92	0.89
MEAN	20.02	1.04	18.84	576.14	1.01	566.22	0.92	0.89
HUB	20.08	1.04	18.74	576.76	1.01	565.44	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	22.66	35.59	31.50	4.09	0.93	0.23	2.90	
MEAN	24.35	27.63	23.50	4.13	0.91	0.23	3.34	0.89
HUB	31.13	10.53	6.50	4.03	0.91	0.24	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.976

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	348.043	144.735	316.521	1167.376	0.298	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.030	18.830	566.385	46.000	24.573	33.000	8.427

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	337.115	144.735	366.871	1168.020	0.289	0.039

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.007	18.882	567.010	440.827	0.038	0.232

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	316.151	0.000	316.151	1169.197	0.270	0.131

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.990	568.153	0.000	0.060	0.060	0.128

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.811	19.981	1.037	576.498	7.353	316.541	2.454

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
45811.047	0.364	240.143	885765.750

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
334347.56	1752.6625	90.6187	1.3226	0.8129	10.9534	1.1027

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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Fan-Core + 4 Stage LPC 60% Stat 2 35% Ice Block 8-31-2011

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 1

RESET = 0.000 BLEED = 0.000 DPInc = 11.987 EfDer = 0.980

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
89.191	2266.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 40.54142

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
87.131	2257.076	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
68613.172	69985.281	3.277	831.557	253.744	619.754	2.442

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	201.25	-0.07	201.25	0.18	406.33
MEAN	17.06	0.00	-0.02	201.25	-0.07	201.25	0.18	
HUB	12.51	0.00	-0.02	201.25	-0.07	201.25	0.18	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	63.75	50.47	13.28	407.95	454.95	14.77	519.43	0.41
MEAN	59.19	47.20	11.99	337.36	392.89	14.77	519.43	0.35
HUB	50.88	38.62	12.26	247.38	318.96	14.77	519.43	0.29

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	378.04	260.69	273.77	1127.18	0.34
MEAN	18.04	388.58	273.28	276.25	1124.93	0.35
HUB	15.00	428.89	324.80	280.09	1121.79	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	407.95	310.86	147.26	0.28	5379.48	
MEAN	356.65	288.56	83.37	0.26	4930.11	1.55
HUB	296.62	281.50	28.18	0.25	4872.87	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.71	1.11	15.46	539.90	1.03	527.96	0.92	0.90
MEAN	16.57	1.10	15.26	538.47	1.03	525.86	0.92	0.90
HUB	16.55	1.10	14.96	538.29	1.03	522.93	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	43.60	28.28	24.20	4.08	0.93	0.42	2.90	
MEAN	44.69	16.79	12.70	4.09	0.94	0.37	3.51	0.90
HUB	49.23	-5.75	-9.30	3.55	0.94	0.23	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.980

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	392.992	272.751	282.930	1125.066	0.349	-0.003

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
16.597	15.252	525.987	24.000	43.951	35.400	-8.551

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	303.095	272.751	407.750	1130.642	0.268	0.394

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.580	15.771	531.213	528.796	0.023	0.513

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	282.322	0.000	282.322	1131.722	0.249	0.414

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.826	532.229	0.000	0.060	0.060	0.434

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.849	16.527	1.094	538.886	16.076	185.454	1.438

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
100088.438	0.601	504.473	846247.312

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =11.987 EfDer = 0.988

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
89.191	2266.000	16.527	538.886	1.000	1.000	0.980

W Kg/sec = 40.54142

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
80.859	2223.154	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
68613.172	69985.281	2.508	590.487	235.480	474.134	2.013

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	270.30	-0.09	270.30	0.24	398.67
MEAN	18.08	0.00	-0.02	270.30	-0.09	270.30	0.24	
HUB	15.21	0.00	-0.02	270.30	-0.09	270.30	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	56.38	46.36	10.02	406.37	488.13	15.88	532.78	0.43
MEAN	52.91	42.30	10.61	357.49	448.25	15.88	532.78	0.40
HUB	48.06	37.84	10.22	300.77	404.45	15.88	532.78	0.36

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	350.74	203.37	285.76	1141.84	0.31
MEAN	18.01	355.39	208.84	287.55	1140.24	0.31
HUB	15.22	382.02	249.12	289.62	1138.61	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	349.05	200.43	0.31	4154.65	
MEAN	356.14	323.08	147.29	0.28	3762.95	1.52
HUB	301.03	294.24	51.91	0.26	3793.70	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.84	1.08	16.71	552.08	1.02	541.81	0.92	0.90
MEAN	17.71	1.07	16.56	550.84	1.02	540.29	0.92	0.90
HUB	17.72	1.07	16.39	550.93	1.02	538.75	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.44	35.05	31.50	3.55	0.93	0.36	2.90	
MEAN	35.99	27.12	23.50	3.62	0.94	0.35	3.30	0.90
HUB	40.70	10.16	6.50	3.66	0.94	0.35	3.92	

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   blockage3   Cor/U1    Cor/Incid
      0.600       1.000       0.988

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960      544.027     209.430     502.100     1125.663       0.483       -1.190

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     17.746      15.122      526.567      46.000      22.641       30.600       7.959

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960      516.375     209.430     557.229     1128.278       0.458      -0.999

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.600       17.722      15.348      529.016     317.610       0.030       0.194

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.823      508.428       0.000     508.428     1129.003       0.450       0.221

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600       15.388      529.696       0.000       0.060       0.057      -0.966

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4        Pt4           PR4        Texit        Del T        Ns         Ns nondim
      0.855       17.689        1.070      551.284      12.398      220.039       1.706

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  77205.188       0.474     389.135  775624.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.829

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     89.191     2266.000       17.689      551.284       1.000        1.000        0.630
W Kg/sec =   40.54142

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     76.413     2198.012        1.402        0.249       53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  68613.172   69985.281        1.576      350.665     222.535      271.233       1.219

     ROTOR LEADING EDGE CONDITIONS, STAGE             3

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     20.07      0.00     -0.02    458.33     -0.16    458.33      0.40    384.96
 MEAN    17.74      0.00     -0.02    458.33     -0.16    458.33      0.40
 HUB     15.05      0.00     -0.02    458.33     -0.16    458.33      0.40

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     40.90     46.36     -5.46   396.88    606.38     15.80    533.74      0.54
 MEAN    37.44     43.40     -5.96   350.77    577.25     15.80    533.74      0.51
 HUB     33.01     38.84     -5.83   297.61    546.56     15.80    533.74      0.48

     ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP      19.81   338.87    157.51    300.03   1152.10      0.29
 MEAN     17.51   346.10    170.89    300.97   1151.24      0.30
 HUB      14.85   374.85    221.42    302.47   1150.41      0.33

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP     391.73    380.63    234.22      0.33   3123.49
 MEAN    346.18    348.30    175.30      0.30   2994.44      1.75
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 HUB    293.65   310.97    72.24     0.27  3290.39

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.55     1.05    17.46   561.20     1.02   551.61     0.92     0.76
 MEAN    18.51     1.05    17.38   560.79     1.02   550.79     0.92     0.76
 HUB     18.59     1.05    17.27   561.73     1.02   550.00     0.92     0.76

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     27.70    37.98    31.50     6.48     0.93     0.42     2.90
 MEAN    29.59    30.22    23.50     6.72     0.87     0.44     3.28     0.76
 HUB     36.21    13.43     6.50     6.93     0.87     0.48     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.829

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     349.922     172.008     304.727    1151.479       0.304       0.002

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.537      17.386     551.018      46.000      29.443      31.500       2.057

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     316.928     172.008     360.597    1153.397       0.275       0.181

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.534      17.586     552.855     471.992       0.012       0.285

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     307.859       0.000     307.859    1153.890       0.267       0.191

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.610     553.328       0.000       0.060       0.038       0.201

    STAGE EXIT CONDITIONS, STAGE             3
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.720      18.504       1.046     561.243       9.958     260.212       2.017

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  62023.055       0.404     312.613 1271833.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     89.191    2266.000      18.504     561.243       1.000       1.000       0.980
W Kg/sec =   40.54142

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     73.703    2178.425       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  68613.172   69985.281       2.392     513.330     214.647     401.059       1.868

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   290.10    -0.10   290.10     0.25   366.13
 MEAN    16.97     0.00    -0.02   290.10    -0.10   290.10     0.25
 HUB     14.32     0.00    -0.02   290.10    -0.10   290.10     0.25

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.71    46.36     6.35   380.86   478.84    17.71   554.22     0.41
 MEAN    49.17    43.80     5.37   335.59   443.67    17.71   554.22     0.38
 HUB     44.32    37.84     6.48   283.17   405.47    17.71   554.22     0.35

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
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B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	343.49	156.97	305.53	1161.63	0.30
MEAN	16.57	350.10	168.87	306.67	1160.70	0.30
HUB	13.89	377.45	218.10	308.06	1159.73	0.33

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	374.38	216.37	0.32	2965.54	
MEAN	327.74	345.38	158.87	0.30	2800.60	1.39
HUB	274.67	313.21	56.57	0.27	3030.81	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.51	1.05	18.36	570.66	1.02	560.81	0.92	0.91
MEAN	19.46	1.05	18.26	570.13	1.02	559.90	0.92	0.91
HUB	19.53	1.06	18.15	570.87	1.02	558.97	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.19	35.31	31.50	3.81	0.93	0.27	2.90	
MEAN	28.84	27.39	23.50	3.89	0.92	0.28	3.29	0.91
HUB	35.30	10.41	6.50	3.91	0.92	0.30	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	345.573	169.824	300.965	1161.400	0.298	0.050

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.488	18.326	560.582	46.000	29.435	32.400	2.965

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	316.596	169.824	359.268	1163.059	0.272	0.199

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.485	18.506	562.184	456.573	0.013	0.293

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	301.385	0.000	301.385	1163.870	0.259	0.192

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.564	562.969	0.000	0.060	0.040	0.246

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.869	19.452	1.051	570.553	9.310	263.421	2.042

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
57992.930	0.416	292.300	803248.688

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =11.987 EfDer = 0.988

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
89.191	2266.000	19.452	570.553	1.000	1.000	0.980

W Kg/sec = 40.54142

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
70.692	2160.578	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
68613.172	69985.281	2.476	509.668	205.882	390.276	1.896

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	281.94	-0.10	281.94	0.24	345.41
MEAN	15.91	0.00	-0.02	281.94	-0.10	281.94	0.24	
HUB	13.07	0.00	-0.02	281.94	-0.10	281.94	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.12	47.36	4.76	362.27	459.13	18.67	563.92	0.39
MEAN	48.15	44.80	3.35	314.67	422.57	18.67	563.92	0.36
HUB	42.52	38.84	3.68	258.45	382.54	18.67	563.92	0.33

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	329.57	142.33	297.25	1170.68	0.28
MEAN	15.50	334.25	150.64	298.37	1169.70	0.29
HUB	12.59	356.75	193.50	299.71	1168.69	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	365.35	212.42	0.31	2555.27	
MEAN	306.46	336.61	155.82	0.29	2336.14	1.37
HUB	248.96	304.80	55.46	0.26	2437.48	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.34	1.05	19.25	578.66	1.01	569.60	0.92	0.90
MEAN	20.26	1.04	19.14	577.97	1.01	568.64	0.92	0.90
HUB	20.30	1.04	19.02	578.29	1.01	567.67	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.59	35.55	31.50	4.05	0.93	0.26	2.90	
MEAN	26.79	27.57	23.50	4.07	0.92	0.26	3.34	0.90
HUB	32.85	10.48	6.50	3.98	0.92	0.26	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.988

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	337.627	153.404	300.764	1169.851	0.289	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.275	19.135	568.791	46.000	27.024	33.000	5.976

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	319.660	153.404	354.564	1170.865	0.273	0.087

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	20.264	19.240	569.777	440.827	0.030	0.265

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	299.869	0.000	299.869	1171.916	0.256	0.177

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.340	570.801	0.000	0.060	0.049	0.174

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.845	20.242	1.041	578.308	7.755	296.734	2.300

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
48314.762	0.384	243.520	847458.625

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
345624.38	1742.0408	87.1308	1.3399	0.8245	11.9868	1.1062

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**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 60%  Stat 2 35% Ice Block 8-31-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.974

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      85.685    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   38.94787

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
      83.706    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  65916.203   67234.383       3.411     831.557     243.770     619.754       2.542

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   193.09    -0.07   193.09     0.17   406.33
  MEAN    17.06     0.00    -0.02   193.09    -0.07   193.09     0.17
  HUB     12.51     0.00    -0.02   193.09    -0.07   193.09     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.67    50.47    14.20   407.95   451.40    14.80   519.70     0.40
  MEAN    60.22    47.20    13.02   337.36   388.77    14.80   519.70     0.35
  HUB     52.03    38.62    13.41   247.38   313.87    14.80   519.70     0.28

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   374.15   266.63   262.48  1127.85     0.33
  MEAN    18.04   382.99   276.60   264.91  1125.52     0.34
  HUB     15.00   420.46   323.53   268.55  1122.36     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   298.11   141.32     0.26  5502.01
  MEAN   356.65   276.74    80.05     0.25  4989.90     1.60
  HUB    296.62   269.90    26.91     0.24  4853.73

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.73     1.11    15.51   540.29     1.03   528.60     0.92     0.89
  MEAN    16.58     1.10    15.30   538.66     1.03   526.41     0.92     0.89
  HUB     16.54     1.09    15.01   538.23     1.03   523.46     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     45.45    28.30    24.20     4.10     0.93     0.44     2.90
  MEAN    46.24    16.81    12.70     4.11     0.94     0.39     3.51     0.89
  HUB     50.30    -5.72    -9.30     3.58     0.94     0.26     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.974

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      18.071     387.055     276.063     271.295    1125.664       0.344      -0.002

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      16.603      15.297     526.546      24.000      45.499      35.400     -10.099

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     18.071     290.363     276.063     400.651    1131.497       0.257       0.422

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.582      15.839     532.017     528.796       0.025       0.539

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     18.083     270.685       0.000     270.685    1132.477       0.239       0.432

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.879     532.939       0.000       0.060       0.069       0.452

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.838      16.524       1.094     539.059      16.249     180.205       1.397

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 101164.203       0.608     489.853  811938.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     85.685    2266.000      16.524     539.059       1.000       1.000       0.980
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     77.709    2222.797       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 65916.203   67234.383       2.609     590.487     226.308     474.134       2.095

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   259.21    -0.09   259.21     0.23   398.61
 MEAN    18.08     0.00    -0.02   259.21    -0.09   259.21     0.23
 HUB     15.21     0.00    -0.02   259.21    -0.09   259.21     0.23

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.47    46.36    11.11   406.37   482.08    15.93   533.45     0.43
 MEAN    54.06    42.30    11.76   357.49   441.65    15.93   533.45     0.39
 HUB     49.25    37.84    11.41   300.77   397.13    15.93   533.45     0.35

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   346.19   211.73   273.89  1142.87     0.30
 MEAN    18.01   349.60   214.95   275.71  1141.15     0.31
 HUB     15.22   374.58   251.27   277.79  1139.40     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   334.52   192.06     0.29  4325.42
 MEAN   356.14   309.75   141.19     0.27  3872.92     1.56
 HUB    301.03   282.21    49.75     0.25  3826.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.88     1.08    16.78   552.80     1.03   542.79     0.92     0.90
 MEAN    17.74     1.07    16.62   551.36     1.02   541.15     0.92     0.90
 HUB     17.72     1.07    16.44   551.21     1.02   539.49     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.71    35.04    31.50     3.54     0.93     0.38     2.90
 MEAN    37.94    27.12    23.50     3.62     0.94     0.37     3.30     0.90
 HUB     42.13    10.15     6.50     3.65     0.94     0.37     3.92


   blockage3   Cor/U1    Cor/Incid
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      0.600       1.000       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.960     524.576     215.557     478.242    1128.054       0.465      -1.113

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.768      15.317     528.808      46.000      24.262      30.600       6.338

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     490.714     215.557     535.971    1131.113       0.434      -0.871

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.600      17.750      15.594     531.679     317.610       0.025       0.216

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.823     483.217       0.000     483.217    1131.761       0.427       0.268

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.600      15.631     532.289       0.000       0.060       0.050      -0.840

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.858      17.721       1.072     551.789      12.730     211.252       1.638

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79272.414       0.486     383.849  743251.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.859

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     85.685    2266.000      17.721     551.789       1.000       1.000       0.630
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     73.311    2197.007       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  65916.203   67234.383       1.642     350.665     213.501     271.233       1.270

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   436.58    -0.15   436.58     0.38   384.78
 MEAN    17.74     0.00    -0.02   436.58    -0.15   436.58     0.38
 HUB     15.05     0.00    -0.02   436.58    -0.15   436.58     0.38

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     42.28    46.36    -4.08   396.88   590.11    16.00   535.87     0.52
 MEAN    38.79    43.40    -4.61   350.77   560.13    16.00   535.87     0.49
 HUB     34.29    38.84    -4.55   297.61   528.45    16.00   535.87     0.47

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   332.41   168.76   286.38  1153.74     0.29
 MEAN    17.51   338.78   179.31   287.44  1152.69     0.29
 HUB     14.85   366.28   225.10   288.94  1151.68     0.32

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   362.95   222.97     0.31  3346.21
 MEAN   346.18   332.37   166.88     0.29  3141.73     1.78
 HUB    293.65   296.97    68.55     0.26  3345.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
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 TIP     18.67     1.05    17.63   562.41     1.02   553.19     0.92     0.79
 MEAN    18.61     1.05    17.53   561.77     1.02   552.18     0.92     0.79
 HUB     18.67     1.05    17.41   562.41     1.02   551.21     0.92     0.79

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.51    37.90    31.50     6.40     0.93     0.43     2.90
 MEAN    31.96    30.14    23.50     6.64     0.88     0.46     3.28     0.79
 HUB     37.92    13.35     6.50     6.85     0.88     0.49     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.859

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     342.421     180.485     290.994    1152.926       0.297       0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.643      17.535     552.406      46.000      31.809      31.500      -0.309

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     302.191     180.485     351.986    1155.184       0.262       0.223

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.641      17.774     554.571     471.992       0.012       0.320

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     293.571       0.000     293.571    1155.630       0.254       0.230

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.795     555.000       0.000       0.060       0.037       0.241

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.751      18.613       1.050     562.197      10.408     245.692       1.905

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  64822.387       0.422     313.880 1211726.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  1.000

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     85.685    2266.000      18.613     562.197       1.000       1.000       0.980
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     70.453    2176.575       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  65916.203   67234.383       2.502     513.330     205.183     401.059       1.955

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   276.75    -0.10   276.75     0.24   365.82
 MEAN    16.97     0.00    -0.02   276.75    -0.10   276.75     0.24
 HUB     14.32     0.00    -0.02   276.75    -0.10   276.75     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.00    46.36     7.64   380.86   470.87    17.88   555.80     0.41
 MEAN    50.50    43.80     6.70   335.59   435.06    17.88   555.80     0.38
 HUB     45.67    37.84     7.83   283.17   396.02    17.88   555.80     0.34

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000
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         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   335.77   167.53   290.99  1163.73      0.29
MEAN    16.57   341.47   176.60   292.26  1162.62      0.29
HUB     13.89   367.54   220.90   293.75  1161.48      0.32

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    373.34   356.42   205.82     0.31  3164.77
MEAN   327.74   329.03   151.14     0.28  2928.59     1.44
HUB    274.67   298.63    53.76     0.26  3069.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.70     1.06    18.59   572.24     1.02   562.83     0.92     0.91
MEAN    19.61     1.05    18.47   571.50     1.02   561.76     0.92     0.91
HUB     19.66     1.06    18.34   571.94     1.02   560.66     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     29.93    35.27    31.50     3.77     0.93     0.30     2.90
MEAN    31.14    27.35    23.50     3.85     0.93     0.30     3.29     0.91
HUB     36.94    10.37     6.50     3.87     0.93     0.32     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     337.395     177.594     286.872    1163.270       0.290       0.048

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.646      18.530     562.390      46.000      31.761      32.400       0.639

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     301.325     177.594     349.766    1165.258       0.259       0.237

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.644      18.750     564.313     456.573       0.011       0.327

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    16.096     286.894       0.000     286.894    1165.989       0.246       0.230

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      18.804     565.022       0.000       0.060       0.037       0.282

   STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      19.614       1.054     571.894       9.697     249.537       1.934

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  60406.645       0.433     292.498  768482.250


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.996

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     85.685    2266.000      19.614     571.894       1.000       1.000       0.980
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     67.431    2158.043       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  65916.203   67234.383       2.595     509.668     196.383     390.276       1.987

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     18.32     0.00    -0.02   268.50    -0.09   268.50     0.23   345.00
MEAN    15.91     0.00    -0.02   268.50    -0.09   268.50     0.23
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 HUB     13.07     0.00    -0.02   268.50    -0.09   268.50     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     53.46    47.36     6.10   362.27   451.00    18.90   565.88     0.39
 MEAN    49.54    44.80     4.74   314.67   413.72    18.90   565.88     0.35
 HUB     43.92    38.84     5.08   258.45   372.74    18.90   565.88     0.32

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   321.39   153.16   282.55  1173.14     0.27
 MEAN    15.50   325.07   158.53   283.79  1171.99     0.28
 HUB     12.59   346.31   196.43   285.22  1170.82     0.30

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   347.09   201.60     0.30  2749.34
 MEAN   306.46   320.04   147.93     0.27  2458.27     1.41
 HUB    248.96   290.01    52.53     0.25  2474.23

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.58     1.05    19.54   580.62     1.02   572.00     0.92     0.91
 MEAN    20.48     1.04    19.41   579.70     1.01   570.88     0.92     0.91
 HUB     20.48     1.04    19.28   579.75     1.01   569.74     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     28.46    35.51    31.50     4.01     0.93     0.29     2.90
 MEAN    29.19    27.53    23.50     4.03     0.92     0.28     3.34     0.91
 HUB     34.56    10.44     6.50     3.94     0.92     0.29     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.996

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     328.464     161.435     286.055    1172.134       0.280      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.493      19.404     571.016      46.000      29.438      33.000       3.562

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     303.495     161.435     343.759    1173.485       0.259       0.134

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.488      19.555     572.333     440.827       0.025       0.299

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     284.790       0.000     284.790    1174.427       0.242       0.220

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.648     573.252       0.000       0.060       0.041       0.217

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      20.469       1.044     580.023       8.128     279.537       2.167

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   50641.680       0.402     245.215  810467.938

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     356307.34   1725.2952     83.7060      1.3550      0.8316     13.0194      1.1094


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
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*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 60%  Stat 2 35% Ice Block 8-31-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  0.966

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      82.317    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   37.41694

    W cor      RPM cor        GAMMA       Cp          R           Blades       THK
      80.416    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   63325.230   64591.602       3.551     831.557     234.188     619.754       2.646

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   185.28    -0.06   185.28     0.17   406.33
  MEAN    17.06     0.00    -0.02   185.28    -0.06   185.28     0.17
  HUB     12.51     0.00    -0.02   185.28    -0.06   185.28     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     65.58    50.47    15.11   407.95   448.11    14.82   519.94     0.40
  MEAN    61.23    47.20    14.03   337.36   384.95    14.82   519.94     0.34
  HUB     53.17    38.62    14.55   247.38   309.13    14.82   519.94     0.28

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   370.79   272.24   251.74  1128.47     0.33
  MEAN    18.04   377.90   279.72   254.10  1126.05     0.34
  HUB     15.00   412.59   322.33   257.56  1122.89     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   285.99   135.71     0.25  5617.60
  MEAN   356.65   265.49    76.94     0.24  5046.04     1.66
  HUB    296.62   258.84    25.71     0.23  4835.73

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     16.76     1.11    15.55   540.65     1.03   529.17     0.92     0.88
  MEAN    16.58     1.10    15.34   538.84     1.03   526.91     0.92     0.88
  HUB     16.52     1.09    15.05   538.17     1.03   523.95     0.92     0.88

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     47.24    28.33    24.20     4.13     0.93     0.47     2.90
  MEAN    47.75    16.85    12.70     4.15     0.95     0.42     3.51     0.88
  HUB     51.37    -5.70    -9.30     3.60     0.95     0.28     4.78


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.966

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      18.071     381.639     279.172     260.213    1126.210       0.339      -0.001

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      16.607      15.337     527.057      24.000      47.013      35.400     -11.613

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      18.071     278.271     279.172     394.172    1132.281       0.246       0.450

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      16.583      15.900     532.754     528.796       0.028       0.564

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     18.083     259.620       0.000     259.620    1133.171       0.229       0.449

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.924     533.592       0.000       0.060       0.078       0.468

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.826      16.518       1.093     539.222      16.412     175.209       1.358

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 102177.656       0.614     475.312  779103.000


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  0.974

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     82.317    2266.000      16.518     539.222       1.000       1.000       0.980
W Kg/sec =   37.41694

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     74.693    2222.462       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63325.230   64591.602       2.715     590.487     217.522     474.134       2.180

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   248.67    -0.09   248.67     0.22   398.55
 MEAN    18.08     0.00    -0.02   248.67    -0.09   248.67     0.22
 HUB     15.21     0.00    -0.02   248.67    -0.09   248.67     0.22

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     58.54    46.36    12.18   406.37   476.49    15.97   534.06     0.42
 MEAN    55.18    42.30    12.88   357.49   435.54    15.97   534.06     0.38
 HUB     50.43    37.84    12.59   300.77   390.32    15.97   534.06     0.34

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   342.35   219.57   262.67  1143.81     0.30
 MEAN    18.01   344.46   220.69   264.48  1141.98     0.30
 HUB     15.22   367.71   253.29   266.56  1140.12     0.32

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   320.83   184.22     0.28  4485.43
 MEAN   356.14   297.15   135.45     0.26  3976.14     1.61
 HUB    301.03   270.80    47.74     0.24  3857.12

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.92     1.08    16.83   553.47     1.03   543.68     0.92     0.89
 MEAN    17.75     1.07    16.67   551.85     1.02   541.94     0.92     0.89
 HUB     17.71     1.07    16.48   551.47     1.02   540.18     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.89    35.04    31.50     3.54     0.93     0.41     2.90
 MEAN    39.84    27.12    23.50     3.62     0.94     0.39     3.30     0.89
 HUB     43.54    10.15     6.50     3.65     0.94     0.39     3.92


  blockage3   Cor/U1    Cor/Incid
     0.600       1.000       0.974

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	506.998	221.308	456.147	1130.172	0.449	-1.040

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.783	15.486	530.796	46.000	25.881	30.600	4.719

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	467.132	221.308	516.903	1133.619	0.412	-0.752

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.600	17.770	15.807	534.039	317.610	0.021	0.239

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	460.044	0.000	460.044	1134.202	0.406	0.313

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.600	15.841	534.588	0.000	0.060	0.044	-0.723

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.858	17.744	1.074	552.263	13.041	203.197	1.575

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
81209.250	0.498	377.771	712383.812

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =14.028 EfDer = 0.888

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
82.317	2266.000	17.744	552.263	1.000	1.000	0.630

W Kg/sec = 37.41694

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
70.367	2196.064	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
63325.230	64591.602	1.711	350.665	204.928	271.233	1.324

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	416.42	-0.14	416.42	0.37	384.62
MEAN	17.74	0.00	-0.02	416.42	-0.14	416.42	0.37	
HUB	15.05	0.00	-0.02	416.42	-0.14	416.42	0.37	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	43.63	46.36	-2.73	396.88	575.35	16.17	537.78	0.51
MEAN	40.12	43.40	-3.28	350.77	544.56	16.17	537.78	0.48
HUB	35.57	38.84	-3.27	297.61	511.92	16.17	537.78	0.45

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	327.07	179.31	273.54	1155.23	0.28
MEAN	17.51	332.44	187.23	274.71	1154.01	0.29
HUB	14.85	358.52	228.55	276.23	1152.83	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	346.34	212.43	0.30	3554.95	
MEAN	346.18	317.38	158.96	0.28	3280.28	1.82
HUB	293.65	283.80	65.10	0.25	3396.16	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.79	1.06	17.77	563.55	1.02	554.62	0.92	0.81
MEAN	18.71	1.05	17.66	562.68	1.02	553.45	0.92	0.81
HUB	18.75	1.06	17.53	563.05	1.02	552.31	0.92	0.81

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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.25    37.83    31.50     6.33     0.93     0.45     2.90
 MEAN    34.28    30.06    23.50     6.56     0.89     0.47     3.28     0.81
 HUB     39.60    13.26     6.50     6.76     0.89     0.50     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.888

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     335.925     188.457     278.081    1154.242       0.291       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.739      17.668     553.669      46.000      34.126      31.500      -2.626

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     288.391     188.457     344.508    1156.822       0.249       0.263

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.737      17.943     556.147     471.992       0.012       0.354

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121     280.233       0.000     280.233    1157.225       0.242       0.265

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.958     556.535       0.000       0.060       0.039       0.277

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.779      18.707       1.054     563.093      10.830     232.910       1.806

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  67449.117       0.440     313.761 1155569.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  0.998

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     82.317    2266.000      18.707     563.093       1.000       1.000       0.980
W Kg/sec =   37.41694

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     67.395    2174.844       1.402       0.249      53.349      56.000       0.050

   CFM        SCFM           A1/A*       Area1        A*      AthrRotor  ChokeMargin
  63325.230   64591.602       2.615     513.330     196.275     401.059       2.043

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   264.27    -0.09   264.27     0.23   365.53
 MEAN    16.97     0.00    -0.02   264.27    -0.09   264.27     0.23
 HUB     14.32     0.00    -0.02   264.27    -0.09   264.27     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.25    46.36     8.89   380.86   463.64    18.04   557.26     0.40
 MEAN    51.79    43.80     7.99   335.59   427.22    18.04   557.26     0.37
 HUB     46.99    37.84     9.15   283.17   387.39    18.04   557.26     0.33

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   329.31   177.27   277.52  1165.62     0.28
 MEAN    16.57   333.95   183.71   278.88  1164.37     0.29
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HUB     13.89   358.63   223.54   280.44  1163.09     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    373.34   339.80   196.08     0.29  3348.55
MEAN   327.74   313.88   144.04     0.27  3046.26     1.48
HUB    274.67   285.06    51.13     0.25  3106.28

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.86     1.06    18.79   573.72     1.02   564.67     0.92     0.91
MEAN    19.75     1.06    18.65   572.76     1.02   563.45     0.92     0.91
HUB     19.77     1.06    18.51   572.95     1.02   562.22     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.57    35.24    31.50     3.74     0.93     0.33     2.90
MEAN    33.37    27.32    23.50     3.82     0.93     0.33     3.29     0.91
HUB     38.56    10.33     6.50     3.83     0.93     0.34     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     330.282     184.739     273.785    1164.973       0.284       0.047

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.783      18.707     564.039      46.000      34.010      32.400      -1.610

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     287.209     184.739     341.493    1167.264       0.246       0.275

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.781      18.964     566.260     456.573       0.011       0.360

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     273.532       0.000     273.532    1167.924       0.234       0.265

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.010     566.900       0.000       0.060       0.037       0.315

    STAGE EXIT CONDITIONS, STAGE            4
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.878      19.751       1.056     573.148      10.055     237.309       1.840

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  62634.797       0.449     291.366  735514.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     82.317    2266.000      19.751     573.148       1.000       1.000       0.980
W Kg/sec =   37.41694

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     64.401    2155.683       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63325.230   64591.602       2.717     509.668     187.559     390.276       2.081

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   256.09    -0.09   256.09     0.22   344.62
 MEAN    15.91     0.00    -0.02   256.09    -0.09   256.09     0.22
 HUB     13.07     0.00    -0.02   256.09    -0.09   256.09     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
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TIP     54.75    47.36     7.39   362.27   443.72    19.10   567.67     0.38
MEAN    50.87    44.80     6.07   314.67   405.78    19.10   567.67     0.35
HUB     45.27    38.84     6.43   258.45   363.90    19.10   567.67     0.31

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500      0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     17.94   314.63   163.03   269.10  1175.37     0.27
MEAN    15.50   317.18   165.74   270.43  1174.07     0.27
HUB     12.59   337.02   199.11   271.91  1172.76     0.29

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    354.76   330.41   191.73     0.28  2926.37
MEAN   306.46   304.85   140.72     0.26  2569.98     1.46
HUB    248.96   276.44    49.85     0.24  2507.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     20.79     1.05    19.78   582.44     1.02   574.17     0.92     0.91
MEAN    20.66     1.05    19.64   581.31     1.01   572.91     0.92     0.91
HUB     20.64     1.05    19.49   581.11     1.01   571.63     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     31.21    35.47    31.50     3.97     0.93     0.32     2.90
MEAN    31.50    27.49    23.50     3.99     0.93     0.31     3.34     0.91
HUB     36.21    10.39     6.50     3.89     0.93     0.31     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     320.599     168.780     272.575    1174.203       0.273      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.677      19.632     573.036      46.000      31.766      33.000       1.234

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     288.775     168.780     334.481    1175.860       0.246       0.177

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.675      19.824     574.655     440.827       0.022       0.332

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     271.063       0.000     271.063    1176.707       0.230       0.260

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.908     575.483       0.000       0.060       0.037       0.256

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.877      20.659       1.046     581.617       8.469     264.710       2.052

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   52767.410       0.419     245.465  775451.500

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     366238.22   1703.6758     80.4157      1.3675      0.8347     14.0280      1.1125


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 60%  Stat 2 35% Ice Block 8-31-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.958

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     79.082    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   35.94620

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.255    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 60836.117   62052.707       3.696     831.557     224.983     619.754       2.755

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   177.81    -0.06   177.81     0.16   406.33
 MEAN    17.06     0.00    -0.02   177.81    -0.06   177.81     0.16
 HUB     12.51     0.00    -0.02   177.81    -0.06   177.81     0.16

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     66.45    50.47    15.98   407.95   445.07    14.84   520.17     0.40
 MEAN    62.21    47.20    15.01   337.36   381.40    14.84   520.17     0.34
 HUB     54.30    38.62    15.68   247.38   304.70    14.84   520.17     0.27

      ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   367.91   277.54   241.51  1129.03     0.33
 MEAN    18.04   373.26   282.64   243.80  1126.54     0.33
 HUB     15.00   405.14   321.08   247.07  1123.37     0.36

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   274.47   130.41     0.24  5726.97
 MEAN   356.65   254.78    74.01     0.23  5098.82     1.72
 HUB    296.62   248.28    24.46     0.22  4816.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.78     1.11    15.59   541.00     1.03   529.70     0.92     0.88
 MEAN    16.59     1.10    15.37   539.01     1.03   527.37     0.92     0.88
 HUB     16.50     1.09    15.08   538.11     1.03   524.40     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     48.97    28.37    24.20     4.17     0.93     0.49     2.90
 MEAN    49.22    16.89    12.70     4.19     0.95     0.44     3.51     0.88
 HUB     52.42    -5.65    -9.30     3.65     0.95     0.31     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.958

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     376.701     282.095     249.651    1126.706       0.334       0.000

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    16.609      15.371     527.521      24.000      48.492      35.400     -13.092

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     266.773     282.095     388.260    1132.998       0.235       0.476

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.582      15.953     533.430     528.796       0.031       0.589

   VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	249.082	0.000	249.082	1133.807	0.220	0.464

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.963	534.192	0.000	0.060	0.088	0.484

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.814	16.510	1.093	539.374	16.564	170.456	1.321

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
103123.086	0.620	460.855	747667.688

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =15.012 EfDer = 0.966

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
79.082	2266.000	16.510	539.374	1.000	1.000	0.980

W Kg/sec = 35.94620

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
71.801	2222.149	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
60836.117	62052.707	2.824	590.487	209.101	474.134	2.267

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	238.62	-0.08	238.62	0.21	398.49
MEAN	18.08	0.00	-0.02	238.62	-0.08	238.62	0.21	
HUB	15.21	0.00	-0.02	238.62	-0.08	238.62	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.58	46.36	13.22	406.37	471.32	16.01	534.62	0.42
MEAN	56.28	42.30	13.98	357.49	429.88	16.01	534.62	0.38
HUB	51.58	37.84	13.74	300.77	383.99	16.01	534.62	0.34

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	339.15	226.95	252.02	1144.66	0.30
MEAN	18.01	339.90	226.07	253.82	1142.73	0.30
HUB	15.22	361.35	255.15	255.88	1140.78	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	307.88	176.84	0.27	4636.07	
MEAN	356.14	285.21	130.07	0.25	4072.95	1.66
HUB	301.03	259.96	45.88	0.23	3885.39	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.94	1.09	16.88	554.10	1.03	544.49	0.92	0.88
MEAN	17.76	1.08	16.70	552.31	1.02	542.66	0.92	0.88
HUB	17.70	1.07	16.51	551.71	1.02	540.81	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	42.00	35.06	31.50	3.56	0.93	0.43	2.90	
MEAN	41.69	27.13	23.50	3.63	0.95	0.42	3.30	0.88
HUB	44.92	10.17	6.50	3.67	0.95	0.41	3.92	

blockage3	Cor/U1	Cor/Incid
0.600	1.000	0.966

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	491.036	226.702	435.572	1132.058	0.434	-0.972

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.793	15.632	532.570	46.000	27.496	30.600	3.104

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	445.314	226.702	499.698	1135.852	0.392	-0.640

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.600	17.783	15.993	536.146	317.610	0.019	0.261

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	438.611	0.000	438.611	1136.376	0.386	0.354

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.600	16.023	536.641	0.000	0.060	0.040	-0.613

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.855	17.760	1.076	552.707	13.333	195.771	1.518

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
83027.117	0.509	371.046	682932.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =15.012 EfDer = 0.915

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
79.082	2266.000	17.760	552.707	1.000	1.000	0.630

W Kg/sec = 35.94620

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
67.569	2195.183	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
60836.117	62052.707	1.782	350.665	196.779	271.233	1.378

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	397.65	-0.14	397.65	0.35	384.46
MEAN	17.74	0.00	-0.02	397.65	-0.14	397.65	0.35	
HUB	15.05	0.00	-0.02	397.65	-0.14	397.65	0.35	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	44.95	46.36	-1.41	396.88	561.91	16.32	539.50	0.49
MEAN	41.43	43.40	-1.97	350.77	530.34	16.32	539.50	0.47
HUB	36.82	38.84	-2.02	297.61	496.77	16.32	539.50	0.44

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	322.76	189.23	261.47	1156.58	0.28
MEAN	17.51	326.97	194.64	262.73	1155.22	0.28
HUB	14.85	351.55	231.84	264.28	1153.88	0.30

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	330.72	202.51	0.29	3751.33	
MEAN	346.18	303.30	151.55	0.26	3409.88	1.86
HUB	293.65	271.41	61.82	0.24	3444.82	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.90	1.06	17.91	564.62	1.02	555.92	0.92	0.84
MEAN	18.80	1.06	17.78	563.53	1.02	554.61	0.92	0.84
HUB	18.81	1.06	17.63	563.65	1.02	553.33	0.92	0.84

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.89	37.76	31.50	6.26	0.93	0.47	2.90	

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 MEAN    36.53    29.98    23.50     6.48     0.89     0.48     3.28     0.84
 HUB     41.26    13.17     6.50     6.67     0.89     0.51     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.915

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     330.312     195.916     265.938    1155.441       0.286        0.007

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.825      17.785     554.822      46.000      36.379      31.500      -4.879

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     17.392     275.462     195.916     338.027    1158.326       0.238        0.302

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.821      18.094     557.597     471.992       0.014        0.388

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     17.121     267.765       0.000     267.765    1158.689       0.231        0.297

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      18.102     557.946       0.000       0.060       0.045        0.309

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.801       18.788       1.058     563.933      11.226     221.544        1.717

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  69918.797       0.456     312.465 1102908.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.995

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     79.082     2266.000       18.788     563.933       1.000        1.000        0.980
W Kg/sec =   35.94620

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     64.515     2173.223        1.402       0.249      53.349       56.000        0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  60836.117   62052.707        2.732     513.330     187.889     401.059        2.135

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa     C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00    -0.02   252.59     -0.09   252.59      0.22   365.25
 MEAN    16.97      0.00    -0.02   252.59     -0.09   252.59      0.22
 HUB     14.32      0.00    -0.02   252.59     -0.09   252.59      0.22

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     56.45     46.36    10.09   380.86    457.08     18.18    558.61      0.39
 MEAN    53.04     43.80     9.24   335.59    420.09     18.18    558.61      0.36
 HUB     48.28     37.84    10.44   283.17    379.52     18.18    558.61      0.33

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88    323.91    186.22    265.03   1167.34      0.28
 MEAN    16.57    327.40    190.27    266.43   1165.96      0.28
 HUB     13.89    350.54    225.92    268.03   1164.56      0.30

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
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 TIP    373.34   324.43   187.13     0.28  3517.45
 MEAN   327.74   299.81   137.47     0.26  3154.95     1.53
 HUB    274.67   272.43    48.74     0.23  3139.33

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.00     1.06    18.95   575.10     1.02   566.34     0.92     0.91
 MEAN    19.87     1.06    18.81   573.95     1.02   565.00     0.92     0.91
 HUB     19.86     1.06    18.65   573.90     1.02   563.64     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     35.09    35.22    31.50     3.72     0.93     0.36     2.90
 MEAN    35.53    27.29    23.50     3.79     0.93     0.35     3.29     0.91
 HUB     40.13    10.31     6.50     3.81     0.93     0.36     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     324.113     191.337     261.609    1166.525       0.278       0.045

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.899      18.859     565.545      46.000      36.181      32.400      -3.781

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     274.125     191.337     334.297    1169.097       0.234       0.311

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.896      19.148     568.042     456.573       0.012       0.393

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     261.172       0.000     261.172    1169.693       0.223       0.296

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.185     568.621       0.000       0.060       0.041       0.344

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.874      19.864       1.057     574.316      10.384     226.474       1.756

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  64682.688       0.464     289.065  704211.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =15.012   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     79.082    2266.000      19.864     574.316       1.000       1.000       0.980
W Kg/sec =   35.94620

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     61.580    2153.488       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  60836.117   62052.707       2.842     509.668     179.345     390.276       2.176

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   244.59    -0.08   244.59     0.21   344.27
 MEAN    15.91     0.00    -0.02   244.59    -0.08   244.59     0.21
 HUB     13.07     0.00    -0.02   244.59    -0.08   244.59     0.21

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     55.98    47.36     8.62   362.27   437.18    19.27   569.32     0.37
 MEAN    52.15    44.80     7.35   314.67   398.62    19.27   569.32     0.34
 HUB     46.59    38.84     7.75   258.45   355.90    19.27   569.32     0.30
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      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   309.05   172.02   256.75  1177.38     0.26
 MEAN    15.50   310.38   172.35   258.12  1175.96     0.26
 HUB     12.59   328.67   201.53   259.64  1174.53     0.28

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   315.14   182.73     0.27  3087.60
 MEAN   306.46   290.88   134.10     0.25  2672.43     1.51
 HUB    248.96   263.94    47.43     0.22  2538.33

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.97     1.06    19.99   584.12     1.02   576.14     0.92     0.91
 MEAN    20.82     1.05    19.83   582.80     1.01   574.76     0.92     0.91
 HUB     20.77     1.05    19.67   582.37     1.01   573.36     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     33.82    35.44    31.50     3.94     0.93     0.35     2.90
 MEAN    33.73    27.45    23.50     3.95     0.93     0.33     3.34     0.91
 HUB     37.82    10.35     6.50     3.85     0.93     0.33     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      313.840     175.515     260.173     1176.081       0.267       -0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     20.830      19.823      574.874       46.000      34.004      33.000      -1.004

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      275.304     175.515     326.494     1178.018       0.234       0.218

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       20.829      20.051     576.769     440.827       0.021       0.365

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701      258.506       0.000     258.506    1178.782       0.219       0.296

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       20.126     577.518       0.000       0.060       0.037       0.292

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4        Pt4          PR4        Texit         Del T        Ns         Ns nondim
      0.880       20.812       1.048      583.097       8.780      251.796       1.952

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   54705.605       0.435     244.478  742248.125

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
     375457.28   1677.9093      77.2548      1.3777       0.8344      15.0123       1.1153


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60%  Stat 2 35% Ice Block 8-31-2011
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.950

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     75.973    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   34.53327

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     74.218    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 58444.840   59613.613       3.847     831.557     216.140     619.754       2.867

    ROTOR LEADING EDGE CONDITIONS, STAGE            1

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.63     0.00    -0.02   170.65    -0.06   170.65     0.15   406.33
MEAN    17.06     0.00    -0.02   170.65    -0.06   170.65     0.15
HUB     12.51     0.00    -0.02   170.65    -0.06   170.65     0.15

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     67.30    50.47    16.83   407.95   442.26    14.86   520.38     0.40
MEAN    63.17    47.20    15.97   337.36   378.11    14.86   520.38     0.34
HUB     55.41    38.62    16.79   247.38   300.58    14.86   520.38     0.27

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   365.41   282.51   231.77  1129.54     0.32
MEAN    18.04   369.02   285.36   233.97  1126.99     0.33
HUB     15.00   398.17   319.90   237.07  1123.81     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    407.95   263.54   125.44     0.23  5829.34
MEAN   356.65   244.59    71.29     0.22  5147.82     1.78
HUB    296.62   238.21    23.28     0.21  4799.24

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.79     1.11    15.62   541.33     1.04   530.17     0.92     0.87
MEAN    16.59     1.10    15.40   539.16     1.03   527.79     0.92     0.87
HUB     16.49     1.09    15.11   538.06     1.03   524.81     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     50.63    28.42    24.20     4.22     0.93     0.51     2.90
MEAN    50.65    16.95    12.70     4.25     0.95     0.46     3.51     0.87
HUB     53.46    -5.61    -9.30     3.69     0.95     0.33     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.950

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     372.173     284.809     239.576    1127.159       0.330       0.000

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.610      15.400     527.946      24.000      49.930      35.400     -14.530

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     255.829     284.809     382.837    1133.655       0.226       0.501

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.579      16.001     534.049     528.796       0.034       0.613

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     239.034       0.000     239.034    1134.392       0.211       0.479
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.997	534.743	0.000	0.060	0.097	0.498

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.802	16.501	1.092	539.515	16.705	165.927	1.286

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
104003.922	0.625	446.521	717563.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =15.972 EfDer = 0.958

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
75.973	2266.000	16.501	539.515	1.000	1.000	0.980

W Kg/sec = 34.53327

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
69.027	2221.858	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
58444.840	59613.613	2.937	590.487	201.025	474.134	2.359

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	229.03	-0.08	229.03	0.20	398.44
MEAN	18.08	0.00	-0.02	229.03	-0.08	229.03	0.20	
HUB	15.21	0.00	-0.02	229.03	-0.08	229.03	0.20	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.60	46.36	14.24	406.37	466.53	16.04	535.13	0.41
MEAN	57.36	42.30	15.06	357.49	424.63	16.04	535.13	0.37
HUB	52.72	37.84	14.88	300.77	378.11	16.04	535.13	0.33

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	336.50	233.89	241.92	1145.44	0.29
MEAN	18.01	335.86	231.14	243.68	1143.42	0.29
HUB	15.22	355.43	256.84	245.70	1141.39	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	295.62	169.91	0.26	4777.69	
MEAN	356.14	273.87	125.00	0.24	4164.18	1.71
HUB	301.03	249.64	44.19	0.22	3911.00	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.96	1.09	16.92	554.69	1.03	545.23	0.92	0.88
MEAN	17.77	1.08	16.74	552.74	1.02	543.32	0.92	0.88
HUB	17.69	1.07	16.54	551.94	1.02	541.39	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	44.03	35.08	31.50	3.58	0.93	0.45	2.90	
MEAN	43.49	27.16	23.50	3.66	0.95	0.44	3.30	0.88
HUB	46.27	10.20	6.50	3.70	0.95	0.43	3.92	

blockage3	Cor/U1	Cor/Incid
0.600	1.000	0.958

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	476.505	231.785	416.332	1133.745	0.420	-0.908

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.798	15.759	534.160	46.000	29.106	30.600	1.494

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	425.024	231.785	484.117	1137.851	0.374	-0.535

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.600	17.790	16.155	538.036	317.610	0.017	0.284

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	418.689	0.000	418.689	1138.322	0.368	0.392

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.600	16.181	538.482	0.000	0.060	0.037	-0.511

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.850	17.768	1.077	553.122	13.607	188.898	1.464

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
84730.938	0.520	363.776	654816.250

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =15.972 EfDer = 0.939

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
75.973	2266.000	17.768	553.122	1.000	1.000	0.630

W Kg/sec = 34.53327

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
64.906	2194.359	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
58444.840	59613.613	1.855	350.665	189.025	271.233	1.435

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	380.11	-0.13	380.11	0.33	384.32
MEAN	17.74	0.00	-0.02	380.11	-0.13	380.11	0.33	
HUB	15.05	0.00	-0.02	380.11	-0.13	380.11	0.33	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.25	46.36	-0.11	396.88	549.63	16.45	541.06	0.48
MEAN	42.71	43.40	-0.69	350.77	517.32	16.45	541.06	0.45
HUB	38.07	38.84	-0.77	297.61	482.84	16.45	541.06	0.42

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	319.34	198.54	250.12	1157.81	0.28
MEAN	17.51	322.32	201.64	251.46	1156.31	0.28
HUB	14.85	345.24	234.88	253.03	1154.84	0.30

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	316.05	193.20	0.27	3935.64	
MEAN	346.18	290.05	144.55	0.25	3532.31	1.90
HUB	293.65	259.77	58.77	0.22	3489.93	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.00	1.07	18.02	565.62	1.02	557.10	0.92	0.86
MEAN	18.87	1.06	17.88	564.34	1.02	555.66	0.92	0.86
HUB	18.86	1.06	17.72	564.20	1.02	554.25	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	38.44	37.68	31.50	6.18	0.93	0.49	2.90	
MEAN	38.72	29.89	23.50	6.39	0.90	0.50	3.28	0.86
HUB	42.87	13.08	6.50	6.58	0.90	0.52	3.87	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.939

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392      325.537     202.961     254.522     1156.530       0.281       0.008

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     18.900      17.886      555.871      46.000      38.570       31.500      -7.070

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392      263.342     202.961     332.479     1159.707       0.227       0.340

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950       18.893      18.226      558.929      471.992       0.016       0.423

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     17.121      256.098       0.000     256.098     1160.033       0.221       0.327

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950       18.225      559.244       0.000       0.060       0.053       0.338

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.818       18.855        1.061      564.720       11.598      211.365       1.638

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  72238.273       0.471     310.142 1053378.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.989

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     75.973     2266.000       18.855      564.720       1.000        1.000        0.980
W Kg/sec =   34.53327

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     61.804     2171.708        1.402        0.249       53.349       56.000       0.050

   CFM        SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
  58444.840   59613.613        2.852      513.330      179.993      401.059       2.228

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     19.26      0.00     -0.02   241.64     -0.08   241.64      0.21    365.00
 MEAN    16.97      0.00     -0.02   241.64     -0.08   241.64      0.21
 HUB     14.32      0.00     -0.02   241.64     -0.08   241.64      0.21

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     57.61     46.36     11.25   380.86    451.12     18.29    559.85      0.39
 MEAN    54.25     43.80     10.45   335.59    413.60     18.29    559.85      0.36
 HUB     49.53     37.84     11.69   283.17    372.32     18.29    559.85      0.32

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial     THK         AeroBl      Blades2
      0.500       0.050        0.950       56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     18.88    319.46    194.53    253.41   1168.91      0.27
 MEAN    16.57    321.70    196.35    254.83   1167.42      0.28
 HUB     13.89    343.21    228.11    256.44   1165.91      0.29

       U2        W2        Wu2      MachRel2  DelRCu      Ws1/W2
 TIP    373.34    310.15    178.82      0.27   3674.27
 MEAN   327.74    286.71    131.39      0.25   3255.76       1.58
 HUB    274.67    260.64     46.56      0.22   3169.61
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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.11     1.07    19.10   576.39     1.02   567.86     0.92     0.91
 MEAN    19.97     1.06    18.94   575.06     1.02   566.42     0.92     0.91
 HUB     19.94     1.06    18.77   574.78     1.02   564.95     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     37.51    35.21    31.50     3.71     0.93     0.39     2.90
 MEAN    37.62    27.27    23.50     3.77     0.94     0.38     3.29     0.91
 HUB     41.65    10.29     6.50     3.79     0.94     0.38     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.989

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     318.774     197.458     250.254    1167.944       0.273       0.043

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.995      18.986     566.924      46.000      38.275      32.400      -5.875

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     261.962     197.458     328.046    1170.778       0.224       0.345

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.991      19.305     569.679     456.573       0.014       0.425

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     249.698       0.000     249.698    1171.316       0.213       0.323

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.332     570.203       0.000       0.060       0.048       0.370

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.865      19.955       1.058     575.408      10.688     216.763       1.680

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  66580.344       0.478     285.850  674453.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc =15.972   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     75.973    2266.000      19.955     575.408       1.000       1.000       0.980
W Kg/sec =   34.53327

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     58.948    2151.443       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  58444.840   59613.613       2.969     509.668     171.678     390.276       2.273

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   233.91    -0.08   233.91     0.20   343.95
 MEAN    15.91     0.00    -0.02   233.91    -0.08   233.91     0.20
 HUB     13.07     0.00    -0.02   233.91    -0.08   233.91     0.20

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.16    47.36     9.80   362.27   431.29    19.41   570.84     0.37
 MEAN    53.38    44.80     8.58   314.67   392.15    19.41   570.84     0.33
 HUB     47.86    38.84     9.02   258.45   348.65    19.41   570.84     0.30

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
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      0.500       0.050       0.950      56.000

          R2      C2      Cu2      Cm2     Ao2         Mach2
  TIP     17.94   304.48   180.31   245.35  1179.21     0.26
  MEAN    15.50   304.48   178.39   246.75  1177.69     0.26
  HUB     12.59   321.15   203.70   248.28  1176.15     0.27

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    354.76   301.05   174.44     0.26  3236.27
  MEAN   306.46   278.00   128.07     0.24  2765.94     1.56
  HUB    248.96   252.37    45.26     0.21  2565.66

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
  TIP     21.11     1.06    20.15   585.68     1.02   577.94     0.92     0.91
  MEAN    20.94     1.05    19.99   584.19     1.02   576.45     0.92     0.91
  HUB     20.87     1.05    19.81   583.55     1.01   574.94     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
  TIP     36.31    35.41    31.50     3.91     0.93     0.37     2.90
  MEAN    35.87    27.43    23.50     3.93     0.93     0.36     3.34     0.91
  HUB     39.37    10.33     6.50     3.83     0.93     0.35     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.997

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
      15.219     307.990     181.664     248.709    1177.795       0.261      -0.009

      Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
      20.954      19.980     576.555      46.000      36.145      33.000      -3.145

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     262.909     181.664     319.567    1179.988       0.223       0.256

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      20.951      20.238     578.703     440.827       0.022       0.397

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     246.957       0.000     246.957    1180.680       0.209       0.329

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      20.304     579.382       0.000       0.060       0.040       0.323

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.878      20.934       1.049     584.474       9.065     240.403       1.864

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   56482.867       0.449     242.499  710715.438

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     384036.34   1648.7886     74.2182      1.3857      0.8313     15.9719      1.1179


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*****************************************************************

    Fan-Core + 4 Stage LPC 60% Stat 2 40% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.999
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
111.020	2266.000	15.107	522.810	1.000	1.000	0.980

W Kg/sec = 50.46355

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
108.455	2257.076	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
85405.578	87113.516	2.633	831.557	315.845	619.754	1.962

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	252.87	-0.09	252.87	0.23	406.33
MEAN	17.06	0.00	-0.02	252.87	-0.09	252.87	0.23	
HUB	12.51	0.00	-0.02	252.87	-0.09	252.87	0.23	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.21	50.47	7.74	407.95	480.04	14.58	517.47	0.43
MEAN	53.15	47.20	5.95	337.36	421.68	14.58	517.47	0.38
HUB	44.38	38.62	5.76	247.38	353.81	14.58	517.47	0.32

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	411.69	220.75	347.51	1122.00	0.37
MEAN	18.04	430.43	250.77	349.84	1120.48	0.38
HUB	15.00	485.97	332.06	354.83	1117.48	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	407.95	394.72	187.20	0.35	4555.88	
MEAN	356.65	365.52	105.89	0.33	4524.33	1.29
HUB	296.62	356.59	35.44	0.32	4982.04	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.48	1.09	15.02	537.28	1.03	523.13	0.92	0.91
MEAN	16.47	1.09	14.88	537.18	1.03	521.71	0.92	0.91
HUB	16.62	1.10	14.59	538.64	1.03	518.91	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.43	28.31	24.20	4.11	0.93	0.26	2.90	
MEAN	35.63	16.84	12.70	4.14	0.92	0.22	3.51	0.91
HUB	43.10	-5.70	-9.30	3.60	0.92	0.10	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	437.269	250.280	358.559	1120.504	0.390	-0.010

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
16.507	14.859	521.730	24.000	34.916	35.400	0.484

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	387.069	250.280	460.937	1124.210	0.344	0.218

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.498	15.197	525.186	528.796	0.015	0.370

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	358.919	0.000	358.919	1126.085	0.319	0.284

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.341	526.940	0.000	0.060	0.037	0.303

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    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.875      16.462       1.090     537.700      14.890     220.181       1.707

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  92703.586       0.557     581.607 1063300.500


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.020    2266.000      16.462     537.700       1.000       1.000       0.980
W Kg/sec =   50.46355

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    100.937    2225.604       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 85405.578   87113.516       2.009     590.487     293.951     474.134       1.613

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   343.01    -0.12   343.01     0.30   399.11
 MEAN    18.08     0.00    -0.02   343.01    -0.12   343.01     0.30
 HUB     15.21     0.00    -0.02   343.01    -0.12   343.01     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.84    46.36     3.48   406.37   531.87    15.44   527.87     0.47
 MEAN    46.19    42.30     3.89   357.49   495.52    15.44   527.87     0.44
 HUB     41.26    37.84     3.42   300.77   456.28    15.44   527.87     0.40

      ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   394.14   145.72   366.21  1133.78     0.35
 MEAN    18.01   403.27   166.92   367.11  1133.24     0.36
 HUB     15.22   436.41   233.88   368.45  1132.64     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   448.02   258.08     0.40  2977.93
 MEAN   356.14   413.01   189.22     0.36  3008.30     1.29
 HUB    301.03   374.52    67.15     0.33  3562.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.40     1.06    16.00   547.16     1.02   534.18     0.92     0.91
 MEAN    17.41     1.06    15.95   547.25     1.02   533.67     0.92     0.91
 HUB     17.58     1.07    15.87   549.01     1.02   533.11     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.70    35.17    31.50     3.67     0.93     0.20     2.90
 MEAN    24.45    27.27    23.50     3.77     0.92     0.22     3.30     0.91
 HUB     32.41    10.33     6.50     3.83     0.92     0.24     3.92


  blockage3   Cor/U1    Cor/Incid
     0.550       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     830.921     167.385     813.887    1086.054       0.765      -2.696

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.447      11.837     490.148      46.000      11.621      30.600      18.979

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     890.595     167.385     906.188    1076.599       0.827      -3.214
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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.550      17.305      11.041     481.578     289.961       0.103      -0.005

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     891.049       0.000     891.049    1077.060       0.827      -0.645

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.550      10.854     481.569       0.000       0.060       0.294      -3.337

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.506      17.014       1.034     547.809      10.109     288.894       2.239

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  62946.453       0.386     394.915  984160.938


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  1.144

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.020    2266.000      17.014     547.809       1.000       1.000       0.580
W Kg/sec =   50.46355

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     98.573    2204.975       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85405.578   87113.516       1.125     322.834     287.073     248.585       0.866

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   728.80    -0.25   728.80     0.66   386.18
 MEAN    17.74     0.00    -0.02   728.80    -0.25   728.80     0.66
 HUB     15.05     0.00    -0.02   728.80    -0.25   728.80     0.66

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     28.59    46.36   -17.77   396.88   829.98    12.67   503.46     0.75
 MEAN    25.72    43.40   -17.68   350.77   808.93    12.67   503.46     0.73
 HUB     22.23    38.84   -16.61   297.61   787.32    12.67   503.46     0.72

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   402.37    67.78   396.62  1138.39     0.35
 MEAN    17.51   407.71   103.29   394.41  1139.57     0.36
 HUB     14.85   434.71   188.31   391.81  1140.88     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   512.11   323.96     0.45  1347.71
 MEAN   346.18   463.20   242.90     0.41  1812.68     1.80
 HUB    293.65   405.72   105.34     0.36  2800.18

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.50     1.03    16.05   552.09     1.01   538.57     0.92     1.05
 MEAN    17.68     1.04    16.18   553.57     1.01   539.68     0.92     1.05
 HUB     18.04     1.06    16.32   556.70     1.02   540.92     0.92     1.05

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP      9.70    39.24    31.50     7.74     0.93     0.40     2.90
 MEAN    14.68    31.63    23.50     8.13     0.79     0.45     3.28     1.05
 HUB     25.67    15.05     6.50     8.55     0.79     0.52     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       1.144
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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     412.393     103.967     399.072    1139.812       0.362       0.009

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.727      16.192     539.917      46.000      14.602      31.500      16.898

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     420.825     103.967     433.478    1139.192       0.369      -0.066

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.674      16.082     539.330     471.992       0.044       0.090

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     410.087       0.000     410.087    1139.979       0.360      -0.084

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.061     540.076       0.000       0.060       0.113      -0.079

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.798      17.566       1.032     554.118       6.310     443.356       3.437

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  39294.582       0.256     246.528 1966822.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.900

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    111.020    2266.000      17.566     554.118       1.000       1.000       0.980
W Kg/sec =   50.46355

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     96.026    2192.385       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85405.578   87113.516       1.836     513.330     279.658     401.059       1.434

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   385.02    -0.13   385.02     0.34   368.47
 MEAN    16.97     0.00    -0.02   385.02    -0.13   385.02     0.34
 HUB     14.32     0.00    -0.02   385.02    -0.13   385.02     0.34

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     44.70    46.36    -1.66   380.86   541.66    16.23   541.74     0.47
 MEAN    41.09    43.80    -2.71   335.59   510.83    16.23   541.74     0.45
 HUB     36.35    37.84    -1.49   283.17   478.02    16.23   541.74     0.42

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2      C2       Cu2      Cm2     Ao2          Mach2
 TIP     18.88   420.62    78.28   413.27  1144.15      0.37
 MEAN    16.57   427.34   111.79   412.46  1144.91      0.37
 HUB     13.89   457.13   196.85   412.58  1145.53      0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   507.79   295.07     0.44  1480.45
 MEAN   327.74   465.57   215.95     0.41  1855.02     1.17
 HUB    274.67   419.86    77.82     0.37  2736.08

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.00     1.02    16.39   558.82     1.01   544.05     0.92     0.82
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 MEAN    18.11     1.03    16.45   560.01     1.01   544.76     0.92     0.82
 HUB     18.37     1.05    16.46   562.81     1.02   545.36     0.92     0.82

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     10.73    35.53    31.50     4.03     0.93     0.09     2.90
 MEAN    15.16    27.64    23.50     4.14     0.89     0.12     3.29     0.82
 HUB     25.51    10.68     6.50     4.18     0.89     0.17     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.900

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     419.620     112.417     404.281    1146.034       0.366       0.052

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.141      16.535     545.842      46.000      15.539      32.400      16.861

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     431.264     112.417     445.675    1145.166       0.377      -0.022

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.082      16.394     545.015     456.573       0.044       0.110

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     411.336       0.000     411.336    1146.638       0.359      -0.059

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.433     546.417       0.000       0.060       0.113       0.001

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.555      17.964       1.023     560.545       6.427     400.764       3.107

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  40026.066       0.287     251.117 1034781.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 5.953   EfDer =  0.841

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
    111.020    2266.000      17.964     560.545       1.000       1.000       0.980
W Kg/sec =   50.46355

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     94.442    2179.781       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  85405.578   87113.516       1.853     509.668     275.049     390.276       1.419

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   383.13    -0.13   383.13     0.33   348.48
 MEAN    15.91     0.00    -0.02   383.13    -0.13   383.13     0.33
 HUB     13.07     0.00    -0.02   383.13    -0.13   383.13     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     43.41    47.36    -3.95   362.27   527.38    16.63   548.29     0.46
 MEAN    39.41    44.80    -5.39   314.67   495.88    16.63   548.29     0.43
 HUB     34.02    38.84    -4.82   258.45   462.23    16.63   548.29     0.40

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
```

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 TIP     17.94   416.09    57.55   412.10  1149.72     0.36
 MEAN    15.50   420.84    89.11   411.30  1150.53     0.37
 HUB     12.59   445.47   170.64   411.49  1151.21     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   508.09   297.20     0.44  1034.91
 MEAN   306.46   465.19   217.35     0.40  1383.06     1.14
 HUB    248.96   418.87    78.32     0.36  2150.14

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.25     1.02    16.67   563.83     1.01   549.38     0.92     0.77
 MEAN    18.34     1.02    16.72   564.94     1.01   550.15     0.92     0.77
 HUB     18.56     1.03    16.74   567.37     1.01   550.80     0.92     0.77

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     7.95    35.80    31.50     4.30     0.93     0.06     2.90
 MEAN    12.22   27.85    23.50     4.35     0.88     0.09     3.34     0.77
 HUB     22.52   10.78     6.50     4.28     0.88     0.14     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.841

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     424.828      90.742     415.024    1150.693       0.369       -0.014

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.350      16.700     550.312      46.000      12.333      33.000      20.667

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     450.008      90.742     459.066    1148.768       0.392       -0.199

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.205      16.376     548.472     440.827       0.107       0.082

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     420.593       0.000     420.593    1151.005       0.365       -0.086

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.556     550.610       0.000       0.060       0.135       -0.091

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.358      18.158       1.011     565.380       4.835     493.112       3.823

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  30114.404       0.239     188.933 1096868.875

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    265085.06   1663.0986    108.4552      1.2020      0.6652      5.9532      1.0814


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

   Fan-Core + 4 Stage LPC 60% Stat 2 40% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  1.000

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.993    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   49.54226
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
106.475	2257.076	1.402	0.249	53.349	32.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
83846.383	85523.125	2.682	831.557	310.079	619.754	1.999

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	248.01	-0.09	248.01	0.22	406.33
MEAN	17.06	0.00	-0.02	248.01	-0.09	248.01	0.22	
HUB	12.51	0.00	-0.02	248.01	-0.09	248.01	0.22	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.71	50.47	8.24	407.95	477.50	14.60	517.67	0.43
MEAN	53.69	47.20	6.49	337.36	418.78	14.60	517.67	0.38
HUB	44.94	38.62	6.32	247.38	350.36	14.60	517.67	0.31

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	407.83	224.69	340.35	1122.56	0.36
MEAN	18.04	425.99	252.99	342.74	1120.96	0.38
HUB	15.00	480.29	331.42	347.61	1117.94	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	407.95	386.55	183.26	0.34	4637.11	
MEAN	356.65	358.07	103.67	0.32	4564.33	1.31
HUB	296.62	349.35	34.80	0.31	4972.38	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.51	1.09	15.07	537.54	1.03	523.65	0.92	0.91
MEAN	16.49	1.09	14.92	537.31	1.03	522.15	0.92	0.91
HUB	16.61	1.10	14.63	538.61	1.03	519.34	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	33.43	28.30	24.20	4.10	0.93	0.27	2.90	
MEAN	36.43	16.83	12.70	4.13	0.93	0.23	3.51	0.91
HUB	43.63	-5.72	-9.30	3.58	0.93	0.11	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	432.581	252.495	351.244	1120.997	0.386	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
16.520	14.905	522.189	24.000	35.711	35.400	-0.311

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	378.833	252.495	455.267	1124.900	0.337	0.234

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.511	15.263	525.831	528.796	0.015	0.382

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	351.409	0.000	351.409	1126.687	0.312	0.297

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.400	527.504	0.000	0.060	0.037	0.316

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	16.475	1.091	537.818	15.008	216.767	1.680

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Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  93438.875       0.561     575.517 1042869.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  0.995

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    108.993    2266.000      16.475     537.818       1.000       1.000       0.980
W Kg/sec =   49.54226

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     99.023    2225.360       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83846.383   85523.125       2.048     590.487     288.378     474.134       1.644

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   335.90    -0.12   335.90     0.30   399.07
 MEAN    18.08     0.00    -0.02   335.90    -0.12   335.90     0.30
 HUB     15.21     0.00    -0.02   335.90    -0.12   335.90     0.30

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.43    46.36     4.07   406.37   527.31    15.49   528.39     0.47
 MEAN    46.79    42.30     4.49   357.49   490.63    15.49   528.39     0.44
 HUB     41.85    37.84     4.01   300.77   450.96    15.49   528.39     0.40

      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   388.86   151.54   358.12  1134.67     0.34
 MEAN    18.01   397.84   171.13   359.16  1134.01     0.35
 HUB     15.22   430.67   235.44   360.62  1133.29     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   438.04   252.25     0.39  3096.91
 MEAN   356.14   404.01   185.01     0.36  3084.10     1.31
 HUB    301.03   366.53    65.59     0.32  3585.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.45     1.06    16.09   547.65     1.02   535.03     0.92     0.91
 MEAN    17.45     1.06    16.02   547.61     1.02   534.39     0.92     0.91
 HUB     17.61     1.07    15.94   549.21     1.02   533.72     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     22.94    35.16    31.50     3.66     0.93     0.22     2.90
 MEAN    25.48    27.25    23.50     3.75     0.92     0.23     3.30     0.91
 HUB     33.14    10.31     6.50     3.81     0.92     0.25     3.92


  blockage3   Cor/U1    Cor/Incid
     0.550       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     798.746     171.608     780.093    1091.271       0.732      -2.542

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.489      12.242     494.875      46.000      12.407      30.600      18.193

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     840.222     171.608     857.568    1085.016       0.774      -2.919

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.550      17.362      11.674     489.200     289.961       0.095       0.025
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VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	836.185	0.000	836.185	1085.874	0.770	-0.454

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.550	11.567	489.788	0.000	0.060	0.251	-2.992

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.585	17.130	1.040	548.158	10.340	281.075	2.179

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
64386.652	0.395	396.576	964193.438

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 6.485 EfDer = 1.029

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
108.993	2266.000	17.130	548.158	1.000	1.000	0.580

W Kg/sec = 49.54226

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
96.149	2204.272	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
83846.383	85523.125	1.153	322.834	280.012	248.585	0.888

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	698.46	-0.24	698.46	0.63	386.05
MEAN	17.74	0.00	-0.02	698.46	-0.24	698.46	0.63	
HUB	15.05	0.00	-0.02	698.46	-0.24	698.46	0.63	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	29.62	46.36	-16.74	396.88	803.46	13.08	507.42	0.73
MEAN	26.68	43.40	-16.72	350.77	781.70	13.08	507.42	0.71
HUB	23.10	38.84	-15.74	297.61	759.32	13.08	507.42	0.69

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	393.72	77.12	386.09	1139.99	0.35
MEAN	17.51	400.21	110.03	384.79	1140.87	0.35
HUB	14.85	428.64	191.40	383.53	1141.86	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	498.04	314.61	0.44	1532.62	
MEAN	346.18	451.48	236.16	0.40	1930.43	1.79
HUB	293.65	396.93	102.25	0.35	2845.94	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.64	1.03	16.24	553.03	1.01	540.08	0.92	0.94
MEAN	17.77	1.04	16.32	554.29	1.01	540.91	0.92	0.94
HUB	18.08	1.06	16.40	557.20	1.02	541.85	0.92	0.94

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	11.30	39.18	31.50	7.68	0.93	0.40	2.90	
MEAN	15.96	31.54	23.50	8.04	0.80	0.44	3.28	0.94
HUB	26.52	14.93	6.50	8.43	0.80	0.51	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.029

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3

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     17.392     404.915     110.747     389.475    1141.110       0.355       0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.811      16.325     541.145      46.000      15.873      31.500      15.627

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     410.074     110.747     424.766    1140.740       0.359      -0.047

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.766      16.247     540.794     471.992       0.040       0.105

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     399.425       0.000     399.425    1141.499       0.350      -0.061

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.232     541.514       0.000       0.060       0.105      -0.056

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.731      17.668       1.031     554.836       6.678     415.927       3.224

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  41591.359       0.271     256.173 1895688.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  0.915

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    108.993    2266.000      17.668     554.836       1.000       1.000       0.980
W Kg/sec =   49.54226

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.787    2190.965       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  83846.383   85523.125       1.879     513.330     273.137     401.059       1.468

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   375.18    -0.13   375.18     0.33   368.24
 MEAN    16.97     0.00    -0.02   375.18    -0.13   375.18     0.33
 HUB     14.32     0.00    -0.02   375.18    -0.13   375.18     0.33

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     45.44    46.36    -0.92   380.86   534.71    16.40   543.08     0.47
 MEAN    41.82    43.80    -1.98   335.59   503.46    16.40   543.08     0.44
 HUB     37.06    37.84    -0.78   283.17   470.13    16.40   543.08     0.41

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   411.00    86.67   401.76  1146.14     0.36
 MEAN    16.57   418.19   117.85   401.24  1146.67     0.36
 HUB     13.89   448.16   199.07   401.52  1147.10     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   493.55   286.67     0.43  1638.82
 MEAN   327.74   452.82   209.89     0.39  1955.48     1.18
 HUB    274.67   408.57    75.60     0.36  2766.97

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.16     1.03    16.61   560.04     1.01   545.94     0.92     0.84
 MEAN    18.25     1.03    16.65   561.05     1.01   546.44     0.92     0.84
 HUB     18.50     1.05    16.65   563.62     1.02   546.85     0.92     0.84
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        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     12.17    35.51    31.50     4.01     0.93     0.10     2.90
 MEAN    16.37    27.61    23.50     4.11     0.89     0.14     3.29     0.84
 HUB     26.37    10.66     6.50     4.16     0.89     0.18     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.915

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     410.800     118.516     393.333    1147.751       0.358       0.052

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.286      16.735     547.479      46.000      16.768      32.400      15.632

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     418.852     118.516     435.296    1147.166       0.365      -0.004

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.236      16.630     546.921     456.573       0.040       0.125

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     16.096     399.377       0.000     399.377    1148.561       0.348      -0.038

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.672     548.251       0.000       0.060       0.105       0.022

    STAGE EXIT CONDITIONS, STAGE             4
      Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
      0.609       18.128       1.026     561.570       6.733     382.022       2.961

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  41935.730       0.301     258.294 1011935.875


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc = 6.485   EfDer =  0.859

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    108.993    2266.000       18.128     561.570       1.000       1.000       0.980
W Kg/sec =   49.54226

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     91.961    2177.791        1.402       0.249      53.349       56.000       0.050

   CFM        SCFM             A1/A*       Area1        A*      AthrRotor  ChokeMargin
  83846.383   85523.125        1.903     509.668     267.823     390.276       1.457

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1       Stator    Alfa      C1       CU1       Cm1     Abs MACH  U1 corrected
 TIP     18.32      0.00    -0.02   372.21    -0.13   372.21     0.32   348.16
 MEAN    15.91      0.00    -0.02   372.21    -0.13   372.21     0.32
 HUB     13.07      0.00    -0.02   372.21    -0.13   372.21     0.32

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     44.23     47.36    -3.13   362.27   519.49     16.86   550.00      0.45
 MEAN    40.22     44.80    -4.58   314.67   487.48     16.86   550.00      0.42
 HUB     34.79     38.84    -4.05   258.45   453.21     16.86   550.00      0.39

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2      Cm2      Ao2          Mach2
 TIP     17.94   404.96     66.90   399.40  1152.14      0.35
 MEAN    15.50   410.25     95.88   398.89  1152.71      0.36
 HUB     12.59   435.17    173.17   399.23  1153.18      0.38
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       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   492.33   287.86     0.43  1202.45
 MEAN   306.46   451.06   210.58     0.39  1487.97     1.15
 HUB    248.96   406.37    75.79     0.35  2181.89

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.47     1.02    16.95   565.39     1.01   551.70     0.92     0.79
 MEAN    18.55     1.02    16.99   566.29     1.01   552.24     0.92     0.79
 HUB     18.75     1.03    16.99   568.50     1.01   552.69     0.92     0.79

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     9.51    35.78    31.50     4.28     0.93     0.07     2.90
 MEAN   13.52    27.83    23.50     4.33     0.88     0.10     3.34     0.79
 HUB    23.45    10.75     6.50     4.25     0.88     0.15     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.859

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     414.109      97.639     402.434    1152.884       0.359      -0.013

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.557      16.972     552.409      46.000      13.638      33.000      19.362

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     435.186      97.639     446.005    1151.323       0.378      -0.175

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.431      16.698     550.914     440.827       0.098       0.097

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     407.043       0.000     407.043    1153.389       0.353      -0.067

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.865     552.893       0.000       0.060       0.128      -0.072

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.437      18.383       1.014     566.726       5.157     463.085       3.590

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   32120.160       0.255     197.837 1071924.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     273472.78   1684.3986    106.4752      1.2169      0.6892      6.4851      1.0840


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
****************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 60% Stat 2 40% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  1.000

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     107.227    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   48.73943

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     104.750    2257.076       1.402       0.249      53.349      32.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
82487.648	84137.219	2.726	831.557	305.054	619.754	2.032

ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	243.79	-0.08	243.79	0.22	406.33
MEAN	17.06	0.00	-0.02	243.79	-0.08	243.79	0.22	
HUB	12.51	0.00	-0.02	243.79	-0.08	243.79	0.22	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.14	50.47	8.67	407.95	475.32	14.61	517.85	0.43
MEAN	54.15	47.20	6.95	337.36	416.29	14.61	517.85	0.37
HUB	45.43	38.62	6.81	247.38	347.38	14.61	517.85	0.31

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	404.59	228.08	334.17	1123.04	0.36
MEAN	18.04	422.23	254.90	336.60	1121.36	0.38
HUB	15.00	475.37	330.81	341.38	1118.33	0.43

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	407.95	379.51	179.87	0.34	4706.94	
MEAN	356.65	351.64	101.75	0.31	4598.84	1.33
HUB	296.62	343.09	34.19	0.31	4963.23	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.53	1.09	15.11	537.76	1.03	524.09	0.92	0.91
MEAN	16.50	1.09	14.96	537.42	1.03	522.53	0.92	0.91
HUB	16.61	1.10	14.67	538.58	1.03	519.70	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	34.31	28.29	24.20	4.09	0.93	0.28	2.90	
MEAN	37.14	16.82	12.70	4.12	0.93	0.25	3.51	0.91
HUB	44.10	-5.72	-9.30	3.58	0.93	0.12	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	428.601	254.406	344.929	1121.412	0.382	-0.009

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
16.530	14.943	522.576	24.000	36.411	35.400	-1.011

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	371.745	254.406	450.463	1125.483	0.330	0.248

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.522	15.318	526.377	528.796	0.015	0.393

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	344.946	0.000	344.946	1127.197	0.306	0.309

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.448	527.981	0.000	0.060	0.037	0.328

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	16.486	1.091	537.919	15.109	213.838	1.658

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
94066.633	0.565	569.995	1025114.500

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.227    2266.000      16.486     537.919       1.000       1.000       0.980
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     97.366    2225.151       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 82487.648   84137.219       2.082     590.487     283.552     474.134       1.672

    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   329.78    -0.11   329.78     0.29   399.03
MEAN    18.08     0.00    -0.02   329.78    -0.11   329.78     0.29
HUB     15.21     0.00    -0.02   329.78    -0.11   329.78     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     50.95    46.36     4.59   406.37   523.43    15.54   528.84     0.46
MEAN    47.32    42.30     5.02   357.49   486.45    15.54   528.84     0.43
HUB     42.38    37.84     4.54   300.77   446.42    15.54   528.84     0.40

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   384.50   156.56   351.18  1135.42     0.34
MEAN    18.01   393.30   174.75   352.35  1134.65     0.35
HUB     15.22   425.79   236.76   353.90  1133.83     0.38

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   429.48   247.23     0.38  3199.37
MEAN   356.14   396.30   181.39     0.35  3149.31     1.32
HUB    301.03   359.68    64.27     0.32  3605.94

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.50     1.06    16.16   548.08     1.02   535.73     0.92     0.91
MEAN    17.48     1.06    16.09   547.92     1.02   535.00     0.92     0.91
HUB     17.63     1.07    15.99   549.37     1.02   534.23     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     24.03    35.15    31.50     3.65     0.93     0.23     2.90
MEAN    26.38    27.24    23.50     3.74     0.92     0.24     3.30     0.91
HUB     33.78    10.29     6.50     3.79     0.92     0.26     3.92


  blockage3   Cor/U1    Cor/Incid
     0.550       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     774.044     175.241     753.946    1095.169       0.707      -2.427

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.522      12.551     498.419      46.000      13.085      30.600      17.515

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     804.742     175.241     823.601    1090.721       0.738      -2.719

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.550      17.408      12.119     494.372     289.961       0.089       0.044

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
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     17.823     798.414       0.000     798.414    1091.772       0.731      -0.339

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.550      12.057     495.230       0.000       0.060       0.222      -2.762

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.636      17.213       1.044     548.458      10.539     274.553       2.128

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  65624.633       0.402     397.651  946910.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.955

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.227    2266.000      17.213     548.458       1.000       1.000       0.580
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     94.160    2203.670       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82487.648   84137.219       1.177     322.834     274.220     248.585       0.907

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   675.30    -0.23   675.30     0.61   385.95
 MEAN    17.74     0.00    -0.02   675.30    -0.23   675.30     0.61
 HUB     15.05     0.00    -0.02   675.30    -0.23   675.30     0.61

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     30.46    46.36   -15.90   396.88   783.41    13.39   510.38     0.71
 MEAN    27.46    43.40   -15.94   350.77   761.07    13.39   510.38     0.69
 HUB     23.80    38.84   -15.04   297.61   738.06    13.39   510.38     0.67

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     19.81   386.92    84.67   377.54  1141.28     0.34
 MEAN    17.51   394.09   115.54   376.78  1141.94     0.35
 HUB     14.85   423.37   193.95   376.33  1142.70     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   486.65   307.07     0.43  1681.92
 MEAN   346.18   441.77   230.65     0.39  2026.80     1.78
 HUB    293.65   389.31    99.70     0.34  2883.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.73     1.03    16.37   553.80     1.01   541.30     0.92     0.87
 MEAN    17.84     1.04    16.42   554.89     1.01   541.92     0.92     0.87
 HUB     18.11     1.05    16.47   557.62     1.02   542.65     0.92     0.87

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     12.64    39.12    31.50     7.62     0.93     0.40     2.90
 MEAN    17.05    31.47    23.50     7.97     0.81     0.44     3.28     0.87
 HUB     27.27    14.84     6.50     8.34     0.81     0.51     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.955

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     398.780     116.296     381.446    1142.178       0.349       0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
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     17.876      16.429     542.157      46.000      16.956      31.500      14.544

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     401.118     116.296     417.637    1142.014       0.351      -0.030

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      17.837      16.377     542.000     471.992       0.036       0.119

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     390.552       0.000     390.552    1142.749       0.342      -0.042

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      16.368     542.699       0.000       0.060       0.098      -0.036

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.691      17.747       1.031     555.436       6.978     395.713       3.068

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  43459.660       0.283     263.343 1839949.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.927

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    107.227    2266.000      17.747     555.436       1.000       1.000       0.980
W Kg/sec =   48.73943

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     91.907    2189.783       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  82487.648   84137.219       1.918     513.330     267.661     401.059       1.498

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   366.98    -0.13   366.98     0.32   368.04
 MEAN    16.97     0.00    -0.02   366.98    -0.13   366.98     0.32
 HUB     14.32     0.00    -0.02   366.98    -0.13   366.98     0.32

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.07    46.36    -0.29   380.86   528.99    16.53   544.19     0.46
 MEAN    42.45    43.80    -1.35   335.59   497.37    16.53   544.19     0.43
 HUB     37.67    37.84    -0.17   283.17   463.61    16.53   544.19     0.41

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   403.25    93.63   392.22  1147.76     0.35
 MEAN    16.57   410.73   122.87   391.92  1148.12     0.36
 HUB     13.89   440.81   200.95   392.34  1148.39     0.38

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   481.75   279.72     0.42  1770.14
 MEAN   327.74   442.24   204.87     0.39  2038.58     1.20
 HUB    274.67   399.20    73.72     0.35  2793.05

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.28     1.03    16.79   561.06     1.01   547.48     0.92     0.85
 MEAN    18.37     1.03    16.81   561.91     1.01   547.82     0.92     0.85
 HUB     18.60     1.05    16.80   564.30     1.02   548.08     0.92     0.85

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     13.43    35.49    31.50     3.99     0.93     0.12     2.90
 MEAN    17.41    27.60    23.50     4.10     0.90     0.15     3.29     0.85
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HUB     27.12    10.64     6.50     4.14     0.90     0.19     3.90


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.927

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     403.623     123.561     384.245    1149.156       0.351       0.052

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.401      16.894     548.821      46.000      17.826      32.400      14.574

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     408.599     123.561     426.873    1148.803       0.356       0.012

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.358      16.819     548.483     456.573       0.037       0.138

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     16.096     389.501       0.000     389.501    1150.135       0.339      -0.019

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      16.864     549.756       0.000       0.060       0.098       0.040

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4        Pt4          PR4        Texit        Del T        Ns         Ns nondim
      0.650      18.259       1.029     562.424       6.988     367.455       2.848

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  43521.051       0.312     263.715  992372.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 6.953   EfDer =  0.875

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    107.227    2266.000       18.259     562.424       1.000        1.000       0.980
W Kg/sec =   48.73943

   W cor       RPM cor         GAMMA       Cp          R            Blades       THK
     89.891    2176.137        1.402       0.249      53.349       56.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  82487.648   84137.219        1.947     509.668     261.796     390.276       1.491

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
 TIP     18.32      0.00     -0.02   363.17     -0.13   363.17      0.32   347.89
 MEAN    15.91      0.00     -0.02   363.17     -0.13   363.17      0.32
 HUB     13.07      0.00     -0.02   363.17     -0.13   363.17      0.32

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
 TIP     44.94     47.36     -2.42   362.27   513.05     17.04   551.41      0.45
 MEAN    40.92     44.80     -3.88   314.67   480.61     17.04   551.41      0.42
 HUB     35.45     38.84     -3.39   258.45   445.82     17.04   551.41      0.39

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl      Blades2
      0.500       0.050       0.950      56.000

          R2      C2       Cu2       Cm2      Ao2          Mach2
 TIP     17.94   396.03     74.61   388.94  1154.12      0.34
 MEAN    15.50   401.67    101.43   388.66  1154.50      0.35
 HUB     12.59   426.74    175.20   389.12  1154.79      0.37

       U2        W2        Wu2      MachRel2  DelRCu     Ws1/W2
 TIP    354.76   479.33    280.14     0.42  1340.84
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 MEAN   306.46   439.42   205.03     0.38  1573.87     1.17
 HUB    248.96   396.05    73.76     0.34  2207.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.65     1.02    17.19   566.68     1.01   553.59     0.92     0.80
 MEAN    18.72     1.03    17.21   567.42     1.01   553.95     0.92     0.80
 HUB     18.90     1.04    17.20   569.43     1.01   554.23     0.92     0.80

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     10.86    35.76    31.50     4.26     0.93     0.09     2.90
 MEAN    14.63    27.81    23.50     4.31     0.88     0.12     3.34     0.80
 HUB     24.24    10.73     6.50     4.23     0.88     0.16     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.875

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     405.433     103.287     392.056    1154.669       0.351      -0.012

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.724      17.192     554.121      46.000      14.759      33.000      18.241

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     423.058     103.287     435.484    1153.398       0.367      -0.154

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.613      16.959     552.902     440.827       0.091       0.110

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     14.701     395.906       0.000     395.906    1155.333       0.343      -0.049

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.116     554.758       0.000       0.060       0.121      -0.054

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.498      18.566       1.017     567.844       5.421     440.591       3.415

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   33766.957       0.268     204.610 1050643.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     280438.94   1699.3142    104.7498      1.2290      0.7070      6.9532      1.0861


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 **********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60% Stat 2 40% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
  RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.999

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     105.235    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   47.83408

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     102.804    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   80955.414   82574.344       2.778     831.557     299.388     619.754       2.070
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ROTOR LEADING EDGE CONDITIONS, STAGE 1

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	239.04	-0.08	239.04	0.21	406.33
MEAN	17.06	0.00	-0.02	239.04	-0.08	239.04	0.21	
HUB	12.51	0.00	-0.02	239.04	-0.08	239.04	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	59.64	50.47	9.17	407.95	472.90	14.63	518.04	0.42
MEAN	54.69	47.20	7.49	337.36	413.53	14.63	518.04	0.37
HUB	45.99	38.62	7.37	247.38	344.06	14.63	518.04	0.31

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	401.07	231.85	327.27	1123.56	0.36
MEAN	18.04	418.09	257.04	329.73	1121.81	0.37
HUB	15.00	469.94	330.17	334.41	1118.76	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	407.95	371.64	176.10	0.33	4784.73	
MEAN	356.65	344.45	99.61	0.31	4637.42	1.35
HUB	296.62	336.09	33.55	0.30	4953.53	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.55	1.10	15.16	538.01	1.03	524.57	0.92	0.91
MEAN	16.51	1.09	15.00	537.54	1.03	522.94	0.92	0.91
HUB	16.61	1.10	14.71	538.55	1.03	520.10	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	35.31	28.28	24.20	4.08	0.93	0.30	2.90	
MEAN	37.94	16.81	12.70	4.11	0.93	0.26	3.51	0.91
HUB	44.63	-5.73	-9.30	3.57	0.93	0.13	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	424.227	256.543	337.868	1121.868	0.378	-0.008

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
16.541	14.984	523.000	24.000	37.209	35.400	-1.809

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	363.843	256.543	445.192	1126.122	0.323	0.264

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.532	15.377	526.975	528.796	0.015	0.406

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	337.741	0.000	337.741	1127.755	0.299	0.321

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.500	528.505	0.000	0.060	0.038	0.341

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	16.496	1.092	538.032	15.222	210.565	1.632

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
94770.008	0.569	563.590	1005147.938

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

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 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    105.235    2266.000      16.496     538.032       1.000       1.000       0.980
W Kg/sec =   47.83408

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     95.508    2224.918       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 80955.414   82574.344       2.123     590.487     278.141     474.134       1.705

    ROTOR LEADING EDGE CONDITIONS, STAGE             2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   322.95    -0.11   322.95     0.29   398.99
MEAN    18.08     0.00    -0.02   322.95    -0.11   322.95     0.29
HUB     15.21     0.00    -0.02   322.95    -0.11   322.95     0.29

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     51.53    46.36     5.17   406.37   519.16    15.58   529.32     0.46
MEAN    47.91    42.30     5.61   357.49   481.85    15.58   529.32     0.43
HUB     42.97    37.84     5.13   300.77   441.40    15.58   529.32     0.39

     ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   379.83   162.11   343.50  1136.24     0.33
MEAN    18.01   388.38   178.78   344.78  1135.35     0.34
HUB     15.22   420.45   238.26   346.43  1134.43     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   420.01   241.69     0.37  3312.55
MEAN   356.14   387.73   177.36     0.34  3221.82     1.34
HUB    301.03   352.07    62.77     0.31  3628.66

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.55     1.06    16.24   548.55     1.02   536.50     0.92     0.91
MEAN    17.52     1.06    16.15   548.26     1.02   535.67     0.92     0.91
HUB     17.65     1.07    16.05   549.56     1.02   534.79     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     25.26    35.13    31.50     3.63     0.93     0.24     2.90
MEAN    27.41    27.22    23.50     3.72     0.92     0.25     3.30     0.91
HUB     34.52    10.27     6.50     3.77     0.92     0.27     3.92


  blockage3   Cor/U1    Cor/Incid
     0.550       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     748.923     179.281     727.148    1099.038       0.681      -2.312

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.558      12.862     501.948      46.000      13.850      30.600      16.750

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     770.385     179.281     790.970    1096.055       0.703      -2.529

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.550      17.455      12.547     499.225     289.961       0.082       0.062

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4        cp 3-4
    17.823     762.456       0.000     762.456    1097.226       0.695      -0.241

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
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      0.550      12.520     500.245       0.000       0.060       0.195      -2.548

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.682      17.294       1.048     548.791      10.759     267.507       2.074

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  66998.305       0.411     398.434  927543.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 7.486   EfDer =  0.891

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    105.235    2266.000      17.294     548.791       1.000       1.000       0.580
W Kg/sec =   47.83408

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     92.009    2203.000       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  80955.414   82574.344       1.205     322.834     267.956     248.585       0.928

     ROTOR LEADING EDGE CONDITIONS, STAGE            3

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.07     0.00    -0.02   651.65    -0.22   651.65     0.59   385.83
 MEAN    17.74     0.00    -0.02   651.65    -0.22   651.65     0.59
 HUB     15.05     0.00    -0.02   651.65    -0.22   651.65     0.59

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     31.36    46.36   -15.00   396.88   763.11    13.70   513.33     0.69
 MEAN    28.31    43.40   -15.09   350.77   740.16    13.70   513.33     0.67
 HUB     24.56    38.84   -14.28   297.61   716.48    13.70   513.33     0.64

      ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
    B2 axial    THK         AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     19.81   379.82    92.73   368.33  1142.64     0.33
 MEAN    17.51   387.54   121.49   368.00  1143.09     0.34
 HUB     14.85   417.46   196.72   368.20  1143.62     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    391.73   474.42   299.01     0.42  1841.46
 MEAN   346.18   431.17   224.69     0.38  2130.90     1.78
 HUB    293.65   380.75    96.94     0.33  2924.63

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.82     1.03    16.51   554.64     1.01   542.59     0.92     0.82
 MEAN    17.91     1.04    16.54   555.56     1.01   543.02     0.92     0.82
 HUB     18.14     1.05    16.54   558.08     1.02   543.53     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     14.13    39.07    31.50     7.57     0.93     0.40     2.90
 MEAN    18.27    31.41    23.50     7.91     0.81     0.44     3.28     0.82
 HUB     28.11    14.75     6.50     8.25     0.81     0.50     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.891

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     392.176     122.290     372.622    1143.329       0.343       0.001

    Pt3        Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.943     16.539     543.248      46.000      18.169      31.500      13.331

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
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RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	391.318	122.290	409.981	1143.389	0.342	-0.011

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.911	16.515	543.305	471.992	0.033	0.134

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	380.854	0.000	380.854	1144.098	0.333	-0.019

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.512	543.979	0.000	0.060	0.089	-0.013

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.661	17.830	1.031	556.092	7.301	375.775	2.913

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
45467.508	0.296	270.392	1781908.750

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 7.486 EfDer = 0.940

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
105.235	2266.000	17.830	556.092	1.000	1.000	0.980

W Kg/sec = 47.83408

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
89.834	2188.491	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
80955.414	82574.344	1.962	513.330	261.626	401.059	1.533

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	358.01	-0.12	358.01	0.31	367.82
MEAN	16.97	0.00	-0.02	358.01	-0.12	358.01	0.31	
HUB	14.32	0.00	-0.02	358.01	-0.12	358.01	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	46.78	46.36	0.42	380.86	522.80	16.66	545.39	0.46
MEAN	43.16	43.80	-0.64	335.59	490.79	16.66	545.39	0.43
HUB	38.35	37.84	0.51	283.17	456.54	16.66	545.39	0.40

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	395.03	101.21	381.85	1149.49	0.34
MEAN	16.57	402.78	128.36	381.78	1149.67	0.35
HUB	13.89	432.87	202.98	382.33	1149.77	0.38

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	468.90	272.13	0.41	1913.25	
MEAN	327.74	430.71	199.38	0.37	2129.48	1.22
HUB	274.67	388.99	71.69	0.34	2821.18	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.42	1.03	16.97	562.17	1.01	549.14	0.92	0.86
MEAN	18.49	1.04	16.98	562.85	1.01	549.31	0.92	0.86
HUB	18.71	1.05	16.96	565.05	1.02	549.40	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	14.85	35.48	31.50	3.98	0.93	0.14	2.90	
MEAN	18.58	27.58	23.50	4.08	0.90	0.16	3.29	0.86
HUB	27.96	10.62	6.50	4.12	0.90	0.20	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.940

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	395.969	129.080	374.339	1150.667	0.344	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.523	17.064	550.265	46.000	19.025	32.400	13.375

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	397.476	129.080	417.910	1150.563	0.345	0.031

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.487	17.020	550.165	456.573	0.033	0.153

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	378.791	0.000	378.791	1151.829	0.329	0.003

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.069	551.376	0.000	0.060	0.090	0.062

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.691	18.398	1.032	563.357	7.265	352.485	2.732

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
45249.766	0.325	269.097	970615.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 7.486 EfDer = 0.892

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
105.235	2266.000	18.398	563.357	1.000	1.000	0.980

W Kg/sec = 47.83408

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
87.627	2174.334	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
80955.414	82574.344	1.997	509.668	255.201	390.276	1.529

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	353.35	-0.12	353.35	0.31	347.61
MEAN	15.91	0.00	-0.02	353.35	-0.12	353.35	0.31	
HUB	13.07	0.00	-0.02	353.35	-0.12	353.35	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	45.72	47.36	-1.64	362.27	506.14	17.24	552.93	0.44
MEAN	41.70	44.80	-3.10	314.67	473.23	17.24	552.93	0.41
HUB	36.20	38.84	-2.64	258.45	437.85	17.24	552.93	0.38

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	386.63	82.94	377.63	1156.22	0.33
MEAN	15.50	392.57	107.46	377.57	1156.40	0.34
HUB	12.59	417.72	177.44	378.16	1156.51	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	465.28	271.81	0.40	1490.22	
MEAN	306.46	426.80	199.00	0.37	1667.37	1.19
HUB	248.96	384.86	71.52	0.33	2235.59	

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        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP    18.84     1.02    17.44   568.09     1.01   555.61     0.92     0.82
 MEAN   18.90     1.03    17.44   568.65     1.01   555.78     0.92     0.82
 HUB    19.07     1.04    17.42   570.45     1.01   555.89     0.92     0.82

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    12.39    35.75    31.50     4.25     0.93     0.11     2.90
 MEAN   15.89    27.79    23.50     4.29     0.89     0.13     3.34     0.82
 HUB    25.14    10.71     6.50     4.21     0.89     0.17     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.892

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219     396.236     109.434     380.824    1156.580       0.343       -0.011

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.904      17.428     555.956      46.000      16.033      33.000      16.967

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     410.020     109.434     424.373    1155.615       0.355       -0.130

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.809      17.240     555.029     440.827       0.083       0.124

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     14.701     383.890       0.000     383.890    1157.416       0.332       -0.028

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950      17.386     556.761       0.000       0.060       0.114       -0.032

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4        Pt4          PR4        Texit        Del T       Ns         Ns nondim
      0.559      18.764       1.020     569.065       5.708     418.108       3.241

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  35553.777       0.283     211.436 1027052.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency      Rotor1Inc   TR
    288039.34   1712.9480     102.8040      1.2421      0.7248      7.4864      1.0885


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ***********************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 60% Stat 2 40% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.998

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
    103.509     2266.000       15.107      522.810       1.000        1.000       0.980
W Kg/sec =   47.04952

   W cor       RPM cor         GAMMA        Cp          R           Blades       THK
    101.118     2257.076        1.402        0.249      53.349       32.000       0.050

   CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
  79627.609    81219.992        2.824      831.557     294.477     619.754       2.105

     ROTOR LEADING EDGE CONDITIONS, STAGE            1
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	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.63	0.00	-0.02	234.94	-0.08	234.94	0.21	406.33
MEAN	17.06	0.00	-0.02	234.94	-0.08	234.94	0.21	
HUB	12.51	0.00	-0.02	234.94	-0.08	234.94	0.21	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	60.07	50.47	9.60	407.95	470.83	14.65	518.20	0.42
MEAN	55.15	47.20	7.95	337.36	411.17	14.65	518.20	0.37
HUB	46.49	38.62	7.87	247.38	341.22	14.65	518.20	0.31

ROTOR EXIT CONDITIONS, STAGE 1 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.700	0.050	0.950	32.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.63	398.16	235.09	321.34	1123.99	0.35
MEAN	18.04	414.58	258.86	323.83	1122.18	0.37
HUB	15.00	465.31	329.62	328.42	1119.12	0.42

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	407.95	364.89	172.86	0.32	4851.52	
MEAN	356.65	338.28	97.79	0.30	4670.22	1.37
HUB	296.62	330.08	33.01	0.29	4945.38	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.57	1.10	15.20	538.22	1.03	524.98	0.92	0.91
MEAN	16.52	1.09	15.03	537.65	1.03	523.29	0.92	0.91
HUB	16.60	1.10	14.74	538.52	1.03	520.44	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	36.19	28.28	24.20	4.08	0.93	0.31	2.90	
MEAN	38.64	16.80	12.70	4.10	0.93	0.27	3.51	0.91
HUB	45.10	-5.74	-9.30	3.56	0.93	0.14	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.998

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	420.522	258.359	331.797	1122.252	0.375	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
16.549	15.018	523.359	24.000	37.907	35.400	-2.507

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	357.069	258.359	440.735	1126.662	0.317	0.278

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.540	15.427	527.480	528.796	0.016	0.417

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	331.565	0.000	331.565	1128.227	0.294	0.332

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.542	528.947	0.000	0.060	0.039	0.352

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	16.504	1.092	538.129	15.319	207.759	1.611

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
95373.062	0.573	557.874	987890.812

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc = 7.953 EfDer = 1.000

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl

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    103.509    2266.000      16.504     538.129       1.000       1.000       0.980
W Kg/sec =   47.04952

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     93.906    2224.718       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 79627.609   81219.992       2.159     590.487     273.476     474.134       1.734

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   317.10    -0.11   317.10     0.28   398.95
 MEAN    18.08     0.00    -0.02   317.10    -0.11   317.10     0.28
 HUB     15.21     0.00    -0.02   317.10    -0.11   317.10     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     52.04    46.36     5.68   406.37   515.53    15.62   529.73     0.46
 MEAN    48.44    42.30     6.14   357.49   477.94    15.62   529.73     0.42
 HUB     43.50    37.84     5.66   300.77   437.13    15.62   529.73     0.39

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.42   375.98   166.81   336.95  1136.92     0.33
 MEAN    18.01   384.27   182.20   338.32  1135.94     0.34
 HUB     15.22   415.92   239.50   340.04  1134.93     0.37

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    403.80   411.94   236.98     0.36  3408.56
 MEAN   356.14   380.42   173.94     0.33  3283.40     1.36
 HUB    301.03   345.56    61.53     0.30  3647.59

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     17.59     1.07    16.30   548.95     1.02   537.15     0.92     0.91
 MEAN    17.55     1.06    16.21   548.56     1.02   536.22     0.92     0.91
 HUB     17.67     1.07    16.10   549.71     1.02   535.27     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     26.34    35.12    31.50     3.62     0.93     0.26     2.90
 MEAN    28.30    27.21    23.50     3.71     0.93     0.26     3.30     0.91
 HUB     35.16    10.26     6.50     3.76     0.93     0.28     3.92


  blockage3   Cor/U1    Cor/Incid
     0.550       1.000       1.000

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.960     728.993     182.712     705.725    1102.037       0.661      -2.222

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.586      13.106     504.692      46.000      14.515      30.600      16.085

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     743.964     182.712     766.072    1100.025       0.676      -2.386

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.550      17.493      12.872     502.850     289.961       0.076       0.075

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.823     735.171       0.000     735.171    1101.244       0.668      -0.171

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.550      12.867     503.939       0.000       0.060       0.175      -2.389

   STAGE EXIT CONDITIONS, STAGE            2
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Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.714	17.355	1.052	549.075	10.946	261.668	2.028

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
68162.164	0.418	398.707	910860.688

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3
RESET = 0.000BLEED = 0.000 DPInc = 7.953 EfDer = 0.850

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
103.509	2266.000	17.355	549.075	1.000	1.000	0.580

W Kg/sec = 47.04952

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
90.206	2202.431	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
79627.609	81219.992	1.229	322.834	262.704	248.585	0.946

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	632.75	-0.22	632.75	0.57	385.73
MEAN	17.74	0.00	-0.02	632.75	-0.22	632.75	0.57	
HUB	15.05	0.00	-0.02	632.75	-0.22	632.75	0.57	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	32.11	46.36	-14.25	396.88	747.03	13.94	515.64	0.67
MEAN	29.02	43.40	-14.38	350.77	723.58	13.94	515.64	0.65
HUB	25.21	38.84	-13.63	297.61	699.34	13.94	515.64	0.63

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	374.08	99.46	360.62	1143.77	0.33
MEAN	17.51	382.11	126.50	360.56	1144.05	0.33
HUB	14.85	412.37	199.02	361.16	1144.41	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	464.19	292.28	0.41	1974.59	
MEAN	346.18	422.22	219.69	0.37	2218.36	1.78
HUB	293.65	373.35	94.63	0.33	2958.73	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.90	1.03	16.62	555.35	1.01	543.66	0.92	0.78
MEAN	17.97	1.04	16.63	556.12	1.01	543.93	0.92	0.78
HUB	18.17	1.05	16.61	558.47	1.02	544.27	0.92	0.78

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	15.42	39.02	31.50	7.52	0.93	0.40	2.90	
MEAN	19.33	31.35	23.50	7.85	0.82	0.44	3.28	0.78
HUB	28.86	14.68	6.50	8.18	0.82	0.50	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.850

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	386.688	127.325	365.124	1144.288	0.338	0.000

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.999	16.629	544.159	46.000	19.225	31.500	12.275

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	383.021	127.325	403.630	1144.536	0.335	0.006

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	17.971	16.629	544.394	471.992	0.030	0.147

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	372.656	0.000	372.656	1145.223	0.325	0.001

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.631	545.049	0.000	0.060	0.083	0.008

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.644	17.898	1.031	556.645	7.570	360.350	2.793

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
47146.848	0.307	275.780	1734769.625

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 7.953 EfDer = 0.950

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
103.509	2266.000	17.898	556.645	1.000	1.000	0.980

W Kg/sec = 47.04952

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
88.069	2187.403	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
79627.609	81219.992	2.001	513.330	256.485	401.059	1.564

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	350.41	-0.12	350.41	0.31	367.64
MEAN	16.97	0.00	-0.02	350.41	-0.12	350.41	0.31	
HUB	14.32	0.00	-0.02	350.41	-0.12	350.41	0.31	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.39	46.36	1.03	380.86	517.62	16.77	546.39	0.45
MEAN	43.77	43.80	-0.03	335.59	485.27	16.77	546.39	0.42
HUB	38.95	37.84	1.11	283.17	450.60	16.77	546.39	0.39

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	388.32	107.61	373.11	1150.93	0.34
MEAN	16.57	396.21	132.99	373.23	1150.96	0.34
HUB	13.89	426.26	204.71	373.89	1150.92	0.37

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	458.07	265.73	0.40	2034.06	
MEAN	327.74	420.98	194.75	0.37	2206.18	1.23
HUB	274.67	380.38	69.96	0.33	2845.18	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.54	1.04	17.13	563.10	1.01	550.51	0.92	0.87
MEAN	18.59	1.04	17.12	563.65	1.01	550.54	0.92	0.87
HUB	18.79	1.05	17.09	565.68	1.02	550.51	0.92	0.87

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	16.09	35.46	31.50	3.96	0.93	0.15	2.90	
MEAN	19.61	27.56	23.50	4.06	0.90	0.17	3.29	0.87
HUB	28.70	10.60	6.50	4.10	0.90	0.21	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.950

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    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     16.481     389.658     133.736     365.989    1151.922       0.338       0.052

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.624      17.205     551.467      46.000      20.073      32.400      12.327

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     388.140     133.736     410.534    1152.026       0.337       0.047

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.594      17.187     551.565     456.573       0.030       0.166

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     369.809       0.000     369.809    1153.236       0.321       0.022

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.239     552.726       0.000       0.060       0.083       0.081

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.723      18.514       1.034     564.145       7.499     340.516       2.640

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  46710.020       0.335     273.225  951994.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 7.953   EfDer =  0.906

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    103.509    2266.000      18.514     564.145       1.000       1.000       0.980
W Kg/sec =   47.04952

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     85.712    2172.815       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  79627.609   81219.992       2.042     509.668     249.625     390.276       1.563

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   345.10    -0.12   345.10     0.30   347.36
 MEAN    15.91     0.00    -0.02   345.10    -0.12   345.10     0.30
 HUB     13.07     0.00    -0.02   345.10    -0.12   345.10     0.30

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     46.40    47.36    -0.96   362.27   500.42    17.40   554.20     0.43
 MEAN    42.37    44.80    -2.43   314.67   467.11    17.40   554.20     0.40
 HUB     36.84    38.84    -2.00   258.45   431.22    17.40   554.20     0.37

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   379.00    89.93   368.17  1157.96     0.33
 MEAN    15.50   385.10   112.53   368.29  1157.98     0.33
 HUB     12.59   410.25   179.32   368.98  1157.94     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   453.53   264.83     0.39  1615.45
 MEAN   306.46   416.23   193.93     0.36  1745.79     1.21
 HUB    248.96   375.49    69.64     0.32  2259.19

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.00     1.03    17.64   569.27     1.01   557.28     0.92     0.83
 MEAN    19.04     1.03    17.64   569.69     1.01   557.31     0.92     0.83
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 HUB     19.20     1.04    17.61   571.32     1.01   557.27     0.92     0.83

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     13.73    35.73    31.50     4.23     0.93     0.12     2.90
 MEAN    16.99    27.77    23.50     4.27     0.89     0.14     3.34     0.83
 HUB     25.92    10.69     6.50     4.19     0.89     0.18     4.06


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.906

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     388.701     114.590     371.426    1158.162       0.336      -0.010

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.055      17.624     557.478      46.000      17.146      33.000      15.854

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     399.182     114.590     415.304    1157.445       0.345      -0.108

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.973      17.473     556.789     440.827       0.076       0.138

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     14.701     373.871       0.000     373.871    1159.142       0.323      -0.009

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.612     558.423       0.000       0.060       0.106      -0.012

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.606      18.930       1.022     570.093       5.948     400.603       3.105

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  37051.969       0.294     216.731 1006914.938

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    294444.06   1722.3165    101.1179      1.2530      0.7388      7.9529      1.0904


*****************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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   Fan-Core + 4 Stage LPC 60% Stat 2 40% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
 RESET =  0.000BLEED =  0.000 DPInc = 8.472   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    101.607    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   46.18479

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     99.259    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  78164.125   79727.242       2.877     831.557     289.065     619.754       2.144

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   230.42    -0.08   230.42     0.21   406.33
 MEAN    17.06     0.00    -0.02   230.42    -0.08   230.42     0.21
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HUB     12.51     0.00    -0.02   230.42    -0.08   230.42     0.21

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     60.55    50.47    10.08   407.95   468.60    14.66   518.38     0.42
MEAN    55.67    47.20     8.47   337.36   408.61    14.66   518.38     0.37
HUB     47.04    38.62     8.42   247.38   338.13    14.66   518.38     0.30

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   395.06   238.61   314.87  1124.46     0.35
MEAN    18.04   410.82   260.86   317.37  1122.58     0.37
HUB     15.00   460.24   328.98   321.86  1119.50     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    407.95   357.52   169.34     0.32  4924.07
MEAN   356.65   331.51    95.79     0.30  4706.30     1.39
HUB    296.62   323.49    32.36     0.29  4935.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.59     1.10    15.24   538.45     1.03   525.42     0.92     0.91
MEAN    16.53     1.09    15.06   537.76     1.03   523.66     0.92     0.91
HUB     16.60     1.10    14.77   538.49     1.03   520.80     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.15    28.27    24.20     4.07     0.93     0.32     2.90
MEAN    39.42    16.80    12.70     4.10     0.93     0.28     3.51     0.91
HUB     45.63    -5.74    -9.30     3.56     0.93     0.15     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    18.071     416.550     260.357     325.158    1122.662       0.371      -0.007

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    16.558      15.054     523.741      24.000      38.685      35.400      -3.285

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    18.071     349.680     260.357     435.961    1127.239       0.310       0.294

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.549      15.479     528.021     528.796       0.016       0.429

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    18.083     324.828       0.000     324.828    1128.733       0.288       0.344

  Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.587     529.421       0.000       0.060       0.040       0.363

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.875      16.511       1.093     538.234      15.424     204.706       1.587

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96025.133       0.577     551.365  968918.375


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 8.472   EfDer =  1.000

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
    101.607    2266.000      16.511     538.234       1.000       1.000       0.980
W Kg/sec =   46.18479
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W cor	RPM cor	GAMMA	Cp	R	Blades	THK
92.150	2224.501	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
78164.125	79727.242	2.200	590.487	268.361	474.134	1.767

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	310.70	-0.11	310.70	0.28	398.91
MEAN	18.08	0.00	-0.02	310.70	-0.11	310.70	0.28	
HUB	15.21	0.00	-0.02	310.70	-0.11	310.70	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	52.61	46.36	6.25	406.37	511.62	15.66	530.17	0.45
MEAN	49.01	42.30	6.71	357.49	473.72	15.66	530.17	0.42
HUB	44.08	37.84	6.24	300.77	432.51	15.66	530.17	0.38

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	371.96	171.92	329.84	1137.65	0.33
MEAN	18.01	379.92	185.94	331.30	1136.57	0.33
HUB	15.22	411.05	240.84	333.10	1135.46	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	403.19	231.88	0.35	3512.78	
MEAN	356.14	372.46	170.20	0.33	3350.72	1.38
HUB	301.03	338.49	60.19	0.30	3667.95	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.63	1.07	16.37	549.39	1.02	537.84	0.92	0.91
MEAN	17.58	1.06	16.27	548.88	1.02	536.82	0.92	0.91
HUB	17.68	1.07	16.15	549.88	1.02	535.77	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	27.53	35.11	31.50	3.61	0.93	0.27	2.90	
MEAN	29.30	27.19	23.50	3.69	0.93	0.27	3.30	0.91
HUB	35.87	10.24	6.50	3.74	0.93	0.29	3.92	

blockage3	Cor/U1	Cor/Incid
0.550	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	708.636	186.463	683.664	1105.037	0.641	-2.130

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.615	13.353	507.444	46.000	15.256	30.600	15.344

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	717.482	186.463	741.316	1103.890	0.650	-2.243

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.550	17.532	13.194	506.390	289.961	0.071	0.089

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	708.099	0.000	708.099	1105.123	0.641	-0.107

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.550	13.207	507.509	0.000	0.060	0.156	-2.233

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.743	17.414	1.055	549.383	11.149	255.470	1.980

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
69427.102	0.426	398.642	892577.875

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc = 8.472 EfDer = 0.816

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
101.607	2266.000	17.414	549.383	1.000	1.000	0.580

W Kg/sec = 46.18479

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
88.270	2201.813	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
78164.125	79727.242	1.256	322.834	257.066	248.585	0.967

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	613.28	-0.21	613.28	0.55	385.62
MEAN	17.74	0.00	-0.02	613.28	-0.21	613.28	0.55	
HUB	15.05	0.00	-0.02	613.28	-0.21	613.28	0.55	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	32.92	46.36	-13.44	396.88	730.61	14.18	517.98	0.65
MEAN	29.78	43.40	-13.62	350.77	706.61	14.18	517.98	0.63
HUB	25.90	38.84	-12.94	297.61	681.77	14.18	517.98	0.61

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	368.12	106.65	352.33	1144.95	0.32
MEAN	17.51	376.36	131.88	352.50	1145.07	0.33
HUB	14.85	406.81	201.49	353.41	1145.25	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	453.22	285.08	0.40	2117.03	
MEAN	346.18	412.53	214.30	0.36	2312.54	1.78
HUB	293.65	365.23	92.16	0.32	2995.27	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.98	1.03	16.73	556.11	1.01	544.79	0.92	0.75
MEAN	18.03	1.04	16.73	556.73	1.01	544.90	0.92	0.75
HUB	18.21	1.05	16.69	558.89	1.02	545.07	0.92	0.75

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	16.84	38.98	31.50	7.48	0.93	0.40	2.90	
MEAN	20.51	31.30	23.50	7.80	0.82	0.44	3.28	0.75
HUB	29.69	14.62	6.50	8.12	0.82	0.50	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.816

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	380.866	132.747	356.983	1145.308	0.333	-0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.058	16.726	545.129	46.000	20.398	31.500	11.102

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	374.045	132.747	396.903	1145.760	0.326	0.026

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.036	16.751	545.559	471.992	0.027	0.162

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	363.800	0.000	363.800	1146.422	0.317	0.023

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.757	546.190	0.000	0.060	0.075	0.031

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.633	17.970	1.032	557.242	7.859	344.928	2.674

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
48947.477	0.319	281.050	1685502.125

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 8.472 EfDer = 0.960

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
101.607	2266.000	17.970	557.242	1.000	1.000	0.980

W Kg/sec = 46.18479

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
86.149	2186.231	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
78164.125	79727.242	2.046	513.330	250.892	401.059	1.599

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	342.20	-0.12	342.20	0.30	367.44
MEAN	16.97	0.00	-0.02	342.20	-0.12	342.20	0.30	
HUB	14.32	0.00	-0.02	342.20	-0.12	342.20	0.30	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.07	46.36	1.71	380.86	512.10	16.89	547.46	0.45
MEAN	44.45	43.80	0.65	335.59	479.37	16.89	547.46	0.42
HUB	39.62	37.84	1.78	283.17	444.24	16.89	547.46	0.39

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	381.31	114.48	363.72	1152.45	0.33
MEAN	16.57	389.29	137.97	364.02	1152.33	0.34
HUB	13.89	419.23	206.58	364.80	1152.15	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	446.43	258.86	0.39	2163.65	
MEAN	327.74	410.52	189.77	0.36	2288.67	1.25
HUB	274.67	371.10	68.09	0.32	2871.05	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.66	1.04	17.29	564.11	1.01	551.97	0.92	0.88
MEAN	18.70	1.04	17.28	564.51	1.01	551.86	0.92	0.88
HUB	18.89	1.05	17.23	566.36	1.02	551.68	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	17.47	35.44	31.50	3.94	0.93	0.17	2.90	
MEAN	20.76	27.53	23.50	4.03	0.90	0.19	3.29	0.88
HUB	29.52	10.57	6.50	4.07	0.90	0.22	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.960

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	383.011	138.744	356.998	1153.255	0.332	0.052

```
     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.733      17.354     552.744      46.000      21.238      32.400      11.162

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     16.481     378.127     138.744     402.778    1153.579       0.328       0.065

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.708      17.365     553.055     456.573       0.027       0.181

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     16.096     360.186       0.000     360.186    1154.732       0.312       0.044

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.419     554.161       0.000       0.060       0.075       0.102

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.754      18.636       1.037     564.993       7.751     328.269       2.545

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  48278.320       0.346     277.208  931691.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 8.472   EfDer =  0.921

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    101.607    2266.000      18.636     564.993       1.000       1.000       0.980
W Kg/sec =   46.18479

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     83.646    2171.183       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  78164.125   79727.242       2.092     509.668     243.607     390.276       1.602

     ROTOR LEADING EDGE CONDITIONS, STAGE            5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   336.25    -0.12   336.25     0.29   347.10
 MEAN    15.91     0.00    -0.02   336.25    -0.12   336.25     0.29
 HUB     13.07     0.00    -0.02   336.25    -0.12   336.25     0.29

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     47.14    47.36    -0.22   362.27   494.36    17.57   555.55     0.43
 MEAN    43.11    44.80    -1.69   314.67   460.60    17.57   555.55     0.40
 HUB     37.56    38.84    -1.28   258.45   424.17    17.57   555.55     0.37

      ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   371.08    97.38   358.07  1159.79     0.32
 MEAN    15.50   377.28   117.95   358.37  1159.66     0.33
 HUB     12.59   402.34   181.33   359.16  1159.46     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   440.98   257.38     0.38  1749.07
 MEAN   306.46   404.92   188.51     0.35  1829.81     1.22
 HUB    248.96   365.48    67.64     0.32  2284.42

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.18     1.03    17.87   570.55     1.01   559.05     0.92     0.84
 MEAN    19.21     1.03    17.85   570.80     1.01   558.92     0.92     0.84
 HUB     19.35     1.04    17.80   572.25     1.01   558.73     0.92     0.84

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
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  TIP     15.21    35.71    31.50     4.21     0.93     0.14     2.90
  MEAN    18.22    27.74    23.50     4.24     0.89     0.16     3.34     0.84
  HUB     26.79    10.66     6.50     4.16     0.89     0.19     4.06


    blockage3   Cor/U1    Cor/Incid
       0.950       1.000       0.921

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
       R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
       15.219      380.822     120.115     361.383     1159.835       0.328       -0.010

       Pt3          Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
       19.217       17.832      559.090      46.000      18.385      33.000       14.615

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
       RCG          Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
       15.219      387.671     120.115     405.853     1159.379       0.334       -0.083

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950       19.148      17.720     558.651     440.827       0.069       0.153

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
      14.701      363.204       0.000     363.204     1160.969       0.313       0.014

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       17.852      560.185       0.000       0.060       0.098       0.010

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4          PR4        Texit        Del T       Ns        Ns nondim
       0.653       19.107       1.025      571.198       6.205     383.083       2.970

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   38653.301       0.307     221.943  985014.562

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     301331.34   1730.2076      99.2594      1.2648      0.7527      8.4720      1.0926


**********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
**********************************************************************

    Fan-Core + 4 Stage LPC 60% Stat 2 40% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.995

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
      99.590     2266.000       15.107      522.810       1.000        1.000        0.980
 W Kg/sec =   45.26799

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
      97.289     2257.076        1.402        0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
   76612.523    78144.609        2.935      831.557      283.327      619.754       2.187

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   225.65    -0.08   225.65      0.20   406.33
  MEAN    17.06      0.00    -0.02   225.65    -0.08   225.65      0.20
  HUB     12.51      0.00    -0.02   225.65    -0.08   225.65      0.20

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1     Rel Mach
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TIP     61.06    50.47    10.59   407.95   466.27    14.68   518.56     0.42
MEAN    56.23    47.20     9.03   337.36   405.93    14.68   518.56     0.36
HUB     47.64    38.62     9.02   247.38   334.90    14.68   518.56     0.30

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.63   391.93   242.30   308.05  1124.94     0.35
MEAN    18.04   406.94   262.95   310.57  1122.99     0.36
HUB     15.00   454.96   328.31   314.96  1119.90     0.41

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    407.95   349.77   165.65     0.31  5000.22
MEAN   356.65   324.40    93.71     0.29  4743.87     1.41
HUB    296.62   316.55    31.69     0.28  4925.55

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.62     1.10    15.28   538.69     1.03   525.86     0.92     0.91
MEAN    16.54     1.09    15.10   537.88     1.03   524.05     0.92     0.91
HUB     16.59     1.10    14.81   538.46     1.03   521.17     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.19    28.27    24.20     4.07     0.93     0.34     2.90
MEAN    40.25    16.79    12.70     4.09     0.93     0.30     3.51     0.91
HUB     46.19    -5.74    -9.30     3.56     0.93     0.17     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.995

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     412.441     262.437     318.173    1123.084       0.367      -0.006

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.566      15.091     524.135      24.000      39.517      35.400      -4.117

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     341.927     262.437     431.031    1127.834       0.303       0.310

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.556      15.532     528.578     528.796       0.017       0.442

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     317.759       0.000     317.759    1129.254       0.281       0.356

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.632     529.910       0.000       0.060       0.042       0.376

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.872      16.517       1.093     538.343      15.533     201.502       1.562

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  96707.609       0.581     544.261  948857.062


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     99.590    2266.000      16.517     538.343       1.000       1.000       0.980
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     90.297    2224.275       1.402       0.249      53.349      56.000       0.050
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CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
76612.523	78144.609	2.246	590.487	262.964	474.134	1.803

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	303.99	-0.10	303.99	0.27	398.87
MEAN	18.08	0.00	-0.02	303.99	-0.10	303.99	0.27	
HUB	15.21	0.00	-0.02	303.99	-0.10	303.99	0.27	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.21	46.36	6.85	406.37	507.57	15.71	530.63	0.45
MEAN	49.63	42.30	7.33	357.49	469.35	15.71	530.63	0.42
HUB	44.70	37.84	6.86	300.77	427.71	15.71	530.63	0.38

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	367.93	177.26	322.42	1138.39	0.32
MEAN	18.01	375.47	189.80	323.97	1137.22	0.33
HUB	15.22	406.03	242.27	325.83	1136.02	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	394.05	226.54	0.35	3621.79	
MEAN	356.14	364.17	166.34	0.32	3420.18	1.40
HUB	301.03	331.08	58.76	0.29	3689.70	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.67	1.07	16.44	549.85	1.02	538.54	0.92	0.91
MEAN	17.60	1.07	16.32	549.21	1.02	537.43	0.92	0.91
HUB	17.69	1.07	16.20	550.06	1.02	536.29	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.80	35.09	31.50	3.59	0.93	0.28	2.90	
MEAN	30.36	27.18	23.50	3.68	0.93	0.29	3.30	0.91
HUB	36.63	10.22	6.50	3.72	0.93	0.30	3.92	

blockage3	Cor/U1	Cor/Incid
0.550	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	688.548	190.332	661.719	1107.935	0.621	-2.040

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.642	13.593	510.110	46.000	16.047	30.600	14.553

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	691.733	190.332	717.440	1107.537	0.625	-2.104

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.550	17.569	13.503	509.743	289.961	0.065	0.102

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	682.005	0.000	682.005	1108.757	0.615	-0.048

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.550	13.530	510.859	0.000	0.060	0.139	-2.084

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.768	17.470	1.058	549.704	11.361	249.151	1.931

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
70747.172	0.434	398.158	873308.312

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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 9.028   EfDer =  0.791

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    99.590    2266.000      17.470     549.704       1.000       1.000       0.580
W Kg/sec =   45.26799

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
    86.266    2201.169       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 76612.523   78144.609       1.285     322.834     251.231     248.585       0.989

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   593.89    -0.20   593.89     0.53   385.51
MEAN    17.74     0.00    -0.02   593.89    -0.20   593.89     0.53
HUB     15.05     0.00    -0.02   593.89    -0.20   593.89     0.53

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     33.77    46.36   -12.59   396.88   714.41    14.42   520.25     0.64
MEAN    30.58    43.40   -12.82   350.77   689.85    14.42   520.25     0.62
HUB     26.63    38.84   -12.21   297.61   664.38    14.42   520.25     0.59

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   362.17   114.10   343.73  1146.16     0.32
MEAN    17.51   370.52   137.45   344.08  1146.11     0.32
HUB     14.85   401.02   204.05   345.22  1146.13     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   441.85   277.63     0.39  2264.43
MEAN   346.18   402.45   208.74     0.35  2409.83     1.78
HUB    293.65   356.66    89.60     0.31  3033.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.05     1.03    16.85   556.90     1.01   545.94     0.92     0.72
MEAN    18.09     1.04    16.83   557.36     1.01   545.89     0.92     0.72
HUB     18.26     1.04    16.77   559.34     1.02   545.91     0.92     0.72

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     18.36    38.93    31.50     7.43     0.93     0.41     2.90
MEAN    21.77    31.24    23.50     7.74     0.83     0.45     3.28     0.72
HUB     30.59    14.55     6.50     8.05     0.83     0.50     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.791

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     374.929     138.348     348.470    1146.354       0.327      -0.001

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.121      16.825     546.124      46.000      21.654      31.500       9.846

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     364.695     138.348     390.055    1147.017       0.318       0.047

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.103      16.876     546.756     471.992       0.024       0.178

   VANED DIFFUSER EXIT:
  R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
    17.121     354.593       0.000     354.593    1147.654       0.309       0.047
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.887	547.363	0.000	0.060	0.068	0.055

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.628	18.045	1.033	557.863	8.158	330.053	2.559

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
50810.836	0.331	285.958	1635789.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 4

RESET = 0.000BLEED = 0.000 DPInc = 9.028 EfDer = 0.969

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
99.590	2266.000	18.045	557.863	1.000	1.000	0.980

W Kg/sec = 45.26799

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
84.137	2185.014	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
76612.523	78144.609	2.095	513.330	245.035	401.059	1.637

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	333.65	-0.11	333.65	0.29	367.24
MEAN	16.97	0.00	-0.02	333.65	-0.11	333.65	0.29	
HUB	14.32	0.00	-0.02	333.65	-0.11	333.65	0.29	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	48.79	46.36	2.43	380.86	506.42	17.02	548.57	0.44
MEAN	45.18	43.80	1.38	335.59	473.30	17.02	548.57	0.41
HUB	40.33	37.84	2.49	283.17	437.69	17.02	548.57	0.38

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	374.30	121.58	354.00	1154.00	0.32
MEAN	16.57	382.28	143.11	354.48	1153.73	0.33
HUB	13.89	412.03	208.50	355.38	1153.41	0.36

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	434.40	251.77	0.38	2297.55	
MEAN	327.74	399.68	184.63	0.35	2373.79	1.27
HUB	274.67	361.49	66.17	0.31	2897.72	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.79	1.04	17.46	565.16	1.01	553.46	0.92	0.89
MEAN	18.81	1.04	17.43	565.40	1.01	553.20	0.92	0.89
HUB	18.98	1.05	17.38	567.06	1.02	552.89	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	18.95	35.42	31.50	3.92	0.93	0.18	2.90	
MEAN	21.98	27.51	23.50	4.01	0.91	0.20	3.29	0.89
HUB	30.40	10.55	6.50	4.05	0.91	0.23	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.969

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	376.289	143.912	347.682	1154.617	0.326	0.052

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.845	17.507	554.051	46.000	22.486	32.400	9.914

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	367.797	143.912	394.950	1155.167	0.318	0.085

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.825	17.546	554.579	456.573	0.024	0.198

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	350.271	0.000	350.271	1156.261	0.303	0.067

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.603	555.630	0.000	0.060	0.068	0.125

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.782	18.762	1.040	565.874	8.011	316.216	2.451

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
49898.367	0.358	280.823	910401.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc = 9.028 EfDer = 0.935

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
99.590	2266.000	18.762	565.874	1.000	1.000	0.980

W Kg/sec = 45.26799

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
81.501	2169.492	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
76612.523	78144.609	2.147	509.668	237.359	390.276	1.644

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	327.12	-0.11	327.12	0.28	346.83
MEAN	15.91	0.00	-0.02	327.12	-0.11	327.12	0.28	
HUB	13.07	0.00	-0.02	327.12	-0.11	327.12	0.28	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	47.93	47.36	0.57	362.27	488.19	17.75	556.94	0.42
MEAN	43.90	44.80	-0.90	314.67	453.98	17.75	556.94	0.39
HUB	38.32	38.84	-0.52	258.45	416.97	17.75	556.94	0.36

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	363.23	105.06	347.70	1161.66	0.31
MEAN	15.50	369.43	123.52	348.17	1161.36	0.32
HUB	12.59	394.33	183.43	349.07	1161.02	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	428.07	249.70	0.37	1886.83	
MEAN	306.46	393.31	182.94	0.34	1916.05	1.24
HUB	248.96	355.17	65.54	0.31	2310.81	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.36	1.03	18.09	571.86	1.01	560.85	0.92	0.86
MEAN	19.37	1.03	18.06	571.96	1.01	560.56	0.92	0.86
HUB	19.50	1.04	18.00	573.21	1.01	560.23	0.92	0.86

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	16.81	35.68	31.50	4.18	0.93	0.16	2.90	
MEAN	19.53	27.72	23.50	4.22	0.90	0.17	3.34	0.86
HUB	27.72	10.63	6.50	4.13	0.90	0.20	4.06	

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   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.935

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     15.219      372.919     125.785     351.066     1161.537       0.321       -0.009

     Pt3         Ps3         Ts3         Vane No.     Alpha3      Vane A3      Incid3
     19.383      18.045      560.733      46.000      19.712       33.000       13.288

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth       cp 2-Th
     15.219      375.922     125.785     396.408     1161.343       0.324       -0.057

   BlockageThr  PtTh        PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
      0.950       19.326      17.972      560.545      440.827       0.061        0.169

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4        cp 3-4
     14.701      352.294       0.000     352.294     1162.830       0.303        0.038

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD       cp 2-4
      0.950       18.097      561.982       0.000       0.060       0.089        0.035

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
      0.697       19.289        1.028      572.344       6.470      366.181        2.839

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  40303.762       0.320     226.825  962104.500

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc    TR
    308467.75   1736.0251      97.2890       1.2768       0.7660       9.0280       1.0947


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 60% Stat 2 40% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.453   EfDer =  0.994

   W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
     98.062     2266.000       15.107      522.810        1.000        1.000        0.980
 W Kg/sec =   44.57341

   W cor       RPM cor         GAMMA        Cp          R            Blades       THK
     95.796     2257.076        1.402        0.249       53.349       32.000        0.050

   CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
  75437.000   76945.578        2.981      831.557      278.980      619.754        2.222

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00     -0.02   222.05     -0.08   222.05      0.20    406.33
  MEAN    17.06      0.00     -0.02   222.05     -0.08   222.05      0.20
  HUB     12.51      0.00     -0.02   222.05     -0.08   222.05      0.20

       BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
  TIP     61.44     50.47    10.97   407.95   464.53     14.70   518.69      0.42
  MEAN    56.65     47.20     9.45   337.36   403.94     14.70   518.69      0.36
  HUB     48.10     38.62     9.48   247.38   332.48     14.70   518.69      0.30
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     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2       Cu2      Cm2     Ao2         Mach2
TIP     20.63   389.65   245.07   302.93  1125.29     0.35
MEAN    18.04   404.07   264.51   305.46  1123.30     0.36
HUB     15.00   451.01   327.80   309.77  1120.20     0.40

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    407.95   343.94   162.88     0.31  5057.40
MEAN   356.65   319.05    92.14     0.28  4772.03     1.43
HUB    296.62   311.33    31.18     0.28  4918.00

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     16.63     1.10    15.31   538.88     1.03   526.19     0.92     0.91
MEAN    16.54     1.10    15.13   537.97     1.03   524.33     0.92     0.91
HUB     16.59     1.10    14.83   538.43     1.03   521.44     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     38.97    28.27    24.20     4.07     0.93     0.35     2.90
MEAN    40.89    16.79    12.70     4.09     0.94     0.31     3.51     0.91
HUB     46.62    -5.75    -9.30     3.55     0.94     0.18     4.78


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.994

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     409.403     263.997     312.916    1123.396       0.364       -0.005

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.572      15.117     524.426      24.000      40.153      35.400      -4.753

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     336.106     263.997     427.390    1128.273       0.298       0.322

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      16.561      15.571     528.990     528.796       0.017       0.452

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
     18.083     312.450       0.000     312.450    1129.639       0.277       0.365

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      15.664     530.272       0.000       0.060       0.044       0.385

   STAGE EXIT CONDITIONS, STAGE            1
     Eff4        Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.870      16.521       1.094     538.426      15.616     199.094       1.543

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  97220.602       0.584     538.752  933693.938


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.453   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     98.062    2266.000      16.521     538.426       1.000       1.000       0.980
W Kg/sec =   44.57341

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     88.898    2224.104       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  75437.000   76945.578       2.281     590.487     258.892     474.134       1.831
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    ROTOR LEADING EDGE CONDITIONS, STAGE            2

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.55     0.00    -0.02   298.95    -0.10   298.95     0.26   398.84
MEAN    18.08     0.00    -0.02   298.95    -0.10   298.95     0.26
HUB     15.21     0.00    -0.02   298.95    -0.10   298.95     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     53.67    46.36     7.31   406.37   504.57    15.74   530.96     0.45
MEAN    50.10    42.30     7.80   357.49   466.09    15.74   530.96     0.41
HUB     45.18    37.84     7.34   300.77   424.14    15.74   530.96     0.38

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   365.04   181.24   316.87  1138.94     0.32
MEAN    18.01   372.24   192.70   318.47  1137.70     0.33
HUB     15.22   402.30   243.31   320.38  1136.42     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   387.22   222.56     0.34  3702.97
MEAN   356.14   357.96   163.44     0.31  3472.43     1.41
HUB    301.03   325.54    57.72     0.29  3705.48

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.70     1.07    16.48   550.19     1.02   539.06     0.92     0.91
MEAN    17.62     1.07    16.36   549.45     1.02   537.88     0.92     0.91
HUB     17.70     1.07    16.23   550.19     1.02   536.68     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     29.77    35.08    31.50     3.58     0.93     0.29     2.90
MEAN    31.18    27.17    23.50     3.67     0.93     0.29     3.30     0.91
HUB     37.21    10.21     6.50     3.71     0.93     0.31     3.92


  blockage3   Cor/U1    Cor/Incid
     0.550       1.000       0.999

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     674.223     193.244     645.936    1109.965       0.607      -1.976

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.662      13.762     511.980      46.000      16.656      30.600      13.944

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     673.505     193.244     700.679    1110.053       0.607      -2.006

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.550      17.595      13.717     512.061     289.961       0.061       0.112

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4          Mach4        cp 3-4
    17.823     663.649       0.000     663.649    1111.250       0.597      -0.007

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.550      13.752     513.162       0.000       0.060       0.127      -1.979

   STAGE EXIT CONDITIONS, STAGE             2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.784      17.508       1.060     549.945      11.519     244.530       1.896

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  71730.844       0.440     397.500  858783.188


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc = 9.453   EfDer =  0.778
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W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
98.062	2266.000	17.508	549.945	1.000	1.000	0.580

W Kg/sec = 44.57341

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
84.777	2200.688	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
75437.000	76945.578	1.308	322.834	246.894	248.585	1.007

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	579.93	-0.20	579.93	0.52	385.43
MEAN	17.74	0.00	-0.02	579.93	-0.20	579.93	0.52	
HUB	15.05	0.00	-0.02	579.93	-0.20	579.93	0.52	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	34.40	46.36	-11.96	396.88	702.84	14.58	521.86	0.63
MEAN	31.18	43.40	-12.22	350.77	677.86	14.58	521.86	0.60
HUB	27.18	38.84	-11.66	297.61	651.93	14.58	521.86	0.58

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	357.91	119.63	337.33	1147.05	0.31
MEAN	17.51	366.25	141.58	337.78	1146.88	0.32
HUB	14.85	396.70	205.97	339.04	1146.78	0.35

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	433.39	272.10	0.38	2373.92	
MEAN	346.18	394.91	204.60	0.34	2482.19	1.79
HUB	293.65	350.19	87.68	0.31	3061.73	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.11	1.03	16.93	557.48	1.01	546.79	0.92	0.71
MEAN	18.14	1.04	16.90	557.83	1.01	546.63	0.92	0.71
HUB	18.29	1.04	16.83	559.67	1.02	546.53	0.92	0.71

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	19.53	38.89	31.50	7.39	0.93	0.41	2.90	
MEAN	22.74	31.20	23.50	7.70	0.83	0.45	3.28	0.71
HUB	31.28	14.50	6.50	8.00	0.83	0.50	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.778

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	370.589	142.513	342.091	1147.124	0.323	-0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.167	16.898	546.857	46.000	22.616	31.500	8.884

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	357.712	142.513	385.055	1147.945	0.312	0.063

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.152	16.969	547.641	471.992	0.022	0.191

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	347.728	0.000	347.728	1148.561	0.303	0.066

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	16.983	548.229	0.000	0.060	0.062	0.074

```
    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.628      18.100       1.034     558.326       8.381     319.631       2.478

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  52197.430       0.340     289.254 1599581.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc = 9.453   EfDer =  0.975

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     98.062    2266.000      18.100     558.326       1.000       1.000       0.980
W Kg/sec =   44.57341

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     82.629    2184.108       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 75437.000   76945.578       2.133     513.330     240.641     401.059       1.667

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   327.27    -0.11   327.27     0.28   367.08
 MEAN    16.97     0.00    -0.02   327.27    -0.11   327.27     0.28
 HUB     14.32     0.00    -0.02   327.27    -0.11   327.27     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.34    46.36     2.98   380.86   502.24    17.11   549.38     0.44
 MEAN    45.73    43.80     1.93   335.59   468.83    17.11   549.38     0.41
 HUB     40.88    37.84     3.04   283.17   432.84    17.11   549.38     0.38

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   369.27   126.85   346.79  1155.14      0.32
 MEAN    16.57   377.20   146.96   347.39  1154.76      0.33
 HUB     13.89   406.73   209.91   348.38  1154.33      0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   425.47   246.50     0.37  2397.07
 MEAN   327.74   391.62   180.78     0.34  2437.67     1.29
 HUB    274.67   354.35    64.76     0.31  2917.24

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     18.88     1.04    17.59   565.94     1.01   554.55     0.92     0.89
 MEAN    18.89     1.04    17.55   566.07     1.01   554.19     0.92     0.89
 HUB     19.05     1.05    17.48   567.59     1.02   553.78     0.92     0.89

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     20.09    35.40    31.50     3.90     0.93     0.20     2.90
 MEAN    22.93    27.49    23.50     3.99     0.91     0.21     3.29     0.89
 HUB     31.07    10.53     6.50     4.03     0.91     0.24     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.975

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     16.481     371.429     147.790     340.760    1155.617       0.321       0.052

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.928      17.619     555.011      46.000      23.447      32.400       8.953

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
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     16.481     360.148     147.790     389.292    1156.334       0.311       0.101

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.911      17.680     555.700     456.573       0.022       0.211

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     16.096     342.939       0.000     342.939    1157.384       0.296       0.085

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.738     556.711       0.000       0.060       0.063       0.142

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.801      18.854       1.042     566.530       8.205     307.620       2.385

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  51103.918       0.367     283.195  894420.812


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 9.453   EfDer =  0.945

   W act      RPM act        Pt         Tt          POTS        POTH       AeroBl
     98.062    2266.000      18.854     566.530       1.000       1.000       0.980
W Kg/sec =   44.57341

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     79.904    2168.235       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  75437.000   76945.578       2.190     509.668     232.710     390.276       1.677

    ROTOR LEADING EDGE CONDITIONS, STAGE            5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   320.36    -0.11   320.36     0.28   346.63
 MEAN    15.91     0.00    -0.02   320.36    -0.11   320.36     0.28
 HUB     13.07     0.00    -0.02   320.36    -0.11   320.36     0.28

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     48.52    47.36     1.16   362.27   483.68    17.88   557.96     0.42
 MEAN    44.50    44.80    -0.30   314.67   449.13    17.88   557.96     0.39
 HUB     38.91    38.84     0.07   258.45   411.69    17.88   557.96     0.36

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   357.62   110.70   340.06  1163.02     0.31
 MEAN    15.50   363.76   127.61   340.65  1162.61     0.31
 HUB     12.59   388.46   184.93   341.62  1162.15     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   418.57   244.05     0.36  1988.04
 MEAN   306.46   384.75   178.85     0.33  1979.35     1.26
 HUB    248.96   347.57    64.04     0.30  2329.67

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.50     1.03    18.26   572.84     1.01   562.16     0.92     0.86
 MEAN    19.49     1.03    18.21   572.81     1.01   561.77     0.92     0.86
 HUB     19.61     1.04    18.15   573.93     1.01   561.33     0.92     0.86

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     18.03    35.67    31.50     4.17     0.93     0.17     2.90
 MEAN    20.54    27.70    23.50     4.20     0.90     0.19     3.34     0.86
 HUB     28.43    10.62     6.50     4.12     0.90     0.21     4.06


   blockage3   Cor/U1    Cor/Incid
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      0.950       1.000       0.945

     ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219     367.219     129.946     343.458    1162.781       0.316      -0.008

      Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
      19.505      18.201     561.936      46.000      20.724      33.000      12.276

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     367.307     129.946     389.616    1162.776       0.316      -0.037

    BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      19.457      18.156     561.930     440.827       0.056       0.182

     VANED DIFFUSER EXIT:
    R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
      14.701     344.282       0.000     344.282    1164.190       0.296       0.058

    Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      18.277     563.298       0.000       0.060       0.083       0.055

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
       0.727      19.422       1.030     573.194       6.664     354.436       2.748

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   41512.258       0.330     230.042  944941.000

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     313765.03   1738.7432      95.7963      1.2856      0.7751      9.4531      1.0964


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
*********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60% Stat 2 40% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.992

    W act       RPM act         Pt          Tt           POTS         POTH        AeroBl
      96.156     2266.000       15.107     522.810        1.000        1.000        0.980
 W Kg/sec =   43.70718

    W cor       RPM cor         GAMMA       Cp          R            Blades       THK
      93.935     2257.076        1.402       0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1        A*      AthrRotor  ChokeMargin
   73970.969    75450.234        3.040     831.557     273.558     619.754       2.266

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   217.56    -0.07   217.56      0.19    406.33
  MEAN    17.06      0.00    -0.02   217.56    -0.07   217.56      0.19
  HUB     12.51      0.00    -0.02   217.56    -0.07   217.56      0.19

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
  TIP     61.93     50.47    11.46   407.95   462.40     14.71   518.86      0.41
  MEAN    57.19     47.20     9.99   337.36   401.49     14.71   518.86      0.36
  HUB     48.68     38.62    10.06   247.38   329.49     14.71   518.86      0.29

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK         AeroBl     Blades2
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     0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   386.93   248.50   296.59  1125.72     0.34
 MEAN    18.04   400.57   266.43   299.11  1123.67     0.36
 HUB     15.00   446.15   327.18   303.32  1120.56     0.40

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   336.73   159.45     0.30  5128.11
 MEAN   356.65   312.42    90.22     0.28  4806.68     1.45
 HUB    296.62   304.86    30.56     0.27  4908.61

         Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.65     1.10    15.34   539.10     1.03   526.60     0.92     0.91
 MEAN    16.55     1.10    15.16   538.08     1.03   524.68     0.92     0.91
 HUB     16.58     1.10    14.86   538.40     1.03   521.78     0.92     0.91

         Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     39.96    28.26    24.20     4.06     0.93     0.36     2.90
 MEAN    41.69    16.78    12.70     4.08     0.94     0.32     3.51     0.91
 HUB     47.17    -5.75    -9.30     3.55     0.94     0.19     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.992

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     405.700     265.916     306.400    1123.775       0.361      -0.005

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.579      15.149     524.780      24.000      40.954      35.400      -5.554

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     328.906     265.916     422.954    1128.808       0.291       0.338

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.567      15.617     529.492     528.796       0.018       0.465

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     305.882       0.000     305.882    1130.109       0.271       0.376

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.703     530.712       0.000       0.060       0.047       0.396

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.866      16.524       1.094     538.527      15.717     196.116       1.520

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  97853.297       0.588     531.720  914825.688


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.997

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     96.156    2266.000      16.524     538.527       1.000       1.000       0.980
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.161    2223.895       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73970.969   75450.234       2.326     590.487     253.831     474.134       1.868

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
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TIP     20.55     0.00    -0.02   292.71    -0.10   292.71     0.26   398.80
MEAN    18.08     0.00    -0.02   292.71    -0.10   292.71     0.26
HUB     15.21     0.00    -0.02   292.71    -0.10   292.71     0.26

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     54.24    46.36     7.88   406.37   500.89    15.77   531.37     0.44
MEAN    50.70    42.30     8.40   357.49   462.11    15.77   531.37     0.41
HUB     45.79    37.84     7.95   300.77   419.77    15.77   531.37     0.37

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   361.61   186.12   310.04  1139.60     0.32
MEAN    18.01   368.34   196.25   311.70  1138.27     0.32
HUB     15.22   397.75   244.59   313.65  1136.92     0.35

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   378.83   217.68     0.33  3802.57
MEAN   356.14   350.31   159.88     0.31  3536.35     1.43
HUB    301.03   318.69    56.44     0.28  3724.93

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.73     1.07    16.54   550.60     1.02   539.68     0.92     0.91
MEAN    17.65     1.07    16.41   549.76     1.02   538.43     0.92     0.91
HUB     17.71     1.07    16.27   550.36     1.02   537.15     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     30.98    35.07    31.50     3.57     0.93     0.31     2.90
MEAN    32.20    27.16    23.50     3.66     0.93     0.31     3.30     0.91
HUB     37.95    10.20     6.50     3.70     0.93     0.32     3.92


  blockage3   Cor/U1    Cor/Incid
     0.550       1.000       0.997

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     657.272     196.805     627.115    1112.325       0.591      -1.900

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.684      13.959     514.161      46.000      17.423      30.600      13.177

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     652.048     196.805     681.101    1112.943       0.586      -1.890

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.550      17.624      13.966     514.732     289.961       0.056       0.123

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     642.147       0.000     642.147    1114.102       0.576       0.039

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.550      14.008     515.802       0.000       0.060       0.113      -1.857

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.801      17.551       1.062     550.240      11.713     238.957       1.852

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  72937.234       0.447     396.330  840755.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.769

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     96.156    2266.000      17.551     550.240       1.000       1.000       0.580
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W Kg/sec = 43.70718

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
82.950	2200.097	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
73970.969	75450.234	1.336	322.834	241.574	248.585	1.029

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	563.27	-0.19	563.27	0.50	385.32
MEAN	17.74	0.00	-0.02	563.27	-0.19	563.27	0.50	
HUB	15.05	0.00	-0.02	563.27	-0.19	563.27	0.50	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	35.18	46.36	-11.18	396.88	689.15	14.78	523.75	0.61
MEAN	31.93	43.40	-11.47	350.77	663.66	14.78	523.75	0.59
HUB	27.87	38.84	-10.97	297.61	637.15	14.78	523.75	0.57

ROTOR EXIT CONDITIONS, STAGE 3 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	19.81	352.86	126.40	329.45	1148.12	0.31
MEAN	17.51	361.15	146.72	330.00	1147.81	0.31
HUB	14.85	391.40	208.31	331.37	1147.57	0.34

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	391.73	423.01	265.34	0.37	2507.85	
MEAN	346.18	385.60	199.47	0.34	2571.93	1.80
HUB	293.65	342.18	85.35	0.30	3096.25	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	18.18	1.04	17.03	558.20	1.01	547.81	0.92	0.70
MEAN	18.20	1.04	16.99	558.41	1.01	547.52	0.92	0.70
HUB	18.33	1.04	16.91	560.07	1.02	547.28	0.92	0.70

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	20.99	38.85	31.50	7.35	0.93	0.42	2.90	
MEAN	23.97	31.15	23.50	7.65	0.84	0.45	3.28	0.70
HUB	32.15	14.44	6.50	7.94	0.84	0.50	3.87	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.769

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.392	365.390	147.679	334.216	1148.055	0.318	-0.002

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
18.225	16.988	547.745	46.000	23.839	31.500	7.661

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.392	349.115	147.679	379.065	1149.072	0.304	0.084

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	18.213	17.082	548.716	471.992	0.019	0.207

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.121	339.293	0.000	339.293	1149.663	0.295	0.089

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	17.100	549.281	0.000	0.060	0.056	0.098

STAGE EXIT CONDITIONS, STAGE 3

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim

```
      0.632      18.167       1.035     558.894       8.654     307.514       2.384

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  53899.586       0.351     292.882 1555933.250


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.982

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     96.156    2266.000      18.167     558.894       1.000       1.000       0.980
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     80.764    2182.997       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73970.969   75450.234       2.182     513.330     235.210     401.059       1.705

     ROTOR LEADING EDGE CONDITIONS, STAGE             4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   319.42    -0.11   319.42     0.28   366.90
 MEAN    16.97     0.00    -0.02   319.42    -0.11   319.42     0.28
 HUB     14.32     0.00    -0.02   319.42    -0.11   319.42     0.28

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     50.02    46.36     3.66   380.86   497.16    17.22   550.38     0.43
 MEAN    46.42    43.80     2.62   335.59   463.38    17.22   550.38     0.40
 HUB     41.57    37.84     3.73   283.17   426.94    17.22   550.38     0.37

      ROTOR EXIT CONDITIONS, STAGE             4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     18.88   363.31   133.31   337.97  1156.51     0.31
 MEAN    16.57   371.11   151.64   338.71  1156.00     0.32
 HUB     13.89   400.33   211.66   339.80  1155.45     0.35

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   414.54   240.04     0.36  2518.95
 MEAN   327.74   381.76   176.10     0.33  2515.12     1.31
 HUB    274.67   345.59    63.01     0.30  2941.47

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.00      1.05    17.74   566.89     1.01   555.87     0.92     0.90
 MEAN    18.99      1.05    17.68   566.88     1.01   555.38     0.92     0.90
 HUB     19.14      1.05    17.61   568.23     1.02   554.85     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     21.53    35.38    31.50     3.88     0.93     0.21     2.90
 MEAN    24.12    27.47    23.50     3.97     0.91     0.23     3.29     0.90
 HUB     31.92    10.51     6.50     4.01     0.91     0.25     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.982

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     365.601     152.492     332.280    1156.827       0.316       0.052

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.028      17.754     556.175      46.000      24.652      32.400       7.748

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     350.809     152.492     382.519    1157.746       0.303       0.120

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
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      0.950      19.016      17.841     557.060     456.573       0.019       0.227

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     16.096     334.001       0.000     334.001    1158.745       0.288       0.107

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.901     558.021       0.000       0.060       0.056       0.164

    STAGE EXIT CONDITIONS, STAGE            4
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.821      18.965       1.044     567.336       8.441     297.498       2.306

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  52577.613       0.377     285.699  874661.438


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          5
 RESET =  0.000BLEED =  0.000 DPInc = 9.988   EfDer =  0.957

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     96.156    2266.000      18.965     567.336       1.000       1.000       0.980
W Kg/sec =   43.70718

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.947    2166.696       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  73970.969   75450.234       2.245     509.668     227.009     390.276       1.719

    ROTOR LEADING EDGE CONDITIONS, STAGE           5

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   312.11    -0.11   312.11     0.27   346.38
 MEAN    15.91     0.00    -0.02   312.11    -0.11   312.11     0.27
 HUB     13.07     0.00    -0.02   312.11    -0.11   312.11     0.27

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     49.26    47.36     1.90   362.27   478.26    18.03   559.20     0.41
 MEAN    45.24    44.80     0.44   314.67   443.28    18.03   559.20     0.38
 HUB     39.64    38.84     0.80   258.45   405.30    18.03   559.20     0.35

     ROTOR EXIT CONDITIONS, STAGE            5     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     17.94   351.04   117.56   330.77  1164.66     0.30
 MEAN    15.50   357.04   132.61   331.50  1164.11     0.31
 HUB     12.59   381.44   186.82   332.56  1163.53     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   407.03   237.19     0.35  2111.05
 MEAN   306.46   374.32   173.85     0.32  2056.78     1.28
 HUB    248.96   338.32    62.15     0.29  2353.41

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.66     1.04    18.46   574.04     1.01   563.75     0.92     0.88
 MEAN    19.64     1.04    18.40   573.87     1.01   563.22     0.92     0.88
 HUB     19.74     1.04    18.32   574.81     1.01   562.66     0.92     0.88

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     19.57    35.64    31.50     4.14     0.93     0.19     2.90
 MEAN    21.80    27.67    23.50     4.17     0.90     0.20     3.34     0.88
 HUB     29.33    10.58     6.50     4.08     0.90     0.22     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.957

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
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      R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
      15.219      360.462     135.037      334.212    1164.283       0.310       -0.008

      Pt3          Ps3         Ts3          Vane No.     Alpha3     Vane A3      Incid3
      19.653       18.388      563.389       46.000      22.001      33.000      10.999

     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG          Cth         Cuth         Cmth         Aoth         Machth      cp 2-Th
      15.219      356.889     135.037      381.582    1164.504       0.306       -0.012

    BlockageThr  PtTh         PsTh        TsTh         AreaTh        w 2-Th  DiffFact4
       0.950       19.616       18.377      563.603      440.827       0.049       0.198

     VANED DIFFUSER EXIT:
    R4           C4           Cu4         Cm4          Ao4           Mach4       cp 3-4
      14.701      334.583       0.000      334.583    1165.834       0.287       0.082

    Blockage4    Ps4         Ts4          Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950       18.494      564.890       0.000        0.060       0.074       0.079

     STAGE EXIT CONDITIONS, STAGE             5
       Eff4        Pt4           PR4        Texit         Del T        Ns         Ns nondim
       0.759       19.583        1.033      574.237       6.901      340.782       2.642

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   42990.500       0.342     233.604  923756.750

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP         MassFloS1cor  OPR       Efficiency       Rotor1Inc   TR
     320258.25   1740.2357      93.9346       1.2963       0.7853       9.9879      1.0984


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

    Fan-Core + 4 Stage LPC 60% Stat 2 40% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.987

    W act       RPM act         Pt          Tt            POTS         POTH        AeroBl
      92.762     2266.000       15.107      522.810        1.000        1.000        0.980
 W Kg/sec =   42.16433

    W cor       RPM cor         GAMMA        Cp          R            Blades       THK
      90.619     2257.076        1.402        0.249       53.349       32.000       0.050

    CFM         SCFM            A1/A*       Area1         A*      AthrRotor  ChokeMargin
   71359.812   72786.852        3.151      831.557      263.901      619.754       2.348

      ROTOR LEADING EDGE CONDITIONS, STAGE             1

         R1       Stator    Alfa      C1       CU1       Cm1      Abs MACH  U1 corrected
  TIP     20.63      0.00    -0.02   209.60    -0.07   209.60      0.19   406.33
  MEAN    17.06      0.00    -0.02   209.60    -0.07   209.60      0.19
  HUB     12.51      0.00    -0.02   209.60    -0.07   209.60      0.19

        BetaFlo   BetaBlade Incid   U1        W1        Ps1       Ts1      Rel Mach
  TIP     62.81     50.47    12.34   407.95   458.71     14.74   519.14      0.41
  MEAN    58.15     47.20    10.95   337.36   397.23     14.74   519.14      0.36
  HUB     49.73     38.62    11.11   247.38   324.29     14.74   519.14      0.29

       ROTOR EXIT CONDITIONS, STAGE             1     SOLUTION IS CONVERGED
     B2 axial    THK         AeroBl      Blades2
       0.700       0.050        0.950       32.000

           R2      C2       Cu2       Cm2      Ao2          Mach2
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 TIP     20.63   382.39   254.50   285.40  1126.45     0.34
 MEAN    18.04   394.57   269.81   287.91  1124.30     0.35
 HUB     15.00   437.62   326.01   291.94  1121.17     0.39

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   324.04   153.45     0.29  5251.84
 MEAN   356.65   300.72    86.85     0.27  4867.47     1.50
 HUB    296.62   293.42    29.39     0.26  4890.99

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.68     1.10    15.40   539.49     1.03   527.28     0.92     0.90
 MEAN    16.56     1.10    15.21   538.27     1.03   525.27     0.92     0.90
 HUB     16.57     1.10    14.91   538.35     1.03   522.35     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP    41.72    28.27    24.20     4.07     0.93     0.39     2.90
 MEAN   43.14    16.79    12.70     4.09     0.94     0.34     3.51     0.90
 HUB    48.16    -5.75    -9.30     3.55     0.94     0.21     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.987

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     399.348     269.283     294.899    1124.421       0.355      -0.004

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.589      15.202     525.384      24.000      42.400      35.400      -7.000

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     316.235     269.283     415.352    1129.724       0.280       0.365

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.574      15.695     530.351     528.796       0.020       0.488

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     294.320       0.000     294.320    1130.914       0.260       0.395

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.766     531.469       0.000       0.060       0.053       0.415

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.859      16.527       1.094     538.704      15.894     190.885       1.480

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  98953.383       0.595     518.717  881331.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.994

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     92.762    2266.000      16.527     538.704       1.000       1.000       0.980
W Kg/sec =   42.16433

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     84.081    2223.530       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  71359.812   72786.852       2.411     590.487     244.863     474.134       1.936

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   281.72    -0.10   281.72     0.25   398.74
 MEAN    18.08     0.00    -0.02   281.72    -0.10   281.72     0.25
 HUB     15.21     0.00    -0.02   281.72    -0.10   281.72     0.25
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      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     55.27    46.36     8.91   406.37   494.55    15.83   532.08     0.44
MEAN    51.77    42.30     9.47   357.49   455.23    15.83   532.08     0.40
HUB     46.88    37.84     9.04   300.77   412.17    15.83   532.08     0.36

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   356.00   194.64   298.08  1140.72     0.31
MEAN    18.01   361.79   202.49   299.82  1139.26     0.32
HUB     15.22   389.93   246.85   301.84  1137.76     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   364.14   209.16     0.32  3976.52
MEAN   356.14   336.90   153.65     0.30  3648.55     1.47
HUB    301.03   306.67    54.18     0.27  3759.20

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.79     1.08    16.63   551.33     1.02   540.75     0.92     0.91
MEAN    17.68     1.07    16.49   550.29     1.02   539.36     0.92     0.91
HUB     17.72     1.07    16.33   550.64     1.02   537.95     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     33.14    35.06    31.50     3.56     0.93     0.33     2.90
MEAN    34.03    27.13    23.50     3.63     0.94     0.33     3.30     0.91
HUB     39.28    10.18     6.50     3.68     0.94     0.33     3.92


   blockage3   Cor/U1    Cor/Incid
      0.550       1.000       0.994

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     629.249     203.056     595.586    1116.133       0.564      -1.772

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.718      14.276     517.688      46.000      18.826      30.600      11.774

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     616.660     203.056     649.232    1117.544       0.552      -1.698

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.550      17.670      14.364     518.998     289.961       0.048       0.144

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.823     606.892       0.000     606.892    1118.620       0.543       0.112

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.550      14.415     519.996       0.000       0.060       0.092      -1.657

    STAGE EXIT CONDITIONS, STAGE            2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.824      17.615       1.066     550.756      12.052     229.460       1.779

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  75049.359       0.460     393.412  808871.375


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          3
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.766

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     92.762    2266.000      17.615     550.756       1.000       1.000       0.580
W Kg/sec =   42.16433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
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    79.767    2199.067       1.402       0.249      53.349      56.000       0.050

  CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
71359.812   72786.852       1.390     322.834     232.303     248.585       1.070

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   535.30    -0.18   535.30     0.48   385.14
MEAN    17.74     0.00    -0.02   535.30    -0.18   535.30     0.48
HUB     15.05     0.00    -0.02   535.30    -0.18   535.30     0.48

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     36.57    46.36    -9.79   396.88   666.48    15.09   526.83     0.59
MEAN    33.25    43.40   -10.15   350.77   640.09    15.09   526.83     0.57
HUB     29.09    38.84    -9.75   297.61   612.56    15.09   526.83     0.54

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   344.59   138.20   315.66  1149.94     0.30
MEAN    17.51   352.55   155.58   316.36  1149.41     0.31
HUB     14.85   382.22   212.33   317.82  1148.93     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   404.87   253.53     0.35  2741.44
MEAN   346.18   369.35   190.60     0.32  2726.95     1.81
HUB    293.65   328.06    81.33     0.29  3155.81

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.31     1.04    17.20   559.46     1.02   549.55     0.92     0.70
MEAN    18.30     1.04    17.14   559.42     1.02   549.04     0.92     0.70
HUB     18.41     1.05    17.05   560.78     1.02   548.58     0.92     0.70

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     23.64    38.77    31.50     7.27     0.93     0.43     2.90
MEAN    26.19    31.07    23.50     7.57     0.85     0.46     3.28     0.70
HUB     33.75    14.35     6.50     7.85     0.85     0.51     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.766

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     356.609     156.602     320.384    1149.646       0.310      -0.001

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.327      17.143     549.265      46.000      26.049      31.500       5.451

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     334.086     156.602     368.968    1151.005       0.290       0.122

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.321      17.279     550.564     471.992       0.015       0.237

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     324.589       0.000     324.589    1151.550       0.282       0.130

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.300     551.086       0.000       0.060       0.047       0.140

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.647      18.283       1.038     559.885       9.129     288.021       2.233

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
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  56854.102       0.370     298.031 1481678.750


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =10.953   EfDer =  0.992

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     92.762    2266.000      18.283     559.885       1.000       1.000       0.980
W Kg/sec =   42.16433

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     77.486    2181.066       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
 71359.812   72786.852       2.275     513.330     225.664     401.059       1.777

     ROTOR LEADING EDGE CONDITIONS, STAGE            4

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     19.26     0.00    -0.02   305.72    -0.11   305.72     0.27   366.57
 MEAN    16.97     0.00    -0.02   305.72    -0.11   305.72     0.27
 HUB     14.32     0.00    -0.02   305.72    -0.11   305.72     0.27

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     51.25    46.36     4.89   380.86   488.46    17.41   552.08     0.42
 MEAN    47.68    43.80     3.88   335.59   454.04    17.41   552.08     0.39
 HUB     42.82    37.84     4.98   283.17   416.78    17.41   552.08     0.36

      ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     18.88   353.57   144.46   322.71  1158.84     0.31
 MEAN    16.57   360.95   159.76   323.67  1158.12     0.31
 HUB     13.89   389.44   214.71   324.91  1157.37     0.34

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    373.34   395.64   228.89     0.34  2729.35
 MEAN   327.74   364.66   167.98     0.31  2649.58     1.34
 HUB    274.67   330.39    59.96     0.29  2983.77

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     19.19     1.05    17.99   568.55     1.02   558.11     0.92     0.91
 MEAN    19.17     1.05    17.92   568.30     1.02   557.42     0.92     0.91
 HUB     19.28     1.05    17.83   569.36     1.02   556.70     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     24.11    35.35    31.50     3.85     0.93     0.24     2.90
 MEAN    26.27    27.43    23.50     3.93     0.92     0.25     3.29     0.91
 HUB     33.46    10.46     6.50     3.96     0.92     0.27     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.992

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    16.481     355.899     160.655     317.575    1158.887       0.307       0.051

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.202      17.985     558.159      46.000      26.834      32.400       5.566

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     334.690     160.655     371.252    1160.156       0.288       0.156

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.195      18.116     559.382     456.573       0.015       0.257

   VANED DIFFUSER EXIT:
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R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	318.608	0.000	318.608	1161.066	0.274	0.147

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.176	560.260	0.000	0.060	0.047	0.202

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.849	19.153	1.048	568.735	8.851	280.881	2.177

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
55130.305	0.396	288.995	839906.375

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =10.953 EfDer = 0.974

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
92.762	2266.000	19.153	568.735	1.000	1.000	0.980

W Kg/sec = 42.16433

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
74.548	2164.028	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
71359.812	72786.852	2.348	509.668	217.110	390.276	1.798

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	297.88	-0.10	297.88	0.26	345.96
MEAN	15.91	0.00	-0.02	297.88	-0.10	297.88	0.26	
HUB	13.07	0.00	-0.02	297.88	-0.10	297.88	0.26	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	50.58	47.36	3.22	362.27	469.09	18.30	561.33	0.40
MEAN	46.58	44.80	1.78	314.67	433.38	18.30	561.33	0.37
HUB	40.96	38.84	2.12	258.45	394.44	18.30	561.33	0.34

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	340.39	129.31	314.88	1167.42	0.29
MEAN	15.50	345.92	141.15	315.81	1166.66	0.30
HUB	12.59	369.59	190.00	317.01	1165.87	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	387.26	225.45	0.33	2321.68	
MEAN	306.46	356.46	165.30	0.31	2189.19	1.32
HUB	248.96	322.45	58.96	0.28	2393.41	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.94	1.04	18.79	576.11	1.01	566.43	0.92	0.89
MEAN	19.89	1.04	18.71	575.69	1.01	565.69	0.92	0.89
HUB	19.96	1.04	18.62	576.33	1.01	564.93	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	22.33	35.60	31.50	4.10	0.93	0.22	2.90	
MEAN	24.08	27.63	23.50	4.13	0.91	0.23	3.34	0.89
HUB	30.94	10.54	6.50	4.04	0.91	0.24	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.974

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	349.312	143.743	318.366	1166.827	0.299	-0.007

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     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     19.905      18.703     565.854      46.000      24.299      33.000       8.701

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     339.167     143.743     368.369    1167.428       0.291       0.034

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      19.881      18.749     566.438     440.827       0.039       0.228

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     318.064       0.000     318.064    1168.621       0.272       0.126

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      18.857     567.595       0.000       0.060       0.061       0.123

    STAGE EXIT CONDITIONS, STAGE            5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.806      19.854       1.037     576.042       7.306     318.973       2.473

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  45515.719       0.362     238.595  886585.625

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    331502.88   1737.7506     90.6187      1.3142      0.8005     10.9534      1.1018


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
*********************************************************************

   Fan-Core + 4 Stage LPC 60% Stat 2 40% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.980

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     89.191    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   40.54142

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     87.131    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  68613.172   69985.281       3.277     831.557     253.744     619.754       2.442

     ROTOR LEADING EDGE CONDITIONS, STAGE            1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   201.25    -0.07   201.25     0.18   406.33
  MEAN    17.06     0.00    -0.02   201.25    -0.07   201.25     0.18
  HUB     12.51     0.00    -0.02   201.25    -0.07   201.25     0.18

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     63.75    50.47    13.28   407.95   454.95    14.77   519.43     0.41
  MEAN    59.19    47.20    11.99   337.36   392.89    14.77   519.43     0.35
  HUB     50.88    38.62    12.26   247.38   318.96    14.77   519.43     0.29

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
  TIP     20.63   378.04   260.69   273.77  1127.18     0.34
  MEAN    18.04   388.58   273.28   276.25  1124.93     0.35
  HUB     15.00   428.89   324.80   280.09  1121.79     0.38
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      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   310.86   147.26     0.28  5379.48
 MEAN   356.65   288.56    83.37     0.26  4930.11     1.55
 HUB    296.62   281.50    28.18     0.25  4872.87

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.71     1.11    15.46   539.90     1.03   527.96     0.92     0.90
 MEAN    16.57     1.10    15.26   538.47     1.03   525.86     0.92     0.90
 HUB     16.55     1.10    14.96   538.29     1.03   522.93     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     43.60    28.28    24.20     4.08     0.93     0.42     2.90
 MEAN    44.69    16.79    12.70     4.09     0.94     0.37     3.51     0.90
 HUB     49.23    -5.75    -9.30     3.55     0.94     0.23     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.980

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     18.071     392.992     272.751     282.930    1125.066       0.349      -0.003

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.597      15.252     525.987      24.000      43.951      35.400      -8.551

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     303.095     272.751     407.750    1130.642       0.268       0.394

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.580      15.771     531.213     528.796       0.023       0.513

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     18.083     282.322       0.000     282.322    1131.722       0.249       0.414

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.826     532.229       0.000       0.060       0.060       0.434

    STAGE EXIT CONDITIONS, STAGE             1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.849      16.527       1.094     538.886      16.076     185.454       1.438

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 100088.438       0.601     504.473  846247.312


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           2
 RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.988

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     89.191    2266.000      16.527     538.886       1.000       1.000       0.980
W Kg/sec =   40.54142

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.859    2223.154       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  68613.172   69985.281       2.508     590.487     235.480     474.134       2.013

     ROTOR LEADING EDGE CONDITIONS, STAGE             2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   270.30    -0.09   270.30     0.24   398.67
 MEAN    18.08     0.00    -0.02   270.30    -0.09   270.30     0.24
 HUB     15.21     0.00    -0.02   270.30    -0.09   270.30     0.24

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     56.38    46.36    10.02   406.37   488.13    15.88   532.78     0.43
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MEAN    52.91    42.30    10.61   357.49   448.25    15.88   532.78     0.40
HUB     48.06    37.84    10.22   300.77   404.45    15.88   532.78     0.36

     ROTOR EXIT CONDITIONS, STAGE            2     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   350.74   203.37   285.76  1141.84     0.31
MEAN    18.01   355.39   208.84   287.55  1140.24     0.31
HUB     15.22   382.02   249.12   289.62  1138.61     0.34

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   349.05   200.43     0.31  4154.65
MEAN   356.14   323.08   147.29     0.28  3762.95     1.52
HUB    301.03   294.24    51.91     0.26  3793.70

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.84     1.08    16.71   552.08     1.02   541.81     0.92     0.90
MEAN    17.71     1.07    16.56   550.84     1.02   540.29     0.92     0.90
HUB     17.72     1.07    16.39   550.93     1.02   538.75     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     35.44    35.05    31.50     3.55     0.93     0.36     2.90
MEAN    35.99    27.12    23.50     3.62     0.94     0.35     3.30     0.90
HUB     40.70    10.16     6.50     3.66     0.94     0.35     3.92


  blockage3   Cor/U1    Cor/Incid
     0.550       1.000       0.988

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    17.960     602.229     209.430     564.641    1119.692       0.538      -1.647

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    17.746      14.571     520.995      46.000      20.350      30.600      10.250

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.960     582.503     209.430     619.008    1121.787       0.519      -1.510

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.550      17.710      14.732     522.947     289.961       0.040       0.165

   VANED DIFFUSER EXIT:
  R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
    17.823     573.053       0.000     573.053    1122.765       0.510       0.180

  Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.550      14.788     523.859       0.000       0.060       0.074      -1.464

   STAGE EXIT CONDITIONS, STAGE             2
     Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
     0.840      17.669       1.069     551.284      12.398     220.039       1.706

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  77205.188       0.474     389.135  775624.625


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.778

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     89.191    2266.000      17.669     551.284       1.000       1.000       0.580
W Kg/sec =   40.54142

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     76.500    2198.012       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
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 68613.172   69985.281       1.449     322.834     222.787     248.585       1.116

    ROTOR LEADING EDGE CONDITIONS, STAGE            3

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   507.80    -0.17   507.80     0.45   384.96
MEAN    17.74     0.00    -0.02   507.80    -0.17   507.80     0.45
HUB     15.05     0.00    -0.02   507.80    -0.17   507.80     0.45

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     38.02    46.36    -8.34   396.88   644.60    15.38   529.75     0.57
MEAN    34.65    43.40    -8.75   350.77   617.27    15.38   529.75     0.55
HUB     30.39    38.84    -8.45   297.61   588.67    15.38   529.75     0.52

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   336.85   150.32   301.45  1151.75     0.29
MEAN    17.51   344.25   164.73   302.28  1151.00     0.30
HUB     14.85   373.01   216.48   303.76  1150.29     0.32

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   386.20   241.41     0.34  2981.40
MEAN   346.18   352.56   181.45     0.31  2886.99     1.84
HUB    293.65   313.41    77.17     0.27  3217.36

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.43     1.04    17.37   560.75     1.02   551.28     0.92     0.71
MEAN    18.41     1.04    17.30   560.45     1.02   550.56     0.92     0.71
HUB     18.50     1.05    17.19   561.50     1.02   549.88     0.92     0.71

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     26.50    38.69    31.50     7.19     0.93     0.44     2.90
MEAN    28.59    30.98    23.50     7.48     0.86     0.47     3.28     0.71
HUB     35.48    14.25     6.50     7.75     0.86     0.51     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.778

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.392     348.118     165.813     306.091    1151.231       0.302       0.000

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.435      17.301     550.782      46.000      28.445      31.500       3.055

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     318.637     165.813     359.198    1152.945       0.276       0.164

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.432      17.478     552.423     471.992       0.013       0.271

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4          Mach4       cp 3-4
     17.121     309.532       0.000     309.532    1153.443       0.268       0.173

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.501     552.901       0.000       0.060       0.040       0.184

    STAGE EXIT CONDITIONS, STAGE            3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.671      18.401       1.041     560.902       9.617     269.769       2.091

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  59896.816       0.390     301.896 1407520.500
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    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =11.987   EfDer =  0.998

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
    89.191    2266.000      18.401     560.902       1.000       1.000       0.980
W Kg/sec =   40.54142

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
    74.096    2179.088       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
 68613.172   69985.281       2.379     513.330     215.790     401.059       1.859

    ROTOR LEADING EDGE CONDITIONS, STAGE            4

       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     19.26     0.00    -0.02   291.66    -0.10   291.66     0.25   366.24
MEAN    16.97     0.00    -0.02   291.66    -0.10   291.66     0.25
HUB     14.32     0.00    -0.02   291.66    -0.10   291.66     0.25

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     52.56    46.36     6.20   380.86   479.79    17.60   553.80     0.42
MEAN    49.01    43.80     5.21   335.59   444.70    17.60   553.80     0.39
HUB     44.16    37.84     6.32   283.17   406.59    17.60   553.80     0.35

     ROTOR EXIT CONDITIONS, STAGE            4     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     18.88   344.44   155.72   307.23  1161.14     0.30
MEAN    16.57   351.14   167.97   308.36  1160.23     0.30
HUB     13.89   378.62   217.74   309.74  1159.28     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    373.34   376.50   217.62     0.32  2941.94
MEAN   327.74   347.30   159.77     0.30  2785.57     1.39
HUB    274.67   314.93    56.92     0.27  3025.91

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     19.40     1.05    18.24   570.24     1.02   560.34     0.92     0.91
MEAN    19.34     1.05    18.15   569.75     1.02   559.45     0.92     0.91
HUB     19.42     1.06    18.04   570.51     1.02   558.54     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     26.88    35.31    31.50     3.81     0.93     0.27     2.90
MEAN    28.58    27.39    23.50     3.89     0.92     0.28     3.29     0.91
HUB     35.11    10.41     6.50     3.91     0.92     0.29     3.90


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.998

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
    16.481     346.566     168.912     302.617    1160.937       0.299       0.050

    Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
    19.374      18.211     560.137      46.000      29.169      32.400       3.231

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
    16.481     318.390     168.912     360.421    1162.557       0.274       0.194

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      19.371      18.386     561.701     456.573       0.013       0.289

   VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
    16.096     303.089       0.000     303.089    1163.379       0.261       0.188
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Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.444	562.495	0.000	0.060	0.040	0.242

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.867	19.337	1.051	570.166	9.264	265.115	2.055

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
57705.547	0.414	290.852	803902.062

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =11.987 EfDer = 0.987

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
89.191	2266.000	19.337	570.166	1.000	1.000	0.980

W Kg/sec = 40.54142

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
71.088	2161.312	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
68613.172	69985.281	2.462	509.668	207.033	390.276	1.885

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	283.52	-0.10	283.52	0.24	345.52
MEAN	15.91	0.00	-0.02	283.52	-0.10	283.52	0.24	
HUB	13.07	0.00	-0.02	283.52	-0.10	283.52	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	51.96	47.36	4.60	362.27	460.10	18.55	563.45	0.40
MEAN	47.99	44.80	3.19	314.67	423.63	18.55	563.45	0.36
HUB	42.36	38.84	3.52	258.45	383.71	18.55	563.45	0.33

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	330.58	141.05	298.98	1170.15	0.28
MEAN	15.50	335.36	149.71	300.09	1169.19	0.29
HUB	12.59	358.00	193.16	301.41	1168.20	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	367.51	213.71	0.31	2532.20	
MEAN	306.46	338.56	156.74	0.29	2321.76	1.36
HUB	248.96	306.54	55.80	0.26	2433.14	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.21	1.05	19.12	578.20	1.01	569.08	0.92	0.90
MEAN	20.14	1.04	19.02	577.54	1.01	568.15	0.92	0.90
HUB	20.17	1.04	18.90	577.89	1.01	567.19	0.92	0.90

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	25.26	35.56	31.50	4.06	0.93	0.25	2.90	
MEAN	26.51	27.58	23.50	4.08	0.92	0.25	3.34	0.90
HUB	32.65	10.49	6.50	3.99	0.92	0.26	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.987

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	338.745	152.459	302.497	1169.340	0.290	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.150	19.009	568.297	46.000	26.748	33.000	6.252

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     STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
      RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
      15.219     321.573     152.459     355.883    1170.314       0.275       0.082

    BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
       0.950      20.138      19.107     569.243     440.827       0.031       0.261

     VANED DIFFUSER EXIT:
    R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
      14.701     301.653       0.000     301.653    1171.379       0.258       0.172

    Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
       0.950      19.208     570.280       0.000       0.060       0.050       0.169

     STAGE EXIT CONDITIONS, STAGE            5
       Eff4       Pt4         PR4       Texit        Del T       Ns        Ns nondim
       0.842      20.116       1.040     577.877       7.711     298.841       2.317

 Del Enthalpy   Del_H/U^2    GHP      Reynolds#
   48039.559       0.382     242.132  848183.812

    OVERALL EXIT CONDITIONS; ALL           5   STAGES

   Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
     342935.56   1728.4884     87.1308      1.3316      0.8124     11.9868      1.1053


*********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
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    Fan-Core + 4 Stage LPC 60% Stat 2 40% Ice Block 3-11-2011

      COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           1
  RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.974

    W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
      85.685    2266.000      15.107     522.810       1.000       1.000       0.980
 W Kg/sec =   38.94787

    W cor      RPM cor        GAMMA       Cp         R           Blades       THK
      83.706    2257.076       1.402       0.249      53.349      32.000       0.050

    CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
   65916.203   67234.383       3.411     831.557     243.770     619.754       2.542

      ROTOR LEADING EDGE CONDITIONS, STAGE            1

         R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
  TIP     20.63     0.00    -0.02   193.09    -0.07   193.09     0.17   406.33
  MEAN    17.06     0.00    -0.02   193.09    -0.07   193.09     0.17
  HUB     12.51     0.00    -0.02   193.09    -0.07   193.09     0.17

        BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
  TIP     64.67    50.47    14.20   407.95   451.40    14.80   519.70     0.40
  MEAN    60.22    47.20    13.02   337.36   388.77    14.80   519.70     0.35
  HUB     52.03    38.62    13.41   247.38   313.87    14.80   519.70     0.28

       ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
     B2 axial    THK        AeroBl     Blades2
       0.700       0.050       0.950      32.000

          R2     C2      Cu2      Cm2     Ao2          Mach2
  TIP     20.63   374.15   266.63   262.48  1127.85     0.33
  MEAN    18.04   382.99   276.60   264.91  1125.52     0.34
  HUB     15.00   420.46   323.53   268.55  1122.36     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
  TIP    407.95   298.11   141.32     0.26  5502.01
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 MEAN   356.65   276.74    80.05     0.25  4989.90     1.60
 HUB    296.62   269.90    26.91     0.24  4853.73

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     16.73     1.11    15.51   540.29     1.03   528.60     0.92     0.89
 MEAN    16.58     1.10    15.30   538.66     1.03   526.41     0.92     0.89
 HUB     16.54     1.09    15.01   538.23     1.03   523.46     0.92     0.89

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     45.45    28.30    24.20     4.10     0.93     0.44     2.90
 MEAN    46.24    16.81    12.70     4.11     0.94     0.39     3.51     0.89
 HUB     50.30    -5.72    -9.30     3.58     0.94     0.26     4.78


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.974

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     18.071     387.055     276.063     271.295    1125.664       0.344      -0.002

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     16.603      15.297     526.546      24.000      45.499      35.400     -10.099

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     18.071     290.363     276.063     400.651    1131.497       0.257       0.422

   BlockageThr  PtTh        PsTh        TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      16.582      15.839     532.017     528.796       0.025       0.539

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4          Mach4       cp 3-4
     18.083     270.685       0.000     270.685    1132.477       0.239       0.432

   Blockage4    Ps4         Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      15.879     532.939       0.000       0.060       0.069       0.452

    STAGE EXIT CONDITIONS, STAGE            1
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.838      16.524       1.094     539.059      16.249     180.205       1.397

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
 101164.203       0.608     489.853  811938.625


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          2
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.982

   W act      RPM act        Pt          Tt           POTS        POTH       AeroBl
     85.685    2266.000      16.524     539.059       1.000       1.000       0.980
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     77.709    2222.797       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  65916.203   67234.383       2.609     590.487     226.308     474.134       2.095

     ROTOR LEADING EDGE CONDITIONS, STAGE            2

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.55     0.00    -0.02   259.21    -0.09   259.21     0.23   398.61
 MEAN    18.08     0.00    -0.02   259.21    -0.09   259.21     0.23
 HUB     15.21     0.00    -0.02   259.21    -0.09   259.21     0.23

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     57.47    46.36    11.11   406.37   482.08    15.93   533.45     0.43
 MEAN    54.06    42.30    11.76   357.49   441.65    15.93   533.45     0.39
 HUB     49.25    37.84    11.41   300.77   397.13    15.93   533.45     0.35
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      ROTOR EXIT CONDITIONS, STAGE             2     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     20.42   346.19   211.73   273.89  1142.87     0.30
MEAN    18.01   349.60   214.95   275.71  1141.15     0.31
HUB     15.22   374.58   251.27   277.79  1139.40     0.33

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    403.80   334.52   192.06     0.29  4325.42
MEAN   356.14   309.75   141.19     0.27  3872.92     1.56
HUB    301.03   282.21    49.75     0.25  3826.51

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     17.88     1.08    16.78   552.80     1.03   542.79     0.92     0.90
MEAN    17.74     1.07    16.62   551.36     1.02   541.15     0.92     0.90
HUB     17.72     1.07    16.44   551.21     1.02   539.49     0.92     0.90

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     37.71    35.04    31.50     3.54     0.93     0.38     2.90
MEAN    37.94    27.12    23.50     3.62     0.94     0.37     3.30     0.90
HUB     42.13    10.15     6.50     3.65     0.94     0.37     3.92


   blockage3   Cor/U1    Cor/Incid
      0.550       1.000       0.982

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     17.960     577.741     215.557     536.022    1122.822       0.515      -1.531

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     17.768      14.829     523.913      46.000      21.907      30.600       8.693

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.960     551.324     215.557     591.965    1125.488       0.490      -1.335

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.550      17.740      15.053     526.404     289.961       0.034       0.186

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.823     542.369       0.000     542.369    1126.362       0.482       0.238

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.550      15.107     527.222       0.000       0.060       0.061      -1.289

    STAGE EXIT CONDITIONS, STAGE             2
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.849      17.708       1.072     551.789      12.730     211.252       1.638

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  79272.414       0.486     383.849  743251.562


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           3
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  0.801

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     85.685    2266.000      17.708     551.789       1.000       1.000       0.580
W Kg/sec =   38.94787

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     73.364    2197.007       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  65916.203   67234.383       1.511     322.834     213.657     248.585       1.163

     ROTOR LEADING EDGE CONDITIONS, STAGE            3
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       R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
TIP     20.07     0.00    -0.02   482.40    -0.17   482.40     0.43   384.78
MEAN    17.74     0.00    -0.02   482.40    -0.17   482.40     0.43
HUB     15.05     0.00    -0.02   482.40    -0.17   482.40     0.43

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     39.46    46.36    -6.90   396.88   624.78    15.63   532.36     0.55
MEAN    36.04    43.40    -7.36   350.77   596.55    15.63   532.36     0.53
HUB     31.69    38.84    -7.15   297.61   566.90    15.63   532.36     0.50

     ROTOR EXIT CONDITIONS, STAGE            3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   330.22   161.92   287.80  1153.42     0.29
MEAN    17.51   336.82   173.46   288.73  1152.47     0.29
HUB     14.85   364.45   220.45   290.21  1151.56     0.32

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   368.30   229.81     0.32  3210.98
MEAN   346.18   336.45   172.73     0.29  3039.61     1.87
HUB    293.65   299.30    73.20     0.26  3276.16

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.56     1.05    17.53   561.99     1.02   552.88     0.92     0.73
MEAN    18.51     1.05    17.45   561.44     1.02   551.97     0.92     0.73
HUB     18.58     1.05    17.33   562.19     1.02   551.10     0.92     0.73

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     29.36    38.61    31.50     7.11     0.93     0.45     2.90
MEAN    31.00    30.89    23.50     7.39     0.86     0.48     3.28     0.73
HUB     37.22    14.16     6.50     7.66     0.86     0.52     3.87


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.801

   ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
    R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
    17.392     340.511     174.597     292.342    1152.701       0.295       0.002

    Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
    18.538      17.447     552.191      46.000      30.847      31.500       0.653

   STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
    RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
    17.392     303.852     174.597     350.443    1154.758       0.263       0.206

  BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
     0.950      18.536      17.664     554.163     471.992       0.012       0.305

   VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     17.121     295.175       0.000     295.175    1155.210       0.256       0.214

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
     0.950      17.685     554.597       0.000       0.060       0.037       0.225

   STAGE EXIT CONDITIONS, STAGE            3
     Eff4       Pt4         PR4       Texit        Del T       Ns        Ns nondim
     0.697      18.508       1.045     561.873      10.084     253.754       1.967

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  62803.766       0.409     304.106 1337925.500


    COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          4
 RESET =  0.000BLEED =  0.000 DPInc =13.019   EfDer =  1.000
```

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
85.685	2266.000	18.508	561.873	1.000	1.000	0.980

W Kg/sec = 38.94787

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
70.832	2177.203	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
65916.203	67234.383	2.488	513.330	206.287	401.059	1.944

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	278.25	-0.10	278.25	0.24	365.92
MEAN	16.97	0.00	-0.02	278.25	-0.10	278.25	0.24	
HUB	14.32	0.00	-0.02	278.25	-0.10	278.25	0.24	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.86	46.36	7.50	380.86	471.75	17.78	555.41	0.41
MEAN	50.34	43.80	6.54	335.59	436.01	17.78	555.41	0.38
HUB	45.51	37.84	7.67	283.17	397.07	17.78	555.41	0.34

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	336.59	166.36	292.61	1163.27	0.29
MEAN	16.57	342.40	175.72	293.87	1162.18	0.29
HUB	13.89	368.65	220.62	295.35	1161.06	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	358.42	206.99	0.31	3142.68	
MEAN	327.74	330.86	152.02	0.28	2914.04	1.43
HUB	274.67	300.25	54.05	0.26	3065.83	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.58	1.06	18.47	571.85	1.02	562.39	0.92	0.91
MEAN	19.50	1.05	18.36	571.12	1.02	561.34	0.92	0.91
HUB	19.55	1.06	18.23	571.61	1.02	560.26	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	29.62	35.28	31.50	3.78	0.93	0.30	2.90	
MEAN	30.88	27.35	23.50	3.85	0.93	0.30	3.29	0.91
HUB	36.76	10.37	6.50	3.87	0.93	0.31	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	1.000

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	338.271	176.711	288.445	1162.837	0.291	0.049

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.531	18.415	561.973	46.000	31.493	32.400	0.907

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	303.026	176.711	350.787	1164.788	0.260	0.233

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.529	18.630	563.861	456.573	0.011	0.323

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	288.506	0.000	288.506	1165.528	0.248	0.226

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.684	564.578	0.000	0.060	0.037	0.278

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.877	19.499	1.054	571.528	9.655	251.046	1.946

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
60139.379	0.431	291.204	769064.500

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 5

RESET = 0.000BLEED = 0.000 DPInc =13.019 EfDer = 0.995

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
85.685	2266.000	19.499	571.528	1.000	1.000	0.980

W Kg/sec = 38.94787

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
67.807	2158.736	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
65916.203	67234.383	2.581	509.668	197.479	390.276	1.976

ROTOR LEADING EDGE CONDITIONS, STAGE 5

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	18.32	0.00	-0.02	269.99	-0.09	269.99	0.23	345.11
MEAN	15.91	0.00	-0.02	269.99	-0.09	269.99	0.23	
HUB	13.07	0.00	-0.02	269.99	-0.09	269.99	0.23	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	53.31	47.36	5.95	362.27	451.89	18.78	565.44	0.39
MEAN	49.38	44.80	4.58	314.67	414.70	18.78	565.44	0.36
HUB	43.76	38.84	4.92	258.45	373.82	18.78	565.44	0.32

ROTOR EXIT CONDITIONS, STAGE 5 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	17.94	322.25	151.97	284.17	1172.65	0.27
MEAN	15.50	326.07	157.68	285.41	1171.51	0.28
HUB	12.59	347.46	196.12	286.82	1170.36	0.30

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	354.76	349.11	202.79	0.30	2727.96	
MEAN	306.46	321.86	148.78	0.27	2445.07	1.41
HUB	248.96	291.65	52.84	0.25	2470.37	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	20.45	1.05	19.41	580.19	1.02	571.52	0.92	0.91
MEAN	20.35	1.04	19.29	579.29	1.01	570.41	0.92	0.91
HUB	20.36	1.04	19.15	579.37	1.01	569.29	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	28.14	35.51	31.50	4.01	0.93	0.28	2.90	
MEAN	28.92	27.53	23.50	4.03	0.92	0.28	3.34	0.91
HUB	34.36	10.44	6.50	3.94	0.92	0.28	4.06	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.995

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
15.219	329.459	160.567	287.684	1171.657	0.281	-0.007

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
20.368	19.278	570.554	46.000	29.167	33.000	3.833

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
15.219	305.278	160.567	344.929	1172.972	0.260	0.128

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   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.362      19.424     571.835     440.827       0.025       0.295

    VANED DIFFUSER EXIT:
   R4          C4          Cu4        Cm4          Ao4           Mach4       cp 3-4
     14.701     286.452       0.000     286.452    1173.926       0.244       0.216

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      19.517     572.765       0.000       0.060       0.042       0.212

    STAGE EXIT CONDITIONS, STAGE             5
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.864      20.344       1.043     579.615       8.088     281.371       2.181

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  50388.125       0.400     243.987  811109.250

   OVERALL EXIT CONDITIONS; ALL           5   STAGES

  Del Enthalpy   GHP        MassFloS1cor  OPR      Efficiency      Rotor1Inc   TR
    353767.91   1712.9988     83.7060      1.3466      0.8198     13.0194      1.1087


********************************************************************
*************** AXIAL & CENTRIFUGAL COMPRESSOR BLADE DESIGN 1-D ****
********************    COMDES Version 12.0 ************************
***************   with Stator Vane, Gasplus Prop  ******************
********************************************************************

   Fan-Core + 4 Stage LPC 60% Stat 2 40% Ice Block 3-11-2011

     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE          1
 RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  0.966

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     82.317    2266.000      15.107     522.810       1.000       1.000       0.980
W Kg/sec =   37.41694

   W cor      RPM cor        GAMMA       Cp         R           Blades       THK
     80.416    2257.076       1.402       0.249      53.349      32.000       0.050

   CFM       SCFM           A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63325.230   64591.602       3.551     831.557     234.188     619.754       2.646

     ROTOR LEADING EDGE CONDITIONS, STAGE           1

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     20.63     0.00    -0.02   185.28    -0.06   185.28     0.17   406.33
 MEAN    17.06     0.00    -0.02   185.28    -0.06   185.28     0.17
 HUB     12.51     0.00    -0.02   185.28    -0.06   185.28     0.17

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     65.58    50.47    15.11   407.95   448.11    14.82   519.94     0.40
 MEAN    61.23    47.20    14.03   337.36   384.95    14.82   519.94     0.34
 HUB     53.17    38.62    14.55   247.38   309.13    14.82   519.94     0.28

     ROTOR EXIT CONDITIONS, STAGE            1     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.700       0.050       0.950      32.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
 TIP     20.63   370.79   272.24   251.74  1128.47     0.33
 MEAN    18.04   377.90   279.72   254.10  1126.05     0.34
 HUB     15.00   412.59   322.33   257.56  1122.89     0.37

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    407.95   285.99   135.71     0.25  5617.60
 MEAN   356.65   265.49    76.94     0.24  5046.04     1.66
 HUB    296.62   258.84    25.71     0.23  4835.73
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	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	16.76	1.11	15.55	540.65	1.03	529.17	0.92	0.88
MEAN	16.58	1.10	15.34	538.84	1.03	526.91	0.92	0.88
HUB	16.52	1.09	15.05	538.17	1.03	523.95	0.92	0.88

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	47.24	28.33	24.20	4.13	0.93	0.47	2.90	
MEAN	47.75	16.85	12.70	4.15	0.95	0.42	3.51	0.88
HUB	51.37	-5.70	-9.30	3.60	0.95	0.28	4.78	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.966

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
18.071	381.639	279.172	260.213	1126.210	0.339	-0.001

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
16.607	15.337	527.057	24.000	47.013	35.400	-11.613

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
18.071	278.271	279.172	394.172	1132.281	0.246	0.450

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	16.583	15.900	532.754	528.796	0.028	0.564

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
18.083	259.620	0.000	259.620	1133.171	0.229	0.449

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	15.924	533.592	0.000	0.060	0.078	0.468

STAGE EXIT CONDITIONS, STAGE 1

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.826	16.518	1.093	539.222	16.412	175.209	1.358

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
102177.656	0.614	475.312	779103.000

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 2

RESET = 0.000BLEED = 0.000 DPInc =14.028 EfDer = 0.974

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
82.317	2266.000	16.518	539.222	1.000	1.000	0.980

W Kg/sec = 37.41694

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
74.693	2222.462	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
63325.230	64591.602	2.715	590.487	217.522	474.134	2.180

ROTOR LEADING EDGE CONDITIONS, STAGE 2

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.55	0.00	-0.02	248.67	-0.09	248.67	0.22	398.55
MEAN	18.08	0.00	-0.02	248.67	-0.09	248.67	0.22	
HUB	15.21	0.00	-0.02	248.67	-0.09	248.67	0.22	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	58.54	46.36	12.18	406.37	476.49	15.97	534.06	0.42
MEAN	55.18	42.30	12.88	357.49	435.54	15.97	534.06	0.38
HUB	50.43	37.84	12.59	300.77	390.32	15.97	534.06	0.34

ROTOR EXIT CONDITIONS, STAGE 2 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	20.42	342.35	219.57	262.67	1143.81	0.30
MEAN	18.01	344.46	220.69	264.48	1141.98	0.30
HUB	15.22	367.71	253.29	266.56	1140.12	0.32

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	403.80	320.83	184.22	0.28	4485.43	
MEAN	356.14	297.15	135.45	0.26	3976.14	1.61
HUB	301.03	270.80	47.74	0.24	3857.12	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	17.92	1.08	16.83	553.47	1.03	543.68	0.92	0.89
MEAN	17.75	1.07	16.67	551.85	1.02	541.94	0.92	0.89
HUB	17.71	1.07	16.48	551.47	1.02	540.18	0.92	0.89

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	39.89	35.04	31.50	3.54	0.93	0.41	2.90	
MEAN	39.84	27.12	23.50	3.62	0.94	0.39	3.30	0.89
HUB	43.54	10.15	6.50	3.65	0.94	0.39	3.92	

blockage3	Cor/U1	Cor/Incid
0.550	1.000	0.974

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
17.960	555.817	221.308	509.859	1125.549	0.494	-1.425

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
17.783	15.050	526.463	46.000	23.464	30.600	7.136

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
17.960	523.116	221.308	568.003	1128.695	0.463	-1.175

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.550	17.762	15.328	529.409	289.961	0.028	0.207

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
17.823	514.754	0.000	514.754	1129.467	0.456	0.288

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.550	15.376	530.134	0.000	0.060	0.053	-1.133

STAGE EXIT CONDITIONS, STAGE 2

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.850	17.734	1.074	552.263	13.041	203.197	1.575

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
81209.250	0.498	377.771	712383.812

COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE 3

RESET = 0.000BLEED = 0.000 DPInc =14.028 EfDer = 0.828

W act	RPM act	Pt	Tt	POTS	POTH	AeroBl
82.317	2266.000	17.734	552.263	1.000	1.000	0.580

W Kg/sec = 37.41694

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
70.409	2196.064	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
63325.230	64591.602	1.574	322.834	205.050	248.585	1.212

ROTOR LEADING EDGE CONDITIONS, STAGE 3

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	20.07	0.00	-0.02	459.21	-0.16	459.21	0.40	384.62

```
MEAN    17.74     0.00    -0.02   459.21    -0.16   459.21     0.40
HUB     15.05     0.00    -0.02   459.21    -0.16   459.21     0.40

      BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
TIP     40.85    46.36    -5.51   396.88   607.05    15.84   534.65     0.54
MEAN    37.39    43.40    -6.01   350.77   577.95    15.84   534.65     0.51
HUB     32.96    38.84    -5.88   297.61   547.30    15.84   534.65     0.48

     ROTOR EXIT CONDITIONS, STAGE             3     SOLUTION IS CONVERGED
   B2 axial    THK        AeroBl     Blades2
     0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2         Mach2
TIP     19.81   324.74   172.81   274.94  1154.94     0.28
MEAN    17.51   330.39   181.66   275.97  1153.81     0.29
HUB     14.85   356.70   224.17   277.45  1152.73     0.31

      U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
TIP    391.73   351.46   218.92     0.30  3426.58
MEAN   346.18   321.29   164.53     0.28  3182.99     1.90
HUB    293.65   286.02    69.49     0.25  3331.27

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
TIP     18.67     1.05    17.68   563.14     1.02   554.34     0.92     0.76
MEAN    18.61     1.05    17.58   562.37     1.02   553.26     0.92     0.76
HUB     18.65     1.05    17.45   562.84     1.02   552.22     0.92     0.76

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
TIP     32.15    38.53    31.50     7.03     0.93     0.47     2.90
MEAN    33.36    30.80    23.50     7.30     0.87     0.49     3.28     0.76
HUB     38.94    14.06     6.50     7.56     0.87     0.53     3.87


   blockage3   Cor/U1    Cor/Incid
      0.950       1.000       0.828

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m         C3          Cu3         Cm3          Ao3          Mach3        cp 2-3
     17.392     333.911     182.849     279.397    1154.038       0.289       0.003

     Pt3         Ps3         Ts3         Vane No.     Alpha3     Vane A3      Incid3
     18.632      17.578     553.475      46.000      33.202      31.500      -1.702

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth         Cuth        Cmth         Aoth         Machth      cp 2-Th
     17.392     289.992     182.849     342.825    1156.422       0.251       0.247

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      18.630      17.832     555.763     471.992       0.012       0.340

    VANED DIFFUSER EXIT:
   R4          C4          Cu4         Cm4          Ao4           Mach4       cp 3-4
     17.121     281.762       0.000     281.762    1156.830       0.244       0.251

   Blockage4    Ps4        Ts4         Vane Angle4   Vane Thk4    w2-4OD      cp 2-4
      0.950      17.849     556.156       0.000       0.060       0.038       0.263

    STAGE EXIT CONDITIONS, STAGE             3
      Eff4       Pt4          PR4       Texit        Del T       Ns        Ns nondim
      0.724      18.602       1.049     562.785      10.522     239.802       1.859

Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  65533.887       0.427     304.852 1273544.000


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           4
 RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     82.317    2266.000      18.602     562.785       1.000       1.000       0.980
W Kg/sec =   37.41694
```

W cor	RPM cor	GAMMA	Cp	R	Blades	THK
67.758	2175.438	1.402	0.249	53.349	56.000	0.050

CFM	SCFM	A1/A*	Area1	A*	AthrRotor	ChokeMargin
63325.230	64591.602	2.601	513.330	197.334	401.059	2.032

ROTOR LEADING EDGE CONDITIONS, STAGE 4

	R1	Stator	Alfa	C1	CU1	Cm1	Abs MACH	U1 corrected
TIP	19.26	0.00	-0.02	265.70	-0.09	265.70	0.23	365.63
MEAN	16.97	0.00	-0.02	265.70	-0.09	265.70	0.23	
HUB	14.32	0.00	-0.02	265.70	-0.09	265.70	0.23	

	BetaFlo	BetaBlade	Incid	U1	W1	Ps1	Ts1	Rel Mach
TIP	55.11	46.36	8.75	380.86	464.45	17.93	556.89	0.40
MEAN	51.64	43.80	7.84	335.59	428.11	17.93	556.89	0.37
HUB	46.83	37.84	8.99	283.17	388.37	17.93	556.89	0.34

ROTOR EXIT CONDITIONS, STAGE 4 SOLUTION IS CONVERGED

B2 axial	THK	AeroBl	Blades2
0.500	0.050	0.950	56.000

	R2	C2	Cu2	Cm2	Ao2	Mach2
TIP	18.88	330.00	176.15	279.06	1165.20	0.28
MEAN	16.57	334.78	182.90	280.41	1163.95	0.29
HUB	13.89	359.63	223.23	281.96	1162.69	0.31

	U2	W2	Wu2	MachRel2	DelRCu	Ws1/W2
TIP	373.34	341.70	197.19	0.29	3327.50	
MEAN	327.74	315.61	144.84	0.27	3032.89	1.48
HUB	274.67	286.61	51.44	0.25	3101.96	

	Pt2	PR	Ps2	Tt2	TR	Ts2	Eff2uCor	Eff2incCor
TIP	19.74	1.06	18.67	573.35	1.02	564.26	0.92	0.91
MEAN	19.64	1.06	18.54	572.41	1.02	563.06	0.92	0.91
HUB	19.66	1.06	18.40	572.63	1.02	561.84	0.92	0.91

	Alfa2	Beta FLO	Beta BLADE	Deviat	Slip F.	Diff Fct	Solidity	AvgRotEff
TIP	32.26	35.25	31.50	3.75	0.93	0.33	2.90	
MEAN	33.11	27.32	23.50	3.82	0.93	0.33	3.29	0.91
HUB	38.37	10.34	6.50	3.84	0.93	0.33	3.90	

blockage3	Cor/U1	Cor/Incid
0.950	1.000	0.999

ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE

R3m	C3	Cu3	Cm3	Ao3	Mach3	cp 2-3
16.481	331.070	183.927	275.279	1164.566	0.284	0.047

Pt3	Ps3	Ts3	Vane No.	Alpha3	Vane A3	Incid3
19.667	18.593	563.648	46.000	33.749	32.400	-1.349

STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:

RCG	Cth	Cuth	Cmth	Aoth	Machth	cp 2-Th
16.481	288.816	183.927	342.409	1166.823	0.248	0.270

BlockageThr	PtTh	PsTh	TsTh	AreaTh	w 2-Th	DiffFact4
0.950	19.666	18.844	565.834	456.573	0.011	0.356

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
16.096	275.052	0.000	275.052	1167.491	0.236	0.261

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	18.891	566.483	0.000	0.060	0.037	0.311

STAGE EXIT CONDITIONS, STAGE 4

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.878	19.636	1.056	572.799	10.014	238.681	1.850

```
Del Enthalpy   Del_H/U^2    GHP      Reynolds#
  62379.285       0.448     290.177  736033.125


     COMPRESSOR INLET CONDITIONS - ANALYSIS, STAGE           5
 RESET =  0.000BLEED =  0.000 DPInc =14.028   EfDer =  0.999

   W act      RPM act        Pt         Tt           POTS        POTH       AeroBl
     82.317    2266.000      19.636     572.799       1.000       1.000       0.980
W Kg/sec =   37.41694

   W cor      RPM cor        GAMMA       Cp          R           Blades       THK
     64.758    2156.338       1.402       0.249      53.349      56.000       0.050

   CFM       SCFM            A1/A*      Area1        A*     AthrRotor  ChokeMargin
  63325.230   64591.602       2.702     509.668     188.598     390.276       2.069

     ROTOR LEADING EDGE CONDITIONS, STAGE             5

        R1      Stator    Alfa     C1      CU1      Cm1     Abs MACH  U1 corrected
 TIP     18.32     0.00    -0.02   257.50    -0.09   257.50     0.22   344.73
 MEAN    15.91     0.00    -0.02   257.50    -0.09   257.50     0.22
 HUB     13.07     0.00    -0.02   257.50    -0.09   257.50     0.22

       BetaFlo   BetaBlade Incid   U1       W1       Ps1      Ts1     Rel Mach
 TIP     54.60    47.36     7.24   362.27   444.53    18.98   567.26     0.38
 MEAN    50.71    44.80     5.91   314.67   406.67    18.98   567.26     0.35
 HUB     45.12    38.84     6.28   258.45   364.90    18.98   567.26     0.31

      ROTOR EXIT CONDITIONS, STAGE             5     SOLUTION IS CONVERGED
    B2 axial    THK        AeroBl     Blades2
      0.500       0.050       0.950      56.000

         R2     C2      Cu2      Cm2     Ao2          Mach2
 TIP     17.94   315.35   161.90   270.62  1174.90     0.27
 MEAN    15.50   318.04   164.93   271.94  1173.62     0.27
 HUB     12.59   338.06   198.81   273.42  1172.33     0.29

       U2       W2       Wu2     MachRel2  DelRCu     Ws1/W2
 TIP    354.76   332.31   192.86     0.28  2906.03
 MEAN   306.46   306.57   141.53     0.26  2557.37     1.45
 HUB    248.96   277.98    50.15     0.24  2504.15

        Pt2       PR      Ps2     Tt2       TR      Ts2      Eff2uCor   Eff2incCor
 TIP     20.66     1.05    19.65   582.02     1.02   573.72     0.92     0.91
 MEAN    20.54     1.05    19.52   580.92     1.01   572.47     0.92     0.91
 HUB     20.52     1.04    19.37   580.75     1.01   571.21     0.92     0.91

        Alfa2  Beta FLO Beta BLADE Deviat   Slip F. Diff Fct Solidity  AvgRotEff
 TIP     30.89    35.48    31.50     3.98     0.93     0.31     2.90
 MEAN    31.24    27.49    23.50     3.99     0.92     0.31     3.34     0.91
 HUB     36.02    10.39     6.50     3.89     0.92     0.30     4.06


  blockage3   Cor/U1    Cor/Incid
     0.950       1.000       0.999

    ROTOR-STATOR GAP EXIT: STATOR LEADING EDGE
     R3m        C3          Cu3        Cm3          Ao3          Mach3        cp 2-3
     15.219     321.465     167.951     274.103    1173.756       0.274      -0.007

     Pt3         Ps3        Ts3         Vane No.     Alpha3     Vane A3      Incid3
     20.553      19.508     572.602      46.000      31.497      33.000       1.503

    STATOR / VANED DIFFUSER THROAT IS NOT CHOKED:
     RCG         Cth        Cuth        Cmth         Aoth         Machth      cp 2-Th
     15.219     290.438     167.951     335.502    1175.380       0.247       0.172

   BlockageThr  PtTh        PsTh       TsTh        AreaTh        w 2-Th  DiffFact4
      0.950      20.551      19.695     574.187     440.827       0.022       0.328
```

VANED DIFFUSER EXIT:

R4	C4	Cu4	Cm4	Ao4	Mach4	cp 3-4
14.701	272.613	0.000	272.613	1176.237	0.232	0.256

Blockage4	Ps4	Ts4	Vane Angle4	Vane Thk4	w2-4OD	cp 2-4
0.950	19.780	575.025	0.000	0.060	0.037	0.252

STAGE EXIT CONDITIONS, STAGE 5

Eff4	Pt4	PR4	Texit	Del T	Ns	Ns nondim
0.876	20.534	1.046	581.230	8.431	266.357	2.065

Del Enthalpy	Del_H/U^2	GHP	Reynolds#
52524.855	0.417	244.336	776020.375

OVERALL EXIT CONDITIONS; ALL 5 STAGES

Del Enthalpy	GHP	MassFloS1cor	OPR	Efficiency	Rotor1Inc	TR
363824.94	1692.4496	80.4157	1.3592	0.8233	14.0280	1.1117

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13. SUPPLEMENTARY NOTES
The contents of this report were presented under the title "Engine Icing Modeling and Simulation (Part I): Ice Crystal Accretion on Compression System Components and Modeling its Effects on Engine Performance," SAE 2011-38-0025 at the International Conference on Aircraft and Engine Icing and Ground Deicing sponsored by SAE International, Chicago, Illinois, June 13-17, 2011.

14. ABSTRACT
The focus of this study is on utilizing a mean line compressor flow analysis code coupled to an engine system thermodynamic code, to estimate the effects of ice accretion on the low pressure compressor, and quantifying its effects on the engine system throughout a notional flight trajectory. In this paper a temperature range in which engine icing would occur was assumed. This provided a mechanism to locate potential component icing sites and allow the computational tools to add blockages due to ice accretion in a parametric fashion. Ultimately the location and level of blockage due to icing would be provided by an ice accretion code. To proceed, an engine system modeling code and a mean line compressor flow analysis code were utilized to calculate the flow conditions in the fan-core and low pressure compressor and to identify potential locations within the compressor where ice may accrete. In this study, an "additional blockage" due to the accretion of ice on the metal surfaces, has been added to the baseline aerodynamic blockage due to boundary layer, as well as the blade metal blockage. Once the potential locations of ice accretion are identified, the levels of additional blockage due to accretion were parametrically varied to estimate the effects on the low pressure compressor blade row performance operating within the engine system environment. This study includes detailed analysis of compressor and engine performance during cruise and descent operating conditions at several altitudes within the notional flight trajectory. The purpose of this effort is to develop the computer codes to provide a predictive capability to forecast the onset of engine icing events, such that they could ultimately help in the avoidance of these events.

15. SUBJECT TERMS
Aircraft icing; Cloud glaciation; Turbine engine; Compressor; Computational fluid dynamics

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